

ENVIRONMENTAL STUDY REPORT


FOUR-LANING OF HIGHWAY 11/17
FROM 8 km WEST OF OUIMET EASTERLY 36 km TO THE
RED ROCK TOWNSHIP WEST BOUNDARY
W.P. 373-90-00

District 61 - Thunder Bay
Northwestern Region


Provincial Highways Class Environmental Assessment
Group 'B' Project


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MINISTRY OF TRANSPORTATION
January 1997

MEMORANDUM FOR THE RECORD

DATE: 10/15/54

TO: SAC, NEW YORK

FROM: SA [Name], NEW YORK

SUBJECT: [Subject Name]

RE: [Subject Name]

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THE PUBLIC RECORD

Copies of this document have been filed with the following offices of the Ministry of Environment and Energy to be placed in the Public Record:

**District Office
435 James Street S.
Thunder Bay, Ontario**

**Regional Office
Approvals and Planning
435 James Street S.
Thunder Bay, Ontario**

To facilitate public review of this report, copies have also been filed at:

**Municipal Office
Township of Dorion
RR#1
Dorion, Ontario**

**Municipal Office
Township of Red Rock
42 Salls St.
Red Rock, Ontario**

**Red Rock Public Library
42 Salls Street
Red Rock, Ontario**

**Nipigon Public Library
25 3rd Street
Nipigon, Ontario**

**Brodie Resource Library
216 Brodie Street S.
Thunder Bay, Ontario**

**Waverley Resource Library
285 Red River Road
Thunder Bay, Ontario**

EXECUTIVE SUMMARY

DESCRIPTION OF THE UNDERTAKING

This study is one of four studies being carried out by the Ministry of Transportation (MTO) in response to the Province of Ontario's commitment to protect property for the four-laning the Trans-Canada Highway (Highway 11/17, Terry Fox Courage Highway) between Thunder Bay and Nipigon. This report deals with the section of Highway 11/17 from 8 km west of Ouimet easterly 36 km to the Red Rock Township west boundary.

The Recommended Plan comprises:

- a new route for eastbound lanes only from Welch Creek to realigned Dorion Amethyst Mine Road; existing 11/17 will operate as westbound lanes (6 km)
- twinning on the south side of existing Highway 11/17 from Dorion Amethyst Mine Road to Ouimet (2 km)
- a short section of four new lanes south of the existing CPR overhead structure at Ouimet (2 km)
- twinning on the north side of existing Highway 11/17 from Ouimet to the Dorion Loop Road east leg (6 km)
- four new lanes from Dorion Loop Road east leg, across Wolf River near existing Highway 11/17, to Stewart Lake Road (7 km)
- four new lanes from Coughlin Road, across Black Sturgeon River to the Red Rock Township west boundary (5 km)
- improvements at intersecting roads
- identifying the properties that require protection for the new corridor and future interchanges

PURPOSE OF THE UNDERTAKING

- provide a safer facility
- improve highway service
- provide twin bridges at all river and stream crossings
- provide continuous emergency east-west access between Thunder Bay and Nipigon

while minimizing impacts to the social, natural and economic environments.

JUSTIFICATION FOR THE UNDERTAKING

- The risk of closure of the existing two-lane highway. Closure of the Trans-Canada highway would have an impact on the economy of the region and the transcontinental movement of goods and people within Canada.
- Existing and projected travel demand along the highway. MTO currently receives complaints regarding delays caused by slow vehicles.
- The accident rates for portions of Highway 11/17 in this study area are higher than the provincial average.
- The benefit to the region of economic development and the improved movement of natural resources.

BACKGROUND

The development of the Trans-Canada Highway to four lanes has been discussed for many years, with the Province continually receiving petitions from municipalities and other organizations throughout northern Ontario. Over the last 10 to 15 years, the Province has responded by constructing the Trans-Canada Highway to four lanes in key locations, such as the approaches to major urban centres where traffic volumes and development have been greatest.

In December 1989, the Ministers of Transportation and Northern Development and Mines announced an accelerated program for highway improvements in northern Ontario. This included the four-laning of Highway 11/17 between Thunder Bay and Nipigon as part of the Transportation Capital Program. With this announcement, commitments were made to identify a corridor for any future 4-laning in the study area with the section of Highway 11/17 through Nipigon as a priority.

The four-laning project is divided into four study areas:

- from Highway 527 to Mackenzie Station Road
- from Mackenzie Station Road to Welch Creek
- from Welch Creek to the Township of Red Rock west boundary (Dorion area)(the subject of this study)
- from the Township of Red Rock west boundary to the junctions of Highways 11 and 17 (Nipigon area)

PUBLIC CONSULTATION

Public Information Centres (PIC) were held at five key points in the study process. These information centres provided an opportunity for the public to learn about the study and provide input to the Study Team. Following each information centre, a report was compiled to document the comments received from the public and to summarize the conclusions drawn from the comments received.

In addition to the information centres, meetings and/or interviews were held with local businesses, interest groups, property owners, members of the public and other agencies.

AGENCY CONTACT

An in-depth consultation process was undertaken with affected ministries, agencies and municipalities. Representatives of government ministries and agencies who have a responsibility to review and comment on environmental assessment and utility companies (pipelines, railways, Bell, Hydro) were contacted for information on their existing and future plant requirements.

Before each information centre, a meeting was held with government ministry agencies and other affected agencies to present the project status and to receive their comments. Also, before each information centre, a presentation was made to representatives of each municipality.

POTENTIAL EFFECTS AND MITIGATION MEASURES

Potential effects of the recommended plan were identified as they pertain to the natural, cultural, social and economic environments. Mitigation measures have also been identified.

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CHAPTER 1 - THE ENVIRONMENTAL STUDY REPORT

The Environmental Study Report (ESR) is prepared in compliance with the requirements of the Provincial Highways Class Environmental Assessment which has been accepted and approved under the Environmental Assessment Act. The ESR documents the environmentally significant aspects of the planning, design, construction and operation of specific Group 'B' projects, which fall within the definition of the class. It includes a description of the project and its purpose, specific environmental effects and mitigation measures, and committed monitoring procedures associated with the implementation of the project.

Other aspects of this class of undertaking such as the environmental assessment process and alternatives to the undertaking are contained in the Provincial Highways Class Environmental Assessment. Readers interested in these matters are encouraged to refer to that document.

In addition, detailed background information is contained in the environmental study file and Preliminary Design Report. The project manager or environmental planner is available to discuss this information.

After clearance of the Environmental Study Report, the selected corridor will be designated as a controlled access highway (CAH).

This document focuses on the need to protect a highway corridor for a future four-lane highway in the study area. The need for protection of a corridor now is based on the province's long-term plan to four-lane the Trans-Canada Highway from Thunder Bay to Nipigon. This ESR is being prepared during preliminary design because there is a need now to protect a corridor for the four-lane highway.

Protecting the corridor will allow development to continue in areas not affected by the future four-lane highway. For example, in sections of the study area where the four-lane highway by-passes the existing highway, the Ministry of Transportation's restrictions on new entrances and development along the existing highway may be relaxed to some extent. In other words, the designation of the corridor will confirm its location and allow the Ministry of Transportation to permit entrances to sections of Highway 11/17 within the study area that will not be affected by the future four-lane highway.

A glossary of technical terms is provided in the appendix.

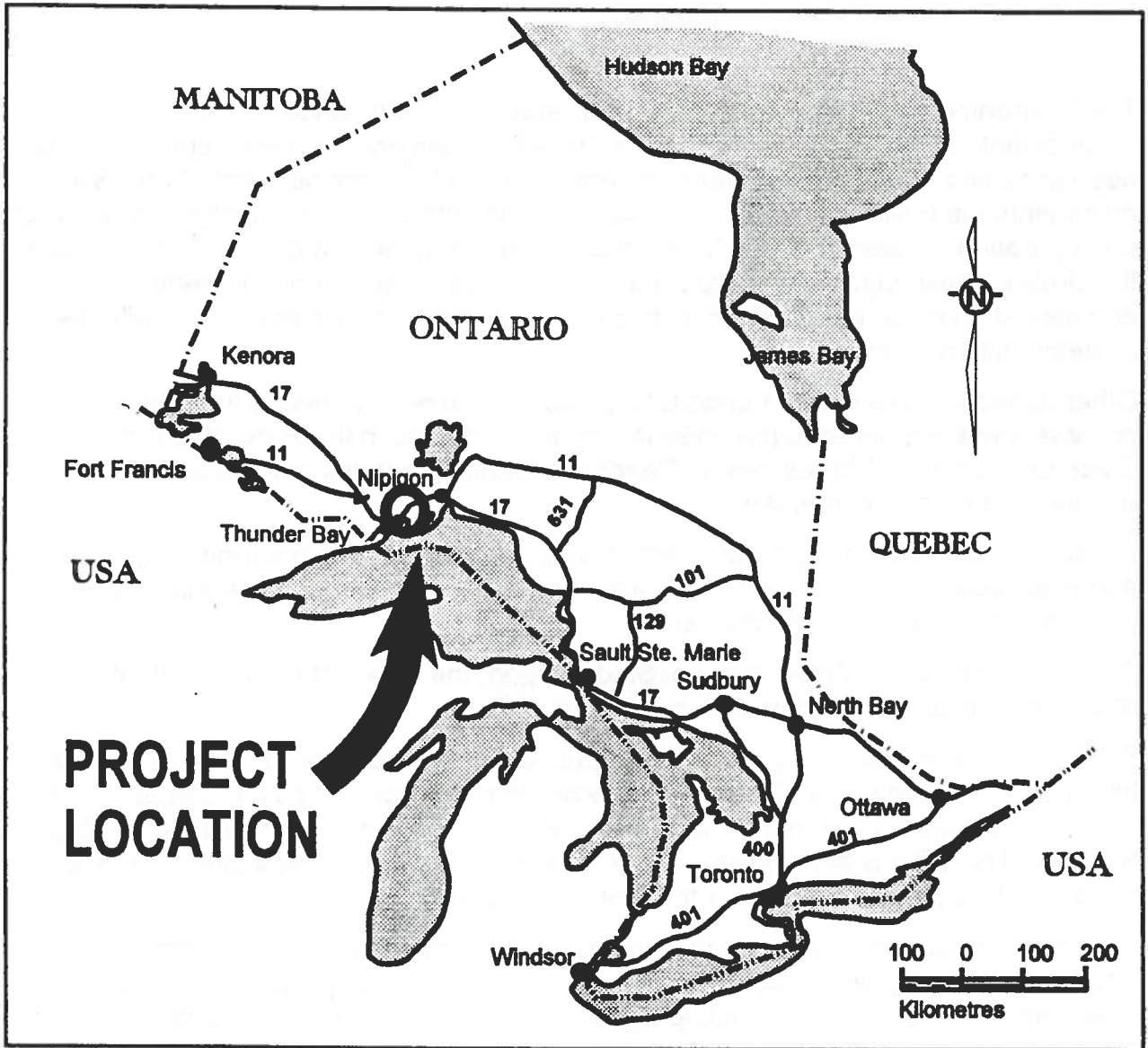


Figure 1 - Provincial Setting

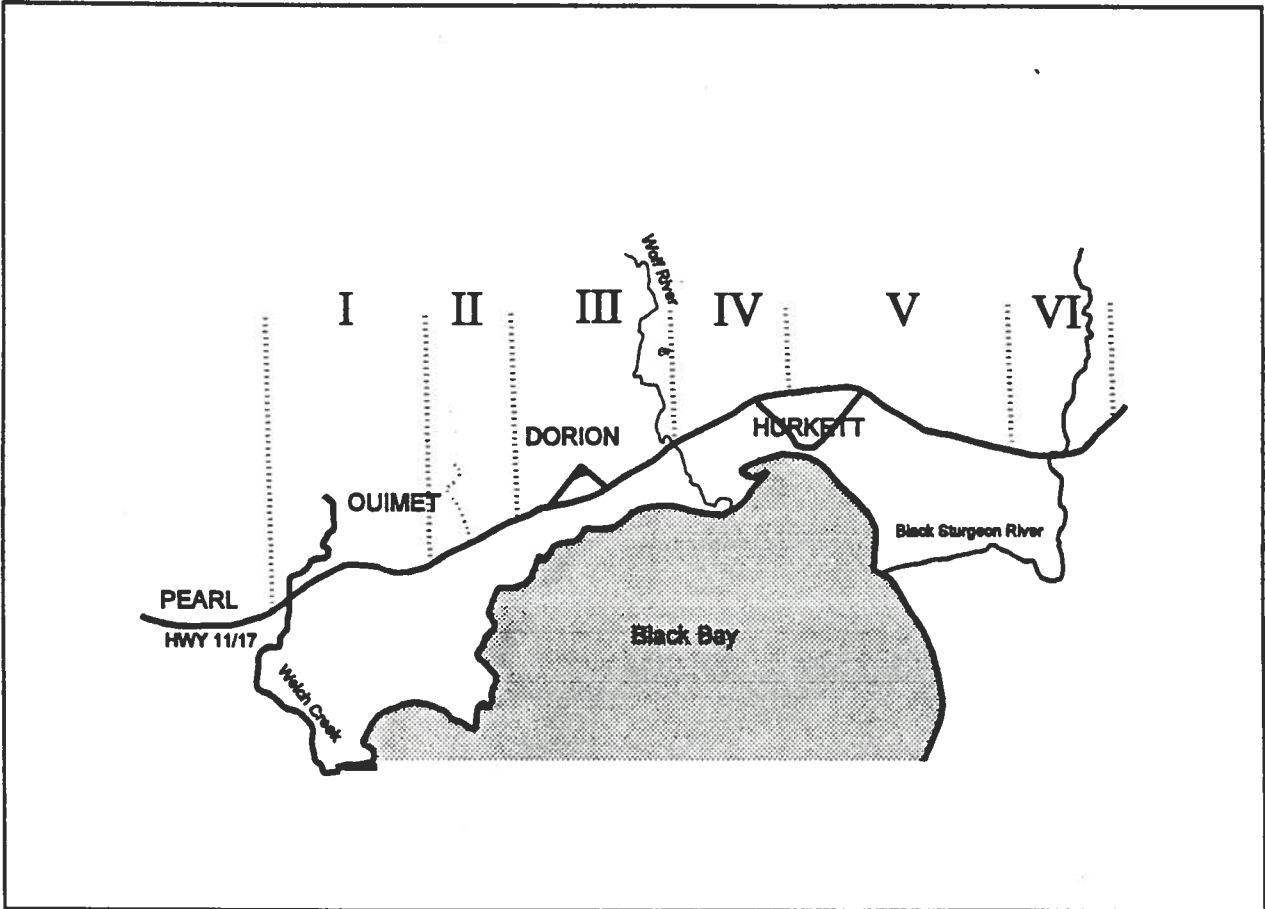


Figure 2 - Study Area - The study area was divided into six manageable sections.



CHAPTER 2 - PROJECT SUMMARY

2.1. LOCATION

This study is one of four studies carried out to identify a four-lane corridor for Highway 11/17 between Thunder Bay, Ontario and Nipigon, Ontario. This ESR deals with the 36 kilometre long section of the highway from 8 km west of Ouimet to the western boundary of the Township of Red Rock.

2.2. DESCRIPTION OF THE PROJECT

The recommended plan is a combination of twinning and new alignment sections. Over the project length of approximately 36 km, 65% is twinning of the existing highway and 35% is new alignment. For the twinned section, existing side roads will be retained at the Dorion Amethyst Mine Road, unnamed side road (Station 10+480 (Dorion)), Dorion Loop Road (west leg), Stewart Lake Road, Highway 582, Squaw Valley Road and Coughlin Road. For the new alignment section, at grade public intersections will be located at the Ouimet Canyon Road, Dorion Loop Road (east leg), unnamed side road (Station 18+930 Dorion)), Wolf River Road, side road at Dorion/Stirling Townships boundary (north leg intersecting with westbound lanes only (Station 22+220 (Dorion))), Black Sturgeon Road and existing Highway 11/17 at the Red Rock Township West Boundary.

The Recommended plan comprises:

Section I

- a new route for eastbound lanes only from Welch Creek to realigned Dorion Amethyst Mine Road; existing 11/17 will operate as the future westbound lanes

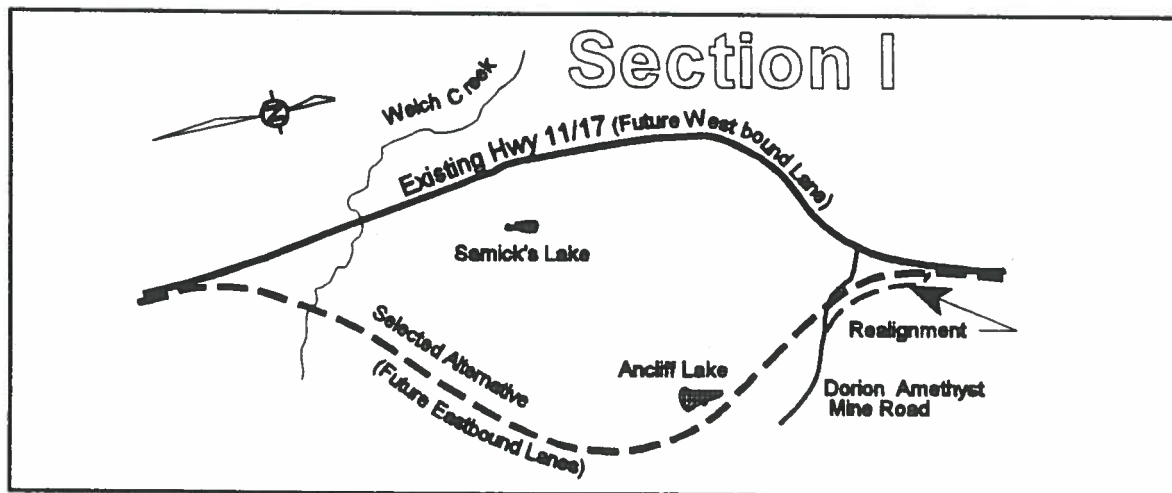


Figure 3 - Section I Selected Alternative

Section II

- twinning on the south side of existing Highway 11/17 from Dorion Amethyst Mine Road to Ouimet
- a short section of four new lanes south of the existing CPR overhead structure at Ouimet

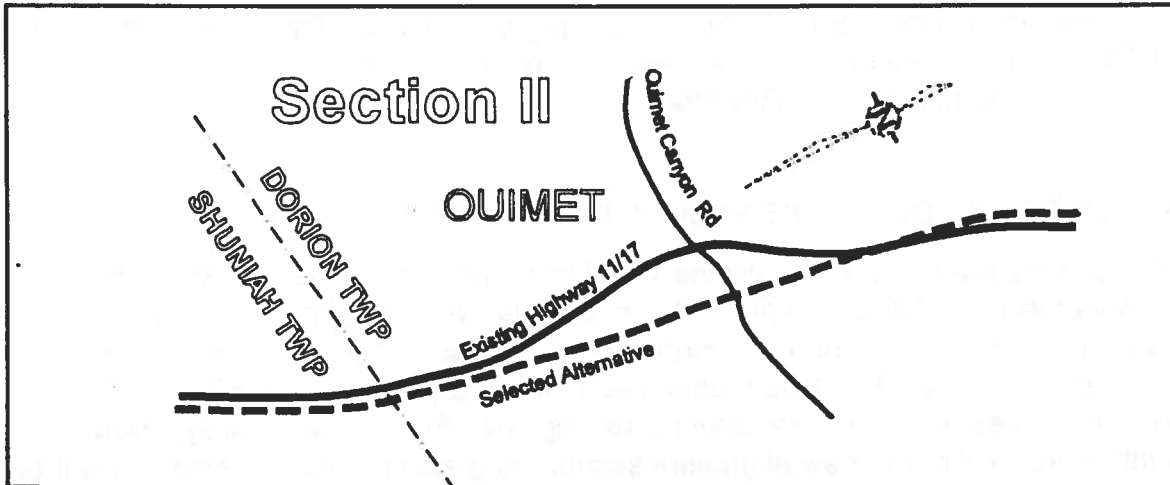


Figure 4 - Section II Selected Alternative

Section III

- twinning on the north side of existing Highway 11/17 from Ouimet to the Dorion East Loop Road
- four new lanes from Dorion East Loop Road across Wolf River near existing Highway 17

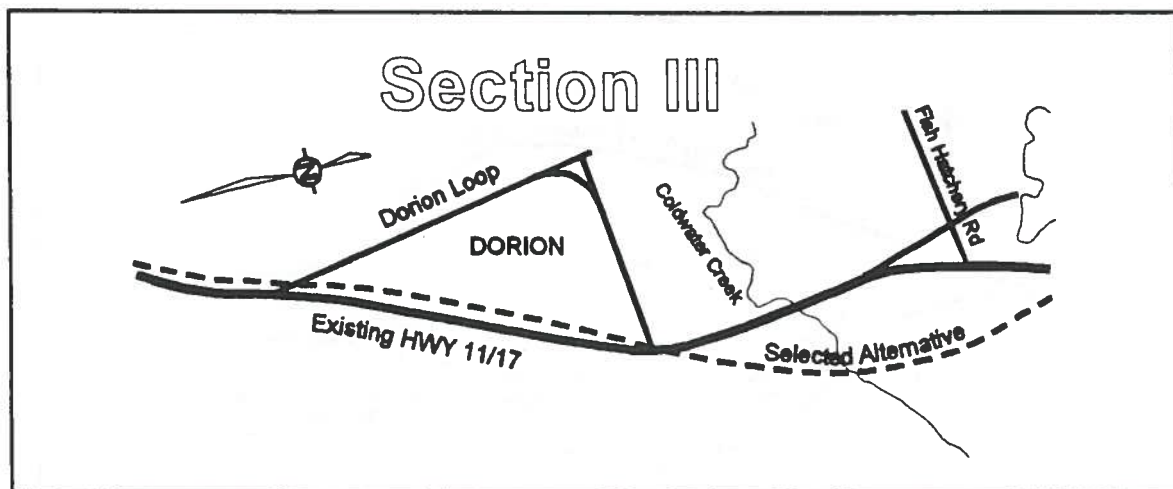


Figure 5 - Section III Selected Alternative

Section IV

- four new lanes across Wolf River near existing Highway 17, to Stewart Lake Road

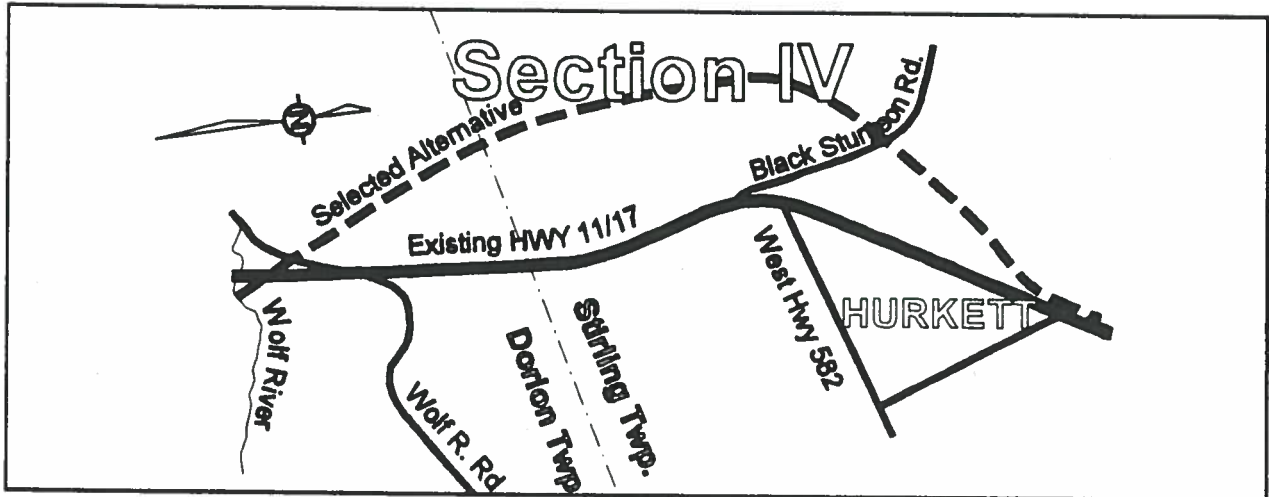


Figure 6 - Section IV Selected Alternative

Section V

- twinning on the north side of existing Highway 11/17 from Stewart Lake Road to Coughlin Road

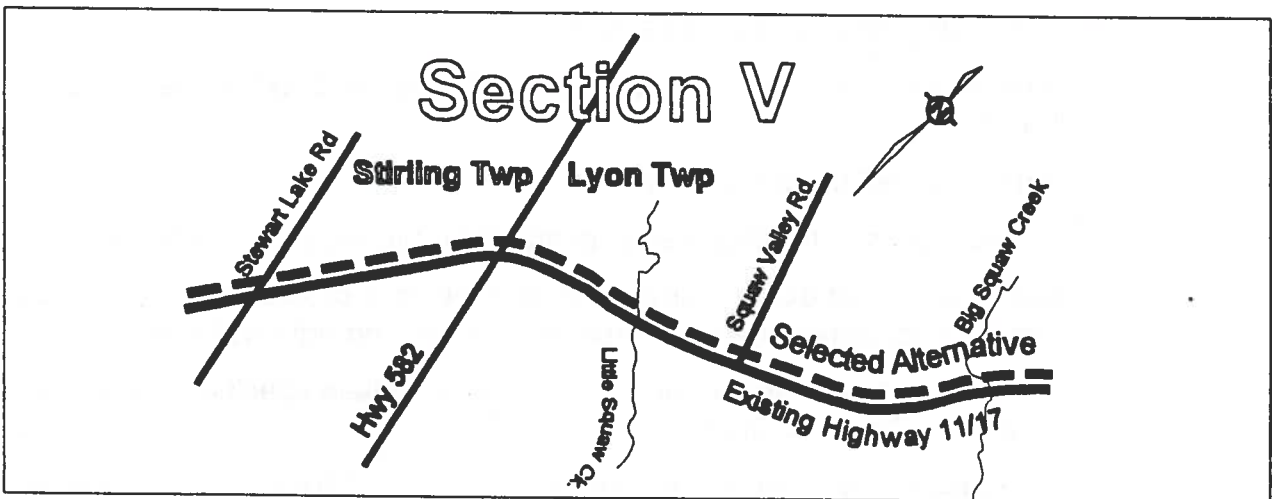


Figure 7- Section V Selected Alternative

Section VI

- four new lanes from Coughlin Road, across Black Sturgeon River to the Red Rock Township west boundary

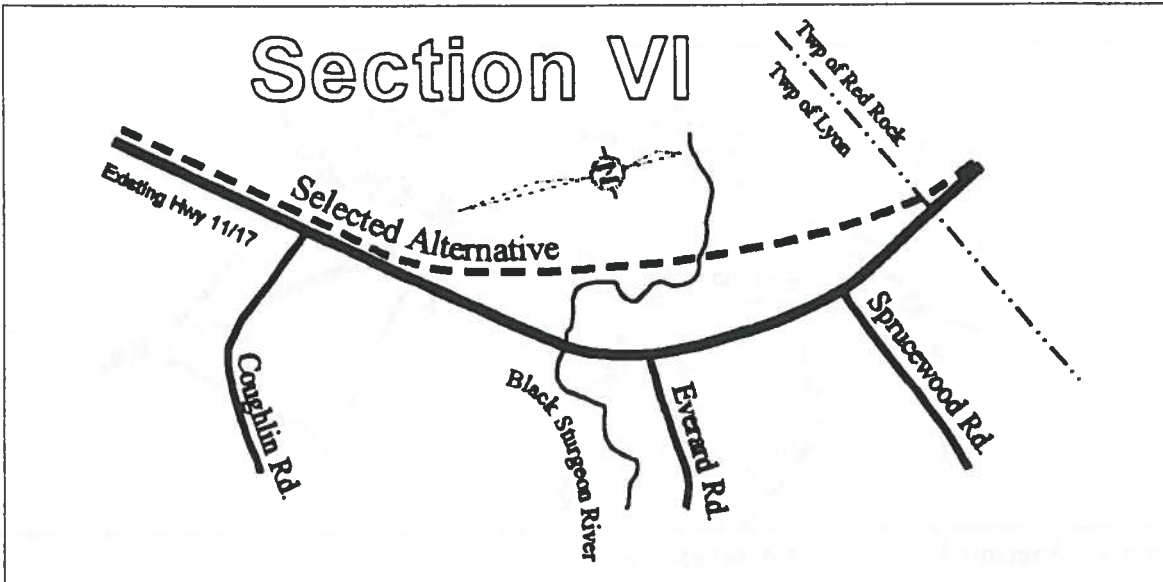


Figure 8 - Section VI Selected Alternative

2.2.1. Design Features

The recommended plan includes:

- two driving lanes in each direction
- a minimum 30 m centre median that separates the opposing lanes of traffic
- a minimum 90 m right-of-way
- public access to the highway at intersecting highways and sideroads
- public access at existing driveways or driveways provided for in previous property agreements, where feasible (right-in and right-out only)
- no new driveways on the four-lane highway, unless specifically approved by MTO's Regional Director.
- intersections and cross-overs on average every 2.5 km to allow for return moves.
- improvements at intersecting roads.
- property protection for future interchanges.

2.2.2. Highway Geometry

The proposed improvements will provide improved highway geometry. Approximately 40% of the existing alignment is substandard for a 120 km/hr design speed with the most notable areas at the Ouimet overpass, Coldwater Creek, Wolf River and the Black Sturgeon River structures. In these areas, the new alignment will be improved to a design speed of 120 km/h.

In twinning sections, all substandard geometry will be improved to a design speed of 120 km/h. These improvements will be relatively minor and can generally be accommodated within the existing right-of-way.

2.2.3. Median Width.

A design feature that has major significance, particularly for alternatives involving the twinning of the existing highway, is the basic cross-section and specifically, the 30 m median width. The following is a summary of the rationale for this median width.

Safety Considerations. A major factor concerning safety relates to the design of at-grade intersections with the highway. At-grade intersections will be included in the initial stage design. The median will be wide enough to store the largest design vehicle (WB 17.5). A median width of at least 30 m is required.

Consideration should be given to a greater than 30 m median in areas of high truck volumes. A review should be undertaken at the time of detail design to identify locations of significant truck volumes and their impact on the intersection design.

Aesthetics and Natural Environment. A 30 m median is wide enough to allow independent grades for opposing lanes. However, independent grades cannot be provided in areas where there are intersections or median cross-overs. In some situations, independent grades are not only economically desirable but can also allow a more aesthetically pleasing highway design.

If the median was narrowed to where a continuous barrier, such as a New Jersey median barrier, was required for safety, the barrier may effect small animals crossing the highway. Such a design would increase the exposure of animals attempting to cross the highway. A narrow median with a continuous raised barrier would also restrict sight distance on a minimum horizontal curve (radius of 650 m for a design speed of 120 km/h) below the minimum stopping sight distance (245 m).

Consequently, a median width adequate to avoid the need for a continuous

barrier is desirable from an aesthetic, natural environmental and safety point of view.

Future Flexibility. MTO has no plans to expand Highway 11/17 to more than a four-lane divided facility. If there is a demand to widen the highway to six lanes, the 30 m median width will allow widening to occur within the median, avoiding the need for additional property and reconstruction of interchanges or intersections. The resulting median width of 22.5 m would still accommodate bridge piers without the need for guiderail protection under current MTO warrants. The 22.5 m median would not require a continuous median barrier.

Economics. The 30 m median width is wide enough to permit a significant difference in grade between opposing lanes. The first 5 km of the study area, from Welch Creek easterly, is an area with some significant rock grading sections. The ability to set independent roadway grades will contribute significantly to reduced roadway construction costs.

The proposed 30 m median width will permit safe at-grade intersection operation. Hence, there is no immediate need to implement fully grade-separated interchanges. This will result in construction and property cost saving.

2.2.4. Bicycles and Pedestrians

Bicycles and pedestrians will be permitted between Thunder Bay and Nipigon. Bicycles will be allowed on the twinned portions of the existing highway and on the bypassed sections. Bicycles will not be allowed on the new four-lane alignment.

2.2.5. School Bus Operations

In areas where the existing highway will be twinned, school children will not cross the median. Children will be picked up or dropped off on the right-hand side of the highway only.

School bus operation is not an issue in areas where new alignments are constructed (four complete new lanes at a new location), since no access will be permitted to the new highway. Children will continue to be picked up or dropped off along the existing highway, and since highway traffic will be removed, there will be fewer conflicts between school buses and other vehicles.

An analysis of additional travel distance and cost was undertaken and reviewed with the School Board. It was determined that the additional time and costs were not significant and would not adversely affect the School Board.

2.2.6. By-passed Portions of Existing Highway

In areas where there is a municipality, MTO will expect the municipality to take over full responsibility for any by-passed portions of existing Highway 11/17 since transfer of the bypassed sections will free up local development opportunities in those areas. MTO provides a subsidy for the maintenance of highways and will increase this subsidy to account for the new length of highway to be maintained.

2.2.7. Structures

New structures will be required at the Ouimet CPR crossing, Coldwater Creek, Wolf River and the Black Sturgeon River for eastbound and westbound lanes. Culverts will be required at all creek crossings. Details on the size and type of structure will be determined during detail design of the project.

The Selected Corridor for the Phase 1 improvements (four-lane divided highway) identifies the following locations where interchanges (structures) may be developed in the future:

- Dorion Amethyst Road
- Ouimet Canyon Road
- east of the Dorion East Loop
- Townline Road
- Black Sturgeon Road
- Coughlin Road
- existing Highway 11/17 at the Red Rock Township Boundary

Property protection for these interchanges is illustrated, in detail, in the Preliminary Design Report and is available for review in the Planning & Design Section of the MTO office in Thunder Bay.

2.2.8. Access Control

The initial intention is to designate the corridor for protection purposes, then develop a four-lane divided facility with partial access control. This will ultimately be developed into a four-lane divided freeway.

"Initial Stage" and "Future Stage" access criteria are detailed below. In cases where implementation of the "Initial Stage" involves a complete by-pass of the existing two-lane facility, the new right-of-way shall be purchased under "Future Stage" access criteria.

MTO will:

- protect for an ultimate facility which will maximize transportation service and minimize potential traffic operational problems, while at the same time

reducing potential socio-economic impacts by allowing existing private entrances to remain under certain conditions

- provide for an interim-stage facility that will adequately address the transportation needs for the future while reducing initial stage construction costs and land acquisition

Initial Stage — Partial Access Control

The following criteria are to be applied in the situation where the present highway will form part of the four-lane divided highway:

1. Safety and design requirements permitting, all existing field, residential, commercial, and public access will be allowed to remain. Also, direct access not presently existing but provided for in previous property agreements may be allowed under similar conditions. Access will be provided from one direction only.
2. Additional or new access, whether private or commercial, will not be permitted except where specifically approved by MTO's Regional Director. Public road access will be considered via at-grade intersections at locations that are compatible with future interchange development and spacing.

Future Stage — Full Access Control

The following criteria are to be applied when conversion of the facility to full access control status is needed:

1. Direct, private or commercial highway access of any description will not be permitted.
2. Public road access will be permitted via interchanges.

2.2.9. Phased Implementation of the Improvements

Phase 1: Four-lane Divided Highway

A four lane highway with at-grade intersections at highways and municipal roads will be provided.

Private access to the four lane highway will be controlled on the following basis:

- safety and design requirements permitting, existing entrances will be allowed to remain with access restricted to one direction (i.e., right-turn-in and right-turn-out); and
- new accesses will not be permitted to the new four lane highway.

Phase 2: Interchanges at Strategic Locations

Interchanges at some intersecting highways and municipal roads will be provided.

Provision of interchanges will be based on the following warrants:

- if traffic signals are warranted; or
- if safety or operational considerations warrant an interchange

Phase 3: Interchanges at Other Locations

Provision will be made for interchanges at the remainder of the intersecting highways and municipal side roads. Roads will be closed at the highway if interchanges are not justified where alternate access is available or can be provided by service roads.

Phase 4: Closure of All Entrances (Designated as a Freeway)

All entrances to the four lane highway will be closed when the highway is designated as a freeway. If alternate access is not feasible by service roads or sideroads, individual properties will be purchased.

2.2. PROJECT JUSTIFICATION AND PURPOSE

The purpose of the undertaking is to:

- provide a safer facility
- improve highway service
- provide twin bridges at all river and stream crossings
- provide continuous emergency east-west access between Thunder Bay and Nipigon

while minimizing impacts to the social, natural and economic environments.

Highway 11/17 between Nipigon and Thunder Bay forms a strategic link in the Trans-Canada Highway system. Trans-Canada and regional/local traffic rely heavily on this highway. There is no alternate route. The four-laning will provide parallel roadways which may serve as emergency relief in case of a major disruption of one of the two roadways as a result of a major roadway accident, natural disaster or structural loss.

Closure of the Trans-Canada system would have an impact on the economy of the region and trans-continental movement of goods and people within Canada.

The risk of such a closure was first brought to light in the early 1970's when a load limit was placed on the original Nipigon River bridge. Since then, MTO has identified the

potential risk of a highway closure at a number of bridge sites along this section of Highway 11/17. In the late 1970's, functional contingency plans were developed for critical sites. In 1987, a preliminary design study was undertaken to determine requirements to implement these contingency plans. Until Highway 11/17 is four-laned, MTO must rely on these contingency plans in case of structural loss.

The four-laning of Highway 11/17 will improve traffic service especially during the peak summer period. Traffic volumes increase approximately 60% during the summer. Although passing lanes have been implemented along more than 10% of the length of Highway 11/17 between Nipigon and Thunder Bay, MTO still receives complaints about delays caused by slow vehicles.

The accidents rates for portions of Highway 11/17 are higher than the provincial average. The four-laning will lower the accident rate and provide a safer facility.

The area between Thunder Bay and Nipigon is rich in natural resources. Many mining and logging operations rely on Highway 11/17 for access. A four-lane facility will improve the movement of these resources and encourage economic development.

Four-laning of Highway 11/17 will benefit the region in terms of new jobs and the creation of spin off industries to serve the construction industry.

In summary, the four-laning of Highway 11/17 between Thunder Bay and Nipigon will:

- provide a second roadway to the existing single link of Highway 11/17, ensuring the operating integrity of the Trans-Canada Highway
- improve traffic operations, especially during the summer
- provide a safer highway facility
- facilitate the movement of natural resources
- encourage economic development.

2.3. SIGNIFICANT ENVIRONMENTAL FEATURES

2.3.1. Watercourses and Fisheries

The Highway 11/17 study area contains many streams that flow into Lake Superior. These coldwater streams are considered significant by MNR. The Lake Superior tributaries may contain resident brook trout and, depending on the size of the creek, may be used as spawning and nursery areas by rainbow trout, chinook salmon, coho salmon and pink salmon. Other species found in these streams include pickerel, northern pike, smallmouth bass, perch, suckers and cyprinids.

The fisheries resource in the study area is managed by MNR, Thunder Bay and Nipigon District offices. Brook trout has been identified by the Nipigon District as the priority species on Lake Superior tributaries with secondary attention to rainbow trout and chinook salmon. The focus of management activities is on the enhancement of

spawning habitat and protection of spawning populations.

MNR's objective is to protect, enhance, maintain and rehabilitate fish communities to provide an optimum contribution of fish, fishing opportunities and associated benefits to society. To meet these objectives, MNR has outlined the following recommendations for stream crossings in the study area:

- 1) prepare plans, for review by MNR, which describe the erosion and sediment controls on site during and after construction
- 2) limit work on coldwater creeks and their tributaries to the period between June 15 and August 31
- 3) prefer bridges to culverts for water crossings. Culvert extensions must be installed according to MNR's "Environmental Guidelines for Access Road and Water Crossings".

Within the study limits, 21 streams are crossed by the existing highway. The larger streams are Welch Creek, Coldwater Creek, Wolf River, Little Squaw Creek, Big Squaw Creek, and the Black Sturgeon River. All have been identified as coldwater streams. The site descriptions, vegetation and wildlife potential and fisheries concerns for the crossing points, as well as upstream and downstream areas are tabulated in Appendix C. The descriptions are based on MNR's "Manual of Instructions - Aquatic Habitat Inventory Surveys" and include the location of manmade structures, potential sources of pollution, instream habitat, bank stability, backshore and valley profile, aquatic vegetation, bank elevation, particle size and discharge.

2.3.2. Vegetation

The dominant trees along the highway corridor include Poplar, White Birch, Balsam Fir and Black Spruce. Other species include White Cedar and White Spruce. Many of these forests are in swampy areas or on land once used for agricultural purposes. Most forests have a good understorey of ferns, grasses and herbaceous plants and provide habitat for wildlife. No significant species were identified by MNR.

2.3.3. Wildlife

The area supports a wide range of wildlife species including moose, black bear, deer, rabbit, gamebirds and waterfowl. This variety provides opportunities for hunting, trapping, viewing and other activities which are enjoyed by outdoor enthusiasts and contribute to the local economy.

A moose winter concentration area is located between Big Squaw Creek and the Black Sturgeon River approximately 1 km south of existing Highway 11/17. An osprey nest is located east of the Black Sturgeon River, approximately 3 km south of existing Highway 11/17.

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2.4. DESCRIPTION OF ALTERNATIVES

This chapter documents the identification and evaluation of alternate methods for highway corridor improvement. Two types of corridor improvement alternatives were identified:

- alternatives requiring the twinning of the existing highway ie. constructing two additional lanes on either the north or south side of the existing highway
- new four-lane alignment alternatives.

These types of corridor improvements resulted in four basic alternatives:

- twinning to the north of the existing highway
- twinning to the south of the existing highway
- a new alignment to the north of the existing highway
- a new alignment to the south of the existing highway

In addition, combinations of these alternatives were examined.

In developing both the twinning and new alignment alternatives, the design speed and horizontal curve radius were the primary design considerations.

All of the alternatives had the following characteristics:

- two driving lanes in each direction
- a minimum 30 m median which separates the opposing lanes of traffic
- a minimum 90 m right-of-way
- public access to the highway at intersecting highways and sideroads
- public access at existing driveways or driveways provided for in previous property agreements, where feasible (right-in and right-out only)
- no new driveways on the four-lane highway, unless specifically approved by MTO's Regional Director.

2.4.1. Existing Constraints

Before the development of route alternatives, a preliminary survey of existing land use and the natural environment was conducted through field survey and secondary source materials. This information, together with the preliminary design criteria, facilitated the identification of route alternatives.

Existing constraints to developing a four-lane highway included:

- areas where entrances (driveways) to the highway are frequent

- operation of commercial businesses adjacent to the highway
- residences immediately adjacent to the highway
- conflicts with public utilities (hydro, pipeline, etc.) and railway lines
- physical features such as large rock formations, swamps and lakes
- environmental features including cold water fish streams, archaeology resources and wildlife habitat

2.4.2. Evaluation Approach and Criteria

The objective is to select the highway improvement alternative which is optimum in terms of:

- transportation service and safety
- impacts on the environment
- total cost.

This is done by predicting the net environmental impacts, transportation service and costs for each alternative, and then comparing the advantages and disadvantages of the alternatives to identify a preferred plan.

The aspects of the environment considered in predicting effects are called "factors". The prediction of effects according to these factors ensured that alternatives were assessed consistently and sets of alternatives were evaluated on an equal basis. The variety of factors applied ensured that a broad range of potential effects and conditions was considered.

Table 4.2 presents the factors considered in the detailed evaluation of alternatives. These factors were developed by MTO for use on the Thunder Bay to Nipigon corridor to ensure consistency in the evaluation of alternatives.

2.4.3. Generation of Alternatives

To facilitate the screening analysis, the highway corridor was divided into six discrete sections with similar topography and land use wherein manageable feasible options could be developed.

Twinning Alternatives

The twinning options within each section included:

- 30 m median with twinning on either side of the existing roadway
- variations in median widths
- switching sides to avoid major constraints.

The initial screening compared effects of north side versus a south side twinning.

Although specific mitigation measures were not discussed at the general level of analysis, reasonable mitigation measures were assumed. Existing conditions were established for the initial screening using:

- MTO's 1:2000 photogrammetric base plans and aerial photography mosaics
- windshield (field) surveys
- secondary sources such as Official Plans and discussions with MNR staff

This initial screening identified constraints due to terrain, utilities, and development which required the development of several twinning options. This conceptual level of analysis was adequate for the preliminary selection of the twinning options along the corridor. Additionally, the initial screening identified serious constraints to various twinning options and thus identified the need to investigate new alignment alternatives.

The initial screening revealed no major natural environmental constraints. The analysis did not identify any sensitive areas such as Areas of Natural and Scientific Interest (ANSI) Environmentally Sensitive Areas (ESA), major community development nor any major constraints from a socio-economic or land-use perspective which would preclude a twinning option.

The initial screening then focused on highway operation and safety, engineering feasibility and cost. This resulted in the screening out of the following twinning options:

- north side between Welch Creek and Ouimet due to the CPR line
- Ouimet CPR Overhead and Ouimet Canyon Road area due to sub-standard highway geometry
- south side immediately west of the west junction of Highway 582 due to the Hurkett Memorial Cemetery.

For the locations where twinning options were screened out, new four-lane alignments were investigated.

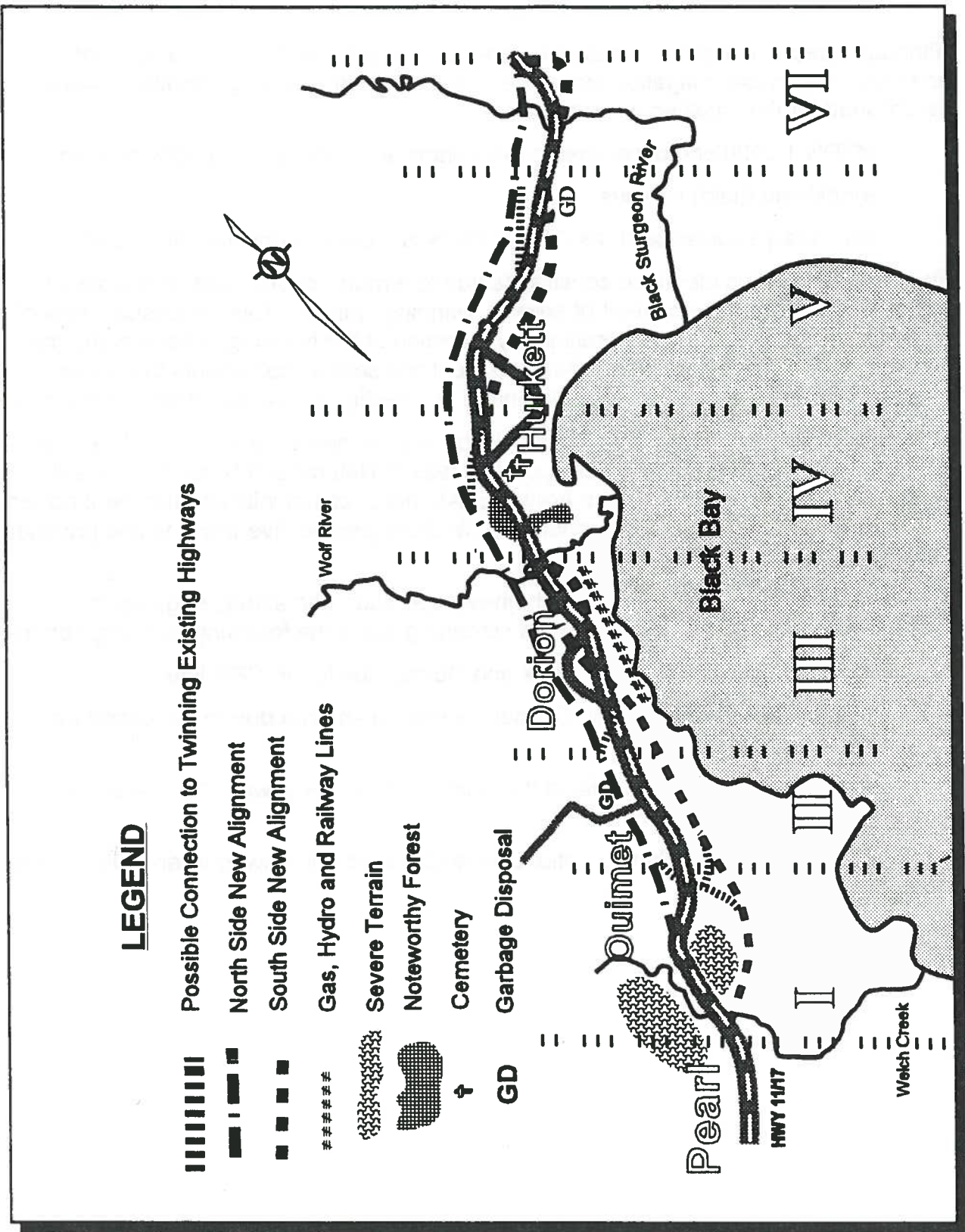


Figure 9 - Constraints and Alternatives

New Alignment Alternatives

New alignments were developed to the north and south of existing Highway 11/17. A new alignment on the north side was examined for most of the study area, except near Welch Creek due to severe terrain. A new south-side alignment was examined except for the following areas:

- at the East Dorion Loop due to hydro power lines, gas pipelines and railway lines
- between Wolf River and Hurkett due to the cemetery and development along West Highway 582
- east of Big Squaw Creek due to the Lyon garbage disposal

Figure 8 shows the new alignment alternatives and options for connecting the new alignments to the twinned highway.

These alternatives were presented to the public at the first series of PICs. Based on the comment forms, questionnaires, notes taken at the first series of PICs, and conversations with the public, it was concluded that:

- the need for improvements to the existing highway was strongly supported
- there was a strong feeling that the improvements should not disrupt communities
- business owners were concerned that the loss of highway traffic could put them out of operation
- there was concern from individual property owners that the improvements would increase proximity impacts of noise, dust, salt spray and visual intrusion.

2.4.4. Evaluation of Alternatives

In most of the study sections, there was very little difference between the alternatives in natural environmental impacts, and highway operations and safety. However there were significant economic impacts to businesses located in Sections III and IV. Therefore, in most sections, the important factors in the decision making were social impacts and cost.

The following is a summary, by section, that provides the rationale for the feasible alternatives that were carried forward for further consideration.

Section I

Section I has very sparse development (a total of four homes and six entrances). There are no businesses on the highway but a mine is located off the Dorion Amethyst

Mine Road.

The alternatives considered at the beginning of the study and presented at the first Public Information Centre were:

- North Twin
- South Twin
- South Twin to New Alignment B (in Section II)
- North Twin to New Alignment B (in Section II)
- South New Alignment A, four lanes wide
- South New Alignment A, two lanes wide serving as the eastbound lanes, with the existing two-lane highway serving as the westbound lanes.

Constraints in this area are rock out-crops north and south of the existing highway, a railway line very close to the existing highway, and a hydro tower line along the north side of the highway, which crosses to the south, then back to the north.

For each alternative, there are no major impacts to the social, economic or natural environment. Highway operations and safety are generally the same. Therefore, in this section, the dominating factor is cost.

The most expensive alternatives are those that involve twinning the existing highway, due to the large amount of rock that must be removed. The two least expensive alternatives are a four lane New Alignment A, and a two lane New Alignment A with the new alignment serving as the eastbound lanes and the existing two lanes serving as the westbound lanes.

The following table summarize the issues and factors used in determining the preferred alternative.

SECTION I — 6 km LONG						
FACTOR	ALTERNATIVES					
	North Twin	South Twin	South Twin to B	North Twin to B	Alignment A, 2 lanes wide	Alignment A, 4 lanes wide
# of homes to be purchased	0	1	0	0	0	0
# of properties from which some land is required	8	12	9	9	9	9
Cost (construction and property in millions of dollars)	14.8	22.7	25.6	16.8	8.1	14.5

The most significant difference between the alternatives is their cost. The alternatives carried forward for further consideration and presented at the second Public Information Centre were:

- South New Alignment A, four lanes wide

- South New Alignment A, two lanes wide serving as the eastbound lanes, with the existing two-lane highway serving as the westbound lanes.

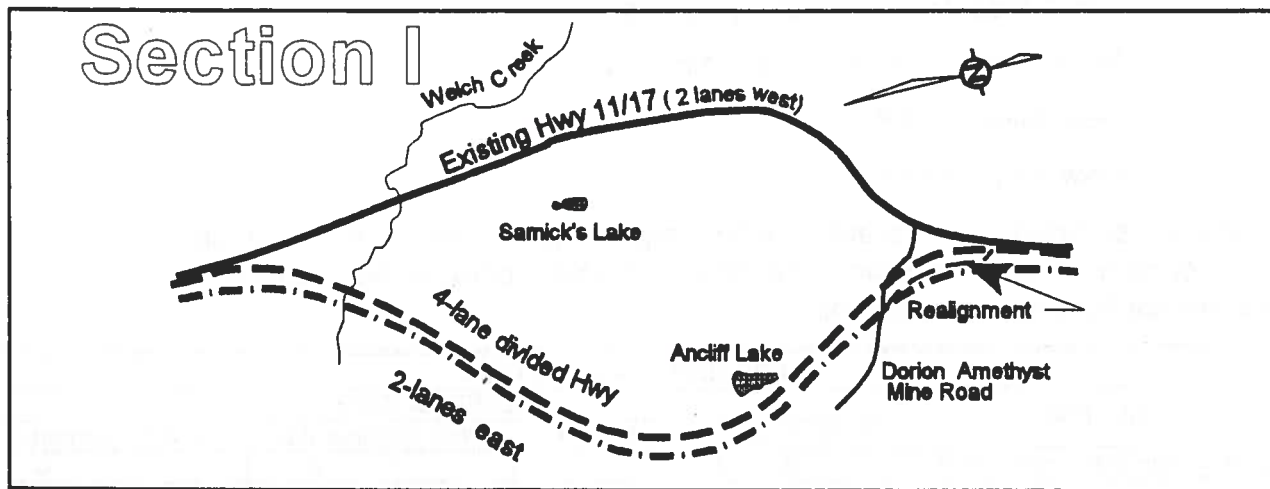


Figure 10 - Section I Alternatives

Both alternatives require a realignment of Mine Road. No residential buy-outs will be required and none of the six entrances will be removed.

The other alternative that was carried forward for further consideration, the four-lane New Alignment A, costs more than the Selected Alternative.

The Selected Alternative for Section I is South New Alignment A two-lanes wide, serving as the eastbound lanes. The existing two-lane highway will serve as the westbound lanes.

No turnaround is possible across the wide median for 5 km. Discussions were held with Ontario Provincial Police and the Shuniah and Dorion Fire Departments regarding emergency vehicle response ie. fire, police and ambulance in this area. (Fire response is from Dorion in this area.) They expressed no concern over the wide median. The Fire Department's main concern is providing adequate turnarounds to reduce out-of-way travel when responding to a house fire. The Manitoba Department of Highways was also contacted since they have experience with similar sections of four-lane divided highway with wide medians. They believe the advantage of reduced headlight glare outweighs any disadvantages provided there are no entrances. With entrances, the potential for wrong-way movements becomes a concern.

Section II

This 4 km section of highway is sparsely populated with 11 homes and 16 entrances. There is a strawberry farm and an orchid site, but no businesses. There is a railway line along the north side of the highway, which crosses to the south. The highway has substandard geometry in the vicinity of Ouimet Canyon Road.

The alternatives considered at the beginning of the study and presented at the first Public Information Centre were:

- North Side Twin of existing highway
- South Side Twin of existing highway
- New Alignment B
- New Alignment A

For each alternative, there are no major impacts to the natural or economic environment. From a highway operation and safety perspective, there is little difference between alternatives.

SECTION II — 4 km LONG				
FACTOR	ALTERNATIVES			
	North Twin	South Twin	New Alignment B	New Alignment A
# of homes to be purchased	3	5	0	0
# of properties from which some land is required	6	8	6	6
Cost (construction and property in millions of dollars)	8.5	7.6	9.7	9.7

 Alternatives eliminated from further study

The most significant difference between the alternatives is the number of homes to be purchased and cost.

The alternatives carried forward for further consideration and presented at the second Public Information Centre were:

- North Side Twin of existing highway
- South Side Twin of existing highway

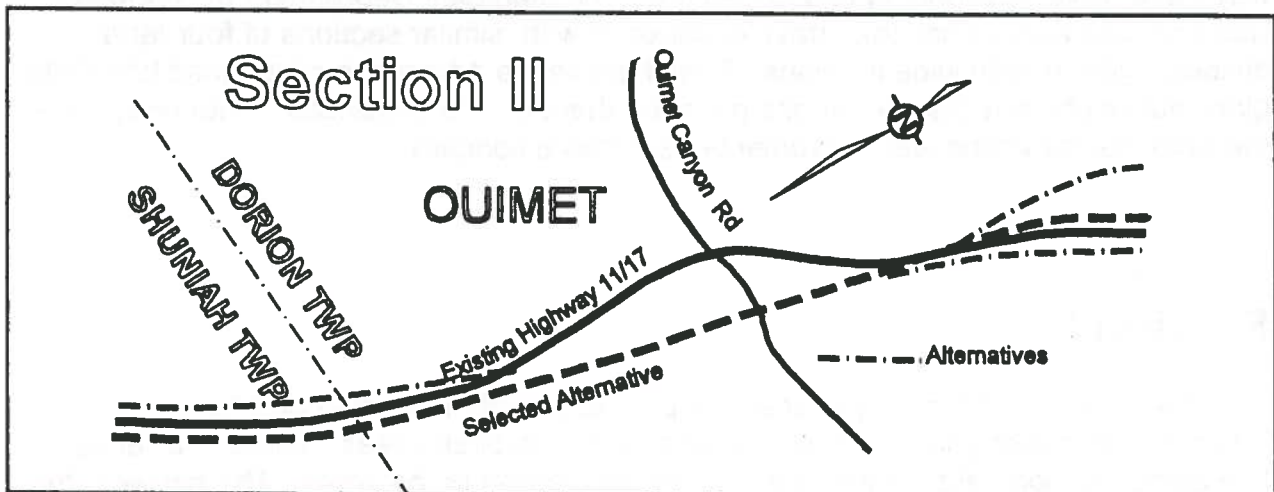


Figure 11 - Section II Alternatives

Both of the alternatives carried forward for further consideration include approximately 2 km of new alignment to improve substandard highway geometry at Ouimet. Three residences would be removed with a North Side Twin, five with a South Side Twin, and five with a South to North combined alternative.

The North Side Twin avoids three residences on the south side of the highway west of Ouimet, but costs an additional \$1 million. The extra cost is for the relocation of the railway due to its proximity to the highway. There would also be hydro towers in the median.

A South Side Twin west of Ouimet was selected as it is the least expensive alternative. East of Ouimet, the North and South Side Twins cost the same and the same number of residences are required. However, the North Side Twin was selected as it is compatible with the Selected Alternative in Section III (North Side Twin to and including New Alignment F).

The Selected Alternative for Section II is a South Side Twin of the existing highway, switching to 2 km of New Four-Lane Alignment to improve substandard highway geometry at Ouimet, to a North Side Twin of the existing highway. The Selected Alternative is the least expensive, although it will require 2.5 ha of the strawberry farm and five residences from a total of 11 in this section. There will be seven entrances remaining out of a total of 16.

The Selected Alternative includes an intersection at the Ouimet Canyon Road and an ultimate interchange.

Section III

This section contains the community of Dorion. There are 25 residences and 25 entrances along the highway. There are also three businesses: Ben's Country Store, Atkinson's Garage and the Dorion Inn at the intersection of the east loop and Highway 11/17. The highway has substandard geometry at the Coldwater Creek and the Wolf River crossings. At Wolf River, the new Sturgeon Timber development is underway. This section is also constrained by utilities to the south, although in the vicinity of the east loop, most of the utilities diverge from the highway and are no longer a constraint.

The alternatives considered at the beginning of the study and presented at the first Public Information Centre were:

- North Side Twin of existing highway
- South Side Twin of existing highway
- North New Alignment B
- New Alignment A to New Alignment E
- North Side Twin of existing highway to New Alignment E
- South Side Twin of existing highway to New Alignment E

- New Alignment A to New Alignment F1
- New Alignment A to New Alignment F2
- North Side Twin of existing highway to and including Alternative F
- South Side Twin of existing highway to and including Alternative F
- New Alignment D at the Dorion East Loop. New Alignment D is a short section of new alignment at the Dorion East Loop that is compatible with a North and South Twin to the west and a North Side Twin and New Alignment F to the east.

Alternatives E and E1 bisect the community of Dorion and therefore were eliminated from further consideration. Alternatives F and F1 have many conflicts with utilities and are expensive and were also eliminated from further consideration.

SECTION III — 7 km LONG						
FACTOR	ALTERNATIVES					
	North Twin	South Twin	Alignment B	Alignments A to E	North Twin to E	South Twin to E
# of homes to be purchased	6	13	0	1	3	4
# of properties from which some land is required	21	10	10	23	25	27
# of businesses to be purchased	2	1	0	0	0	0
Cost (construction and property in millions of dollars)	13.6	15.6	18.5	17	14.5	15.6

SECTION III — 7 km LONG					
FACTOR	New Alignments A to F1	New Alignments A to F2	North Twin to F	South Twin to F	Alternative D
# of homes to be purchased	1	0	2	3	In addition, there is a short section of new alignment, Alternative D, at the Dorion East Loop that is compatible with a North and South Twin to the west and a North Side Twin and New Alignment F to the east.
# of properties from which some land is required	18	15	21	12	
# of businesses to be purchased	0	0	2	1	
Cost (construction and property in millions of dollars)	16.9	26.9	15	17	

 Alternatives eliminated from further study

The most significant difference between the alternatives is the number of homes and businesses to be purchased, and cost. The alternatives carried forward for further consideration were:

- North Side Twin of existing highway
- North Side Twin of existing highway to and including Alternative F
- South Side Twin of existing highway to and including Alternative F
- North New Alignment B
- New Alignment D at the Dorion East Loop

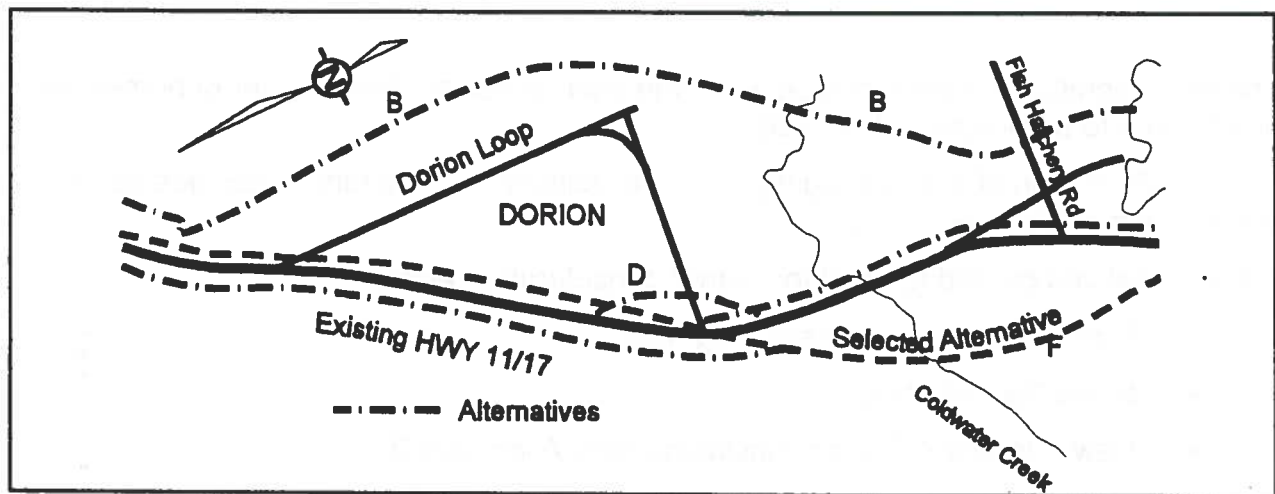


Figure 12 - Section III Alternatives

(Refer to Section III and IV on the following page (page 26) for the discussion on the selected alternative.)

Section IV

This section, contains many residences and part of the community of Hurkett. There are 28 residences and 25 entrances along the highway. There are four businesses: the Tree Farm located on the north side of the highway near Hurkett; Sturgeon Timber; Smith's R.V. on the south side; and Bait n' Tackle. A cemetery is located immediately across the highway from the Tree Farm.

The alternatives considered at the beginning of the study and presented at the first Public Information Centre were:

- North Side Twin of existing highway
- South Side Twin of existing highway
- North New Alignment B
- New Alignment G to and including New Alignment B

SECTION IV — 5 km LONG				
FACTOR	ALTERNATIVES			
	North Twin	South Twin	Alignment B	Alignments G to B
# of homes to be purchased	6	11	0	0
# of properties from which some land is required	13	23	10	13
# of business to be purchased	0	1	0	0
Cost (construction and property in millions of dollars)	7.9	8.7	12.1	12.1

 Alternatives eliminated from further study

The most significant differences between the alternatives are the number of homes and businesses to be purchased, and cost.

A South Side Twin of the existing highway was eliminated from further consideration due to the high community impacts.

The alternatives carried forward for further consideration were:

- North Side Twin of existing highway
- North New Alignment B
- New Alignment G to and including New Alignment B

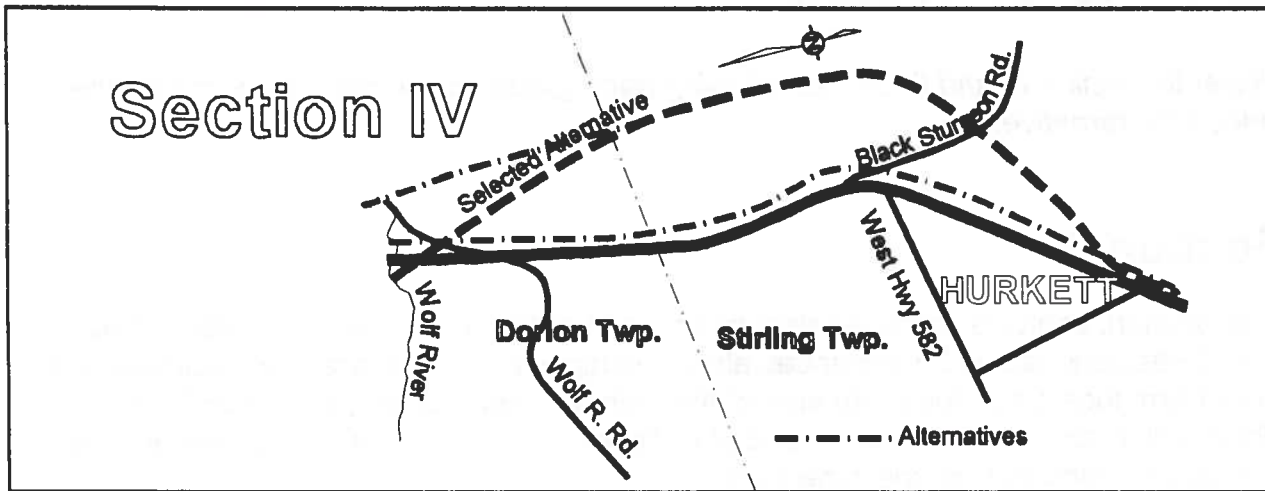


Figure 13 - Section IV Alternatives

Sections III and IV

At the request of Dorion Council, an additional alternative was examined between Dorion and Hurkett. The resulting combination of alternatives (Alternatives A, B, and C) which were evaluated for Sections III and IV are shown in Figure 14. For all three alternatives, the bridges at Coldwater Creek and Wolf River on existing Highway 11/17

will remain open.

The alternatives presented at the second Public Information Centre for Section III were:

- North Side Twin of Existing highway
- North Side Twin of existing highway to and including Alternative F
- South Side Twin of existing highway to and including Alternative F
- North New Alignment B
- New Alignment D at the Dorion East Loop

The alternatives presented at the second Public Information Centre for Section IV were:

- North Side Twin of existing highway
- North New Alignment B
- New Alignment G to and including B

Alternatives A, B and C were presented to the public at the fourth series of PICs. Based on the comments received, it was concluded that:

- Most business owners preferred Alternative C since it maintains highway access and visibility from the highway
- Alternative C was preferred since it did not bisect the community of Dorion
- some residents indicated concerns about loss of some or all of their property, landlocking of property with impacts such as access problems and decrease in real estate values
- some concerns regarding nuisance impacts such as noise, exhaust, loss of access to natural recreation areas, a decrease in quality of life, and the alignment of Stewart Lake Road.

The public indicated strong support for Alternative C between Dorion and Hurkett, and for the selected alternative outside the Dorion and Hurkett area.

The Selected Alternative for Sections III and IV is Alternative C to A, comprising a North Side Twin to the Dorion Loop Road, east leg, and a New Four-Lane Alignment south of existing Highway 11/17, crossing to the north side near Wolf River and joining into a North Side Twinning in Hurkett.

Significant differences between the alternatives are:

- Alternative C requires property (not buy-outs) from 28 residences, while Alternative B affects 16 residences and Alternative A affects 12 residences.
- Alternative A impacts 5.1 ha, Alternative B impacts 3.0 ha, and Alternative C impacts 2.0 ha of land designated as "Hamlet"
- Alternatives A and B impact 2.7 ha more land designated Environmental Protection Area

- Alternative C landlocks 14 properties (89 ha), Alternative B landlocks 11 properties (153 ha), and Alternative A landlocks 10 properties (143).
- Alternative A causes 1% more net job loss in the municipality than Alternative B and C
- Alternative B and C require two businesses to be purchased while Alternative A by-passes 3 businesses
- Alternative C removes 5 ha less vegetation than Alternatives A and B
- Alternative A impacts 5.8 more ha of active agricultural lands than B and C. Alternative A, because it by-passes the businesses in Dorion, conflicts with the following two goals of the Township of Dorion Economic Development Strategy :
 - it weakens rather than strengthens the existing business community
 - it reduces the diversification of the local economy.

Alternative C was selected because it requires the purchase of less private property and less land designated as Hamlet, and landlocks a smaller area of land.

Four residences and two businesses will be removed. The bridges on existing Highway 11/17 at Coldwater Creek and Wolf River will be retained.

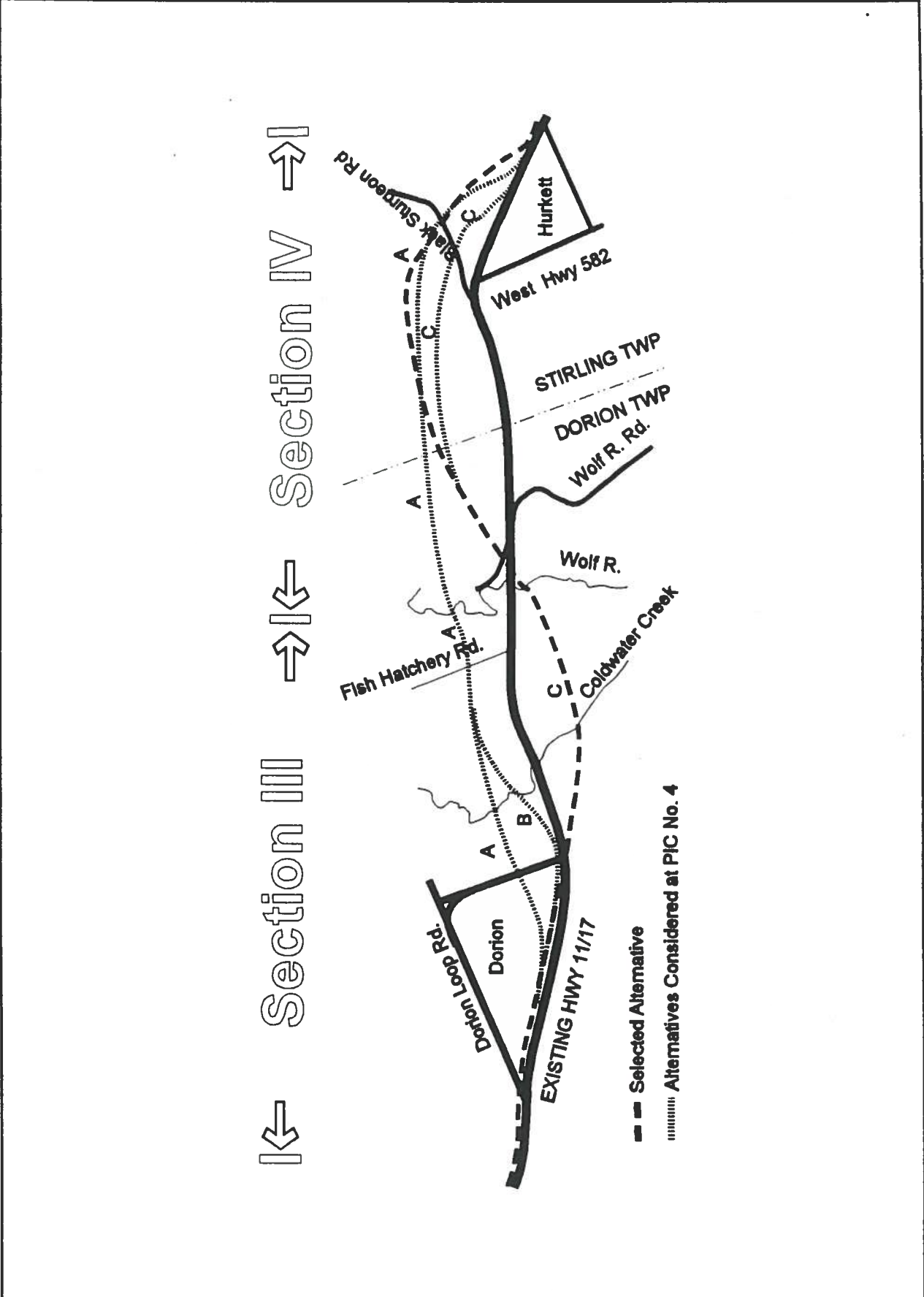


Figure 14 - Section III-IV Alternatives



Section V

The alternatives considered at the beginning of the study and presented at the first Public Information Centre were:

- North Side Twin of existing highway
- South Side Twin of existing highway
- New Alignment B
- New Alignment H

This 8.5 km section is in the unincorporated Townships of Stirling and Lyon. It includes Big Squaw Creek, 19 residences and 25 entrances, and the garbage disposal for the Township of Lyon. There are no businesses. For each alternative there are no major impacts from an economic environment, natural environment, or highway operations and safety perspective. Therefore, the important factors are residences affected and cost. The most expensive alternatives are new alignments H and B.

SECTION V — 8 km LONG				
FACTOR	ALTERNATIVES			
	North Twin	South Twin	Alignment B	Alignment H
# of homes to be purchased	4	5	0	0
# of properties from which some land is required	25	22	17	13
Cost (construction and property in millions of dollars)	15.2	15.3	20.5	20.5

 Alternatives eliminated from further study

The most significant difference between the alternatives is their cost. The alternatives carried forward for further consideration were:

- North Side Twin of existing highway
- South Side Twin of existing highway

The Selected Alternative for Section V is a North Side Twin of the existing highway.

A North Side Twin would require four residences and a South Side Twin would require five residences.

A North Side Twin was selected because it requires one less residence, avoids the Township of Lyon garbage disposal and allows for more room on the north side to

widen the median to allow for possible realignment of Big Squaw Creek.

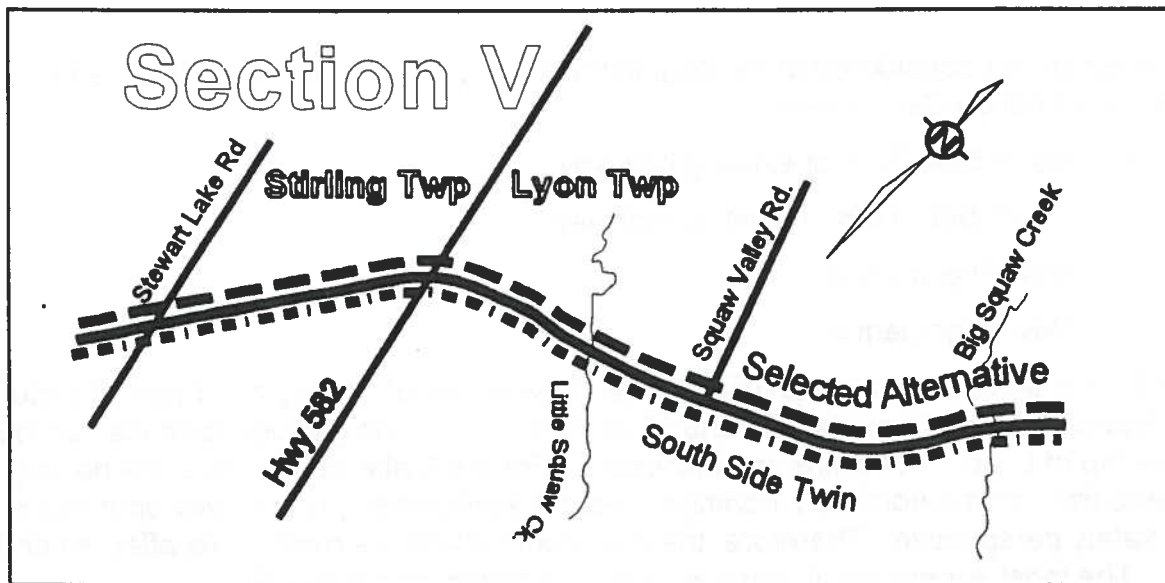


Figure 15 - Section V Alternatives

The Selected Alternative includes intersections at Stewart Lake Road, East Highway 582, Squaw Valley Road, and the garbage disposal. There will be an ultimate interchange at the east junction of Highway 582.

Four residences will be removed out of a total of 19 residences. There will be 13 entrances remaining out of a total of 25.

Section VI

This section contains a community just east of the Black Sturgeon River with 25 residences and 25 entrances along the highway. There is a trailer park along the highway. There is also an airfield located on the north side of the highway. The airfield is private, grassed and has no structures. There are no businesses. The highway crossing of the Black Sturgeon River is substandard for horizontal curvature and profile.

The alternatives considered at the beginning of the study and presented at the first Public Information Centre were:

- North Side Twin of the existing highway
- South Side Twin of the existing highway
- North New Alignment B
- North Side Twin of the existing highway including New Alignment I to a North Side Twin
- South Side Twin of the existing highway including New Alignment I to a South Side Twin

- North Side Twin of the existing highway to and including New Alignment B1

For each alternative, there are no major impacts to the natural and economic environment. From a highway operation and safety perspective, there is little difference. Alternatives with a South Side Twin of the existing highway were screened from further consideration due to high community impacts.

SECTION VI — 6 km LONG						
FACTOR	ALTERNATIVES					
	North Twin	South Twin	North Alignment B	Alignment B1	North Twin to I to North Twin	South Twin to I to South Twin
Homes to be purchased	3	10	0	0	0	3
Properties from which some land is required	8	18	8	6	12	18
Cost	10.3	11.1	15.3	13.3	11.5	11.7

 Alternatives eliminated from further study

The most significant differences between the alternatives are the number of homes to be purchased, and cost. The alternatives carried forward for further consideration were:

- North Side Twin of the existing highway
- North Side Twin of the existing highway including New Alignment I to a North Side Twin
- North Side Twin of the existing highway to and including New Alignment B1.

A North Side Twin was eliminated as it would have high community impacts: three residence takings, plus many residences with proximity damages.

Although Alignment I avoids the removal of most of the residences, it is still within the community and was considered unacceptable due to proximity impacts to residences. Alignment I by-passes most of the community, but comes back in the middle, thus dividing the community.

The North Side Twin to New Alignment B1 was selected because the New Four-Lane Alignment B1 avoids the community located east of the Black Sturgeon River. There will be no residential buy-outs and no entrances.

The Selected Alternative for Section VI is a North Side Twin of the existing highway to the New Four-Lane Alignment B1. The Selected Alternative includes intersections with ultimate interchanges at Coughlin Road and the existing highway.

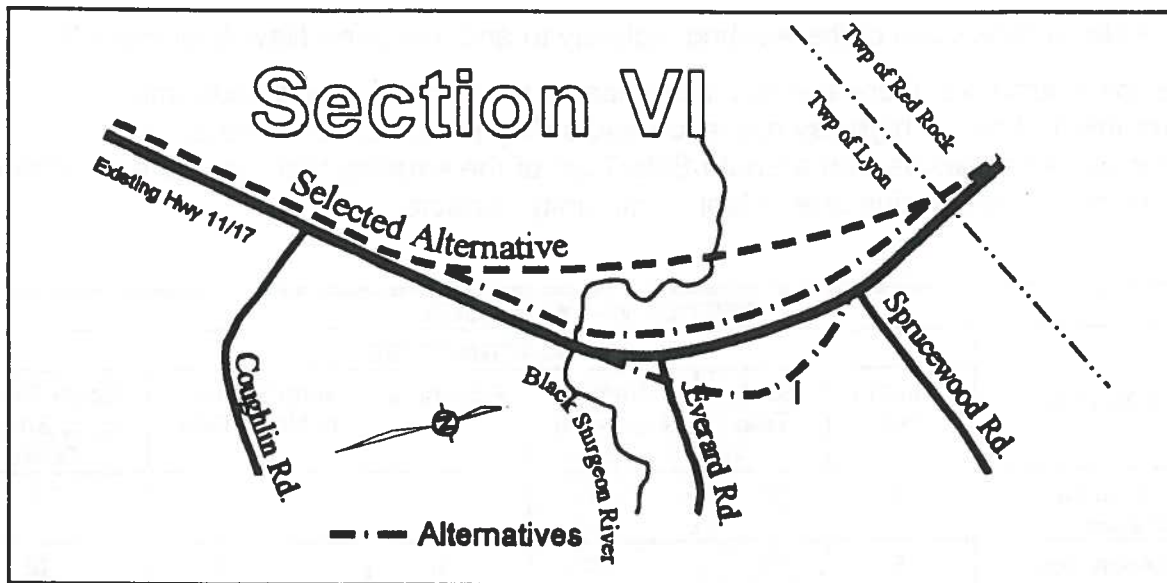


Figure 16 - Section VI Alternatives

2.4.5 Preliminary Design Alternatives (Within the Selected Alternative)

This section documents the comparative evaluation of design-related alternatives for the Selected Alternative and includes:

- Unnamed Side Road (Station 10+480 (Dorion))
- Ouimet Canyon Road (south leg)
- Dorion Loop Road (east leg)
- Coldwater Creek crossing
- Stewart Lake Road
- Big Squaw Creek Crossing

Unnamed Side Road (Station 10+480 Dorion)

This unnamed side road located in Ouimet just west of the CPR Overpass provides access to local properties and utilities. Three design alternatives were assessed as follows:

- Alternative 1: provide an at-grade crossing near the present location of the intersection with Highway 11/17
- Alternative 2 : construct an underpass for the side road
- Alternative 3 : relocate the at-grade crossing with Highway 11/17 further to the west

Analysis of these alternatives resulted in the following:

Highway 11/17 will be four, new lanes to the south of the existing highway. This shift to the south and the raise in profile due to the CPR grade separations makes matching the grade of the existing highway extremely difficult, as the grade at the side road falls toward the south.

The second alternative, providing a grade separation, would meet the current road grade, however, would be far more expensive given the cost of two new structures.

Therefore, it was decided to realign the side road to the west. This alternative (#3) provides access to lands to the south, at minimal cost, without any significant property impacts.

Ouimet Canyon Road (south leg)

The south leg of Ouimet Canyon Road provides access to an inactive farm. Four design alternatives were assessed as follows:

Alternative 1: construct an underpass through a culvert for Ouimet Canyon Road

Alternative 2: realign the south leg so that it crosses the realigned section of Highway 11/17 through the proposed CPR Overpass

Alternative 3: purchase the property to remove the access and road crossing requirement of the realigned section of Highway 11/17

Alternative 4: close the existing road and construct a new farm access at the unnamed side road west of the CPR Overpass

Analysis of these alternatives resulted in the following:

Alternative 1 and 2 involve either a new structure, or an enlarged structure, to provide access to the properties to the south. Both alternatives, while providing access, would have a high cost.

The fourth alternative involved a new side road running easterly from the unnamed side road to the west. This new side road would also involve a new, at-grade crossing of the CPR.

The third alternative was selected as it does not require any new structures, or extensive lengths of side road to be constructed. Furthermore, no new crossing of the CPR is required.

Dorion Loop Road (east leg)

Four alternatives were investigated to provide an intersection between the Dorion Loop Road (east leg) and the proposed Highway 11/17. In developing these alternatives, consideration was given to providing access to the Dorion Inn, providing a reasonable parcel of land for development on the north side, and safe intersection geometrics.

All alternatives provided for good intersection geometrics and required approximately the same length of new side road. Therefore, from the MTO's perspective all

alternatives were considered equal. To arrive at a decision, meetings were held with the directly affected property owners. Through discussions, a consensus was reached that resulted in a minor realignment of the Dorion East Loop Road. The minor realignment improved the current substandard geometrics, allowed for a larger parcel of land in the north-west quadrant and provided good access to the Dorion Inn.

Coldwater Creek Crossing.

Several alternatives were identified for the crossing of Coldwater Creek. The soils in the area are very poor. The banks are high with evidence of considerable erosion near the creek itself.

The rail line is immediately to the south of the proposed highway. There is a pipeline, Bell FOTS cable and Ontario Hydro transmission lines in the area.

The poor soils plus numerous utilities make a crossing of Coldwater Creek extremely difficult. To minimize land-locking of parcels fronting on existing Highway 11/17, the proposed highway was kept as close to the rail line as possible.

The selection of a recommended crossing depended largely on providing suitable abutment and pier placement with an economical span length, while minimizing utility relocation.

Stewart Lake Road

Several alternatives were investigated for the connections to Stewart Lake Road and Highway 582. Both intersections are either on, or close to, a horizontal curve. Separate alternatives were prepared that provide for decision sight distance. However, the result was two intersections that were very close to each other. The decision was made to provide one intersection as there are very low traffic volumes, little out of way travel and the number of intersections on the highway would be reduced.

Big Squaw Creek Crossing

An assessment of the fish habitat conditions were undertaken in the vicinity of the Big Squaw Creek crossing. Generally, it was found that Big Squaw Creek supports a very limited population of brook trout. Areas away from the highway did not exhibit any of the characteristics of providing spawning substrate (gravel, coarse sand) or other resources (riffles, discharging groundwater, pool class) required for successful brook trout reproduction.

Based on these findings it was decided that there was not a major concern over the potential loss of fish habitat and suitable mitigation would be the provision of a slightly wider median, approximately 20 m more than the typical 30 m. This resulted in a slightly wider right-of-way but no significant property impacts.

The Fisheries Investigations of Big Squaw Creek report, dated April, 1994, contains additional information and is on file at MTO.

2.5. External Agency and Public Consultation

The following sections describe the involvement of all contacts, external to the consultant and MTO members. These external contacts can be broadly defined by the following categories:

- affected municipalities
- government ministries and agencies
- the public
- affected property owners
- utility companies
- local businesses

The main purpose of the in-depth and organized consultation program can be summarized as follows:

- to ensure that all relevant concerns of the various parties are given appropriate consideration
- to assist in identification of key issues
- to ensure that where any adverse effects of the Recommended Alternative are unavoidable, effects are minimized and the appropriate mitigation measures are introduced
- to ensure that a project can be implemented and the appropriate approvals received by attempting to deal with all the issues and concerns prior to the submission of this Environmental Study Report.

2.5.1. Ministries, Agencies and Municipal Involvement

An in-depth consultation process was undertaken with affected ministries, agencies and municipalities. Representatives of all government ministries and agencies who have a responsibility to review and comment on environmental assessment were contacted. In addition, representatives from the Townships of Shuniah, Dorion, Stirling and Lyon were contacted for their input.

Before each of the five information centres, a meeting was held with government ministry agencies to present the project status and to receive their comments. Also, before each information centre, a presentation was made to representatives of each municipality.

The municipalities have indicated general agreement with the recommended plan and are aware of MTO's intention to transfer by-passed sections of the existing highway to them.

2.5.2. Public Consultation Program

The public consultation program provided opportunities for both the public and the directly affected property owners to comment and provide their input to the project. Public Information Centres (PICs) were held on the following dates:

- June 16 & 17, 1992
- January 27 & 28, 1993
- June 23 & 24, 1993
- February 22 & 23, 1994
- November 23 & 24, 1994

Following each PIC, a report was compiled describing the PIC, containing detailed descriptions of the centre organization, attendance and response, and a summary of comments and questionnaire responses. Appended to each report are external contacts, displays and handouts, sign-in sheets, comment forms, and questionnaires. The reports are titled:

1. Summary Report of the First Series of Public Information Centres, Highway 11/17 Dorion 4-Laning, March 1993, M.M. Dillon Limited.
2. Summary Report of the Second Series of Public Information Centres, Highway 11/17 Dorion 4-Laning, April 1993, M.M. Dillon Limited.
3. Summary Report on the Third and Fourth Series of Public Information Centres, Highway 11/17 Dorion 4-Laning, June 1994, M.M. Dillon Limited.
4. Summary Report on the Fifth Series of Public Information Centres, Highway 11/17 Dorion 4-Laning, January 1995, M.M. Dillon Limited.

These reports are on file with MTO.

The PICs were advertised in advance through both a newspaper advertisement and brochure delivery to all residents and businesses within the study area. Furthermore, a mailing list was generated for those who expressed interest in the project and these individuals were mailed a copy of the brochure advertising the information centre.

As noted above, meetings were held with affected agencies and ministries before each information centre and presentations were made to representatives of the local municipalities.

The information centres were held for two days in an informal, open-house format from 2:00 p.m. to 8:00 p.m. Comment forms were provided at all information centres with stamped, addressed envelopes. Responses were provided to all individuals who completed a comment form.

In addition, extensive contact was maintained within the business community. All business owners were invited to the PICs. In addition, meetings with individual business owners were held during August 1992 and March 1993. The purpose of the meetings was to learn about the business operation, identify potential impacts due to the alternatives and to discuss methods of mitigation.

i) First Series of Public Information Centres

The purpose of the first series of PICs was to:

- provide an opportunity to review the study background including existing land use conditions and constraints
- present the proposed improvement alternatives for the four-laning in this study area
- answer questions and receive comments on work undertaken to date, alternatives presented and other possible alternatives
- identify the factors which would be used to compare the alternatives.

One hundred and fifty-four people signed the register over two days. Thirty-five comment forms, 29 questionnaires, two petitions and one letter were received.

The returned questionnaires showed that all of the evaluation factor groups (social environment, economic environment, natural environment, highway operations and safety, and cost) were considered important and were given equal weighting by the public.

Based on the comment forms, questionnaires, notes taken at the PICs, and conversations held with members of the public, it was concluded that:

- the need for improvements to the existing highway was strongly supported
- there was a strong feeling that the improvements should not disrupt communities
- business owners were concerned that the loss of highway traffic could put them out of operation
- there was concern from individual property owners that the improvements would increase proximity impacts of noise, dust, salt spray and visual intrusion.

ii) Second Series of Public Information Centres

The purpose of the second series of PICs was to:

- review the results of the first series of PICs
- review the evaluation of all the alternatives
- answer questions and receive comments on those alternatives still under consideration

A total of 130 people signed the register over two days. Thirty-eight comment forms/questionnaires were received.

Based on the comment forms/questionnaires, notes taken at the PICs, and conversations held with members of the public, it was concluded that:

- some residents expressed no concern while others strongly disapproved of

an alternative that displaced their house

- some residents expressed no concern while others strongly disapproved of an alternative that would disrupt their property with proximity impacts such as increased noise, dust, salt and visual intrusion
- many people expressed an interest in impacts that the alternatives still under consideration would have on the businesses in the study area, however, the significance of those impacts to the individuals varied from no concern to disapproval of by-passing or buying out a business
- there was strong support for the following alternative:
 - Section I - South New Alignment A, two lanes wide
 - Section II - North Side Twin
 - Section V - North Side Twin
 - Section VI - North New Alignment B1
- there was not a clear consensus for a preferred alternative in Sections III and IV (Dorion and Hurkett).

iii) Third Series of Public Information Centres

The purpose of the third series of PICs was to:

- review the results of the second series of PICs
- review the evaluation of all the alternatives
- display the preferred alternative
- provide the opportunity to comment on the preferred alternative.

A total of 164 people signed the register over two days. Eighteen comment forms and two letters were received as follows:

- 10 comment forms and one letter (55%) indicated support for the location of the preferred alternative
- four comment forms (20%) did not support the preferred alternative
- four comment forms and one letter (25%) did not indicate a preference.

It was concluded that the public strongly supported the preferred alternative which was identified as the "selected" alternative in the fourth series of PICs.

Following the third series of PICs, Dorion Council requested that the MTO examine an additional alternative within the area between Dorion and Hurkett.

iv) Fourth Series of Public Information Centres

The purpose of the fourth series of PICs was to:

- review the results of the third series of PICs
- display the selected alternative. The selected alternative was a refinement of the preferred alternative presented at the third series of PICs.
- display the alternatives still under consideration within the area between Dorion and Hurkett
- provide the public with the opportunity to view the plans, make comments and discuss their concerns with MTO representatives and their consultants.

A total of 139 people signed the register over two days. Twenty-nine comment forms and three letters were received.

Based on the comment forms/questionnaires, notes taken at the PICs, and conversations held with members of the public, it was concluded that:

- outside the Dorion and Hurkett area, only two comments were received that stated they did not support the selected alternative for the twinning of Highway 11/17. Eight comments stated they were in support of this alternative.
- in the Dorion and Hurkett area, 20 comments stated they preferred Alternative C, nine preferred Alternative A, and one preferred Alternative B (see Exhibit 4.6). Alternative C was preferred because it gives highway access and visibility to the businesses and does not bisect the community of Dorion.
- there were concerns about property impacts including the loss of some or all of their property, landlocking of property, access problems and decrease in real estate values
- there were concerns about nuisance impacts such as noise, exhaust, loss of access to natural recreation areas, a decrease in quality of life, and the alignment of Stewart Lake Road.

It was concluded that the public strongly supported Alternative C between Dorion and Hurkett, and the selected alternative outside the Dorion and Hurkett area.

v) Fifth Series of Public Information Centres

The purpose of the fifth series of PICs was to:

- review the results of the fourth series of PICs
- display the selected alternative in the area between Dorion and Hurkett. The selected alternative was a refinement of the preferred alternative presented at the third series of PICs and the alternatives under consideration presented

at the fourth series of PICs

- provide the public with the opportunity to view the plans, make comments and discuss their concerns with MTO representatives and their consultants

A total of 89 people signed the register over two days. Seven comment forms were received.

Based on the comment forms/questionnaires, notes taken at the PICs, and conversations held with members of the public, it was concluded that:

- the public generally supported the selected alternative between Dorion and Hurkett
- some comment forms indicated concerns regarding noise impacts
- some comment forms indicated they were glad the route had been selected so that other plans could proceed.

CHAPTER 3 - ENVIRONMENTAL EFFECTS AND MITIGATION MEASURES

The table describes the potential environmental impacts of the recommended plan and proposed mitigation measures.

Table 3.1 - Potential Environmental Impacts and Mitigation Measures		
Issue	Potential Effects	Proposed Mitigation Measures
<i>Natural Environment</i>		
Watercourses and Fisheries	effects on fish habitat in watercourses throughout the study area	implement MNR river crossing procedures and approved fisheries mitigation measures where necessary carry out detailed fisheries studies at each creek crossing to satisfy the requirements of the Fisheries Protocol limit work on cold water creeks to period between June 15 and August 31
Soil Erosion Water Quality Drainage	sheet and embankment erosion sediment flow into surface drainage during construction impacting water quality/drainage	incorporate erosion and sediment control measures at detail design incorporate stormwater quality, river crossing and drainage management guidelines in the detail design incorporate permeable roadbed materials in the areas where the alignment bisects organic deposits
Vegetation	effect on access to forest management areas loss of vegetation	access via existing driveways will be maintained to forest management areas with right-in, right-out movements permitted turn around opportunities will be provided at intersections and median crossovers throughout study area standard procedures will be implemented for vegetation clearing and residual vegetation protection some vegetation will remain in median where feasible (to be determined in detail design) provision of snowfence (or equivalent) and silt fence protection along sensitive areas

Table 3.1 - Potential Environmental Impacts and Mitigation Measures

Issue	Potential Effects	Proposed Mitigation Measures
Cultural Environment		
Heritage Resources	effect on potential heritage/archaeological resources in vicinity of new alignment at MacKenzie River crossing and in vicinity of Highway 587	conduct an archaeological assessment along the corridor in accordance with <i>A Protocol for Dealing with Archaeological Concerns on MTO Undertakings</i> and implement mitigation (if required) prior to construction
Social Environment		
Community Disruptions	changes to established travel patterns in residential communities as a result of new four-lane highway Selected Plan subjects 27 residences to out-of-way travel	provision of right-in, right-out movements at existing entrances turn around opportunities to be provided at intersections and median crossovers access to be provided at intersections with sideroads (in initial phase) and at future interchanges (in ultimate phase) existing highway to continue to provide local access in areas with new alignment
Residential Property Acquisition	Selected Plan requires the purchase of 13 residences	owners to be compensated at fair market value as provided in the Expropriations Act
	Selected plan requires a partial property purchase from 87 properties	owners to be compensated at fair market value for landlocked property, the MTO will offer to purchase the landlocked portion or the owner can continue to own it if they desire MTO will examine houses that are close to the highway but not close enough to be bought out on a case by case basis. If the proximity damage is expected to be equal to or greater than the purchase price, the MTO will consider a purchase. Proximity impacts will be taken into consideration in determining the cost for property compensation it is expected that properties will be purchased approximately two to three years prior to construction, unless a hardship can be proven
Noise	5 residences will experience a minimum increase of about 3.0 dBA	total impact on study area is considered minimal noise impacts are reduced by existing vegetation adjacent to Preferred Plan throughout most of the study corridor noise assessment study could be carried out in specific areas if deemed necessary

Table 3.1 - Potential Environmental Impacts and Mitigation Measures		
Issue	Potential Effects	Proposed Mitigation Measures
<i>Economic Engineering</i>		
Business Disruptions	Preferred Plan requires the purchase of land from two commercial properties at the Dorion East Loop Road	owners to be compensated at fair market value as provided in the Expropriations Act the MTO generally does not mitigate business loss due to reduction in traffic volumes. However, claims for loss may be submitted for consideration
<i>Engineering</i>		
Utilities	conflict with existing and proposed utilities such as hydro towers, FOTS or TransCanada Pipeline, and CP/CN Rail	compliance with utility crossing requirements (including the National Energy Board Pipeline Crossing Regulations) and investigations during detail design

Aggregates

Mineral aggregates, such as good quality sand and gravel, are a vital construction material required for Ministry of Transportation undertakings. The Aggregate Resources Act and the Mining Act ensure that environmental concerns associated with aggregate extraction operations are addressed. In accordance with this legislation, MTO reviews possible environmental concerns associated with aggregate operations (excluding commercial licensed operations) expressed by Government Agencies, local municipalities and the public, when applicable to site-specific projects.

Waste Management

A Ministry of Transportation and Ministry of Environment and Energy protocol identifies material-by-material management options both inside and outside the construction area, which includes the right of way and property with a boundary contiguous to the right-of-way.

All excess materials may be reused or recycled. Inside the right-of-way, materials such as asphalt, concrete, swamp material, wood, earth and rock may be reused as a construction material or managed as fill. Materials also may be temporarily stockpiled in preparation for these uses.

Management of excess materials outside the right-of-way, stockpiling and wood management depends upon local circumstances.

Site protection is provided by the imposition of constraints and for the protection of water and air quality adapted from existing legislation. The constraints on the management of these materials also involve discussions and written agreements with property owners, and may involve consultation with MOEE and other authorities.

Where an excess material management option cannot meet constraints, another option must be pursued, or the material must be disposed of as waste.

Emergency Spill Response

Direct responsibility for containment and clean up of spills and abandoned materials on MTO highway facilities rests with the owner of the material and person in control of the material at the time of the spill or abandonment.

Where spills or abandoned materials occur on MTO highway facilities, MTO may assist where persons legally responsible cannot be located or are not able to respond. MTO assistance may include notification of authorities, provision of equipment and materials, and traffic management.

In the event of a spill of MTO material by MTO staff, MTO undertakes all notification, containment and cleanup responsibilities required by provincial and federal legislation.

CHAPTER 4 - MONITORING

After the corridor is designated for a controlled access highway, the Ministry of Transportation will monitor development along both the corridor and the existing highway to ensure compatibility with its long-range plans. No development will be permitted within the proposed corridor, where it is on new alignment. Where the corridor involves twinning with the existing highway, new entrances will only be considered by way of permit to be approved by the MTO Regional Director. In sections where the four-lane highway by-passes the existing highway, restrictions on new entrances and development along the existing highway may be relaxed to some extent.

The detail design phase will be carried out prior to construction. Some environmental issues that cannot be anticipated at this time (ie., during preliminary design) may emerge during detail design. Specific compensation and mitigation measures will be identified for these issues during detail design and will require monitoring during construction. The Ministry of Transportation is committed to the appropriate mitigation and compensation required to deal with these issues in the future.

During construction, monitoring will be conducted by on-site construction supervisory staff to ensure that environmental protection measures outlined in the contract or developed and prepared by the contractor are implemented. This monitoring consists of ensuring the proper execution of environmental protection measures and dealing with environmental problems that develop during construction. In the event that protective measures do not address concerns identified or major problems develop, the appropriate ministry will be contacted to provide additional input.

In the event that the impacts of construction are different than anticipated or that the method of construction is such that there are greater than anticipated impacts, the Contractor's method of operation will be modified to reduce those impacts.

CHAPTER 1: INTRODUCTION

The first chapter of this book introduces the reader to the basic concepts and terminology of the subject. It covers the following topics:

- 1.1. The scope and objectives of the course.
- 1.2. The importance of the subject in the field of study.
- 1.3. The relationship between the subject and other disciplines.
- 1.4. The role of the student in the learning process.
- 1.5. The structure and organization of the book.

The chapter concludes with a summary of the key points discussed and a list of references for further reading.

APPENDIX A - GLOSSARY

APPENDIX A - GLOSSARY



GLOSSARY

The following are definitions of the technical terms used in this Environmental Study Report.

- Continuous Left-turn Lane** A continuous left-turn lane is a lane introduced between through lanes in both directions, to provide storage for left-turning vehicles from either direction. They are usually designated for left turns only throughout their length.
- Controlled Access Highway (CAH)** A type of designation for a highway that imposes stricter controls on permits and the use of frontage lands abutting the highway.
- Cross-intersection** A cross-intersection is the general area where two roads cross.
- Decision Sight Distance** Decision sight distance is the distance required for a driver to detect an information source or hazard which is difficult to perceive in a roadway environment that might be visually cluttered, then recognize the hazard or its potential threat, select appropriate action, and complete the corresponding manoeuvre safely and efficiently, prior to reaching the hazard.
- Design Speed 120** Design speed is the speed selected for the purposes of designing the geometric features of a road. It is the highest continuous speed at which individual vehicles can travel with safety on a road when weather conditions are favourable and traffic density is sufficiently low so that the safe speed is determined by the geometric features of the road. Design speed 120 is when the selected design speed is 120 km/h.
- Diamond Interchange** A diamond interchange is a type of interchange where the configuration of ramps resembles the shape of a diamond in plan view. The ramps intersect with the crossing road at intersections controlled by either traffic signals, or where volumes are low, stop signs on the exit ramps. See Appendix D for a schematic diagram of a diamond interchange.
- Dieback** A condition in woody plants in which peripheral parts are killed especially by parasites.

Independent Alignments	In this report, independent alignments refers to the vertical alignment or profile of the eastbound and westbound lanes of the proposed Highway 11/17. It means that the westbound and eastbound lanes have different profiles and are not always at the same elevation.
Loop Ramp	A loop ramp is a circular turning roadway used to permit the movement of traffic from one roadway to another roadway (i.e., the highway) at an interchange.
Median	A median is the area that separates roadway lanes carrying traffic in opposite directions. The median width is the distance between the inner travelled lanes.
New Alignment	In this report the new alignment refers to those areas where the future four-lane highway does not use the existing Highway 11/17. In most cases it means that the four-lane highway is by-passing the existing highway.
Parclo A Interchange	A Parclo A interchange is a partial cloverleaf interchange with two inner loop ramps both located adjacent to the highway approach to a crossing road. See Appendix D for a schematic diagram of a Parclo A interchange.
Permeable	Permeable means having pores or openings that permit liquids or gases to pass through.
RAD 120	RAD 120 is a road classification that identifies the roadway as a Rural Arterial Divided roadway with a design speed of 120 km/h.
RAU 90	RAU 90 is a road classification that identifies the roadway as a Rural Arterial Undivided roadway with a design speed of 90 km/h.
Stop-Controlled Intersection	A stop-controlled intersection is an intersection where all vehicles must stop on the side road at a stop sign.
T-Intersection	A T-intersection is where two roads meet, but one does not cross the other.
Twinning	In this project, twinning means that a new two-lane roadway will be constructed alongside the existing two-lane highway, separated by a median, thus creating a four-lane twinned facility. The existing highway will

carry traffic in one direction of travel and the two new lanes will carry traffic in the opposite direction of travel.

WB 17.5 Design Vehicle

A design vehicle is a motor vehicle of selected dimension and operating characteristics that is representative of a class or group of vehicles. It is used to establish geometric design controls for specific turning requirements and conditions for the purpose of accommodating vehicular movements of a designated type. A WB 17.5 design vehicle is representative of a tractor - semi-trailer combination. This design vehicle represents the 13.7 m and 14.0 m length semi-trailers. The current maximum legal trailer length is 14.65 m.

1. The first part of the document is a letter from the author to the editor, dated 10/10/1954. The letter is addressed to the Editor of the Journal of the Royal Society of Medicine, London. The author is Dr. J. H. Green, of the Department of Pathology, St. Mary's Hospital, London. The letter is a request for the publication of a paper on the subject of the pathology of the heart in the case of a patient with a long history of rheumatic fever. The author states that the patient had died of a sudden cardiac arrest, and that the post-mortem examination had revealed a number of changes in the heart which were characteristic of rheumatic fever. The author asks the editor to consider the paper for publication in the next issue of the Journal.

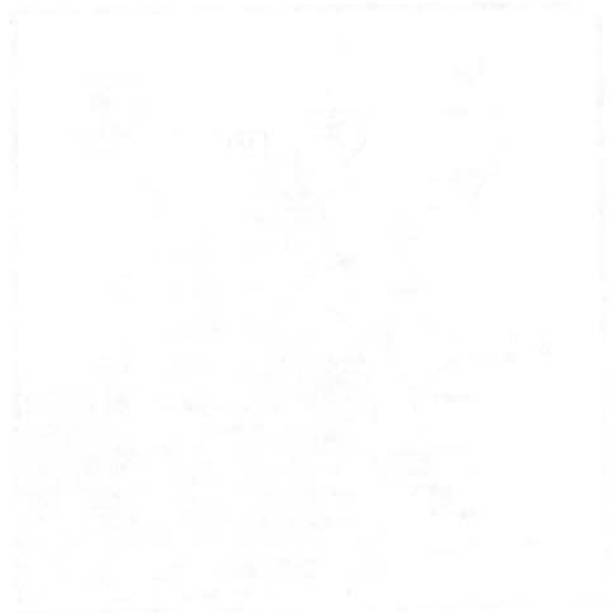
2. The second part of the document is the paper itself, which is a short communication. The title of the paper is "The pathology of the heart in the case of a patient with a long history of rheumatic fever." The author states that the patient had a long history of rheumatic fever, and that the post-mortem examination had revealed a number of changes in the heart which were characteristic of rheumatic fever. The author describes the changes in detail, and concludes that the changes were typical of rheumatic fever. The author asks the editor to consider the paper for publication in the next issue of the Journal.

Dr. J. H. Green

APPENDIX B - PUBLIC NOTICES AND LETTERS

STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
DIVISION OF WATER RIGHTS
1001 L STREET, SACRAMENTO, CALIF. 95833
TEL: (916) 227-1200 FAX: (916) 227-1201

NOTICE OF PUBLIC HEARING
ON THE APPLICATION OF THE
SACRAMENTO COUNTY WATER USER GROUP
FOR A CHANGE OF WATER RIGHTS
TO THE SACRAMENTO RIVER
PROJECT



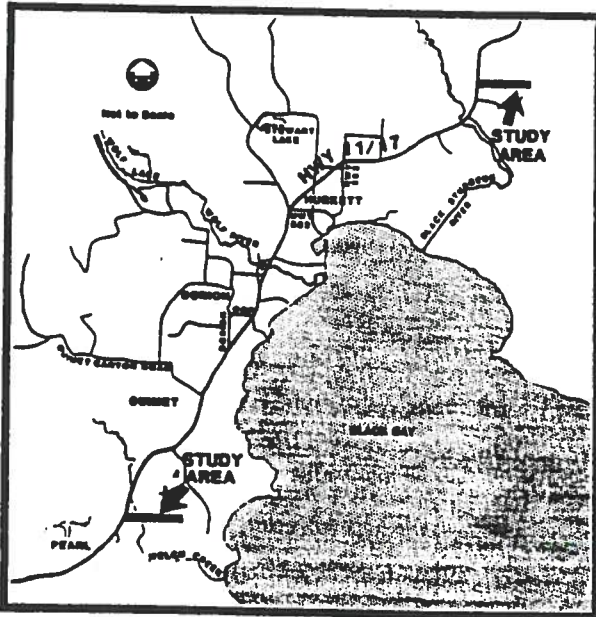
FOR MORE INFORMATION
CONTACT THE DIVISION OF WATER RIGHTS
AT (916) 227-1200

THE PUBLIC HEARING WILL BE HELD AT THE
SACRAMENTO COUNTY COURTHOUSE
1001 L STREET, SACRAMENTO, CALIF. 95833
ON WEDNESDAY, APRIL 15, 1998
AT 10:00 AM

ONTARIO GOVERNMENT NOTICE

PUBLIC INFORMATION CENTRES HIGHWAY 11/17 PLANNING AND PRELIMINARY DESIGN STUDY FOR THE FOUR-LANING OF THE TRANS-CANADA HIGHWAY FROM 8 KM WEST OF OUMET TO WEST RED ROCK TOWNSHIP BOUNDARY

The Ministry of Transportation is currently conducting a planning study of the Trans-Canada Highway (Highway 11/17) between approximately 8 kilometres west of Oumet, and the west boundary of the Township of Red Rock, a distance of 36 kilometres. This study is one of a series of studies currently underway to examine the upgrading of the Trans-Canada Highway to a four lane divided highway between Thunder Bay and Nipigon.



The first Information Centres are intended to provide the public with the opportunity to review the study background and the proposed improvement alternatives. We are interested in hearing any comments or concerns you or your group may have regarding this project. In order to introduce you to the study and to provide the opportunity to discuss your concerns with Ministry of Transportation staff, Public Information Centres will be held as follows:

Tuesday, 16 June 1992
Hurlett Community Centre
West Highway 562
2:00 p.m. to 6:00 p.m.

Wednesday, 17 June 1992
Dorion Community Centre
Dorion Loop Road
2:00 p.m. to 6:00 p.m.

Further information centres will be held at key points in the study. The study is scheduled to be completed by the spring of 1993. You are encouraged to contact Ministry of Transportation staff throughout the course of the study if you have questions or concerns.

Upon completion of this planning study, a report required under the Environmental Assessment Act will be made available to the public. A notice will be published announcing the locations where the report will be available for viewing.

Comments and information regarding this study are being collected to assist the Ministry of Transportation in meeting requirements under the Environmental Assessment Act. Your comments will be kept on file for use during the study and, unless otherwise requested, may be included in the study documentation which is made available for public review.

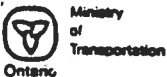
Comments and enquiries may be directed to:

Unda Jackson
Senior Project Manager
Ministry of Transportation
Planning & Design Section
615 South James Street
Thunder Bay, Ontario
P7C 4X9

Jim Horton, P. Eng.
Consultant Project Manager
M.M. Dillon Limited
1426 Bishop Street
Cambridge, Ontario
N1R 6J9

Telephone: (807) 473-2120
Toll Free: 1-800-465-8734

Telephone: (519) 823-6761
Call Collect



Nipigon-Red Rock Gazette
2 & 9 June, 1992
Thunder Bay Times News/
Chronicle Journal
3 & 10 June, 1992
Thunder Bay Post
3 & 10 June 1992



Public Information Centre N^o 1
Newspaper Advertisement

EXHIBIT 1

**ONTARIO
GOVERNMENT NOTICE
PUBLIC INFORMATION CENTRES**

**HIGHWAY 11/17 FOUR LANING PROJECT FROM 8 KM WEST OF OUMET,
EASTERLY 36 KM TO THE WEST RED ROCK TOWNSHIP BOUNDARY**

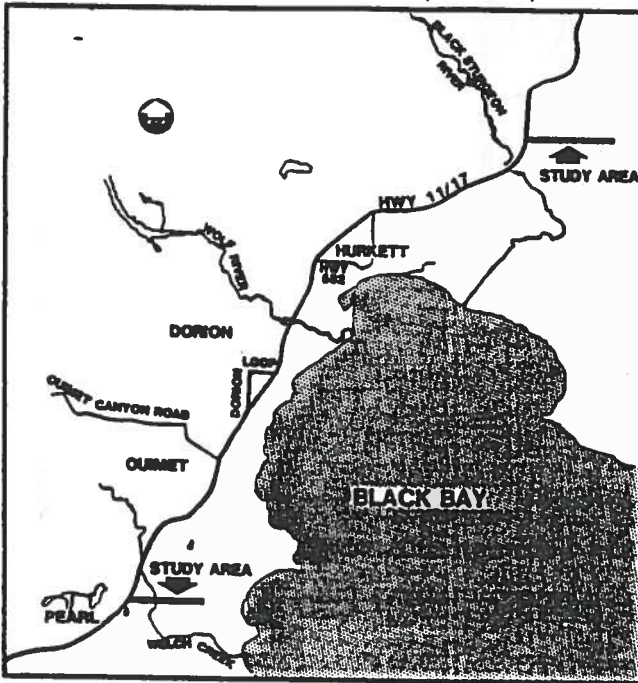
DISPLAY OF ALTERNATIVES UNDER CONSIDERATION

Public Information Centres will be held to display the four lane alternatives for Highway 11/17. These information centres will provide you with the opportunity to review the evaluation of all alternatives, and comment on those alternatives still under consideration.

The Information Centres will be held as follows:

Wednesday, January 27, 1993
DORION COMMUNITY CENTRE
Dorion Loop Road
2:00 p.m. to 8:00 p.m.

Thursday, January 28, 1993
HURKETT COMMUNITY CENTRE
West Highway 582
2:00 p.m. to 8:00 p.m.



Comments and enquiries may be directed to:

Linda Jackson
Senior Project Manager
Ministry of Transportation
615 James Street South
Thunder Bay, Ontario
P7C 4X9

Jim Horton
Consultant Project Manager
M. M. Dillon Limited
1425 Bishop Street
Cambridge, Ontario
N1R 6J9

Telephone: (807) 473-2120
Toll Free: 1-800-465-5034

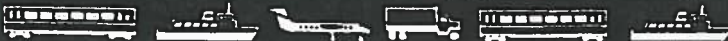
Telephone: (519) 623-6761
Call Collect

This project is one of a series of studies currently under way to examine the upgrading of the Trans-Canada Highway to a four lane divided highway between Thunder Bay and Nipigon. It is being conducted in accordance with the Environmental Assessment Act. Names and addresses associated with comments submitted to the Ministry will not be included in public documentation.

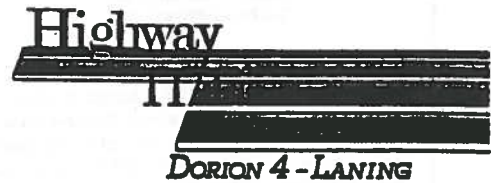


Ministry
of
Transportation
Ontario

Ministère
des
Transports



Nipigon-Red Rock Gazette
12 & 19 January 1993
Thunder Bay Times News/
Chronicle Journal
13 & 20 January 1993
Thunder Bay Post
13 & 20 January 1993



Public Information Centre No 2
Newspaper Advertisement

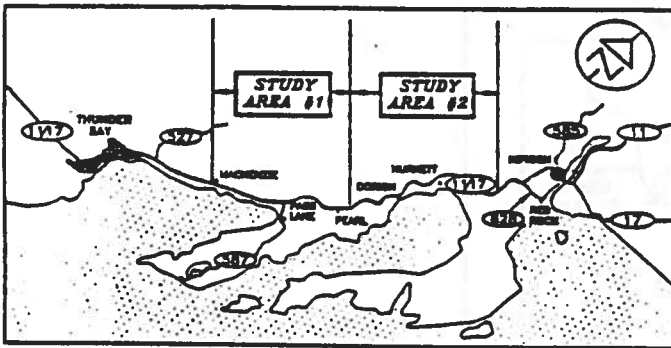
EXHIBIT 1

ONTARIO
GOVERNMENT NOTICE

PUBLIC INFORMATION CENTRES
HIGHWAY 11/17 FOUR-LANING PROJECTS

DISPLAY OF PREFERRED ALTERNATIVES

During the last year, a series of Public Information Centres have been held to assist the Ministry of Transportation in evaluating alternative corridors for the four-lane highway within the study areas indicated below. Factors considered include property impacts, environmental and economic impacts, highway safety and cost. The evaluation process is now nearing completion and a preferred corridor has been selected by the ministry's project team. Public Information Centres will now be held to present the corridor and to obtain further public comment before a final decision is made.



STUDY AREA #1

FROM MACKENZIE STATION ROAD EASTERLY
33 KM TO 4 KM EAST OF PEARL

The information centres will be held as follows:

Wednesday, June 16, 1993 STRATFORD ROOM LANDMARK INN 1010 Dundas Road Thunder Bay, Ontario 2:00 pm. to 6:00 pm.	Thursday, June 17, 1993 KILGERRIE PUBLIC SCHOOL Lakeshore Drive Municipality of Shantah 4:00 pm. to 8:00 pm.
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Comments and enquiries may be directed to:

Gordon Sawick
Senior Project Manager
Ministry of Transportation
615 James Street South
Thunder Bay, Ontario
P7C 4X3

Telephone: (807)473-2131
Toll Free: 1-800-485-6034

STUDY AREA #2

FROM 8 KM WEST OF OUMET EAST LIMIT OF
STUDY AREA #11 EASTERLY 36 KM TO THE
RED ROCK TOWNSHIP WEST BOUNDARY

The information centres will be held as follows:

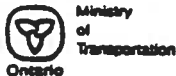
Wednesday, June 23, 1993 HURON COMMUNITY CENTRE West Highway 262 Huron, Ontario 2:00 pm. to 6:00 pm.	Thursday, June 24, 1993 DORION COMMUNITY CENTRE Dorion Loop Road Dorion, Ontario 4:00 pm. to 8:00 pm.
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Comments and enquiries may be directed to:

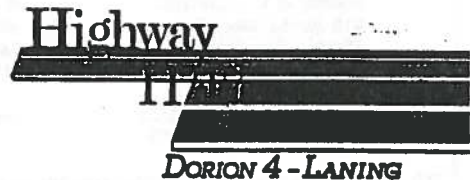
Linda Jackson
Senior Project Manager
Ministry of Transportation
615 James Street South
Thunder Bay, Ontario
P7C 4X3

Telephone: (807)473-2120
Toll Free: 1-800-485-6034

These projects are two of a series of studies currently under way to examine the upgrading of the Trans-Canada Highway to a four lane divided highway between Thunder Bay and Nipigon. Comments and information are being collected to assist the Ministry in meeting the requirements of the Environmental Assessment Act. They will be maintained on file for use during the study and may be included in study documentation. With the exception of personal information, all comments received will become part of the public record.



Nipigon-Red Rock Gazette
3, 10 & 17 June 1993
Thunder Bay Times News/
Chronicle Journal
2, 9 & 16 June 1993
Thunder Bay Post
1, 8 & 15 June 1993
Trucker Talk
June issue 1993



Public Information Centre No. 3
Newspaper Advertisement

Exhibit 1

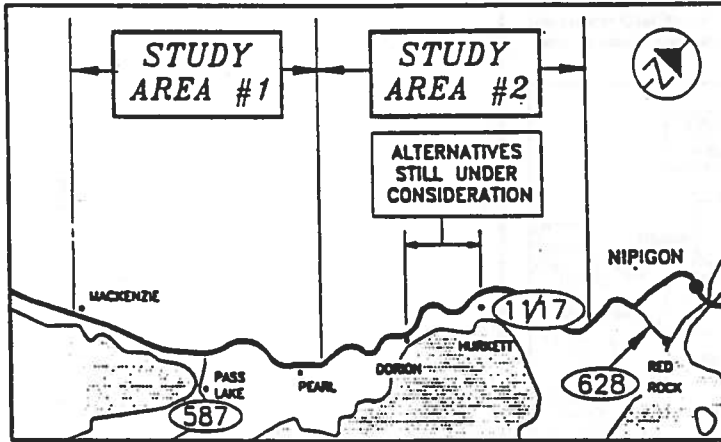
ONTARIO
GOVERNMENT NOTICE

**PUBLIC INFORMATION CENTRES
HIGHWAY 11/17 FOUR-LANING PROJECTS**

The Ministry of Transportation (MTO) will be holding Public Information Centres to display the **SELECTED ALTERNATIVE** in the study areas shown on the map below. The **SELECTED ALTERNATIVES** is a refinement of the corridor presented at the last information centre.

These Public Information Centres will be held to provide property owners and the public with the opportunity to view the plans, make comments and discuss their concerns with MTO representatives and their consultants. Preliminary details and effects on properties will be identified.

In Study Area #2, **THREE ALTERNATIVES ARE STILL UNDER CONSIDERATION** in the section between Dorion and Hurkett. The ministry is seeking public input on these three alternatives prior to making a decision on a selected alternative.



STUDY AREA #1

From Mackenzie Station Road Easterly 33 km to 4 km east of Pearl (West Limit of Study area #2)

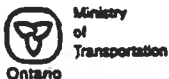
The information centres will be held as follows:

Tuesday, March 7, 1994	Tuesday, March 8, 1994
Stratford Room	McKenzie Public School
Landmark Inn	Lakeshore Drive
1070 Barzani Road	Municipality of Shamash
Thunder Bay, Ontario	Ontario
2:30 p.m. to 6:00 p.m.	4:30 p.m. to 8:00 p.m.

Comments and enquiries may be directed to:

Gordon Sawlak Senior Project Manager Ministry of Transportation 815 James Street South Thunder Bay, Ontario P7C 4X9 Telephone: 887-473-2131 Toll Free: 1-800-463-6034	Dave McCann, P.Eng. Parbr Consultants Ltd. 1406 Rymal Road East Hamilton, Ontario L8W 3N9 Telephone: 865-313-3234 (CALL COLLECT)
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These projects are two of a series of studies currently underway to examine the upgrading of the Trans-Canada Highway to a four-lane divided highway between Thunder Bay and Nipigon. They are being conducted in accordance with the Environmental Assessment Act. Names and addresses associated with comments submitted to the ministry will not be included in public documentation.



STUDY AREA #2

From 8 km West of Oulmet (East Limit of Study Area #1) Easterly 36 km to the Red Rock Township West Boundary.

The information centres will be held as follows:

Tuesday, Feb. 22, 1994	Wednesday, Feb. 23, 1994
Dorion Community Centre	Burbett Community Centre
Dorion Loop Road	West Highway 582
Dorion, Ontario	Hurkett, Ontario
2:30 p.m. to 5:00 p.m.	2:30 p.m. to 5:00 p.m.
7:30 p.m. to 8:00 p.m.	7:30 p.m. to 8:00 p.m.

Presentations will be made on both days at 7:30 p.m., followed by a question and answer session.

Comments and enquiries may be directed to:

Gordon Sawlak Senior Project Manager Ministry of Transportation 815 James Street South Thunder Bay, Ontario P7C 4X9 Telephone: 887-473-2131 Toll Free: 1-800-463-6034	Jim Horton, P.Eng. Project Manager M.J. Dillon Limited 1428 Bishop Road Cambridge, Ontario N1R 6J9 Telephone: 519-823-6761 (CALL COLLECT)
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Nipigon-Red Rock Gazette
10 & 17 Feb. 1994
Thunder Bay Times News/
Chronicle Journal
8 & 15 Feb. 1994
Thunder Bay Post
8 & 15 Feb. 1994
Trucker Talk
Feb. issue 1994



Public Information Centre No. 4
Newspaper Advertisement

Exhibit 2

ONTARIO
GOVERNMENT NOTICE

PUBLIC INFORMATION CENTRES

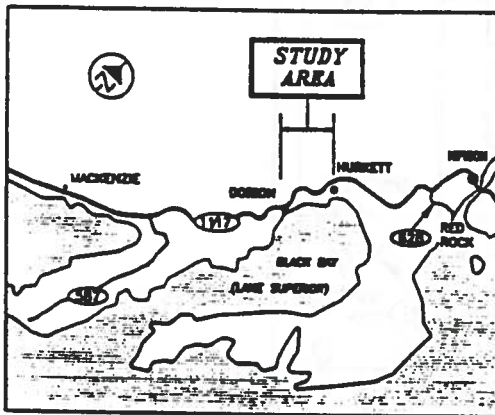
Planning and Preliminary Design Study Highway 11/17
Four-Laning Project Between Dorion and Hurkett

DISPLAY OF SELECTED ALTERNATIVE

The Ministry of Transportation (MTO) will be holding Public Information Centres to display the **SELECTED ALTERNATIVE** in the study area between **DORION AND HURKETT** as shown on the map below.

At previous Public Information Centres held in February, 1994, the selected alternative for the four-laning of Highway 11/17 from 8 km west of Oulmet to the west boundary of Red Rock Township was displayed. Also displayed were three alternatives still under consideration for the area between Dorion and Hurkett.

These Public Information Centres will now display the selected alternative between Dorion and Hurkett and will be held to provide property owners and the public with the opportunity to view the plans, make comments and discuss their concerns with MTO representatives and their consultants. Preliminary details and effects on properties will be identified.



The Public Information Centres will be held as follows:

Wednesday, Nov. 23, 1994 HURKETT COMMUNITY CENTRE West Highway 582 2:00 p.m. to 5:00 p.m. 7:00 p.m. to 9:00 p.m.	Thursday, Nov. 24, 1994 DORION COMMUNITY CENTRE at the Public School Dorion Loop Road 2:00 p.m. to 5:00 p.m. 7:00 p.m. to 9:00 p.m.
--	--

Comments and enquiries may be directed to:

Gordon Sawick
Senior Project Manager
Ministry of Transportation, Ontario
615 South James St.
Thunder Bay, Ontario
P7C 4X5
Telephone: (807) 473-2131
Toll Free: 1-800-485-6034

Jim Horton
Consultant Project Manager
M.M. Dillon Limited
1423 Bishop Street
Cambridge, Ontario
N1R 6J9
Telephone: (519) 623-6781
(call collect)

This project is one of a series of studies currently underway to examine the upgrading of the Trans-Canada Highway to a four-lane, divided highway between Thunder Bay and Nipigon. It is being conducted in accordance with the Ontario Environmental Assessment Act. Names and addresses associated with comments submitted to the Ministry will not be included in public documentation.


Ministry
of
Transportation
Ontario

Ministère
des
Transports



Nipigon-Red Rock Gazette
Nov. 10 & 17 1994
Thunder Bay Times News/
Chronicle Journal
Nov. 8 & 19 1994
Thunder Bay Post
Nov. 8 & 15 1994

Highway
11/17
DORION 4-LANING

Public Information Centre No. 5
Newspaper Advertisement

Exhibit 1

DILLON

Consulting Engineers • Planners
Environmental Scientists

June 2, 1993

Mr. John Coupland
Emergency Planning Officer
Emergency Measures Organization
Thunder Bay Area
330 North Vickers Street
THUNDER BAY, Ontario
P7C 4B2

Re: *Presentation of Preferred Alternative
Highway 11/17 Four-Laning Project from 8
km West of Ouimet, Easterly 36 km to the
Red Rock Township West Boundary*

Dear Mr. Coupland:

The Ministry of Transportation has initiated a series of studies to examine the upgrading of the Trans-Canada Highway (Highway 11/17) to a four-lane divided highway between Thunder Bay and Nipigon. This particular study is examining the section of the highway from 8 km west of Ouimet, easterly 36 km to the Red Rock Township west boundary. The study is being conducted in accordance with the requirements of the Environmental Assessment Act. An analysis and evaluation of alternatives has been completed and a *preferred corridor* for the referenced section of the highway has been identified.

On behalf of the Ministry of Transportation, we extend an invitation for you to attend a presentation of the *preferred corridor* at:

Time: 1:30 p.m.
Date: Tuesday, June 22, 1993
Place: Auditorium A
Ontario Government Building
189 Red River Road
Thunder Bay, Ontario
P7B 5G5

continued.....

This presentation is intended for all interested ministry, agency or utility representatives, to:

- review the results of Public Information Centre No. 2,
- review the evaluation of all alternatives,
- present the *preferred alternative*, and
- receive comments on the *preferred corridor*.

This presentation will take place prior to the third series of Public Information Centres being held in the study area. You are also welcome to attend a centre at the following locations:

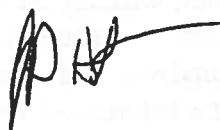
Wednesday, June 23, 1993
HURKETT COMMUNITY CENTRE
West Highway 582
Hurkett, Ontario
2:00 p.m. to 8:00 p.m.

Thursday, June 24, 1993
DORION COMMUNITY CENTRE
Dorion Loop Road
Dorion, Ontario
2:00 p.m. to 8:00 p.m.

If you plan to attend the presentation on June 22, 1993 or require further information, please telephone Linda Jackson, Senior Project Manager, MTO at (807) 473-2120 or the undersigned.

Yours truly,

M.M. DILLON LIMITED



Jim Horton, P. Eng.
Project Manager

JH:ms

- cc. L. Jackson — Senior Project Manager, Ministry of Transportation
W. Mound — Supervisor, Environmental Unit, Ministry of Transportation

HIGHWAY 11/17 DORION FOUR-LANING
Mailing List - Presentation June 22, 1993 - MINISTRY CONTACTS

W3449-01/3
May 28 1993

MINISTRY.J22

Mr. W. Ross
Regional Archaeologist
Ministry of Culture, Tourism and
Recreation
1825 East Arthur Street
THUNDER BAY, Ontario
P7E 5N7

Mr. D.W. Murray
District Officer
Ministry of the Environment, District
Office
435 South James Street
THUNDER BAY, Ontario
P7C 5G6

Mr. Charlie Lauer
Acting District Manager
Thunder Bay District
Ministry of Natural Resources
P.O.Box 5000
435 South James Street
THUNDER BAY, Ontario
P7C 5G6

Mr. Ron Running
District Manager
Nipigon District
Ministry of Natural Resources
P.O.Box 970
NIPIGON, Ontario
P0T 2J0

Ms. M. Henttonen
General Manager
Lakehead Region Conservation Authority
P.O.Box 3476
1136 Oliver Road
THUNDER BAY, Ontario
P7B 5J9

Mr. D.E. Moorhouse
Regional Director
Ministry of Northern Development and
Mines
435 South James Street
THUNDER BAY, Ontario
P7E 5G6

~~Mr. L. Maki~~ *Mark Sutterfield*
Acting Chief Approvals and Planning
Ministry of the Environment, Regional
Office
435 South James Street
THUNDER BAY, Ontario
P7C 5G6

Mr. R. Rivard
Area Manager East
Ministry of Tourism and Recreation
1265 Arthur Street East
THUNDER BAY, Ontario
P7E 6E7

Mr. Paul Ertel
Nipigon District
Ministry of Natural Resources
P.O. Box 970
NIPIGON, Ontario
P0T 2J0

Officer Tim Harper
Ontario Provincial Police
NIPIGON, Ontario
P0T 2J0

Ms. Barb MacLean
Horticulture Crop Advisor
Ministry of Agriculture and Food
435 South James Street
THUNDER BAY, Ontario
P7E 6E3

Mr. H. Van Wesenbeeck
Land Use Branch
Ministry of Agriculture and Food
ELMVALE, Ontario
LOL 1P0

Regional Manager
Ontario Provincial Police
P.O. Box 3080
THUNDER BAY, Ontario
P7B 5G5

HIGHWAY 11/17 DORION FOUR-LANING
Mailing List - Presentation June 22, 1993 - AGENCY CONTACTS

92-3449-01/3

May 28 1993

AGENCY J22

Mr. John Coupland
Emergency Planning Officer
Emergency Measures Organization
Thunder Bay Area
330 North Vickers Street
THUNDER BAY, Ontario
P7C 4B2

Mr. Chas. James Eccles
Chairman, Board of Governors
Lake Superior School
P.O.Box 3163, Bay's End
THUNDER BAY, Ontario
P7B 5G6

Mr. M. Rampersad
Business Administrator
Red Rock Nipigon Board of Education
RED ROCK, Ontario
POT 2PO

HIGHWAY 11/17 DORION FOUR-LANING
Mailing List - Presentation, June 22, 1993 - UTILITY CONTACTS

W3449-01/4

May 28 1993

UTILITY.J22

Mr. G.W. Pilot
Manager, O.P. Planning
Bell Canada
1001 William Street, Second Floor
THUNDER BAY, Ontario
P7B 6J9

Mr. Ivan Hamelin
Thunder Bay, L.A.N.
TransCanada Pipeline
91 Cumberland Street South
THUNDER BAY, Ontario
P7B 6A7

Mr. Robert Malvern
Manager, Environmental Support and
Integration Department
Engineering and Construction Services
Branch
Ontario Hydro
Floor H17-E22, 700 University Avenue
TORONTO, Ontario
M5G 1X6

Mr. Robert Alstrom
Design and Development Division -
Transmission
Transmission Stations Programs
Department
Ontario Hydro
700 University Avenue
TORONTO, Ontario
M5G 1X6

Mr. J.D. Champion
Superintendent Algoma Division
CP Rail
233 Elgin Street
SUDBURY, Ontario
P3E 3N7

Mr. D. Wilke
Outside Plant Engineering
City of Thunder Bay Telephone
1046 Lithium Drive
THUNDER BAY, Ontario
P7B 6G3

Mr. Doug Smith
District Manager, Manitoba District
CN Rail
460-123 Main Street
WINNIPEG, Manitoba
R3C 2P8

Mr. Robert Thompson
Northwestern Region
Ontario Hydro
34 Cumberland Street North
THUNDER BAY, Ontario
P7A 4L5

Mr. J.D. Forsyth
Supervising Project Manager
Design and Development Transmission
Ontario Hydro
700 University Avenue
TORONTO, Ontario
M5G 1X6

Mr. G.R. Whitney
Maintenance Superintendent
Northwestern Region
Ontario Hydro
34 Cumberland Street North
THUNDER BAY, Ontario
P7A 4L5

APPENDIX C - RELEVANT STUDIES AND REPORTS

The following is a list of relevant studies and reports prepared on behalf of the Ministry of Transportation for this study area:

- Highway 11/17 (Thunder Bay to Nipigon) Project Appraisal Report, July 1990, M.M. Dillon Ltd.
- Highway 11/17: Dorion Built Heritage and Cultural Landscape Assessment, September 1991, Unterman PmPhail Cuming Associates.
- Pre-field Study of the Highway 11/17 4-Laning Project from Thunder Bay to Nipigon, Ontario, March 1992, Archaeological Services Inc.
- Summary Report of the First Series of Public Information Centres, Highway 11/17 Dorion 4-laning, March 1993, M.M. Dillon Ltd.
- Summary Report of the Second Series of Public Information Centres, Highway 11/17 Dorion 4-laning, April 1993, M.M. Dillon Ltd.
- Highway 11/17, Dorion Four-Laning Fisheries Investigations of Big Squaw Creek, March 1994, M.M. Dillon Ltd.
- Highway 11/17 Dorion 4-Laning Study, Fisheries Investigations of Big Squaw Creek, April 1994, M.M. Dillon Ltd.
- Summary Report of the Third and Fourth Series of Public Information Centres, Highway 11/17 Dorion 4-laning, June 1994, M.M. Dillon Ltd.
- Summary Report of the Fifth Series of Public Information Centres, Highway 11/17 Dorion 4-laning, January 1995, M.M. Dillon Ltd.
- Highway 11/17 Dorion 4-Laning, Planning and Preliminary Design Study of the Trans Canada Highway from 8 km West of Ouimet to Red Rock Township West Boundary, May 1996, M.M. Dillon Limited.

Relevant studies and reports prepared for adjacent projects are as follows:

- Highway 11/17, Red Rock to Nipigon, Planning Study, July 1993, McCormick Rankin Consulting Engineers.
- Planning and Preliminary Design Report Four-Laning Highway 11/17(MacKenzie to East of Pearl), November 1995, C.C. Parker Consultants.
- Environmental Study Report, Highway 11/17, MacKenzie to East of Pearl, January 1996, C.C. Parker Consultants
- Highway 11/17, Red Rock to Nipigon, Planning Study Update and Preliminary Design Study, 1996, C.C. Parker Consultants
- Highway 11/17, Highway 527 to the MacKenzie Station Road, Preliminary Design Study, May 1996, Giffels Associates Ltd.
- Environmental Study Report, Four-Laning of Highway 11/17, Red Rock to Nipigon, C.C. Parker Consultants (pending)
- Environmental Study Report, Four-Laning of Highway 11/17, From Highway 527/Spruce River Road to MacKenzie Station Road. Ministry of Transportation (pending)

APPENDIX D - NATURAL ENVIRONMENT ANALYSIS - EXISTING CONDITIONS

Area	Resources	Impacts	Measures
Water Resources	Surface water, groundwater, wetlands	Alteration of hydrology, water quality degradation	Water quality monitoring, riparian zone protection
Soil Resources	Productive soils, wetlands	Soil erosion, loss of soil productivity	Erosion control measures, soil conservation practices
Vegetation	Native plants, trees, shrubs	Loss of habitat, reduction in biodiversity	Reforestation, preservation of existing vegetation
Wildlife	Native animals, birds, insects	Habitat loss, disturbance to nesting sites	Wildlife corridors, nesting site protection
Cultural Resources	Historic sites, archaeological remains	Disturbance to cultural heritage	Archaeological investigations, site preservation
Scenic Resources	Natural beauty, views, landmarks	Visual intrusion, loss of scenic quality	Screening measures, landscape integration
Recreation Resources	Parks, trails, recreational areas	Disturbance to recreational activities	Recreation management plans, access control
Geological Resources	Geological formations, seismicity	Geological hazards, seismicity	Geological hazard assessments, seismic safety measures
Climate Resources	Microclimate, air quality	Climate change impacts, air quality degradation	Climate change mitigation measures, air quality monitoring

Natural Environment Analysis — Existing Conditions

Crossing Point	Site Description	Vegetation/Wildlife	Fisheries Concern	Site Assessment
<p>SITE 1 Welch Crk St. 0+000</p>	<ul style="list-style-type: none"> •stream passes under road through a 2 m culvert at grade •on north side, stream flows through open area with good cover of vegetation and good undercut banks •beavers have dammed stream upstream, creating two large ponds •substrate is gravel with high level of organic debris •on south side is a small pond with good population of fish •substrate is gravel with boulders upstream •temperature 16°C (August 1, 1991) •a spring-fed tributary enters stream 50 m from culvert 	<ul style="list-style-type: none"> •eel grass •arrowhead •joe pye weed •sedges •redtop •reed canary grass •water buttercup •jewel weed •poplar •balsam fir •black spruce •white birch •blue heron observed fishing, beaver and muskrat activity 	<ul style="list-style-type: none"> •culvert does not inhibit passage - at least 30 cm of flowing water •beaver dam prevents fish movement upstream •MNR has identified this stream as a brook trout fishery 	<ul style="list-style-type: none"> •south side has more cover than north side •agricultural activities were noticed on north side •stream parallels road on north side for short distance
<p>SITE 2 Tributary of Welch Creek Sta. 0+925</p>	<ul style="list-style-type: none"> •passage is evident, but was dry August 1, 1991 •vegetation changes from grass to cattail as it approaches main branch of Welch Creek 	<ul style="list-style-type: none"> •hay field to north •flora in swale consists of: •sedges •wild mint •marsh marigold •small willows 	<ul style="list-style-type: none"> •grassed waterway •fish potential is zero 	<ul style="list-style-type: none"> •appears to be spring runoff tributary
<p>SITE 3 Small Stream West of Strawberry Farm Sta. 6+425</p>	<ul style="list-style-type: none"> •small stream with good flow •passage is impeded by broken sticks and other debris •a grill has been placed on the north side to prevent beaver entry •substrate is gravel and sand •stream 1 m wide and 0.7 m deep •water was cloudy (rained night before) •temperature 14°C (August 1, 1991) •stream had been stocked with minnows by nearby resident •stream is spring fed 	<ul style="list-style-type: none"> •stream has good cover of: •joe pye weed •poplar •white birch •black spruce •purple flowering raspberry •grasses •sedges •red-osier dogwood •stream flows into small woodlot dominated by poplar and white birch 	<ul style="list-style-type: none"> •culvert does not impede flow •grill on north end of culvert was clear but may become clogged •minnows were observed •local residents say no game fish exist 	<ul style="list-style-type: none"> •main purpose of stream is to drain surrounding area including agricultural fields to the north and south

Crossing Point	Site Description	Vegetation/Wildlife	Fisheries Concern	Site Assessment
<p>SITE 4a Ouimet Sta. 7+650 to Sta. 7+850</p>	<ul style="list-style-type: none"> •no culvert found •dry stream channel 1 m wide as of July 31, 1991 	<ul style="list-style-type: none"> •dry area: •poplar •purple flowering raspberry •brambles and grasses 	<ul style="list-style-type: none"> •none 	<ul style="list-style-type: none"> •dry ditch used for drainage purposes
<p>SITE 4b</p>	<ul style="list-style-type: none"> •low flow in channel •culvert 2 m in diameter; water height to 2/3 of culvert •ponding downstream •river widens 10 m, 30 cm deep •substrate sand/silt 	<ul style="list-style-type: none"> •some evidence of water fowl •vegetation includes: •instream of swamp horsetail •broadleaved cattail, burreed •water plantain, arrowhead •evidence of beaver •bank supports red-osier dogwood •balsam fir •very little topsoil 	<ul style="list-style-type: none"> •depending on passage downstream could act as a nursery for young fish 	<ul style="list-style-type: none"> •could act as a headwater for downstream fisheries
<p>SITE 4c East Ponds</p>	<ul style="list-style-type: none"> •two large, shallow, man-made ponds •topsoil has been removed leaving sunbaked clay with very little cover •water source appears to be seepage and ground water 	<ul style="list-style-type: none"> •good population of waterfowl including waders and bottom feeders •both ponds have good population of emergents including variegated and swamp horsetail cattails •evidence of moose/deer •site stripped of topsoil 	<ul style="list-style-type: none"> •some minnows seen •pond is shallow, open and has limited cover for fish •bottom cover is limited 	<ul style="list-style-type: none"> •south side has wildlife potential; ponds could act as a rest station for migrating birds •little value for sports fishing because of lack of cover and because ponds are too shallow
<p>SITE 5 East End of CP Rail Bridge 125 m West of Ouimet Canyon Road Sta. 8+175</p>	<ul style="list-style-type: none"> •north side — low flow channel with sedges, marsh marigold grasses in a poplar and willow bush; a stagnant pool of 1 m diameter sits in front of a 1.5 culvert at grade •south side — stream is 1 m wide with water 10 cm deep; substrate of gravel; passage is restricted because of boulders, sticks, etc. — stream enters poplar bush where it meanders with deep pools; temperature 14°C (August 1, 1991) 	<ul style="list-style-type: none"> •in open area along banks of bridge is good cover of crown vetch and grasses •in poplar bush — understorey of: •red osier dogwood •ostrich fern •alder •white birch •black ash •wild sarsaparilla •water plantain 	<ul style="list-style-type: none"> •boulders and sticks impede fish passage 	<ul style="list-style-type: none"> •no fish seen •stream does not appear to expand in the spring •is a headwater for fish downstream •thick forest cover keeps water cool

Crossing Point	Site Description	Vegetation/Wildlife	Fisheries Concern	Site Assessment
<p>SITE 6 South of Dorion Loop Sta. 10+550</p> <p>Upstream</p> <p>Downstream</p>	<ul style="list-style-type: none"> •2 m diameter culvert •channel width 1 m, steeply sided •low flow •densely vegetated streambank •roots, large rocks form channel, sand/gravel substrate •bank full 30 cm above water level •river meanders to the west along highway •flows from small pond in hydro ROW through rock dam, pool ringed with cattails <ul style="list-style-type: none"> •elevated culvert 20 cm above water level 	<ul style="list-style-type: none"> •north side — manicured lawn to the north with woodlot surrounding stream •spp. include poplar, white birch, osier dogwood, asters and ferns <ul style="list-style-type: none"> •south side has small pool with good instream cover of water plantain and potamogeton •bank supports white birch, poplar, white spruce, alder with thick understorey of goldenrod, ferns and grasses 	<ul style="list-style-type: none"> •16°C •trout observed in small pool 2.5 m wide, 0.5 m deep •stream has greater gradient upstream which might make fish passage difficult <ul style="list-style-type: none"> •trout observed downstream •elevated culvert will restrict migration upstream during low flow 	<ul style="list-style-type: none"> •stream provides habitat for brook trout
<p>SITE 7 Boutters Creek East of Dorion Loop West Entrance Sta. 11+225</p> <p>Upstream</p>	<ul style="list-style-type: none"> •2.5 m culvert •old beaver dam directly upstream of culvert, water flows through dam •substrate sand/silt/clay, banks exposed clay/silt •stream 2.5 m wide, very silty •no instream cover, little flow •bank full 0.5 m above water level •meanders east upstream of culvert and follows adjacent to highway for 40 m •overhanging vegetation 	<ul style="list-style-type: none"> •50% cover of young white spruce and poplar •area appears to be abandoned pasture with brambles, goldenrod and Canada thistle 	<ul style="list-style-type: none"> •open area between road and rail limits cover and raises temperature 	

Crossing Point	Site Description	Vegetation/Wildlife	Fisheries Concern	Site Assessment
Downstream	<ul style="list-style-type: none"> •culvert elevated above water level 20 cm •opens to large pool 4 m x 10 m •50 m to railway, 1.5 m diameter culvert under rail, elevated 0.5 m above water level •small patches of gravel downstream •faster flow closer to railway 	<ul style="list-style-type: none"> •badly eroded area, needs rehabilitation •spp. include willows, grasses, Sonchus, joe pye weed, chicory and wild carrot 	<ul style="list-style-type: none"> •culverts at highway and rail are raised, restricting fish passage upstream during low flow 	<ul style="list-style-type: none"> •south side previously impacted by hydro, rail and highway
<p>SITE 8 Between East and West Dorion Loop Entrance Sta. 12+500</p> <p>Upstream</p> <p>Downstream</p>	<ul style="list-style-type: none"> •1 m diameter culvert •cattails in stream and in highway ROW •standing water, not flowing •no definite channel <ul style="list-style-type: none"> •standing water at culvert, cattails •wet to railway tracks — no sign of culvert under rail 	<ul style="list-style-type: none"> •dominant plants are cattails, sedges, joe pye weed, fireweed and brambles •trees which are scattered include black ash, cedar, larch, and willow •wetter on north side <ul style="list-style-type: none"> •wide corridor for hydro wires, area is maintained, grasses, sedges and joe pye weed •area may be cut once a year 	<ul style="list-style-type: none"> •tadpoles observed in pools of standing water <ul style="list-style-type: none"> •no culvert under railway bed, thus no migration upstream 	<ul style="list-style-type: none"> •passage appears to be for drainage purposes only, with some value for amphibians
<p>SITE 9 Dorion East Loop Entrance Sta. 14+300</p> <p>Upstream</p> <p>Downstream</p>	<ul style="list-style-type: none"> •1.5 m diameter culvert •no culvert — intermittent <ul style="list-style-type: none"> •some standing water at base of culverts, cattails in channel •2 m wide, 30 cm deep, bank full 30 cm above water level •channel downstream 1 m wide, substrate of sand/gravel, densely vegetated banks •no flow 30 m downstream •small meander patterns, sand bed 	<ul style="list-style-type: none"> •follows field to northeast, passage would drain this field in spring •ditch well vegetated with cattail reed canary grass, wild parsnip, creeping vetch, brambles and fireweed <ul style="list-style-type: none"> •channel enters woodlot of poplar, white spruce, black spruce and white birch •open areas of cattails, reed canary grass, fireweed 	<ul style="list-style-type: none"> •culvert is raised in the middle restricting passage of low flow •intermittent 	<ul style="list-style-type: none"> •north side twinning would impact on field drainage to north •stream passage appears to be man-made

Crossing Point	Site Description	Vegetation/Wildlife	Fisheries Concern	Site Assessment
<p>SITE 10 Coldwater Creek Sta. 15+000</p> <p>Upstream</p> <p>Downstream</p>	<ul style="list-style-type: none"> •under bridge substrate — large boulders •bridge abutments are out of water •river 5-6 m wide, 1-2 m deep •upstream substrate — sand/silt •no instream cover or vegetation •some submerged logs •evidence of erosion for each bank •sedges along west bank (inside of curve of meander) •water contained high silt content (possibility of rain overnight) •upstream creek meanders to west, widens to 10 m •very silty, vegetated banks, no instream cover or vegetation <ul style="list-style-type: none"> •under bridge are large boulders to protect bridge footing •river narrows and deepens under bridge — restricted by boulders •rock weir immediately downstream from bridge, pool 10-12 m wide •banks of sand/silt, some patches of clay •southwest bank shows evidence of erosion, root bundle has fallen into stream •little to no instream cover •high slope on west bank •100 m downstream — small rapid boulders — man-made — 5 m wide, large pool below at crossing point of old highway •200 m downstream river widens, steep, exposed banks 	<ul style="list-style-type: none"> •area maintained 50-75 m north of bridge •woodlot to the north includes white birch, poplar, black spruce, alder, white spruce •limited instream cover of redtop, sedges, arrowhead, red-osier, dogwood and grasses <ul style="list-style-type: none"> •pool shaded by black spruce, poplar and white birch - some slippage noticed on west side •old road base now covered with alders, balsam fir, alders, grasses •area has been disturbed but has grown over very well 	<ul style="list-style-type: none"> •16°C, 11:55 a.m., July 31, 1991 •drainage from highway enters creek via culverts from top of slope <ul style="list-style-type: none"> •steeply sided valley of sand and silt could cause sedimentation problems in stream 	<ul style="list-style-type: none"> •downstream on east side at old bridge abutments previously impacted •potential for sedimentation during construction due to sand/silt river banks

Crossing Point	Site Description	Vegetation/Wildlife	Fisheries Concern	Site Assessment
<p>SITE 11 Wolf River Sta. 17+000</p> <p>Upstream</p> <p>West Side of River (Oxbow)</p> <p>Downstream</p>	<ul style="list-style-type: none"> •gabion basket protection of northeast bank at bridge abutment •wide floodplain •diversion of east meander •substrate gravel/sand/cobble •east bank — sand •cut-off meander — ponded, sand, little instream cover •standing water — wetland area •no fish observed •10 m wide, variable depth 0.5 m •bridge abutments form banks on east and west banks •substrate — gravel/rock cobble/sand •fast flowing •area under bridge consists of run with some boulders •no instream vegetation •southeast bank — some shrub vegetation, little overhanging vegetation •bank full 1 m above water level •banks are predominantly sand •trail along southeast bank •meanders to the east 100 m downstream from bridge, undercut bank shows exposed sand/gravel/ cobble •inside bend of meander — fine sand, pool areas, small area of aquatic vegetation in shallow 	<ul style="list-style-type: none"> •area is open and has been cleared •bank cover is limited to planted alfalfa, birds foot trifoil and grasses - needs rehabilitation to support any wildlife •soil cover is limited, bank is mainly gravel based •cover of bulrushes, potamogeton, joe pye weed, water plantain, horsetail sedges, water plantain around oxbow •some evidence of bears •banks appear to be maintained with no instream plants •small tract of woodlot east of bridge with cedar, white birch, poplar, balsam fir, black ash, white spruce •banks and cover has been disturbed by fishing activities (i.e. trampling) 	<ul style="list-style-type: none"> •fish sample taken on west bank in instream grass •dam upstream to stop spawning lamprey •20°C, 10:10 a.m., July 31, 1991 	<ul style="list-style-type: none"> •slippage on northeast side needs rehabilitation •slope currently 3:1 - some trees are becoming established, but would be washed away during large storm event

Crossing Point	Site Description	Vegetation/Wildlife	Fisheries Concern	Site Assessment
<p>SITE 12 Sta. 20+000 to Sta. 20+250</p> <p>Upstream</p> <p>Downstream</p>	<ul style="list-style-type: none"> •2 m culvert •stream 2 m wide, channel 4 m, 15 cm deep at culvert •substrate sand/gravel •bank full depth 0.5 m above water level •series of riffles caused by fallen logs, scattered boulders •sand/gravel banks •overhanging vegetation (alders) •no instream vegetation •21°C, 4:45 p.m., July 30, 1991 •downstream from culvert, cement and wood retaining wall forms east bank of stream •wall constructed to provide slope protection for cemetery •wall causes stream to meander to west •large boulders at culvert mouth •sand/gravel substrate, gravel bard •downstream well shaded, overhanging vegetation •meanders and pool/riffle patterns, riffles caused by instream log debris, gravel beds •evidence of old channels (oxbows) •stream 2 m wide, 30 cm deep in run areas 	<ul style="list-style-type: none"> •tree farm on west side •banks have good cover of madder, joe pye weed, willow, poplar and alder •in open areas Canada thistle, redtop, aster, meadow rue, red osier, dogwood, brambles, pussytoes are dominant •along stream area is very disturbed •banks support alder, black spruce, poplar, balsam fir •understorey consists of red osier dogwood, white baneberry, wild sarsapanilla, sedges and joe pye weed •area around stream bank very muddy 	<ul style="list-style-type: none"> •fish sample collected in off-stream pond •brook trout immediately downstream from culvert •presence of retaining wall prevents shading and creates shallow pool which may cause increase in temperatures •wall is constructed from creosote treated wood, concern about toxins entering water 	<ul style="list-style-type: none"> •provides good habitat - slight meanders, pool/riffle pattern, gravel beds, well shaded •provides good habitat •gravel beds provide suitable spawning habitat for brook trout •stream requires more rehabilitation on south side •existing stream works will eventually force river into base of road

Crossing Point	Site Description	Vegetation/Wildlife	Fisheries Concern	Site Assessment
<p>SITE 13 Sta. 21+750</p> <p>Upstream</p> <p>Downstream</p>	<ul style="list-style-type: none"> •very low flow entering culvert •dense, overhanging vegetation •instream tree debris •sand/silt substrate •no instream vegetation <ul style="list-style-type: none"> •1 m culvert •very low flow •channel 1 m wide, 0.5 m deep at bank full height •sand/silt substrate •downstream stream has dense overhang, patches of gravel •stream flows under the surface in some areas •instream log debris 	<ul style="list-style-type: none"> •stream flows from forest of poplar, white birch, balsam fir and alder •good light penetration supports red-osier dogwood, bunch berry, wild sarsaparilla <ul style="list-style-type: none"> •flows into scattered poplar and black spruce •thick understorey of seeding soft maple, red osier dogwood, wild black currants, ferns and marsh marigold 	<ul style="list-style-type: none"> •some ponding water at culvert, culvert should be lowered to permit flow 	
<p>SITE 14</p> <p>Upstream</p> <p>Downstream</p>	<ul style="list-style-type: none"> •intermittent stream •seepage from hillside •drainage from ditch along highway; ROW undercuts bank behind the culvert •cuts through steep bank <ul style="list-style-type: none"> •very low flow •sand substrate •channel approximately 1 m wide 	<ul style="list-style-type: none"> •large outcrop of bedrock on north side •drains forest of poplar, black spruce, white birch and white spruce <ul style="list-style-type: none"> •flows into forest of poplar, balsam fir and white birch 	<ul style="list-style-type: none"> •culvert elevation too high to permit low flow 	<ul style="list-style-type: none"> •culvert should cross stream at high angles
<p>SITE 15 West of Stewart Lake Road North of Highway Sta. 22+500</p> <p>Upstream</p> <p>Downstream</p>	<ul style="list-style-type: none"> •two 1.5 m culverts •5 m upstream from culvert substrate is large flat bedrock slab 10 m x 7 m •upstream of bedrock the stream narrows to 2 m wide <ul style="list-style-type: none"> •culverts elevated above water surface •flow over sheet of bedrock •substrate — sand, gravel, scattered vegetation 	<ul style="list-style-type: none"> •no instream cover because of bedrock •overhanging vegetation of poplar, alder and green ash •bedrock slab covered with algae <ul style="list-style-type: none"> •stream flows under fence with some debris, no instream cover •flows into forest of poplar and black spruce 	<ul style="list-style-type: none"> •upstream migration impossible during low flows due to elevation of culvert •bedrock outcrop would restrict upstream migration during low flow •some flow underneath culvert 	<ul style="list-style-type: none"> •zero to low potential for fish and benthics in present state

Crossing Point	Site Description	Vegetation/Wildlife	Fisheries Concern	Site Assessment
<p>SITE 16 Sta. 23+000</p> <p>Upstream</p> <p>Downstream</p>	<ul style="list-style-type: none"> •culvert 1.5 m diameter •very low flow •stream bank heavily vegetated — willow, alder, dogwood •upstream intermittent; flows through cleared land <ul style="list-style-type: none"> •stream 1.5 m wide, 30 cm deep •substrate sand/silt •little flow •no noticeable stream banks •stream widens through ROW, 30 m downstream narrows to 1 m •dense overhang, instream log debris •riffles caused by instream debris •gravel patches 	<ul style="list-style-type: none"> •some alder, white birch, poplar and willow exists in uncleared land <ul style="list-style-type: none"> •flows into balsam fir, poplar cedar •instream cover of cattail, swamp horsetail, fescues, alders, joe pye weed, fireweed, ferns, madder, marsh marigold •understorey is dense - ferns, swamp, currant, red-osier dogwood, bunch berry, swamp rose •good population of leopard frogs •good rabbit population 	<ul style="list-style-type: none"> •upstream is intermittent; cleared banks lacking protection •elevation of culvert too high to permit movement during low flow •16°C, 3:30 p.m., July 30, 1991 	<ul style="list-style-type: none"> •downstream provides good habitat in terms of cover; overhanging vegetation, instream cover, gravel substrate •north side stream is intermittent and previously impacted by clearing
<p>SITE 17 Sta. 23+500</p> <p>Upstream</p> <p>Downstream</p>	<ul style="list-style-type: none"> •1 m diameter culvert •slow moving •sand/gravel substrate •stream 30 cm wide •algae instream •grass banks through ROW clearing, cattails •no flow upstream — intermittent, poorly defined stream bank •standing water in ROW clearing <ul style="list-style-type: none"> •standing water in ROW clearing •intermittent, no flow 	<ul style="list-style-type: none"> •area very damp; supports Mentha sp. •stream enters from balsam fir, white birch, cedar, alder bush <ul style="list-style-type: none"> •very rich woods with good stand of poplar, white birch with meadow rue undergrowth 	<ul style="list-style-type: none"> •very little potential for fish because of low flow 	<ul style="list-style-type: none"> •rich woods on south side

Crossing Point	Site Description	Vegetation/Wildlife	Fisheries Concern	Site Assessment
SITE 18 Sta. 24+000 Upstream Downstream	<ul style="list-style-type: none"> •grass banks in open ROW clearing •banks 0.5 m above water level •substrate — sand/silt •stream crosses highway at right angles then meanders to the east through ROW for 15 m •1.5 m wide, 0.5 m deep •high flow channel is braided •channel has dense overhanging vegetation and instream log debris which form weirs and riffles •substrate — silt •1.5 m diameter culvert •stream 2 m wide at culvert •substrate sand/silt/gravel •grass/weed banks in area adjacent to ROW •fast flowing downstream from ROW •overhanging woody vegetation; eelweed instream •sand/silt banks •some fallen logs instream, 2-3 m wide, 0.5 m deep •slight meander pattern; undercutting an inside curve, banks 1 m above water level 	<ul style="list-style-type: none"> •woodlot very thick •many dead large cedars; giving rise to yew, balsam fir, cedar, poplar, white birch and alder •woodlot has limited understory of ferns •instream cover - eelweed •banks support sedges, brambles, joe pye weed, asters, willow •stream flows into forest of black spruce, cedar, balsam fir, soft maple •instream vegetation - eelweed, burreed 	<ul style="list-style-type: none"> •culvert of main channel would restrict drainage of spring runoff channels •20°C, 2:30 p.m., July 30, 1991 •no fish observed 	<ul style="list-style-type: none"> •good instream cover •well shaded throughout

Crossing Point	Site Description	Vegetation/Wildlife	Fisheries Concern	Site Assessment
<p>SITE 19 Little Squaw Creek Sta. 26+400</p> <p>Upstream</p> <p>Downstream</p>	<ul style="list-style-type: none"> •beaver dam upstream from culvert •large pond, 25 m wide; sand/silt substrate •downstream of dam stream is 2 m wide; substrate — boulders, gravel with riffle areas and small ponds •overhanging woody vegetation •culvert 3 m diameter corrugated pipe, boulders at upstream end •eelweed at mouth of culvert •opens into pool 5 m wide, 10 m long •substrate sand/silt •no overhanging vegetation •patches of gravel downstream •30 m downstream of culvert, stream has overhanging vegetation, boulders, rock cobble, riffles caused by instream debris •stream meanders to the east downstream 	<ul style="list-style-type: none"> •good cover of willow, alder, poplar with understorey of madder, marsh , manigold, meadow rue, cow parsnip, joe pye weed, violets, swamp candles •well established windbreak of red pine and white spruce on upstream side •very open area of alder, white birch, poplar, fireweed, redtop with instream cover of potomogeton and burreed and eelweed 	<ul style="list-style-type: none"> •19°C, 12:20 p.m., July 30, 1991 •upstream of culvert is impacted by beaver dam and temperature increases due to ponding 	<ul style="list-style-type: none"> •red pine and white spruce windbreak has some value
<p>SITE 20 Big Squaw Creek Sta. 29+500</p> <p>North Side of Culvert</p> <p>20 m Upstream of Culvert</p>	<ul style="list-style-type: none"> •box culvert 2 m x 4 m •boulders from V-shaped weir at upstream end of culvert •water depth 10 cm through culvert •some filamentous algae at culvert •substrate — boulders, rubble •stream 4 m wide •slow moving •little instream cover, some filamentous algae •overhanging vegetation, vegetation banks •small tributary enters stream 	<ul style="list-style-type: none"> •stream banks have good cover of Kentucky blue grass, asters, clover, horsetails, thistles •has good cover of Kentucky blue grass, asters, clover, horsetails, thistles, alder, red-osier dogwood, arens, madder, willow, meadow rue, redtop, joe pye weed 	<ul style="list-style-type: none"> •16°C, 11 a.m., July 30, 1991 	

Crossing Point	Site Description	Vegetation/Wildlife	Fisheries Concern	Site Assessment
Further Upstream Adjacent to ROW	<ul style="list-style-type: none"> •substrate — sand with gravel patches •some filamentous algae •overhanging banks •3 m wide, 0.5 m deep •some instream logs cause small riffles 			
Small Culvert to the East at Sta. 29+600	<ul style="list-style-type: none"> •30 cm diameter pipe culvert •low flow through culvert •upstream end of culvert restricts flow •very dense overhanging and bank vegetation •stream 1 m wide, bank full, 1 m high, water depth 15 cm •slow moving, no riffles, slight meanders 	<ul style="list-style-type: none"> •dense bank cover include red-osier dogwood, sedges, redtop aster 	<ul style="list-style-type: none"> •13°C, 11:15 a.m., July 30, 1991 	
South Side of Culvert 20 m from Edge of ROW	<ul style="list-style-type: none"> •north bank is grassed, no overhanging vegetation adjacent to ROW •south bank overhanging vegetation — alders •4 m wide, 30 cm deep •filamentous algae •sand/gravel substrate •log weirs •no instream vegetation 	<ul style="list-style-type: none"> •black spruce on upper banks •plant spp. include asters, sedges, fireweed, Kentucky blue grass, red top, joe pye weed and brambles •some areas are maintained 	<ul style="list-style-type: none"> •stream impacted by pipeline crossing and by existing highway •17°C, 11:50 a.m., July 30, 1991 	<ul style="list-style-type: none"> •south side twinning would require wide median to buffer stream
South Side of Culvert	<ul style="list-style-type: none"> •boulders/riffle at downstream end of culvert •large pool, 1 m deep, 5 m wide •stream meanders east of pool •clay banks around pool •gravel/sand substrate 		<ul style="list-style-type: none"> •stream probably diverted at culvert, evidence is large pool and large meander upstream of culvert 	
Small Culvert to the East	<ul style="list-style-type: none"> •stream meanders from east to south •some undercutting on east bank, fallen trees, logs •sand substrate, patches of gravel •stream narrows downstream, to 2 m wide, 0.5 m deep •overhanging vegetation, instream logs cause riffles 	<ul style="list-style-type: none"> •good cover of black spruce, poplar, white birch, alder •understorey and along bank consists of brambles, joe pye weed, cow parsnip, sedges grasses 		

Crossing Point	Site Description	Vegetation/Wildlife	Fisheries Concern	Site Assessment
<p>SITE 21 Black Sturgeon River St.33+000</p> <p>100 m Upstream of Bridge</p>	<ul style="list-style-type: none"> •substrate — sand, clay •little instream cover, some fallen logs •banks predominantly sand, erosion evident on northeast •upstream is a run/riffle area consisting of cobble/gravel/boulders •meander on northeast has been diverted or straightened to protect the east bank near bridge •overhanging vegetation along streambank •northeast bank — sand/clay with signs of erosion caused by highway runoff 	<ul style="list-style-type: none"> •banks covered with clubrush, sedges and horsetail •instream cover of arrowhead, skullcap, water horehound and red top •in some placed alders touch water, but water shallow 	<ul style="list-style-type: none"> •potential for further erosion of banks and increased sedimentation of stream 	
<p>At Existing Bridge</p>	<ul style="list-style-type: none"> •bridge abutments form the streambanks under bridge •substrate — sand and clay •little instream cover, some logs on west bank •downstream substrate — sand, gravel, cobble •40 m wide 	<ul style="list-style-type: none"> •vegetation is maintained for 15 m on each side •has good cover of sonchus, creeping vetch, sedges, clovers, thistles and goldenrod •some erosion under bridge that has been filled with boulders 	<ul style="list-style-type: none"> •little instream cover •evidence of sedimentation •river widens under bridge •drainage ditch enters via culverts up and downstream of bridge on west bank •21°C, 3:17 p.m., July 29, 1991 	<ul style="list-style-type: none"> •area in the vicinity of the bridge provides little habitat due to lack of significant instream cover
<p>Downstream of Bridge</p>	<ul style="list-style-type: none"> •fast flowing, pool/riffle pattern •substrate — angular cobble •no instream vegetation •vegetation on west bank consists of low shrubs and boulders •east bank — grass and rock rubble •river meanders to west, 100 m downstream 	<ul style="list-style-type: none"> •scattered poplar, alder, red-osier dogwood with joe pye weed, horsetail, grasses 	<ul style="list-style-type: none"> •riffle/run area would provide spawning habitat for trout •same oily seepage enters from west bank 	
<p>Black Sturgeon Pond (cut-off meander)</p>	<ul style="list-style-type: none"> •sand substrate •very little water movement •seepage from bank 	<ul style="list-style-type: none"> •pond sp. include arrowhead, sedges, water parsnip, swamp horsetail, grasses, coon tail and potomogeton 	<ul style="list-style-type: none"> •26°C •still, warm July 29, 1991 water may provide a nursery area for fish for forage species 	