Federal Environmental Assessment and Review Process

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Federal Environmental
Assessment Review Office

CN Rail
Twin Tracking
Program

British Columbia

Interim Report of
the Environmental
Assessment Panel

September 1983

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CN Rail Twin Tracking Program

British Columbia

Interim Report of the Environmental Assessment Panel

September 1983

Government of Canada | Gouvernement du Canada

Environmental Assessment Review | Examen des évaluations environnementaies

Hull, Quebec
K1A OH3

The Honourable Charles Caccia, P.C., M.P.
Minister of the Environment
House of Commons
OTTAWA, Ontario

Dear Minister:

In accordance with the mandate issued on April 19, 1983 the Environmental Assessment Panel has commenced a review of the CN Rail twin tracking program in British Columbia and of the long term environmental implications of transportation related activities in the Fraser and Thompson River corridors.

Following information meetings held in Clearwater, Kamloops, Lytton, Chilliwack and Surrey from June 20 to 24, 1983 the Panel decided to prepare this interim report. Its purpose is to outline issues which have been identified, information which the Panel requires from CN Rail to complete its review and the Panel's plans for examination of the long term environmental implications of transportation related activities in the river corridors. In addition, the Panel wishes to transmit to appropriate levels of government and CN Rail, issues and concerns which have been brought to its attention but which it considers to be outside the terms of reference.

We are pleased to submit this interim report to you for your consideration.

Respectfully yours

R. G. Connelly
Chairman
CN Rail Twin Tracking
Environmental Assessment Panel

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1. INTRODUCTION

In December, 1982 the Minister of Transport asked the Minister of the Environment to establish an Environmental Assessment Panel to conduct a public review of the environmental and related socio-economic effects of CN Rail's plans to twin the track on its British Columbia main line from Valemount to Vancouver. The letter of referral also asked that the Panel examine the long term environmental implications of transportation related activities in the Fraser and Thompson River corridors.

The Minister of the Environment established a Panel in April, 1983 to undertake the review, in accordance with the federal government's Environmental Assessment and Review Process. The Panel members are Robert Connelly (Chairman), Fraser MacLean, Norman McLeod, Robert Pasco, Ross Peterson and Denis Russell. A short biography of the Panel members is included in Appendix A. The Executive Secretary to the Panel is Paul Scott. The Panel's terms of reference, issued by the Minister of the Environment, are reproduced in Appendix B.

Following an inspection trip along the CN Rail line and a series of public information meetings held in June, the Panel decided to prepare this interim report. The report outlines additional information required from CN Rail to complete the review, outlines plans for the examination of the long term environmental implications of transportation related activities in the Fraser and Thompson River corridors and transmits to appropriate levels of government and CN Rail the issues and concerns which have been brought to the Panel's attention but which the Panel considers to be outside its terms of reference.

2. PANEL REVIEW PROCESS

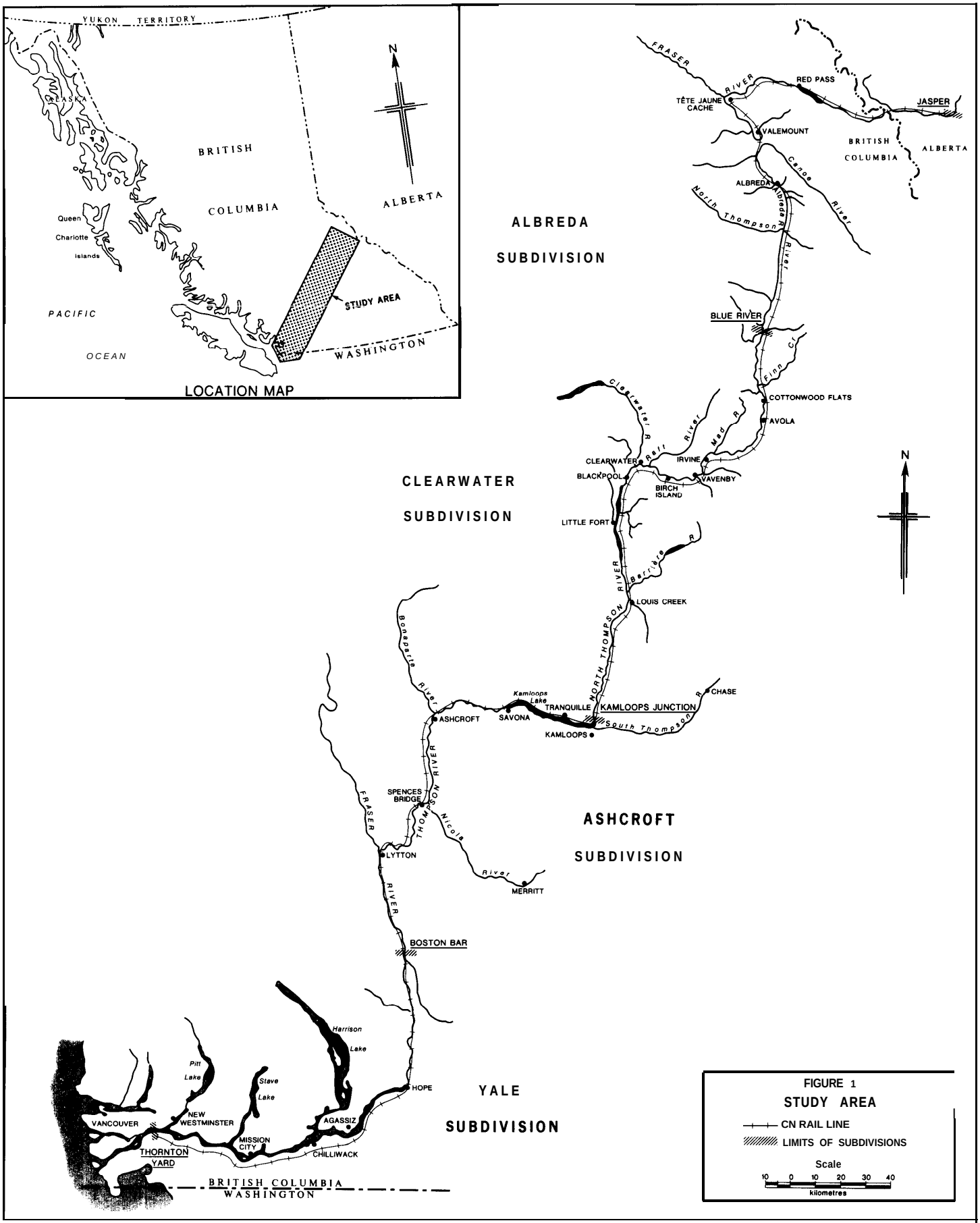
2.1 Panel Activities to Date

The main activities to date have included a series of public information meetings, an inspection trip along the CN Rail main line from Edmonton to Vancouver, a review of project documentation and dissemination of information to the public.

Public information meetings were held in Clearwater, Kamloops, Lytton, Chilliwack and Surrey between June 20 and 24, 1983. Their purpose was to provide the public with information on the twin tracking program and on the review process and to receive initial public views.

The meetings were attended by over 300 people. Oral submissions were made by over 30 individuals and groups and many used the opportunity to question CN Rail on the project and the Panel about the review process. Ten written submissions were received which included amongst others: the provincial Heritage Conservation Branch, the Nl'akapxm Tribal Council, the Sto:Lo Nation Tribal Council, the North Thompson Indian Band and the Regional District of Fraser Cheam. A variety of issues and concerns were raised by individuals, non government organizations, native groups and government agencies. Subsequent sections of this report deal more fully with these issues and concerns.

The inspection trip along the CN Rail line from Edmonton to Vancouver took place in May, 1983. This trip which was organized and conducted by CN Rail provided the Panel with a valuable view of the project area.


YUKON TERRITORY
ALASKA
BRITISH COLUMBIA
ALBERTA
Queen Charlotte Islands
PACIFIC OCEAN
STUDY AREA
WASHINGTON
LOCATION MAP
N
FRASER RIVER
RED PASS
TÊTE JAUNE CACHE
JASPER
VALEMOUNT
BRITISH COLUMBIA
ALBERTA
ALBREDA
Canoe River
North Thompson R.
ALBREDA SUBDIVISION
BLUE RIVER
Finn Cr.
COTTONWOOD FLATS
AVOLA
Clearwater R.
Raft River
Mad R.
CLEARWATER
IRVINE
BLACKPOOL
VAVENBY
BIRCH ISLAND
CLEARWATER SUBDIVISION
LITTLE FORT
Barriere R.
LOUIS CREEK
NORTH THOMPSON RIVER
Bonaparte River
Kamloops Lake
TRANQUILLE
KAMLOOPS JUNCTION
CHASE
ASHCROFT
SAVONA
KAMLOOPS
South Thompson R.
SPENCES BRIDGE
FRASER
THOMPSON RIVER
Nicola River
LYTTON
MERRITT
ASHCROFT SUBDIVISION
RIVER
BOSTON BAR
Harrison Lake
Pitt Lake
Stave Lake
HOPE
VANCOUVER
NEW WESTMINSTER
AGASSIZ
MISSION CITY
CHILLIWACK
THORNTON YARD
BRITISH COLUMBIA
WASHINGTON
YALE SUBDIVISION
FIGURE 1
STUDY AREA
CN RAIL LINE
LIMITS OF SUBDIVISIONS
Scale
10 0 10 20 30 40
kilometres

Accompanying the Panel on the trip were participants from government agencies, interest groups and the media.

From the beginning of the review, the Panel, through its Secretariat, has provided information about the twin tracking program and the review process to individuals, groups and agencies through regular mailings and meetings. Documentation issued by CN Rail has been placed in community libraries along the railway line and has been made available to groups and agencies interested in the review.

2.2 Future Panel Activities

Future activities will include:

1. completion of the review of the CN Rail twin tracking program; and
2. examination of the long term environmental implications of transportation related activities in the Fraser and Thompson River corridors.

After an adequate response to the information required by the Panel is received, final public meetings will be held to discuss in more detail the main issues associated with the twin tracking program. Details will be announced well in advance of the meetings. Following the meetings, the Panel will prepare a report to the Minister of the Environment containing its conclusions and recommendations on the twin tracking program.

The Panel's plans to examine the long term environmental implications of transportation related activities in the river corridors are outlined in section 6.

3. GOVERNMENT REVIEW OF THE TWIN TRACKING PROGRAM

Prior to the Panel being formed, a federal-provincial Task Force was established in 1980 to review CN Rail's twin tracking program. The Task Force provides a focal point for discussion between CN Rail and federal and provincial agencies on the environmental issues associated with the twin tracking program. It also advises on the environmental studies underway by CN Rail and reviews details of twin tracking projects. The Task Force has representatives from the following agencies:

- Fisheries and Oceans Canada
- Environment Canada
- International Pacific Salmon Fisheries Commission
- B.C. Ministry of Environment

The Department of Indian and Northern Affairs and the provincial Heritage Conservation Branch attend Task Force meetings as observers.

Task Force activities to date have focussed on issues relating to fish. Non-environmental issues have not been considered by the Task Force.

Twin tracking projects completed or started, including those planned for the 1983 construction year, have been reviewed and approved by the Task Force. Projects planned for subsequent years are still under review.

4. CN RAIL TWIN TRACKING PROGRAM

4.1 Setting

The CN Rail main line from Edmonton to Vancouver traverses some of the most difficult and spectacular terrain in Canada. Following the Thompson and Fraser River Valleys the line crosses both the Rocky Mountains and the Coast Range and the interior plateau lands between (see Figure 1). The rugged topography provides very significant constraints to railway location and construction.

The great diversity of landscape and terrain contributes to a variety of resource uses including mining, forestry, fishing, farming and recreation. In addition, the river valleys provide a major transportation corridor for a number of uses including railways, highways, pipelines and transmission lines.

A large Indian population living on many reserves has a life style based on the land, the rivers and the salmon fishery. The non-native population has settled in communities ranging from dispersed rural settings to larger urban areas.

Resource uses are expanding and the corridor is becoming increasingly congested particularly near the

larger communities and within the constricted canyon areas of both rivers.

4.2 Program Rationale

Information on the program rationale has been provided by CN Rail and is summarized in this section as background.

CN Rail indicated that the limit of single track capacity is approximately 600,000 to 700,000 cars per year. In 1980, CN Rail projected that by 1990 traffic on the B.C. South Line through Kamloops to Vancouver would be 1.1 million cars per year. To handle this projected traffic CN Rail investigated a number of different alternatives. These included:

1. Bypassing the difficult Kamloops to Hope section by constructing an entirely new and more direct route which would require tunnels of 27 miles (43 km.) and 48 miles (77 km.) in length. After completion of a number of studies on this route, CN Rail concluded that the costs would be prohibitive. Also since construction would take some 10 years to complete, there would be no capacity increase until all of the construction was finished, whereas each project along the main line represents an immediate incremental increase in capacity.
2. Sharing the existing CN Rail and CP Rail lines between Kamloops and Vancouver. This concept was examined by Transport Canada prior to 1980 and is now being re-examined. CN Rail is not in favour of this option citing problems such as operational inefficiencies and jurisdictional difficulties as well as environmental effects associated with the construction of the required interconnections between the two lines. However, CN Rail will be having input to the new Transport Canada study.
3. Other means of expanding plant capacity such as improved motive power and equipment, increased siding and yard capacity, longer trains, introduction of modern traffic control systems and upgrading of the track and roadbed have all been implemented.

After all of these options were either rejected or implemented, CN Rail decided that twinning its line represented the only remaining alternative for meeting its capacity problems.

4.3 Program Description

Although there were some inconsistencies in the data provided, the Panel concludes that the CN Rail twin tracking program under review involves 442 miles (707 km.) of route from the end of a double track section about 2.2 miles (3.5 km.) north of Valemount (Mile 73.3 of the Albreda Subdivision) to the Thornton Yards near Vancouver. The program consists of a series of short projects to be carried out over an extended number of years. The original twin tracking program (CN Rail's Plant Expansion Program 197579) coupled with the existing program started in 1980 will provide CN Rail with a total of approximately 130 miles (208 km.) of twin track by the end of 1983. This includes about 70 miles (112 km.) of operational sidings. During the next 5 years (1984-88), CN Rail plans to construct an additional 140 miles (224 km.) of second track leaving 172 miles (275 km.) to be completed after 1988,including 15 tunnels of approximately 17 miles (27 km.) in length.

5. ISSUES

5.1 Introduction

This section, first of all, addresses the scope of the review with particular reference to concerns expressed at the public meetings regarding limits placed on the Panel's mandate and secondly, documents and examines all issues of consequence that have been brought to the attention of the Panel or that the Panel itself has identified. The treatment of issues within the Panel's mandate includes requests for further information. Issues outside the mandate are documented for the attention of appropriate levels of government and CN Rail.

5.2 Scope of the Panel Review of the CN Rail Twin Tracking Program

During the information meetings, some participants stated that the terms of reference were too narrow. In their opinion the review should include the rationale for the second track, alternate routes, shared track usage with CP Rail, a broad range of socio-economic issues, and the effects of other non-transport related activities on the Thompson and Fraser rivers. Others were concerned that the Panel review had started late since some projects were already underway.

In the Panel's view, the terms of reference are clear with respect to the need for the twin tracking program. They state that:

> "the federal government has recognized the need for and therefore has encouraged construction of twin tracking of CN's main line in Western Canada. It is in the national interest to have adequate, safe, economical and efficient railway transportation".

The Panel, therefore, has no mandate to make judgement on the need for the program. However, it has observed during the information meetings that many people did not understand why CN Rail is proceeding with the program. Although CN Rail has explained the program rationale in its documentation, this does not seem to have been widely read or understood. Perhaps many of these people recognize the effect the recent economic climate has had on rail traffic and are sceptical of projections based on 1980 and prior statistics. Projections based on more current statistics may assist future explanations. The Panel encourages CN Rail to improve public understanding of the need for the program. One means would be to convene a series of open-house meetings to explain the program and its need. The need for further public consultation is also addressed in Section 5.6.2.

Changes that have been made to proposed construction schedules have led to some confusion about the timing of specific twin tracking projects. While the Panel is not critical of such flexibility, it is concerned that frequent scheduling changes could affect the lead time required for proper environmental planning, mitigative measures and monitoring.

The Panel, therefore, would like information on the criteria used by CN Rail to determine when and where individual twin tracking projects are needed. This should include a listing of all projects by priority and an indication of the increased capacity each project would generate.

The Panel observed that its mandate dealing with "related socio-economic impacts" was not well understood. The Panel has interpreted related socio-economic impacts as meaning those attributed to or directly related to a change in the biophysical environment. For example, any decrease in fish stocks caused by twin tracking would have an impact on those that depend on the fishery, including the Indian, sport and commercial fisheries.

Even though certain projects were undertaken before the formation of the Panel, they were reviewed by the federal-provincial Task Force and found to be acceptable. It should also be noted that these projects were undertaken in areas that are generally less environmentally sensitive than many of those planned for the future. Nevertheless the Panel intends to examine, as stated in the terms of reference:

> "any currently known environmental and related socio-economic issues associated with CN Rail's expansion projects recently completed in B.C. and the adequacy of CN's designs to resolve these issues".

The mandate requires the Panel to include in its review consideration of environmental design factors and of mechanisms for continuing review. This is a departure from most other environmental assessment reviews where it has been possible to examine a proposed project, issue guidelines for the proponent's Environmental Impact Statement, hold public hearings, complete the review and report on the proposed project, all before final design and construction. In the present case, the twin tracking program has been underway since 1980, will continue on an incremental basis and may not be completed before the end of the century. The process of design and review of environmental impacts has also been underway since before 1980 and will be ongoing until the program is completed. In these circumstances, the Panel review must emphasize the development of the design, review and implementation process that will take account of environmental concerns. The incremental nature of the program provides opportunities to learn from experience. The Panel has been able to begin its review with an assessment of the available information and the work done to date. The next step will be to obtain additional information from CN Rail as requested in this report.

5.3 Environmental Impact Issues Within the Panel Mandate

5.3.1 Encroachment of the Second Track on Rivers

Encroachment on the river will occur when granular fill or rip-rap or both are placed within the flood plain or wetted perimeter of the river for the proposed second track roadbed.

The local environmental and directly related socio-economic concerns associated with encroachment are expressed in general terms in Table 1.

TABLE 1 — POTENTIAL IMPACTS FROM RIVER ENCROACHMENTS BY CN RAIL's TWIN TRACKING PROGRAM

RIVER RESOURCE OR USE CONCERN	POTENTIAL IMPACTS	CN RAIL CONSTRUCTION ACTIVITY
Fish resources	Blockage or delay in rnigration	Reduction of cross-section area and consequent increase in river velocity and change in flow behavior
	Loss of rearing or holding habitat.	Infilling of shallow, or quiet water areas or pools along the river margin, straightening the river margin, and loss of riparian vegetation.
	Loss of spawning or rearing habitat.	Alteration of river velocity and/or flow behavior and resulting in downstream scour or deposition.
	Loss of feeding.	Infilling of shallows, downstream scour or deposition and consequent loss of food producing habitat (mainly aquatic invertebrates).
	Improved rearing and holding habitat.	Large rip-rap placement and increased bank roughness.
	Improved water quality and spawning conditions	Bank armouring and reduced erosion and fines introduction into the river and spawning beds.
Wildlife resources	Loss of shallow aquatic riparian habitat for waterfowl, other birds, and fur-bearers.	Filling of shallows, straightening of the bank, loss of riparian vegetation, and steepening of the river bank.
Sport fishing, Indian fishing	Loss of fishing (holding) pools (reduced fish availability).	Infilling of pools by fill or rip-rap placement or by downstream deposition resulting from velocity or flow behavior changes.
	Loss of or hindered access to fishing sites	Filling or rip-rap placement on access trails, creating difficult or hazardous access.
Recreation	Loss of landing sites for river recreation.	Filling over of beaches, etc., creating steep fill or rip-rap slopes.
	Loss or hindered access to the river for recreation.	Filling or rip-rap placement on access trails, creating difficult or hazardous access.
	Loss of aesthetic quality of the river banks.	Filling or rip-rap placement changing normal riparian character to an artificial, perhaps steeper and more uniform slope.
Other land uses.	Loss of heritage values.	Filling over land.
	Loss of present and potential land use on opposing river bank.	Reduction of cross-section area, increased velocity and/or altered flow behavior and resulting compensatory erosion of opposite bank.

At this time, river encroachment is viewed by the Panel to be the most important long term construction related issue. Of particular concern is the potential impact on salmon and trout migration, spawning and rearing, including the as yet unknown cumulative effects that sequential river encroachments could have on this valuable resource. The Panel also views as important the potential effects on sport and Indian fishing through loss of fishing pools.

As a first principle, the Panel believes that the avoidance of potential encroachment impacts by judicious location of the second track should be a priority. Where encroachments cannot be avoided, there may be design measures that could reduce impacts to more acceptable levels. Early consideration of environmental and resource use concerns will be required to influence the location and design.

The avoidance of a significant number of proposed encroachments could reduce or perhaps eliminate the cumulative risk to salmon and trout. Where this cannot be done, there will likely be a need for research into the matter of cumulative impacts on fish which could involve several years of investigation. This in turn could constitute a determining factor in construction priority and scheduling. The Panel is particularly anxious, therefore, that the avoidance of river encroachments be a high priority in CN Rail's planning.

The obvious alternative to river encroachments is an upland location for the second track. The Panel recognizes that there are a number of environmental and other problems associated with this alternative, including upland bank instability and spoil disposal. Such concerns have to be balanced against the gains made by avoiding encroachments.

The Panel has been informed of the environmental study and design procedures being followed by CN Rail and its consultants for resolving encroachment conflicts. It generally agrees with basic methodologies. However, it has not seen evidence that all opportunities for avoidance of river encroachments in sensitive areas have been fully explored.

To respond to the preceding concerns, the Panel would like CN Rail to provide the following information:

1. **What criteria are used by CN Rail in the preliminary selection of the preferred second track location? How are environmental and related socio-economic issues considered in the final design process?**
2. **For the 1984 construction program, what encroachments shown on the preliminary design plans have been eliminated on the final plans as a result of the consideration of environmental factors? For the remaining encroachments, what alternatives were considered and how were environmental and related socio-economic impacts weighed against other design factors? What mitigation measures are planned where encroachments are still proposed?**

5.3.2 **Access to the Rivers**

The Panel heard from Indians and others about problems created as a result of the existing rail line blocking access to the rivers or making access difficult. Such access may be to traditional Indian cultural, fishing and fish drying sites or for recreation. Concerns were expressed that the construction of the second track could make this situation worse by destroying or making present access routes impassable. The Panel recognizes that the presence of the rail line facilitates access to the rivers in some areas.

CN Rail has advised that some effort has been made to obtain information to identify traditional Indian fishing and drying sites and access trails. This information should serve as input to the final design and location of the second track. This matter, however, has not been vigorously pursued due, in part, to uncertainties regarding sources of information.

The Panel would like CN Rail to respond to the following question:

1. **What steps will be undertaken to identify, preserve, replace or improve traditional Indian and sport fishing sites along the rivers and access to these sites?**

5.3.3 **River and Stream Crossings**

River and stream crossings for the second track involve both bridge and culvert structures for the Fraser and

TABLE 2 — POTENTIAL IMPACTS FROM RIVER AND STREAM CROSSINGS

RIVER OR STREAM RESOURCE OR USE CONCERN	POTENTIAL IMPACTS	CN RAIL CONSTRUCTION ACTIVITY
Fish resource	Blockage or delay of migration, and denied use of upstream habitats (mainly on streams, not mainstem rivers).	Increased stream velocity from: — Stream diversion during construction, — Restriction of channel width for abutments, — Undersized or oversloped culvert, — Steeply sloped aprons, etc. Unsuitably designed culvert inverts and inadequate plunge pools.
	Loss of spawning and rearing habitat.	Alteration of river/stream velocity and/or flow behavior and resulting downstream scour or deposition. Dyking and bank armouring for bridge protection and resulting loss of side channels.
Sport fishing, Indian fishing	Loss of fishing (holding) pools (reduced fish availability).	Filling of pools on site or downstream by deposition resulting from velocity or flow behavior changes.
Land use	Flooding, erosion, ice damage.	Channel changes and deposition from bridge piers, abutments and bank protection.

Thompson rivers and tributary streams. The environmental concerns associated with river and stream crossings are outlined in general terms in Table 2. In the Panel's opinion, the chief concern is with the potential blockage of fish migration by unsuitably designed and placed culverts and bridges.

Proper design and installation of river and stream crossing structures is largely a matter of good engineering practice that takes into account environmental needs. The Panel emphasizes the need for early consideration of fish passage requirements and of possible upstream and downstream consequences of flow interruption and behaviour changes.

The Panel would like to draw CN Rail's attention to opportunities that exist for improving fish passage at several existing culverted stream crossings. It seems appropriate to consider improvements while extending these culverts for the second track (for example at Goose Creek, mile 1.15 on the Clearwater Subdivision and at Cedar Creek, mile 130.3 on the Albreda Subdivision as identified by Fisheries and Oceans).

The Panel would like CN Rail to respond to the following:

1. **How does CN Rail determine which streams have sufficient fish resources to warrant designs that permit fish passage?**
2. **What is CN Rail's policy for improving existing culverts or bridges during the construction of the second track to enhance fish passage?**

5.3.4 **Drainage**

The Panel heard concerns about the effects of the existing rail line on surface drainage patterns and whether twin tracking projects could exacerbate existing drainage problems or create new problems,

Good drainage of the rail subgrade is important to the load-carrying capacity of the railway and to the stability of side cuts and embankments. However, poorly sited and designed drainage outlets can cause problems by concentrating runoff at unsuitable locations.

Because of its importance to the railway, the Panel expects that CN Rail will ensure the adequacy of all new and existing facilities. However, care will be necessary in the location and design of drainage works to avoid adverse effects.

The Panel suggests that in designing and constructing drainage facilities for the second track, CN Rail take advantage of this work to identify and rectify any drainage problems associated with the existing rail embankment.

53.5 **Heritage Resources**

Heritage and archaeological issues were brought to the attention of the Panel from a number of sources including the provincial Heritage Conservation Branch, the Archaeological Society of B.C. and local Indians.

Early aboriginal inhabitants were attracted to the Fraser and Thompson River areas because the rivers provided both transportation corridors and easy access to fish and other food resources. The more recent white habitation also involves extensive use of and settlement in the two river corridors. This long history has left a legacy of numerous and important heritage resources, many of which are on or close to the CN Rail right-of-way. The provincial Heritage Conservation Branch has stated that over half of the CN Rail main line between Blue River and Vancouver has been identified as having "moderate to high" heritage potential that should be subject to further examination. CN Rail has agreed to examine areas of "high" potential but not those designated as "moderate to high" potential.

The Panel believes that the identification and preservation of heritage resources is important and encourages CN Rail and the Heritage Conservation Branch to reach early agreement on this issue in order that procedures can be established and followed to ensure that these resources are protected. CN Rail's procedures to identify, evaluate and protect these resources should be clearly outlined. The Panel would also be interested in hearing from the Heritage Conservation Branch on their methods and criteria for identifying, classifying and protecting heritage resources.

With the foregoing in mind, the Panel would like to know from CN Rail:

1. **What heritage resources associated with twin tracking projects, either constructed or planned for construction up to the end of 1983, have been identified, evaluated and protected?**

2. **How will CN Rail identify, evaluate and protect heritage resources associated with future twin tracking projects?**

5.3.6 Ancillary Activities

Construction of the second track will result in activities off the CN Rail right-of-way such as camp sites for construction personnel, equipment and fuel storage facilities, access roads, temporary power and water lines, borrow pit areas and waste and spoil disposal areas. All of these have the potential for creating environmental problems.

Some of these ancillary activities will be carried out by contractors and not directly by CN Rail. This does not exempt CN Rail from responsibility. Accordingly contract documents should include effective environmental controls for carrying out the contracted work.

To aid in its assessment and review of these activities, the Panel would like CN Rail to respond to the following questions:

1. **What criteria will be used by CN Rail to decide where to dispose of waste material from the various twin tracking projects? Of particular concern to the Panel are disposal practices for spoil material from cuts and tunnelling.**
2. **Which government agency guidelines and regulations has CN Rail required its contractors to follow and how is this being accomplished at the present time?**
3. **I-low will borrow pits and spoil disposal areas be rehabilitated? In this regard, the Panel was impressed with the borrow pit rehabilitation practices that were followed in Jasper Park.**

5.3.7 Toxic Spills

The Panel believes that the most important environmental issue associated with the operation of the CN Rail line is the possible spill of toxic substances into the river as the result of a train derailment. There is a potential for such a derailment to result in the release of large quantities of toxic chemicals into either the Fraser or Thompson Rivers which could destroy millions of adult salmon.

The Panel acknowledges the seriousness with which CN Rail views the general issue of rail transportation safety and the steps it has taken to reduce the frequency of all accidents. Such actions as a general upgrading of the track (i.e. crushed rock ballast and concrete ties with heavier and continuous rail along with modernized maintenance procedures) have created a much stronger and safer track structure. Highly technical traffic control systems, hot box and dragging equipment detectors, improved design in locomotive and car equipment, slide fence detection systems and rock slope stabilization in slide prone areas have no doubt contributed to reducing the risk of derailment. These elements coupled with the improved operating procedures for train handling, switching and marshalling have benefited both human safety and environmental protection objectives.

The role of the Canadian Transport Commission in establishing public safety standards is recognized. The Panel, therefore, will only address the environmental risks associated with the rail transport of hazardous materials, in particular how these risks may be altered through the construction and operation of CN Rail's second track.

In order to better understand the magnitude of the hazardous goods derailment problem, its relationship to the twin tracking program and CN Rail's capabilities for dealing with it, the Panel would like to receive answers to the following questions:

1. **What hazardous and toxic chemicals are shipped by CN Rail? What are the approximate quantities in car loads of these chemicals now handled over the Valemount to Vancouver line? What effect will the twin tracking program have on these quantities?**
2. **What risk analysis has CN Rail carried out regarding the spillage of hazardous goods? Has CN Rail identified high risk areas along the line and how will the twin tracking program affect these areas?**
3. **What, in CN Rail's opinion, are possible ways and means of reducing the risk of derailments? Would special train handling procedures in sensitive areas be effective?**
4. **What emergency response program does CN Rail have for handling derailments involving hazardous goods, particularly where the materials may enter or threaten to enter fish bearing streams or rivers?**

5.3.8 Vibration and Noise

Some residents adjacent to the CN Rail right-of-way stated that vibrations within their homes and on their properties have been aggravated since the installation of concrete ties. They were concerned that increased traffic over two tracks could make this problem worse.

CN Rail indicated that it is studying these problems but at this time no results are available.

Noise caused by trains and engine whistling, particularly at night was also mentioned as a concern. The Panel notes that increased rail traffic along two tracks may increase noise problems and consequently efforts should be made to minimize noise wherever possible.

The Panel would like CN Rail to respond to the following:

1. **What methods are being employed to study the vibration problem and when will results be available? Will the study include consideration of the effects of twin tracking?**

5.3.9 Wildlife Habitat

Construction of the second track will result in a small loss of wildlife habitat. The main area of such loss is in the North Thompson section of the line, principally wetlands that will be filled in by the roadbed for the second track.

The Panel does not consider wildlife habitat loss to be a major concern.

5.3.10 Wildlife Collisions

Concern was expressed that increased rail traffic would result in greater wildlife kills. In areas of high snowfall, ungulates (particularly moose) travel on the track corridor and are often unable to escape an oncoming train because of high snow banks created by snowplowing. **CN** Rail noted that a second track should reduce train-wildlife collisions since it would provide an escape route. They also referred to an interim report prepared on Jasper National Park related to this subject. To permit further examination, the Panel requests a copy of the final Jasper Park report.

To better assess the effects of the second track on wildlife collisions, the Panel would like to receive answers to the following:

1. **How and to what extent will snow be removed from and between the double tracks?**
2. **What programs does CN Rail have now and what new programs are planned to reduce wildlife kills?**

5.3.11 Track and Right-of-Way Maintenance

In the mountainous country of the Fraser and Thompson canyons, the natural forces of wind, precipitation and frost are constantly eroding the steep terrain. Relative stability of cut and fill slopes can be achieved with appropriate drainage works, berms and vegetation cover, however, constant maintenance is essential to assure continued stability. The Panel heard numerous concerns about slope stability problems and problems related to eroded material entering and contaminating rivers and streams. While most of these concerns are related to the existing rail line, the twin tracking program will require the opening up of long established back slopes and the addition of new fill. Unstable slopes with accelerated erosion can contribute high silt loads to drainage water. This may lead to restricted drainage and in turn cause flooding, fill washout, saturated soils, subgrade instability and eventual watercourse contamination. In addition to ensuring that newly constructed cut and fill sections are designed for adequate stability, the twin tracking program should also present opportunities to improve existing slopes that are not considered stable.

Regular maintenance work involves the removal from the railway grade of slide and eroded material, and rejected or fouled material from ballast cleaning and replacement operations. The Panel has been informed that these materials have been randomly cast over the edge of the grade (frequently into adjacent watercourses), or held at local storage sites for more timely disposal (i.e. at times when impacts on fish would be minimized). In precipitous terrain where the maximum amount of slide and eroded material accumulates, the twin tracking program could reduce the area available to store this material. Moreover, where the grade would be extended closer to watercourses, more of this material could end up in the watercourses.

The twin tracking program may not directly affect the present program of weed control along the rail line. However, twin track construction will open up new areas that may previously have had a stable ground cover.

The Panel suggests that a weed control program for these areas be adopted as soon as possible after construction before weeds have a chance to become established and spread to adjacent properties.

Another area of concern relates to the use of rail flange lubricators at many points of high curvature. Much of the lubricant appears to accumulate on the ties and ballast. There is concern that the lubricant will find its way into nearby watercourses. With the second track, increased quantities of lubricant will be used and water contamination could be increased.

The above concerns raise the following questions that the Panel would like CN Rail to respond to:

1. **What are CN Rail's present practices for the control of steep slopes along its rail line?**
2. **What are CN Rail's present practices for the disposal from the roadbed of eroded materials and fouled bal-**

last? Will these practices be changed in any way due to the twin tracking program? What restrictions are presently placed on CN Rail by fisheries agencies for the disposal of material into watercourses?

3. **What is the composition and toxicity of the flange lubricant? How much of this lubricant is presently used and to what extent will this consumption be increased by twin tracking? Are there any plans to remove or clean up excess lubricant from the ties or ballast?**

5.3.12 Dust

Coal and sulphur dust escaping from passing trains was mentioned as a concern. The Panel notes that new techniques have been introduced to suppress dust and it does not consider dust to be a major issue. It assumes that twin tracking will not have a significant effect on dust generation.

5.4 Other Issues Related to the Panel Mandate

5.4.1 CN Rail's Environmental Design and Approvals Process

The Panel believes that a good environmental design and approvals process is critical to the success and environmental acceptability of the twin tracking program. For this reason it is an area of considerable interest to the Panel.

The process for incorporating environmental considerations into the design and construction of major projects has been changing rapidly. Fifteen to twenty years ago, environmental factors were largely ignored and projects were designed mainly on economic and engineering criteria. Today, environmental and social considerations are routinely incorporated into the design process. However, the design process involves continual compromise and tradeoffs between different and often competing criteria and it works best in a congenial, collaborative atmosphere where the various issues and tradeoffs can be debated fairly and resolved on their merits. The Panel believes that a collaborative, holistic design process should be followed by CN Rail for the twin tracking program, and in fact it sees that many elements of such a process are already in place.

In designing a section of second track through rugged terrain, a key decision is on which side of the existing track should the new track be laid. Placing the new track on the river side can cause encroachment. Alternatively, placing the new track on the uphill side could add significant cost and perhaps increase the risk of a slide. These types of considerations must always be in a designer's mind and risks, costs and benefits have to be carefully weighed before decisions are made. It is the Panel's impression that for these decisions, CN Rail relies more on the intuition and judgement of experienced railway engineers than on formal analysis.

It is the Panel's understanding that the first step in CN Rail's environmental design process was a reconnaissance of the entire line from Valemount to Vancouver to identify potential environmental problems and categorize the various sections of the line as:

1. sections where there are no environmental problems;
2. sections where there are potential environmental problems that can probably be resolved by discussions during the design phase; and
3. sections where there are potentially severe problems and the environmental criteria must be treated as constraints; for example, encroachment on a key spawning habitat cannot be tolerated.

The Panel has some difficulty in understanding clearly how the design and approvals process functions. The Panel's understanding is as follows:

For those sections with no environmental problems, CN Rail uses its normal design procedures. For those sections with environmental problems with a potential to be resolved, preliminary drawings are prepared by CN Rail and sent to both their consultants and the Task Force. This is then followed by a series of meetings at which the issues at each particular site are resolved. Following these, CN Rail revises the drawings and submits them for formal approval by Task Force agencies. For those sections of line with potentially severe environmental problems, the environmental constraints are taken into account by CN Rail when preparing their preliminary drawings.

In addition, a series of separate studies (known as Task C studies) are proposed to provide essential design and environmental impact assessment information. An example is a study to determine the swimming capacity of pink salmon, information important to the making of informed decisions at a few critical locations.

These procedures seem to meet the general requirement for an effective design process. However, some problems have been noted:

1. there seems to be insufficient lead time to allow the above procedures to be carried out in good time before construction begins;

2. the background (Task C) studies seem to have been delayed;
3. the Task Force meetings have been very large; it is difficult to get a balanced decision from a large group with, at times, a number of transient members;
4. there appears to be some confusion regarding how the recommendations of CN Rail's environmental consultants are incorporated into design;
5. at times, there appears to be a somewhat adversarial relationship between CN Rail and some of the Task Force agencies; and
6. not all environmental issues are handled by the Task Force and not all have been studied by CN Rail.

In order to better understand the design process and how environmental considerations are to be fully integrated into it, the Panel would like CN Rail to respond to the following:

1. **What procedures will be followed to ensure that all environmental concerns and the results of environmental studies will be given full and fair consideration in the development of project designs? Will there be provision for final design drawings to be signed by CN Rail's environmental consultants to indicate professional acceptance?**
2. **By what process will changes be made as the result of environmental input and how will these be documented?**
3. **What responsibilities will CN Rail's environmental consultants, the Task Force and the regulatory agencies have in the design process?**
4. **What steps can be taken to ensure an adequate lead time between environmental studies and final design approval?**
5. **What procedures will be adopted to resolve disagreements involving environmental factors? Is there a need for a senior group to resolve disagreements?**

The Panel was told that CN Rail try to ensure that a concern for safety permeates their whole organization. The Panel was impressed by the extent to which they have succeeded. The paramount importance of safety now seems to be almost second nature to most CN Rail employees. However, this concern for safety has not been achieved just by exhortation and example. There are specially appointed safety officers and the Canadian Transport Commission enforces compliance with safety regulations. All mechanisms tend to reinforce one another and to emphasize the importance of safety. The Panel was also told that CN Rail is trying to ensure that a concern for the environment also permeates the organization. This is a somewhat newer concern and it will probably take some time before it is equally ingrained. The Panel strongly encourages the development of this environmental ethic within CN Rail. If it were to become a truly ingrained and routine part of CN Rail's design, construction and operational procedures, then environmental factors would be afforded the same high degree of care and attention that safety concerns now enjoy.

5.4.2 **Surveillance and Monitoring**

Environmental surveillance (site supervision and regulatory agency inspection) and monitoring issues are described below:

1. *Site Supervision*

Site supervision is carried out during construction to ensure that environmentally acceptable procedures are being followed by CN Rail and its contractors. Site supervision is normally a proponent's responsibility. An environmental supervisor can provide assurances to both CN Rail and regulatory agencies that good environmental practices are being followed. In addition, an environmental supervisor can provide advice and direction if unexpected conditions are encountered. The Panel was informed that an environmental supervisor was provided by CN Rail for twin track construction through Jasper Park and that this position contributed to these projects being completed with minimal environmental damage and problems. In the Panel's view, such a position also provides visible evidence to the public of CN Rail's concern for the environment.

2. *Regulatory Agency Inspec tion*

Federal and provincial regulatory agencies have a responsibility to ensure that twin tracking projects are carried out in such a manner that all applicable regulations are adhered to. The Panel recognizes that these agencies, primarily the federal Department of Fisheries and Oceans and the provincial Ministry of Environment, do not have sufficient staff to maintain their own inspectors on site at all times. Their role, therefore, becomes one of spot inspections unless such work is contracted out. In addition to fulfilling their regulatory responsibilities, these inspectors can also carry out a role of consultation and provision of advice to avoid environmental problems.

3. Monitoring

Environmental monitoring consists of measuring a number of selected environmental parameters before and after construction to gauge the effect of construction. The Panel believes that a good monitoring program is particularly important for the twin tracking program. It would provide observations and measurements on the performance of certain works completed early in the program so that the information could be used to modify designs for the later projects.

The Panel recognizes that the design of an effective monitoring program for the twin tracking program is difficult. Most of the environmental concerns are associated with the rivers and the effects of encroachments on fish migration, spawning and rearing. The fish are not visible and thus difficult to count and monitor and river flows vary continuously so that changes in velocities or currents may be difficult to detect. In general, the Panel favours relatively simple monitoring procedures which are easy to carry out and maintain rather than elaborate programs which may yield disappointing results and be discontinued. The Panel also recognizes the need to select the most' meaningful parameters for measurement commensurate with the complexity of the impact.

The Panel would like to see the following questions addressed:

1. **What plans does CN Rail have for hiring an environmental supervisor for future twin tracking projects? What duties would CN Rail see this individual fulfilling and what reporting procedures would be in place?**

2. **What is the status of CN Rail's plans for the development of an ongoing environmental monitoring program? How will results from this program be incorporated into the design of future projects?**

5.4.3 **Resolution of Fisheries Habitat Issues**

CN Rail stated that it will follow the Department of Fisheries and Oceans (DFO) objective of "no net loss" for resolving fisheries habitat impacts. Since DFO has yet to fully explain this objective, the Panel suggests that CN Rail work with DFO towards drafting a clear definition of this concept, including the criteria that will be used for its application to the twin tracking program, and the respective responsibilities of CN Rail and DFO in determining habitat importance, impact significance and means of avoidance or mitigation of impacts.

The Panel requests that it be informed by both CN Rail and DFO on this matter at the same time as CN Rail responds to the Panel's other information requests.

5.4.4 **Completion of Recommended Studies**

CN Rail's environmental consultants and government agencies have identified and agreed upon a number of studies that should be completed in order to assess the cumulative impact of the twin tracking program on the river environment. These studies focus primarily on fisheries resources.

The Panel has learned that there is a disagreement as to who should fund these studies and it is concerned that this could seriously delay their completion. The Panel believes that these studies are important to the proper design of twin tracking projects and for assessing the cumulative impacts of the total program. Therefore, it strongly encourages an early resolution to this dispute to ensure that proper design and project approvals are not delayed.

The Panel would appreciate being informed by CN Rail on the status of this matter.

5.5 Issues Outside the Panel Mandate

During the information meetings, the Panel heard concerns that are outside its mandate. The Panel recognizes that it cannot deal substantively with or make judgements on these areas of concern but feels it would be remiss if it did not report on what it has heard. The Panel expects that these concerns will not be ignored and will be dealt with by CN Rail and the appropriate government agencies.

This section describes these concerns and in some instances, suggests possible solutions.

5.5.1 **Private Crossings**

Landowners with private crossings over the railway right-of-way currently pay installation and maintenance costs for the crossings. There is uncertainty and concern about how the construction of the second track will affect these crossings, in particular whether there will be an additional assessment of costs to the land owner.

5.5.2 **Land Fragmentation**

The initial construction of the CN Rail line resulted in the severance of many farm properties. In such cases CN

Rail provides and maintains free of charge one farm crossing per parcel. Concerns were expressed that additional farm crossings for changing requirements are not being provided to allow farmers sufficient access between their severed lands.

Some farmers also expressed concern that twin tracking projects will exacerbate the present problems of moving cattle and other livestock across the CN Rail right-of-way.

5.5.3 Traffic Problems At Crossings

Concerns were expressed that traffic problems at level crossings would be increased with a second track. The hazard to vehicles at level crossings could be increased because of increased train frequency and the fact that two trains could travel over a crossing at any one time.

5.5.4 Public Safety

The Panel heard concerns relating to the danger of the railway operations to those people living along the CN Rail right-of-way, particularly when they cross the right-of-way. They believe that construction of the second track will increase these dangers.

5.5.5 Identification of Right-of-Way

A number of Indians advised the Panel that there is uncertainty as to the boundaries of the CN Rail right-of-way through reserves. In some areas, the rail line and associated cuts and fills may extend outside the right-of-way which was originally surveyed over 60 years ago. The construction of the second track could aggravate these uncertainties and apprehensions.

CN Rail indicated that if a legitimate request were made to survey and define its right-of-way, they would be prepared to do so. CN Rail is planning to file registered right-of-way drawings with the affected Indian tribal councils. Such actions, together with a program by CN Rail to clearly mark the right-of-way and the toe of the slope or top of the cut for the new track would go a long way to overcome present concerns about the possible effects on adjacent properties.

5.5.6 Right-Of-Way Cleanup

Right-of-Way maintenance involves, amongst other things, the general cleanup and orderly disposal of litter, empty fuel and lubrication containers and other discarded items. Concerns that present procedures are inadequate were brought to the Panel's attention. The Panel encourages CN Rail to examine present practices and to improve them where necessary.

5.5.7 Trespass on Private and Reserve Lands

A concern was drawn to the Panel's attention that CN Rail employees cross private or reserve lands without permission to gain access to the railway. The Panel does not know if this is a widespread practice but it is a concern that CN Rail may wish to address. On the other hand, the Panel recognizes that the CN Rail right-of-way is frequently used by the public.

5.5.8 Rail Relocation

During the information meeting held in Chilliwack, a suggestion was made that the existing CN Rail line be relocated from its present routing through Chilliwack to a less populated route closer to the Fraser River. It was pointed out that this would eliminate traffic problems at existing crossings in town and obviate the need to construct expensive grade separations. It would also reduce noise, vibration and dust problems and increase public safety. However, it was noted by others that the proposed relocation would place the railway in a more ecologically sensitive area and would result in it passing through a number of Indian reserves and private holdings. Such a relocation, therefore, could eliminate some problems but create others.

5.5.9 Local Employment

A number of people wondered whether CN Rail had a preferential policy for hiring local people for the proposed construction program. CN Rail indicated that its policy was to award contracts to the lowest tender. CN Rail's contract documents specify that "whenever possible local labour is to be employed". It is also CN Rail policy to accept union and non-union contractors.

5.6 Other Considerations

5.6.1 Indian Concerns

The CN Rail line goes through about 60 reserves along the Fraser and Thompson Rivers. The railway is not only highly visible to Indians living on these reserves, but it is also frequently a significant factor affecting their daily lives.

Many of their concerns are addressed in previous sections. However, because of the large number of Indians who spoke to the Panel and the obvious depth and sincerity of their concerns, the Panel would like to highlight some of these.

The Panel heard of resentment towards CN Rail which was directed as much towards past actions as it was to the twin tracking program. Some saw CN Rail as part of the Government of Canada; a government that they saw as having taken their land many years ago and being responsible for a long string of injustices ever since. Some questioned CN Rail's right to run its line through reserves and there was a general feeling from those that spoke that Indians would be better off without CN Rail.

The question of land claims was raised on several occasions and some expressed the view that construction should not be allowed to proceed until these claims have been settled. In the Panel's view, much of the Indians' resentment was due to a feeling of being ignored, of not being properly consulted and of not having sufficient or reliable information on twin tracking projects.

The Panel recognizes that CN Rail's effects on Indians are not all negative. The most obvious positive aspect of the CN Rail operation is the employment opportunities that are provided. In spite of this, it seems that CN Rail is viewed primarily as a negative factor in the lives of the Indians living along the line.

The Panel notes that most of the concerns outlined above are not new. They have been expressed many times in the past, dating back to the original construction of the CN Rail and CP Rail lines. The fact that they have been expressed so many times and are largely still unresolved has heightened the Indians' sense of frustration.

The Panel believes that CN Rail should deal with Indians in a fair and straight forward manner. CN Rail cannot resolve the land claims issue, therefore, such dealings will have to be carried out "without prejudice" to land claims.

5.6.2 **Public Consultation**

During the information meetings, it was apparent that there was a lack of understanding of the twin tracking program. This appears to have created some frustration and led to a negative reaction to the project by many participants. One purpose of the information meetings was to permit an exchange of information and thereby allow all involved to gain a better understanding of the program, its environmental consequences and public concerns. However, in the Panel's view, these meetings should not be considered the sole means for public consultation. Effective public consultation should be an important element in CN Rail's future twin tracking program. To date, CN Rail's approach to public consultation appears to have been passive. Access to meaningful information on the program by concerned citizens and adjacent property owners appears to have been difficult. It was brought to the Panel's attention that requests for information are frequently referred to the CN Rail regional office in Edmonton. This involves additional communication delays and expense and it is difficult for the average citizen to determine who can meaningfully discuss or deal with a problem. On the CN Rail side, the officials who can deal with the problems have other responsibilities and have limited time to handle individual queries.

With the proposed increase in construction activity, the Panel believes that the time may now be right for CN Rail to review its mechanisms for public consultation. One means to improve public consultation would be to establish an office in a central location such as Kamloops under the direction of a senior experienced railway official having access to all levels including the highest levels of management. The individual would have superior human skills and be sympathetic to individual and public concerns. This individual would coordinate and monitor all public and agency (provincial, municipal and regional) interaction by various CN Rail staff and consultants, to ensure they conform to consistent standards set out by CN Rail management, and be the centre for the dissemination of information and the processing of public concerns. The Panel would welcome CN Rail's reaction to this suggestion.

6. LONG TERM ENVIRONMENTAL IMPLICATIONS OF TRANSPORTATION RELATED ACTIVITIES IN THE FRASER AND THOMPSON RIVER CORRIDORS

In referring the CN Rail twin tracking program for review by an Environmental Assessment Panel, the Minister of Transport stated "Transport Canada would appreicate any view and concern that the Panel may receive on the

possible long term implications to the Fraser and Thompson corridors due to other transportation related activities. The above information should be compiled in a report separate from the Panel report dealing specifically with CN Rail's projects. In addition, Transport Canada would find useful any suggestion the Panel may have regarding ways and means of dealing with these potential corridor implications".

During the public information meetings, the Panel heard little in the way of concerns relating to long term corridor implications. Following a preliminary search by the Panel, it would appear that detailed information on this topic is neither currently available nor likely to be forthcoming soon. The Panel, therefore, has decided that to fulfill this part of its task, it will have to obtain some information of its own. The Panel intends to have a document prepared which will identify the main transportation related corridor users and their potential for expansion. The Panel expects cooperation from the various government agencies and the corridor users which include among others, CN Rail, CP Rail, B.C. Ministry of Highways, B.C. Hydro, Westcoast Transmission and Trans Mountain Pipelines. The document will also outline the important resources and land uses along the corridor and identify critical areas of potential conflict with transportation related activities. It will be used by the Panel to provide a basis for public, government agency and industry discussion on the possible long term implications. Following public consultation on this matter, the Panel will outline, in a separate report, ways and means of dealing with the environmental effects of transportation related developments in the Thompson and Fraser River corridors. The report will also identify the appropriate agencies and their views on river and land transportation capacities in the corridor.

ENVIRONMENTAL ASSESSMENT PANEL

CN RAIL TWIN TRACKING PROGRAM B.C.

R. G. Connelly

F. A. MacLean

N. L. McLeod

R. S. Pasco

G. R. Peterson

S. O. Russell

APPENDIX A

PANEL MEMBER BIOGRAPHIES

Mr. Robert G. Connelly (Chairman)

Mr. Connelly is Director of the Central Region with the Federal Environmental Assessment Review Office in Ottawa. He graduated from the University of Waterloo in Civil Engineering and was first employed with the Proctor and Redfern Group, consulting engineers in Ontario. In late 1970 he joined Environment Canada in Winnipeg and was involved in environmental monitoring and pollution control programs in Manitoba. From 1975 to 1978, Mr. Connelly worked for the United Nations Economic Commission for Europe in Geneva where he was a member of the U.N. secretariat to international meetings on environmental matters.

Mr. Fraser A. MacLean

Mr. MacLean is a retired provincial public servant now living in Victoria. He was born in British Columbia and graduated with a degree in Mechanical Engineering from the University of British Columbia in 1947. He joined the B.C. Department of Public Works then moved to the new Department of Highways in 1956 holding various positions including Assistant Deputy Minister and member of the Highway Board from 1962 to 197 1. In 197 1 he moved to the Department of Commercial Transport as Deputy Minister then through a series of Ministry reorganizations became Assistant Deputy Minister, Transportation, in the current Ministry of Transportation and Highways. From 1971 to his retirement in 1980, his responsibilities have included size and weight regulation of highway trucking, regulation of motor vehicles and aerial tramways, regulation of provincial railways and pipelines, and transportation policy planning.

Mr. Norman L. McLeod

Mr. McLeod is retired and lives in White Rock. He worked from 1943 until his retirement in 1978 with CN Rail in various capacities. From 195 1 to 1957, he was Roadmaster at Boston Bar responsible for the area between Boston Bar and Spences Bridge. He then became Assistant Division Engineer in 1957 with jurisdiction from Vancouver to Jasper. In 1962, he was appointed Assistant Area Engineer in Vancouver and then in 1969 he became Assistant Operations Manager also in Vancouver. He moved to Edmonton in 1972 as Assistant to the Regional Chief Engineer for the Mountain Region (Alberta and B.C.). In 1974 he returned to Vancouver as the Manager of the Plant Expansion Program. In this capacity, he had responsibility for the planning and execution of work involved in the construction of early segments of double tracking. From 1972 to 1975, Mr. McLeod also served as a member of the Railway Transport Commission's Safety Committee which was charged with the initial study and supporting recommendations to improve safety of CN Rail and CP Rail operations.

Mr. Robert Pasco

Mr. Pasco is a rancher in the Ashcroft area. He is the Chief of the Oregon Jack Indian Band and a member of the Nl'akapxm Tribe. He obtained a Bachelor of Arts Degree in Chemistry in 1970 from Eastern Washington State University. In addition to his ranching activities, he is president of the Western Indian Agricultural Corporation and acts as a consultant to a number of Indian Bands on farm development projects.

Mr. Ross Peterson

Mr. Peterson is a Vancouver based consultant specializing in fisheries biology. He obtained his Masters of Science in Zoology from the University of British Columbia in 1966. His work experience has included employment as a biologist with the Fisheries Research Board of Canada and the B.C. Wildlife Branch. In 1972, he joined and became Vice President of the consulting firm of Howard Paish and Associates Limited, a position he still holds. Mr. Peterson has been a president of the B.C. Chapter of the Canadian Society of Environmental Biologists, the Pacific Fishery Biologists and the North Pacific International Chapter of the American Fisheries Society. Mr. Peterson's professional training and experience has focussed on aquatic ecology and resource management, particularly as related to fresh water fisheries.

Dr. Denis Russell

Dr. Russell is a Professor with the Civil Engineering Department at the University of British Columbia (UBC). He received his education in Northern Ireland and obtained his doctorate in civil engineering from Queen's University in Belfast. Since coming to Canada in 1957, Dr. Russell has worked with consultants in the planning and design of major water resource projects, including the Mica Dam on the Columbia River. He joined the Civil Engineering Department at UBC in 1968 where he has been involved in teaching and research in water resources. He has also been involved with the Westwater Research Centre at UBC and a number of major interdisciplinary studies including the Okanagan Water Basin Study.

APPENDIX B

TERMS OF REFERENCE FOR CN RAIL MAINLINE CAPACITY EXPANSION IN BRITISH COLUMBIA ENVIRONMENTAL ASSESSMENT PANEL

Mandate

The Environmental Assessment Panel is to undertake a review of the environmental and related socio-economic impacts of the CN Rail capacity expansion projects on its mainline in British Columbia with emphasis on the Valemont-Vancouver segment.

Scope of the Review

The Panel is to assess the environmental and related socio-economic impacts of CN Rail's planned projects as outlined in the Project Description below.

The Panel is to examine the adequacies of the recent past, present and future CN Rail study programs, environmental designs, organization and processes associated with the implementation of these projects and conceptual designs.

Project Description

The CN Rail Plant Expansion Program involves the construction of double track over a significant length of its 440 mile route, predominantly within CN Rail's right-of-way corridor in B.C. The program projects involve cut and fill sections, bin walls and rip-rap for slope stabilization, reclamation and revegetation, tunnels, bridges, culverts and other engineering works to build a safe roadbed for the second track, with the centre line of this new track generally being 15 feet from the existing track. For some sections along the route, building the additional roadbed will require encroachments on the rivers and/or terrain adjacent to the present corridor. At present, CN Rail envisages the installation of 40% - 50% of double track by about 1990. Some projects have been completed, some are under construction, others are at the engineering-environmental design and review stage, while the remainder of projects have been monitored and some accepted by a federal-provincial environmental task force.

Review

The federal government has recognized the need for and therefore has encouraged the early construction of twin tracking of CN Rail's mainline in Western Canada. It is in the national interest to have adequate, safe, economical and efficient railway transportation. Given the indeterminate configuration and scheduling and the continuing nature of CN Rail's railway mainline expansion program in B.C., the review process is to include:

1. Review of the CN Rail mainline expansion program as described above, assessment of the environmental and related socio-economic impacts, and identification of ways and means of dealing with these impacts. This will include a review of CN Rail's environmental study reports, mapping, environmental design study programs, status reports and site specific field survey reports and site specific engineering designs for component projects either completed, approved for construction or in the design stage;

2. Examination of any currently known environmental and related socio-economic issues associated with CN Rail's expansion projects recently completed in B.C. and the adequacy of CN Rail's designs to resolve these issues;

3. Identification of appropriate mechanisms that could facilitate implementation of the findings of the Panel. In this review the Panel should take account of existing mechanisms such as, the current federal-B.C. task force;

4. Convening of public meetings by the Panel to receive input prior to the preparation of its reports;

5. Provision of existing and any additional information to interested parties to allow their participation in the review;

6. Submission to the Minister of the Environment, of a Panel report or reports which:

   i) presents the findings of the Panel and provides conclusions and recommendations on the environmental design of the CN Rail program and projects;

   ii) identifies an appropriate mechanism and process to monitor the continuing work of CN Rail and to implement the recommendations of the Panel.