

BRITISH COLUMBIA HYDRO AND POWER AUTHORITY

HAT CREEK PROJECT

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B.C. HYDRO &
POWER AUTHORITY

HAT CREEK
SOCIO-ECONOMIC STUDIES
VOLUME 2

IMPACTS, MITIGATION
COMPENSATION
AND ENHANCEMENT

by:
STRONG HALL & ASSOCIATES LTD.
and
CORNERSTONE PLANNING GROUP LIMITED
and
URBAN SYSTEMS LIMITED

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PREFACE TO VOLUME 2

This is the second volume in the socio-economic studies related to the proposed Hat Creek mine and thermal generating project. Volume 1, "Inventory and Projections of Regional Social and Economic Conditions", contains an inventory of all relevant data on existing socio-economic conditions as well as projections of future conditions without the project.

Volume 2 draws upon the base data presented in Volume 1 and contains an assessment of the impacts on the future socio-economic conditions which might arise as a result of the Hat Creek Project. The analysis of potential impacts follows the general structure of accounts used in the inventory volume.

All project components, including the mine, thermal plant and off-site facilities, are considered in the impact analysis. In addition, the impacts are assessed for the Pre-Construction, Construction and Operating, and Decommissioning phases of the project. The majority of identifiable impacts occur during the Construction and Operating Phase.

Socio-economic impacts stem primarily from the project's demand for labour and the resultant influx of temporary and permanent in-migrants into the study area. The changes in population levels produce subsequent impacts on the demands for infrastructure, housing, and social and commercial services. There are also some impacts which stem from the physical presence of the project's components.

For some of the impacts identified, there appears to be justification for potential mitigation, compensation or enhancement measures. A description of these measures and additional planning suggestions and considerations also are included in this volume.

This impact report brings together the findings of the study team which comprises Strong Hall & Associates Ltd., Cornerstone Planning

Group Limited, and Urban Systems Limited, as well as the conclusions of other reports included in the Hat Creek Detailed Environmental Studies.

In addition, potential impacts on the local Indian population have been provided by Bob Ward Management Services. The identification and assessment of these impacts have been integrated and included in the volume where appropriate by the socio-economic coordinating consultant, Strong Hall & Associates Ltd. Due to the constraints imposed on the consultants in carrying out the study of impacts on the local Indian population, the identification of these impacts in this report must be considered preliminary.

* See Strong Hall & Associates Ltd. and Bob Ward Management Services "Hat Creek Detailed Environmental Studies. Preliminary Inventory of Indian Socio-Economic Characteristics", B. C. Hydro & Power Authority, 1978. In addition, the physical and biological impact assessment consultants were not given access to meet with the Indian people during the course of their studies.

4. PRE-CONSTRUCTION PHASE

a) Introduction

Each aspect of the proposed Hat Creek Project must be analyzed in order to identify all potential socio-economic impacts associated with the project. The majority of potential impacts would occur as a result of the construction and operating phases of the project. However, the changes in the study area induced by the pre-construction or decommissioning phases also require consideration. This section looks at the potential impacts related to the pre-construction phase.

In this context, the pre-construction phase includes B.C. Hydro's activities from the early feasibility studies in 1974, until the commencement of plant construction. Some of these activities have been completed, such as the bulk sample program; some are in the process of completion, such as the detailed environmental studies; and some are not yet started, such as the licensing application hearings.

Pre-construction activities are varied in type and duration. Many of the activities involve a range of studies, from the physical sampling of the coal deposits to impact assessment studies. Other activities include land acquisition, engineering design, community surveys and public information programs.

The assessments and identification of changes associated with the pre-construction phase are drawn from a number of consultants familiar with the study area, the results of ongoing studies, and informal discussions with community residents.

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Unlike the other phases of the project, the pre-construction phase must be examined from an historical as well as predictive viewpoint. Socio-economic impacts of this phase must be identified from past

as well as future activities. Distinctions must be maintained between impacts identified from an historical perspective, and those identified as potential impacts stemming from future activities.

The pre-construction phase of the project is divided into three time periods. Within each time period, certain activities have been carried out by B.C. Hydro, as well as others. Activities have been identified as Preliminary, Evaluation and Preparation, and Assessment. The historic or expected impacts of these activities are considered under these time periods.

b) Preliminary Activities

The preliminary activities were basically concluded with the 1975 publication, "Preliminary Environmental Impact Study of the Proposed Hat Creek Development."* The period began with B.C. Hydro's definitive drilling of the Hat Creek coal deposit in mid-1974 and continued until public opinions on the preliminary impact study had been expressed. This period of the pre-construction phase is characterized by the initial investigation of the development potential and effects of the Hat Creek coal deposit, and assessments of the need for a coal-fired thermal plant.

During this time, there were some consultants and mining technologists active in the study region. However, the number of individuals involved was too small to create either servicing difficulties or identifiable economic gains in the local communities. The transient nature of these specialists made their local presence comparable to tourists. In addition, there was some alienation of land in the

* B.C. Research and Dolmage Campbell and Associates, Limited.

Hat Creek Valley as a result of exploratory drilling; however, these drill sites have been or will be reclaimed shortly. This activity was limited in scale to the extent that land use impacts were small.

Of more consequence, however, were the changes in the attitudes or expectations of local residents caused by these preliminary activities. To Hat Creek Valley residents, B.C. Hydro's exploratory activities on the coal deposit disturbed their sense of security and increased their feelings of uncertainty about the future of the Valley. The awareness that a coal development was being considered aroused concern that the rural character and lifestyle of the Valley was being threatened. Although most residents were aware of the coal deposit potential, the activities in 1974 and 1975 served to confirm their apprehensions.

For the residents of the local communities, the preliminary activities by B.C. Hydro also caused some attitudinal changes. For the most part, the community residents were not threatened with the loss of their homes, like the Valley residents, and their feelings towards a possible coal development project were mixed. For some, the development was considered to be potentially disruptive to the existing community, or to their natural environment. For others, B.C. Hydro's activities generated an air of expectancy for a potentially attractive economic and community future. To all residents, the preliminary activities created an awareness of a project which could play a major role in the future of the Hat Creek region.

c) Evaluation and Preparation Activities

Activities in this group form the basis of B.C. Hydro's current involvement in the Hat Creek region. Beginning in late 1975, after the preliminary studies, and continuing into the present, this period

is oriented toward a detailed evaluation of all factors associated with the proposed project. Extensive investigations are being carried out by B.C. Hydro and its consultants during this period of the pre-construction phase. These investigations and studies are intended to provide sufficient evidence upon which decisions regarding the future of the project can be based.

In addition to these detailed studies, B.C. Hydro has also undertaken other activities in anticipation of the proposed project. These preparatory actions are considered to be necessary in advance of the project. Included in these activities are the bulk sampling program in 1977, community surveys and liaison programs, land acquisition, engineering design, and community information programs. B.C. Hydro activities of this kind are intended to lay the proper technical, physical and community framework for the project.

Concurrently, other activities have been occurring independently within the local study area communities. At the present time, detailed community plans are being prepared for Clinton, Ashcroft and Cache Creek, and regional plan preparation is in progress for the Thompson-Nicola Regional District. A boundary extension for Cache Creek has been applied for in order to meet expected long-range land requirements. Local private developers have been involved in some land purchase or consolidation activities, and there have been some land ownership changes among local residents. While there is no direct linkage between these activities and the proposed project, the local study area clearly has been preparing itself for future development.

Consultants and other B.C. Hydro employees have been active in the study area. For most research personnel, the communities have provided an operational base, and the local food and accommodation facilities have enjoyed the increased business. The transient

researchers, like tourists in their service needs and consumption habits, have not been limited to the peak tourist seasons. In effect, the service industries have probably benefitted as B.C. Hydro personnel or consultants have reduced seasonal fluctuations; there has been an increasing amount of business in the off-season.

The presence of B.C. Hydro and related personnel has stimulated some other types of local sales, but the amount has not been large. These non-permanent employees have not generated excessive demands on community or social services or infrastructure. It is assumed that the publicity associated with the project has generated some curiosity-seekers to the area, increasing marginally the overall tourist trade in the communities. No inflationary affects have been identified with this period of activities.

A few local residents have gained some employment as a result of activities during this period. Some residents were able to find jobs during the drilling tests and the bulk sampling program. Others have been able to perform various contracting jobs for B.C. Hydro, related to small-scale clearing or other site development work. Some indirect jobs associated with community preparatory actions have also accrued to a few local residents. Increases to total local income, tied to the project activities, have been estimated to be minimal. No changes in the physical structure of the community have been attributed to B.C. Hydro's activities during this period; there have been no identifiable additions to the community infrastructure, housing stock or community facilities as a result of the evaluation or preparation activities.

There also have been some changes in land ownership within the study region. B.C. Hydro has offered to buy land in the Hat Creek Valley in the vicinity of the proposed mine and plant site. Some property has been acquired by B.C. Hydro, resulting in the movement of some

previous residents. The majority of the land has been leased back for agricultural uses. Within the communities, some local residents have purchased or consolidated land parcels for future developments. The change in ownership patterns seems to involve mainly local residents, rather than outside interests moving in to speculate on community land.

Activities by the local communities have created some administrative costs and increased expectations. The activities could be characterized as "precautionary", including the preparation of community plans, the application for a boundary extension in Cache Creek, the visitation by local councils to a thermal coal plant operation in Washington, and renewed interests in joint facility developments for Ashcroft and Cache Creek. There have been costs associated with these activities, but the long-run benefits to the community, as a result of the measures, are expected to exceed the costs. The communities have benefitted from an increase in knowledge about the potential ramifications of the project, an improved data base on the communities and the region, and about possible means of coping with future community developments.

Some changes have occurred in the attitudes and expectations of the study area residents toward the Hat Creek Project. As a result of intensified and more visible activities by B.C. Hydro in recent years, community residents have come to realize the possibility of future alterations in the employment, income, and physical structures of their community. For some, the proposed project offers increased opportunities to better their material well-being, and to improve their lifestyle; expectations have been raised to the point of counting on the project to occur. This is especially true for persons concerned about the existing employment base in the area, particularly the long-term prospects of other mining activities. The Hat Creek Project is

considered necessary for employment stability. For others, the expectations associated with the project are negative; these individuals view it as a disruptive influence which would reduce the elements of community life which are considered most important to them:

For all community residents, the altered expectations of the community's future stem from an increased awareness of the project's nature. Community meetings, B.C. Hydro liaison personnel, local studies and B.C. Hydro information programs have all contributed to the citizen's knowledge of the proposed project. While there are some individuals who do not feel that the information exchange has been extensive enough, the general understanding of the project by many local residents has been increased as a result of these activities.

For the residents in the Hat Creek Valley, it appears that the stepped-up activities of B.C. Hydro have contributed to increased anxieties and insecurities. The future of the Valley appears to be more threatened as B.C. Hydro's presence continues to expand. Some of the properties in the Valley have been purchased by B.C. Hydro. There seems to be uncertainty about the timing and value of future land purchases, and some residents have become suspicious about the transactions being negotiated by other residents and B.C. Hydro. In addition, for the majority who wish to keep the rural and agricultural character of the Valley intact, it appears that the forces favouring the project are gaining, at the possible expense of the Valley residents. Reductions in recreational amenities and some minor incidents with exploration crews have been experienced by Valley residents.

d) Assessment Activities

The period of assessment activities would include all the necessary steps which result in a decision either to proceed with or forego the project. Although some detailed studies are completed and ready

for assessment, this period actually would commence when all evaluations are finalized and available to B.C. Hydro. The duration of these activities would be determined by the decision-making process necessary to reach a final conclusion on the merits of the project.

The internal assessment of all studies would give B.C. Hydro an opportunity to weigh the pros and cons associated with the Hat Creek Project, including engineering aspects, financing, economic feasibility, and environmental and social impacts. Only if it appears that the project is deemed necessary, economic and beneficial would B.C. Hydro then apply for licensing.

The exact nature of all activities to be undertaken in this period is not known, and the course of the decision-making process itself could suggest other future activities. At the moment, however, it is considered possible that B.C. Hydro would engage in the following activities: assess all background studies; release impact reports for public scrutiny and comment; decide whether or not to proceed with project licensing; hold public meetings to disseminate information and gather comments from the residents in the area.

The impacts, or changes in the local study area as a result of these activities are difficult to identify with certainty. The effects on the attitudes or lifestyles of local residents would be influenced by the contents and assessments of the background studies, and the subsequent decisions made regarding the future of the project. The outcomes of these activities can lead to diversified reactions by local residents and changes within the local areas.

In total, the continued movement towards and ultimately a final decision on the future of the Hat Creek Project might generate disparate views among the local study area residents. The availability of

information and the decision-making process itself may cause a few people to switch their support for or against the project, but the majority of people are not expected to change their opinions as a result of the detailed studies. While the mixture of opinions might temporarily divide local study area residents into separate factions, the differences in belief are not expected to produce an unresolvable or disruptive split in the long-term social fabric of the area.

Whether the project proceeds or not, the local population would adjust its future activities accordingly. If the project licence were approved, residents in the area might initiate activities to prepare for expected economic or population growth. These activities might include property developments or investments, business expansions or creations, and home or community improvements. If the project license were denied, area residents would continue "business as usual" and perhaps begin to think about other futures for the area. The residents of the Hat Creek area have traditionally adjusted to all changes which have occurred in their economic structure, and can be expected to accommodate any final decision which is made on the Hat Creek Project.

5. CONSTRUCTION AND OPERATING PHASE

5.1 Employment and Labour Force

This section identifies and assesses the regional employment impacts expected to arise from the Hat Creek Project. Both positive and negative effects are identified in terms of direct, indirect and induced employment required for the construction and operating phases.

Impacts are measured by comparing the "without project" case to the "with project" case. Total employment growth expected to occur without the project is shown in Chapter 3, Section 3.2.

a) Direct Project Employment

(i) Project Employment Opportunities

Total direct employment opportunities on the project have been presented in Table 5.1.1. The table presents the average number of persons per year until 1990 required during the construction and operating phases for each of the project's major components: mine, thermal plant and off-site. Examples of employment requirements for the years 2000, 2010 and 2020 are also presented, illustrating the decline in construction employment, stability of plant employment, and the growth of mining employment. These requirements are presented diagrammatically in Table 5.1.1.

The operating phase of both the mine and thermal plant will overlap with the construction phase. The mine will begin operating during 1980, while the first 500 MW unit of the thermal plant is expected to commence operation in January, 1984. The thermal plant will reach a stable employment level in 1986 and continue with 247 persons employed until the end of its economic life. The mine, on the other hand, will require a steadily increasing operating labour force through its economic life. Since construction employment would steadily decline, however, total mine employment would actually be fairly constant beyond 1990.

TABLE 5.1.1

DIRECT EMPLOYMENT FOR TOTAL HAT CREEK PROJECT
CONSTRUCTION AND OPERATING PHASES
FOR YEARS (1978-1990) AND 2000, 2010, 2020

	<u>Construction</u>				<u>Operating</u>		
	<u>Thermal Plant</u>	<u>Mine</u>	<u>Offsites</u>	<u>Total</u>	<u>Thermal Plant</u>	<u>Mine</u>	<u>Total</u>
1978	75	-	160	235	1	-	1
1979	232	123	285	640	1	-	1
1980	545	260	131	936	1	136	137
1981	1,299	258	509	2,066	3	141	144
1982	2,102	712	100	2,914	54	179	233
1983	2,200	740	10	2,950	156	203	359
1984	1,562	618	10	2,290	169	276	445
1985	990	618	10	1,618	237	347	584
1986	295	618	10	923	247	394	641
1987	-	618	10	628	247	580	817
1988	-	331	-	331	247	591	838
1989	-	331	-	331	247	607	854
1990	-	331	-	331	247	616	863
2000	-	244	-	224	247	696	943
2010	-	75	-	75	247	850	1,097
2020	-	-	-	-	247	905	1,152

SOURCE: B. C. Hydro & Power Authority, Thermal Division,
personal communication, August 25, 1977.

A. Construction Phase

The construction phase for the thermal plant and offsites is proposed to begin in 1978 and continue through 1986. The mine, on the other hand, involves construction-type activities beyond the year 2010. Peak labour requirements will occur during 1983, when construction activities will employ 2,950 persons. Construction activities are expected to involve one shift working a 7-1/2 hour day, five days per week.

It is expected that the plant will require a peak labour force of 2,200 and a total of about 9,400 man-years of employment. Labour requirements for the thermal plant construction phase are presented by trade classification in Table 5.1.2. The early construction years will require inputs primarily from the General Labourers, Operating Engineerings, Carpenters and Electrical Workers, while the peak and wind-down periods will emphasize the inputs of Plumbers and Pipefitters, Iron Workers, Electrical Workers and Boilermakers.

Mine activities classified as construction are expected to require about 9,865 man-years of direct labour through to the year 2013. Employment would peak in 1985, with a total of 740 jobs. The skill requirements are presented in Table 5.1.3.

The construction labour requirements for offsite facilities would reach a maximum of 509 jobs in 1981. Total man-years of direct labour through 1987 amount to 1,235. Skill breakdowns are not available but, for the most part, would require general earth-moving and light construction skills. The exception would be during the laying of the water line, when specific pipeline construction skills would likely be required. Water supply employment would reach a peak of 425 jobs in 1981, road construction would employ a maximum of 150 in 1979, airport construction would require 25 employees in 1979, diversion and dam work would reach a peak of 64 jobs in 1981, and camp construction would employ a

TABLE 5.1.2

DIRECT EMPLOYMENT BY TRADE CLASSIFICATION
THERMAL PLANT CONSTRUCTION

	<u>Average</u> <u>Man-Years</u>
General Labourers	755
Operating Engineers	615
Culinary Workers	440
Office and Technical Employees	890
Carpenters	450
Plumbers and Pipefitters	885
Electrical Workers	1,180
Iron Workers	1,025
Heat and Frost Workers	290
Machinists/Millwrights	175
Boilermakers	915
Sheet Metal Workers	295
Other Labourers	<u>305</u>
Total Labourers	8,235
Engineer and Supervisory	<u>1,180</u>
Total Direct Employment	<u>9,400</u>

SOURCE: B. C. Hydro & Power Authority,
personal communication,
August 25, 1977.

maximum of 80 people in 1978.

TABLE 5.1.3

DIRECT EMPLOYMENT BY TRADE CLASSIFICATION
MINE CONSTRUCTION

	<u>Average Man-Years</u>
General Labourers	1,295
Operating Engineers	3,440
Teamsters	435
Culinary	315
Carpenters	890
Plumbers and Pipefitters	435
Electrical Workers	435
Machinists/Millwrights	<u>1,725</u>
Total Labourers	8,970
Engineer and Supervisory	<u>895</u>
Total Direct Employment	9,865

SOURCE: B. C. Hydro & Power Authority
"Hat Creek Mining Project Engineering
Description for Environmental Report",
August, 1977

B. Operating Phase

The completed thermal plant will require a staff of about 250 persons constantly over its operating life, amounting to a total of 9,200 man-years of labour. Personnel will be phased into the operation prior to completion, with the startup of each generating unit. The first 500 MW unit will commence operation in January, 1984, and each succeeding unit will follow at one-year intervals. Total staff requirements, presented in Table 5.1.4, are shown by general work divisions.

TABLE 5.1.4

DIRECT EMPLOYMENT BY WORK DIVISIONS
THERMAL PLANT OPERATING PHASE

	<u>Unit 1</u> <u>Jan. 1984</u>	<u>Unit 2</u> <u>Jan. 1985</u>	<u>Unit 3</u> <u>Jan. 1986</u>	<u>Unit 4</u> <u>Jan. 1987</u>
Supervisory, Professional and Confidential	22	22	25	25
Office and Technical Employees	14	14	16	16
Operating	69	74	115	120
Mechanical Maintenance	15	19	27	30
Electrical Maintenance	6	8	10	11
Instrument Maintenance	6	7	8	9
General Tradesmen	16	16	25	26
Stores	3	4	5	5
Security Guards	<u>5</u>	<u>5</u>	<u>5</u>	<u>5</u>
Total Direct Employment	<u>156</u>	<u>169</u>	<u>237</u>	<u>247</u>

SOURCE: B. C. Hydro & Power Authority,
"Preliminary Hat Creek Staffing,
Thermal Division, 1977".

The plant will be a three-shift operation, seven days a week, with most of the shift work involving the Operating group.

Direct employment in the mining operation is presented by work divisions in Table 5.1.5. Stages 1 through 7 identify particular operating phases from 1980 through the operating life of the mine. It is apparent that the mine operating labour force is increasing through the sixth stage (2013-2017). However, since the mine construction labour force is declining through this same period, overall mine employment is reasonably constant beyond 1990. Mine operating activities will account for the largest amount of project man-years, totalling more than 29,300.

As with the thermal plant, the mine will also operate three shifts, seven days per week.

Among the off-site facilities, only the airport is expected to have an operating workforce. The size of this workforce is unknown, but is not expected to be very large.

TABLE 5.1.5

DIRECT EMPLOYMENT BY WORK DIVISIONS
MINE OPERATING PHASE

	<u>Stage</u>						
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>
	<u>1980-84</u>	<u>1985-87</u>	<u>1988-93</u>	<u>1994-2006</u>	<u>2007-13</u>	<u>2014-18</u>	<u>2019-22</u>
Mine Operating	93	168	276	303	376	424	404
Mine Maintenance	37	101	194	214	272	310	294
Mine Labour	12	40	67	81	104	112	109
Mine Staff	<u>61</u>	<u>81</u>	<u>98</u>	<u>98</u>	<u>98</u>	<u>98</u>	<u>98</u>
Total Direct Employment	203	390	635	696	850	944	905

SOURCE: B. C. Hydro & Power Authority.
"Hat Creek Mining Project Engineering
Description for Environmental Report",
August, 1977.

(if) Determinants of Regional Labour Force
Participation in Hat Creek Project

The involvement of the regional labour force in the Hat Creek Project will be limited by the demands of other major construction projects occurring in the region during the same period, by the project's skill requirements, by union access, jurisdictional and dispatch factors, as well as by B. C. Hydro collective agreements. These limitations will vary between the construction and operating phases.

A. Construction Phase

The Hat Creek Project will be constructed basically by a union labour force. Either Columbia Hydro Constructors or Peace Power Constructors, subsidiaries of B. C. Hydro & Power Authority, will be responsible for providing the construction labour force and managing labour relations on the project. Traditionally, Constructors have negotiated collective agreements with the Allied Hydro Council, and supported by reference agreements for each particular union, established the terms and conditions of employment for all workers on the project. The Constructors-Allied Hydro Council agreement states that "consideration (be) given to qualified non-union workers who live in the area". Discussions with union officials indicate that this clause tends to enhance local involvement, but the extent to which this clause is applied depends on the level of unemployment among existing union members.

As it is considered likely that the British Columbia construction unions will be experiencing fairly high levels of unemployment during the foreseeable future, openings for local residents who are not union members are expected to be limited. Those unions that would likely be most accessible to non-unionized local residents

At the time of writing, this statement is valid for the thermal plant and offsite facilities but no decision has been made on whether or not Constructors will be responsible for mine construction.

would be the General Labourers (Local 602), Office and Technical Employees Union (Local 378) and, to a lesser extent, the Carpenters Union (Local 1540). Local 602 will sometimes provide training programs to interested individuals in the vicinity of the project in order to qualify them for union membership and project work.

Among the region's unionized construction labour force, the number of individuals in many trade categories is insufficient to meet the project's labour demands. The effective regional supply of construction workers is shown in Table 5.1.6.* Culinary Workers, Office and Technical Employees, Electrical Workers (Wiremen), Iron Workers and Boilermakers are in particularly short supply in relation to peak project demands. Most of these tradesmen will come from other regions of the province or from Alberta. Of the regional supply of 1,875 unionized construction workers, most live in Kamloops, while about 90 reside in the local study area.

In addition, the demands of other projects, likely to be under construction in the Highland Valley during the same period as Hat Creek construction, will put further strains on the regional labour supply. Appendix Table A-1 denotes that these demands could be particularly strong during the 1983-84 period.

Construction supervisory and engineering personnel, about 10% of the construction labour force requirements, will also be obtained from outside the region. Many of these individuals will be existing B. C. Hydro employees or staff members of the project's prime constructor. Very few individuals with the specific skills and experience required for these positions will be available in the study area.

* Obtained from discussions with union officials and Canada Manpower, Kamloops. "Effective", used in this context, is that proportion of the total unionized labour force which normally would be mobile and would participate in heavy industrial construction projects.

TABLE 5.1.6

ESTIMATED EFFECTIVE REGIONAL SUPPLY
OF UNIONIZED CONSTRUCTION WORKERS

	<u>Effective Regional Supply Spring, 1977</u>
General Labourers	450
Operating Engineers	500
Teamsters	30
Culinary Workers	30
Office and Technical Employees	75
Carpenters	245
Plumbers and Pipefitters	200
Electrical Workers (Wiremen)	175
Iron Workers	50
Machinists/Millwrights	25
Boilermakers	15
Sheet Metal Workers	20
Others	<u>60</u>
Total Regional Supply	1,875

* Others include Heat and Frost Workers, Bricklayers, Cement Masons and Finishers, and Painters.

SOURCE: Construction unions expected to participate in Hat Creek Project, personal communication, 1977.

In spite of the fact that almost all unions to be represented on the project have members resident in the region, it is unlikely that all regional union members will participate on the project. Local jurisdiction and dispatch procedures will be an important determinant of regional participation. Only four construction union locals have hiring halls within the region from which members are dispatched. The Carpenters (Local 1540), Operating Engineers (Local 115), Electrical Workers (Local 993) and General Labourers (Local 602) have hiring halls in Kamloops. Regional members of these unions can be assured of Hat Creek work, if they desire.

All other unions dispatch from Vancouver, generally on a first in/first out basis. In some cases, preference is given to members residing near the project site, usually within a 30-mile radius, but there are few members at the present time living within this radius. In most of these unions, members resident in Kamloops will receive no preferential hiring treatment.

B. Operating Phase

The inability of regional residents to meet project skill requirements, and union-negotiated hiring practices, will likely limit regional participation at the thermal plant and the mine during the operating phase.

At the present time, there are about 80 experienced miners unemployed in the study region. Over the next five years, it is expected that between 250 and 350 operating miners will become available from the closure of the Craigmont Mine at Merritt.^{*} However, mining expansions expected to occur throughout the region with or without the Hat Creek Project should require in the order of 1,700 open-pit mining personnel.^{**} Some of these opportunities

^{*} See Chapter 3, Section 2, for details.

^{**} See Appendix A for details.

would be taken by the regional unemployed who have the required mining skills.* Other job opportunities may be taken by the more than 2,000 high school graduates or school leavers annually entering the labour market, provided they have some training or skills. Some jobs may be taken by those switching from other regional mining jobs.

The union jurisdiction for the mine operation has not yet been defined, but it is assumed the mine will be certified by one of the traditional mining unions. Representation by one of these unions with an open hiring policy will likely facilitate greater potential for regional participation than representation by the existing B. C. Hydro unions.

Thermal plant operating labour requirements, excluding skilled technicians and management personnel, represent a variety of skills, including: steam engineering, mechanical, electrical and instrument maintenance, general trades, clerical and general labour. The latter three categories are the most likely to be available in the study region, and represent about 80 job opportunities.

The specialised skill qualifications for the operation of the thermal plant represent only one of the obstacles to regional participation. B. C. Hydro hiring practices are seen as a further limiting factor to regional labour involvement and will effectively prevent some qualified regional residents from obtaining employment on the project. The hiring flexibility of B. C. Hydro is limited by the requirements of the several collective agreements to which the company is party. The most relevant of these contracts involve the International Brotherhood of Electrical Workers (IBEW), Local 258, and the Office and Technical Employees Union (OTEU), Local 378. These agreements make no specific provision for local hiring priorities.

* See Table 3.2 in Chapter 3 for details of regional unemployed.

(iii) Estimated Regional Participation
in the Direct Employment of the Project

In spite of constraints to regional participation outlined above, members of the current regional labour force, and potential new entrants to the regional labour force from current residents, will participate at Hat Creek during both the construction and operating phases. The project's large labour demands, high wage rates, and attractive fringe benefits will draw some residents from currently-held jobs. In addition, the project will provide opportunities for those with relatively low skill levels, both for some of the region's currently unemployed and for some of the new regional entrants to the labour market. Estimates of total regional participation are presented below and are disaggregated between the construction and operating phases.

A. Construction Phase

During the construction phase, the four unions previously identified with Kamloops' dispatch centres will utilize its resident members before calling members from other locals in British Columbia. This group will constitute the majority of regional residents expected to participate on the project. In addition, regional members of those unions usually giving priority to local residents will likely be involved in the project's workforce.

In order to estimate the number of project construction employees likely to originate from the local area and the total Hat Creek region, the effective supply of local unionized construction workers (see Section 5.1 a) was compared to the project's demand for industrial construction workers during each year of the construction period. For the four unions which dispatch from Kamloops, or clearly give dispatch priority to regional members, local members were allocated to the job up to the level where demand exceeded local supply. During periods when there is expected to be a high competitive demand for construction labour from projects being

constructed in the Highland Valley, and total regional demand exceeds supply, the effective regional supply was allocated between the Hat Creek and Highland Valley projects in proportion to their relative demands.

For those unions which clearly dispatch from Vancouver and assign their total provincial membership on a first in/first out basis, regional members were allocated on the project in proportion to their numbers relative to the total provincial membership. In cases where the dispatch procedure is less clearly defined, it was assumed that regional members had a 50% chance of being dispatched to Hat Creek.

The estimate of direct local and regional participation in the construction phase is shown in Table 5.1.7.

Within the region, it is estimated that local study area residents would obtain a maximum of about 115 jobs at peak labour demand. Due to their priority status in some unions, it is likely that they will be hired in the construction period and their jobs will be maintained until the latter stages of construction wind down. Most of the local participants will be members of the General Labourers, Operating Engineers and Carpenters Unions. It is anticipated that some local non-union workers will have access to the General Labourers and Carpenters Unions, but it is not expected that these entrants will be numerically significant.

With the exception of Electrical Workers Union, the project by itself will not absorb the total available supply of members in the unions with regional jurisdiction. The demand for electrical workers is expected to exceed regional supply from 1982 to 1985, inclusive. If the Valley Copper project begins construction during 1984, as expected, operating engineers, carpenters and electrical workers all would be in short supply regionally.

TABLE 5.1.7

ESTIMATE OF DIRECT LOCAL AND REGIONAL PARTICIPATION
IN HAT CREEK PROJECT:
CONSTRUCTION PHASE EMPLOYMENT

	<u>Regional Residents</u> <u>Local</u>	<u>Other</u>	<u>Non-Regional</u> <u>Residents</u>	<u>Total Construction</u> <u>Employment</u>
1978	60	115	60	235
1979	115	315	210	640
1980	115	435	386	936
1981	115	780	1,171	2,066
1982	115	1,290	1,509	2,915
1983	115	1,255	1,580	2,950
1984	115	925	1,250	2,290
1985	115	715	788	1,618
1986	115	430	378	923
1987	60	325	243	628
1988	60	140	131	331
1989	60	140	131	331
1990	60	140	131	331
2000	45	125	87	257
2010	20	30	25	75
2020	-	-	-	-

SOURCE: Strong Hall & Associates Ltd., 1978.

Over the construction period, regional residents are likely to obtain about 11,200 man-years of employment directly on the project, or 55% of total construction labour requirements. Local residents are expected to obtain about 2,100 man-years of work.

Non-regional workers will originate primarily in the Lower Mainland, although members from throughout British Columbia, and possibly Alberta, will be involved. It is generally recognized by union leaders that the project's geographical accessibility, duration and income potential will make it one of the more attractive major construction projects expected in the province in the foreseeable future.

B. Operating Phase

Regional residents will also have an opportunity for employment in both the mining and thermal plant operations of the project. The operating phase of the project will provide a large number of jobs encompassing a wide range of skill requirements. Jobs associated with this relatively unique project will have a number of comparative advantages over other regional mining jobs, including job security, high wages, excellent fringe benefits, and possibly an open hiring policy.

The regional labour force totals about 34,000 persons, and, without the project, would grow to about 54,000 persons by 1990. Regional unemployment is likely to range between 2,500 and 4,000 persons during the mid-1980's. Individuals with little work experience will be entering the labour market, and others with various levels and types of industrial experience will be desirous of changing their jobs. Furthermore, both the general population and existing local mining employees have expressed an interest in operating phase jobs of the project.*

* Hat Creek Resident Survey (1977). Approximately 5% of the population was interested in operating jobs at either the mine or thermal plant while over 30% were interested in some combination of construction and operating employment on the overall project.

The majority of the potential labour force would likely have relatively low skill capabilities. These persons, if interested, would be able to fill most of the job descriptions for the Hat Creek mine which require relatively low skill levels. These jobs are estimated to account for 15 to 207 of the total Hat Creek mine workforce.

In addition, there will be a large supply of experienced open-pit mining personnel in the region over the next decade. Some of these individuals, associated with Highland Valley developments, would likely view Hat Creek opportunities as more desirable than those they would otherwise hold, and could possibly switch jobs. The 1977 Hat Creek Resident Survey * indicated that more than 30% of the local mining labour force were interested in some type of employment in the operating phase of Hat Creek.

The potential for job switching and the high incidence of mine workers' interests are likely related to uncertainties surrounding the future of other mining activities. At the present time, between 25% and 30% of the Bethlehem and Lornex labour force are previous residents of the region, while 10% to 15% are previous local study area residents.

As previously mentioned, it is assumed that the hiring policy at the Hat Creek mine is likely to be open. Mine management will probably look favourably upon suitable regional resident applications, as experience shows their turnover rates tend to be relatively low.**

A great deal of uncertainty surrounds the estimation of regional participation in the operating phase of an industrial project such as Hat Creek. If specific regional employment targets were

* Hat Creek Resident Survey, 1977, Cornerstone Planning Group Limited.

** Personal discussions with staff at Bethlehem Copper and Lornex Mines.

established, given the sufficient time available for training programs, most of the project's labour force requirements could likely be obtained from within the Hat Creek region. However, given existing legal, social and political realities, neither existing government nor corporate policy is directed towards the setting of regional employment priorities or targets.

At the present time, no suitable model exists for estimating the regional participation in the mine operation. For the purpose of this study, it has been assumed that the regional and local participation currently being experienced by Bethlehem and Lornex mines could be expected for the Hat Creek mine. These proportions have, therefore, been used to estimate participation at Hat Creek. Total expected regional and local employment in the operating phase of the Hat Creek Project are shown in Table 5.1.8.

It is expected that regional interest in employment in the thermal plant, during the operating phase, will be high. Relatively high wages* and the uniqueness of the project within British Columbia will largely account for this interest. On the other hand, skill and union constraints to participation will exist.

As with the mine, no rigorous method exists for estimating regional participation and there are no data available on precedent situations. In discussions with B. C. Hydro officials, it was generally considered that clerical, general tradesmen and operating and maintenance helpers would be the most likely positions for which the regional and local labour force would be most qualified. In addition, these are the positions for which union constraints would be least significant. These positions account for about 80 out of the 247 jobs in the plant.

* See Section 5.3.

TABLE 5.1.8

ESTIMATE OF DIRECT LOCAL AND REGIONAL PARTICIPATION
IN HAT CREEK PROJECT:
OPERATING PHASE EMPLOYMENT
(MINE AND THERMAL PLANT)

	Regional Residents		Non-Regional Residents	Total Operating Employment
	Local Area	Other		
1978	-	-	1	1
1979	-	-	1	1
1980	25	15	97	137
1981	25	15	104	144
1982	30	20	183	233
1983	55	40	264	359
1984	65	50	330	445
1985	75	80	429	584
1986	80	85	476	641
1987	90	110	627	827
1988	100	120	618	838
1989	105	135	614	854
1990	115	135	613	863
2000	130	145	668	943
2010	150	180	767	1,097
2020	155	195	802	1,152

SOURCE: Strong Hall & Associates Ltd., 1978.

In estimating regional participation, it is considered reasonable to expect that 75% of the 80 potential jobs would be filled by regional residents. Local residents would be expected to fill about half of the regional total.

b) Indirect Employment and Induced Employment

(i) Regional Expenditures and Indirect Employment Opportunities

Indirect employment is typically defined as that employment which arises from project expenditures on goods and services. To the extent that project purchases are made from suppliers within the region, regional employment could be increased. The extent of regional and local indirect employment generated by the project is determined by the amount and type of expenditures made to local suppliers.

Most of the equipment, material and supply requirements for the construction and operation of the Hat Creek facilities will be purchased from suppliers outside of the region. This "importing" of goods directly into the region contributes little to the regional economy. However, some purchases, including some earth-moving equipment, trucks, small tools and consumables (e.g., camp catering supplies) will be made from regional suppliers, both producers and wholesalers.

Few, if any, of these requirements for the construction phase would be purchased from suppliers resident in the local study area. Kamloops is the only community in the region capable of supplying a significant proportion of these requirements. Limited regional purchases outside Kamloops might include lumber from Clinton or Savona and bulk fuels from Ashcroft. Incremental employment associated with these local area purchases would be minor.

Kamloops has a variety of heavy equipment dealers and industrial wholesalers who supply the existing regional mining industry.

It is reported by one major open-pit mining company in the region that they purchase about 40% of their equipment, materials and supplies from Kamloops.

It is considered reasonable to expect that this expenditure pattern would occur at Hat Creek and, if so, the mining operation alone would spend about \$5.5 million annually in the region by 1985. This expenditure would increase to about \$16.5 million (1976 dollars) by the year 2000. Over the life of the mine, about \$400 million would be spent on industrial equipment and supplies in Kamloops.*

The lack of useful precedents makes it difficult to determine the project supply requirements which would be purchased in Kamloops. As a regional distribution centre, Kamloops has a number of goods such as small tools and consumables, which would be available for purchase. The total supply requirements would account for 4% of the contract price**, or capital cost of the thermal plant, which is estimated at \$1.0 billion (1976 dollars). A conservative estimate suggests that 50% of these items would be purchased in Kamloops. This expenditure would represent an additional \$20 million (1976 dollars) in Kamloops sales during the plant construction period.

The operating phase of the plant would also be expected to contribute little in direct regional purchases. General hardware items would be purchased regionally only if prices are competitive with Lower Mainland suppliers. Should some of this business go to Kamloops, volume is likely to be small and, by itself, would not be sufficient to justify the location of new suppliers in Kamloops to serve this market.

Estimated from "Preliminary Report on Hat Creek Open Pit No. 1", PD-NCB Consultants Limited, Volume I, 1976.

** Ebasco Services of Canada Ltd., personal communication, September 9, 1977.

The provision of catering supplies for the construction camps is a market in which Kamloops would likely play a substantial role although the volume of sales would be fairly small. In discussions with industrial caterers, it has been estimated that about 25% of the food and catering supplies required for the camp would be supplied from Kamloops. Over the life of the construction camp, these expenditures would contribute about \$15 million to the Kamloops economy.

In total, then, it might be expected that the Hat Creek Project would increase industrial sales in the region, primarily in Kamloops, by about \$435 million (1976 dollars) over the life of the project. These increased sales would generate the need for an additional 1,200 man-years of indirect employment, averaging 35 persons per year.* Indirect employment estimates are included in Table 5.1.9 described below.

(ii) Induced Employment Opportunities

Induced employment is defined in this analysis to include incremental employment associated with the consumer spending patterns of the project's direct and indirect employees as well as public service employees associated with all project-related population increments.

Induced employment includes additions to the workforce in commercial trade and service sectors, hospitals, municipal government and other service areas. The usual way of estimating induced employment is by means of an employment multiplier. The explanation and derivation of employment multipliers is presented in association with the Regional Income and Employment Model in Appendix 3. Employment multipliers were estimated as follows: Ashcroft/Cache Creek (1.42), Lillooet (1.42), Clinton (1.35) and Kamloops (1.66).

• On the basis of wages constituting 4% of wholesale sales at an average salary of \$15,000 per year.

Using these multipliers, induced employment likely to occur in the region and local study area communities, as a result of the Hat Creek Project, is shown in Table 5.1.9. It is expected that most of the induced employment will be generated in the local study area, however, due to the consumption and service linkages with Kamloops, that city will also share in both indirect and induced employment growth.

Within the local study area, induced employment increments for the operating phase are assumed to occur in the settlement community of the operating workforce. It is possible, however, due to inter-community shopping patterns among Ashcroft, Cache Creek and Clinton, that this assumption will not hold. The actual result will depend on the promotional ability of business in the individual communities, and possible competitive advantages obtained by a community gaining an increasing population differential over the other communities. For example, under Scenario 1, outlined in Section 5.2, the growth of Ashcroft in relation to the other two communities could result in the attraction of commercial and public service facilities that would draw consumption expenditures away from the other communities to a greater extent than occurs at the present time. In this case, some of the induced employment assumed to occur in Clinton would occur, instead, in Ashcroft.

During the construction phase, the induced employment effects of direct construction workers are assumed to occur largely in Ashcroft and Cache Creek.

(iii) Estimated Regional Participation in Indirect and Induced Employment

A high proportion of the currently unemployed regional and local area labour force have experience and skills in sales, services and clerical occupations.

The skill requirements for many of the induced or indirect employment opportunities created by the Hat Creek Project will be

TABLE 5.1.9

ESTIMATE OF LOCAL AND REGIONAL PARTICIPATION
IN THE INDIRECT AND INDUCED EMPLOYMENT
ASSOCIATED WITH HAT CREEK PROJECT

	<u>Local Area</u>		<u>Rest of Region (Kamloops)</u>		<u>Total Regional Indirect and Induced Employment</u>
	<u>Induced Employment</u>	<u>Local Area Residents</u>	<u>Indirect and Induced Employment</u>	<u>Regional Residents</u>	
1978	20	5	5	-	25
1979	55	15	15	10	70
1980	160	50	80	50	240
1981	265	80	115	70	380
1982	420	125	175	105	595
1983	480	145	205	125	685
1984	490	145	220	130	710
1985	465	140	205	125	670
1986	465	140	205	125	640
1987	470	140	225	135	695
1988	460	140	225	135	685
1989	465	140	225	135	690
1990	470	140	225	135	695
2000	490	145	235	140	725
2010	490	145	225	145	715
2020	485	145	225	135	710

SOURCE: Strong Hall & Associates Ltd., 1978.

minimal. Therefore, it can be expected that a higher percentage of these jobs will be filled by local residents than would be the case for the direct Hat Creek jobs. Higher skilled professionals, managerial and entrepreneurial skills, however, will still likely be imported from other areas of British Columbia and possibly Western Canada. Estimated local participation in indirect and induced employment opportunities is shown in Table 5.1.9.

It has been assumed that approximately 30% of these employment positions created in the local study area will be obtained by local area residents. In Kamloops, it has been assumed to 60% of the service jobs will be obtained by Kamloops' area residents.

c) Effects of the Project on Labour Supply for Other Regional Industries

The employment opportunities created by the Hat Creek Project will attract some individuals to switch from jobs they currently hold in the region. They will switch for perceived increases in real total income (higher wages and benefits or shorter travelling time), increased job security, opportunities to learn new skills or simply for a change. At the same time, there will be constraints on their ability to switch, at least to the direct project jobs.*

There will inevitably be some movement between jobs by existing regional employees. Some non-union workers will join the General Labourers, Carpenters and OTEU unions to participate on project construction. Some workers will switch from the existing regional mines to take positions in the Hat Creek mine and the thermal plant.**

* These constraints are fully discussed in Section 5.1 a).

** In past situations, it has been suggested by some mining industry officials that job switching among competing mines in a small geographical area has been discouraged.

Some workers will switch jobs to participate in the housing and commercial construction activities induced by the project. Part-time service employees will switch to new, full-time positions in the expanding service sectors induced by the project.

In general terms, the Hat Creek Project will introduce a stimulating effect to the regional labour market. As with any large-scale development activity which disrupts the status quo, the employment levels generated by the project will lead to periods of labour force instability. Labour turnover and job switching are likely to be high if the current project timing holds, and there is overlap with other mining developments expected to occur in the Highland Valley. The anticipated major shift in demand for labour within the region will produce a labour market which is more diversified and dynamic.

The most severe instability in the labour force could occur between 1983 and 1985 when the Valley Copper property begins development. Depending on the exact timing of this development, it could result in significant excess demand for construction labour or it could provide a continued construction stimulus to the region as Hat Creek construction activities subside. The combined demand for operating miners will inevitably be high during the mid to late 1980's, irrespective of the exact year that Valley Copper comes on stream.

Given the nature of the Hat Creek Project, the most likely regional sectors to experience personnel losses will be mining, transportation, and forestry, and personnel adjustments will also be required by local contractors and the Kamloops pulp mill. Most job switching will be among equipment operators and general labourers, and these skills should not be too difficult to replace. The major problems will arise if significant switching occurs in occupations which may be in short supply, thereby creating recruiting difficulties for other employers. Included in this group would be heavy duty mechanics, electricians, machinists, welders and millwrights.

Although the thermal plant will result in heavy demands for steam

engineers, some of whom could switch from the Kamloops pulp mill, the mine will potentially pose the greatest threat to employers wanting to retain their employees who have skilled trades.

The amount of switching that will occur would depend, to a great extent, on the wage rates and fringe benefits established by the Hat Creek collective agreements. If these are consistent with the existing regional mining industry, then potential switching will be reduced. The main impetus to switching will then be job security and travel time savings.

The Hat Creek Project will likely increase the turnover rates at the Bethlehem Copper and Lornex mines in the short run. Hat Creek will represent significantly shorter travel distance on superior road conditions for Bethlehem Copper and Lornex employees resident in Ashcroft and Cache Creek. Hat Creek would likely be viewed favourably from this perspective.

In addition, there is a great deal of uncertainty among Bethlehem employees, at the present time, over the future of the Bethlehem property. Since the existing property has but a few years of economic life, however, it is likely that this uncertainty would be resolved before the Hat Creek mining demands reach sizeable proportions. Job security would only be a factor, then, if Bethlehem decided to close down its operation. Retaining staff during the phasing-out period would likely be difficult.

Although it is suggested that job switching within the region would occur, there are factors operating to minimize its negative effects. Hat Creek and the Highland Valley projects will have a fairly high public profile and will, therefore, attract speculative job seekers. The projects' locations, near Highway No. 1, will enhance this speculative activity. Indeed, the existing mines obtain a high proportion of their job applications from transients and tourists just passing through the region. Although the level of activity cannot be predicted, it will tend to reduce the difficulties in

replacing job switchers and minimize the negative impacts.

d) Effects of the Project on Indian Employment Opportunities

The inventory report* concluded that there was a high level of unemployment among Indian people in the study area. It was estimated that only some 50 Indian people are currently employed on a regular basis in the primary study area, that there are about 70 Indians essentially unemployed among the bands in the primary study area, and that in the order of 100 Indian people will have to be newly accommodated in the labour force over the next 10 to 15 years.

The report continued that various types of barriers exist to Indian employment in the local wage economy and concluded that many of the barriers might be largely overcome in the future. The report also noted that Indian employment levels will increase in the study area, even without the Hat Creek Project. There are, however, so many factors involved that it is not possible to make firm predictions of the possible scale of achievement or of the time scale involved.

Much of the economic growth predicted for the area without the Project is predicated on the expansion of mining operations in the Highland Valley. Many of the employment opportunities that would be generated by these mining activities are similar in nature to the jobs that would be generated by the Hat Creek Project. The Hat Creek Project would offer a considerable amount of employment opportunities. In addition to adding to the total number of employment opportunities available in the area, the Hat Creek Project would offer the local Indian people a marginal benefit, in that it is located closer to their homes, thus, easing barriers that are created by distance and transportation difficulties.

* Strong Hall & Associates Ltd. and Bob Ward Management Services, "Hat Creek Environmental Studies: Preliminary Inventory of Indian Socio-Economic Characteristics", B. C. Hydro & Power Authority, March, 1978.

Local and regional participation in the construction and operating phases of the Hat Creek Project are shown in Tables 5.1.7 and 5.1.8. The relatively low levels of local area participation in the project reflect a variety of employment constraints. These constraints include the demand of other major construction projects occurring in the region during the same period, the project skill requirements, union access, jurisdictional and dispatch factors, as well as B. C. Hydro collective agreements. The limitations vary between the construction and operating phases.

The current disparity between unemployment levels in the study area for Indians and non-Indians reflects the relative likelihood of the two groups being able to obtain new jobs as they are created. Therefore, if the level of local area participation forecast for the project is low, then the number of jobs likely to be taken by Indians, without special steps being taken to solve their specific employment problems, is still lower.

The Project would also create some wage employment and business opportunities in the local economy, which might offer further potential for Indian employment benefits. Current Indian unemployment and lack of involvement in local business or commerce ventures would tend to suggest that these spinoffs offer no real benefits to local Indians. However, it is possible that the various forces that are acting to overcome the barriers to Indian employment in the area, as described in the Preliminary Socio-Economic Inventory Report, might allow some benefits to accrue over time to Indian people from the spinoff areas.

There may be some loss of employment opportunities in the agricultural and ranching operations that would be negatively impacted by the project but, in the absence of reliable base information about the distribution of Indian employment in these sectors, no firm predictions can be made.

Effects of the project on Indian non-wage employment, such as in the areas of trapping, hunting and food fishing are not expected to be significant.

5.2 POPULATION

a) Introduction

Population levels would increase in the region as a result of the proposed Hat Creek Project. Most of the project-associated population changes would be concentrated in the local study area, but some would be felt in Kamloops and other communities throughout the region.

These changes would be brought about by the project's requirements for labour and the indirect and induced labour requirements generated from these initial direct demands as described in Section 5.1.2. The extent of population changes throughout the region also will depend on the ability of the region to supply labour from existing residents who are either unemployed or not currently in the labour force.

b) Population Growth Associated with Hat Creek Project

The increase in population associated with the Hat Creek development would be determined by the number of in-migrating direct, indirect and induced employees and their marital status and dependency characteristics. The estimated in-migrant population associated with direct, indirect and induced employment positions is shown in Table 5.2.1. These population totals and their expected place of residence only include those individuals, and their dependents, who obtain employment.

In addition, it can be expected that the project would attract a number of speculative job seekers who would not obtain employment. These individuals would arrive both at the job site and at the regional hiring halls in Kamloops, and would stay in the area for varying periods of time. The length of stay of these individuals would be largely determined by the likelihood of obtaining work, availability of accommodation and social services and controls

placed on their settlement behaviour.

The level of speculative job seekers cannot be predicted. It would depend on such factors as the amount of hiring done at the job site, general public awareness of the project, levels of unemployment throughout British Columbia and Alberta, and the level of indirect and induced economic activity in the area.

Most of the in-migrant direct employees, during the construction phase, would occupy single status construction camps proposed for the Hat Creek Valley. Of the remaining construction employees, most will reside in the nearby communities, although some are expected to reside in the rural areas. Operating employees, as well as indirect and induced employees, are expected to reside in the communities and surrounding rural areas and not in segregated camps.

Construction collective agreements generally include provisions for free room and board in a single status construction camp located in close proximity to the job site, which would be available to all in-migrant workers desiring single-status accommodation.

In order to derive estimates for the number of construction workers likely to seek accommodation outside the construction camps, previous B.C. Hydro projects were reviewed and discussions were held with appropriate union officials. The factors expected to have the greatest influence on accommodation decisions of workers during the construction phase include:

- length of employment
- existence of living-out allowance
- availability of accommodation

TABLE 5.2.1

ESTIMATED IN-MIGRANT POPULATION
ASSOCIATED WITH HAT CREEK PROJECT
BY EXPECTED PLACE OF RESIDENCE

	<u>In-Migrants</u> <u>to Communities</u> <u>and Rural Areas</u>	<u>Construction</u> <u>Camp</u> <u>Residents</u>	<u>Total Regional</u> <u>In-Migrants</u>
1978	70	165	235
1979	285	470	755
1980	1,085	675	1,760
1981	1,755	1,660	3,415
1982	2,940	2,290	5,230
1983	3,445	2,315	5,760
1984	3,700	1,655	5,355
1985	3,435	1,065	4,500
1986	3,470	485	3,955
1987	3,835	300	4,135
1988	3,785	30	3,815
1989	3,840	30	3,870
1990	3,870	30	3,900
2000	4,010	-	4,010
2010	3,885	-	3,885
2020	3,860	-	3,860

SOURCE: Strong Hall & Associates Ltd., 1978.

- work schedule of the project
- proximity of the job site to workers' current residences
- worker status and family influences

It was generally concluded that union members currently residing outside the local area, but within the total region, would likely live in the camps or possibly commute to the job site. Members currently residing outside the region, primarily in the Lower Mainland, would be expected to live in the camps as they would have a low affinity to move their families into the region. Due to the project's central location and consequent accessibility to their residences, many workers living in camps would commute on a weekend or bi-weekly basis to their homes.

Based on other B.C. Hydro projects, the one group expected to seek community rather than camp accommodation on an extensive basis is the supervisory and engineering staff. It is expected that most of this group would reside outside the construction camps and would be seeking family accommodation in the communities or rural areas.

Demographic and social characteristics of the in-migrants also affect population levels. The in-migrant population associated with the construction phase is expected to have different marital status characteristics than the in-migrant population of the operating phase. During construction, all workers living in the camps would have single status, while about 90% of the in-migrants seeking community residence would be married.* Examination of other recent B.C. Hydro projects suggests that the married in-migrants will average 2.4 dependents each.

* Although many camp residents would be married, they would not be accompanied by wives and families. Experiences at B.C. Hydro projects at Hudson Hope, Mica Creek and Revelstoke show that about 90% of engineering and supervisory staff are married. It is also likely that all other union workers seeking community residence would be accompanied by their families.

Operating employees, in-migrating to the communities and rural areas, are expected to be about 25% single and 75% married. Married residents are expected to average 2.8 dependents.

Indirect and induced employees are expected to have similar marital and demographic characteristics to the direct operating employees.

Total local population changes expected in the study area as a result of the project were estimated using the population model described in Appendix A and the coefficients defined above. The results are shown in Table 5.2.2 and compared to population growth expected without the project. The project may generate both growth-inducing and decline-inducing effects on Kamloops.* Given that the Kamloops population will increase to about 87,000 persons by 1990 without the project, it is expected that the project's population effect in Kamloops would be minimal.

c) Settlement Patterns of Incremental Population in the Local Study Area

(f) Factors Affecting Settlement Patterns

A prerequisite to assessing population influx associated with the Hat Creek Project is to project the distribution of this population among the various communities and rural areas. The incremental or incoming population used in this distribution analysis generally excludes workers living in construction camps, but includes all other direct, indirect and induced employees and their families who migrate to the region for employment purposes.

• Growth inducement would come from project associated indirect and induced expenditures in Kamloops while Kamloops residents obtaining employment on the project and relocating in the local study area would have a retarding effect on Kamloops growth.

TABLE 5.2.2.

POPULATION GROWTH IN THE LOCAL STUDY AREA
WITH AND WITHOUT THE PROJECT

	<u>Without the Project</u>	<u>With the Project</u>	<u>Project Associated Population Increment*</u>
1976	7500	7500	-
1977	7615	7615	-
1978	7615	7850	235
1979	8080	8835	755
1980	8080	9840	1760
1981	8990	12405	3415
1982	8990	14220	5230
1983	8990	14750	5760
1984	8990	14345	5355
1985	9370	13870	4500
1986	9370	13325	3955
1987	9665	13800	4135
1988	9665	13480	3815
1989	9665	13535	3870
1990	9960	13860	3900
2000	-	-	4010
2010	-	-	3885
2020	-	-	3860

- Equivalent to the total regional in-migrants including construction camp population.

SOURCE: Strong Hall & Associates Ltd. 1978

For the incremental population expected in the local study area, four alternatives are suggested as potential places of residence.

- Ashcroft/Cache Creek
- Clinton
- Lillooet
- Rural Areas

Assuming a situation whereby newcomers would be given a free choice in selecting a place of residence, the resultant settlement patterns would represent the cumulative decisions of all newcomers seeking a place of residence. The decisions of individuals to locate in a certain community would likely be influenced in varying degrees by some or all of the following variables:

- commuting time and expense from place of residence
- cost of serviced land
- availability of residential land
- property tax levels and utility rates
- natural features of community - climate, view, recreation opportunities
- lifestyle preference - urban, semi-urban, rural

The relative importance, or weighting, of each of these variables is of course very difficult to quantify. Because of this it is not practical to formulate an equation which could be used for calculating the proportion of the incremental population expected to locate in each community. As such, the approach which has been taken is to compare each community on a descriptive basis in terms of the foregoing variables. On this basis, an implicit weighting is attributed to the variables and a distribution pattern is estimated. In evaluating the communities, Ashcroft and Cache Creek are considered

as a single community, primarily because these two villages are located close together.

A. Commuting Time and Expense From Place of Residence

The following table illustrates the relative location of the communities to the proposed mine site and thermal plant. It is assumed that access to Ashcroft and Cache Creek would be via proposed access route along Medicine and Cornwall Creeks, and access to Clinton would be via Highway 12.

TABLE 5.2.3
DISTANCE FROM COMMUNITIES TO HAT CREEK PROJECT

<u>Community</u>	<u>Approximate Road Distance in Kilometres</u>	<u>Approximate Travel Time in Minutes</u>
Ashcroft	26 (16 miles)	20
Cache Creek	30 (19 miles)	25
Clinton	51 (32 miles)	40
Lillooet	67 (42 miles)	60

SOURCE: Urban Systems Ltd., 1978.

The foregoing information indicates that, compared to the other communities, the distance and travel time to Lillooet would be prohibitive. As such, it is projected that there would be no increase in the population of Lillooet attributable to the Hat Creek Project. It is also suggested that the significant difference in distance and time between Ashcroft/Cache Creek and Clinton would be an important factor in determining the split between these two areas. Two factors to take into consideration are:

Extra Travel Time. For each round trip, the Clinton resident would have to travel approximately 35 to 40 minutes longer than the Ashcroft/Cache Creek resident.

Extra Travel Expense. For each round trip to the mine and thermal plant, the Clinton resident would have to travel approximately 48 kilometres (30 miles) more than the Ashcroft/Cache Creek resident. As a result, the travel expenses per month would be approximately \$120.00 per month greater from Clinton to the site than from Ashcroft/Cache Creek. Travel expense can be expressed in dollar terms and is estimated as follows:

- Assume travel expense of 12.5 cents per kilometre (20 cents per mile).
- Assume average 20 trips per month to the place of work.
- Cost = 48 kilometres x 12.5 cents/kilometre
x 20 trips
= \$120.00 per month

B. Cost of Serviced Land

In the communities under consideration, the main variable in the cost of housing is the cost of serviced land. At the present time, property values in Ashcroft/Cache Creek are significantly higher than in Clinton. It is further considered that because a significantly higher proportion of development is likely to take place in Ashcroft/Cache Creek than in Clinton, the inflationary pressures on property in Ashcroft/Cache Creek would also likely be greater than in Clinton. As such, it is considered that for a typical single family lot, values in Ashcroft/Cache Creek are likely to exceed values in Clinton by approximately \$6,000 to \$10,000. Translated into monthly mortgage payments, a difference of \$8,000 in the purchase price of a property would amount to approximately

\$82 per month (assuming interest rate of 12% for a term of 25 years). The cost of land variable therefore favours Clinton over Ashcroft/Cache Creek. This is considered to be an important factor, although the extent to which the land cost advantage of Clinton would offset the travel time and expense disadvantage of Clinton is not easily ascertainable.

Information on the cost of land in rural areas has not been obtained. However, if proposed Regional District policies on rural development are adopted, it is likely that new development would be restricted to very low density country residential developments (minimum lot size of .9 hectares); pockets of urban density development (i.e. mobile home parks) in rural areas would not likely be permitted. It is therefore considered that the values of rural acreages suitable for country residential development would be similar to or higher than values of urban lots in the villages.

C. Availability of Residential Land

In each of the three villages - Ashcroft, Cache Creek and Clinton - there is an abundance of land suitable for urban residential development. As the councils in each village are anxious to promote growth in their communities, they would unlikely present much resistance to development proposals.

The situation would likely be significantly different in the unorganized rural areas. A shortage in the supply of land for rural or country residential development would likely arise for several reasons:

- The Thompson-Nicola Regional District's proposed rural development policy for unorganized areas is designed to discourage development which is not truly rural in nature. This implies that only developments with very low density, minimal public services, and physical separation from existing villages by at least 8 kilometres

(5 miles) will be permitted. Rural concentrations of development such as the mobile home development at 26 kilometres (16 miles) north of Cache Creek will no longer be permitted.

- Legislative or policy constraints also effect the type of land use and development in the rural areas. Rural developments and subdivisions are controlled by such factors as the B.C. Land Commission Act (Agricultural Land Reserves) and conflicts with other uses (e.g., forestry).
- The provision of large amounts of land for residential development in the rural areas may also face local opposition. Municipal Councils can be anticipated to oppose extensive rural subdivisions if they perceive that these rural developments might draw potential development away from their communities.

D. Property Tax Levels and Utility Rates

Property tax levels in Clinton are among the lowest of any municipality in the province, and significant increases are unlikely unless an overly ambitious capital works program is undertaken. Tax levels in Ashcroft and Cache Creek are significantly higher, and are projected to increase (see Section 5.8). The following table illustrates the relative tax levels of the three communities in 1976, and the amount of tax on a property assessed at \$15,000 (restricted value assessment).

TABLE 5.2.4
TAX LEVELS IN LOCAL AREA COMMUNITIES

<u>Community</u>	<u>Tax Rate In Mills</u>	<u>Property Tax on \$15,000 Assessed Value</u>	<u>Effective Tax after Deducting Homeowners Grant of \$250</u>
Ashcroft	30.9	463.50	\$213.50
Cache Creek	28.0	420.00	\$170.00
Clinton	15.6	234.00	\$ 50.00 minimum

SOURCE: Urban Systems Ltd., 1978

Table 5.2.4 indicates that tax levels vary considerably between communities, but the difference in absolute costs is not considered large enough to be a major influence on settlement patterns.

Similarly, the water and sewer utility rates are somewhat higher in Ashcroft and Cache Creek than in Clinton, but the absolute value of the difference is not a large amount.

E. Natural Features of the Community

Although the three communities are similar in that each is a small village, there are differences in their natural features - climate, setting, view, outdoor recreation opportunities. Ashcroft and Cache Creek are characterized by higher summer temperatures and natural surroundings appear more arid than Clinton. However, it is not possible to predict the extent of the influence of these factors on settlement patterns.

F. Lifestyle Preference

Of the three villages, the Village of Clinton is most likely to appeal to those newcomers who prefer a rural or semi-urban lifestyle. In the Villages of Cache Creek and Ashcroft, new residential

developments, when evaluated by subdivision design, level of service, etc., would be very similar to suburban developments in other urban communities. In addition, Ashcroft and Cache Creek have more urban amenities such as shopping and recreation facilities than Clinton has. While Ashcroft and Cache Creek cannot be described as urban communities in the same context as larger cities, these two communities would be the most attractive of the choices available to those newcomers with an urban lifestyle preference. Since information on the lifestyle preferences of the incremental population is not available, it is not possible to predict the degree of influence this factor has on settlement patterns.

* * * *

The foregoing evaluation provides a basis for implicitly weighting the relative importance of the above variables. Given the circumstances as described above, it is suggested that the most dominant variable is commuting time and expense. In this respect, Ashcroft/Cache Creek has a distinct advantage over Clinton. However, the cost of serviced land is an important variable which favours Clinton and would therefore tend to counteract the above advantage of Ashcroft/Cache Creek over Clinton. It is not clear what the relative influences of the other variables would be. Based upon available background information and professional judgement, the estimated distribution pattern for incremental population in Table 5.2.5 is used in all subsequent population projections for each of the communities.

TABLE 5.2.5
DISTRIBUTION OF INCREMENTAL POPULATION

<u>Community</u>	<u>Estimated Proportion of Incremental Population</u>
Ashcroft/Cache Creek	80%
Clinton	15%
Lillooet	0%
Rural Areas	5%

SOURCE: Strong Hall and Associates, Ltd., 1978

It is important to note that the foregoing estimates are used as a basis for population projections of the various communities, which in turn are used as a basis for calculating space demands for new development, servicing demands and municipal expenditure and revenue estimates. The reader is cautioned that the resultant predictions may be expressed in such a manner as to imply a degree of precision greater than what is actually possible, given the imprecise manner in which the estimates for the proportionate distribution patterns were derived.

The identification of community impacts requires a population distribution between Ashcroft and Cache Creek. Due to the proximity of these communities and the lack of any obvious settlement constraints in either of them, quantitative predictions of settlement distribution are difficult. In order to permit assessment of various population implications, however, two settlement scenarios were constructed for these villages. Scenario No. 1 assumes that 70% of the designated Ashcroft/Cache Creek population would settle in Ashcroft and 30% in Cache Creek. Scenario No. 2 reverses this distribution. The associated populations are shown in Table 5.2.6 and Figures 5.2.1 - 5.2.3, and are compared to population projections without the project.

TABLE 5.2.6

PROJECTED POPULATION OF COMMUNITIES
WITH AND WITHOUT HAT CREEK PROJECT

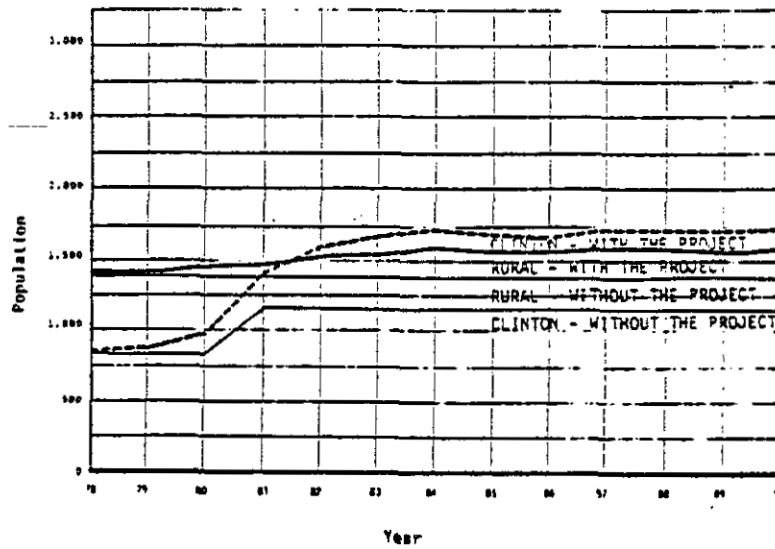
	CLINTON		ASHCROFT			CACHE CREEK			RURAL AREAS	
	Without Project	With Project	Without Project	With Project Scenario #1	With Project Scenario #2	Without Project	With Project Scenario #1	With Project Scenario #2	Without Project	With Project
1978	810	820	2,100	2,140	2,115	1,095	1,110	1,135	1,390	1,558
1979	810	855	2,455	2,615	2,520	1,205	1,270	1,365	1,390	1,874
1980	810	975	2,455	3,060	2,715	1,205	1,465	1,810	1,390	2,119
1981	1,155	1,420	2,455	3,435	2,875	1,205	1,625	2,165	1,390	3,130
1982	1,155	1,595	2,455	4,100	3,160	1,205	1,910	2,850	1,390	3,827
1983	1,155	1,670	2,455	4,385	3,285	1,205	2,035	3,135	1,390	3,877
1984	1,155	1,710	2,455	4,645	3,395	1,205	2,145	3,395	1,390	3,230
1985	1,155	1,670	2,685	4,610	3,510	1,355	2,180	3,280	1,390	2,627
1986	1,155	1,675	2,685	4,630	3,520	1,355	2,185	3,300	1,390	2,048
1987	1,155	1,730	2,860	5,010	3,780	1,475	2,395	3,625	1,390	1,882
1988	1,155	1,725	2,860	4,980	3,765	1,475	2,380	3,595	1,390	1,609
1989	1,155	1,730	2,860	5,015	3,780	1,475	2,395	3,630	1,390	1,612
1990	1,155	1,735	3,035	5,200	3,965	1,595	2,525	3,760	1,390	1,613

Scenario #1 - Split of Ashcroft/Cache Creek Incremental population - 70% Ashcroft, 30% Cache Creek

Scenario #2 - Split of Ashcroft/Cache Creek Incremental population - 30% Ashcroft, 70% Cache Creek

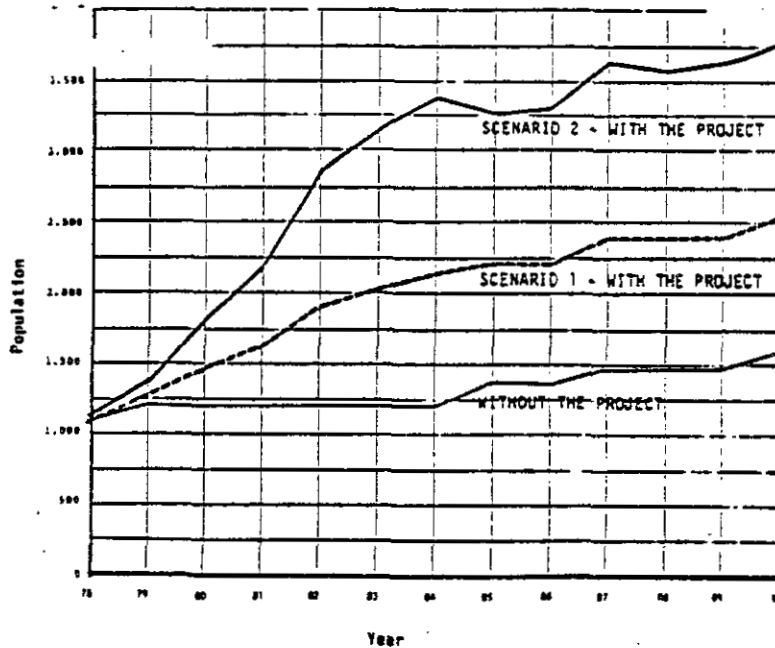
SOURCE: Strong Hall & Associates Ltd., 1978.

FIGURE 5.2.1
COMPARISON OF POPULATION PROJECTIONS FOR CLINTON AND RURAL AREAS



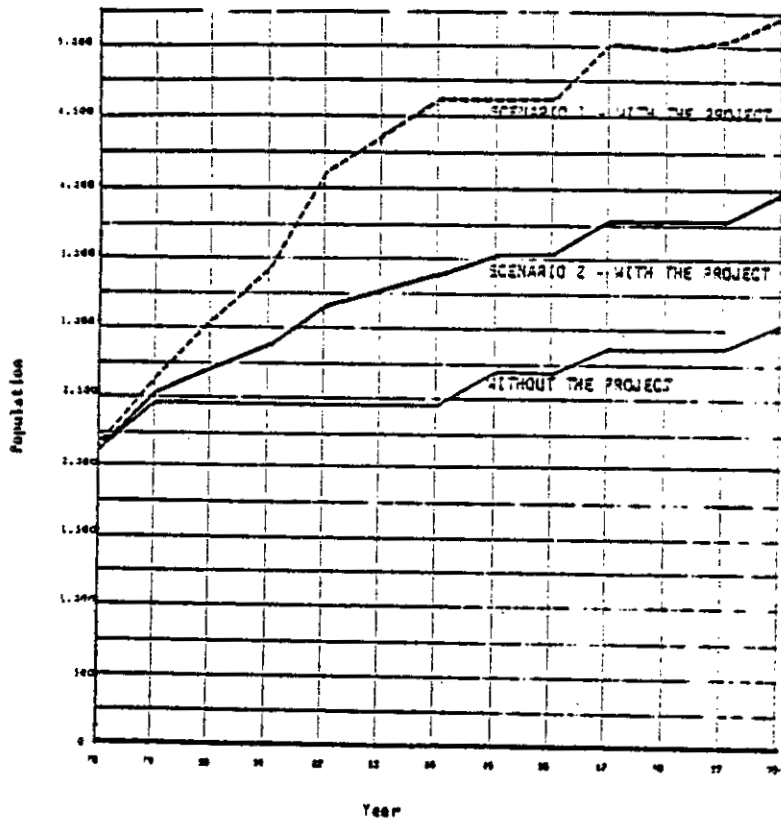
SOURCE: Cornerstone Planning Group Limited, 1978.

FIGURE 5.2.2
COMPARISON OF POPULATION PROJECTIONS FOR CACHE CREEK



SOURCE: Cornerstone Planning Group Limited, 1978.

FIGURE 5.2.3
COMPARISON OF POPULATION PROJECTIONS FOR ASHCROFT



SOURCE: Cornerstone Planning Group Limited, 1978.

d) Characteristics of Incremental Population

(i) Introduction

Another prerequisite to assessing the effects of population changes resulting from the Hat Creek Project is to analyse the characteristics of the incremental population locating in the various communities and rural areas. Table 5.2.6 established that projected populations for Ashcroft, Cache Creek, Clinton and the rural areas would be larger as a result of the project than under circumstances without the project.

However, estimates of the magnitude and distribution of the incremental population are not sufficient to identify all the consequences of project-induced community growth. The age, sex, marital status and family size characteristics of the incoming population may alter the composition of the local area population. These characteristics would be prime determinants of demands for housing, community facilities and social services.

The incremental population characterized in this section comprise mine and thermal plant operating workforces and their dependents, and all indirect or induced employees and their families who would come to the local study area as a result of job opportunities. Characteristics are described for both the construction and operating phases.

(ii) Incremental Population of Construction Phase

It is assumed that the characteristics of the population associated with the project's construction phase would be similar to those of populations involved in other B.C. Hydro projects. The Mica Creek Dam and the Seven Mile project were selected as representative projects on the basis of data availability and comparability to the workforce of the Hat Creek Project.

A. Construction Camp Residents

In recent years, B.C. Hydro construction projects have been viewed as relatively steady, long-term employment activities. As a result, a stable construction workforce has built up which moves from one project to the next throughout the Interior Region. For example, over two-thirds of the workers on the Seven Mile project had been employed on three or more previous Hydro projects*. Depending on other construction activities in the region, this experienced workforce may well form the core of the Hat Creek construction employees.

A continuing involvement with B.C. Hydro projects and a high degree of mobility are reflected in the age distribution of these workers. It is anticipated that the Hat Creek workforce would have age characteristics similar to those of the Mica Creek Dam workforce**. As such, approximately one-third of the construction workers would be aged 34 years or less, another third between 35 and 44 years, and slightly more than one-third aged 45 years or greater. Thus, the Hat Creek Project, like the Mica Creek Dam Project, would be expected to attract a workforce somewhat older than that often associated with other large-scale construction projects.

Of the total construction workforce, including those not living in the camps, approximately 75% are expected to be married while the remainder would be single, widowed, divorced or separated. This estimate falls within the ranges suggested by analysis of other B.C. Hydro projects ***. Most of the married workers would live in the construction camps, choosing to leave their families at home. Within the construction camps, then, the proportion of married to single workers will be approximately two to one.

-
- Labour Force Analysis, Seven Mile Project (1976), Kootenay Boundary Regional District, 1977.
 - ** Sample of Employee Records, Columbia Hydro Constructors.
 - *** Sample of Employee Records, Columbia Hydro Constructors and Labour Force Analysis of Seven Mile Project (1976), Kootenay Boundary Regional District, 1977.

B. Community and Rural Area Residents

As stated in Section 5.2 b), some employees of the project's construction phase would choose to live with their families in nearby communities or rural areas. The majority of those choosing non-camp residences would be engineering and supervisory staff. Although no comparative data were available, it is considered likely that this group would be somewhat older than the general construction workforce.

While 75% of the entire construction workforce is anticipated to be married, it is assumed that an even higher proportion of those workers residing in the communities would be married.

The comparative projects do not provide data on the average family size of all workers associated with the construction phase. The average family size of construction workers, using data from the Mica Creek Dam and Seven Mile Project, was 3.3*; this figure excluded supervisory personnel and single person families. Including these two groups, it is assumed that the average family size of the project's total construction personnel living outside the camp would be about 3.4.

Based on data from the Mica Creek Dam, it is likely that one-third of the married workers who bring their families to the local study area would have no children. About 44% of those families would have one or two children, while only about one-fifth are likely to have three or more children.**

* The average family size at Mica Creek Dam was 3.4 and it was 3.2 at the Seven Mile Project. Sample of Employee Records, Columbia Hydro Constructors and Labour Force Analysis, Seven Mile Project (1976), Kootenay Boundary Regional District, 1977.

** Sample of Employee Records, Columbia Hydro Constructors.

Expected characteristics of the Hat Creek Project construction personnel are summarized in Table 5.2.7

TABLE 5.2.7
ANTICIPATED CHARACTERISTICS OF INCREMENTAL POPULATION
ASSOCIATED WITH CONSTRUCTION PHASE OF
HAT CREEK PROJECT

	<u>Construction Camp Residents</u>	<u>Community and Rural Area Residents</u>
<u>Age:</u>		
16 - 34	31%	31%
35 - 44	32%	32%
44 +	37%	37%
<u>Marital Status:</u>		
Married	67%	90%
Other	33%	10%
<u>Family Size:</u>		
0 children	-	37%
1 - 2 children	-	44%
3 or more children	-	19%

SOURCE: Cornerstone Planning Group Ltd. based on Sample of Employee Records, Columbia Hydro Constructors and Labour Force Analysis of Seven Mile Project (1976), Kootenay Boundary Regional District, 1977.

(iii) Incremental Population of Operating Phase, Indirect and Induced Employment

The permanent incremental population stemming from the Hat Creek Project would be drawn from the operating workforces and their families, and the indirect and induced employees and their families. The characteristics of this group, treated in the aggregate,

provide an indication of the total incremental population expected to reside in the various study area communities.

The anticipated characteristics of this population group were drawn from three examples of single industry resource communities. The communities examined, Sparwood and Mackenzie, British Columbia, and Grande Cache, Alberta, were considered to have populations representative of the incremental populations associated with Hat Creek.

The incoming population associated with the Hat Creek Project is expected to be relatively young. In the comparative communities, between 54% and 61% of the population were under 25 years of age and approximately one-third were in the prime employment age, between 25 and 44 years. The percentage of the population 45 years or older varied between 6.3% and 16.9%.*

Since B.C. Hydro has no employee recruitment policy favouring older people, it is expected that the total incremental population coming to the Hat Creek area would have age characteristics similar to those above. The anticipated age distribution is 58% in ages 0 to 24 years, 32% in ages 25 to 34 years, and about 10% in the over 45 year age group.

In the three comparison communities, between 69% and 76% of the population aged 15 and over were married. Single people, and those separated, divorced or widowed represented between 24% and 31% of the same age group.** In the Hat Creek area, nearly 80% of the workforce at Bethlehem Copper and 72% at Lornex Mine were married. It is expected, therefore, that approximately 75% of the incremental population associated with the Hat Creek Project would be married, and the remaining 25% would be either single, divorced, widowed or separated.

* Statistics Canada, 1971 Census, and Cornerstone Planning Group Limited.

** Statistics Canada, 1971 Census, and Cornerstone Planning Group Limited.

While the trend in family size in Canada, over the past few years, has been towards smaller families, the number of people entering the family formation period has been increasing. In discussion with representatives from Statistics Canada, it was indicated that family size is likely to continue to diminish but there will be an overall increase in the actual proportion of families with children. This is expected to result in an absolute increase in the number of children by the mid-1980's.

The average family size in the comparative communities was between 3.8 and 3.9 persons*. The family size of the project associated incremental population is assumed to be 3.8 persons. It is expected that about 25% of the incoming families would have no children, 48% would have one or two children, and 27% would have three or more children**.

The overall characteristics are summarized in Table 5.2.8.

* Statistics Canada, 1971 Census and Cornerstone Planning Group Limited.

** Statistics Canada, 1971 Census and Cornerstone Planning Group Limited.

TABLE 5.2.8
ANTICIPATED CHARACTERISTICS OF INCREMENTAL POPULATION
ASSOCIATED WITH OPERATING PHASE, INDIRECT AND
INDUCED EMPLOYMENT OF HAT CREEK PROJECT

Community and Rural
Area Residents

Age:

0 - 24	58%
25 - 44	32%
45 +	10%

Marital Status:

Married	75%
Other	25%

Family Size:

0 children	25%
1 - 2 children	48%
3 or more children	27%

SOURCE: Statistics Canada, 1971 Census and Cornerstone Planning Group Limited, 1978.

e) A Comparison of Local Study Area Populations
With and Without the Project

To estimate possible changes in community composition, population projections have been completed to 1990 both with and without the project to show probable new population characteristics and distributions. Characteristics to be compared include age, marital status and family size.

The populations settling in any specific community may have slightly different characteristics than those of the general incremental populations, but these refinements have not been assessed. The incremental population distributed among the local study area communities is treated as a homogeneous group.

Comparisons between the community populations projected both with and without the project are based on 1990 estimates.

With the project, it is assumed that the population distributions and compositions would fluctuate throughout the construction and early operation phases. By 1990, however, it is assumed that the incoming populations associated with the project would be located on a relatively permanent basis throughout the local study area and the composition would be normalized.

In general, the incoming population associated with the Hat Creek Project would result in relatively small changes in the composition of the population in the various study area communities. The projected population with the project would result in a slightly younger population which would include a slight increase in the number of married residents, and a larger proportion of families with one or two children. A brief comparison of the projected

populations with and without the project for each community is presented below.

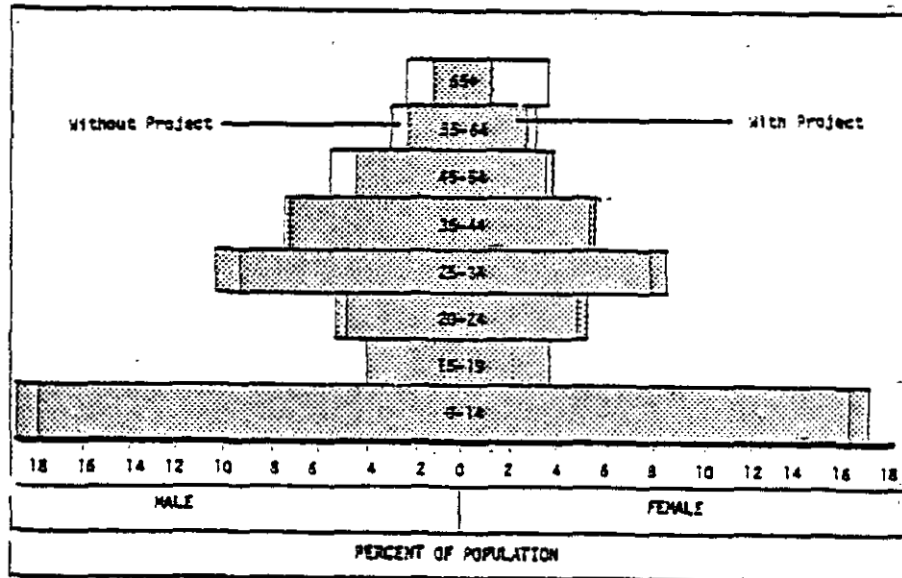
(i) Hat Creek Valley

The small number of ranching families in the Valley would be reduced somewhat in number. In addition, a large new single-status transitory construction workforce, numbering up to 2,400 workers at the employment peak, would occupy temporary camps in the Valley from 1978 to 1987. The characteristics of this workforce are described in Section 5.2 d) (ii).

(ii) Ashcroft

In Scenario 1, the project-related population would result in a change in the estimated without project composition of the community. The already large population of residents aged 44 years and younger would increase with a concurrent decrease in the proportion of older people, especially those aged 65 and older, as noted in Figure 5.2.4.

FIGURE 5.2.4
ASHCROFT AGE-SEX DISTRIBUTION
SCENARIO 1



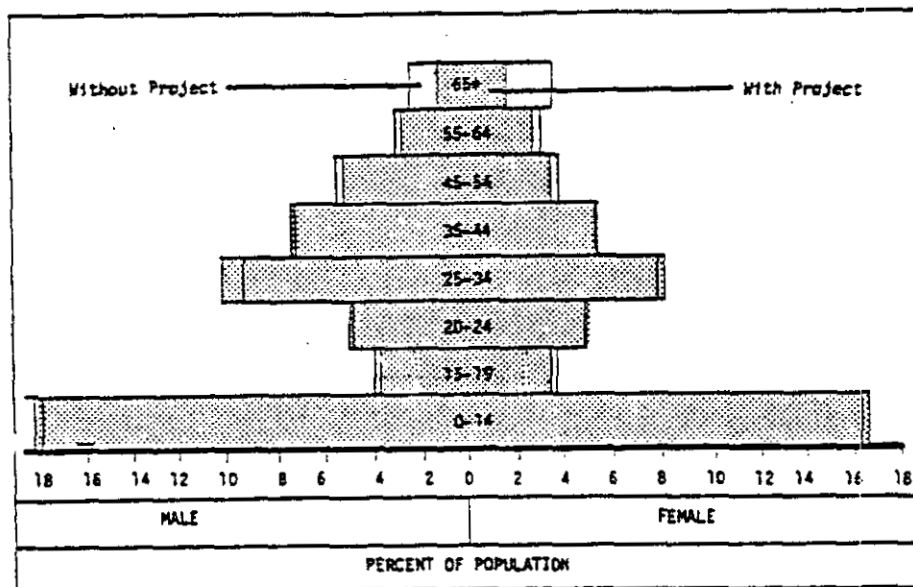
SOURCE: Cornerstone Planning Group Limited, 1978.

There would be a slight increase in the proportion of married residents living in the community due to the greater incidence of marriage among the incoming population. Furthermore, this incoming married population may create a slight increase in the average number of children per family, although the proportion of larger families may decrease. These proportions are outlined in Table 5.2.9.

As Scenario 2 represents a much smaller incoming population, the effects on the overall population characteristics are reduced in comparison to Scenario 1. However, the conclusions are basically the same. In general, the incoming population would result in a slightly younger age structure of Ashcroft residents. Again, there would be an increase in the proportion of the population under 44 years of age and a decrease in those aged 45 years and above. However, except for the 65+ category, these differences

are relatively small when compared to projected population without the project as illustrated in Figure 5.2.5.

FIGURE 5.2.5
ASHCROFT AGE-SEX DISTRIBUTION
SCENARIO 2



SOURCE: Cornerstone Planning Group Limited, 1978.

The increase in the proportion of married people is relatively insignificant as is evidenced by Table 5.2.9.

In summary, the impact of the smaller population increase on these specific aspects of Ashcroft's population would be less than those associated with Scenario 1.

TABLE 5.2.9
PROJECTED POPULATION CHARACTERISTICS
OF ASHCROFT RESIDENTS - 1990

<u>Characteristic</u>	<u>Without Project Population</u>	<u>Incoming Population</u>	<u>With Project Population</u>	
			<u>Scenario 1</u>	<u>Scenario 2</u>
Age Distribution:				
0 - 24	51%	58%	54%	52%
25 - 44	29	32	30	30
45 +	20	10	16	18
Marital Status (15 & Over):				
Married	70	75	72	71
Other	30	25	28	29
Children Per Family:				
0	28	25	27	27
1 - 2	43	48	45	45
3 +	30	27	28	28

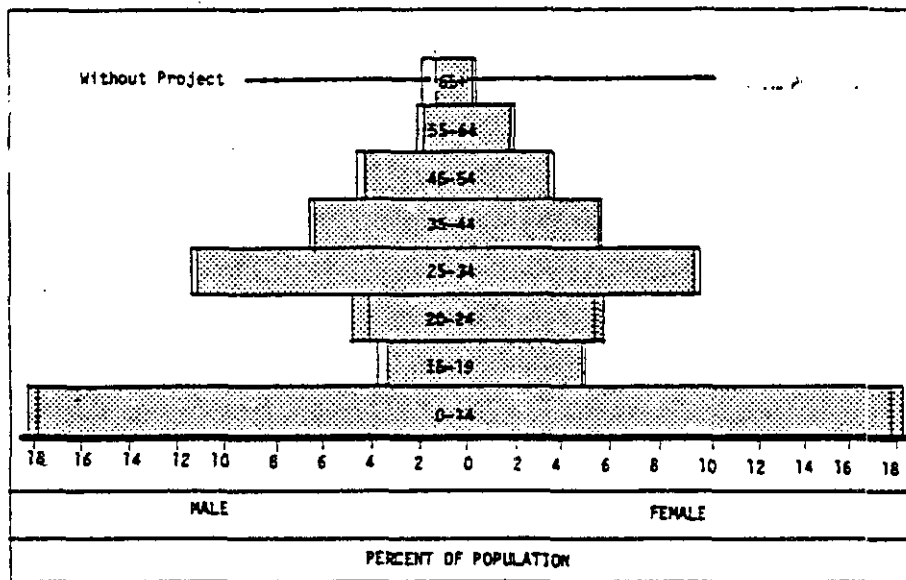
SOURCE: Statistics Canada, 1971 Census, and
Cornerstone Planning Group Limited, 1978.

(iii) Cache Creek

Scenario 1 would see a 58% increase in the Cache Creek population over the period of construction and initial operating phases of the Hat Creek Project. While this represents a substantial population increase, the age composition of the town would differ only slightly from that expected without the project. The proportion of children would increase slightly, as would the 20 to 24-year age group, while the proportion of people in the older age groups would diminish slightly. Cache Creek would continue to have a population biased strongly towards the younger ages, corresponding closely to the project-related population age structure, as illustrated in Figure 5.2.6.

FIGURE 5.2.6

CACHE CREEK AGE-SEX DISTRIBUTION
SCENARIO 1



SOURCE: Cornerstone Planning Group Limited, 1978.

The proportion of married people would increase slightly, resulting from the fact that Cache Creek, without the project, would have the lowest proportion of married residents in the study area. This factor would be expected due to the transient nature of many residents and the economic base of the town.

Family size proportions would change slightly as the project-related population would consist of a larger proportion of families with one or two children and smaller proportions of childless families or families with three or more children. These characteristics are further detailed in Table 5.2.10

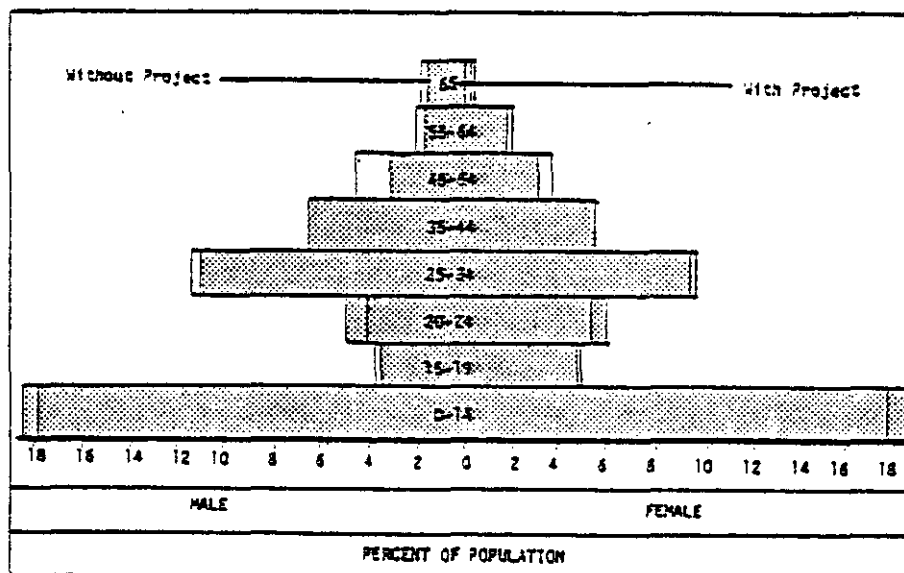
Scenario 2 projects a 136% increase in the community's population. As a result of this large increase on a relatively small base population, the characteristics of the incoming population would produce a greater change in the composition of the town than would Scenario 1. The already youthful age of the community would be further accentuated with a notable increase in the proportion of people 24 years of age or less. This will be accompanied by a decrease in the proportion of residents 45 years or older, as illustrated in Figure 5.2.7.

TABLE 5.2.10
PROJECTED POPULATION CHARACTERISTICS
OF CACHE CREEK RESIDENTS - 1990

<u>Characteristic</u>	<u>Without Project Population</u>	<u>Incoming Population</u>	<u>With Project Population</u>	
			<u>Scenario 1</u>	<u>Scenario 2</u>
Age Distribution:				
0 - 24	54%	58%	55%	56%
25 - 44	32	32	32	32
45 +	14	10	13	12
Marital Status (15 & Over):				
Married	66	75	69	71
Other	34	25	31	29
Children Per Family:				
0	27	25	27	26
1 - 2	40	48	43	45
3 +	33	27	30	29

SOURCE: Statistics Canada, 1971 Census, and
 Cornerstone Planning Group Limited, 1978.

FIGURE 5.2.7
CACHE CREEK AGE-SEX DISTRIBUTION
SCENARIO 2



SOURCE: Cornerstone Planning Group Limited, 1978.

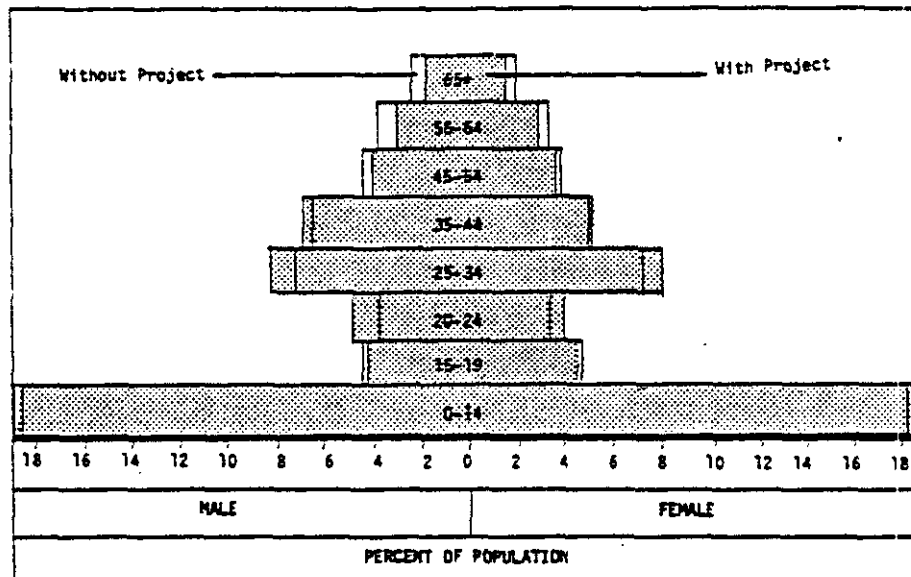
The proportion of married residents would be greater than that expected without the project. This would result in Cache Creek having similar marital status characteristics to the other study area communities. There would be a decrease in the proportion of couples having large families due to the lower proportion of families with three or more children.

In summary, the characteristics of projected Cache Creek residents would not vary greatly with or without the project. Greater differences would occur with Scenario 2 than Scenario 1, however, but the direction of these changes would be the same. In general, the project-related population would accentuate the existing youthful character of the residents, and the proportion of married residents and those with small-sized families also would increase.

(iv) Clinton

While Clinton would experience the smallest absolute increase in population of the three communities as a result of the Hat Creek Project, this increase would represent a 50% growth in its population by 1990. The project-related population would alter the projected age structure of the community without the project. The proportion of people under 44 years would increase and, in particular, there would be increases in the 20 to 34-year age group. There would be a slight decrease in proportion of residents in the older age categories. The projected age groups are shown in Figure 5.2.8 and Table 5.2.11.

FIGURE 5.2.8
CLINTON AGE-SEX DISTRIBUTION



SOURCE: Cornerstone Planning Group Limited, 1978.

TABLE 5.2.11

PROJECTED POPULATION CHARACTERISTICS
OF CLINTON RESIDENTS - 1990

<u>Characteristic</u>	<u>Without Project Population</u>	<u>Incoming Population</u>	<u>With Project Population</u>
Age Distribution			
0 - 24	52%	58%	54%
24 - 44	27	32	29
45+	21	10	17
Marital Status (15 years and over)			
Married	73	75	74
Other	27	25	26
Children Per Family			
0	29	25	28
1 - 2	30	48	36
3 or more	41	27	36

SOURCE: Statistics Canada, 1971 Census, and
Cornerstone Planning Group Limited., 1978.

The marital status of the residents in the community would remain basically constant. The existing and projected proportion of married to single-status persons is most similar to that of the project-related population. Therefore, there would be no changes in the proportion of married residents as large as those expected in either Ashcroft or Cache Creek.

As noted previously, Clinton has a higher proportion of families with three or more children than the other study area communities. Given the estimated family sizes of the project-relation population,

the family size characteristics of Clinton would be altered from those expected without the project. There would be an increase in the number of families with one or two children and a decrease in the proportion with three or more children. However, Clinton would still have a larger average family size than either of the other local communities.

5.3 INCOME

a) Introduction

Large resource developments or industrial projects typically generate increased income in the regional and local economies within the site's vicinity. The changes in regional or local income levels caused by a project depend on a number of variables. Both the magnitude and distribution of these income changes reflect the level of local project expenditures and the behaviour patterns of a wide range of individuals.

In a general sense, income is injected into a region by direct project expenditures on regional labour, materials and supplies purchased from regional sources. In addition, the initial injection generates further income within the region as recipients of this income re-spend it on other consumer goods or services. That is, the total income effect of direct project expenditures is obtained through the multiplication of direct income by successive rounds of regional spending. The total gross regional income generated depends on the size of the initial injection and the spending stream leakages from the region.*

The net increase in regional income must account for the losses from opportunities foregone in obtaining project-generated incomes. Government transfer payments given up by regional residents in order to obtain project employment and income would have to be subtracted from project-generated incomes in order to derive the net

* Expenditure leakages refer to funds which are withdrawn from the spending stream within the region. They would include expenditures by regional recipients made outside the region, extra-regional taxes and savings. These leakages are implicit in determination of size of the regional income multiplier.

gain in regional income. Job switching, i.e., changing jobs between regions or within a region, also has important implications in determining net changes in regional income. Regional income would increase if a worker with dependents resident in the region of the project, but temporarily employed in a different region, manages to get direct project employment. This would lead to a recapture of only the amount of wages previously spent outside the project's region. However, the regional income increase would be larger if a worker with dependents from another region moved to the project's region as a result of a new job; the net regional income gain would be that total amount of income received by the worker. Often, then, the maximization of regional project employment might not maximize regional income gains.*

Job switching within the region will lead to regional income gains if the loss of income from the original job is less than the income obtained from the new job. The net regional income gain would represent the difference between the two levels. If the original job is subsequently filled by an individual who was not previously a regional income earner, then the net regional income gain would be the full amount of the income generated by the new position on the project.

The development of a project can also result in regional income reductions. Individuals dependent upon income generating opportunities precluded or reduced as a direct or indirect result of a project would incur an income loss. For example, if regional agricultural production declines due to a project, this decline represents a regional income loss which would have to be netted from the project's regional income gains.

* This situation is typical of construction industry employment, but is generally not applicable to longer-term operating employment.

In addition to the change in total regional income, a development project will possibly alter the distribution of income in the region. If most of the income increment accrues to individuals who are already in the upper income brackets, then it might be concluded that the additional income does little to enhance regional income equity. On the other hand, if income from the project enhances the relative position of the lower income groups, it might be considered more desirable as a development instrument. Finally, if the incremental income accrues largely to "outsiders", the project might be viewed less favourably than alternative projects, which result in a higher proportion of the incremental income accruing to regional residents.

In addition to the direct distribution of incremental income, project effects on commodity prices can affect indirectly the relative purchasing power of individuals in the region and effectively result in a redistribution of regional income.

b) Estimated Net Income Benefits Generated
by the Hat Creek Project

It is evident from the above that an accurate representation of the new income generation resulting from the Hat Creek Project relies on detailed knowledge of labour market dynamics. Unfortunately, the data required to develop the desirable labour response functions are not possible to obtain. Judgement and a set of assumptions are, therefore, the only tools available to estimate the results of this process.

The Hat Creek Project would result in an expansion in regional and local area income. To facilitate the estimation of these gains, total income is divided into three types: direct, indirect and induced.

Direct income is defined as wages and salaries paid directly to the project workforce. Indirect income results from project purchases of regional materials and supplies. It represents the increase in

regional value added accruing to regional enterprises from the provision of these materials and supplies. Induced income is defined as the increase in regional value added resulting from the re-spending of direct and indirect income by its recipients on consumer goods and services, including public services.

(i) Construction Phase

A. Direct Net Income

The estimation of direct net income begins with the wages and salaries paid to the project's workforce. Average hourly wages and associated annual earnings for construction workers are shown by union groupings in Table 5.3.1.**

* Regional value added represents the sum of wages and salaries, interest, rents and profits retained in the region.

** Engineering and supervisory personnel are assumed to earn an average of \$25,000 per year.

TABLE 5.3.1

APPROXIMATE CONSTRUCTION UNION WAGE RATES
AND ESTIMATED ANNUAL EARNINGS

	<u>Approximate Hourly Wage* Rates, 1976</u>	<u>Estimated Annual Earnings</u>
Operating Engineers, Carpenters, Iron Workers, Machinists, Mill- wrights, Boilermakers, Painters	\$10.60	\$20,700
Tunnel, Rock Labourers, Teamsters, Office and Technical Staff	\$ 9.55	\$18,600
Culinary Workers	\$ 7.75	\$15,100
Plumbers, Pipefitters, Electrical Workers	\$11.00	\$21,500
Heat and Frost Workers, Insulators, Sheet Metal Workers, Bricklayers, Cement Masons and Finishers	\$10.10	\$19,700

* These rates have been selected as general averages from 1975 Columbia Hydro Constructors contracts and updated to 1976 by extending May to November 1975 increases over 1976.

SOURCE: Interpolated from Columbia Hydro Constructors contracts by Strong Hall & Associates Ltd., 1978.

Annual income estimates are derived assuming a 37.5-hour work week for 52 weeks per year.** This work schedule reflects current construction plans and does not include potential overtime earnings. Should the project get behind schedule during its construction, overtime earnings could significantly increase these annual earnings estimates.

** B.C. Hydro and Power Authority, personal communication, July 1977

Direct net regional and local income estimates by recipient category are shown for the construction phase in Table 5.3.2. The total direct net income gains are estimated at \$239 million, (1976 dollars) throughout the construction phase. About 55% of the total would accrue to regional residents. In fact, regional residents would receive substantially greater wages and salaries from Hat Creek than is shown in the table (an additional \$227 million); however, this gross figure has been netted to account for regional income opportunities foregone to obtain those wages and salaries.

Income opportunities foregone include Unemployment Insurance Commission benefits as well as job switching income differentials. At the current time, about 25-30% of the regional construction workforce is unemployed. While this unemployment should decline somewhat due to other construction projects expected to occur in the region, a substantial number of the regional construction labour force would still be unemployed without the Hat Creek Project. This group is considered likely to account for 50% of the regional construction workers participating on the Hat Creek Project. The other 50% of the regional participants on the project are assumed to switch from extra-regional jobs.*

Community resident in-migrants shown in Table 5.3.2, are defined as workers from outside the study or from other centres in the region moving into the settlement communities with their families during the construction phase. This group is assumed to spend

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- To determine net benefits associated with formerly unemployed resident workers, their average gross income of \$22,100 was reduced by \$4,800, the value of annual UIC benefits foregone. For regional switching from employment in other regions, net income benefits equal the proportion of their income that they formerly spent in the other region. This has been assumed at 10% of their normal income.

their income in a similar manner to existing community residents. Their income can be expected to account for 40% of the direct net regional income total.

TABLE 5:3.2
TOTAL DIRECT NET INCOME GAINS, CONSTRUCTION PHASE
HAT CREEK REGION AND LOCAL STUDY AREA
(\$Million 1976)

	<u>Residents</u>	<u>Community Residents In-Migrants*</u>	<u>Camp Residents In-Migrants**</u>	<u>Total Direct Income Gain</u>
Local Study Area	13.0	154.0	22.4	189.4
Hat Creek Region	132.6	96.0	10.4	239.0

* Community resident in-migrant income is higher in the local study area than in the overall region because some local area in-migrants would come from other regional centres.

** Camp resident in-migrant income only includes 10% of their total income which, it is assumed, would be spent in the region. The spending of formerly unemployed regional residents from outside the local study area is not included for the Hat Creek region, but is included in the local study area. Their total net income is included in the regional resident column.

SOURCE : Strong Hail & Associates Ltd., 1978.

Camp resident in-migrants are expected to spend about 10% of their earnings in the region. Only this percentage of their total earnings has been included in the direct regional income estimates, and it is assumed that the remainder is transferred out of the region to their region of residence. The local study area would obtain about 80% of the direct regional income gains, primarily in the form of in-migrant resident income and camp resident spending. Existing local area residents would obtain about 5% of the total direct regional income benefits when adjustments for lost UIC benefits and job switching are accounted for.*

B. Indirect and Induced Income

Indirect and induced regional income estimates for the construction phase are shown in Table 5.3.3.

TABLE 5.3.3

TOTAL NET REGIONAL INCOME GAINS, CONSTRUCTION
PHASE, HAT CREEK REGION AND LOCAL STUDY AREA
 (\$Million, 1976)

	<u>Direct</u> <u>Income</u>	<u>Indirect</u> <u>Income</u>	<u>Induced</u> <u>Income</u>	<u>Total</u> <u>Income</u>
Local Study Area	189.4	-	46.9	236.3
Hat Creek Region	239.0	4.8	122.1	365.9

SOURCE : Strong Hall & Associates Ltd., 1978.

* These adjustments utilized the same UIC and job switching assumptions previously described for the total region.

Indirect income would be the regional value added generated by project expenditures for catering supplies, small tools and consumables and miscellaneous equipment and materials produced in the region or supplied by regional distributors. Most of this income would accrue to Kamloops, the only regional community able to supply these products. However, small amounts may be earned by one or more sawmills located throughout the region.

The total project expenditures on regionally supplied goods and services during the construction phase are estimated at about \$140 million. However, the regional value added associated with these sales is expected to be only about \$4.8 million.* Little indirect income is expected to be earned in the local study area.

The re-spending by regional recipients of direct and indirect income would induce further income gains throughout the region. This income gain has been estimated by using an induced income multiplier of 1.5 for the total region and 1.25 for the local study area.**

Induced regional income is expected to total about \$122 million throughout the construction phase, \$46.9 million of which would benefit the local study area. In the order of 30% of this income is expected to accrue to local residents, with the other 70% going to in-migrating residents.

Total regional income benefits, the sum of direct, indirect and induced income, are estimated at \$365.9 million from construction activities. The local study area would obtain about \$236 million of this total.

* Regional value added in the wholesale sector is estimated to approximate 3.5% of gross sales.

** The methodology for estimating these multipliers is described in Strong Hall & Associates Ltd., "Inventory and Projections of Regional Social and Economic Conditions", Appendix B, Volume 1, B.C. Hydro and Power Authority, 1978.

(ii) Operating Phase

The operating phase of the Hat Creek Project would also generate a substantial increase in regional and local income. The approach to determining these income benefits is similar to that used for the construction phase.*

A. Direct Net Income

As with the construction phase, the primary determinant of direct income benefits are the wages and salaries of the project. The expected wage and salary structure for the operating phase of the mine and thermal plant is shown in Table 5.3.4.

* The only major difference is that job switching by regional residents from jobs held outside the region is not considered relevant for operating jobs. The effects of switching within the region and local area, however, have been included.

TABLE 5.3.4

ESTIMATED ANNUAL EARNINGS
MINE AND THERMAL PLANT EMPLOYEES
(OPERATING PHASE)

<u>MINE</u>	<u>Number of Positions in 1988</u>	<u>Average Annual Earnings</u>
<u>Mine Operating</u>		
Equipment Operators	276	\$15,900
Maintenance	194	\$17,000
Labourers	67	\$14,300
<u>Office & Technical</u>		
Secretarial, Labour and Technical Assistants	30	\$10,100
Technical	26	\$14,100
Managerial	42	\$22,500
Weighted Average Earnings, Mine	-	<u>\$16,200</u>
<u>THERMAL PLANT</u>		
Supervisory and Professional	26	\$27,700
Technical, Mechanical, Electrical and Foremen	121	\$21,400
Technical Assistants, Helpers, Labourers	93	\$17,900
Office Clerical	7	\$11,900
Weighted Average Earnings, Thermal Plant	-	<u>\$20,500</u>

SOURCE: B.C. Hydro and Power Authority, "Preliminary Report, Hat Creek Staffing" 1977
 B.C. Hydro and Power Authority, "Hat Creek Mining Project, Engineering Description for Environmental Report" August, 1977

Direct gross income benefits have been determined on an annual basis by applying weighted average wages and salaries for the mine and thermal plant to total expected resident and in-migrant employees.

Two adjustments were made to gross income in order to estimate net income. Firstly, regional employment estimates from Table 5.1.8 were adjusted downward to reflect the effects of job switching. Secondly, gross income to assumed formerly unemployed residents was adjusted downward to account for UIC benefits foregone.

The estimated direct increase in net regional and local income as a result of the operating phase of the Hat Creek Project is shown in Table 5.3.5.

TABLE 5.3.5
TOTAL DIRECT NET INCOME GAINS, OPERATING
PHASE, HAT CREEK REGION AND LOCAL STUDY AREA
(\$ Million 1976)

	<u>Residents</u>	<u>In-Migrants</u>	<u>Total</u>
Local Study Area	42.9	643.2	686.1
Hat Creek Region	101.9	581.5	683.4

* The lower regional income total reflects the fact that UIC income has been deducted from the gross income of all regional residents. However, since regional residents from outside the local area would be in-migrating to the local area, their total gross income would be considered a gain to the local area.

SOURCE : Strong Hall & Associates Ltd., 1978.

The overall study region would receive a direct income gain of about \$683.4 million during the 35-year life of the project. Net benefits in the hands of regional residents would likely be about 15% of the totals. The remainder would accrue to in-migrants.

The local study area would receive slightly greater direct net regional income benefits than the region as a whole. Table 5.3.5 indicates that an incremental \$686.1 million in net income would be generated in the local area, compared to \$683.4 million for the region as a whole. This situation occurs through the process of deducting UIC income losses from unemployed regional and local residents working on the Hat Creek Project. Unemployed residents of Kamloops, Merrit and other regional communities outside the local study area are expected to work on the operating phase of the project. In accounting the net regional income implications of this employment, foregone UIC benefits have to be deducted from the gross value of wages and salaries. Therefore, the net income benefit is lower than the gross income benefit for the region as a whole. However, since it is assumed that these workers would relocate to residences within the local study area, rather than commuting over 60 miles every day, the full amount of their wages and salaries is counted as a net benefit to the local study area. This area distribution effect is illustrative of the implications of altering the geographic perspective in net income estimation.

B. Indirect and Induced Income

The operating phase would also result in indirect and induced expansions in regional and local income. Table 5.3.6 summarizes these expected increases.

TABLE 5.3.6
TOTAL NET INCOME GAINS, OPERATING PHASE
HAT CREEK REGION AND LOCAL STUDY AREA
(\$ Million 1976)

	<u>Direct Income</u>	<u>Indirect Income</u>	<u>Induced Income</u>	<u>Total Income</u>
Local Study Area	\$686.1	-	148.8	834.9
Hat Creek Region	683.4	23.6	353.5	1060.5

SOURCE : Strong Hall & Associates Ltd.

As with the construction phase, indirect income gains are likely to occur primarily in the Kamloops area. Induced income gains reflect both the locations experiencing direct and indirect expansions as well as regional shopping patterns. Most of the induced regional income over and above that generated in the local study area will accrue to Kamloops.

(iii) Summary of Total Net Income Gains

Total net income gains expected to accrue to the region and local area are shown in Table 5.3.7. In summary, the Hat Creek Project would introduce considerable income expansion throughout the study region and the local area. The combined construction and operation of the project would contribute about \$1,426.4 million in '976 terms to the region, including \$1,071.1 million to the local study area over the life of the project.

TABLE 5.3.7
TOTAL NET INCOME GAINS, CONSTRUCTION AND
OPERATING PHASES, HAT CREEK REGION AND LOCAL STUDY AREA
(\$Million 1976)

	<u>Direct</u> <u>Income</u>	<u>Indirect</u> <u>Income</u>	<u>Induced</u> <u>Income</u>	<u>Total</u> <u>Income</u>
Local Study Area	875.5	-	195.7	1071.2
Hat Creek Region	922.4	28.4	475.6	1426.4

SOURCE : Strong Hail & Associates Ltd.

Without the Hat Creek Project, income per capita in the local study area is expected to reach a level of \$6,205 (constant \$1976) in 1990.* Income per capita levels would be enhanced with the project, reaching a level of \$6,320 per capita in 1990.

c) Regional and Local Income Distribution
Implications of the Hat Creek Project

The Hat Creek Project might be expected to alter the geographical distribution of income in the study region. The western part of the region, centred at Ashcroft and Cache Creek, would expand relatively its contribution to overall regional income levels and growth. Kamloops and Merrit would lose some UIC income as members of its unemployed relocate nearer the project. Kamloops would receive some compensatory income through project purchases and through some of the consumer spending of the project's workforce. Merritt, however, would likely obtain little compensatory benefit.

Within the local area, Ashcroft and Cache Creek could be expected to obtain the greatest share of the total income benefits. Both direct wage income and consumer spending would be centred in these communities. In fact, it is likely that the commercial services of these centres

• See Tables 3.1.11 and 3.3.9

would expand in a manner which would attract additional consumer expenditures from Clinton. This alteration would likely expand the trading area of these communities, providing them with further growth impetus.

From an individual point of view, the construction and early operating phases of the project would increase the income of the region's construction workforce, both union and non-union. Union workers would participate directly on the project while non-union workers would be involved in residential and commercial construction to accommodate the associated population growth. Both groups would benefit from reduced unemployment, and, therefore, higher earnings.

Owners of commercial establishments, particularly motels, hotels, restaurants and bars would generally benefit during the construction phase through higher usage rates, particularly during the fall and winter seasons. Reduced seasonality of income would also be expected, resulting in overall higher incomes than would be expected without the Hat Creek Project.

Local landowners would benefit in the form of higher capital gains on the sale of their land. It is expected that some land price increases would occur in the local areas, both as a result of speculation and temporary imbalances between the demand and supply of land. These capital gains, however, are expected to be moderate.

Women would share in the income benefits of the project, but proportionately no more than they would share in regional income growth without the project. There is nothing inherent in the project's labour demands that would unusually favour the employment of women. There is, however, a possibility that the reduced seasonality of commercial trade and service employment in the local area would provide relatively more year-round employment in positions traditionally held by women.

Generally, it could be expected that the distribution of personal income throughout the local area would improve as a result of the project. Although rigorous statistical analysis is not possible, a general assessment of the existing income distribution, in conjunction with the income potential of in-migrants, suggests that the total regional income would be more widely held with the Hat Creek Project than without it.

d) Effects of the Project on Local Prices

The project could be expected to affect some commodity prices at particular stages of its development.

Land prices would appear to have already experienced some effects of speculative buying in Ashcroft and Cache Creek as a result of pre-construction activities. However, the market appears to be stable at the present time and is likely to remain so until a decision to proceed with licencing is announced. Further price pressures could be expected as a result of rapid growth in the demand for land during the early years of project construction.

Although price increases would likely occur in land, both rural and municipal, it is expected that increases would be moderate. The main reasons for this conclusion rest in the number of settlement communities available within commuting distance of the project, the fairly wide distribution of serviceable land ownership in these communities, and the physical availability of land. The ability of municipalities to administer rapid development is also important to the final determination of land price changes. Although all the municipal governments are preparing community plans, and the Thompson-Nicola Regional District (TNRD) is preparing a regional plan, commencement of the project as currently scheduled would likely pressure these administrations during the early stages of construction before they are adequately prepared.*

* This aspect is discussed further in Section 5.4 and 5.6.

Delays in the provision of serviced land during this period would likely put undue pressure on community land prices.

The greatest land price increases might be expected in lakeshore properties of short supply in the vicinity of the project. Pavilion and Loon Lake property would likely experience the greatest pressure in this respect.

Price pressures would also be expected in temporary accommodation (hotels, motels, rental apartments) and restaurants, as demand by project associated staff, consultants and construction workers would likely be insensitive to price changes.

General consumer prices are not expected to be significantly affected by the project. Kamloops has traditionally provided a shopping alternative to consumers in the local area and, in this respect, acts as a buffer to unusual price increases in consumer goods in the local area. It is expected that this buffer would be effective during the early construction years, when price pressures would be greatest.

5.4 HOUSING

a) Introduction

In order to assess the effect of the Hat Creek Project on housing supply and demand, a separate housing market analysis has been carried out for the municipalities of Ashcroft, Cache Creek and Clinton. For each community, an evaluation of demand and supply factors is included in the market analysis. For comparative purposes, the demand and supply factors, both with and without the project, are taken into consideration.

Demand for new housing is the estimated quantity and mix of dwelling units required to meet the needs of new households. Quantity is defined as the number of dwelling units required to accommodate the housing demand. Housing mix is defined as the proportion of various housing types, such as single-family dwellings, duplexes, mobile homes and apartments, needed to accommodate the housing demand.

The primary determinant of the quantity of dwelling units demanded is the number of incremental household units expected to locate in each of the municipalities. The number of household units are, in turn, a function of population increases in each municipality and average household size. Projected population increases are derived from data presented in Section 5.2.

The proportionate mix of various housing types demanded is dependent upon a number of variables. One is the ability to pay for housing which is, in turn, dependent on household incomes and the relative costs of the various housing types. Another factor is the age and size of the households requiring housing units. A third factor is lifestyle preferences of the households and the ability of each housing type to meet these needs.

The supply of housing depends upon the existing housing stock and three main factors associated with the provision of new housing units. The first is the availability of developable land within the local areas. The second includes both municipal and other relevant land development policies. The last factor to be considered is the output capabilities of the local or regional construction industry.

In Ashcroft and Cache Creek, two projections of housing demand have been prepared for each municipality, one for each of the two scenarios in which the estimated population increases for the combined communities are split between them as described in Section 5.2 c). For the purposes of translating projected population increases into households, an average household size of 3.4 is used.

b) Ashcroft

(i) Demand

A. Quantity of Housing

In estimating the number of households locating in Ashcroft for each scenario, the projected population increases were translated in a number of projected households. The resultant estimates on an annual basis are outlined in Table 5.4.1. It is assumed that each household would require a new housing unit.

TABLE 5.4.1
VILLAGE OF ASHCROFT
PROJECTED INCREASES IN NUMBERS OF HOUSEHOLDS
1978 - 1990

Year	<u>Without Project</u>		<u>With Project-Scenario 1*</u>		<u>With Project-Scenario 2*</u>	
	<u>Projected Population</u>	<u>Annual Incremental Households**</u>	<u>Projected Population</u>	<u>Annual Incremental Households**</u>	<u>Projected Population</u>	<u>Annual Increment Households</u>
1978	2,100	-	2,140	-	2,115	-
1979	2,455	105	2,615	140	2,520	120
1980	2,455	-	3,060	130	2,715	55
1981	2,455	-	3,435	110	2,875	45
1982	2,455	-	4,100	195	3,160	85
1983	2,455	-	4,385	85	3,285	35
1984	2,455	-	4,645	75	3,395	35
1985	2,685	70	4,610	-	3,510	35
1986	2,685	-	4,630	-	3,515	-
1987	2,860	50	5,010	110	3,780	80
1988	2,860	-	4,980	-	3,765	-
1989	2,860	-	5,015	-	3,780	-
1990	3,035	50	5,200	55	3,965	55
	TOTAL	275		900		545

* Split of Ashcroft/Cache Creek Incremental population:
 Scenario 1 - 70% Ashcroft/30% Cache Creek assumed
 Scenario 2 - 30% Ashcroft/70% Cache Creek assumed

See Section 5.2 for settlement distribution rationale

** An average household size of 3.4 persons is assumed

SOURCE: Urban Systems Ltd.

Of the estimated increase of 900 households under Scenario 1, approximately 625 households would be attributable to the Hat Creek Project. It should be noted that the influx of households attributable to the project would be concentrated in the time period from 1978 to 1984. In 1984, it is projected that the incremental population level attributable to the Hat Creek Project would reach a peak of 2,190. The project-induced population is then expected to decline slightly by 1986, followed by an increase in 1988 and a subsequent rise to 2,165 by 1990. The implication of this temporary drop in population between 1984 and 1986 is that if the projected offsetting population increase attributable to other projects (e.g. Highland Valley developments) does not in fact take place, the resultant population decrease would contribute to a temporary excess capacity situation in the housing market for a period of approximately two to four years.

Following 1990, increases attributable to the Hat Creek Project are expected to be very modest, with an increase of approximately 15 households.

Using the same method of calculation for Scenario 2, there would be an estimated increase of 545 households. Comparing this increase to the projected population without the project, approximately 270 households would be attributable to the Hat Creek Project. Similar to Scenario 1, the influx in households generated by the project is concentrated in the time period from 1978 to 1984. Unlike Scenario 1, however, a temporary decline in population between 1984 and 1986 is not expected; the incremental population attributable to the project increases between 1978 and 1990 without any major declines. Project-induced household increases beyond 1990 are expected to be similar to those in Scenario 1.

B. Housing Mix

As introduced in Section 5.4 a), demand for housing of various types will likely be dependent on a number of variables, including

ability to pay, demographic characteristics, and lifestyle preferences. In order to estimate the quantity of each type of housing unit that would be demanded, it is necessary to match these factors against the total quantity demanded. These variables are discussed briefly below.

The ability to pay for housing incorporates a number of criteria, but the two main factors are considered to be the level of household income and the relative cost of various housing types. Other factors, such as credit rating, assets, interest rates and debt load, are part of the overall ability to pay for housing, but they are such personal and unique variables they cannot be assessed in a practical manner.

Estimated incomes of incremental households, based on employment forecasts, are expected to be distributed as shown in Table 5.4.2. Projected income distributions can be translated into ability to pay for housing by applying a housing debt service ratio which specifies the maximum proportion of household income which can be allocated for housing mortgage repayments as well as property taxes.

TABLE 5.4.2
VILLAGE OF ASHCROFT:
PROJECTED INCOME DISTRIBUTION OF NEW HOUSEHOLDS

<u>Household Income Range</u> <u>Constant 1976 Dollars</u>	<u>Proportionate Distribution (%)</u>		
	<u>1980</u>	<u>1984</u>	<u>1990</u>
\$ 6,000 - 11,999	10	10	5
12,000 - 15,999	25	20	30
16,000 - 19,999	20	25	30
20,000 - 24,999	35	35	25
25,000 +	10	10	10

SOURCE: Strong Hall and Associates Ltd., 1978.

For normal mortgage lending, the maximum debt service ratio is 30% of gross income. The Assisted Home Ownership Program (AHOP), sponsored by the Central Mortgage and Housing Corporation, provides assistance to low income families to reduce the debt service ratio to approximately 25% of gross income. Under AHOP, assistance by means of an interest reduction loan can also be provided to guarantee a mortgage interest rate of 8%. Average household incomes of families receiving interest reduction loans range between \$12,000 and \$14,000 per year. For families with lower incomes ranging from about \$10,000 down as low as \$6,400 per year, additional subsidies are available to ensure that the debt servicing ratio does not exceed 25%. The maximum amount of subsidy for eligible households is \$750 per year from CMHC, and an additional \$750 per year from the province.

To be eligible for AHOP assistance, the maximum purchase price of the dwelling unit is \$40,000, and the maximum mortgage amount is \$38,000.

The ability to pay for housing depends not only on the income of households, but also on the relative cost of each type of housing unit. Based upon current knowledge of housing costs, it is possible to provide some general estimates about the cost differences between these various types:

Single Family Dwellings. For standard 1,100 and 1,200 square foot bungalows, market prices generally range from \$45,000 to \$50,000. Assuming a purchaser could make a downpayment averaging 20% of the purchase price, the average mortgage repayment (assuming 25 year term at 10%) would be approximately \$3,800 to \$4,400 per year. To this amount should be added approximately \$500 to \$600 per year for property taxes, resulting in a total of principal, interest and taxes of approximately \$4,500 to \$5,000 per year. Applying the 30% debt service ratio to these figures, the minimum household income which could service annual debt retirement payments of \$4,500 would be approximately \$15,000 per year.

Duplexes, Townhouses, etc. Market prices for dwellings in this category can range from \$30,000 to \$40,000 per unit, depending on size, age and quality. Dwelling units up to a maximum market value of \$40,000 can be purchased by means of the AHOP program. These units could be purchased by households with annual incomes in the \$10,000 to \$14,000 range, and in some cases by households with incomes lower than \$10,000 per year.

It is assumed that the annual rental cost of these dwelling units will be roughly equivalent to 9% of the market price. Using this approach, the annual rental on a \$30,000 unit would be \$2,700, and applying the 30% debt service ratio to this figure, the minimum annual income which could support rental payments of this amount would be \$9,000.

Mobile Homes. Purchase prices for new mobile homes generally range from \$22 to \$29 per square foot of floor area. Based on the fact that few mobile homes are now sold with a floor area of less than 900 square feet, this translates into a minimum purchase price for a new mobile home of approximately \$20,000. Good quality used mobile homes range in price down to approximately \$10,000.

Financing on a new mobile home is available from banks on the basis of 15% down payment, with the balance financed over 15 years at an interest rate of 12½%. Using this financing formula, annual payments on a \$20,000 unit would amount to approximately \$2,400. To this amount should be added approximately \$900 to \$1,000 per year for rental of a mobile home space, thereby resulting in a total of approximately \$3,300 to \$3,400 per year. Applying the 30% debt service ratio to this figure, the minimum annual income which could support payments of this amount would be \$11,000.

Apartments. Rentals range from a low of approximately \$1,800 to \$2,000 per year upward. For very low income households (less than \$9,000 per year), apartments at the lower end of the rental scale would be the only type of affordable accommodation.

Based on the foregoing analysis of ability to pay and relative housing costs, it is projected that of the project-induced incremental households, approximately 70% could afford all types of housing units, including single family homes. Another 25% of new households would be able to purchase mobile homes, duplexes or townhouses in addition to other housing types. It is expected that on a cumulative basis, 100% of all incoming households could afford to rent an apartment.

It should be noted that all housing costs and incomes have been analyzed in constant 1976 dollars. The projected distribution of household ability to pay does not account for potential inflationary pressures exerted by the early years of the project's construction and operating phases. The potential extent of inflation on land costs is considered in more detail in Section 5.3.

A second determinant of housing mix is the demographic characteristics of the incremental population. It is indicated in Section 5.2.d) that there would be a preponderance of young families with children in the incoming population. The expected age distribution includes 58% less than 25 years of age, and 32% between 25 and 44 years of age. The expected marital status distribution is 75% married and 25% single, widowed, divorced or separated.

The implication with respect to housing demand is that there would be an emphasis on demand for family-oriented housing, namely single family dwellings and mobile homes. The demographic information also indicates that most singles are in the 15 to 24 age group, thereby suggesting that the demand for housing by individuals in this group would likely be concentrated in rental apartments.

A third demand characteristic is the lifestyle preferences of individual households. Although the preferences of household units moving to the area are unknown, general indications can be obtained

from empirical data of other communities where population increases attributable to resource development projects have taken place. The communities reviewed include Sparwood and Logan Lake, British Columbia and Grand Cache, Alberta. Table 5.4.3 summarizes the distribution of housing types in these representative communities. Anticipated demand for various housing types in Ashcroft is also presented.

TABLE 5.4.3
DISTRIBUTION OF HOUSING TYPES BY SELECTED MUNICIPALITIES
AND ANTICIPATED DEMAND BY INCREMENTAL HOUSEHOLDS IN ASHCROFT (%)

<u>Housing Type</u>	<u>Sparwood</u>	<u>Grande Cache</u>	<u>Logan Lake</u>	<u>Projected Ashcroft Demand</u>
Single and two family dwelling	55.4	62.9	54	57
Townhouses, Rowhouses	13.1	-	4	5
Apartments	14.9	10.5	21	15
Mobile Homes	<u>16.6</u>	<u>26.6</u>	<u>21</u>	<u>23</u>
TOTAL	<u>100%</u>	<u>100%</u>	<u>100%</u>	<u>100%</u>

SOURCE: Statistics Canada, 1971 Census, Village of Logan Lake and Urban Systems Ltd., 1978.

In general, it can be expected that demand would be greatest for low density, detached housing. The two most common housing types are single-family dwellings, and mobile homes. There is a lower level of acceptance and demand for higher density, multiple unit residences in small communities than in larger urban centres.

Because of their availability, convenience, and mobility, mobile homes appear to be a preferred housing type by many households which have an ability to pay for more expensive forms of housing such as

single family dwellings.

Taking all of the foregoing factors into consideration, the demand for new housing units for Ashcroft can now be projected. The total number of housing units for each scenario of population growth is distributed according to housing type in Table 5.4.4. The new housing unit distribution includes the demand in the without project case as well as the demands by the project-induced incremental population.

TABLE 5.4.4
VILLAGE OF ASHCROFT
PROJECTED DISTRIBUTION OF NEW HOUSING UNITS BY TYPE
1978 - 1990

<u>Housing Type</u>	<u>Percentage Distribution</u>	<u>Number of Units Scenario 1</u>	<u>Number of Units Scenario 2</u>
Single and two family	57	515	310
Townhouses, Rowhouses	5	45	25
Apartments	15	135	85
Mobile Homes	<u>23</u>	<u>205</u>	<u>125</u>
TOTAL	100%	900	545

SOURCE: Urban Systems Ltd., 1978.

(ii) Supply

In evaluating the supply factors associated with accommodating the projected housing demand, it is important to note that with the project, particularly under Scenario 1, there would be a very high demand for additional single and two family dwelling units. The majority of these units would be required in the relatively short

time period between 1978 and 1982. The evaluation of the housing supply issue therefore focuses on this particular time period.

New housing units are supplied as a result of a complicated and lengthy process. At the conclusion of this process, raw land would have been converted into residential units which in turn have been either purchased or rented. Assuming there is an adequate amount of developable land, the output of the supply process would be determined by municipal and other land use development policies and the production capabilities of the construction industry. A detailed description of this process is found in Appendix K.

Given the projected demand for new housing units, residential land requirements for Ashcroft can be estimated. The projected land requirements can then be compared to the available supply of developable land. Detailed analysis of the residential land supply for Ashcroft, described in Section 5.6.a) shows that there is sufficient land available to meet anticipated demands to 1990.

With an adequate supply of developable land and favourable development policies by the municipal council and other regulatory agencies, the housing supply would then depend on the local construction industry. It is likely that the combined Ashcroft/Cache Creek and Kamloops housing construction industries have the capability to produce the required units, even under exceptionally high demand conditions during the initial years of the project.

Because the process is involved, however, each of the numerous interrelated activities must be carried out in a coordinated and timely manner. Because it is essentially a sequential process, delays in any of the required activities, especially in the early stages, can affect the delivery of housing units to incoming households.

In summary, it is possible for the entire housing supply process to be carried out in such a manner that supply shortages could be avoided. However, immediately following project commencement, it is likely that some lags or delays would occur in one or several of the activities involved in the process. Such delays in the process during the period of exceptionally high demand could in turn be expected to give rise to a temporary shortage in the supply of housing. As would be expected, such a shortage would be significantly more pronounced under Scenario 1 than under Scenario 2.

c) Cache Creek

(i) Demand

A. Quantity of Housing

As in Ashcroft, two projections of housing demand have been prepared for Cache Creek. The resultant estimates of housing demand without the project and under both the with project scenarios are displayed on an annual basis in Table 5.4.5.

TABLE 5.4.5
VILLAGE OF CACHE CREEK
PROJECTED INCREASES IN NUMBER OF HOUSEHOLDS
1978 - 1990

<u>Year</u>	<u>Without Project</u>		<u>With Project-Scenario 1*</u>		<u>With Project-Scenario 2*</u>	
	<u>Projected Population</u>	<u>Annual Incremental Households**</u>	<u>Projected Population</u>	<u>Annual Incremental Households</u>	<u>Projected Population</u>	<u>Annual Incremental Households</u>
1978	1,095	-	1,110	-	1,135	-
1979	1,205	35	1,270	50	1,365	70
1980	1,205	-	1,465	55	1,810	130
1981	1,205	-	1,625	45	2,185	110
1982	1,205	-	1,910	85	2,850	195
1983	1,205	-	2,035	35	3,135	85
1984	1,205	-	2,145	35	3,395	75
1985	1,355	45	2,180	10	3,280	-
1986	1,355	-	2,185	-	3,300	-
1987	1,475	35	2,395	65	3,625	70
1988	1,475	-	2,380	-	3,595	-
1989	1,475	-	2,395	-	3,630	-
1990	1,595	35	2,525	35	3,760	40
	TOTAL	150		415		775

* Split of Ashcroft/Cache Creek Incremental population:

Scenario 1 - 70% Ashcroft/30% Cache Creek
Scenario 2 - 30% Ashcroft/70% Cache Creek

** Assumed household size of 3.4 persons

SOURCE: Urban Systems Ltd., 1978.

In Scenario 1, there is a projected increase of 415 new households. Of this total, about 265 would be associated with the project. The majority of these households attributable to the Hat Creek Project would locate in the community between 1978 and 1984. The incremental population attracted by the project would peak in 1984 at 945, and remain fairly constant to 1990. There are no major population

declines expected and the housing market is not expected to have any periods of excess supply. Projected increases attributable to the project after 1990 are expected to be very modest.

Using the same approach for Scenario 2, it is estimated that the project would account for 625 more new households in Cache Creek than if the project did not occur. The total number of new households expected is 775. Over 80% of these new households would be demanding new housing units in the peak 1978 - 1984 period. Like Scenario 1 for Ashcroft, a temporary population decrease may arise after 1984 if population growth associated with other projects does not take place. This could give rise to a temporary excess capacity situation in the housing market. Post-1990 project-related household expansions are projected to be limited in number.

B. Housing Mix

In projecting the demand for housing in Cache Creek, it was concluded that the factors used to assess the demand would be virtually identical to those used for Ashcroft. The net housing mix of the incremental households would be subject to similar constraints as identified in the ability to pay, demographic characteristics, and lifestyle preferences. The resultant demand is summarized in Table 5.4.6. The Table shows the total number of new housing units required under both Scenarios.

TABLE 5.4.6
VILLAGE OF CACHE CREEK
PROJECTED DISTRIBUTION OF NEW HOUSING UNITS BY TYPE
1978 - 1990

<u>Housing Type</u>	<u>Percentage Distribution</u>	<u>Number of Units Scenario 1</u>	<u>Number of Units Scenario 2</u>
Single and two family	57	235	440
Townhouses, Rowhouses	5	20	40
Apartments	15	65	115
Mobile Homes	<u>23</u>	<u>95</u>	<u>180</u>
TOTAL	100%	415	775

SOURCE: Urban Systems Ltd., 1978.

(ii) Supply

The findings of the evaluation of the housing supply process for Ashcroft are also of general applicability to the Cache Creek situation. In general terms, some delays in the housing supply process would be likely, particularly under Scenario 2, during the first four years following project commencement. These delays would in turn give rise to a temporary shortage in the supply of housing.

d) Clinton

i) Demand

A. Quantity of Housing

Estimates of the demand for new housing in Clinton are outlined in Table 5.4.7.

TABLE 5.4.7
VILLAGE OF CLINTON
PROJECTED INCREASES IN NUMBER OF HOUSEHOLDS
1978 - 1990

<u>Year</u>	<u>Without Project</u>		<u>With Project</u>	
	<u>Projected Population</u>	<u>Annual Incremental Households*</u>	<u>Projected Population</u>	<u>Annual Incremental Households*</u>
1978	810	-	820	-
1979	810	-	855	10
1980	810	-	975	35
1981	1,155	100	1,420	130
1982	1,155	-	1,595	50
1983	1,155	-	1,670	25
1984	1,155	-	1,710	10
1985	1,155	-	1,670	-
1986	1,155	-	1,675	-
1987	1,155	-	1,730	10
1988	1,155	-	1,725	-
1989	1,155	-	1,730	-
1990	1,155	-	1,735	-
	<u>TOTAL</u>	<u>100</u>		<u>270</u>

* Assumed household size of 3.4 persons

SOURCE: Urban Systems Ltd., 1978.

Of the estimated increase of 270 households to 1990, approximately 170 would be attributable to the Hat Creek Project. It is important to note that the demand both with and without the project is expected to be concentrated in the time span from 1980 to 1984. Increases after 1984 are expected to be relatively insignificant. Projected population totals are also expected to be fairly constant after 1984.

8. Housing Mix

In projecting the demand for housing in terms of the various housing types similar criteria were used for Clinton as in Ashcroft and Cache Creek. However, an additional factor taken into consideration is that Clinton would likely attract households with preferences for the semi-rural atmosphere. It is expected that households with lifestyle preferences of this nature would demand accommodation in low density housing. It is therefore anticipated that of the new dwelling units required, a higher proportion would be single-family dwellings than in Ashcroft or Cache Creek. The projected distribution of new housing units for Clinton is outlined in Table 5.4.8, and includes the total number of units demanded.

TABLE 5.4.8
VILLAGE OF CLINTON
PROJECTED DISTRIBUTION OF NEW HOUSING UNITS BY TYPE
1978 - 1990

<u>Housing Type</u>	<u>Percentage Distribution</u>	<u>Number of Units</u>
Single and two family	70	190
Townhouses, Rowhouses	-	-
Apartments	5	15
Mobile Homes	<u>25</u>	<u>65</u>
TOTAL	100%	270

SOURCE: Urban Systems Ltd., 1978.

(ii) Supply

In the Village of Clinton, it is very unlikely, given the projected levels of population increase with or without the project, that there would be any delays in the housing supply process. A possible

short-term exception may be the year 1981 when demands for an additional 100 housing units are projected without the project, and only an additional 130 housing units with the project. If the 1981 projected population increases without the project are not realized, increases attributable to the Hat Creek Project in 1981 would be relatively minor.

In reviewing the various elements of the housing supply process in Clinton, it is likely that more than twice the number of projected housing units attributable to the project could be supplied in Clinton without any delays. During the first four years following project commencement, this would represent an increase of 125 to 250 additional housing units.

5.5 SERVICES

a) Introduction

This section outlines the projected levels and costs of public services that would be required as a result of population growth associated with the Hat Creek Project. Distinctions are drawn between the changes in service levels and costs that would occur without the project and those that would be attributable to project-related population growth. The municipal, provincial or federal government services discussed in this section are categorized under education, health, recreation, social, cultural, corrections, courts, legal, police, fire, and communication systems.

The existing facilities, costs, staff, and service areas for each of these services are described in Section 3.5. In addition, Section 3.5 and Appendix D present, in detail, the forecasting procedures and the projected service requirements without the Hat Creek Project. These projections of service requirements consist of facility, staff, land requirements, and operating and capital costs.

Using the same basic forecasting procedures, this section contains similar projections for all public services with the project. The projections are based upon current government servicing standards, 1976 base data for each service system, and population forecasts for the study area with the Hat Creek Project. All projections are made to 1990, and detailed annual service requirement projections are included in Appendix L.

*

All costs are given in 1976 constant dollars. Capital and operating cost estimates discussed in Section 5.5 and Appendix L were developed by Hanscomb Roy and Associates, 1978.

As described above, current government standards have been used as a basis for developing service requirements for the Hat Creek study area. The application of these service standards should be viewed with caution. Government service standards are not rigid rules which are strictly adhered to; rather, they are considered as flexible guidelines which need to be reviewed and refined on a regular basis. The application of service standards often assumes a defined level of facilities and delivery mechanisms that may not always be relevant or possible in each specific area. In addition, standards are not available for all services as a result of integrated or specialized service delivery programs or community needs.

Most government department policies and practices require that there be an expressed level of demand before an existing service is expanded or a new service is provided. As a result of these policies and practices, time lags may occur between expressed demands for services and the actual provision of the services. A service generally is not provided in advance of demand in case the service subsequently is determined to be unnecessary or inefficient for a particular area.

However, to be most effective, a service and its delivery mechanisms should be planned to be available as it is required. The service projections completed in this section identify the year in which each service should be in operation, as the population reaches the size required by government standards.

b) Education

i) Elementary Education

Elementary school enrollments are projected to increase both with and without the Hat Creek Project. The projected annual enrollments without the project are presented in Section 3.5 and Appendix D, and include the projected facilities and teachers required to

accommodate the increased enrollments. With the Hat Creek Project, the elementary school enrollments within School District No. 30 (including Ashcroft, Cache Creek and Clinton) would be over 50% greater than the enrollments without the project.

The projected enrollments were derived in the following manner. Data from the 1976 Statistics Canada Census were used as the base figures for school district enrollment. The projected annual population changes with the project (see Section 5.2) were used to determine annual increases in enrollment, using an average of one school age child per four residents.* The estimated annual percentage increases were then applied to the known 1976 elementary school enrollment figures. The projections were thus adjusted to resolve any discrepancies between 1976 Census data and more detailed school enrollment data.

Having derived a projected total school age population, it was then necessary to distinguish between those in elementary and secondary schools. It was estimated that about 67% of the projected student population were elementary students.** This proportion has been applied generally for the projected school enrollments. The 1976 to 1990 summary of enrollments both with and without the project is presented in Table 5.5.1, and the forecasts for Ashcroft, Cache Creek and Clinton are shown graphically in Figures 5.5.1 to 5.5.3. Annual enrollments and other detailed projections are presented in Appendix Tables L1 to L5.

* This represents the average ratio in British Columbia, according to the Administrative Services Branch, B.C. Ministry of Education.

** This estimate was obtained from the B.C. Research Enrollment Model, Form B. A trend in changing elementary and secondary enrollments has been identified by B.C. Research, and while those figures have not been applied specifically, the trend has been applied as an average in these forecasts.

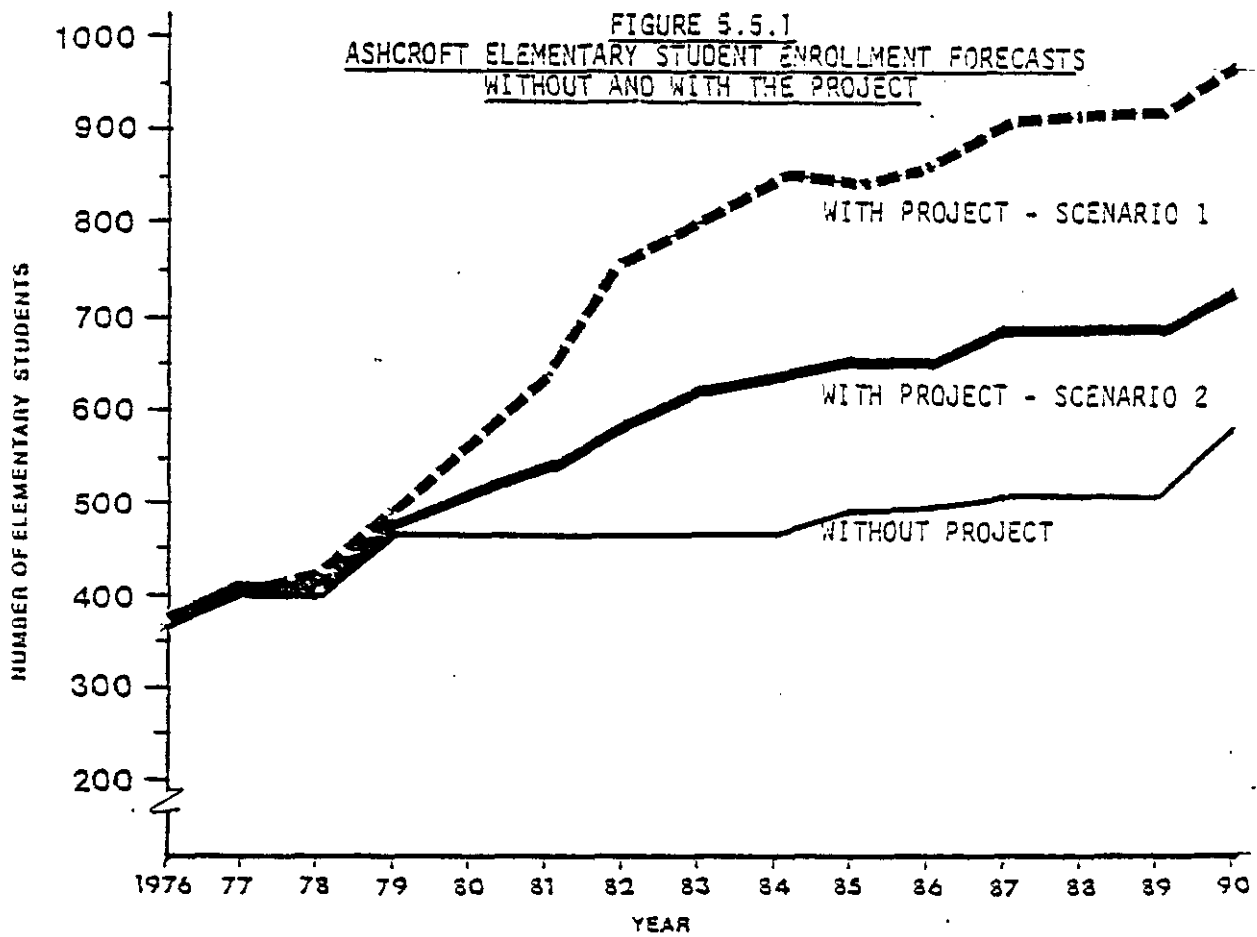
TABLE 5.5.1

HAT CREEK AREA SCHOOLS
 PROJECTED ELEMENTARY SCHOOL ENROLLMENT:
 WITH AND WITHOUT PROJECT

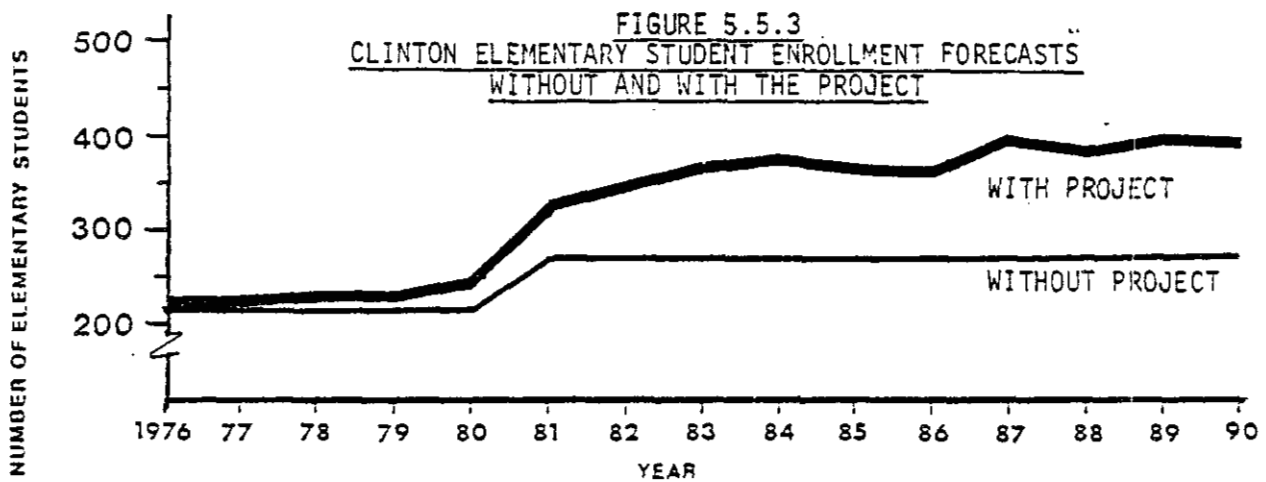
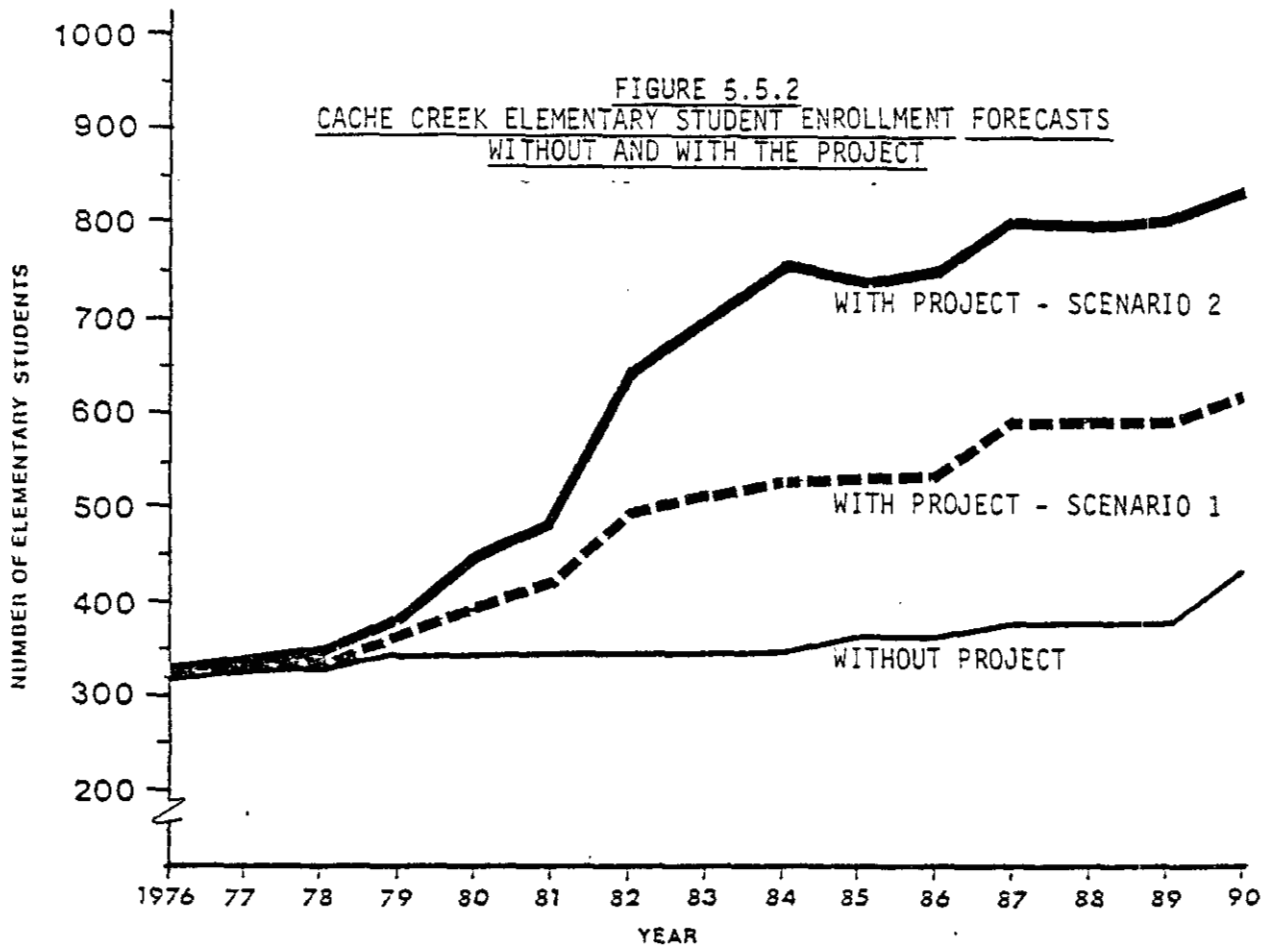
ELEMENTARY SCHOOL ENROLLMENT							
		1990 WITHOUT PROJECT		1990 WITH PROJECT-SCENARIO 1		1990 WITH PROJECT-SCENARIO 2	
	1976	ENROLL- MENT*	% INCREASE	ENROLL- MENT*	% INCREASE	ENROLL- MENT*	% INCREASE
Ashcroft	391	560	(44)	960	(146)	725	(86)
Cache Creek	313	435	(39)	595	(90)	825	(164)
Clinton	217	280	(29)	390	(80)	390	(80)
TOTAL	921	1,275	(39)	1,945	(111)	1,940	(111)

* All figures in projections have been rounded to the nearest five.

Source: Cornerstone Planning Group and Strong Hall and Associates, Limited, 1978.



SOURCE: Cornerstone Planning Group Ltd., 1978.



SOURCE: Cornerstone Planning Group Ltd., 1978.

Without the project, total elementary enrollment will increase from 920 to 1,275 between 1976 and 1990. With the project, however, total enrollment in the three communities would increase to more than 1900 by 1990, more than double that in 1976.

A. Ashcroft*

With the project, Ashcroft would experience growth in enrollment of 146% under Scenario One and 86% under Scenario Two. The absolute differences in enrollment with the project when compared to the enrollment without the project would be 400 under Scenario One and 165 under Scenario Two.

The total capacity of the elementary schools in Ashcroft is 480 students. Without the project, this capacity will be reached in the 1985-86 academic year. With the project, the capacity would be exceeded in 1979-80 for Scenario One and 1980-81 for Scenario Two. In all cases, additional classroom facilities would be needed to accommodate projected student enrollments to 1990, as indicated below:

	<u>Projected Increase in Classrooms Required to 1990**</u>	<u>Projected Increase in Classrooms Attributable to Project</u>
Without Project	3	-
With Project - Scenario One	20	17
With Project - Scenario Two	10	7

** Calculations of space required are based on an average of 30 square feet per student and an average of 25 children per classroom. See Appendix Table L.1.

SOURCE: Cornerstone Planning Group Ltd., 1978.

* Detailed annual projections for Ashcroft; including enrollments, facilities, staff and costs, are presented in Appendix Table L.1.

Most additional space requirements would be met through leased portable facilities. However, under Scenario One it is estimated that a new school facility of 26,200 square feet (capacity 330 students) would be required for the 1983-84 academic year, at a total capital cost of approximately \$1.8 million.

In all cases, additions to the teaching staff would be required as a result of increased elementary school enrollments. For Ashcroft, the 1976-77 ratio of 24 students per teacher has been used as the basis for estimating future staff requirements. The projected numbers of staff required are indicated below:

	<u>Projected Increase in Teachers Required to 1990*</u>	<u>Projected Increase in Teachers Attributable to Project</u>
Without Project	7	-
With Project - Scenario One	24	17
With Project - Scenario Two	14	7

* For detailed annual calculations, see Appendix Table L.1.

SOURCE: Cornerstone Planning Group Ltd., 1978.

The capital and operating costs of the elementary schools in Ashcroft would increase as a result of projected student enrollments. Capital costs generally consist of the costs for new furnishing and equipment for expanded facilities, and the cost of constructing new facilities (excluding the costs of site development, fees and contingencies). Only under Scenario One would new facilities need to be constructed, resulting in capital costs \$1,876,368 more than without the project and \$1,844,805 more than Scenario Two, as described in detail in Appendix Table L.1.

	<u>Projected Capital Costs to 1990*</u>	<u>Projected Capital Costs Attributable to Project</u>
Without Project	\$ 14,742	-
With Project- Scenario One	\$1,891,110	\$1,876,368
With Project- Scenario Two	\$ 46,305	\$ 31,563

* For detailed annual calculations, see Appendix Table L.1.

SOURCE: Cornerstone Planning Group Ltd., 1978.

The operating costs of the Ashcroft elementary schools will increase proportionately to the total number of students enrolled. The operating costs are calculated in constant 1976 dollars based on an average of \$1,490 per student for the 1975-76 academic year.** These costs would include salaries, services, maintenance and other costs typically associated with school operations. In addition, costs for leasing portable facilities would have to be added to total operating costs. Therefore, differences in operating costs on an annual basis with and without the project would be attributable to enrollments, leased facilities, and capital debt services.

B. Cache Creek***

Without the project, enrollment in Cache Creek's elementary school will increase only 39% to 1990, compared with increases with the

** Operating costs per student for the 1976-77 academic year were not available at the time of writing this report.

*** Detailed annual projections for Cache Creek, including enrollments, facilities, staff and costs, are presented in Appendix Table L.2.

project of 90% under Scenario One and 164% under Scenario Two. With the project, the projected 1990 enrollment for Scenario One would be 160 students more than without the project, and under Scenario Two there would be 390 more students than without the project.

The total capacity of the elementary school in Cache Creek is 337 students. Without the project, this capacity will be reached in the 1980-81 academic year. With the project, the school would be at capacity by 1979-80 for both Scenario One and Two. In all cases, additional classroom facilities would be needed to accommodate projected student enrollments to 1990. Classroom requirements were projected in a similar manner to those for Ashcroft, as indicated below:

	<u>Projected Increase in Classrooms Required to 1990*</u>	<u>Projected Increase in Classrooms Attributable to Project</u>
Without Project	4	-
Without Project - Scenario One	10	6
Without Project - Scenario Two	19	15

- Calculations are based on an average of 30 square feet per student and 25 children per classroom. See Appendix Table L.2.

SOURCE: Cornerstone Planning Group Ltd., 1978.

Most additional space requirements would be met by leasing portable facilities. Under Scenario Two, however, it is projected that a new school facility of 26,200 square feet (capacity 330 students) would be required by the 1982-83 academic year. This elementary school facility would cost approximately \$1,811,730.

Additions to the teaching staff would also be required as a result of projected elementary school enrollment increases. The current (1976-77) student to teacher ratio of 19.6 in Cache Creek has been retained to

estimate future staff requirements. The projected number of staff required to 1990 under Scenario One would double that required without the project, and under Scenario Two would be more than three times greater. The projected staff requirements are indicated below:

	Projected Increase in Teachers <u>Required to 1990*</u>	Projected Increase in Teachers <u>Attributable to Project</u>
Without Project	7	-
With Project - Scenario One	15	8
With Project - Scenario Two	26	19

* For detailed annual calculations, See Appendix Table L.2.

SOURCE: Cornerstone Planning Group Ltd., 1978.

Capital costs would increase in proportion to the amount of new facilities required, as most capital cost expenditures would result from new furnishings and equipment. Under Scenario Two, a new elementary school would be necessary, boosting total 1976-1990 capital costs to \$1,860,174 more than without the project and \$1,829,307 more than Scenario One. If a new school is not required, differences in capital costs will vary proportionately to the number of leased facilities which need to be outfitted.

	<u>Projected Capital Costs to 1990*</u>	<u>Projected Capital Costs Attributable to Project</u>
Without Project	\$ 17,895	-
With Project - Scenario One	\$ 48,762	\$ 30,867
With Project - Scenario Two	\$1,878,069	\$1,860,174

* For detailed annual calculations, see Appendix Table L.2.

SOURCE: Cornerstone Planning Group Ltd., 1978.

Operating costs would increase in proportion to the total number of students enrolled in the school at an assumed rate of \$1,490 per student plus the costs of leased facilities.

C. Clinton**

With the project, the enrollment in Clinton's elementary school would increase by 80% between 1976 and 1990, compared to a projected increase of only 29% over the same period without the project. The increased number of students would be about 110 more than without the project, raising the school enrollment to about 390 in 1990.

The existing elementary school has a capacity for 255 students. This capacity would be exceeded as a result of increased enrollments projected both with and without the project. Without the project, the capacity will be reached in the 1981-82 academic year, necessitating at least one leased portable classroom. With the project, the school would also reach full capacity in 1981-82, but more portable facilities would have to be leased to accommodate the larger projected enrollment to 1990.

** Detailed annual projections for Clinton, including enrollments, facilities, staff and costs, are presented in Appendix Table L.3.

	<u>Projected Increase in Classrooms to 1990*</u>	<u>Projected Increase in Classrooms Attributable to Project</u>
Without Project	1	-
With Project	6	5

* Calculations are based on an average of 30 square feet per student and 25 students per classroom. See Appendix Table L.3.

SOURCE: Cornerstone Planning Group Ltd., 1978.

Additional staff would be required in both cases as a result of projected increases in elementary school enrollment. Since staffing is dependent on the total enrollment, the number of teachers required with the project would be greater than the number required without the project. Calculations of the number of teachers required are based on the differences in projected requirements and are indicated below:

	<u>Projected Increase in Teachers Required to 1990*</u>	<u>Projected Increase in Teachers Attributable to Project</u>
Without Project	3	-
With Project	8	.5

• For detailed annual calculations, see Appendix Table L.3.

SOURCE: Cornerstone Planning Group Ltd., 1978.

Capital expenditures would be required for expansions to the Clinton School capacity. However, since a new facility would not have to be constructed with or without the project, the difference in capital costs would be directly proportional to the number of leased facilities which must be equipped. The projected enrollment increase with the project would require five more classrooms than would be needed

without the project, resulting in capital costs of \$15,120 more than without the project.

	<u>Projected Capital Costs to 1990*</u>	<u>Projected Capital Costs Attributable to Project</u>
Without Project	\$10,395	-
With Project	\$25,515	\$15,120

* For detailed annual calculations, see Appendix Table L.3.

SOURCE: Cornerstone Planning Group Ltd., 1978.

Detailed annual operating cost increases for the Clinton School are given in Appendix Table L.3.

(ii) Secondary Education

Secondary education enrollment in the service study area is projected to increase both with and without the Hat Creek Project. The projected annual enrollment increases without the project, and their related requirements in facilities, staff and costs, are given in Section 3.5 and Appendix D. With the project, the enrollment in both secondary schools is projected to more than double between 1976 and 1990. The total enrollment with the project would be more than 50% higher than the 1990 enrollment without the project.

Projected enrollments were derived in a similar fashion to those for the elementary school enrollments discussed in Section 5.5.b.i) above.

The projected secondary school enrollments to 1990 both with and without the project are presented in Table 5.5.2, and the forecasts are shown graphically in Figure 5.5.4. Detailed annual calculations are provided in Appendix Tables L.4 and L.5.

TABLE 5.5.2

HAT CREEK AREA SCHOOLS
PROJECTED SECONDARY SCHOOL ENROLLMENTS:
WITH AND WITHOUT PROJECT

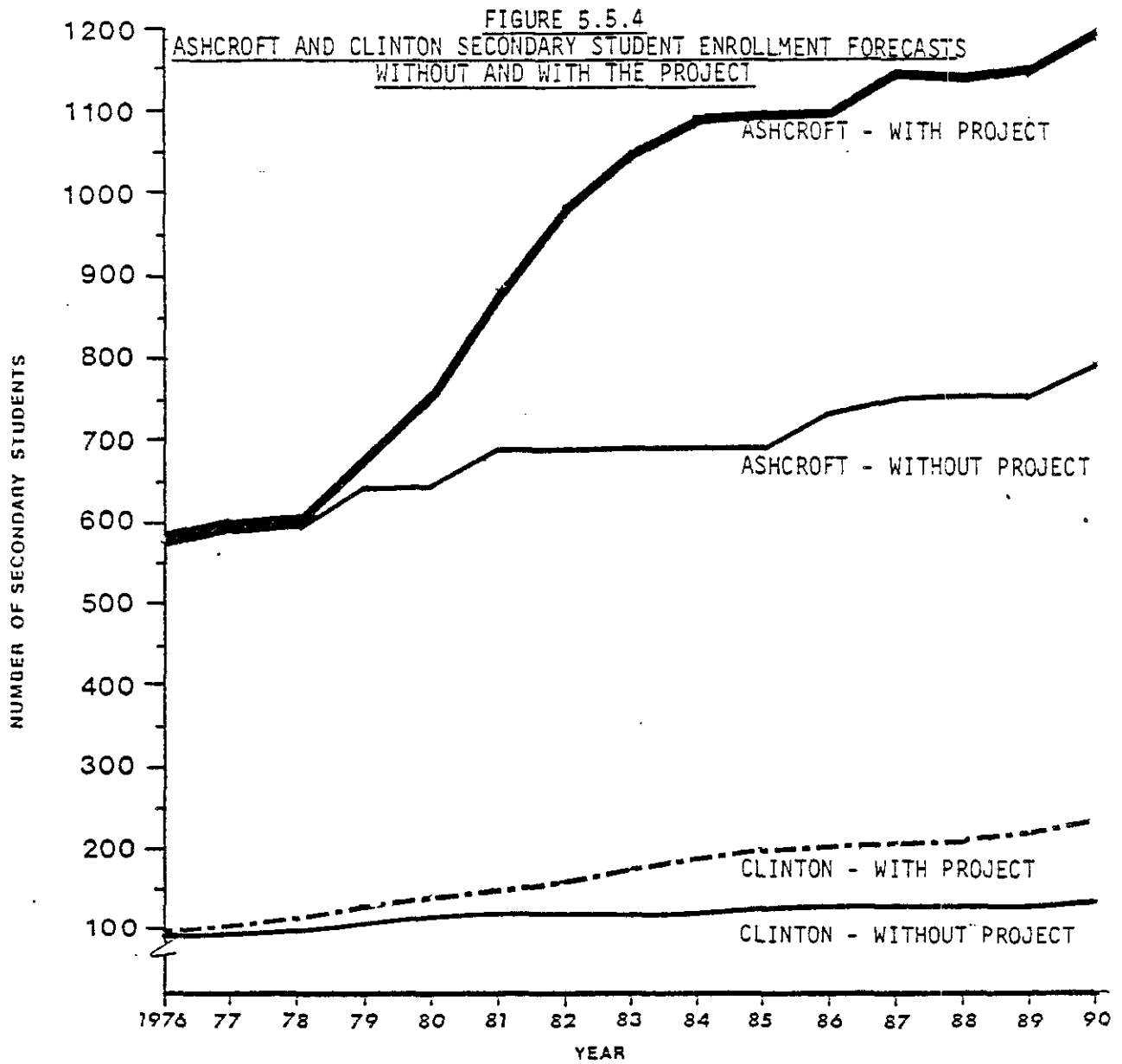
SECONDARY SCHOOL ENROLLMENT

	<u>1976</u>	<u>1990 WITHOUT PROJECT</u>		<u>1990 WITH PROJECT</u>	
		<u>Enrollment*</u>	<u>(% Increase)</u>	<u>Enrollment</u>	<u>(% Increase)</u>
Ashcroft	573	785	(37%)	1190	(108%)
Clinton	104	140	(35%)	220	(112%)
TOTAL	677	925	(37%)	1410	(108%)

5.5 - 15

* All figures in projections have been rounded to the nearest 5.

SOURCE: Cornerstone Planning Group and Strong Hall and Associates, Limited, 1978.



SOURCE: Cornerstone Planning Group Ltd., 1978.

Without the project, the total enrollment in the study area will increase from 677 in 1976 to 925 in 1990, an increase of 37%. With the project, the total enrollment in the two secondary schools would increase to more than 1400 by 1990, an increase of 108% above the 1976 level.

A. Ashcroft*

The secondary school in Ashcroft services all of the secondary school age students in Ashcroft, Cache Creek and the surrounding rural areas. For this reason, the enrollment projections for this school would be the same for both Scenario One and Two.

With the project, the enrollment in Ashcroft's secondary school would increase by about 620 students between 1976 and 1990, or 108%. This would be about 400 students more than projected without the project, creating a need for more classrooms and staff.

The total capacity of the Ashcroft school is 595 students. Both with and without the project, the capacity would be exceeded by the 1979-80 academic year, requiring additional classroom space. This additional capacity would probably be provided through leased portable facilities, although it is possible that a new school would be built in either Cache Creek or Ashcroft with the project. Based on an average of 30 square feet per student and 25 students per classroom, the following projections were made:

* Detailed annual projections for Ashcroft, including enrollments, facilities, staff and costs, are presented in Appendix Table L.4.

	<u>Projected Increase in Classrooms Required to 1990*</u>	<u>Projected Increase in Classrooms Attributable to Project</u>
Without Project	8	-
With Project	24	16

* For detailed annual calculations, see Appendix Table L.4.

SOURCE: Cornerstone Planning Group Limited, 1978.

Increased enrollments would result in increased staff requirements, and the number of teachers required with the project would be greater than the number required without it. Based on a 1976-77 student to teacher ratio of 19.1 in Ashcroft, the projected number of staff increases required are presented below:

	<u>Projected Increase in Teachers Required to 1990*</u>	<u>Projected Increase in Teachers Attributable to Project</u>
Without Project	11	-
With Project	33	22

* For detailed annual calculations, see Appendix Table L.4.

SOURCE: Cornerstone Planning Group Limited, 1978.

Capital costs for the secondary schools are calculated in a similar manner to those for elementary schools. Although a new school may be constructed as a result of project-related enrollment increases, it is not considered an absolute necessity and has not been included in the projected capital costs. With the project, the projected capital costs to 1990 would be about \$89,000 more than without the project, as indicated below:

	<u>Projected Capital Costs to 1990*</u>	<u>Projected Capital Costs Attributable to Project</u>
Without Project	\$ 41,895	-
With Project	\$131,198	\$89,303

* For detailed annual calculations, see Appendix Table L.4.

SOURCE: Cornerstone Planning Group Limited, 1978.

As with the elementary schools, operating costs for secondary schools have been calculated on a basis of \$1,490 per student per year (1976 constant dollars) and the annual costs for portable classroom leasing. Operating costs would increase both with and without the project, although the increase would be greater with the project as a result of larger enrollments and greater classroom requirements.

B. Clinton*

Clinton's junior secondary school would have a 112% increase with the project, approximately doubling the enrollment from 104 to 220 between 1976 and 1990. The project would add about 80 students more than the number projected without the project. The school has a capacity of 225 students, and since this capacity would not be reached either with or without the project, no additional classroom facilities would be needed before 1990.

As a result of projected enrollment increases, the staff at Clinton's secondary school would have to be increased. The projected enrollment growth without the project will be only one-third of that projected with the project, and therefore, fewer teachers will be required in the without case. Teacher requirements have been calculated on the

-
- Detailed annual projections for Clinton, including enrollments, facilities, staff and costs, are presented in Appendix Table L.5.

1976-77 student to teacher ratio of 13 for Clinton.

	<u>Projected Increase in Teachers Required to 1990*</u>	<u>Projected Increase in Teachers Attributable to Project</u>
Without Project	3	-
With Project	9	6

* For detailed annual calculations, see Appendix Table L.5.

SOURCE: Cornerstone Planning Group Limited, 1978.

Capital costs for the secondary school in Clinton would not increase either with or without the project. The existing classroom facilities would be adequate to accommodate projected enrollments in both cases, and it is assumed that the existing equipment and furnishings would meet the needs of the 1990 enrollments.

Operating costs are directly proportional to the projected enrollments, especially if there are no leasing costs for portable facilities involved. As in other school projections, an annual cost of \$1,490 per student is used to calculate future operating costs. While operating costs would increase in both cases, the projected costs would be higher with the project than without it due to the larger enrollment.

(iii) Post-Secondary and Continuing Education

Specific enrollment forecasts cannot be predicted for post-secondary and continuing education in the study area either with or without the project. At present, enrollments are lower than the B.C. average, but this trend is changing, and is expected to increase considerably in the future, particularly with the project.**

** Director of Continuing Education, Cariboo College, Kamloops, B.C. September, 1976.

Courses are provided in public school facilities after regular school hours, and there would be sufficient space in these facilities to accommodate any increased enrollment up to 1990. However, by 1982 or 1983, some administrative space might be required in the study area for the post-secondary and continuing education programs.

Enrollment in post-secondary and continuing education is expected to be noticeably greater with the project than without the project. Since the available public school facilities would provide adequate space, the only difference between the two situations may be the need, with the project, for some additional administrative space, administrators, additional teachers, and materials.

As specific projections of enrollment in post-secondary and continuing education cannot be calculated, estimates of capital and operating costs with the project have not been prepared.

c) Health

Health services include a variety of different services and facilities. For the most part, these services are publicly-operated, either directly, such as hospitals and ambulances, or indirectly, such as medical services paid through the British Columbia Medical Plan. Dental services, however, are generally privately owned and operated, with publicly-assisted programs available to some users.

Existing facilities, programs, staff, costs and service areas for each component of health services are described in Section 3.5 and Appendix D. Projections for service requirements to 1990 without the project are also found in Section 3.5 and Appendix D. Projections for the without project case consist of facilities, staff, capital requirements, and operating and capital costs.

The projected requirements with the project are based on the same forecasting procedures. That is, the projected service requirements draw upon 1976 base data for each service, and apply current government servicing standards to projected population levels associated with the project. All projections are made to 1990, and detailed projections are found in Appendix Tables L.6 - L.12.

i) Hospital*

The hospital in Ashcroft had an occupancy rate close to 50% in 1976. The occupancy of a hospital is determined by the number of cases admitted, the average length of stay of each patient, and the rated bed capacity. Like other similar-sized hospitals in British Columbia, the occupancy in the Ashcroft and District General Hospital has decreased over the past few years. While this is a noticeable trend, the causes are not easy to identify; the decreased occupancy is a result of changing medical practices, treatment policies, population composition and other factors.

As stated in Section 3.5, the Ministry of Health assumes that an average occupancy of 70% is an acceptable rate for a 33-bed hospital. Beyond that occupancy level, the hospital would be considered near capacity and would lose efficiency, and perhaps quality, in patient care. The Ministry of Health suggests that Ashcroft and District General Hospital could support approximately 9,000 to 10,000 patient days per year.**

In 1976, the hospital had a total patient day volume of 6,057 days, with 720 cases admitted at an average stay of 8.4 days. This hospital

* For detailed annual projections for the service population and requirements at the Ashcroft hospital, see Appendix Table L.6.

** Research Division, Hospital Programs, Ministry of Health, Province of British Columbia, 1977.

load was generated by a population of 5,280 in the service area. It is possible that, depending on the trends in hospital occupancy, the hospital may be operating close to capacity (70%) in the peak years of population from 1982 to 1984. However, it is expected that the hospital should be able to accommodate service demands of the increased population to 1990 both with and without the project.

While the general population growth associated with the project would increase the patient admissions to the hospital, it is unlikely that the project's construction workforce alone would increase hospital occupancy up to 1990. Based on other similar projects in S.C., the number of construction accidents requiring emergency treatment or extended hospitalization is minimal. Most construction-related accidents would be treated on site by first aid or by the employee's own doctor.

Projected hospital occupancy and admission trends are difficult to project, especially given the declining occupancy over the past few years. However, it is assumed that an increasing work load would be placed upon staff as a direct result of population growth and subsequent increases in admissions, average stay, or occupancy. It is further assumed that the existing rate of staff to patients remains constant up to 1990. Given these assumptions it is expected that a range of one to five additional staff would be required for an increase of 1,000 in the service population, and five to ten additional staff for an increase of 2,000.*

Depending on the trends in hospital utilization, it is likely that more staff would be required at the hospital with the project than without it. Staff increases required with the project range from 14 to 40 between 1976 and 1990. Without the project, however, the

* For detailed annual calculations of hospital service requirements, see Appendix Table L.6.

projected staff requirements to 1990 are between five and 17 additional staff.

Capital and operating costs have not been projected for hospital services in the study area, either with or without the project. It is assumed that no additional hospital facilities would be required in either case, although there may be some increased capital costs due to purchases of specialized hospital equipment. Annual operating costs are dependent on the size of the hospital staff and the occupancy and, therefore, cannot be projected with any degree of accuracy.

ii) Medical*

As stated in Section 3.5, there are presently four general practitioners in the service study area. Based on the 1976 population of 5,280, there is a ratio of one general practitioner for 1,320 population. This service ratio is better than the general practitioner for 2,200 population ratio suggested by the College of Physicians and Surgeons of British Columbia.

To maintain the current ratio of general practitioners to population, one additional physician will be required to 1990 without the project. With the project, however, 4 additional doctors and support staff would be needed in the service study area to 1990, resulting in a projected total of 9 doctors and 8 support staff.

The medical centre in Ashcroft has space to accommodate one additional physician; the other four doctors projected with the project would require new facilities. Under Scenario One, two of the additional physicians would be needed in both Ashcroft and Cache Creek, and the remaining doctor would be required in Clinton. Under Scenario Two, both Ashcroft and Clinton would require one doctor, and three doctors would be needed in Cache Creek.

* For detailed annual projections for the service population and medical personnel requirements in the study area, see Appendix Table L.7.

iii) Dental^{*}

At present, there are no permanent dentists in the service area. As indicated in Section 3.5, the recognized need for dental services is in the process of being met; the College of Dental Surgeons of British Columbia is setting up a rental facility in Ashcroft to be leased out to a dentist. Without the project, it is projected that two dentists plus support staff will be required to meet service demands from 1977 to 1990.

Using the same standard of one dentist for 2,500 population in rural areas of British Columbia,^{**} a total of four dentists would be required in the service study area to 1990 with the Hat Creek Project, or two more than required without the project. One dentist would likely locate in Clinton, and the remaining three would be divided between Ashcroft and Cache Creek, with two locating in Ashcroft in Scenario One and two in Cache Creek in Scenario Two.

iv) Public Health^{***}

As indicated in Section 3.5, the 1976 staff of the Health Unit branch office in Ashcroft consisted of seven full-time and one part-time staff members. Without the project, the Ministry of Health indicated that one additional public health nurse and one home care nurse would be needed in the service study area to 1990. In addition, the Ashcroft Public Health Office is being moved into a larger leased space in a new building in Ashcroft.

* For detailed annual projections of service populations and requirements for dental services, see Appendix Table L.8.

** President, College of Dental Surgeons of B.C., 1977.

*** For detailed annual calculations for public health requirements, see Appendix Table L.9.

Based on the standard of one public health nurse for 4,000 population, and the recommendations of the Public Health Branch of the Ministry of Health, two additional public health nurses and one additional home care nurse would be needed to 1990 with the Hat Creek Project. Therefore, only one extra public health nurse would be needed in the area as a result of project-related population growth.

During the initial stages of construction associated with the project, additional public health inspections would be required at the construction campsites. It is unlikely, however, that the extra workload would be sufficient to require an additional public health inspector at the Ashcroft office.

There are no figures available for capital costs of public health facilities, but the new rental space would be sufficient to accommodate staff increases to 1990. Operating costs would increase approximately \$21,000 per year with the addition of a public health nurse, as detailed in Appendix Table L.9.

v) Mental Health*

There are no special mental health services currently provided in the study area. As indicated in Section 3.5, there is an immediate need for these services and the Mental Health Branch of the Ministry of Health has indicated that a mental health worker should be located in the study area. This requirement is based on a standard of one mental health worker for 10,000 population, and would meet the needs of the projected population growth without the project.

With the Hat Creek Project, at least one additional mental health worker would be required by 1982; the expanded staff would be

* For detailed projections for mental health service requirements, see Appendix Table L.10.

sufficient to meet the needs of the projected population to 1990. Additional rental space would be necessary to accommodate the extra mental health worker.

No additional capital costs would be required for mental health services as a result of the Hat Creek Project. Annual operating costs, however, would be twice as much as those projected without the project as a result of adding an extra staff member.

vi) Ambulance*

Ambulance services operated by the Emergency Health Services Branch of the Ministry of Health are located in Ashcroft and Clinton, as described in Section 3.5. At present, the Ashcroft ambulance unit consists of two ambulances, one full-time employee and a volunteer staff; the Clinton unit has one ambulance operated by a volunteer staff. The level of ambulance service in a service area is determined by demonstrated need.**

Without the project, one additional employee is needed immediately to operate the second ambulance in Ashcroft, while an additional ambulance and full-time operator will be required in Ashcroft or Cache Creek by 1987. If the Clinton unit demonstrates need based on the demand for services, a full-time operator might be required there also.

With the project, four additional full-time employees and two more ambulances would be required in Ashcroft and Cache Creek to 1990, depending on need. The staff requirements for the Clinton unit would

• For detailed annual requirements and costs for ambulance services see Appendix Tables L.11-12.

** When the number of calls per year in a rural area exceeds 100, then a full-time staff member is employed.

depend on the number of calls per year, but it is considered likely that no extra employees would be necessary as a result of the project. The net staff requirements attributable to the project would be two full-time employees in the Ashcroft-Cache Creek ambulance service area.

Ambulances are provided by the province at the cost of approximately \$15,000 per ambulance. With the project, the capital costs to the province for the Ashcroft-Cache Creek area would be \$30,000 for the two required ambulances; no ambulances will be required without the project.

Operating costs would be greater in the Ashcroft-Cache Creek area with the project than without it. Projections of operating costs include wages and costs totalling \$150 per call, with the number of calls increasing on a pro-rated basis to the size of the service population. The larger service population and staff requirements with the project would increase operating costs beyond those projected without the project. Operating costs would be the same for Clinton both with and without the project.*

d) Recreation**

The existing recreation facilities in the local study area and the importance of recreation resources for the quality of life and sense of stability in small, resource communities are described in Section 3.5. As described in that section, the existing facilities in the study area communities are in need of upgrading. In addition, residents in the study area have expressed concern about the lack of community recreation opportunities and the need for additional facilities.

* For detailed annual cost calculations, see Appendix Tables L.11-12.

** For more detailed information and projections on the recreation services in each community, see Appendix Tables L.13-15.

The youthful nature and level of population growth both with and without the project will place increasing demands on recreation facilities in the communities. Given the larger population levels projected with the project, the needs and demands of the population for recreation facilities would be greater than without the project. Improvements and additions to the recreation services would be needed, including enlarged community halls in all three communities and more open space in both Ashcroft and Cache Creek.

There are no useful standards for determining what facilities should be developed or required for communities of different sizes. Additional recreation facilities such as a curling rink, bowling alley, indoor swimming, or multi-purpose facility may be required in Ashcroft, Cache Creek or Clinton to 1990, both with or without the project. It is suggested, however, that the choice of recreation facilities and the timing of the additions should be determined by the residents of the communities. Any additional facilities required in the communities could be planned for joint use by residents of all three communities.

The needs of the construction work force also might have to be considered when recreation services are planned in the study area. The construction workforce would utilize recreation facilities provided in the Hat Creek Valley camps as well as in the communities. Recent experiences at B.C. Hydro construction camps in Revelstoke and Portage Mountain indicate that outdoor activities such as soccer, softball and swimming are popular recreation pursuits. In addition, indoor activities such as basketball, volleyball and other gymnasium games are also popular.

The capital costs for upgrading existing facilities and for developing more open space have not been estimated. In addition, the operating costs for the existing recreation facilities in the three communities have not been projected. Given the uncertainty of future recreation demands and the provision of new facilities, differences

in costs with or without the project have not been determined.

e) Human Resources*

The existing programs and staff of the three Ministry of Human Resources offices, and the projections for future requirements without the project, are described in Section 3.5. The Ministry of Human Resources does not plan its staff or facility requirements on the basis of per capita standards, but rather on the basis of an undisclosed formula related to caseloads. Projected requirements without the project are based on a B.C. average of one Human Resources worker per 2,600 population (excluding the Lower Mainland area).** No additional staff or facilities will be required to 1990 without the project.

Using the same ratio of Human Resource workers to population, two additional social workers and support staff would be required in the service area to 1990 with the project. No additional space or facilities would be required to accommodate these staff additions. Any additional day care services required by the projected population growth would be provided, at least initially, by private sources from family dwellings.

There would be no additional increases in capital costs required with the project. However, with the larger projected population associated with the project, operating costs would be greater than those expected without the project. The additional operating costs would result from

• For detailed annual projections on the service populations and requirements for human resource services, See Appendix Table L.16.

** Provincial Service Requirements and Costs for Proposed Community, Resource Planning Unit, E.L.U.C. Secretariat, Province of B.C., September, 1976.

the increase in staff members and the resulting increase in wages and salaries, as detailed in Appendix Table L. 16.

f) Cultural*

As indicated in Section 3.5, there are no standards available for most cultural services. Of the existing cultural services in the service study area, most have been developed by local residents in response to local demands and the availability of funds. As the population grows, the demand for cultural activities and other forms of entertainment would increase.

Library services, however, are based on standards developed by the B.C. Library Development Commission.** Without the project, it was projected that no additions to the existing library facilities and staff would be needed in the service study area up to 1990. With the project, some additional space would be needed for the Cache Creek library by 1982 with Scenario Two and one extra staff member would be needed in Ashcroft by 1982 with Scenario One. The Cariboo Thompson Nicola Library System has suggested that a temporary library in portable facilities could be placed at the construction camp to provide library services for the workforce living there.

Total capital costs for library services with the project have not been calculated. The operating costs are expected to increase with the project to 1990 as a result of increased staff and increased

* For detailed annual projections for library services, see Appendix Table L.17.

** British Columbia Library Development Commission. Standards for Integrated Library Systems, 1973.

user populations. The operating costs are based on \$8.00 per capita plus 20% to adjust for three separate locations.

Residents of the study area have expressed the desire for additional opportunities for other cultural activities in their communities. As with recreation resources, the initiation, development, and continuing support for these activities depends on community interest. As the population grows, the interest in, and the demand for, a variety of cultural activities and facilities will continue to increase, but it is not possible to predict the exact nature of this demand. As in the projections without the Hat Creek Project, it should be up to the individual communities to determine what cultural resources they would prefer in their towns.

g) Corrections*

As per capita standards are not applied in determining staffing requirements for probationary services in an area, it is difficult to make any projections for this service. As indicated in Section 3.5, staffing requirements are dependent on other characteristics such as community concerns, the number of transients in the area, the availability of recreation facilities and programs, and the amount of counselling provided by other services.

Without the Hat Creek Project, additional probation officers would not be needed in the service study area. With the project, however, it is likely that one additional part-time probation officer would be required by 1982 or 1983. Extra space would have to be provided for that person.

The capital costs for corrections services with the project would be the same as the 1976 capital costs since no additional facilities

• For detailed annual projections for corrections services, see Appendix Table L.18.

would be required. The average yearly operating costs would increase with the project as the result of increasing staff. As noted in Appendix Table L.18, the increased operating costs with the project include both the salary and extra leasing costs.

h) Courts*

Additional staff or facilities for the Ashcroft Provincial Court are not expected to be needed as a result of population increases to 1990 with or without the Hat Creek Project. As mentioned in Section 3.5, one sheriff is needed presently to provide services to the area including Lytton, Lillooet, Ashcroft, Cache Creek and Clinton. The same requirements were projected for the area with the Hat Creek Project.

No additional facilities will be needed to accommodate court services. Therefore, the capital costs up to 1990 with the project would be the same as those without the project. The annual operating costs would increase as a result of population growth associated with the project and subsequent demand for more court sittings. With the project, the operating costs would increase pro-rated to the growth of the service population, as calculated in Appendix Table L.19.

i) Legal**

There are no standards available for the provision of legal services

* For detailed annual projections for the costs of court services, see Appendix Table L.19.

** For detailed service population projections for legal services, see Appendix Table L.20.

in British Columbia. In the study area, it was suggested through discussions with members of the legal profession that the area could support at least one more lawyer up to 1990 without the Hat Creek Project. It is assumed that the same situation would occur as a result of the project.

The requirements and costs of legal services with the project have not been estimated.

j) Police*

As described in Section 3.5, additions have already been planned for the Ashcroft RCMP detachment. According to RCMP "E" Division Headquarters in Victoria, a new facility for the detachment is to be completed in early 1979.** The facility should be adequate to accommodate the needs of the detachment to 1990 both with and without the project. Two extra officers to be added to the Ashcroft police force over the next few years would be sufficient to meet the needs in the area to 1990 without the project.***

In addition to the two additional officers without the project, seven more RCMP would be needed to 1990 with the Hat Creek Project. It should be pointed out that these staff increases are for general duty officers only. Additional officers for highway patrol would also likely be needed. Also, one to two more general duty officers may be needed by 1981 or 1982 to service the Hat Creek construction camp.

• For detailed projections on police staff requirements and costs, see Appendix Tables L.21-22.

** RCMP "E" Division Headquarters, Victoria, B.C., 1977.

*** Officer in Charge, Ashcroft RCMP Detachment, 1976.

The total capital costs for the Ashcroft police services to 1990 would be \$750,000 for the new RCMP facility. The Hat Creek Project is not expected to generate any additional capital costs. The operating costs of the detachment are based on an average of \$35,000 per officer per year. Since the population growth associated with the project would exceed that projected without the project, staff requirements and therefore operating costs would be greater with the project. The annual calculations of operating expenses for Ashcroft are described in Appendix Table L.21.

No additional police officers would be needed up to 1990 without the project at the Clinton RCMP detachment. However, the Clinton detachment would need two extra officers up to 1990 with the Hat Creek Project. The existing facility space would be adequate over that time period to accommodate the needs of the RCMP both with and without the project.

The capital costs of the Clinton detachment up to 1990 would not increase with the project as a result of increased staff requirements, as described in Appendix Table L.22.

k) Fire*

Without the Hat Creek Project, there is no indication that any additional facilities or staff would be required in fire services up to 1990. The only changes required in the three communities with the project would be the possible addition of a full-time fire chief in Ashcroft under Scenario One, sometime between 1983 and 1987.

Both with and without the project, the total capital costs for fire services up to 1990 would be the same as the 1976 costs. The annual operating costs would increase in both cases because operating costs

* For detailed annual projections of fire services, see Appendix Table L.23.

are estimated on a per capita basis. The operating costs with the project would be higher than without the project, primarily because of the additional salary paid to the full-time fire chief required in Ashcroft under Scenario One, and because of the larger population associated with the project.

l) Communication*

As in the forecasts of service requirements without the Hat Creek Project, projections of staff and facilities for postal services have not been calculated, as any changes are determined on the basis of workload increases. In Section 3.5, it was pointed out that a new federal building has been planned for Ashcroft, and that facility would house the Ashcroft post office. When that facility is completed, additional staff could be required.

The capital costs of postal services with the project have not been calculated. The operating costs for postal services are based on a cost of \$50.88 per capita per year. Operating costs will increase in direct proportion to the population growth of the service study area, thus they are expected to be higher with the project than without it.

For other communication services, a radio transmitter and T.V. repeater may be required at the construction camp site. Otherwise, no additional transmitters or repeaters should be needed in the study area, with or without the project. The costs of radio and television services have not been projected.

m) General Commercial and Industrial/Service Commercial Facilities

In contrast to most other service elements discussed in this section, commercial, industrial and service commercial activities are privately-

* For detailed projections on service populations and requirements for postal services, see Appendix Table L.24.

owned and operated. As such, decisions pertaining to the creation or expansion of establishments in any of the local study area communities are made within the private sector. These decisions are based upon anticipated supply and demand factors and the overall economic viability of an establishment.

Because the creation or expansion of these activities affects the physical structure of a community, and because these activities are affected by the availability of suitable development sites, the discussion of these activities is included in Section 5.6, Community Development and Land Requirements.

5.6 COMMUNITY DEVELOPMENT AND LAND REQUIREMENTS

a) Introduction

Each of the local study area communities is projected to experience population growth to 1990, with or without the Hat Creek Project. This population growth would be accompanied by an expansion in the physical structure of the communities. Homes, commercial establishments, industrial buildings and service commercial facilities would be built to meet the needs of the growing communities.

The demand for projected space requirements would be met in part by expansions of existing facilities. However, the majority of the estimated building space needs would have to be fulfilled by the construction of new buildings. In each community, the projected demand for new developments is greater with the project than if the Hat Creek activities did not occur.

Projected space requirements can also be translated into demands for community land. Each type of building development would require sites which are vacant, suitable and available. These land requirements can then be compared with the available supply of land in each community as detailed in Section 3.6. In the following section, the supply and demand relationships of community land are assessed for each community both with and without the Hat Creek Project.

b) Residential Development

In Section 5.4, housing units by type were projected for each community based on different population forecasts. These units are translated into space requirements for residential development by applying various density factors to the different housing types. The density factors used for this assessment in each community are outlined in Table 5.6.1.

TABLE 5.6.1

AVERAGE DENSITY OF HOUSING
UNITS BY VARIOUS TYPES

<u>Housing Type</u>	<u>Dwelling Units per Gross* Hectare</u>
Single and two family	12.5 units
Mobile Homes	16.0 units
Townhouses/Rowhouses	29.5 units
Apartments	49.0 units

-
- A gross hectare includes space allocation for lots, roads, public open space, schools, and undevelopable areas. A net hectare includes space allocation only for the lots on which housing is constructed.

SOURCE : Urban Systems Limited, 1978.

(i) Ashcroft

The Village of Ashcroft would require between 275 and 900 new housing units to 1990. Of those attributable to the Hat Creek Project, it is estimated that in Scenario 1 this total would be 625 and in Scenario 2 it would be 270. Based on the division of these totals into housing type, the demand for residential land can be calculated. The projected space requirements to 1990 are presented in Table 5.6.2.

TABLE 5.6.2

VILLAGE OF ASHCROFT
SPACE REQUIREMENTS TO 1990 FOR NEW RESIDENTIAL DEVELOPMENT

<u>Housing Type</u>	<u>Without Project</u>		<u>With Project</u>			
	<u>Number of Units</u>	<u>Space Requirement (hectares)</u>	<u>Scenario 1</u>		<u>Scenario 2</u>	
			<u>Number of Units</u>	<u>Space Requirement (hectares)</u>	<u>Number of Units</u>	<u>Space Requirement (hectares)</u>
Single and 2 family	155	12.5	515	41	310	25
Mobile homes	65	4	205	13	125	8
Townhouses/ Rowhouses	15	0.5	45	1.5	25	1
Apartments	40	1	135	3	85	1.5
TOTAL	<u>275</u>	<u>18</u>	<u>900</u>	<u>58.5</u>	<u>545</u>	<u>35.5</u>

SOURCE : Urban Systems Limited, 1978

Based on the foregoing calculations, space requirements or land demand for residential development range from 18 hectares in the without case to 59 hectares in Scenario 1. Space requirements attributable to the Hat Creek Project are expected to be between approximately 17.5 hectares (Scenario 2) and 41 hectares (Scenario 1).

As described in Section 3.6, there are approximately 65 hectares of developable land suitable for residential use available on the lower benches in both South Ashcroft and North Ashcroft. There is also the potential for large scale urban expansion on the higher level benches both to the south and north of Ashcroft. Given the

maximum projected space requirements for new residential development (59 hectares under Scenario 1), the foregoing information would indicate that there would be an adequate supply of land on the more easily developable lower benches to accommodate the anticipated demand.

Although the foregoing information indicates that there is an adequate supply of vacant developable land for housing, it is important to note that under Scenario 1, approximately 40.5 hectares of serviced land would be required within the first four years following project commencement. In the short-term process of converting this amount of vacant developable land into serviced residential land, time lags and delays may arise. Potential delays would be attributable to one or more of the following factors :

- Delays in the development approval process by the municipality.
- Delays in the expansion of municipal infrastructure components required to serve new development areas.
- Delays in the installation of on-site services.

As outlined in Section 5.4, it would be physically possible to achieve the delivery of the required supply of serviced land. However, due to the very rapid rate of development required in the initial years after project commencement, some delays or time lags in the administrative process are likely.

These delays, during a period of rapidly growing demand, would be expected to add pressure on land and temporary accommodation prices, in the short run. In addition, temporary land shortages or upward pressures on land prices may alter the settlement distribution pattern that would otherwise occur. Land prices would stabilize in the long run as the rate of growth in demand declines.

(ii) Cache Creek

The approach used for calculating space requirements for new residential development in Cache Creek is the same as that outlined above for Ashcroft. Cache Creek would require between 150 and 775 new housing units to 1990, and between 265 and 525 of these would be attributable to the Hat Creek Project. The projected space requirements to 1990 both without the project and with the project are presented in Table 5.6.3.

TABLE 5.6.3

VILLAGE OF CACHE CREEK
SPACE REQUIREMENTS TO 1990 FOR NEW RESIDENTIAL DEVELOPMENT

<u>Housing Type</u>	<u>Without Project</u>		<u>With Project</u>			
	<u>Number of Units</u>	<u>Space Requirement (hectares)</u>	<u>Scenario 1</u>		<u>Scenario 2</u>	
	<u>Number of Units</u>	<u>Space Requirement (hectares)</u>	<u>Number of Units</u>	<u>Space Requirement (hectares)</u>	<u>Number of Units</u>	<u>Space Requirement (hectares)</u>
Single and 2 family	85	7	235	19	440	35
Mobile Homes	35	2	95	10	180	11
Townhouses/ Rowhouses	10	0.5	20	0.5	40	1.5
Apartments	20	0.5	65	1.5	115	2.5
	<u>150</u>	<u>10</u>	<u>415</u>	<u>31</u>	<u>775</u>	<u>50</u>

SOURCE : Urban Systems Limited, 1978

Space requirements for residential development range from 10 hectares to 50.5 hectares. Between approximately 17 hectares (Scenario 1) and 41 hectares (Scenario 2) for residential development would be attributable to the Hat Creek Project.

The evaluation of developable land presented in Section 3.6 indicated that there are approximately 109 hectares suitable for residential development in Central and East Cache Creek. In addition, with detailed site planning of the area south of Cache Creek, it is likely that after an adequate allocation is made for light industrial/service commercial land use, there would be certain residual areas ideally suited for residential use. Given the projected space requirements of a maximum of 50.5 hectares (Scenario 2), information would indicate that there is an adequate supply of land suitable for residential development in the immediate Cache Creek area.

However, similar to the situation outlined in the previous section for Ashcroft, there may be some delays or time lags in the process of converting vacant land into serviced residential land. It is expected that such delays would be most pronounced under Scenario 2 in the first four years after project commencement.

(iii) Clinton

Space requirements were calculated in similar fashion to those for Ashcroft and Cache Creek. As noted in Section 5.4, only two projections of housing units were made for Clinton. The number of housing units required was estimated to be 100 without the project and 270 with the project. It is expected that no townhouses or rowhouses would be constructed. Projected space requirements to 1990 are presented in Table 5.6.4.

TABLE 5.6.4

VILLAGE OF CLINTON
SPACE REQUIREMENTS TO 1990 FOR NEW RESIDENTIAL DEVELOPMENT

<u>Housing Type</u>	<u>Without Project</u>		<u>With Project</u>	
	<u>Number of Units</u>	<u>Space Requirements (hectares)</u>	<u>Number of Units</u>	<u>Space Requirements (hectares)</u>
Single and 2 family	70	5.5	190	15
Mobile Homes	25	1.5	65	4
Apartments	5	.1	15	0.5
TOTAL	100	7.1	270	19.5

SOURCE: Urban Systems Limited, 1978

Assuming development takes place at the densities previously described, space requirements for residential development attributable to the Hat Creek Project are expected to be approximately 12 hectares. If development were to take place at reduced densities, which would be consistent with existing development patterns in Clinton (e.g. 7.5 units per hectare for single family), it could be anticipated that total space requirements with the project would amount to approximately 31 hectares. Of that total approximately 18 hectares would be attributable to the Hat Creek Project.

The evaluation of developable land as presented in Section 3.6 indicated that there is a land area of approximately 40.5 hectares suitable for residential development on the sloping vacant land

lying below the B.C. Rail tracks immediately west of the existing development areas in the village. This would be more than an adequate supply of land to meet even the highest estimate with reduced densities (i.e. 31 hectares).

c) General Commercial Development

Decisions pertaining to the creation of new commercial space are made within the private sector. Experience in other communities has been that the response of the private market to potential opportunities arising from a population increase is quite unpredictable and there are no useful standards for prediction purposes. In addition, a review of planning literature indicates that there is no well-defined relationship between trade area population levels and commercial space provision (on a per capita to square metre basis). For these reasons, no attempt has been made to definitively project the specific establishments or the amount of additional square footage space which would likely be created to serve local community trading area populations. Rather, general consideration is given to the type of commercial establishments which may be created due to population increases, and to the amount of new commercial space required on an "order of magnitude" basis.

Without the project, the combined population of 3,200 in Ashcroft and Cache Creek is projected to increase to approximately 4,600 by 1990. As outlined in Section 3.5, it is unlikely that this population growth would justify the entrance of mini-department stores or national supermarket chains, but the retail depth in clothing lines, household appliances, groceries, and a few miscellaneous articles would likely broaden. Expansions of this nature are likely to result in an "order of magnitude" estimate of approximately 1,358 2,787 square metres of new commercial space.

With the project, the combined population of the two communities is projected to reach approximately 7,700 by 1990. In response to this increase in the trading population, existing businesses would expand and new businesses would be established to provide services similar in nature to existing facilities (e.g., small supermarkets, personal service establishments and variety stores).

In addition to an increase in the number of establishments providing services already available, it is probable that the broader range of commercial services and products would be made available to meet the demands of a trade area population of approximately 8,000. These new facilities and services might include :

- A small department store carrying a broader range of clothing, footwear, hardware items, sporting goods, household appliances, etc., than is presently available in existing facilities.
- Miscellaneous speciality retail stores such as radio and TV, sporting goods, carpet and floor coverings, photo supplies, sewing goods, clothing stores, etc.
- Finance, insurance and legal offices.
- Commercial recreation facilities such as bowling alleys, pool rooms and games arcades.
- Outlets selling large consumer durables, such as furniture and major household appliances.

It is also anticipated that a trend toward increased involvement in the commercial sector by regional or national chains would arise, both by setting up new establishments and by purchasing existing establishments owned by independent proprietors.

This expansion would substantially improve the commercial amenities of the local study area, would further reduce residents' dependence on the commercial facilities of Kamloops, and would likely geographically expand the Ashcroft/Cache Creek trading area.

With the project, an "order of magnitude" estimate of new commercial space likely to be created is approximately 5,574 to 1,432 gross square metres. This is roughly equivalent to the floor space of a neighbourhood or small town shopping centre serving a minimum population of 4,000, together with an allowance for expansion of existing commercial establishments.

This level and type of commercial expansion can be considered reasonable for the expected population increase in these communities. However, the rate of population growth and the competitive psychology associated with rapid growth would likely produce temporary adjustment difficulties such as over-expansion of commercial facilities during the early years of project construction and operation. This over-expansion would result in an initial dilution of expected income benefits to commercial establishments and probably produce relatively high ownership turnover during these years. This condition would be expected to stabilize after the construction period.

Whether this new commercial development would be concentrated in one community or evenly distributed between Ashcroft and Cache Creek cannot be predicted with certainty. Since there are no known constraints or restrictions to commercial development in either community, the effectiveness of village promotion for new commercial ventures would be a significant factor in location decisions.

Currently, Ashcroft dominates the shopping patterns for the trading area. However, the small shopping centre which has been proposed for Cache Creek would be more economically viable with the project

than without. In the event that it is developed prior to competing facilities in Ashcroft, it would bring about an alteration in traditional shopping patterns.

In Clinton, the population without the project is expected to increase from 800 to approximately 1,150 by 1990. Significant changes in the existing retail or service structure would not be anticipated. With the project, the population is projected to reach approximately 1,750 by 1990. An increase of this magnitude would likely increase the utilization of existing capacity and give impetus to the expansion of retail and service establishments providing goods and services required on a regular or convenience basis. Establishments marketing specialty goods and services or major consumer durable goods would not be likely to locate in Clinton in response to this population increase. Therefore, the demand for new commercial space would be minimal.

(i) Ashcroft

In evaluating the development of the general commercial sector, the communities of Ashcroft and Cache Creek were considered as a single trading area. Assuming that new commercial development would be evenly distributed between the two communities, approximately one-half of the "order of magnitude" estimates of gross floor area would locate in Ashcroft. This demand for commercial floor space is translated into land requirements in Table 5.6.5.

TABLE 5.6.5

VILLAGE OF ASHCROFT
SPACE REQUIREMENTS TO 1990
FOR GENERAL COMMERCIAL DEVELOPMENT

	<u>Without Project</u>	<u>With Project</u>
Type of Development	Expansion in existing central business district (CBD)	Expansion in CBD and/or possible development of neighbourhood shopping centre in North Ashcroft.
Approximate Gross Floor Area	929 - 1,394 sq. m.	2,787 - 3,716 sq. m.
Approximate Space Requirements	.3 to .4 hectares	.8 to 1.2 hectares without shopping centre. 2 to 2.8 hectares with shopping centre.

SOURCE : Urban Systems Limited, 1978

The space requirements for new commercial development are estimated to be about .4 hectares without the project and up to 2 to 2.8 hectares with the project. The amount of land attributable to the project would range from .4 to 2.4 hectares.

As noted in Section 3.6, the Central Business District (CBD) in Ashcroft, consisting of approximately 8 hectares (excluding roads), has a relatively low intensity of existing commercial development and many of the buildings are old. Therefore, there is potential for a considerable amount of redevelopment to take place in the Ashcroft CBD. There would be a more than adequate supply of land available to accommodate anticipated demands for commercial land either with or without the Hat Creek Project.

If a small neighbourhood shopping centre were to locate in North Ashcroft, only 1.2 to 1.6 hectares would be required. Land for this facility is available either on the west side of the highway or integrated into a new residential subdivision on the east side of the highway. Whether or not such a facility would be established in North Ashcroft depends largely on the perceived economic viability of such a facility by the private market, and municipal land use policies.

(ii) Cache Creek

Using the approach outlined for Ashcroft where it was assumed that new commercial development would be evenly distributed between the two communities, the following is an estimate of space requirements for commercial development in Cache Creek with and without the project. In either case, it is projected that new commercial development would take place primarily in response to perceived consumer demands of residents in the local trading area. New development in the highway commercial sector, which is presently the predominant form of commercial development in Cache Creek, is not anticipated. Space requirements for commercial development are shown in Table 5.6.6.

TABLE 5.6.6
VILLAGE OF CACHE CREEK
SPACE REQUIREMENTS TO 1990 FOR GENERAL COMMERCIAL DEVELOPMENT

	<u>Without Project</u>	<u>With Project</u>
Type of Development	Gradual expansion of existing establishments and modest increases in number of businesses providing goods and services of a similar nature to those presently available.	Expansion of existing businesses as well as probable establishments of a community shopping center.
Approximate Gross Floor Area	929 - 1,394 sq. m.	2,787 - 3,716 sq. m.
Approximate Space Requirements	.3 to .4 hectares	2 to 2.8 hectares

SOURCE: Urban Systems Limited, 1978

Projected commercial land demands for Cache Creek are similar to those for Ashcroft. Whereas only .4 hectares at most may be needed for space requirements without the project, there would be a need for 2 to 2.8 hectares with the project. The amount of land attributable to the project would be about 1.5 to 2.4 hectares.

As in Ashcroft, there is an adequate supply of land to meet the projected space requirements with or without the Hat Creek Project. In the preliminary draft of the community plan for the Village of Cache Creek, there are two vacant sites designated as potential shopping centres.

Provision in the plan is also made for further general commercial development along Quartz Road by means of redeveloping the older, mixed uses (residential, commercial, industrial) presently occupying this area.

(iii) Clinton

Space requirements for commercial development both with and without the project are expected to be modest, that is, considerably less than 2 hectares. It is recognized that a small shopping centre development with a space requirement of approximately 1 hectare is presently in the planning stage. Demand estimates would generally indicate that commercial space of that magnitude would be more than adequate to support the projected population increases.

Existing commercial development is generally concentrated along the Cariboo Highway. In this area, there is an adequate amount of vacant or underdeveloped land which would be suitable for commercial development, if the demand warranted.

d) Industrial/Service Commercial Development

In evaluating industrial/service commercial development to 1990 in the local study area, it is expected that mineral development activities will continue in the Highland Valley, but it is unlikely that new secondary manufacturing activities will be established. It is anticipated that the types of industrial and service commercial establishments likely to locate in the study communities would be classified into two categories:

- Establishments providing services to the local trading area population, e.g. building supply, ready-mix concrete, machine shops, automobile sales and service, bulk fuel outlets, trucking.
- Establishments providing services to local construction and mining activities, e.g. heavy duty equipment sales and service, tire sales.

The combined population of Ashcroft and Cache Creek, without the project, is projected to increase by 1,400 persons by 1990. Similar to the situation with the general commercial sector, it is likely that a population increase of this magnitude would provide an impetus for modest expansion of existing population-oriented light industrial or service commercial establishments. These activities basically service the local trading area population and Highland Valley mining activities, and include retail building supplies, bulk fuel outlets and machine shops. It is possible that an equipment sales and service depot might be established.

With the project, the combined population of these communities is projected to increase from 3,200 to approximately 7,700 by 1990. It is anticipated that there would be an increase in the number of population-oriented light industrial and service commercial establishments as well as a broadening in the scope and range of available services. For example, a trading area population of approximately 8,000 would likely support new industrial uses such as small scale warehousing, distribution and storage.

Although increased demand for new population-oriented light industrial and service commercial uses is anticipated, the amount of development which would take place cannot be predicted with certainty. On an "order of magnitude" basis, it is estimated that approximately 10 to 20 hectares of land would likely be required to adequately accommodate the demand for local population-serving industrial activities of both communities.

Similar to the general commercial demand projections, it is difficult to predict how the new light industrial or service commercial development serving the local population would be distributed between both communities. It is anticipated that adequate supplies of land for light industrial and service commercial uses will be designated in both the community plans which are being prepared. As such, no constraints or restrictions on the supply of land are anticipated in either community, and community promotion would, therefore, be a major determinant of industrial/service commercial location.

There are also currently light industrial or service commercial facilities which serve the local construction and mining activities. With the expected increase in Highland Valley mining activities, it is probable that new business-oriented light industrial or service commercial activities would be attracted to the area. Even without the project, establishments such as heavy duty equipment service and tire sales would likely find it economically feasible to locate in

the Ashcroft/Cache Creek area. These activities would represent a continuation of the existing mining orientation of the local industrial or service commercial activities.

With the Hat Creek Project, there would likely be a marginal expansion of these business-oriented facilities to serve the needs of the project's mining operation. In addition, new establishments of similar nature might be expected to consider a site in the project's immediate vicinity.

The space requirements for light industrial establishments catering to the local mining activities may require up to 40.5 hectares in total to accommodate the projected demand. It is anticipated that uses of this nature would most likely locate in the proposed light industrial area south of Cache Creek, primarily because of proximity to the Trans Canada Highway and the proposed access road to the Hat Creek site.

(i) Ashcroft

The space requirements for new development in the light industrial and service commercial activities were projected for the combined Ashcroft and Cache Creek area. It is assumed that most of this new development would be concentrated in Cache Creek.

It is considered unlikely that more than 50% of the new development serving the local trading area population would occur in Ashcroft, and there would be only a modest demand by industries serving the local mining or construction activities. As a maximum, the space requirements are projected to be less than 4 hectares without the project, and less than 12 hectares of new industrial or service commercial development with the project.

There are approximately 12 hectares of vacant land zoned for light industrial use on the lower bench adjacent to the CNR tracks in North Ashcroft. This area should be adequate to accommodate anticipated space requirements for development in the light industrial/service commercial sector, both with or without the project.

During the construction period, some light industrial activity associated with the trans-shipment of equipment and machinery from rail to trucks may take place if B.C. Hydro decides to develop CNR off-loading facilities at Ashcroft. If the development takes place in Ashcroft, approximately 3 hectares of land adjacent to the CNR in North Ashcroft would be required.

(ii) Cache Creek

It is assumed that space requirements for development in the light industrial and service commercial sector in Cache Creek would be relatively modest without the project. As described in Section 3.6, there is some unmet demand for industrial land in Cache Creek. In addition, at least one-half of the expected demand for new developments serving the local trade area population would be expected to locate in Cache Creek. Therefore, the projected space requirements for light industrial or service commercial activities without the project are less than 4 hectares. Projected space requirements for population-oriented industries with the project would range between about 6 to 16 hectares.

There would also be a demand for space to accommodate new businesses being established to provide service to the local mining activities. With the Hat Creek Project and other mining developments, up to 40.5 hectares of land may be required to accommodate this demand.

Within the existing boundaries of Cache Creek, there are no areas suitable for light industrial or service commercial development.

However, in the area immediately south of Cache Creek extending toward Boston Flats, there is a total of approximately 71 hectares of land which would probably be developed for light industrial or service commercial purposes if the demand warrants. The Village of Cache Creek has submitted a boundary extension application to the Ministry of Municipal Affairs and Housing to incorporate these potential development areas within the municipality. If this extension is permitted, there would be an adequate supply of land to meet the future space requirements with or without the project.

(iii) Clinton

In Clinton, the small population increase to 1990 projected without the project is not expected to cause any significant changes in the existing light industrial or service commercial sector. With the project, the population is projected to increase from 800 to 1,750 by 1990. A population increase of this magnitude would likely provide an impetus for modest expansion of light industrial or service commercial establishments serving the local trading area population.

Space requirements for light industrial and service commercial development in Clinton would be modest both with and without the Hat Creek Project. It is anticipated that in either case the space requirements for developments of this nature would be less than 4 hectares.

Within the existing municipal boundaries, there is a shortage of land suitable for new light industrial or service commercial development. There are, however, several areas immediately outside the municipal boundaries where adequate land suitable for this use could be made available if the demand warranted.

5.7 COMMUNITY AND REGIONAL INFRASTRUCTURE

a) Introduction

Projected increases in community population, social services and commercial/industrial facilities, both with and without the Hat Creek Project, would lead to an expanded physical structure in each of the local study area communities. As outlined in Section 5.6, there is generally an adequate supply of land to meet the expected space requirements of future growth. It must also be assessed, however, whether the physical infrastructure in each of these communities is capable of supporting this growth.

Each component of a community's physical infrastructure can be evaluated by its overall quality, life expectancy and rated population capacity. A summary description of the infrastructure in each community is provided in Section 3.7. In the same section, projections were made on the necessary improvements which would be required to service the projected population growth without the project. In addition, an extensive analysis of existing community water and sewer systems is presented in Appendix F, Sections F.1 and F.2.

The following section is based on the detailed information presented in Section 3.7 and Appendix F. In a summary fashion, this section consists of a comparative evaluation of the infrastructure requirements of each municipality under consideration both with and without the Hat Creek Project. In addition, there is a brief synopsis of the regional infrastructure changes which are expected to occur with and without the project.

b) Ashcroft

(i) Water System

The basic supply capacity of the existing Ashcroft water system is 3,100 persons. Without the project, population is expected to increase to approximately 3,000 by 1990. While the rated capacity of the system will be adequate to meet the needs of the projected population, some improvements are required to adequately service the existing population and the expected incremental growth. It is expected that the existing water intake on the Thompson River will have to be upgraded to correct present operational difficulties. Assuming that most of the new residential developments occur in North Ashcroft, improvements will also have to be made on some of the existing supply mains in the area. Furthermore, the Elm Street Booster Station will have to be reconstructed to provide adequate flow in the distribution system. These major improvements will be necessary by the mid 1980's without the Hat Creek Project.

With the project, the 1990 population is estimated to be between approximately 5,200 (Scenario 1) and 4,000 (Scenario 2). In either case, the projected population would exceed the supply capacity of the existing water system. In addition to the water system improvements required without the project, certain improvements would be attributable to the population growth associated with the project.

Much of the incremental population growth would locate on the Mesa Vista Bench, causing inadequacies in the system. Both the supply mains and the booster station would have to be upgraded. In addition, the existing storage capacity in the reservoir would have to be increased to improve the static pressure in the distribution system. These improvements would be necessary within a few years after the commencement of the project.

(ii) Sanitary Sewerage System

Without the Hat Creek Project, no improvements to the sanitary sewerage system will be required to accommodate population increases to 1990. The collection and treatment system has recently been upgraded to service a population of 5,000, and there is potential for increasing the capacity of the existing systems to service a population in excess of 6,000. The existing capacity is greater in South Ashcroft than in North Ashcroft; in the latter, rated population capacity is estimated to be 1,800.

Under both Scenarios with the project, the population levels in North Ashcroft would exceed the 1,800 level. As such, the collection system would become inadequate and upgrading of the Tingley Street Lift Station and the forcemain across the Thompson River bridge would be required. In addition, with extension of development in a northerly direction to the remainder of the Mesa Vista Bench area, a second outfall sewer main to connect to existing primary collectors on 6th Street in South Ashcroft would be required. The treatment plant has a capacity for a population of 6,200 and would be adequate to meet projected population levels.

(iii) Solid Waste Disposal

The common land fill site utilized by the Villages of Ashcroft and Cache Creek has adequate capacity to accommodate the projected population increases of both communities for the foreseeable future both with and without the project.

(iv) Roads

Without the project, the roads are expected to have adequate capacity to accommodate projected population increases to 1990. The roads should remain in good condition and major expenditures for upgrading will not be required to 1990.

Components of the roadway system likely to become increasingly congested with continuing development in Ashcroft include the Thompson River bridge and the access road to Mesa Vista Bench.

With the project, and in particular under Scenario 1, increasing congestion in these areas would make upgrading of the above roadway components desirable. However, unless a more detailed transportation study is carried out, it is not possible to define in precise terms the population levels at which upgrading would be required.

(v) Storm Drainage

No major trunk storm sewer facilities or upgrading would be required, in view of the general accessibility of natural drainage features. It is recognized, however, that several outfalls from the natural drainage courses to the river would be required. The modified storm drainage system, with the increased number of outfalls, would be adequate for all projected populations both with and without the project.

(vi) Timing

With the project, the required upgrading and expansion of the various infrastructure components as outlined above would generally have to be carried out in the first two to three years following project commencement. Given the nature and extent of the infrastructure upgrading required in Ashcroft, it is possible that the required upgrading could be carried out in a relatively short time period under ideal circumstances. With the present Hat Creek schedule, there is a distinct possibility, however, that delays or time lags would be encountered in the planning and arranging the financing of these expansions, particularly the securing of commitments for infrastructure grants from senior governments. Delays experienced in this expansion would contribute to the price pressures on land and accommodation previously mentioned.

c) Cache Creek

(i) Water System

The Cache Creek water system has a basic supply capacity for a total population of 1,800. As stated in Section 3.7, the major deficiency in the system concerns East Cache Creek, where there is insufficient pressure to supply new developments and inadequate fire storage reserves.

Without the project, the population is projected to increase to approximately 1,600 by 1990. There would be no need for upgrading the existing water system if new developments are directed to the vacant areas in the central portion of Cache Creek. Inadequacies in the water supply system in East Cache Creek would not need upgrading with limited new developments.

With the project, the population is projected to exceed the 1,800 level by 1990 under both Scenarios. Under Scenario 1, population would reach approximately 2,500, and under Scenario 2 it would increase to approximately 3,800. In both cases, the existing supply capacity of the system would be exceeded.

As a result of the project, investments in new facilities would have to be made. In particular, this would include a new water intake for the system and a new water reservoir to serve East Cache Creek. In addition, services would have to be extended to serve future light industrial/service commercial development areas immediately south of Cache Creek. Improvements would include a new supply main and reservoir.

(ii) Sanitary Sewerage System

Without the project, no improvements to the existing system will be required to serve the projected population to 1990. The treatment

plant has a rated capacity to serve a population of 5,000, and trunk main facilities have adequate capacity to serve potential development in each sector.

With the project, the projected populations under either Scenario would not exceed the capacity limits of the system. The only improvements required under both Scenarios would include a new trunk main to serve the future light industrial/service commercial development areas immediately south of Cache Creek. The cost and timing of this collection system expansion would depend on the extent of the development necessary to meet projected demands for new industrial/service commercial facilities.

(iii) Solid Waste Disposal

The common land fill site utilized by Cache Creek and Ashcroft has adequate capacity to serve the projected population increases of both communities for the foreseeable future both with and without the project.

(iv) Roads

As outlined in Section 3.7, major upgrading of the intersection of Trans Canada Highway and Cariboo Highway is planned by the Ministry of Highways. These improvements are required regardless of the extent and timing of population increases in Cache Creek and Ashcroft.

Without the project, requirements for upgrading of local roads will be relatively minor. The village is presently proceeding with plans to upgrade Quartz Road and Parke Road.

With the project, under either Scenario 1 or Scenario 2, improvements or upgrading of several local roads would be required. The main

access route (Quartz Road/Stage Road) to the east of Cache Creek would have to be upgraded. Under Scenario 2, it would also be necessary to extend this access route eastward to reconnect to the Trans Canada Highway at the east boundary of Cache Creek. Secondly, a new access route would have to be extended to the proposed industrial/service commercial area immediately south of Cache Creek. By the use of this route, access to the area east of the Trans Canada Highway would be gained without using the Trans Canada Highway. Finally, Old Stage Road north, past the drive-in theatre site, would have to be extended to connect into the Cariboo Highway at Parke Road.

(v) Storm Drainage

No major trunk storm sewerage facilities would be required, in view of the general accessibility of the natural drainage features. The existing or potential capacity of these facilities would be adequate to serve projected population levels both with and without the project.

(vi) Timing

Similar to the situation in Ashcroft, there may be some short-term delays or time lags in the community infrastructure expansion program. These delays would be most pronounced under Scenario 2 in the first two to three years following project commencement.

d) Clinton

(i) Water System

As noted in Section 3.7, the water supply for Clinton is considered to be inadequate due to insufficient Clinton Creek water licenses held by the village. Potential groundwater sources are being

investigated because of the impossibility of securing additional licensed diversion from the Creek.

The existing distribution system is generally adequate to service the projected 1990 population of approximately 1,200 without the project. However, additional storage at the source of supply (dam on Clinton Creek) will be required to ensure an adequate supply and improve the fire protection flow.

With the project, the population is projected to reach approximately 1,800 by 1990. In addition to the required improvements at the source of supply, some trunk main extensions would be required to serve the proposed new development areas in the western sector of Clinton.

(ii) Sanitary Sewer System

The service capacity of the treatment lagoons will accommodate a population between 1,800 and 2,000. However, the present Pollution Control Permit only authorizes a discharge from a population equivalent of 1,200. The trunk sewer main has a capacity adequate for a service population of 2,700. Without the project, therefore, no major improvements will be required to service the projected population increments to 1990.

With the project, the projected population level would not exceed the capacity of the treatment or collection systems. However, some improvements would be necessary to extend the collection system to service new developments. Similar to the situation with the water system, the extension of trunk mains would be limited to new development areas in the westerly sector of the village. Because of the favourable topographical features of the proposed new development areas, costs for extending trunk mains to these areas would be relatively low.

(iii) Solid Waste Disposal

The existing land fill site has adequate capacity to serve the Village of Clinton and surrounding areas for the foreseeable future, both with and without the project.

(iv) Roads

Without the project, no major roadway improvements will be required to serve the projected 1990 population.

With the project, and with expansion to the proposed new development area west of the community, a new access route would be required to serve this area.

(v) Storm Drainage

No major trunk storm drainage facilities are required either with or without the project, in view of the general accessibility of natural drainage features.

e) Regional Infrastructure

Regional infrastructure in this study includes public utilities and major transportation systems. Within the local study area, no major improvements or expansions of the existing utility systems would be necessary to service the increased demands of the projected population levels. Continuing development of the local study area, both with and without the project, would increase traffic on the area highway network.

The projected changes in the regional infrastructure to 1990 are discussed in this section. The potential effects of these changes are further discussed in Section 5.9, Social Environment.

(i) Utilities

As outlined in Section 3.8, consultations were made with B.C. Hydro, B.C. Telephone and Inland Natural Gas. In each case, it was concluded that there was sufficient capacity to provide adequate services to projected population increases both with and without the project. Each of the utility companies indicated that no problems are foreseen in providing the required additional services in the three municipalities under consideration. Each of the utilities emphasized, however, that considerable lead time is required to ensure there would be no delays in the delivery of new services during periods of rapid growth.

(ii) Transportation

A. Roads

Projected growth in traffic volumes on regional roads in the Hat Creek study region without the project was presented in Section 3.8. These projections are based upon current traffic flow data extrapolated to 1990 without the Hat Creek Project. In general, traffic volumes on Highway No. 1 in the vicinity of Ashcroft and Cache Creek are expected to decline between 1981 and 1990 as a result of the proposed Coquihalla Highway. Traffic volumes on Highway No. 97 and Highway No. 12 are projected to increase over the same time period.

The Hat Creek Project would increase both vehicular and truck traffic on the regional highway system and through local communities. Most of the anticipated increase in highway trips would stem from passenger traffic to and from the vicinity of the project, although trucks carrying materials and equipment to the project would also increase regional highway traffic flows during the construction phase.

Passenger traffic would be generated by the project's workforce. Workers residing in the Ashcroft, Cache Creek or Clinton area would commute to the project on a daily basis. Regional residents

accommodated in the Hat Creek Valley construction camps would likely commute by car to their family residences twice a week.* Many non-regional camp residents who live in other parts of the province would also drive home during weekends on a regular basis.

In addition, passenger traffic would be generated by evening trips for entertainment to and from the local communities. The volume of these trips is likely to be substantial, given the current camp recreation facility plans.

Truck movements associated with the project would approximate 50 vehicles per day.** For the most part, these vehicles would be moving from the railyard to the site.

Current access to the project is provided by Highway No. 12. However, as an alternative to Highway No. 12, B.C. Hydro has proposed to build a new access road by 1980. This road would intersect Highway No. 1 near the south Ashcroft connector and follow the Medicine and Cornwall Creeks into the project site.*** After 1980, this road would likely be used by most of the projected commuter, passenger and truck traffic, as it would provide a shorter route to Ashcroft and Cache Creek and is expected to be a better road than Highway No. 12. This new route would minimize potential noise and safety hazards on Bonaparte Reserve Nos. 1 and 2.

* Typical commuting days are Wednesdays and Fridays, as suggested by various construction union leaders during personal discussion.

** B.C. Hydro and Power Authority, "Hat Creek Environmental Studies, Off-Site Facilities", 1977.

*** Ibid.

However, traffic congestion would be expected during heavy commuting periods at the junctions of the proposed B.C. Hydro access road with Highway No. 1, and possibly still at the junction of Highway No. 12 with Highway No. 97. Without appropriate turning lanes and possibly signal lights on Highways No. 1 and No. 97, these intersections would present a potential safety hazard, particularly during peak summer traffic periods.

B. Rail

Without the project, no changes or additions to the existing rail network in the local study area will be necessary. With the Hat Creek Project, however, it would be necessary to construct a trans-shipping terminal at an appropriate point on the railway.

Most of the materials and equipment needed on the Hat Creek Project would be shipped by rail from suppliers. These cargos would then have to be trucked to the project site. In order to transfer these materials from the rail cars onto highway trucks, a special off-loading facility would have to be constructed near the railway. The off-loading facility would also be used as a temporary storage yard for materials and equipment pending further transport.

One possible site for the 3 hectare (7.5 acre) area would be in Ashcroft adjacent to the CNR line.* The trans-shipping terminal would require an additional spur track, an access road, an enclosed gravelled work area, an office building, and a stiff-leg derrick. This facility would generate increased train and truck traffic in Ashcroft, and subsequent minor increases in noise and safety hazards. The facility would also generate increased local property tax revenue and could possibly be used by other mining operations to reduce transportation costs on imported materials and equipment.

* B.C. Hydro & Power Authority, "Hat Creek Environmental Studies, Off-Site Facilities", 1977.

C. Air

The existing airstrip facilities in the local study area will not need expansion or major upgrading without the Hat Creek Project. As noted in Section 5.1, however, an improved airstrip facility would be considered a necessary off-site facility with the project.*

Three possible sites for the airstrip facility are being considered in the Ashcroft and Cache Creek area. All three sites are relatively close to the existing communities and to the project site. Expanded or improved airstrip facilities would benefit both business-related and recreational flights, and commercial users such as B.C. Telephone, the RCMP, and CP Transport. Increasing numbers of recreational flights are taking place in the central interior of B.C., and the improved facility would make the Ashcroft - Cache Creek area a more popular stop-over. On the other hand, however, the expanded or improved facility would generate some increased aircraft noise and would alienate some agricultural land uses. These impacts are expected to be minor.

* B.C. Hydro and Power Authority, "Hat Creek Environmental Studies, Off-Site Facilities", 1977.

5.8 LOCAL AND REGIONAL GOVERNMENT

a) Introduction

As a result of the Hat Creek Project, rapid population growth is projected for the local study area communities over the next decade. For these communities, and for Ashcroft and Cache Creek in particular, there would be a commensurate increase in the level and cost of required local government activity. The municipality's ability to maximize the benefits and minimize the costs of rapid population growth would be determined partially by the effectiveness of its development administration.

There are five main areas of responsibility which would likely require increased municipal government attention. These responsibilities include: development review and approvals process; infrastructure expansion and upgrading programs; new capital investment in community facilities and programs; general administrative and clerical organization; and operational and maintenance programs. Within each of these areas of responsibility, a number of new or revised activities would have to be undertaken to meet the needs of the growing communities.

In general, the need for increased governmental activities would result in changes in both the administrative and financial structures of each community. This section examines these general changes for the individual municipalities and the regional government.

b) Local Government Structure and Management

Each of the local government responsibilities mentioned above would require adjustments to accommodate rapid population change and the efficient management of community development. Each of these responsibilities would have to be examined in detail and fitted to meet the specific demands of the affected communities. However,

there are some general features which characterize the necessary changes in the local government structure and operation.

In the first place, there would have to be an increase in overall planning and preparation activities. For each of the local study area communities, an official community plan must be prepared and adopted, as well as the necessary implementation mechanisms, such as zoning and subdivision control bylaws. At present, each of the communities has retained consultants to prepare the community plans and the implementation bylaws. In addition, plans would have to be prepared which prescribe a program for the upgrading and expansion of community infrastructure, such as roads, water and sewer systems. Similarly, a master plan would be required for other community service developments, especially for the expansion of recreation facilities and programs.

Secondly, the local government staff would need to be expanded. While much of the detailed planning and design studies would be undertaken by consultants, the municipalities would need to increase their own technical staffs. This would include personnel to prepare planning and engineering studies, enforce bylaws, and review and process development applications. New or expanded recreation or other community service programs also would require additional staff. As the community infrastructure develops, there would be a need to increase the public works operating and maintenance staff. In addition, the growth and sophistication of the local government would require increasing the number and specialization of senior staff, possibly adding trained administrators, clerks or treasurers.

The decision-making process of the local councils would have to resolve such issues as the adoption of an official community plan, the timing, phasing and sizing of expanded infrastructure components, and the approval of new recreation facilities and programs. The local government structure and procedures may have to be altered

in order to reach timely decisions in these complex matters.

Finally, the local administrations will have to arrange financing and support for all new capital projects and service programs. The financial considerations are particularly important for the construction of new community facilities or infrastructure, but they also are important for operating costs of new or expanded programs. The financing arrangements will have an affect on the timing and scale of new facilities and programs required to meet community growth and development.

The preparatory activities required for municipalities to effectively carry out their responsibilities during the period of rapid growth are complicated and extensive. Given the nature of these activities, some time lags in the delivery of services and processing of development applications would likely result in the first several years of rapid growth. Even with a community plan and implementation bylaws in place, it is estimated that approximately one to one and one-half years of lead time would be required for each municipality to efficiently administer the project-related expansion. This lead time would enable the municipalities to initiate and complete changes and modifications required in the local government structure.

c) Municipal Finance and Budgeting Projections

A comparative evaluation of projected expenditures, revenues, assessments and tax rates has been carried out for each of the municipalities. In summary, the evaluation indicates that over the long term, both with and without the Hat Creek Project, each of the municipalities will be financially capable of carrying out its responsibilities without imposing unrealistic or excessive tax burdens on its local taxpayers*.

* For each utility, such as water or sewers, an excessive annual user fee or levy would be about \$150. See Section 3.9 for more information.

It should be noted, however, that with the project, the financial position of each municipality and the corresponding tax rates to residents would vary during different periods of population growth. It is likely that both Ashcroft and Cache Creek, during the first three to four years after project commencement, would experience increases in expenditures as local government structures and responsibilities expand. During this period, these municipalities would likely be faced with temporary fiscal difficulties, which in turn would be translated into short-term increases of 15% to 30% in municipal tax rates. As the role of population growth moderates, there would be a gradual reduction in the taxation levels, and eventually a new equilibrium between population levels and government financing would be reached.

(i) Approach to Projected Expenditures

In order to estimate future municipal government costs, municipal expenditures were divided into a number of different categories including general government, transportation, protection, recreation, etc. The historical annual expenditures for each municipality by these categories are presented in Appendix G. Costs were projected on a per capita basis for each category, and included both capital and operating costs. This projection method deviates slightly from present budgeting methods, where only operating costs are represented in each category, with capital costs for all categories aggregated into the fiscal services category. The base year for making the projections was 1976, and the per capita costs by category are obtained from Appendices G.1, G.5, and G.9. The per capita costs for previous years were also taken into consideration to ensure that there were no significant anomalies in the 1976 figures. In addition, expenditure patterns of other B.C. communities were also taken into consideration.

The general categories used for projecting municipal expenditures for each municipality are summarized briefly below.

General Government - This includes the costs attributed to the council and the overall administration of the council and municipality. During the period of rapid development, particularly within the first two to three years after project commencement, costs per capita would be expected to rise sharply, reflecting the required expansion of the municipal administrative structure in a very short time period to adequately handle the anticipated increased level of activity. Once the administrative structure has been expanded to the required levels, per capita costs decrease gradually to the existing levels.

Protective Services - This category includes fire protection and policing. Per capita fire protection costs are expected to remain relatively stable. Increases in population and municipal revenue would enable the purchase of additional fire equipment and hiring of additional personnel. When the population of a municipality reaches 5,000, as projected for Ashcroft in 1990 under Scenario 1, the municipality is required to take over expenses of policing, which amounts to approximately \$35 per capita per year.

Transportation - Annual costs per capita would likely remain relatively stable. Major upgrading of existing roads or extending roads into new development areas would be financed largely by grants under the Highways component of the Provincial Revenue Sharing Program, and by revenues derived by the imposition of Development Cost Charges. Improvements in the level of servicing (e.g. sidewalks, curb and gutter) are generally financed on a local improvement basis.

Recreation and Cultural - Trends in costs are relatively difficult to project on a general basis for each municipality, given the uncertainties associated with the provision of new facilities or services. With increases in population, it is

projected that costs per capita would tend to remain stable or even decrease, primarily because the capital and operating costs of some existing facilities, which have excess capacity, would be spread across a larger population.

Public Health and Welfare - Per capita costs for public health would likely remain stable as population increases. When the population reaches 2,500, the municipality is required to commence making contributions toward the cost of providing welfare and social assistance. The amount of contribution is established by the provincial government.

Environmental Development - This category includes planning, zoning and development management. During the first four to five years after project commencement, costs would be expected to jump significantly to a level commensurate with the amount of new development activity projected to take place. A decline in expenditures is expected when moderations occur in the rate of population increase and new development.

Fiscal Services - This category includes the short-term servicing of loans and bank charges. Costs per capita during periods of rapid development are expected to be significantly higher than costs after the rate of population increase moderates. While the costs per capita would be high during the first four to six years following project commencement, the long-term costs would decline to levels comparable to those projected without the project.

Other Services - This is a category used primarily for miscellaneous expenditures. Costs per capita would likely remain relatively stable.

Three other categories, typically included in the municipal expenditures, are not included in these projections. The

categories of environmental health, which includes garbage disposal and sanitary sewers, and water works, are considered separately since it is expected that these services would continue to be self-liquidating. The other category not included in the municipal projections consists of contributions to other agencies for which the municipality collects taxes, such as the School District, Regional District, etc.*

The projections of expenditures have been adjusted such that the capital cost components of the various expenditure categories reflect the net costs to the municipality. That is, the costs take into consideration both funds available from senior governments in the form of municipal infrastructure grants, and contributions from developers realized by implementation of a Development Cost Charge Bylaw. The availability of funds from these sources is expected to effectively reduce the effects of cost increases on the local taxpayer that would otherwise be associated with the construction of major infrastructure components required to accommodate the projected population increases.

(ii) Approach to Projected Self-Liquidating Services

In Section 3.9, a thorough evaluation of the financial aspects of providing community water and sewer services without the project was presented. For each of the municipalities, it was concluded that water and sewer rates required to finance the services would not be excessive. With the project, it is also projected for each of the three municipalities that user rates and charges for water and sewer services would not increase to levels which by provincial standards would be considered excessive**. This can be attributed to the following factors.

* School District cost and tax rate changes are assessed in Section 5.8 (g) while no change is expected in Regional District finances as a result of the project.

** Annual user rates and charges in excess of \$150 each for water and sewer services would generally be considered excessive.

Under the Provincial Revenue Sharing Program, the grant structure is set up in such a manner that the amount of assistance provided on an annual basis is adjusted according to the relationship between total annual debt retirement costs and the assessment base of the community. The formula* is structured in such a manner that annual debt retirement costs do not represent a disproportionately high share of total system costs (operating, maintenance, and capital). This assistance formula offsets some of the system's user costs and is particularly beneficial for smaller municipalities where sharp increases in user rates would normally arise as a result of major upgrading or expansion of system components.

Also, municipalities are now able to realize revenues to offset additional costs caused by new development by means of implementing Development Cost Charge Bylaws. The basic intent of a Development Cost Charge Bylaw is to ensure that new developments pay their own way, without imposing additional tax burdens on existing residents of the community. With a properly structured bylaw working in concert with an orderly and coordinated system upgrading program, it should be possible to maintain per capita debt servicing costs at a relatively stable level. Each of the three municipalities are in the process of preparing Development Cost Charge Bylaws as part of their community planning programs presently being carried out.

For operation costs, it is generally assumed that costs would rise in direct proportion to population increases. An exception to this generalization is likely, however, during periods of rapid expansion of the system components, as would be likely with the Hat Creek Project in Ashcroft and Cache Creek during the first four years following project commencement. This increase in per capita operating costs would be due primarily to increased manpower requirements. As population increases to levels for which the

* Grant is equivalent to .75 (annual debt retirement costs - amount derived by 2.5 mill levy).

system components are designed, per capita operating costs would likely drop to an equilibrium level similar to present levels and anticipated levels without the project.

For capital debt retirement costs, net costs to the municipality are derived by taking into consideration grants available from the provincial government and estimates of revenues by the imposition of development cost charges.

(iii) Approach to Projected Revenues from Non-Property Tax Sources

There are two primary sources of revenue available to the local governments. The most direct source of municipal revenue is the local property tax, where the total revenue collected is dependent on both the total assessments in the municipality and the tax rates. A larger source of revenue, however, is derived from grants or transfers from senior governments and other non-property tax sources. The revenues from non-property tax sources are projected on the following basis:

Grants in Lieu of Taxes - It is projected that revenues from this source, which are relatively minor, would increase in direct proportion to population increases.

Revenue Sharing Program - Grants from the province include a basic \$30,000 grant plus an amount derived by the Ministry of Municipal Affairs considering such things as population levels, expenditure levels, and assessment levels relative to the provincial average. Although the provincial funding formula is likely to change on an annual basis, the 1978 grants are assumed in this study to remain constant on a per capita basis for the duration of the projection period.

Infrastructure Grants - As previously noted, specific estimates of revenues in the form of infrastructure grants are not

presented. The grants are taken into consideration by means of estimating net capital costs to the municipality, which are equivalent to total annual debt servicing costs less revenues from senior governments in the form of infrastructure grants.

Municipal Incentives Grants - For each new dwelling unit which meets specific density and price criteria (i.e. medium and high density units), grants of \$2,000 per unit are made available to municipalities from the provincial and federal governments. It is assumed that this program will continue in effect for the duration of the projection period.

Revenues from Own Sources - This category includes licences and permits, rentals, return on investments, penalties and interest, and miscellaneous revenue. Revenues from these sources are expected to increase in direct proportion to population increases.

Development Cost Charges - Revenues from this source are not specifically estimated, but are taken into consideration when the net annual debt retirement costs to the municipality are derived.

(iv) Approach to Projected Property Assessment Levels

In projecting assessments and associated property tax levels, the assessment base of 1976 is used as a basis for projections. The reader is therefore cautioned against making a direct comparison with the projections contained in this report and actual assessment levels following implementation of the Assessment Amendment Act in 1978.

For the purposes of making projections, total assessments are broken into two broad categories - residential assessment, and

non-residential assessment (primarily commercial and industrial). It is projected that the residential component of the assessment base would increase in direct proportion to the rate of population increase. In the case of the non-residential component, it is projected that the present ratio of non-residential assessments to total assessments would remain relatively stable. As such, total assessments are projected to increase in direct proportion to the rate of population increase.

(v) Approach to Projected Tax Rates

The derivation of projected tax rates is based on the total amount of revenue required from property tax sources. This figure is equivalent to the difference between total expenditures and revenues from non-property tax sources. The projected property tax revenue requirements can then be divided by the projected assessment levels to derive the projected tax rate (in mills).

A. Ashcroft Projections

The municipal finance projections for Ashcroft both with and without the project are summarized in Tables 5.8.1, 5.8.2, and 5.8.3. These projections are based on the methods described in Section 5.8.c) above. In general, the per capita costs for the various categories of government expenditures would likely remain stable in the long run, both with and without the project. While the per capita costs would increase in the short term for general government, environmental development and fiscal services, these costs would be expected to revert back to present levels over the long term. Per capita costs for recreation expenditures would likely decline over the long term.

TABLE 5.8.1
VILLAGE OF ASHCROFT
PROJECTED MUNICIPAL FINANCES: WITHOUT PROJECT

	1978	1980	1982	1984	1986	1988	1990
Estimated Population	2,100	2,455	2,455	2,455	2,685	2,860	3,035
Projected Expenditures *(\$)	404,000	469,500	469,500	469,500	553,000	588,500	625,000
Projected Non-Property Tax Revenues *(\$)	229,500	284,500	263,500	263,500	299,500	317,500	337,500
Projected Revenue Requirements From Property Tax *(\$)	174,500	185,000	206,000	206,000	253,500	271,000	287,500
Projected Taxable Assessments *(\$)	4,935,000	5,769,000	5,769,000	5,769,000	6,310,000	6,721,000	7,132,000
Projected Tax Rate (Mills)**	35.4	32.1	35.7	35.7	40.2	40.3	40.3

* Constant 1976 dollars

** Average mill rate to obtain required property tax revenue from both residential and non-residential properties.

SOURCE: Urban Systems Ltd., 1978

TABLE 5.8.2
 VILLAGE OF ASHCROFT
 PROJECTED MUNICIPAL FINANCES: WITH PROJECT
 SCENARIO 1

	1978	1980	1982	1984	1986	1988	1990
Estimated Population	2,140	3,060	4,100	4,645	4,630	4,980	5,200
Projected Expenditures *(\$)	459,500	699,500	900,500	961,500	945,500	1,014,500	1,240,000
Projected Non-Property Tax Revenues *(\$)	233,500	384,000	497,000	523,500	491,000	545,500	563,000
Projected Revenue Requirements From Property Tax *(\$)	226,000	315,500	403,500	438,000	454,500	469,000	677,000
Projected Taxable Assessments *(\$)	5,029,000	7,191,000	9,635,000	10,916,000	10,916,000	11,703,000	12,220,000
Projected Tax Rate (Mills)**	44.9	43.9	41.9	40.1	41.6	40.0	55.4

* Constant 1976 dollars

** Average mill rate to obtain required property tax revenue from both residential and non-residential properties.

SOURCE: Urban Systems Ltd., 1978

TABLE 5.8.3
VILLAGE OF ASHCROFT
PROJECTED MUNICIPAL FINANCES: WITH PROJECT
SCENARIO 2

	1978	1980	1982	1984	1986	1988	1990
Estimated Population	2,115	2,715	3,160	3,395	3,515	3,765	3,965
Projected Expenditures *(\$)	437,500	600,000	672,500	696,500	721,000	770,000	811,500
Projected Non-Property Tax Revenues *(\$)	230,500	325,500	366,000	378,500	378,500	421,000	434,500
Projected Revenue Requirements From Property Tax *(\$)	207,000	274,500	306,500	318,000	342,500	349,500	377,000
Projected Taxable Assessments *(\$)	4,970,000	6,380,000	7,426,000	7,978,000	8,260,000	8,848,000	9,318,000
Projected Tax Rate (Mills)**	41.6	43.0	41.3	39.9	41.5	39.5	40.5

* Constant 1976 dollars

** Average mill rate to obtain required property tax revenues from both residential and non-residential properties.

SOURCE: Urban Systems Ltd., 1978

Revenues from non-property tax sources are projected to increase between 1978 and 1990, both with and without the project. Most of these funds are tied to the overall growth of Ashcroft, and are considered to be supplied at a relatively unchanging rate beyond 1978.

Although the municipal assessments may be altered by the implementation of the Assessment Amendment Act of 1978, the projected assessment levels are likely to increase in direct proportion to the rate of population increase. Therefore, the assessment totals are greatest in Table 5.8.2 (Scenario 1 With the Project) where the population growth is the largest.

In examining the different projected tax rates among the three future cases, the following observations are made.

Without the project, taxes are projected to remain relatively stable until 1986, when the population is expected to exceed 2,500. With the additional responsibility of welfare payments, the mill rate is expected to increase by approximately 13%.

With the project under both Scenario 1 and Scenario 2, tax rates are projected to jump sharply in the initial period following commencement of the project. Tax rates are then expected to gradually decline, reaching a comparable level with rates projected without the project in 1986.

With the project, tax rates under Scenario 1 are projected to be slightly higher in the first six years after project commencement than tax rates under Scenario 2. In 1990, a sharp jump in the tax rate under Scenario 1 would coincide with the increase in population to the 5,000 level, at which time the municipality would be required to take on the financial responsibility for providing police protection.

Water and sewer services have been excluded from the municipal expenditure projections because they are considered self-liquidating services. Estimated future costs of these services are discussed briefly below.

In 1976, the per capita costs for capital, operating and maintenance expenditures for water services were estimated at \$43.58. More recent expenditure data for 1977 and 1978 indicate a relatively sharp increase in operating expenses, and the 1978 total budget increased to \$131,395 or about \$62 per capita.

In 1976, the user rates for the water services were estimated at \$60 per year per residential user and about \$.50 per year per front foot, resulting in a frontage tax for an average residential lot equivalent to \$90 per year. Recent increases have resulted in user rates of approximately \$72 per year for a residential user and a frontage tax of about \$125 per year for an average residential lot.

Without the Hat Creek Project, per capita operating costs of the water system are expected to remain relatively stable. A capital works program for \$700,000 to remove existing deficiencies and to provide additional capacity for population increases would give rise to an increase in annual debt retirement payments of approximately \$20,000 per year (after provincial grants). Without any increases in population, this increase in total expenditures would necessitate a rate increase of approximately 15%.

With the Hat Creek Project, there would likely be a temporary increase in both operating and capital costs for the water services on a per capita basis during the first three to four years following project commencement. An increase in rates by a factor of 15% to 25% during this period is considered likely, and should be followed by a decrease to present levels after a new equilibrium in population is reached.

The sewer system is adequate to meet the needs of Ashcroft's population without the project. As stated in Section 3.9, municipal costs, and therefore user rates, are projected to remain relatively stable without the project.

With the project, given the nature of capital improvements required, it is anticipated that both operating and capital costs on a per capita basis would remain relatively stable. While there would be minor temporary increases in per capita capital costs during the first three to four years following project commencement, the long-term costs would approximate those without the project.

B. Cache Creek Projections

The projected finances for Cache Creek are presented in Tables 5.8.4, 5.8.5, and 5.8.6. Projections are made to 1990 both with and without the Hat Creek Project. The projections were derived in a similar fashion to those for Ashcroft.

The projected municipal expenditures would follow the general patterns described earlier in this section. For the most part, per capita expenditures by category would remain relatively stable over the long term. Similar to the situation in Ashcroft, there would be increases in per capita costs in the early years of the project, particularly in the categories of general government, environmental development and fiscal services. Costs per capita are expected to decrease gradually for transportation activities, particularly since many of the necessary road improvements would be supported by senior government grants or Development Cost Charges.

Non-property tax revenues are projected to increase along the lines of those in Ashcroft. That is, much of this revenue is assumed to be derived from existing programs and it is assumed that the provision ratios would remain constant over the projection period. These revenues would increase as population increases, but the overall annual sum is not directly proportionate to the size of the village population.

* TABLE 5.8.4
VILLAGE OF CACHE CREEK
PROJECTED MUNICIPAL FINANCES: WITHOUT PROJECT

	1978	1980	1982	1984	1986	1988	1990
Estimated Population	1,095	1,205	1,205	1,205	1,355	1,475	1,595
Projected Expenditures*(\$)	230,000	247,500	247,500	247,500	271,000	295,500	311,500
Projected Non-Property Tax Revenues*(\$)	116,000	133,500	126,500	126,500	150,500	161,000	175,000
Projected Revenue Requirements From Property Tax*(\$)	114,000	114,000	121,000	121,000	120,000	134,500	136,500
Projected Taxable Assessments*(\$)	4,347,000	4,760,000	4,760,000	4,760,000	5,298,000	5,723,000	6,125,000
Projected Tax Rate (Mills)**	26.2	24.0	25.4	25.4	22.7	23.5	22.3

* Constant 1976 dollars

** Average mill rate to obtain required property tax revenues from both residential and non-residential properties.

SOURCE: Urban Systems Ltd., 1978

TABLE 5.8.5
 VILLAGE OF CACHE CREEK
 PROJECTED MUNICIPAL FINANCES: WITH PROJECT
 SCENARIO 1

	1978	1980	1982	1984	1986	1988	1990
Estimated Population	1,110	1,465	1,910	2,145	2,185	2,380	2,525
Projected Expenditures*(\$)	250,000	319,500	390,000	429,500	438,000	476,500	545,500
Projected Non-Property Tax Revenues*(\$)	117,000	172,000	221,000	243,500	240,500	268,000	278,000
Projected Revenue Requirements From Property Tax*(\$)	133,000	147,500	169,000	186,000	198,000	208,500	267,500
Projected Taxable Assessments*(\$)	4,406,500	5,684,000	7,162,500	7,915,000	8,248,500	8,592,000	9,027,000
Projected Tax Rate (Mills)**	30.2	26.0	23.6	23.5	24.0	24.3	29.6

* Constant 1976 dollars

** Average mill rate to obtain required property tax revenues from both residential and non-residential properties.

SOURCE: Urban Systems Ltd., 1978

TABLE 5.8.6
VILLAGE OF CACHE CREEK
PROJECTED MUNICIPAL FINANCES: WITH PROJECT
SCENARIO 2

	1978	1980	1982	1984	1986	1988	1990
Estimated Population	1,135	1,810	2,850	3,395	3,300	3,595	3,760
Projected Expenditures*(\$)	265,500	421,500	652,000	725,000	719,500	757,500	792,000
Projected Non-Property Tax Revenues*(\$)	119,000	223,500	359,000	396,500	358,500	396,000	411,000
Projected Revenue Requirements From Property Tax*(\$)	146,500	198,000	293,000	328,500	361,000	361,500	381,000
Projected Taxable Assessments*(\$)	4,500,500	6,833,000	9,918,000	11,203,500	11,000,000	11,684,000	12,032,000
Projected Tax Rate (Mills)**	32.6	29.0	29.5	29.3	32.8	30.9	31.7

* Constant 1976 dollars

** Average mill rate to obtain required property tax revenues from both residential and non-residential properties.

SOURCE: Urban Systems Ltd., 1978

It is projected that the residential component of total assessments would increase in direct proportion to population increases. With significant population increases, the ratio of the non-residential component to total assessment would likely decrease somewhat from the presently high level of 62%. With the Hat Creek Project, however, it is probable that some service commercial/light industrial development would be established in the area immediately south of Cache Creek to serve demands created by the project itself. Developments of this nature would tend to maintain the non-residential assessment base at a relatively high level, thereby dampening the extent of the downward trend in per capita assessment which would be expected if new commercial development were limited primarily to serving the consumer needs of the local trading area population.

Without the project, tax rates are projected to remain relatively stable, with the possibility that slight decreases in tax rates would likely be realized after 1984. This situation would result from a growth in both population and projected taxable assessments.

With the project, it is likely that tax rates would jump sharply in the first year following project commencement, reflecting the rapid expansion of the local government structure required to adequately handle the increased level of development activities in the community.

With the project under Scenario 1, tax rates would be roughly equivalent to tax rates without the project within three to four years following project commencement. Under Scenario 1, the sharp jump in taxes in 1990 is attributable to the increased welfare expenditures required when the population reaches the 2,500 level.

With the project under Scenario 2, it is likely that the tax rates would exceed those projected without the project by an average

of approximately 30%. This can be attributed, among other things, to:

- with the population projected to exceed 2,500 under Scenario 2, the municipality would be required to make contributions toward the welfare function.
- with the population increases under Scenario 2, the per capita taxable assessment level would be expected to decrease somewhat.
- with the larger size of the municipality under Scenario 2, the less significant would be the effect of the basic \$30,000 grant given to all municipalities as part of the Revenue Sharing Program. For instance, in 1990 without the project, it is projected that the \$30,000 grant is equivalent to a tax levy of approximately 5 mills. On the other hand, with the project under Scenario 2, the same \$30,000 grant in 1990 is projected to be equivalent to a tax levy of 2.5 mills.

The water and sewer service costs for Cache Creek have not been included in the projected municipal expenditures. As self-liquidating services, the rates charged to users reflect the changes in both operating and capital costs.

Existing water rates in Cache Creek are relatively high (see Section 3.9). Information from village engineering studies indicate that with the upgrading required to accommodate population increases both with and without the project, although temporary increases may be necessary in the first three to four years, these increases would likely be relatively minor (i.e., less than 10%). These rates should return to a more moderate level, possibly even lower than existing rates, when an equilibrium between population and servicing capacities is reached.

Given the existing capacity of the sewer system, user rates both with and without the project would remain relatively stable. This is similar to the situation projected for Ashcroft.

C. Clinton Projections

The projected municipal finances for Clinton are presented in Tables 5.8.7 and 5.8.8 below. These projections are based on the same assumptions and approaches used for both Cache Creek and Ashcroft. Projections are made to 1990 both with and without the Hat Creek Project.

In general, the per capita expenditures by category would remain stable both with and without the project. That is, the projected municipal expenditures for each major cost category would remain relatively fixed on a per capita basis, and the total expenditures would be directly proportional to the population levels. The only category likely to experience an increase in per capita costs is recreation and culture.

Non-property tax revenue projections have been carried on a similar basis to that outlined in Section 5.8.c). The projected revenue would depend on the continuation of the existing revenue sharing programs and the revenues from other municipal sources.

The project assessment levels within the community would increase in direct proportion with population increases. In addition, it is likely that the existing ratio of residential to non-residential components of the assessment base would remain relatively constant with or without the project.

The projected changes in tax rates are drawn from the other components of the municipal finance projections. The comparison of these changes with or without the project is relatively straightforward, but a few considerations should be stressed.

TABLE 5.8.7
VILLAGE OF CLINTON
PROJECTED MUNICIPAL FINANCES: WITHOUT PROJECT

	1978	1980	1982	1984	1986	1988	1990
Estimated Population	810	810	1,155	1,155	1,155	1,155	1,155
Projected Expenditures*(\$)	117,000	117,000	175,500	175,500	175,500	175,500	175,500
Projected Non-Property Tax Revenues*(\$)	91,000	91,000	127,000	122,000	122,000	122,000	122,000
Projected Revenue Requirements From Property Tax*(\$)	26,000	26,000	48,500	53,500	53,500	53,500	53,500
Projected Taxable Assessments*(\$)	1,417,500	1,417,500	2,021,500	2,021,500	2,021,500	2,021,500	2,021,500
Projected Tax Rate (Mills)**	18.3	18.3	24.0	26.5	26.5	26.5	26.5

* Constant 1976 dollars

** Average mill rate to obtain required property tax revenues from both residential and non-residential properties.

SOURCE: Urban Systems Ltd., 1978

TABLE 5.8.8
VILLAGE OF CLINTON
PROJECTED MUNICIPAL FINANCES: WITH PROJECT

	1978	1980	1982	1984	1986	1988	1990
Estimated Population	820	975	1,595	1,710	1,675	1,725	1,735
Projected Expenditures *(\$)	120,000	142,000	254,000	272,500	268,500	274,000	275,000
Projected Non-Property Tax Revenues *(\$)	91,500	108,500	184,500	187,000	185,000	189,500	192,000
Projected Revenue Requirements From Property Tax *(\$)	28,500	33,500	69,500	85,500	83,500	84,500	83,000
Projected Taxable Assessments *(\$)	1,435,000	1,706,500	2,791,500	2,992,500	2,950,000	3,019,000	3,036,500
Projected Tax Rate (Mills)**	19.9	19.6	24.9	28.5	28.3	28.0	27.3

* Constant 1976 dollars

** Average mill rate to obtain required property tax revenues from both residential and non-residential properties.

SOURCE: Urban Systems Ltd., 1978

Without the project, the tax rates are projected to increase by approximately 6 mills when the population increases from 810 to 1,155. As outlined under the previous section dealing with Cache Creek, the effect of the \$30,000 base grant under the Revenue Sharing Program becomes increasingly significant, the smaller the size of the municipality. For example, with an estimated 1980 assessment base of \$1,822,500, a tax rate of 16.5 mills would have to be levied to raise \$30,000. On the other hand, with an increase in population between 1980 and 1982 and a subsequent increase in the assessment base to \$2,599,000, a tax rate of only 11.5 mills would have to be levied to raise \$30,000. This represents a differential of 5.0 mills.

Both with and without the project, the population would increase, and it is likely that the per capita expenditures on recreation and cultural services would increase slightly from the present relatively low level of \$21 per capita. This would also necessitate a slight increase in the required revenues from property taxes and an increased tax rate.

With the project, tax rates are projected to be only slightly higher (less than 2 mills) than tax rates without the project.

The water and sewer services in Clinton, as self-liquidating services, have not been included in the projected municipal expenditures. Estimated changes in rates are discussed below.

In Section 3.9, it was projected that without the project, user rates for water services would increase from a very low level to a more moderate range. With the project, given the relatively minor nature of the system upgrading required to accommodate projected population increases, it is anticipated that user rates would be approximately the same as these projected without the project.

d) School District - Finance and Budgeting

A comparative evaluation of projected expenditures, revenues, assessments and tax rates has been carried out for School District No. 30, encompassing all of the local study area communities. These projections have been made to 1990 both with and without the project.

(i) Expenditures

In projecting School District costs, it is necessary to divide costs into a number of categories in recognition of the varying methods of collecting revenues for each category.

Total Operating Costs - Total operating costs are equivalent to Basic Education Costs plus excess operating costs. In both cases, costs are assumed to increase in direct proportion to the increase in the number of students. The Basic Education Program, as defined by the Ministry of Education, includes all costs of administration, instruction, operation and maintenance, and conveyance. Any additional costs for these activities, which are in excess of those cost allowances established by the Ministry of Education, are considered as separate budgetary items.

Non-Operating Costs - This category includes contributions toward regional colleges. Costs are assumed to increase in direct proportion to increases in the number of students.

Debt Services - This category includes debt servicing costs for school facilities which are shareable under the provincial granting estimates for new facilities, as outlined in Table 5.8.9. For purposes of calculating incremental debt retirement costs in addition to existing costs, terms of repayment are assumed on the basis of a 25-year term with a 10% interest rate.

TABLE 5.8.9
PROJECTED CAPITAL COSTS
SCHOOL DISTRICT NO. 30

(\$)*

	<u>Without Project</u>	<u>With Project</u> **
1978	Nil	Nil
1979	47,000	126,000
1980	Nil	207,000
1981	87,000	269,000
1982	Nil	1,140,000
1983	Nil	1,017,000
1984	Nil	102,000
1985	73,000	12,000
1986	Nil	Nil
1987	71,000	152,000
1988	Nil	5,000
1989	Nil	5,000
1990	<u>105,000</u>	<u>81,000</u>
Totals	383,000	3,116,000

• Constant 1976 Dollars

** Capital costs for both elementary and secondary schools, based on the combined average cost for Scenario 1 and Scenario 2.

SOURCE: Cornerstone Planning Group Limited, 1978.

Non-Shareable Capital Costs - This category includes expenditures on equipment and building sites. Costs are assumed to increase in direct proportion to increases in the number of students.

A summary of total projected costs on an annual basis, with and without the project, are shown in Tables 5.8.10 and 5.8.11.

TABLE 5.8.10

PROJECTED ANNUAL COSTS
SCHOOL DISTRICT NO. 30: WITHOUT PROJECT

(\$)*

Year	Number of Students	Total Operating Costs						Total Annual Costs
		Totals =	Basic Education Program +	Excess Operating Costs +	Non-Operating Costs +	Debt Services +	Non-Shareable Capital =	
1978	2080	3,744,500	3,078,500	666,000	208,000	663,000	93,500	4,709,000
1980	2194	3,949,500	3,247,500	702,000	219,500	668,000	99,000	4,936,000
1982	2244	4,039,500	3,321,500	718,000	224,500	676,000	101,000	5,041,000
1984	2244	4,039,500	3,321,500	718,000	224,500	676,000	101,000	5,041,000
1986	2386	4,295,000	3,531,500	763,500	239,000	684,000	107,500	5,325,500
1988	2495	4,491,500	3,693,000	798,500	249,500	691,000	112,500	5,544,500
1990	2612	4,702,000	3,866,000	836,000	261,500	701,000	117,500	5,782,000

* Constant 1976 Dollars.

SOURCE: Urban Systems Limited, 1978.

TABLE 5.8.11

PROJECTED ANNUAL COSTS
 SCHOOL DISTRICT NO. 30: WITH PROJECT

(\$)*

Year	Number of Students	Total Operating Costs						Total Annual Costs
		Totals =	Basic Education Program +	Excess Operating Costs +	Non-Operating Costs +	Debt Services +	Non-Shareable Capital =	
1978	2105	3,789,000	3,115,500	673,500	210,500	663,000	94,500	4,757,000
1980	2560	4,608,500	3,789,000	819,500	256,000	696,000	115,500	5,676,000
1982	3210	5,778,000	4,751,000	1,027,000	321,000	837,000	144,500	7,000,500
1984	3500	6,300,000	5,180,000	1,120,000	350,000	949,000	157,500	7,756,500
1986	3485	6,273,500	5,158,000	1,115,500	348,500	950,000	157,000	7,729,000
1988	3695	6,642,500	5,469,000	1,182,500	369,500	966,000	166,500	8,144,500
1990	3805	6,849,000	5,631,500	1,217,500	380,500	975,000	171,000	8,375,500

* Constant 1976 Dollars.

SOURCE: Urban Systems Limited, 1978.

(ii) Financing

While projecting the expenditure budget is relatively straightforward, projecting revenues for School District No. 30 is a complicated procedure. Total costs are shared between School District No. 30 and the Ministry of Education, according to a number of different financing formulas. The proportion of total costs paid by each one will vary over time depending on the amount of revenue generated by School District No. 30. The existing financing structure in B. C. is intended to enable those School Districts with higher assessments to pay for a larger share of education expenditures than those School Districts with limited assessments.

In general, the revenues consist of transfer payments (in the form of government grants) and revenues obtained from property taxes. Where the Ministry of Education has established a fixed levy for various cost items, the difference between the amount of property tax revenue raised by the School District and the actual cost is financed by government grants. For cost items which are solely the responsibility of the School District, property tax rates must be set to cover all expected costs.

The financing projections in Tables 5.8.12 and 5.8.13 are estimated in equivalent mill rates, or annual taxation rates. The projected mill rates are given for revenue categories similar to those for the projected expenditures. The total mill rate can then be applied to the projected assessment values within the School District in order to estimate the total property tax revenue which must be supplied by the School District. Projected expenditures not met by projected School District revenues will be financed by provincial government grants. The formulae discussed below determine the equivalent mill rates required to generate the property tax revenues which must be financed by School District No. 30.

Total Operating Costs - Total Operating Costs are financed from government grants and property taxes. In addition, the Department of Indian Affairs pays tuition fees to School District No. 30 for Indian children attending schools within the District. In these projections, the amount received is assumed to remain constant at the current rate of \$250,000 per year.

For the Basic Education Program costs, the share paid by the School District in 1976 was equivalent to the amount raised by a levy of 32.5 mills. This levy is established by the provincial government and is subject to change over time. However, for projection purposes, this rate is assumed to remain constant. The School District share of these costs is therefore fixed at revenues derived for a 32.5 mill rate and costs in excess of this amount are financed by the Ministry of Education. For excess operating expenses, the School District is responsible for financing the entire amount. That is, the projected expenditures in this category must be paid by the School District from property tax revenues. The equivalent mill rate to finance these costs is obtained by dividing the projected annual expenditures in this category by the total assessments. As noted in Tables 5.8.12 and 5.8.13, these mill rates vary over time.

Non-Operating Costs - Non-Operating Costs are paid by the School District at a rate fixed by the Ministry of Education. At present, this share is equivalent to the amount raised by a levy of 1.20 mills, and costs in excess of this amount are financed by government grants. This rate is assumed to remain constant throughout the projection period.

Debt Services Costs - Debt Services Costs are financed by the School District according to an ability to pay formula. If total annual debt retirement costs are less than an amount equivalent to a levy of 12 mills, the School District is required to finance 50% of the expenditures. The equivalent mill rate can be estimated by dividing

one-half of the projected debt services costs by the total assessments.

If the total annual debt retirement costs exceed an amount equivalent to a levy of 12 mills, the share to be paid by the School District will be adjusted downwards. The annual mill rate equivalent financed by the School District will be equal to the amount raised by a levy of 4.5 mills, plus 10% of the difference between the budgeted costs and the amount equivalent to a levy of 12 mills, with the sum then divided by the total assessment.

Non-Shareable Capital Costs - Non-Shareable Capital Costs are financed by the School District. Property tax revenues must be generated to meet the entire annual costs for the budget item. Therefore, the annual mill rate equivalent is obtained by dividing the projected expenditures by the total assessments.

Summary data for School District No. 30 financing, both with and without the project, are presented in Tables 5.8.12 and 5.8.13. These tables provide projected annual tax rates rather than the total revenues generated by the property tax. These rates are applied throughout the School District, and each sub-area of the District will contribute an amount equivalent to its projected assessment value times the projected tax rate.

In Table 5.8.13, it is assumed that the assessed value of the Hat Creek Project will be included in the School District's assessments starting in 1984. Estimated school taxes which would be paid by B.C. Hydro were converted to an estimated assessment base for the Hat Creek Project by applying the projected tax level to the 1976 school tax levy of 47 mills.

one-half of the projected debt services costs by the total assessments.

If the total annual debt retirement costs exceed an amount equivalent to a levy of 12 mills, the share to be paid by the School District will be adjusted downwards. The annual mill rate equivalent financed by the School District will be equal to the amount raised by a levy of 4.5 mills, plus 10% of the difference between the budgeted cost and the amount equivalent to a levy of 12 mills, with the

Non-Shareable Capital Costs - Non-Shareable Capital Costs are financed by the School District. Property tax revenues must be generated to meet the entire annual costs for the budget item. Therefore, the annual mill rate equivalent is obtained by dividing the projected expenditures of the total assessments.

Summary data for School District No. 30 financing, both with and without the project, are presented in Tables 5.8.12 and 5.8.13. These tables provide projected annual tax rates rather than the total revenues generated by the property tax. These rates are applied throughout the School District, and each sub-area of the District will contribute an amount equivalent to its projected assessment value times the projected tax rate.

In Table 5.8.13, it is assumed that the assessed value of the Hat Creek Project will be included in the School District's assessments starting in 1984. Estimated school taxes which would be paid by B.C. Hydro were converted to an estimated assessment base for the Hat Creek Project by applying the projected tax level to the 1976 school tax levy of 47 mills.

TABLE 5.8.12

PROJECTED ANNUAL TAXATION RATES
SCHOOL DISTRICT NO. 30: WITHOUT PROJECT

Equivalent Mill Rates Based on Projected Revenue Requirements

Year	Projected Assessment Values * (\$)	Total Operating Revenues				= Total +	Non- Operating Revenues +	Debt Services Revenues +	Non- Shareable Capital Revenues +	Property Tax Revenues =
		Basic Education Program	+ Excess Operating Expenses	- Miscellaneous Revenues (\$250,000/Year)						
1978	43,189,000	32.5	15.4	5.8	42.1	1.2	4.8	2.2	50.3	
1980	44,419,000	32.5	15.8	5.6	42.7	1.2	4.8	2.2	50.9	
1982	45,023,000	32.5	15.9	5.6	42.8	1.2	4.8	2.2	51.0	
1984	45,023,000	32.5	15.9	5.6	42.8	1.2	4.8	2.2	51.0	
1986	46,093,000	32.5	16.6	5.4	43.7	1.2	4.8	2.3	52.0	
1988	46,938,000	32.5	17.0	5.3	44.2	1.2	4.8	2.4	52.6	
1990	47,751,000	32.5	17.5	5.2	44.8	1.2	4.8	2.5	53.3	

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* Figures given in constant 1976 Dollars and include assessments in the local study area communities and the rural areas. For projection purposes, the assessment values in the rural areas are kept constant and the assessments within the municipalities are increased at the rates projected without the project in Section 3.9

SOURCE: Urban Systems Limited, 1978.

TABLE 5.8.13

PROJECTED ANNUAL TAXATION RATES
SCHOOL DISTRICT NO. 30: WITH PROJECT

Equivalent Mill Rates Based on Projected Revenue Requirements

Total Operating Revenues

Year	Projected Assessment Values(\$)*	Basic Education Program	+	Excess Operating Expenses	- (\$250,000/Year) =	Miscellaneous Revenues	Total	+	Non-Operating Revenues	+	Debt Services Revenues	+	Non-Shareable Capital Revenues	=	Property Tax Revenues
1978	44,758,000	32.5		15.0		5.6	41.9		1.2		4.8		2.1		50.0
1980	50,010,000	32.5		16.4		5.0	43.9		1.2		4.7		2.3		52.1
1982	57,736,000	32.5		17.8		4.3	46.0		1.2		4.8		2.5		54.5
1984	168,365,000	32.5		6.7		1.5	37.7		1.2		2.8		1.0		42.7
1986	280,493,000	32.5		4.0		0.9	35.6		1.2		1.7		0.6		39.1
1988	336,267,000	32.5		3.5		0.7	35.3		1.2		1.4		0.5		38.4
1990	336,154,000	32.5		3.6		0.7	35.4		1.2		1.5		0.5		38.6

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* Figures given in constant 1976 Dollars and include assessments in the local study area communities and the rural areas. Including estimated equivalent value of Hat Creek Project for which school taxes would be payable and increasing assessments in the municipalities as projected with the project in Section 5.8.

SOURCE: Urban Systems Limited, 1978.

From the preceding tables, it is evident that, without the project, a very gradual increase in taxation rates is projected from 50.3 mills in 1978 to 53.3 mills in 1990. With the project, a short-term increase of 10% is projected from 1978 to 1982, followed by a sharp drop in rates from 1984 to 1990. Rapidly increasing costs during the period from 1978 to 1982 are not expected to be offset by assessment increases during the same time period, necessitating an increase in property tax revenue and the mill rates. Starting in 1984, however, with the B. C. Hydro generating plant coming on stream as a taxable improvement for school purposes, the assessment base is projected to increase very sharply. This large-scale increase in the assessment base will result in a sharp decrease in property tax levels well below existing rates, as well as rates projected without the project.

e) A Comparison of Tax Rates and Revenues With and Without the Project

(i) Introduction

In general, the taxable assessments and the tax rates determine the amount of property tax revenue available to the municipalities and School District No. 30. In the preceding analyses, the assessments and mill rates were projected to 1990 both with and without the Hat Creek Project.

Given the projected expenditures and revenues necessary to provide both municipal and school district services, and the expected taxable assessments, property tax rates have been estimated. It should be noted, however, that for general revenue property taxes, the rates are expressed as an average mill rate applied to both residential and non-residential assessed values. No distinction has been made between the residential and non-residential tax rates. The rates, therefore, do not reflect the projected tax burdens for property-owners, but rather the average mill rate for total assessed values.

(ii) Projected Taxable Assessments

Table 5.8.14 summarizes the projected taxable assessments for each municipality to 1990 both with and without the project. Without the project, the assessed values grow steadily in each municipality, with Ashcroft having the highest assessments and Clinton having the lowest. For each municipality, the assessments without the project are substantially lower than those with the project, reflecting the increased real values that would occur as a result of growth in both residential and non-residential developments.

With the project, Clinton would continue to have the lowest total assessed values, but Ashcroft would have the largest amount of assessments in Scenario 1 and Cache Creek would have the largest assessment base in Scenario 2. The growth in assessments in these two communities reflects the different population totals projected under each scenario. In all municipalities, the assessed values would about double between 1978 and 1990 as a result of the project.

(iii) Projected Property Tax Rates

Tax rates have been projected for both general revenue property taxes and for school district property taxes. A summary of these rates is presented in Table 5.8.15 below. The general revenue tax rates for each municipality include taxes applied to both residential and non-residential assessments, although the exact mill rate for each category may vary. For School District property taxes, the mill rate levy is the same for both residential and non-residential assessments.

Without the project, Ashcroft would have the highest rates between 1978 and 1990 and Clinton would have the lowest rates.

TABLE 5.8.14
LOCAL STUDY AREA COMMUNITIES
PROJECTED TAXABLE ASSESSMENTS:
WITH AND WITHOUT PROJECT

(\$000 1976)

	1978	1980	1982	1984	1986	1988	1990
ASHCROFT							
Without Project	4,935	5,769	5,769	5,769	6,310	6,721	7,132
With Project - Scenario 1	5,029	7,191	9,635	10,916	10,916	11,703	12,220
With Project - Scenario 2	4,970	6,380	7,426	7,978	8,260	8,848	9,318
CACHE CREEK							
Without Project	4,347	4,760	4,760	4,760	5,298	5,723	6,125
With Project - Scenario 1	4,407	5,684	7,162	7,915	8,249	8,592	9,027
With Project - Scenario 2	4,501	6,833	9,918	11,204	11,000	11,684	12,032
CLINTON							
Without Project	1,823	1,823	2,599	2,599	2,599	2,599	2,599
With Project	1,845	2,194	3,588	3,848	3,769	3,881	3,904

SOURCE : Urban Systems Limited, 1978

TABLE 5.8.15
LOCAL STUDY AREA COMMUNITIES
PROJECTED PROPERTY TAX RATES
WITH AND WITHOUT PROJECT

(Mills)

	1978	1980	1982	1984	1986	1988	1990
ASHICROFT							
Without Project	35.4	32.1	35.7	35.7	40.2	40.3	40.3
With Project - Scenario 1	44.9	43.9	41.9	40.1	41.6	40.0	55.4
With Project - Scenario 2	41.6	43.0	41.3	39.9	41.5	39.5	40.5
CACHE CREEK							
Without Project	26.2	24.0	25.4	25.4	22.7	23.5	22.3
With Project - Scenario 1	30.2	26.0	23.6	23.5	24.0	24.3	29.6
With Project - Scenario 2	32.6	29.0	29.5	29.3	32.8	30.9	31.7
CLINTON							
Without Project	14.3	14.3	18.7	20.6	20.6	20.6	20.6
With Project	15.4	15.3	19.4	22.2	22.2	21.8	21.3
SCHOOL DISTRICT NO. 30							
Without Project	50.3	50.9	51.0	51.0	52.0	52.6	53.3
With Project	50.0	52.1	54.5	42.7	39.1	38.4	38.6

SOURCE : Urban Systems Limited, 1978

Ashcroft's rates are projected to remain approximately twice as high as those in Clinton. For both these municipalities, the mill rates increase over time as a result of required property tax revenues growing faster than the assessments. For Cache Creek, the rates would increase slightly to 1984, and then decrease to 1990. By 1990 Cache Creek's mill rates would be comparable to those in Clinton.

The School District tax rates would increase only slightly without the project. The growth in rates would be steady to 1990, resulting in a mill rate about 6% higher than the 1978 rate. As this rate would be the same for all municipalities, regardless of assessment base or population, Ashcroft would provide the greatest amount of School District revenues throughout the entire period.

Under Scenario 1 with the project, the property tax rates would fluctuate in both Ashcroft and Cache Creek, and grow steadily in Clinton. During most of the 1978-1990 period, the general revenue mill rates would decrease in Cache Creek and Ashcroft as a result of project-related growth in taxable assessments. In 1990, the tax rate in Ashcroft would rise to a level higher than in 1978, primarily due to increased municipal expenditures incurred when the population grows more than 5,000; the rate in Cache Creek would be lower than the 1978 rate. In Clinton, the 1990 rates would be higher than in 1978 as a result of increasing expenditures and a relatively low initial tax rate.

Scenario 2 would result in similar trends in the municipal property tax rates. Ashcroft would still have the highest rates over the projection period and Clinton would have the lowest. In both Cache Creek and Ashcroft, rates would decrease steadily to 1984, and then alternatively increase and decrease to 1990, resulting in 1990 rates lower than those in 1978. These rates would reflect the large growth in assessments which would partially off-set increases

in municipal expenditures. Clinton's rates would grow as described under Scenario 1.

The School District property tax rates with the project would decline dramatically to 1990. While there would be initial increases in the mill rate during the first five or six years following project commencement, the rates would decrease considerably in 1984. This would result from the addition of the Hat Creek Project to the district's taxable assessments and the substantial property tax revenues paid by B.C. Hydro to the district. The 1990 rate would be 24% less than the 1978 rate.

In summary, the property tax burdens in Ashcroft, combining the general revenue mill rates with the School District mill rates, would be higher both with and without the project than the other municipalities. In Ashcroft, the 1990 combined property tax rate without the project will be 93.6 mills, increasing by about 7.9 mills over the 1978 rate. With the project, under Scenario 1, the average rate to a taxpayer would decrease from 94.9 mills in 1978 to 94 mills in 1990, as the increasing general revenue rates would be off-set by decreases in the School District rates. Under Scenario 2, the combined tax rates would decrease substantially between 1978 and 1990, primarily as a result of lowered School District rates. The combined tax rate in 1990 would be 79.1 mills compared to a 1978 rate of 91.6 mills.

In Cache Creek, the relatively static general revenue tax rates associated with the project would be off-set by the decreased School District tax rates. As a result, the average taxpayer would have lower mill rate levies with the project than without. In 1978, the combined tax rate without the project would be 76.5 mills; in 1990, without the project, this rate would have decreased slightly to 75.6. Under Scenario 1 with the project, the tax rate would decrease from 80.2 mills in 1978 to 68.2 mills in

1990, and under Scenario 2, these rates would be 82.6 and 70.3, respectively. The reduction in tax rates with the project would be attributed directly to the different school tax rates required with the project, compared to those required without the project. In Clinton, the combined tax rates with or without the project would be comparable until 1984. At that time, the rates with the project would be lower as a result of decreased school taxes. Over the projection period, the property tax levy without the project would be higher than that with the project. In the former case, the tax rate would increase from 64.6 mills in 1978 to 73.9 in 1990; in the with project case, the rate would be 65.4 mills in 1978, but only 60.2 in 1990. The general revenue tax rate increases associated with project-related population growth would partially off-set the decreasing school tax rates, and would keep the overall mill rate at a relatively constant level.

f) Present Value of Per Capita Tax Revenues Required

Given the projected taxable assessments, combined property tax mill rates and projected populations both with and without the project, it is possible to take out the effects of population growth on tax requirements by analyzing requirements on a per capita basis, and to examine tax changes on a dollar basis. It has been noted that property tax revenues are derived from both residential and non-residential assessed values. As such, the per capita tax requirements do not indicate the actual property tax burden for each resident, but simply identifies the amount of tax paid by all property owners on a standardized basis. The projected property tax revenues include both general purpose and School District tax rates.

In order to evaluate the comparative tax implications over time, both with and without the project, the projected future payments must be discounted into equivalent present values. This process permits the comparison of different payments occurring at different points in time in terms of their current value equivalent.

For this exercise, discount rates of 6%, 8%, 10% and 12% have been chosen.

Table 5.8.16 shows the estimated per capita tax requirements for Ashcroft, Cache Creek and Clinton from 1978 to 1990, both with and without the project. In addition, the table shows the present value of the cumulative per capita property taxes.

In both Cache Creek and Clinton, the cumulative present value of taxes per capita would be less with the project than without. The per capita tax revenues required in the first few years after project commencement would exceed those in the same years without the project. However, after 1984, the tax burdens would be lower with the project, primarily as a result of declining School District property taxes, than the expected taxes without the project.

In Ashcroft, however, the projected tax requirements per capita would generally be less without the project than with it. Even though the required tax revenues would be lower with the project after 1984, the relatively large per capita tax burdens associated with the early years of the project would lead to higher cumulative taxes than without the project. This difference in present value of the total taxes over the 1978-1990 period would be less in Scenario 2 as a result of smaller population increases and reduced general tax revenue requirements. Only in Scenario 2 with a 6% discount rate would the present value of taxes with the project be less than those without it.

TABLE 5.8.16
LOCAL STUDY AREA COMMUNITIES
PER CAPITA PROPERTY TAX REQUIREMENTS
WITH AND WITHOUT THE PROJECT
 (Combined General Revenue And School District Revenues)
 (\$1976)

								Present Value						
								(12%)	(10%)	(8%)	(6%)			
								1978	1980	1982	1984	1986	1988	1990
ASHCROFT														
	Without Project	201	195	204	204	217	218	220	739	812	897	999		
	With Project - Scenario 1	233	226	226	195	190	184	221	783	852	935	1035		
	With Project - Scenario 2	215	224	225	194	189	183	186	754	821	900	995		
CACHIE CREEK														
	Without Project	304	296	302	302	292	295	290	1079	1180	1301	1443		
	With Project - Scenario 1	318	302	293	246	238	226	244	1017	1104	1207	1329		
	With Project - Scenario 2	327	306	292	238	240	225	225	1023	1106	1207	1326		
CLINTON														
	Without Project	145	147	157	161	163	165	166	555	610	677	751		
	With Project	147	152	166	146	138	135	135	535	583	643	712		

SOURCE : Urban Systems Limited and Strong Hall & Associates Ltd., 1978

5.9 SOCIAL ENVIRONMENT

a) Introduction

The Hat Creek Project would alter the social environment of the local study area in a variety of ways. Changes in the quality and use of natural resources, the area's economic structure and pattern of development, and in the rate, nature and extent of population growth would alter the quality of life in the study area. The nature of the alteration and the extent of the effects would vary, depending on the stage of project development and the nature and timing of community adjustments to provide for the needs of the expanding population.

In the previous impact sections of this report, and in many of the other reports comprising the Hat Creek Detailed Environmental Studies, economic impacts, environmental impacts and the community expansions to accommodate project-associated population growth have been identified. Many of these changes, and the process of change itself, would alter the quality of life for area residents in the short and long term. Rather than introduce these social effects in the previous individual sections of this report, they have been brought together in total in this section.

Quality of life changes would primarily occur in the local study area, particularly Ashcroft, Cache Creek, the Hat Creek Valley and the Indian Reserves adjacent to the Valley. Minimal effects would occur among the regional population beyond the local area.

An extensive literature review of similar resource development situations, the results of the Resident Survey, informal field work in the area, and inputs from other consultants' reports provide the basic data sources for this analysis.*

* All references in Section 5.9 to Indian people are based upon Strong Hall & Associates Ltd. and Bob Ward Management Services, "Hat Creek Environmental Studies: Preliminary Inventory of Indian Socio-Economic Characteristics", B. C. Hydro & Power Authority, 1978.

b) Quality of Life Alterations Arising from
Changes in the Natural Environment

Over 70% of the residents interviewed in the Resident Survey* consider the local area a good or excellent place to live. The perceived favourable climate, minimal air and water pollution, and the accessibility to a variety of recreational resources are primary factors contributing to this attitude. Rural residents, ranchers and farmers demonstrate particular enthusiasm towards these aspects of their living environment.

Indian people on Reserves in the study area have a heritage that is integrally tied to the natural environment, encompassing the cultural, social and economic aspects of their way of life.

The Hat Creek Project would alter the character of the natural environment beyond what could be expected without the project, through the effects of various project components on land, water and air resources. These changes would differ from those expected without the project and would alter the amenities obtained from these resources and, thus, the quality of life for those individuals affected.

(i) Impacts Arising from Project Components
in the Hat Creek Valley

In the Hat Creek Valley and adjacent hills, the mine, thermal plant, waste dumps, temporary construction camps, roads, and the diversion of Hat Creek would result in an interrelated set of environmental changes, many of which would affect Valley residents and other users of the Valley. The resource changes that might have social implications include:

- reduction in the quantity and quality of agricultural, recreational and forest land
- reduction in the quantity and quality of wildlife habitat
- reduction in the quantity of groundwater supplies

* Cornerstone Planning Group, 1977. Residents of Indian Reserves not included in the Survey.

- increase in noise levels and alterations in noise characteristics
- reduction in the quality of the ambient air

The details concerning these environmental changes can be found in the specific environmental reports that comprise the program of environmental studies for the Hat Creek Project. These details will not be reiterated here, except when it is considered necessary for clarification.

A. Impacts Associated with Agricultural and Settlement Land Alienation

The project facilities in the Valley would alienate some lands which would otherwise be employed for agricultural uses or human settlement.* The alienation of these lands would be the primary cause of altering the level or source of livelihood for a few Valley ranchers, or in causing their relocation. At the present time, only one Valley family has relocated as a result of the project's pre-construction activity.

B.C. Hydro has extended an offer to purchase all Upper Hat Creek Valley property from those desirous to sell and a few land owners who do not live in the Valley have negotiated the sale of their Valley property to the Authority. A few other ranchers may sell during the pre-construction phase, or they may wait to make decisions until the construction or operating phases are underway. Some individuals may still sell their ranches and continue to operate them on a lease-back basis. Since the terms of sale and leaseback are confidential, it is not possible to determine whether these individuals would be more financially secure than they would have been without the project. However, some of the social implications of this land alienation process on the Valley community can be identified.

Canadian Bio Resources Consultants, Agricultural Report,
Hat Creek Detailed Environmental Studies, 1978.

Among the 30 to 40 people resident in the Valley, the project's demand for land and the negotiations necessary to effect its transfer have introduced a degree of uncertainty, anxiety and suspicion, often characteristic of potential expropriation situations. This distrust is essentially oriented towards the Authority.

At the same time, the process has appeared to further strengthen the sense of community apparent among Valley residents. Many families and individuals have developed strong, long-standing relationships which are reflected in their concern for the consideration received by families deciding to relocate. The relocation of individuals can be expected to produce a sense of loss in those who leave and those who remain. While this sense of loss would be felt by relatively few people, it must be considered very important to those involved.

Although some individuals would likely improve their financial position through this process, financial compensation in forced relocations, among individuals giving up long-standing attachments, is often perceived to not compensate for the total personal losses involved.**

For those residents not relocating as a direct result of land alienation and for the Indians resident near the project, other direct project activities altering the environment in the vicinity of the Valley would affect them to varying degrees and in a variety of ways.

B. Impacts Associated With Changes in Other Land Uses

As discussed above, the alienation of productive agricultural and settlement lands would reduce the viability of a few farms*** and result in some

* Appendix J. Resident Comments on the Proposed Hat Creek Mine and Thermal Generating Station.

** Wilson, J.W., "People in the Way, The Human Aspects of the Columbia River Project", University of Toronto Press, 1973, Chapter 15.

*** Canadian Bio Resources Consultants, op.cit., 1978.

families leaving the Valley. In addition, some forests and grasslands, as well as wildlife habitat in the northern end of the Valley, would be foregone for use by the mine, thermal plant and valley-located offsites. To Valley residents, it is unlikely that these alienations would represent any further income losses, but they might contribute to the overall reduction in the living amenities of the Valley.

It is reported that the game harvesting and trapping activities by local Indian people, in the area which would be affected by the project, are relatively small.* Therefore, impacts on consumption use and income in kind are expected to be minimal.

However, Valley residents and Indians are used to relatively unrestricted mobility throughout the Valley environs, notwithstanding land ownership status. This mobility in the outdoors is fundamental to their way of life. It is felt that restrictions on this mobility for those who remain in the area would be viewed as an important loss, even though the land surface alienated is small in relation to the total area within easy access to their homes.

C. Impacts Associated With Changes in Noise Levels and Characteristics

Noise levels in the vicinity of the project would be increased during the construction and operating phases of the project. The major contributors are indicated to be mining equipment and plant generator noise.**

Alterations in the general level of noise in the Valley would be audible within a distance of about 11,500 metres south of the centre of the coal pit, although, beyond 6,500 metres, the effects are

* Strong Hall & Associates Ltd. and Bob Ward Management Services, "Hat Creek Environmental Studies: Preliminary Inventory of Indian Socio-Economic Characteristics", B.C. Hydro & Power Authority, 1978.

** Harford, Kennedy, Wakefield, Ltd., "Noise Report, Hat Creek Detailed Environmental Studies", 1978.

considered insignificant. Intermittently, incremental noise levels at 11,500 metres would be moderately high, but not likely to awake a sleeping person.

Noise level alterations produced by the mine operation would be noticeable at six residences south of the pit.* Residents continuing to live north of Anderson Creek during the project, or individuals active in that area, would experience a constant background noise level of between 50 and 60 decibels, about double the existing noise levels. Changes in noise levels from both the mine and the plant would be noticeable by a few reserve residents on the southwest side of Bonaparte Reserve No. 1.

The effects of this general noise level alteration have been identified as being incompatible with residential use in two or possibly three residences in the Valley and for the southwest portion of Bonaparte Reserve No. 1. For other Valley and reserve residents, the effects are predicted to have some nuisance potential but are not incompatible with residential use.

However, as sensitivity to noise is a highly individualistic condition, families experiencing these impacts may still find the nuisance effects sufficient to warrant their relocation.

D. Impacts Associated With Other Resource Alterations

The development of the pit would alter groundwater supplies in the north end of the Upper Hat Creek Valley. Other project components would result in the draining of Finney and Aleece Lakes and the alteration of streamflows in a number of locations, including the diversion of Hat Creek and Medicine Creek. Water quality would be

* Ibid. This estimate assumes that the Ed Lehman ranch would be unoccupied as a result of land alienation.

reduced in Hat Creek downstream from the mine, resulting in attendant fishery losses.

Groundwater effects would not be experienced beyond 1,000 metres of the southern edge of the open pit and it is, therefore, unlikely that residents not relocating as a result of land alienation would experience any inconvenience or incremental water supply costs.

Surface waters, considered likely to be used for irrigation in the Valley in the future without the project, would be disturbed and their availability reduced in a number of locations.^{***} These small losses would reduce the viability of ranches already affected by land alienation, but would not likely affect any additional ranches in the area. A few additional operators in the lower reaches of Hat Creek and the lower Bonaparte drainage would find a small reduction in their potential future income through reduced availability of irrigation water. This reduction might affect future potential Indian agriculture on Bonaparte Reserve Nos. 1 and 2, but too little information is available on present or potential Indian agricultural activity to permit firm predictions.

The diversion reservoir, proposed for the Valley, might generate potential irrigation benefits from water supplies stored in the proposed Hat Creek reservoir. This potential benefit, however, is uncertain at the present time.

Water quality in Hat Creek downstream of the open pit would be reduced through sedimentation and possible chemical alteration. It is understood that the domestic water supply for the residents of Bonaparte

• Beak Consultants Ltd., "Water Resources, Hat Creek Detailed Environmental Studies", 1978.

** Canadian Bio Resources Consultants, op.cit., 1978.

Reserves Nos. 1 and 2 comes from wells drilled in the vicinity of, and probably using water from, Hat Creek. Because of lack of detailed information on, or access to, these wells, no predictions could be made as to possible changes in well water quality, as a result of the changes in water quality in Hat Creek. However, it is predicted that the Creek water would not meet the federally recommended limits for drinking water for four of the 15 appropriate parameters.

Fishery losses could occur in Hat Creek, and it is likely that Reserve residents fish the Creek for recreational and food purposes, and would, therefore, feel some impact.

These water resource and fishery alterations may affect the livelihood or recreational amenities of the area for a few of the area's residents. However, the symbolic importance of Hat Creek in the locational identity of residents, and the amenity it provides to their residences (as opposed to a more distant recreational resource) indicates that it might have some existence value to residents. Therefore, alterations in the stream and its fishery which would occur from this project might be perceived as an important loss by Indians and Valley residents.

E. Impacts Associated With Air Quality Changes

The air quality in the vicinity of the Valley would be altered by coal dust scattered during the operation of the mine and by air emissions from the operations of the thermal plant.

Total suspended particulates from fugitive dust emissions in the immediate vicinity of the mine are predicted to reduce visibility and, under certain conditions, to exceed the existing ambient air quality guidelines recommended for the protection of human health.* These effects

*

Environmental Research and Technology Inc., "Air Quality and Climatic Effects of the Proposed Hat Creek Project", B.C. Hydro and Power Authority, April, 1978.
Western Research and Development, "Epidemiology", B.C. Hydro and Power Authority, April 1978.

would be highly localized and would be generally more severe on Bonaparte Reserve No. 1 than to the south.

As with the noise effects, changes in air quality caused by increased dust particles would likely reduce residential amenities north of Finney Creek and on the Bonaparte Reserve No. 1. (Although increased dust effects would be experienced intermittently south of Anderson Creek and on Bonaparte Reserve No. 2, the effects would appear to have more nuisance and aesthetic implications than health or visibility implications.)

Air emissions from the thermal plant are not predicted to have detrimental effects on human health in the region, although it is acknowledged that for some emissions available research is either insufficient for prediction or research results are equivocal.* This uncertainty might reinforce existing feelings of apprehension over the air quality effects of the project, held by some residents, particularly during the early period of project operation. The report also does not predict long-term cumulative effects of trace element contamination.

The appropriate resource impact reports were examined for potential impacts on health through the consumption of, or contact with, vegetation, agricultural products, wildlife and fish.**

* Western Research and Development and Flow Resources Corporation, "Epidemiology Report", Detailed Hat Creek Environmental Studies, April 1978. (P.51)

** TERA Ltd., Hat Creek Environmental Studies - Wildlife Report, 1978.
TERA Ltd., Hat Creek Environmental Studies - Physical Report, 1978.
Habitat and Range Vegetation Report, 1978.
Canadian Bio Resources Ltd., Hat Creek Environmental Studies - Agriculture Report, 1978.
Beak Ltd., Fisheries and Bethnic Species - Impact Assessment, 1978.

However, none of these reports was able to draw definitive conclusions on the subject. The wildlife report did express concern about trace element and stack emission impacts and advised the establishment of appropriate monitoring programs. This recommendation should also, presumably, apply to the other resources, and/or appropriate further studies should be carried out as to the potential effects of air quality impacts.

It should be noted that, at several locations across Canada, severe health problems have been identified in Indian communities in recent years as a result of eating fish that had been contaminated by mercury pollution from industrial development projects (e.g., Kenora, Ontario; Stuart Lake, B.C.). While these developments might not be comparable to the Hat Creek Project, the issue has been of sufficient magnitude elsewhere to merit it being addressed specifically for the proposed Hydro project.

(ii) Impacts Arising from Project Off-Site Facilities

Off-site project components would also generate impacts on the social environment in the local study area through changes in the natural environment.

The proposed access road, pipeline and transmission line corridor would alienate small amounts of agriculture, forest and recreational lands, as well as cause some stream and fishery disruptions. The economic effects of these components would be minor, as demonstrated in Appendix C.3, Resource Evaluation. The social consequences also would be considered minimal.

A. Impacts Associated With the Proposed Airstrip

The proposed airstrip, either at Site A or Site C, would not likely generate significant noise impacts at the level of use identified in the short term. It would, therefore, be unlikely to generate significant negative social impacts in the short term.

Long-term changes caused by the airstrip would be dependent on the future rate and nature of use, and the future direction of residential expansion in the communities. Although Cache Creek residences are expanding towards the east at the present time, current Agricultural Land Reserve regulations applying to the area surrounding the Site C location would preclude expansion to potential high noise level areas.

Residents of all study area communities generally favour the addition of an airstrip to the area. However, it is likely that the benefits of the airstrip, given its non-commercial nature, would be primarily in the form of improved facilities for recreational and business flyers, as well as emergency medical flights. Although important to these users, the overall benefits would likely be small.

B. Impacts Associated With the Proposed Off-Loading Facilities

The off-loading facilities, if located at the CNR station in North Ashcroft, would increase the incidence of large trucks passing residential areas, parks and the elementary school in North Ashcroft, during the construction phase.

This increased vehicular traffic would generate both noise and congestion nuisance, and would raise the road safety hazard in this residential area. For these reasons, the increased truck traffic would be of concern to residents in the vicinity.

C. Impacts Associated With the Water Intake

Cooling water for the plant would be taken from the Thompson River just north of its confluence with the Bonaparte River. Since the water-intake system is located north of the confluence, the effects of the water intake on spawning in the Bonaparte River would be minimized. The construction activity will be timed so as to effectively eliminate all impacts to the pink salmon population.

However, the Fisheries Impact Report concludes that in a potentially worst case impact situation (i.e., none of the fish protection design features will be effective), there might be some losses of returning adult salmon from the Fraser/Thompson system. These losses would occur as a result of salmon fry entrapment in the water-intake system and possibly as a result of the proposed Bonaparte River crossings of the water-intake pipeline.*

One of the prime objectives of Federal Department of Fisheries' management programs is to ensure that sufficient fish return to spawn. The escapement into the river systems is maintained partly by controlling the total catch allowed to commercial fishermen. The escapement would also normally be set to allow for adequate Indian food fishing along the river system. If management works effectively, the projected loss of salmon due to the water intake would be felt by the commercial fishermen rather than by the local Indian people.

However, in a situation where returning escapement volumes are only sufficient to meet the spawning needs, it is possible that attempts would be made to reduce the volume of Indian food fishing along the river system. To the extent that this is connected with the loss of salmon fry to the water-intake system, the reduction in Indian food fishing would be a project impact.

On the basis of the limited information available on Indian subsistence fishing, it was estimated in the preliminary Indian inventory report that up to 19% of the total food consumed by the local Indian population might come from salmon fishing. This was estimated as having an income equivalent of up to \$400 per capita. The Indian population would, therefore, be very sensitive to impacts on the salmon food fishery.

*
Ebesco Services of Canada Limited, Environmental Consultants.
"Hat Creek Detailed Environmental Studies: Water Intake"
B.C. Hydro and Power Authority, June 1978.

The No. 1 booster pumping station for the proposed water-intake is about 90 metres (300 ft) from the nearest residence. Incremental noise levels from the proposed operating station would likely be a major annoyance to the 15 to 20 residents living in the immediate area.*

Although these residents have become accustomed to the intermittent train noises they currently experience, and do not consider them incompatible with residential use, the constant incremental background noise of the pumping station would likely be considered incompatible by them. If this attitude were generally upheld by the housing market, property values for residences in the vicinity of the pumping station would be expected to decline, and the present homeowners might suffer both financial and social hardship.

c) Quality of Life Alterations Arising From Changes in Economic Structure and Employment Opportunities

The Hat Creek Project would lower unemployment rates in the short term, create a large number of short and long-term employment opportunities, create employment opportunities for individuals wanting to enter the local labour force, and generate opportunities for individuals in the region to improve their employment positions and skills. These benefits would increase the sense of well-being of regional and local area residents. The project would also raise the prosperity expectations of many residents in the area, and many of these residents would be disappointed if their expectations were not realized.

Unemployment rates in the region are expected to decline as a result of employment created during the early construction and operating stages of the project. This reduction in local unemployment would contribute to increased personal and family security, and possibly relieve some people from the disruption of having to leave the area in

Harford, Kennedy, Wakefield Ltd., op.cit., 1978.

search of employment elsewhere. As a result, out-migration would decrease during the early period of the project.

During the wind-down of project construction, and later as the project's operating phase labour demands stabilize, unemployment rates would likely rise to their normal level in relation to other regions of the province. Out-migration would occur during this period until the equilibrium is established.

The total number of employment positions created by the project would be large in relation to expected employment levels without the project. However, the realistic employment opportunities for locals to work on the project are modest, given the relative shortage of required skills in the region and the hiring conditions of the B.C. Hydro collective agreements. Many of the direct, indirect and induced employment positions created by the project would be similar in nature to those currently existing in the region. The thermal plant operation would, however, present a variety of novel employment positions and, therefore, would provide opportunities for some members of the regional labour force to develop new skills.

Local residents have expressed, both formally and informally, a desire to participate in employment opportunities related to the project. During the Resident Survey, 20% of the women respondents, 50% of the students, and 60% of those unemployed, expressed interest in project-related employment opportunities. In addition, the Resident Survey indicated that about one-third of the students interviewed would like to stay and work in the area. Informal discussions with some community residents indicate that their employment hopes are high. While these types of expressed interest do not suggest a commitment to apply for work, they suggest that new employment opportunities are of concern to local residents, particularly students and unemployed persons.

Limited conclusions can be drawn from the above information but, combined with general attitudes of residents in many areas experiencing major resource development, it would suggest that if local residents did not receive at least some hiring preference for direct project jobs, a degree of resentment might arise.

At the moment, the only stated hiring preference for local residents appears in several of the construction union collective agreements likely to be in force during the construction phase. These agreements vary considerably in terms of the definition of "local" and they only apply to existing union members. It is doubtful that hiring preference of this type only would meet the desires of local residents.

Female employment on the project would likely be modest, but comparable to that of other mines and heavy industrial plants operating in the province. Substantially more women would be employed in the induced jobs and it is possible that the proportion of induced jobs to direct employment positions would expand marginally in the long term over those estimated in Section 5.1, through increases in the long-term induced employment multiplier.

Female participation rates have been growing steadily over the past 15 years reflecting the increasing interest and aspirations of women in traditional, as well as non-traditional employment. A level of unsatisfied employment aspirations, however, exist among women and it has been identified at the present time in the study area. In-migrant women would bring an added set of aspirations. It is unlikely that all aspirations would be fulfilled by the employment growth associated with the Hat Creek Project, especially those of more highly skilled women, and those desiring non-traditional work. However, it cannot be determined whether the proportion of unfulfilled aspirations would be greater with the project, than without it.

In general, increased employment opportunities would contribute to increased financial security, reduce out-migration and generally

increase the well-being of in-migrants and some local residents. However, unrealized expectations and unfulfilled aspirations might be experienced by some current residents and in-migrants alike, possibly contributing to individual frustrations.

d) Quality of Life Alterations Arising from Population Changes and Community Expansion

The project would result in a large and rapid population increase in the local study area, resulting in a variety of personal adjustments and inducing expansions in community social services, commercial goods and services, housing and community infrastructure. During the early years of project construction and operation, growth would be rapid, followed by a slight decline during the construction wind-down, and finally rising again to a fairly stable level by 1990.

Generally, the rapid growth period would produce short-term benefits associated with income and employment gains, but would also likely result in a variety of short-term reductions in the quality of life in the local study area through disruptions and overloading of service capabilities.

Over the longer term, income and employment benefits would continue, personal adjustments would normalize and new social patterns would emerge. Completed service expansions would provide a wider variety and greater choice over that likely to occur during the same time horizon without the project. The new physical character of the settlement communities also would be established. For most residents of the study area, these changes would lead to an enhancement in the quality of life. For some, however, the transformation in community life and character would represent a decline in their quality of life.

(i) Social Impacts in the Hat Creek Valley and Environs

The existence in the north end of the Upper Hat Creek Valley of the large, single-status construction population (peaking at an estimated

2,400 persons), creates the potential for social conflict with Valley and Reserve residents during the construction period. These potential conflicts may occur as a result of both work and leisure activities of the construction camp workforce.

The large incremental movements of heavy machinery and other vehicles would increase the safety hazard to people, livestock and wildlife in the north end of the Valley along the proposed access road. Both vehicular movements and the presence of a large number of construction personnel might raise the incidence of trespassing and property damage. A few incidents of this nature have already occurred, with the limited current activity levels in the Valley, and the likelihood of such incidences occurring would increase with the expected level of project construction activity.

The construction labour force is expected to work a five-day week at seven and one-half hours per day, giving them an amount of leisure time comparable to non-construction jobs, but more than is experienced on most large-scale construction projects. The large proportion of construction workers from the Kamloops area, and the accessibility of Kamloops, Prince George and the Lower Mainland, would encourage a high degree of weekend commuting. In addition, mid-week commuting from the construction camp to Kamloops is considered a likely possibility.

These activities would tend to reduce the amount of leisure activity spent in the study area, but would not eliminate it. Construction workers would be expected to engage in such activities as spring and fall fishing and winter snowmobiling in the vicinity of the Hat Creek Valley.

* There would be stringent firearm regulations at the camp, thereby reducing potential hunting activity by the camp labour force.

These activities likely would not be restricted to the north end of the Valley. The expected increases over current activity levels would likely be noticeable by Valley and Reserve residents; it would not only reduce the feelings of privacy among them but would increase the potential for similar conflicts to those mentioned above. For residents trying to maintain their life in the Valley in spite of the general environmental transformations occurring in the north end, the occurrence of these incidents would tend to further reduce the perceived livability of the area.

Both the presence of a large population in the construction camp and the visible signs of construction activity would be potentially disruptive to Valley and Reserve residents. The tensions and anxiety associated both with relocation or coping with the overall changes in the Valley environment might cause family problems among Valley area residents. Increased irritability and depression have been identified as family problems common to residents living adjacent to similar projects.

* Appendix M. Review of Comparable Projects,
Section 2.3.

(ii) Social Impacts in Local Communities

A. Effects of Short-Term Adjustments in Service and Infrastructure Expansion

Camp resident construction workers would pursue leisure activities in the communities, primarily Ashcroft and Cache Creek. Use of the local bars and restaurants, as well as playing fields, swimming pools and possibly curling rinks would be expected. Use of the commercial facilities would generally produce increased economic benefits to their owners, but would also result in periods of overcrowding to their users. For some local residents, crowding in recreation and entertainment facilities would reduce the overall quality of life in the communities in the short term.

Although the camp construction workforce would place some specific demands on community services and infrastructure, the in-migrant population settling in the communities would generate a much broader set of demands.

Demands for housing, services and appropriate infrastructure would grow rapidly as population growth occurred during the early years of the project. This population growth would almost inevitably result in short-term periods of either excess demand or excess supply, each with a different set of social implications.

Excess demand would arise if the provision of housing, services and infrastructure did not keep up with the needs of the incoming population. This situation might arise if governments provided services only in response to demonstrated demand, rather than in anticipation of need, or through a variety of potential delivery problems such as delays in the administrative and financing process. Excess demand might occur in the housing market, primarily through lags in the provision of infrastructural elements.

Excess demand for services would result in overcrowding and, in

some cases, a noticeable lack or shortage of services or facilities. These situations might increase anxieties and frustrations among resident and in-migrant service users, leading to more reliance on the services of Kamloops and possibly causing population turnover in the communities.

Of all the basic population needs, the availability of adequate housing appears to be the most essential issue for residents of growing resource towns. In similar growth situations elsewhere, many other community problems have been tolerated by residents as long as adequate and appropriate housing were available. Specifically, dissatisfaction with only a limited housing choice and the ability to pay for desired housing have been noted as problems.*

Housing choices would be especially critical for residents employed in the lower paying service sector jobs and for those households relying on one income earner. Conditions in the housing market would be an important cornerstone to the degree of tolerance that house purchasers would have during this short-term adjustment process.

The provision of housing in the study area is not expected to be constrained by the availability of land, financing or construction capabilities. The expected rapid growth in housing demand, however, might result in periodic shortages in the provision of serviced lots during the early growth period. In addition, the matching of available housing mix with the dwelling types demanded is likely to be fairly imprecise during this period.

Excess demands for housing and inappropriate mixes would put pressures on temporary accommodation, and introduce a further

* Appendix M. Review of Comparable Projects, Sections 2.1 and 2.2.

degree of anxiety and instability to in-migrants having to reside in temporary accommodation. Preferred settlement locations may be sacrificed for second-best alternatives, and increased in-migrant population turnover might occur.

Excess demands would also put pressure on individuals involved in the administration and delivery of services. The pressures caused by periods of excess demand are likely to be most acute among municipal staff faced with the broad tasks of infrastructure planning and implementation with an uncertain supply of funds. In a number of similar rapid growth situations, pressures on municipal staff and decision-making structures, resulted in higher staff turnover and subsequent replacement difficulties.*

In general, while situations of excess or unmet demand would likely affect a broad spectrum of the population, they would affect people with specific needs at specific times and would be short in duration.

Periods of excess supply might follow the provision of public services in anticipation of need or speculative pre-building in the commercial service or housing markets. Service supply in advance of demand would eliminate concerns of overcrowding or service shortages. However, public or commercial service provision in advance of demonstrated demand would not be without costs. These costs might be borne by specific groups or by the resident population at large.

* Appendix M. Review of Comparable Projects, Sections 2.1 and 2.2.

A limited group of private investors or entrepreneurs would be affected if income expectations were not realized as planned. Owners of businesses with insufficient working capital to survive this adjustment period would suffer financial and corresponding social hardship through business failure. These individuals are most likely to be the small, independent businessperson.

Excess capacity in public infrastructure and services would result in an increased municipal tax burden to existing residents and in-migrants during the early growth periods until the costs could be spread over a broader taxpayer base. This increased tax burden would reduce the private expenditure opportunities of these individuals, while they would receive little short-term service quality gain.

B. Effects of Long-Term Adjustments in Service and Infrastructure Expansion

Beyond the period of short-term adjustment problems, the long-term growth process would increase the number, variety and selection of commercial and social services available in the community. Adequate service delivery is generally an important component of personal and community well-being for many residents in the study area.* Increased choice and convenience of commercial and social services would be considered a beneficial effect of service expansion. Expansions to the physical and social services currently available in the communities would have to at least maintain the current delivery standards in order to satisfy existing local residents. On the other hand, any additions to the existing cultural, entertainment, recreation facilities and programs, shopping facilities and some medical services would generally be considered an

* See Section 3.10, Social Environment.

enhancement to the quality of life in the study area.

This overall process of population growth with service housing and infrastructural expansion would also affect the social environment by altering the physical character of the communities. The extent of expansion likely to occur in Ashcroft would transform the existing structural character of Ashcroft to one dominated by new facilities. The downtown core would see new buildings on currently vacant lots and in places where old, badly deteriorated and unutilized structures now exist. Worthy older buildings could be retained, provided the pressures to put the land to more economic uses are resisted.

Cache Creek would also experience substantial character change. The village would experience a more stable commercial strip and a further decentralization of commercial activity. An improved balance between highway service and local population service orientations would be obtained.

The increased population, physical size and new construction appearance of these communities would be viewed favourably by some and unfavourably by others. The Resident Survey indicated a strong local interest in growth. About two-thirds of the community population were in favour of a doubling of the population in a short period of time, recognizing the physical changes necessary to accommodate this rate of growth. At the same time, many residents value the small town, friendly atmosphere of the communities and some might leave if this atmosphere were changed substantially or actually lost.

It is not possible to determine whether these two concepts are incompatible. Certainly, the communities would still be viewed by many as small towns despite the long-run population levels projected as a result of the Hat Creek Project. The visual character changes and the increased activity levels would be positively viewed by many, but might be incompatible with the perceptions of small towns held by some residents, particularly

those of long-standing residence. For those viewing growth as undesirable, some would adjust to the new environment and physical structures of the town, while some might leave.

e) Quality of Life Alterations Arising from
Changes in the Social Condition

As discussed in Section 3.10, a wide range of attributes are used to describe the quality of life for residents in the region. These attributes were divided into two major groupings for the purpose of this study, the social setting and the social conditions. The quality of life alterations from changes in the social setting have been discussed throughout various sections of Chapter 5.

Alterations in the quality of life for Hat Creek area residents would also result from changes in the existing social condition. The major topic areas describing the social condition include: social problems; community stability; and community social structure. In general, the social condition of the study area considers the perceptual indicators of and from society as influenced by the physical environment and the social setting. Changes in the existing social condition which might arise as a result of the project are discussed below.

(i) Social Problems

The process of rapid change in small, rural areas brought about by large-scale industrial development often creates an atmosphere in which a general set of community problems can be expected to surface in varying degrees. It is not possible to identify the specific causes of these social problems as they are usually the product of combined stimuli.* Furthermore, it is not possible to

* Some of the contributing factors to social problems include increased transient populations, unfulfilled personal expectations, conflicts arising during periods of basic service shortages, direct conflicts with project elements, lack of activities to which one has become accustomed, value conflicts, role changes, and racial attitudes.

project for each community the specific problems that might arise, nor the extent to which they would occur. Much would depend on the extent to which the needs and demands of the in-migrants and residents are accommodated during the rapid growth period.

The types of problems which may occur in the local communities as a result of the Hat Creek Project have arisen in a number of other small communities experiencing rapid growth under similar circumstances. It is expected, therefore, that some of these problems might occur in the study area communities.

Some communities affected by large-scale industrial developments and consequent rapid population growth have experienced considerable increases in petty crimes, often in excess of the increases in their population during the years of rapid expansion.

The offenses most commonly noted were breaking and entering, larceny, disorderly conduct, and alcohol-related offenses, particularly impaired driving. This offense pattern is similar to that reported in the study area at the present time and is considered largely attributable to the level of transiency and juvenile delinquency which presently characterizes the area, particularly in Cache Creek.

The proximity of the construction camp labour force and the increased flow of transient unemployed job seekers, attracted by the activity but unable to participate, would tend to increase alcohol consumption in the study area communities. Due to the level of development activity and leisure-time facilities in Cache Creek and Ashcroft, most of the transiency and alcohol-related problems would likely be more visible in these communities. The non-visible and potentially more critical problem of increased alcohol consumption

• Appendix M, Review of Comparable Projects, Sections 2.2 and 2.3.

may occur in the private residences in all study area communities. Increased alcohol consumption might lead to further policing and family problems in the Hat Creek region, an area already beset by serious drinking problems.* Whether these problems would be exacerbated by the construction labour force or not, they would often be attributed to that source, particularly by residents opposed to the project.

A somewhat related problem reported in other areas experiencing rapid growth is an increase in juvenile delinquency. Increases in petty juvenile crime and difficulties with runaway girls later found visiting the construction camps have been experienced in some comparative situations.

The increased activity levels and transients in the communities would likely attract local juveniles to the source of the action, particularly given the lack of active evening recreation programs for local youth. Cache Creek, with its greater amount of restaurants and commercial entertainment facilities, would likely be the major centre for these types of problems.

In addition to alcohol abuse, transiency, and juvenile delinquency, other common outgrowths of rapid social change include increased cases of depression, alienation, marital breakup and child custody.** These problems would likely occur to varying degrees in the study area, and would likely increase the need for services handling problems of mental stress. At the present time, there is an identified lack of mental health and counselling services in the study area communities to handle these types of social and health problems.***

* See Section 3.10, Social Environment.

** Appendix M. Review of Comparable Projects, Sections 2.2 and 2.3.

*** Section 3.10, Social Environment.

Another social and health problem that has occurred in similar project development situations has been an increase in venereal diseases. Increases in temporary and transient populations often resulted in increases in the incidence of these diseases, unless adequate health controls were initiated. Related problems that might be expected to occur are those associated with drugs and prostitution. These problems would likely occur extensively during the early years of construction and decline during the post-construction period.

(ii) Changes in Community Stability

In the study area, the incoming population would affect the values of the long-time residents. If the newcomers arrive from more urban settings, it would likely be the rural and small town way of life that would be challenged. This learning process would start in the schools, where new students meet the local children, and extend from there to the families and the communities. New residents would likely question the values and assumptions of the established residents, possibly creating resentment and uncertainty and decreasing stability in the communities through the adjustment period.

Problems would arise if the issues result in coalitions of groups acting against each other, because of different lifestyles, occupations, or value premises. If the issues are resolved and the resentment dealt with during adjustment, the stability of that community would be improved.

Suspicion created by uncertainties related to the development of the Hat Creek Project would have an adverse affect on the stability of the study area communities in the initial years. In other project situations, perceived secretive approaches to land acquisition and the lack of public information on project developments have created anxiety and hostility in the residents and lessened

their sense of well-being.* This feeling already exists to some extent in the study area, especially with rural residents, as evidenced by the comments made to the researchers by some present area residents during the survey.**

The project would likely reduce the normal out-migration of youth from the study area during the short-term, through increased employment opportunities. It is likely that more young people would be able to remain living in Ashcroft, Cache Creek and Clinton than without the project, due to these increased employment opportunities, contributing to increased family stability. For similar reasons, some former residents might return and re-establish residency in the study area, also contributing to stability in the social situation.***

(iii) Changes in Community Social Structure

Housing differing groups of employees or management personnel and their families in isolated subdivisions or residential areas makes integration between newcomers and existing residents a difficult proposition. This relative segregation of individuals by occupation or employer often creates a stratified community.**** In the study area, the degree of social stratification in the towns would be affected by the location and tenure of housing developments built for Hat Creek Project employees. The results of such social

* Appendix M, Review of Comparable Projects, Section 2.2.

** Section 3.10, Social Environment.

*** Appendix J, Resident Comments on the Proposed Hat Creek Mine and Thermal Generating Station.

**** Appendix M, Review of Comparable Projects, Section 2.2.

stratification would be that, while the different groups might meet during various community activities or functions, individuals would likely not mix, preferring their own friends, who would be primarily those people they knew through work. This condition already exists in the study area and, if encouraged, would make the integration of newcomers more difficult.

The roles of key individuals within the communities would be altered if the Hat Creek Project proceeded. Some existing residents might feel threatened initially if their social positions, involvement on appointed boards, or other non-elected roles were challenged. Some existing residents, who might not favour the project, would likely feel estranged from other residents interested in the benefits and needs associated with the project-related incoming population. It is projected that ranching and rural populations in the study area would feel a loss of position in the communities, especially those who frequently utilize Cache Creek and Ashcroft.

It could take several years before the new residents begin to participate to any degree in the community and its activities. This is particularly true of the incoming residents' involvement in the local voting or election process. Once the new residents do become involved, however, the leaders at the elected levels might shift from those preferred by the long-time residents to those preferred by the new residents.

Over time, new organizations would be formed to meet the needs of community residents, new events and activities would be available for residents, and new members would have increased the size of some existing organizations. The overall increase in population would also allow some organizations to become more self-supporting and economically viable than with a smaller population. In general, this increased social and organizational activity would be manageable and beneficial to most residents, increasing the quality of life in the communities and leading to more complete integration of different resident groups.

In addition to these general comments on changes in community social structure, some specific observations can be made for each of the study area communities.

Ashcroft would experience the greatest increase in population and related changes in the social structure under Scenario 1. Other communities with similar growth situations have noted an increase in the turnover of residents and a reduction in the proportion of long-time residents compared with newcomers; this would be the case in Ashcroft. However, because a substantial portion of the established residents already are involved in mining activities, in-migrants associated with the Hat Creek Project might be more accepted in Ashcroft than in areas which lack an understanding of mining populations. The similar economic background of the incoming and existing populations would likely contribute to stabilizing the social structure of Ashcroft more quickly than in other communities in the study area. However, social stratification has already occurred in Ashcroft and, as the precedent is set, the housing situation associated with the project might reinforce the separation of mining families from other town residents. If this occurred, the community may become even more stratified and possibly lengthen the process of community integration and stabilization.

With the project, some rivalry would likely continue to exist between Ashcroft and Cache Creek. This would be healthy for the community cohesion and identity of both towns, provided that the competition is directed to non-overlapping activities or services. If the competition leads to increased service delivery problems or costs caused by unnecessary duplication of programs and facilities, the rivalry would become disruptive and might lead to hostile feelings between the populations.

Cache Creek would become dominated by new groups during the construction phase of the project. This would occur as a result of the large influx of new residents and the use of the community's entertainment and commercial facilities by the non-resident construction workforce.

This might lead to resentment by some local area residents who normally frequent the facilities in Cache Creek. Some of these residents would either seek new places that are not frequented by newcomers or would not go out, preferring to maintain established friendship patterns by socializing with their friends at home.

The young people of Cache Creek would likely be curious about the newcomers in their neighbourhoods, at school, and in the town. Depending on the nature of the social contacts between existing residents and the in-migrants, stratification and conflicts might emerge between youth groups or integration and stability might arise as a positive result of the stimulus of cultural diversity.

Initially, the image of Cache Creek to its residents would change considerably, resulting in a temporary loss of community identity.

The shift in employment structure would be significant in Cache Creek. The in-migrant construction and operating workers would likely be paid higher wages than those employed in the service sector, and the latter group might develop some resentment towards the higher income groups. However, the service sector population would likely be united in its efforts to support the development and growth of Cache Creek, contributing to increased social cohesion and a new sense of community.**

In Clinton, the existing trends towards social instability and stagnation have been created by the decline in population. With the project-related employment, these trends would be arrested as there would be an influx of new population and existing residents would have improved opportunities for remaining in the area.

* Appendix M. Review of Comparable Projects, Sections 2.2 and 2.3.

** Section 3.10, Social Environment.

(iv) Changes in Indian Cultural Identity

The project would result in a large increase in the numbers of non-Indian people in the study area. Thus, the Indian people would become an even smaller ethnic minority than they would be over the projection period without the project.

The possibility exists of further erosion of Indian racial integrity as a result of interracial relationships and marriages. The large number of unattached males attracted to the area during the construction period, and the general increase in the non-Indian population in the study area communities, would likely result in an increased occurrence of interracial personal relationships.

Although these relationships may be positive or negative on an individual basis, taking a wider view, it could be argued that any such relationships which result in the enfranchisement of Indian women through marriage, their leaving the Reserves to preserve relationships, or the dilution of Indian blood, where such relationships produce mixed blood children, are detrimental to the maintenance of the Indian culture and race.

The further encroachment of non-Indian society and industrial development on the local Indian communities represent another step away from the traditional Indian lifestyle. The potential for land-based activities such as hunting, trapping, fishing and wilderness use would be reduced. Certain of these activities are not pursued to any great extent by the local Indians, but the potential for doing so in the future would be eroded, and that is probably important to the local Indian population.

Information for this summary based upon Strong Hall & Associates Ltd. and Bob Ward Management Services, "Hat Creek Environmental Studies: Preliminary Inventory of Indian Socio-Economic Characteristics", B.C. Hydro & Power Authority, 1978.

Without specific measures being taken to strengthen the ability of the local Indian people to withstand the increased pressures on their cultural identity through the project's attraction to the area of non-Indian society, it is likely that their sense of cultural identity would be eroded.

f) Summary

With the Hat Creek Project, it is likely that some changes would occur in the natural environment, economic structure, lifestyles, attitudes and overall quality of life of the residents in the Hat Creek region. Because these changes would result from a number of interrelated factors, projections about the range and scope of quality of life alterations are difficult to specify with certainty. While professional judgement is a necessary component of the forecasting process, most of the projections are drawn from residents' comments, analyses of background data and relevant comparative examples, a review of pertinent literature, and interpretations of the specific natural, economic and social structure of the region.

(i) Effects of Changes in Natural Environment

In general, residents in the Hat Creek Valley would be most affected by changes in the natural environment attributable to the project. When viewed individually, the project components in the Valley would have a variety of impacts which would often have overlapping effects on residents in the immediate vicinity of the project, thus obscuring the overall importance of the complex of activities. In aggregate, however, it is likely that this nucleus of project components would create difficult choices for some Valley residents.

Some residents living on Bonaparte Reserve No. 1 and in the northern part of the Valley, particularly in the area between Highway No. 12 and Anderson Creek, might decide to give up their residences.

The presence of the project, especially in the vicinity of the mine, might render undesirable continued residence in that part of the Valley. A few residents might also choose to leave the study area or the region.

The existence of the project in the northern part of the Valley might be incompatible with the amenities valued by most of the residents in the southern part of the Valley. The project might impose constraints on freedom of movement within the Valley and might also transform some of the aesthetic characteristics of the area.

As a result of these tolerable but still significant changes in the natural environment, a few existing residents south of Anderson Creek and east of Bonaparte Reserve No. 1 might also prefer to leave the Valley. For those residents who choose to remain in the Valley, some would get used to the new environment with the project, while others, particularly those who experience a deep-felt sense of loss, might have a more difficult time in adjusting to their altered environment. The Indian people, on the other hand, would have little alternative but to remain and adjust to the environment with the project.

Throughout the broader study area, isolated construction impacts such as increased pedestrian safety hazards in the vicinity of the off-loading facilities, would be important to the groups of people directly affected.

Study area residents would likely view losses of recreational resources in and around the Valley with concern as the quality and availability of these resources are considered a prime amenity of life in the area. However, the relatively small area affected, the modest recreational quality of the resources, and the availability of substitute areas suggests this loss would be minor. The major concern of regional residents would likely centre on maintaining acceptable air quality throughout the area.

(ii) Effects of Changes in the Social Condition

In general, changes in the quality of life in the Hat Creek region caused by the project would have greater effects in the short term than over a longer period of time. The large influx of population and alterations to the employment base in the early years of the project would generate a number of changes in the physical, economic and social structure of the study area. Over the long term, however, the project would become an accepted and key feature of the Hat Creek region, generating both attendant costs and benefits associated with community growth and development.

Disruptions and changes in the existing economic and social structure of the region would occur during the first few years following project commencement. Construction activities and related population growth would affect such quality of life indicators and measures as employment and income patterns, traffic volumes, recreational and rural amenities, neighbourhood composition, organization memberships, and social cohesion and stability.

If this rapid growth leads to a period of excess demand, then the study area residents might also experience changes in the availability and cost of housing, the cost, level and quality of services, and the physical structure of the communities; these changes may in turn lead to overcrowding, feelings of loss or anxiety, increased turnover rates, and a variety of other social or personal problems related to changing community characteristics.

Project-induced changes during the first few years of the construction phase might result in altered perceptions of the quality of life in the study area. For some residents, particularly those in the Hat Creek Valley, a number of factors, including reduced rural amenities, unfulfilled expectations, increased costs of living, and altered leadership roles, might lead to a perceived reduction in the quality of life. For others, however, the perceived quality of life may be enhanced as a result of improved employment and income opportunities, expanded infrastructure and public services, increased variety of goods and commercial services, and diversified social groups.

Over the long term, an equilibrium population growth rate projected for the operating phase would replace the rapid growth rates expected during the construction phase. Given the relatively stable and manageable rates projected for the long term, the effects of many problems and impacts associated with the project would be lessened. Both the public and private sectors would have sufficient lead times to provide adequate goods, services and infrastructure, thereby resolving the temporary conditions of excess supply or demand which might occur during the early years of the project.

Personal adjustments to project-induced changes would normalize for most study area residents and the changes themselves would be accepted as part of the region's growth and development process. Gradual refinements and continued changes in the quality of life indicators would occur, but in a less dramatic and disruptive fashion than those associated with the early stages of the project. The altered economic, social and physical structures of the study area would evolve to the point where they would become self-sustaining, recognized and established, providing residents with a new framework for community cohesion and integration.

A few residents, particularly those in the Hat Creek Valley, might perceive that the long-term alterations generated by the project would reduce the overall quality of life in the study area. The transformation from a rural to a more developed lifestyle in the region would be difficult to accept for some residents, particularly if these community changes would be accompanied by social and personal problems, alienation and reduced feelings of social cohesion.

For the majority of study area residents, the project-induced changes would enhance the perceived quality of life over the long term. Increased income and employment opportunities would provide economic stability and market sizes large enough to support an enlarged variety of commercial services. Population growth and community development would provide reductions in taxes and support expanded and improved public services and infrastructure. Community stability would increase and new social patterns, friendships and cultural activities would also emerge in the long term.

(iii) Effects on Indian Cultural Identity

The large increase in population in the local study area would result in the local Indian population becoming an even smaller ethnic minority group in the area.

The increased potential incidence of interracial marriages and mixed-blood children, along with a reduction in the future potential for resource harvesting activities in the immediate vicinity of the project, might be considered detrimental to the maintenance of the Indian culture and race.

6. DECOMMISSIONING PHASE

a) Introduction

As part of the overall impact identification process, it is necessary to analyze the potential effects of the decommissioning phase of the Hat Creek Project on the local study area communities. At the present time, the Hat Creek thermal plant is estimated to have an economic plant life of approximately 35 years. At the end of this lifespan, the plant would cease operations and be decommissioned. As a result of this expected shutdown of the plant, all operating and other project-related jobs would terminate.

The potential impacts of such a closure can only be highly speculative at this time. It must be stressed that the attempt to foresee with any certainty events which would occur more than 35 years in the future is questionable. The predictive capability of most disciplines, especially in the field of social sciences, is limited and the reliability of predictions diminishes as the time horizon expands. Projections about possible events or occurrences in 2025 cannot possibly account for all the future technological, social and behavioural changes that would exert an effect on those occurrences.

Given these inherent difficulties in such long-term projections, it is considered useful to present a broad range of possible changes that might be wrought by the closure of the project. Assumptions are made about alternative futures, and the potential impacts on the local communities are identified. As might be expected, the major changes would result from employment-related population declines.

b) Expanded and Diversified Economic Base

In this scenario, it is assumed that the thermal plant ceases to operate in 2025 at the end of its productive life. Prior to its closure, however, other large-scale and high speculative developments, utilizing additional Hat Creek coal deposits, would have been identified, analyzed, determined to be economically viable, approved, financed and partially completed.

Developments in this category are large in scale and dependent on technological advances. B.C. Hydro would have to determine the economic feasibility of such capital and labour-intensive projects. The main developments would include an aluminum smelter operation, using Hat Creek coal and provincial energy supplies, and a coal gasification plant, also using available coal deposits. The magnitude of these projects might even exceed the total labour requirements associated with the thermal plant operation.

If either of these developments occurred at the appropriate time, the closure of the thermal plant would generate very modest changes within the local study area communities. The large workforce displaced from the thermal plant would be taken up by the employment demands of the other projects. Although there would not be an exact match of job skills to jobs required, the net change in total employment would likely be modest. The population size, income levels, housing requirements and service demands would remain basically the same for the employees of the new activities.

c) Alternative Developments

This scenario also assumes a decommissioning of the Hat Creek thermal plant in 2025, but it assumes a more realistic assessment of the economic development potential in the study region. Based on current resource evaluation and analysis of possible future

markets, the only reasonable large-scale developments which are likely to occur in the region are privately-owned copper mines in the Highland Valley, or near Cache Creek.

In this scenario, it is expected that the other development projects would not be able to absorb all of the employees losing jobs from the thermal plant closure. Some of the workforce would be willing and able to switch jobs or find alternative employment in these resource activities, but the employment potential would be less than the employment losses.

As a result of this situation, the unemployed would be forced to leave the area, taking their families with them. The population losses to the communities would be significant enough to result in some changes, including business failures, excess capacity in the social and physical infrastructure, a sense of loss in community cohesion associated with declining economies, loss in property values, and higher tax burdens for remaining residents. However, the net effect of these changes would depend on the population and employment levels which can be retained in the community. In addition, the community size and local economy may be strong enough at that time to continue to be self-sustaining, even with a fairly large loss of population or net local incomes.

d) Limited Employment Opportunities

This scenario assumes a situation where the economic development potential of the Hat Creek region is essentially exhausted. That is, by the time of the decommissioning of the Hat Creek thermal plant in 2025, all other resource development projects either would be completed or economically impractical. In this case, the closure of the thermal plant occurs at a time when alternative employment would be difficult to find in the study region.

It is expected that this "bust" situation would produce serious disruptive changes in the communities under consideration. The communities would experience significant losses in population and tax revenues. Public services and facilities would have excesses in capacity and decreased revenues, necessitating cutbacks in the extent or quality of service or continuous operating losses. Private commercial or service activities would close due to a loss in market size or disposable incomes. Property values would decline as housing supply exceeded demand; mortgage foreclosures may further depress the housing market.

In addition to these economic considerations, a situation of this type would cause social problems within the communities. For those individuals unable to find employment, they would either have to collect transfer payments or move to other areas, disrupting the normalcy of their previous existences. For those able to remain in the area, the economic decline and subsequent changes in the community would be difficult to cope with. Not only would their material well-being be affected, but their social patterns, attitudes and future plans would also be affected. There would be a sense of loss for all community residents who felt that the closure of the thermal plant signified the end of an era or a decline in the quality of their home town or neighbourhood.

7. MITIGATION, COMPENSATION AND ENHANCEMENT

a) Introduction

Mitigation can be defined as measures taken in any phase of a project which would lessen or eliminate adverse impacts on values associated with the resources used or affected by the project.* Expenditures for mitigation must generally result in at least an equivalent reduction in the value of resource losses caused by the project.

Compensation refers to payments for losses in resource values which are not taken care of by mitigation measures. Compensation payments can be made either to ensure a more efficient allocation of society's resources or to spread the costs of utilizing those resources more equitably among different groups in society.

Enhancement is defined as to make or become greater, as in value or desirability.** It is used in this section to describe measures that could be taken in the planning, design or operation of a project which would increase the beneficial impacts on values associated with the resource used or affected by the project.

As with compensation, enhancement measures can be undertaken in a manner which would improve allocative efficiency or which would direct project benefits, for equity purposes, to particular groups in society.

* Knetsch, J., "Principles of Mitigation and Compensation Policies", draft unpublished paper, Simon Fraser University, 1977.

** Webster, A.M., "Websters New International Dictionary", G.C. Merriam and Company, 1970.

These concepts are relatively straightforward for issues of efficient resource allocation. However, equity issues are not as clear cut, particularly when potential negative impacts can be reduced or minimized by government rather than developers' actions.

For this Section, the following structure has been provided*:

Impact Identification

Project impacts should be defined as a basis for determining mitigation or compensation measures.

Mitigation Measures

These would include only those recommendations which deal with impacts by means of adopting various project alternatives or design modifications.

Compensation Measures

Additional recommendations which are not based on project alternatives or modifications would be included in this category. These would include all community and social planning-related recommendations as well as those dealing with impact monitoring.

Impacts or concerns for which a clearly defined and effective compensation measure cannot be determined, could be dealt with in the form of suggestions. These would include ideas such as local liaison or planning committees, and means of disseminating information about the project. These are discussed in Section 8.

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- B.C. Hydro, personal communication, August 22, 1978

For each of the major project phases identified below, impacts are identified and, as appropriate, mitigation, compensation or enhancement measures are recommended.

b) Pre-Construction Phase

There are no identified impacts expected to occur during the pre-construction phase that lend themselves to mitigate, or enhancement measures. The exploration program, however, has required that the Authority drill on private lands, possibly causing minor disturbances to land owners. In such cases, compensation payments to landowners are justified.

c) Construction and Operating Phase

A number of impacts, expected to occur during this phase, are discussed below, along with their recommended mitigation, compensation or enhancement measures.

- (1) *The project would produce continuous and intermittent noise levels that are considered to be incompatible with residential land use, according to generally established standards, in the vicinity of the project. As it is presently designed, the project would produce dust (total suspended particulate) levels, under certain climatic conditions, which would result in occasional contamination in excess of levels recommended to ensure the protection of human health, as well as reducing visibility and the aesthetic quality of the land resources in the vicinity of the project.*

These impacts are identified as primarily affecting Valley residents between the southern perimeter of the coal pit and Anderson Creek, and also Indian people in the southwest portion of the Bonaparte Reserve No. 1.

It is expected that these impacts solely, or in combination, would severely reduce the residential satisfaction enjoyed by these residents.

A. Mitigation

Mitigation recommendations have been provided in Section 7 of the Appendix E1 report. However, neither the effectiveness of these proposed measures nor the cost of their implementation has been provided. Both of these pieces of information would have to be obtained and compared to the expected value of the damages from noise in order to determine the efficiency of these suggestions.

Specific mitigation recommendations for reducing the expected dust effects should be forthcoming from further studies.

B. Compensation

The alternative to mitigation would be to compensate affected individuals for the losses incurred as a result of the increased noise and dust levels. As Stated above, these losses would appear to be primarily in the nature of reductions in residential satisfaction.

The most appropriate course of action, if compensation were the preferred alternative, would be for B.C. Hydro to negotiate the purchase of the affected residential rights. The appropriate value of these rights would be that which made residents equally well off by foregoing their residential rights as retaining them. The value, therefore, can only be determined through negotiation with the affected parties.

Since the effects of noise and dust appear to affect the same individuals, the compensation option should be compared to the overall costs of noise and dust mitigation, rather than to each individually.

(ii) *The location of the project and its nature in relation to the former nature of Valley land use; noise, dust and general activity levels during project construction and operation; alterations in Valley aesthetics, alterations in fishery populations and wildlife habitat; and other resource changes, when taken in concert, might reduce the residential amenities of other existing residents at their settlement locations in the Upper Hat Creek Valley and Bonaparte Reserve No. 1.*

The group of individuals affected can be identified and are, for the most part, long-standing Valley residents with deep-felt social and cultural attachments to the Valley environment. Although few in number, their individual amenity losses are likely to be high in relation to those experienced in other areas of the study region as a result of the growth and development effects of the project.

These residences are sufficiently close to the project that those effects might be expected to occur. Although claims might be made for an extension of the areas described above, it is felt that an extension would be difficult to justify on the basis of the current environmental information.

A. Mitigation

It is felt that the project location in relation to these residences is the major determining impact factor. Therefore, it is unlikely that individual aesthetic, noise, air quality, fisheries or wildlife-oriented mitigative efforts would eliminate these impacts completely, although they may be important in marginal cases among Valley ranchers.

8. Compensation

Given that mitigative measures, such as altering the location of the project, could not be effected, compensation is recommended. The most appropriate compensation would likely be in the form of an offer to purchase the property of affected residents. If possible, however, a land swap could be effected with the Indian people. In other cases where property rights are not an issue, compensation would simply be in the form of payments for relocation costs. Again, the value and nature of compensation would have to be negotiated with the affected parties.

(iii) The No. 1 Booster Pumping Station for the water intake system, located near the mouth of the Bonaparte River, would generate noise levels incompatible with residential land use for 15 to 20 residents located in its immediate vicinity.

A. Mitigation

A number of mitigative recommendations have been made to reduce noise, including the use of fans and screens which would lessen the noise generated by the pumper station. A preliminary examination indicates that these would be cost-effective. Some, in fact, are now part of the preliminary design.

B. Compensation

Compensation could be achieved by purchasing the affected properties. A minimum compensation guide would be the market value of the properties affected. However, as discussed above, the appropriate value would have to be obtained through negotiation.

(iv) *Rapid population growth in the local study area would likely result in short-term reductions in the quality of life for area residents as a result of temporary lags in public service delivery during the process of staff and facility expansion. These lags would affect a fairly broad sector of the Ashcroft, Cache Creek and surrounding populations reliant on village-located services. The effects would include.*

- periods of overcrowding and consequent decline in the quality of service delivery in most existing social and community services.

- a period when existing service deficiencies, particularly dental and mental health services, would become more acute.

The severity of these impacts and their specific duration cannot be predicted, as they depend on the timeliness of public sector responses in relation to growing demand. However, the general government practices of service delivery in response to demonstrated demand, rather than in anticipation of demand, would suggest their likely occurrence.

A. Mitigation

There are no project design adjustments that would clearly result in an efficient reduction in these impacts.

B. Compensation

Given the dependence on senior government service delivery responses, the consequent uncertainty surrounding the specific nature, duration

and value of losses, and the inability to identify individuals or specific groups affected, a cash compensation payment for these impacts is not considered a reasonable approach.

One of the critical determinants of the extent to which impacts would occur is the timely availability of service demand information. As compensation, then, B.C. Hydro could assist the public service delivery process by providing this information. It is recommended, therefore, that B.C. Hydro fund a monitoring program oriented towards the provision of on-going planning information to assist in the timely provision of community and social services.

Discussions should be held with the Thompson Nicola Regional District, provincial agencies and the local communities to determine the appropriate sponsoring and controlling agency.

- (v) *The rapid community population growth would require early expansion of community sewer and water facilities in all communities in order to ensure the timely availability of serviced lots for incoming residents, and a continuing quality of service for existing residents. In addition, in order to manage and control the growth, expansions and structural changes would be required in the local government administrations.*

As with the community and social services, it would appear that during the early period of rapid growth, lags in these adjustments are likely. These lags would primarily be reflected in land price increases, housing shortages and attendant social problems.

A period of approximately 18 to 24 months from the time of an announced decision to proceed with the project, with appropriate planning and design studies, would be required for the initial preparation. It is unreasonable to expect that investments in preparation be undertaken by the communities until a decision to proceed with the project is announced, and it is not clear at the present time that adequate lead time would be available.

A. Mitigation

A potential mitigation measure would be for B.C. Hydro to provide a minimum of 18 months between the announcement of a decision to proceed with the project and the start of construction to enable the municipalities to be fully prepared.

B. Compensation

If the above mitigative measure is not feasible, appropriate compensation would be for B.C. Hydro to encourage the undertaking of the initial design studies required prior to a decision to proceed with the project and to remove the risks to the municipality associated with undertaking expenditures at that time by funding the required studies.

(vi) *The large construction workforce resident in the Hat Creek Valley would put pressure on some community facilities in Ashcroft and Cache Creek, primarily during the evenings and weekends. Community recreation, commercial entertainment and parking facilities would experience the most pressure. Increased use of commercial entertainment facilities have both positive and negative effects, but since expansions would be undertaken on a private speculative basis, based on long-term growth expectations, it is expected that the negative effects on local users would be minor.*

However, community recreation and parking congestion would likely be problematic at certain times. The recreational demands of the construction workers are most likely to be oriented towards the use of playing fields for soccer, baseball, touch football, etc., and possibly swimming. In addition, the extensive use of automobiles for commuting increases the risk of traffic-related problems in the communities and along the access highways.

A. Mitigation

It is therefore recommended that B.C. Hydro provide a basic quality playing field as a part of the construction camp facilities.

It is also recommended that B.C. Hydro contract a scheduled bus service to and from the construction camp and the Villages of Ashcroft and Cache Creek during evening hours. This service would minimize parking pressures in the communities and minimize traffic-related problems.

Although cost estimates cannot be made at this time, it is expected that these expenditures would be effective.

(vii) *Small rural communities undergoing rapid expansion due to the construction of large-scale industrial projects sometimes experience a variety of community social problems associated with the development process. Increased transiency, personal anxieties and adjustment requirements can result in an increased incidence of petty crime, juvenile delinquency, alcohol abuse, family problems and other social problems.*

The extent to which the local study area communities would experience some or all of these problems cannot be predicted.

However, they have occurred in some similar development situations and their occurrence in the local area could be expected to reduce the quality of life in these communities.

A. Mitigation

No mitigation opportunities are available that would appear reasonable and efficient.

B. Compensation

It is recommended that the monitoring study, discussed under (iv) above, be expanded to provide sufficient information on which to determine whether or not further compensation should be provided. The requirement for, nature of, and value of potential compensation can only be determined on actual information as the project evolves.*

(viii) *The Hat Creek Project would involve the rapid growth of both the industrialized economy and the non-Indian population around the local Indian communities. This would create pressures and impacts that would lead to an increased erosion of local Indian cultural identity.*

There is an increased likelihood of inter-racial marriages that would produce children with proportionately less Indian blood, and may involve Indian women moving away from the local reserves.

The development would alienate some fish and wildlife habitat and project-related population growth would increase pressure on fish and wildlife resources. These impacts

* Social planning considerations to assist in minimizing these potential problems are discussed in Section B.

would further erode the potential for Indians to pursue their traditional economy and lifestyle, albeit that local Indian involvement in fishing, hunting and trapping presently appears to be relatively small.

The Hat Creek Project, and the increased activity that would accompany it, would be a highly visible reminder to local Indian people of the growth of the industrialized economy that is very different to their own traditional economy. Some local Indians are likely to participate directly in the development.

These factors would lead to an erosion of the sense of cultural identity of local Indian people as they become more integrated into general society. Although the same effects might accompany the future growth of the area without the project, the rate at which these effects are achieved are likely to be increased by the project.

A. Mitigation

There do not appear to be any mitigative measures available that would reduce this expected impact.

B. Compensation

It is reasonable, therefore, that B.C. Hydro might take some compensatory action to help local Indian people cope with the potential adverse effects of the project on their social and cultural development.

One way in which this could be done would be to participate with local Indian representatives and appropriate government agencies in the creation of an organization that would work to advance the socio-economic and cultural development of local Indian people. The economic opportunities that the Hat Creek Project could offer might be a

significant factor in the success of such an organization. The exact nature of B.C. Hydro involvement and the extent, if at all, to which B.C. Hydro would be involved in the funding of such an organization, would have to be determined by discussion with the appropriate government agencies.

(ix) *The Hat Creek Project would generate a large number of employment opportunities in the study region through the creation of direct, indirect and induced jobs. Some of the job recipients would come from the ranks of the regional or provincial unemployed, many others would switch from formerly-held positions to jobs associated with the Hat Creek Project, others would be new labour market entrants, while others would come from other provinces.*

On the basis of current information, a small percentage of the local labour force would participate in project construction while the overall region, particularly Kamloops, would make major contributions to this phase. Local labour would likely obtain 10% to 15% of the operating employment positions while the regional labour force might obtain 25% to 30%. The local labour force would primarily participate in the induced service sector jobs, of which they might obtain up to 30%.

There are no B.C. Hydro plans at the present time to encourage specific groups in their hiring programs and to do so would require the agreement of the unions with which B.C. Hydro is involved.

There is no clear government employment policy guiding employers in terms of establishing priorities among regional residents versus other provincial residents versus other Canadian residents, whether they be unemployed,

handicapped, school dropouts, women, Indians or any other identifiable group. In fact, there is some concern that policies in this regard might be considered discriminatory and run counter to the B.C. Human Rights Code.

Some initiatives, however, have recently been taken by specific federal and provincial departments to promote affirmative action programs on large-scale resource projects for regional or social development purposes. The socio-economic terms and conditions developed for the Alaska Highway Pipeline call for an affirmative action hiring and training program for women and Indians in the Yukon. The pipeline conditions also require priority status be given to Yukon and Northwest Territory residents. In addition, the Ministry of Economic Development has recently stressed the need for affirmative action programs in the proposed northeast coal developments.

A. Enhancement

On the basis of these precedents, it is recommended that B.C. Hydro initiate discussions with the Ministry of Labour, the Ministry of Economic Development and other institutions, as appropriate, with a view to establishing employment priorities in a manner which would orient the potential benefits from increased employment accruing from this project in the desired manner. If the proposed in-service date is maintained, these discussions should be initiated immediately as the time period for establishing appropriate employment policies and implementing appropriate programs would likely be lengthy. Any programs implemented would have to be tailored to the specific needs of selected target groups.

- (a) *An opportunity exists for enhancing the benefits of this project that would accrue to the Village of Clinton. Clinton has recently experienced a number of sawmill closures that have reduced the community's economic base*

and resulted in a gradual decline in population. Through this period they have received some government indications of future economic growth potential, but nothing has yet materialized and the outlook is not encouraging. Should Clinton receive a greater share of the projected in-migrant population than that which is expected, this growth would likely be considered beneficial.

The existing project description proposes the construction of a new access road through the Medicine and Cornwall Creek area. This road provides a shorter link to Ashcroft and Cache Creek than is presently available via Highway No. 12. Thus, it tends to favour settlement in these communities at the expense of Clinton.

The construction of this road would cost considerably more than upgrading Highway No. 12, therefore, not building the road would likely be an efficient allocation of resources.

Use of Highway No. 12, however, would have negative noise and safety effects on the Indian population on the Bonaparte Reserves adjacent to the highway, and it has not been possible in these studies to discuss the effects of increased traffic with the Indian people.

A. Enhancement

It is therefore recommended that B.C. Hydro investigate the possibility of utilizing Highway No. 12 as the sole project access road. This will require an assessment of potential noise and safety impacts on the residents of Bonaparte Indian Reserves No. 1 and 2.

The increased use of Highway No. 12 might require that it be upgraded and widened, and this might involve the alienation of those parts of the reserve immediately adjacent to the highway. This would involve

appropriate discussions with the Bonaparte Band and the Department of Indian Affairs, using the well established mechanism that is in place to deal with such instances.

(vi) *The growth of population in the local study area communities would result in increased responsibilities and costs for the local governments. In order to manage the projected growth as efficiently as possible, the municipal governments would need to increase the specialization and number of staff, alter government administrative and review structures, expand and upgrade municipal infrastructure and facilities, and undertake detailed preparatory studies. For all local study area communities, these new or revised government undertakings would require increased tax revenues during the early years of project-related growth.*

However, the Hat Creek Project would be included in total assessment base for school district tax purposes. B.C. Hydro, therefore, would contribute to the total property tax revenues (both general and school taxes) of the local study area communities. The effects of B.C. Hydro's tax contributions would be noticeable to most local area taxpayers about 1984. After that time, the school tax levies would be significantly lower than would otherwise be paid by school district residents without the project.

For residents in Cache Creek and Clinton, the estimated present value of total property tax per capita required between 1978 and 1990 would be lower with the project than without it. Over the same period, even with the reduced school tax rates, the residents of Ashcroft would face a larger cumulative tax burden with the project when compared to the present value of anticipated tax requirements without the project.

A. Mitigation

There are no identifiable means of adjusting the design of the project that would clearly result in an efficient mitigation of the short-term tax increases in all the local communities and the long-term minor increases in per capita tax requirements in Ashcroft.

B. Compensation

It is recommended that B.C. Hydro contribute to the municipal revenues of Ashcroft a sum which would ensure that existing Ashcroft residents do not incur larger tax burdens as a result of the project than would otherwise be expected without the project.

d) Decommissioning Phase

The potential impacts associated with the decommissioning phase of the Hat Creek Project would result from exactly opposite forces to those associated with the early years of the construction and operating phases, should no alternative employment opportunities arise in the area. The overriding set of impacts would arise as follows.

- (i) *Project-associated employment losses and subsequent population declines might leave the local study area communities with excess public, social and commercial services and infrastructure, impose financial burdens on remaining residents, as well as social and financial hardship on unemployed persons and their dependents.*

A. Mitigation

The only direct actions B.C. Hydro could undertake would include prolonging the economic life of the thermal plant, through alternative coal supplies or other fuels, investigating other potential uses for the coal deposits, or designing alternative productive uses for the thermal plant facilities. If any of these other prospects become

practical, the partial or complete loss of this major employment base might be delayed or averted.

B. Compensation

If mitigation is not efficient, then a series of studies on the provision of compensation should be conducted every ten years during the operating period of the Hat Creek Project. These studies would determine the expected economic lifespan of the plant, the expected changes in employment levels in the plant, new technological changes possibly affecting the operation life, and the potential activities which may absorb employment in or adjacent to the Hat Creek region. These studies would keep B.C. Hydro, their employees and the residents of the communities aware of the on-going economic development potential of the area. If it appears that major employment and population losses would be inevitable as a result of changes in the Hat Creek operations, sufficient advance warning should be provided by B.C. Hydro to discourage community investments that would prove non-viable.

For individuals losing their employment positions, B.C. Hydro should attempt to place as many as possible in alternative employment positions with the Authority.

8. PLANNING CONSIDERATIONS AND SUGGESTIONS

The Hat Creek Project raises a number of considerations in the planning of growth and development which do not fit comfortably within the mitigation, compensation and enhancement structure required for project evaluation, but which are considered worthy of mention. These suggestions do not imply direct responsibility on the part of B.C. Hydro, but, rather, are put forward for the consideration of the developer, government and local citizens.

The availability of information is critical to the effective planning and management of rapid growth. It is also important as means of informing local residents on the nature of the changes occurring or expected to occur in their communities during project development, and as a means of introducing prospective new residents to the characteristics of the settlement area.

A project-information package, describing and illustrating the project, should be made available to local residents. Another information package, prepared by B.C. Hydro and possibly the local Chambers of Commerce, should be made available to non-resident job candidates.

It is essential that it is made clear to applicants and their families exactly what the study area has to offer. If potential residents are aware of the range of options offered, they are more likely to be satisfied with their choice. This would add to the stability and cohesion of the communities.

The information being developed in the previously-recommended monitoring program should receive relatively wide dissemination. The dissemination of this information, in a manner which promotes a continuous dialogue between residents and the developer, residents and service agencies, and among residents themselves, would contribute to an improved understanding of the project and of

community needs. It would encourage a greater sense of resident involvement in the development process, thereby reducing feelings of alienation and creating an atmosphere conducive to the identification and implementation of useful community volunteer self-help programs.

It is suggested that an appropriate vehicle be developed for disseminating project-monitoring information which would encourage community understanding of and participation in the development process.

Appropriate vehicles might be Community Social Planning Task Forces, composed of existing residents from the settlement communities, project-related in-migrants, local town administrators, planners and service personnel, as well as representatives from B.C. Hydro and other relevant community groups in Ashcroft, Cache Creek and Clinton.

The mandate of these task forces would include reviewing community development plans relating to project social impacts. As well, the task forces would liaise with service committees in defining local project-induced social problem areas, such as juvenile delinquency, family stress, traffic safety, and overloading of services. The task forces would define service requirements for the service committee and promote programs for handling these needs.

In addition, these task forces would contribute to the integration of the population influx by handling local relocation, temporary housing problems, and "welcome wagon" activities. Other integration activities, such as community orientation, adjustment, referral and information services, would also be the responsibility of these planning task forces. The focus of the integration activities should include not only newcomers but also rural and established residents who also have to adjust to changing social environments.

Each task force could develop working groups at its discretion, but must maintain the line of communication essential in those first critical years of change.

Existing study area residents, based on their experiences within these communities, have developed identifiable expectations of local service delivery quality. Incoming residents from a variety of origins will bring their own service expectations and needs; if there are differences in these needs and expectations from those of existing residents, these differences will require early identification to enable appropriate responses. Most government department policies and practices require an expressed demand before a service is provided. However, as previously identified, in periods of rapid population growth this approach would likely contribute to service shortages between the time of demand identification and service delivery. Shortages in the supply of facilities, programs or staff would have different effects, depending on the service required.

It is suggested that essential services, including primary and secondary education, hospital, doctor, ambulance and police services, be provided by the appropriate service agency in anticipation of need, rather than in response to demand. Other services not considered as essential should be developed in response to demand as part of the social planning process.

The period of rapid growth also puts a premium on well-coordinated activity in the delivery of required services. It would, therefore, be desirable for the responsible government departments to design a vehicle for coordinated service delivery in the region which would be operational one year before project construction commences.

In this respect, it is suggested that two levels of service delivery committees be established. The first would be a Government Services Board, based in Victoria, while the second would be a Coordinated Services Committee, established in the region.

The Government Services Board would be a senior level board responsible for dealing with service expansion and coordinated delivery in the study area towns. Members would represent the Ministries of Education, Health, Human Resources, the Attorney-General, Recreation and Conservation, Municipal Affairs and Housing, the British Columbia Building Corporation, and the Environment and Land Use Committee Secretariat in Victoria. The Board function would be to review integrated program, facility, and staffing requirements for the study area services. It would review funding allocations in light of development plans and budgets. The Services Board then would promote service hiring based on the accepted development philosophy and social planning principles.

The Board would liaise with the RCMP and other federal services to facilitate coordinated effort at both senior government levels, and offer policy direction to the impacted communities through the Coordinated Services Committee.

The Coordinated Services Committee would be composed of selected representatives of regional and local service administrators and senior program staff, focusing on Ashcroft, Cache Creek, Clinton and, when applicable, Lillooet and Kamloops. It would advise the other committees on the study area perspective with regard to operational service problems relating to project impacts on the communities. It would provide the initial link between the residents and service ministries, and would design program extensions and make requests for funds to the senior committee. Service expansions resulting from the influx of residents to the study area and movement of residents within the study area would be a concern of this committee. Adjustment needs of single people and families would be considered, including the provision of child care facilities, women and work programs, mental health counselling, job counselling, recreational and cultural activities. In designing and operating these programs, these groups would use the Social Planning Task Forces as a resource.

9. SUMMARY MATRICES

The dimensions of predicted socio-economic impacts, potential mitigation measures, compensation considerations and enhancement opportunities are summarized in the following matrices.

9. SUMMARY MATRICES

<u>IMPACT</u>	<u>Positive Effects</u>	<u>Negative Effects</u>	<u>Impact Distribution</u>	<u>Impact Duration</u>	<u>Impact Significance</u>	<u>Mitigation</u>	<u>Compensation</u>	<u>Enhancement</u>
1. Alienation of agricultural land and reduced potential productivity		Reduces income and employment from agriculture	Hat Creek Valley area; vicinity of proposed airstrip	Long term	Area and productivity losses are minor in regional context		Negotiated payment to land owners for agricultural losses	
2. Alienation of recreational land		Reduces settlement amenities of area, particularly Valley and Bonaparte Reserves 1 and 2	Hat Creek Valley area	Long term	Alienation is minor in regional context but more important to Valley and Reserve residents		Offer to purchase property of all Valley and Reserve residents desiring to relocate Payment for relocation costs	
3. Alienation of settlement lands		Reduces sense of well being for affected residents Imposes real relocation costs on affected residents	Hat Creek Valley	Long term	Affects 2-3 families		Negotiated payment to land owners for settlement value losses and relocation costs	
4. Reduced settlement land use from increased industrial noise	Potential capital gain through property sales	Reduced settlement land values Imposes real relocation costs on affected residents Reduces sense of well being for affected residents	Hat Creek Valley; Bonaparte Reserve 1; vicinity of No. 1 Booster Pumping Station	Long term	Affects about 5 families in Valley and Reserve area and 5-8 in vicinity of Pumping Station	Adopt noise mitigation measures at Pumping Station	Negotiated payment to land owners in the Valley and to Reserve residents for lost settlement values and relocation costs	
5. Potential health hazard from levels of suspended particulates in excess of recommended air quality guidelines for the protection of public health		Potential reduced health of residents in immediate vicinity	Immediate vicinity of the pit; south west corner of Bonaparte Reserve 1; extreme north end of Valley	Long term	Indeterminate	Ensure TSP levels are within the recommended guidelines		

<u>IMPACT</u>	<u>Positive Effects</u>	<u>Negative Effects</u>	<u>Impact Distribution</u>	<u>Impact Duration</u>	<u>Impact Significance</u>	<u>Mitigation</u>	<u>Compensation</u>	<u>Enhancement</u>
6. Reduced settlement amenities from existence of the industrial complex		Reduced sense of well being for affected residents	Hat Creek Valley area	Long term	Indeterminate but potentially affects about 100 people in Valley area and on Reserves who are not affected by land alienation or extreme noise effects		Offer to purchase property of all Valley and Reserve residents desiring to relocate. Payment for relocation costs	
7. Reduced trout fisheries resources		Reduces settlement amenities of Valley and Bonaparte Reserves 1 and 2	Hat Creek	Long term	Losses are minor in regional context but more important to Reserve residents			
8. Reduced Wildlife habitat		Potential to reduce settlement amenities of Valley area and Bonaparte Reserves 1 and 2	Hat Creek Valley area	Long term	Minor		Payment to Indian residents for income benefits lost	
		Potential to reduce income in kind from hunting for Reserve residents						
9. Reduced Water Quality		Potential to reduce settlement amenities on Bonaparte Reserves 1 and 2	Hat Creek	Long term	Appears minor		Investigate and fund, if reasonable, restoring water quality at user's residences	
10. Alteration of air quality with some uncertainty as to effects		Potential to raise anxiety of residents	Hat Creek Valley; local area; region	Long term	Appears minor	Monitoring and information distribution to eliminate anxieties		

<u>IMPACT</u>	<u>Positive Effects</u>	<u>Negative Effects</u>	<u>Impact Distribution</u>	<u>Impact Duration</u>	<u>Impact Significance</u>	<u>Mitigation</u>	<u>Compensation</u>	<u>Enhancement</u>
11. Increased no. of industrial and service employment opportunities	<p>Increases incentive to enter labour force</p> <p>Increases job diversity and experience potential</p> <p>Increases income potential</p>	<p>Increases amount of transient labour</p> <p>Encourages job switching, leading to short-term increases in labour costs for regional industries</p> <p>Opportunities might not meet expectations</p>	Region and local area	Long term	Creates 1,900 additional jobs by 1990, representing a 41% increase in local area and 4% increase in region employment without project			Could direct benefits to specific target groups through affirmative action hiring and training
12. Reduced regional unemployment rates	<p>Increases resident income</p> <p>Reduces personal and family problems</p> <p>Reduces short-term out-migration</p>	Increases short-term transient in-migration	Region and local area	Short term	Undetermined but should be a substantial reduction in the male unemployment rate			
13. Reduced seasonability of employment base	<p>Improves income stability</p> <p>Increases sense of community well being and stability</p>	Reduces proportion of seasonal part-time employment opportunities for expanding youth and female labour force	Local area	Long term	Added employment positions will have no seasonal element			

<u>IMPACT</u>	<u>Positive Effects</u>	<u>Negative Effects</u>	<u>Impact Distribution</u>	<u>Impact Duration</u>	<u>Impact Significance</u>	<u>Mitigation</u>	<u>Compensation</u>	<u>Enhancement</u>
14. Increase per capita regional income	Expands opportunities for increased size and diversity of commercial market Represents an increase in overall economic well-being of residents		Local area	Long term	By 1990 project would generate additional income of \$120 per capita, representing a 2% increase in local study area without project			Improve employment opportunities for regional low-income earners
15. Improved distribution of regional income	Increases sense of well being		Local area	Long term	Indeterminate			Could direct income benefits through affirmative action programs
16. Increased size and diversity of regional population	Increases size and diversity of local market Increases potential for new or improved services Increases potential for new and diverse social relationships Increases potential for new soci-cultural interest groups and activities	Increases potential for value structure conflicts Increases potential for overcrowding of facilities and services Reduces small town atmosphere Increases pressure towards reducing local Indian sense of cultural identity	Local area	Long term	Adds total population increment of 3,900 to local study area, representing a 40% increase in population without project			

<u>IMPACT</u>	<u>Positive Effects</u>	<u>Negative Effects</u>	<u>Impact Distribution</u>	<u>Impact Duration</u>	<u>Impact Significance</u>	<u>Mitigation</u>	<u>Compensation</u>	<u>Enhancement</u>
17. Increased proportion of single status transients in population	Increases supply of labour	Increases potential for petty crimes, alcohol, prostitution and drug-related social problems Increases competition with locals for jobs during expansion period Increases pressure on local services and facilities	Local area	Short term	Construction camp residents peak at 2,315 in 1973 Total transient increase indeterminate			
18. Increased rate of population growth	Increases present value of regional income gains Increases ability of communities to support increased number and diversity of services Increases ability of communities to generate tax reserves for additional municipal responsibilities	Places unusual pressure on municipal administrations to accommodate growth Increases potential for lags in housing service and infrastructure delivery Increases pressure on land prices Increases the potential for personal anxieties during adjustment period	Local area	Short term	Between 1978 and 1996, the growth rate would be 70% with the project, compared to an estimated 23% without the project			

<u>IMPACT</u>	<u>Positive Effects</u>	<u>Negative Effects</u>	<u>Impact Distribution</u>	<u>Impact Duration</u>	<u>Impact Significance</u>	<u>Mitigation</u>	<u>Compensation</u>	<u>Enhancement</u>
19. Price increases for land and accommodation from land servicing lags	<p>Increased capital gains for land settlers</p> <p>Increased income for landlords</p> <p>Increased borrowing power for land owners</p> <p>Enhancement of lifestyle choices for those gaining increased income</p>	<p>Reduced discretionary income for renters and house purchasers</p> <p>Reduced sense of well being for individuals affected</p> <p>Increased anxiety for in-migrants seeking accommodation</p>	Local area	Short term	Indeterminate but expected to be moderate	Provide minimum 18 month lead time to communities before commencement of project	Fund monitoring program	
20. Increased number and diversity of housing units	<p>Greater consumer choice</p> <p>Raises land productivity</p>		Local area	Long term	Total increase in stock of 1,060 net additional units by 1990 represents an increase of 82% over 1990 stock without project	<p>Provide minimum 18 month lead time</p> <p>Provide certain recreation facilities in the construction camp</p>	Fund monitoring program	
21. Reduction in service quality through expansion lags and overcrowding		<p>Reduces sense of well being among users</p> <p>Decreased service access may increase costs of acquiring services</p>	Local area	Short term	Indeterminate; depends on government response, timing and particular user groups		Fund monitoring program	

<u>IMPACT</u>	<u>Positive Effects</u>	<u>Negative Effects</u>	<u>Impact Distribution</u>	<u>Impact Duration</u>	<u>Impact Significance</u>	<u>Mitigation</u>	<u>Compensation</u>	<u>Enhancement</u>
22. Increased number and diversity of services	Improves service access, saving time and costs Greater service choice Increased sense of well being		Local area	Long term	All services would expand staff; a few would expand facilities			
23. Alteration in physical character of communities	Improves community image for some residents	Reduces small town atmosphere for some residents	Local area	Long term	Substantial physical changes would occur through new construction			
24. Increased property taxes	Minimizes potential service and infrastructure expansion problems	Reduced disposable income of taxpayers Reduced sense of well being	Local area. Also Ashcroft	Short term For Ashcroft, medium to long term	Approximately 6-9% higher rates with project than without (1970-1982) Higher present value taxes paid per capita between 1978-1990 than without project in Ashcroft		Payment of tax increases to Ashcroft Municipal Revenues	
25. Reduced property taxes	Increased disposable income Increased sense of well being		Local area	Long term	Undetermined beyond 1990			

<u>IMPACT</u>	<u>Positive Effects</u>	<u>Negative Effects</u>	<u>Impact Distribution</u>	<u>Impact Duration</u>	<u>Impact Significance</u>	<u>Mitigation</u>	<u>Compensation</u>	<u>Enhancement</u>
26. Increased potential for community social problems (juvenile delinquency; alcohol related; drugs; Prostitution; petty crime; family problems)		Potential to reduce sense of well being for community residents Potential to increase costs of service delivery	Local area	Short term	Indeterminate			
27. Increased pressures towards reduction of Indian cultural identity	Increased opportunity for those who want to integrate into non-native society	Decreased proportion of total area population Increased potential for inter-racial personal relationships Reduced opportunity to pursue traditional activities	Local Indian people	Long term	Indeterminate		Formation of Indian socio-economic development organization to combat cultural pressures	
28. Alterations in community stability and changes in community identity	(Long term) Creation of new and more dynamic communities New organizations, clubs, facilities New opportunities for social and personal relationships	(Short term) Increased potential for value conflicts loss of established roles Individual anxieties and frustrations	Local area	Short term (negative effects) Long term (positive effects)	Indeterminate			