



DISTRICT OF CHILLIWACK

# *Chilliwack Mountain*

## *Comprehensive Development Plan*

***DRAFT***

**URBAN**SYSTEMS  
*February 1996*

# CONTENTS

|   |    |
|---|----|
| <b>SECTION 1 Introduction and Purpose of the Plan</b> ..... | 1  |
| 1.1 Introduction .....                                      | 1  |
| 1.2 Plan Area Context .....                                 | 3  |
| 1.3 Purpose of the Plan .....                               | 5  |
| 1.4 Description of the Plan .....                           | 6  |
| <b>SECTION 2 Overall Plan Area</b> .....                    | 7  |
| 2.1 General Principles .....                                | 7  |
| 2.2 Approach to the Plan Area .....                         | 8  |
| 2.3 Developable Area .....                                  | 8  |
| 2.4 Estimated Future Development and Population .....       | 9  |
| <b>SECTION 3 Land Use Policies</b> .....                    | 10 |
| 3.1 Residential .....                                       | 10 |
| 3.2 Parks and Open Space .....                              | 14 |
| 3.3 Agricultural and Rural .....                            | 18 |
| <b>SECTION 4 Transportation System</b> .....                | 19 |
| 4.1 Transportation .....                                    | 19 |
| <b>SECTION 5 Infrastructure Servicing</b> .....             | 24 |
| 5.1 Water .....   | 24 |
| 5.2 Sanitary Sewer .....                                    | 26 |
| 5.3 Storm Drainage .....                                    | 30 |
| 5.4 Utilities .....   | 34 |
| <b>SECTION 6 Development Permit Guidelines</b> .....        | 35 |
| 6.1 Designation of Development Permit Area .....            | 35 |
| 6.2 Protection of the Natural Environment .....             | 36 |
| 6.3 Hazards .....   | 38 |
| 6.4 Multi-family Residential Development .....              | 40 |
| <b>SECTION 7 Implementation</b> .....                       | 44 |

# LIST OF MAPS

- Map 1 - Land Use Plan
- Map 2 - Developable Areas
- Map 3 - Parks and Open Space
- Map 4 - Roadway Network
- Map 5 - Water Servicing
- Map 6 - On-Site Sanitary Servicing
- Map 7 - Off-Site Sanitary Servicing
- Map 8 - Alternate Off-Site Sanitary Servicing
- Map 9 - Storm Drainage
- Map 10 - Development Permit Area No. 9-6C

# APPENDICES

- Appendix A - Background Report (May 1995)
- Appendix B - Discussion Paper (September 1995)
- Appendix C - Servicing Design and Cost Parameters

## SECTION 1

## Introduction and Purpose of the Plan

---

### 1.1 Introduction

Council of the District of Chilliwack authorized the preparation of an Area Plan amendment to the Official Community Plan (Bylaw No. 1449) for the Chilliwack Mountain area of the District at a meeting held in early spring of 1995. A consultant, Urban Systems Ltd., was selected to conduct the process and prepare a comprehensive development plan for Chilliwack Mountain. The process for this plan involved consultation with District staff and Council, local and government agency representatives, a landowners group, the Chilliwack Mountain ratepayers association, and members of the public in Chilliwack.

The District of Chilliwack Official Community Plan (OCP) for the Chilliwack Mountain area currently provides broad direction for land use and servicing within this sector of the District. The policies of the OCP envisioned a rural level of development and servicing for most of the plan area. Single family residential development serviced by community water (and private septic sewage systems) was the predominant form of future development contemplated by the Official Community Plan when it was adopted in 1990.

With increasing growth pressures in the District and a limited supply of land available for development, in part due to the preservation of lands on the valley floor within the Agricultural Land Reserve (ALR), the upland areas of the District are anticipated to accommodate a portion of the future urban growth. Chilliwack Mountain has now been identified as an upland area that could provide for some of the expected urban development in the District. Council has therefore given direction to reconsider the policies of the OCP for this area to allow for an urban level of development and servicing in the plan area. The preparation of a comprehensive development plan provides direction for land use, servicing, transportation, environmental and visual features, and development guidelines for future growth on the mountain.

The process for preparation of a plan for Chilliwack Mountain involved an open consultation with the key participants in the planning process, including residents of the District and Chilliwack Mountain in particular, landowners and ratepayers groups, government agencies, and staff and Council of the District. A technical analysis of the plan area was first conducted to provide the basis for further land use planning and included an examination of the existing land use context, physical features (topography, landscape and visual features, geotechnical hazards, and environmental features), and servicing (roads, sanitary sewer, water, and storm drainage) context. Issues for consideration in development of options and preparation of the

plan were also identified at this stage and included in a *Background Report* (May, 1995). A public information meeting was held at the District Municipal Hall on June 20, 1995, to review the background information and obtain public input regarding the future direction of the plan area. With this input, further review of issues and then several options for land use and servicing the plan area were developed. These options were included in a *Discussion Paper* (September 1995) and presented at a second public open house in September 28, 1995. Following the second open house a draft plan was prepared on the basis of a preferred option. This draft plan was subject to review by the participants in the process and presented at a third public open house held at the District Municipal Hall on January 25, 1996. Following this public open house, a final Comprehensive Development Plan was completed and submitted to District Council for consideration as an amendment to the Official Community Plan.

## 1.2 Plan Area Context

The Chilliwack Mountain plan area is located in the northwest sector of the District of Chilliwack, approximately 4 kilometres west of Chilliwack's downtown core. The plan area covers approximately 545 hectares situated on the south side of the Fraser River and north of the level plains of the Fraser Valley floor. The Trans-Canada highway and a CN rail line bound the south side of Chilliwack Mountain. Lands surrounding the plan area include a mix of agricultural and industrial uses to the south and west of the mountain. There are two Indian Reserves (I.R.8 & I.R. 3A) on Chilliwack Mountain, and a number of Indian Reserve lands directly north and east between the plan area and the neighbourhoods of Chilliwack Proper. The Chilliwack Mountain area is identified on Figure 1 - Plan Area Location.

The existing population of the plan area is approximately 600-700 people who are predominantly housed in single family dwellings, with a new development accommodating residents in duplex dwellings. The Chilliwack Mountain area has been partially developed, primarily for single family residential subdivisions of varying density (ie. rural, suburban, and a small area of urban development at the east end) and varying levels of servicing. The developed area of the mountain comprises approximately 45%, and is focused primarily in the central and north portions of the plan area. The undeveloped remainder of the plan area contains rural, agricultural, and vacant lands. These areas contain a mixture of moderate and steeply sloping topography as well as significant natural features, including environmentally sensitive areas (eg. riparian corridors and wildlife habitat), watercourses and forest cover.



PLAN AREA LOCATION

FIGURE 1

### 1.3 Purpose of the Plan

The purpose of the Chilliwack Mountain Comprehensive Development Plan is to set out the policy direction with respect to land use and servicing for the plan area. The Plan addresses the broad issue of allowing for an urban level of development in the plan area, and provides associated policies for the following matters:

- overall land use management
- land uses and densities of development
- parks and open space network
- transportation system
- infrastructure servicing
- development permit guidelines
- implementation

The Area Plan for Chilliwack Mountain is an amendment to the Official Community Plan, and as such provides more specific direction for this portion of the District. The plan identifies the areas where future urban development will be accommodated, the location, extent, phasing and estimated costs for servicing these areas, and the policies and guidelines for residential development, provision of park and open space elements, protection of key features related to environment, steep slopes and potential geotechnical hazards, visual sensitivities, and the character of existing developed areas on the mountain.

## 1.4 Description of the Plan

The plan for Chilliwack Mountain is organized into the following elements:

- Section 1** provides the introductory and background information, together with the process and purpose of the plan.
- Section 2** sets out the overall plan area principles and approach to future development.
- Section 3** provides the specific land use objectives and policies for Residential (Suburban, Low Density Single Family, Low Density Multi-Family), Parks and Open Space (Community and Neighbourhood Parks, Open Space and Trail Network) and Rural and Agricultural land uses.
- Section 4** presents strategies for the Transportation System.
- Section 5** contains the strategies for Infrastructure Servicing (Water, Wastewater, Storm Water, and Utilities) of the plan area.
- Section 6** sets out the Guidelines for Development Permit Areas, respecting Environment Protection, Hazards, and Multi-family Residential development.
- Section 7** implementation issues for the plan area are presented in this final section, including staging, servicing, transportation, financing, and the approvals process.

## 2.1 General Principles

The direction for the future of the Chilliwack Mountain area has been based on a set of principles developed through consultation with the participants in the planning process. These general principles provide guidance for the overall plan area and for specific policy directions found in the remainder of this plan:

- *The Chilliwack Mountain area is planned to accommodate a portion of the anticipated future urban growth of the District of Chilliwack.*
- *The new growth that is provided for in the Chilliwack Mountain plan area will be developed with an urban level of servicing, including community water, sanitary sewer, storm drainage, roads, and utilities.*
- *The plan and policies emphasize the protection and preservation of the following key features of the plan area:*
  - ▶ *environmentally sensitive areas*
  - ▶ *steeply sloping topography*
  - ▶ *visual sensitivities*
  - ▶ *character of existing subdivision areas*
- *A suitable transportation system (including arterial, collector and local roads) will be necessary to accommodate future development and the associated traffic demand.*
- *The plan area should ultimately contain a range of housing opportunities, including single-family and multi-family residential forms to ensure a more balanced residential community.*
- *A park and open space system should be formalized in the plan area to meet the recreational needs of the community and to protect environmentally sensitive areas.*
- *Guidelines for future development in a mountain/hillside context should be developed for protection of environmental features, steep slopes and geotechnical hazards, and visually sensitive areas, and used in the preparation of implementing zoning bylaw amendments and issuance of development permits for the plan area. The plan area should continue to be designated a Development Permit Area.*

## 2.2 Approach to the Plan Area

The plan area is essentially composed of **existing developed areas** (residential subdivisions) and **undeveloped areas**. The two Indian Reserves (I.R.8 and I.R.3A) are not included in the plan area in terms of designation of land uses on Map 1 - Land Use Plan, however the Indian Reserve lands (I.R.8 in particular) are integral to the plan area in terms of road, water and sanitary servicing.

The **existing developed areas** are not contemplated to accommodate any of the future urban growth on the mountain. The provision of community servicing will be limited to the future development areas, with the exception of community water service, which is anticipated to be extended to existing subdivision areas over time. Existing development areas are therefore expected to retain the present character of single family dwellings in larger parcel subdivisions. Policies of this plan reflect the preservation of the single family character of these areas.

The **undeveloped areas** of Chilliwack Mountain are contemplated to accommodate the future urban growth in the plan area. The future development areas on the mountain will be provided with an urban level of servicing. An urban level of servicing to these areas will in part dictate a more urban form and density of residential development, including a mix of multi-family and single-family dwellings. Policies of the plan direct urban development to these undeveloped areas.

## 2.3 Developable Area

Future development within the Chilliwack Mountain plan area is expected to be concentrated within the **developable areas** identified through the technical analysis stage of the planning process. The developable areas generally refer to lands with topographic conditions containing slopes of less than 30%. These lands are typically considered suitable for urban development. For purposes of this plan the developable area designation will be applied to lands containing slopes up to 30%. Lands with slopes between 30-50% are considered to represent some constraint to urban development. These lands are considered to be **conditional developable areas** meaning there may be potential for urban development subject to a geotechnical study of slope conditions and potential hazards. For purposes of this plan the conditional developable area designation will be applied to lands containing slopes between 30-50%. For lands containing steeper slope conditions (slopes greater than 30%), geotechnical assessment will be required prior to permitting urban development. Map 2 - Developable Areas indicates the development capability respecting topographic

slope conditions and provides the general location of areas most suitable for future urban development.

## 2.4 Estimated Future Development and Population

As part of the technical analysis and later the review of several future land use scenarios for Chilliwack Mountain, estimates of the expected level of development and population of the plan area were prepared. Based on the analysis of development capability of the undeveloped areas, and assuming the existing developed areas remain in the current form of development (i.e. suburban single family - partially serviced and rural residential - unserviced), it is estimated that a total of approximately 1700 dwelling units (including existing developments) and a population of 4,500 persons can be accommodated in the plan area. This estimate for ultimate development and population levels has been assumed for purposes of preparing land use and servicing strategies for the plan area.

The anticipated population levels for Chilliwack Mountain in the range of 4,000 to 5,000 people is not considered sufficient to warrant locating community facilities (such as schools) or commercial land uses within the plan area. Concerning school facilities, although the ultimate population levels may approach the lower threshold for considering an elementary school within the plan area, there are additional factors which mitigate against planning for such a facility. As identified in the technical analysis, there are no suitable level sites (due to steep topography) central to the plan area population available to accommodate a school site. The location, setting, and existing character of residential development, together with the complex topographic and servicing conditions for the plan area, will likely influence the residential market such that new dwelling units (whether multi-family or single family) will tend toward the higher scale of the market. This will likely alter the demographic picture for Chilliwack Mountain, pushing the threshold population needed to warrant a school facility, beyond the expected population for the plan area. School services will continue to be provided for the Chilliwack Mountain residents within the Chilliwack Proper area of the District, with busing to the Valley Floor facilities for students. Limited retail uses may occur in a location within the plan area, however the relatively small scale of the community and proximity to Chilliwack Proper will not likely attract even a convenience store level of commercial use.

### 3.1 Residential

Housing is the primary form of existing and future development anticipated in the plan area. The current suburban and rural level of residential development, if continued in future development areas, would accommodate a relatively limited amount of the District's expected growth. There is a need to consider more urban levels of residential development in the undeveloped portions of the plan area to provide for this growth. Chilliwack Mountain, in providing an alternative for a portion of the District's growth, will represent an area of residential choice in the District. A mix of low density single family housing and multi-family housing within the natural context of Chilliwack Mountain offers this choice to existing and future residents. In addition, the limitations regarding the developable land base due to topography and environmental protection, together with the provision of community services (water and sanitary sewer) to the undeveloped areas of the mountain, suggest that urban levels of residential development (including multi-family forms of housing and cluster development) will be more appropriate for the majority of future development in the plan area. The future development areas of the plan area are intended to provide for growth through a mix of housing forms, including single-family and multi-family residential development. The use of Comprehensive Development zoning and Development Permit Guidelines provides the District with the opportunity to ensure sensitive mixed-use residential development and protection of open space occurs within each of the future development areas. Policies regarding residential uses are intended to acknowledge both the character of existing single family subdivisions and the constraints and opportunities for higher density forms of housing in new development areas.

#### Objectives

Council's objectives are to:

- *Ensure an effective use of the District's upland areas and provide residential choice in the plan area by supporting an urban density of residential development in appropriate locations.*
- *Allow for a range of housing types, including a mix of multi-family and single family dwellings, within the plan area.*
- *Retain the low density character of existing residential neighbourhoods in the developed areas of Chilliwack Mountain.*

- *Ensure new residential development respects the significant natural features, visual sensitivities, and topographic constraints of the plan area.*

## **Policies**

Council's policies with respect to residential development are to:

- 3.1.1 *Permit residential development in the areas designated on Map 1 - Land Use Plan for residential use.*
- 3.1.2 *Direct new residential development to Developable Areas (slopes less than 30%) as identified on Map 2 - Developable Areas, to protect development from steeply sloping topography and to preserve environmental features of the plan area.*
- 3.1.3 *Consider permitting limited residential development in Conditional Developable Areas (slopes between 30-50%) as identified on Map 2 - Developable Areas where it is demonstrated to the satisfaction of the District through a geotechnical engineering study that development could be accommodated without major risk to property or impact on the environment.*
- 3.1.4 *Require new residential development to be provided with community services, including roads, storm drainage, water and sanitary services.*
- 3.1.5 *Provide for the specific location and type of residential uses on larger parcels in new development areas to be determined through the preparation of Comprehensive Development Zones as part of an amendment to the District's Zoning Bylaw and as provided for in the Official Community Plan (amending Bylaw No. 2140).*
- 3.1.6 *Ensure the appropriate form and character of multi-family development and that new residential development is located to avoid steep slope hazards, visually sensitive features and environmentally sensitive areas through the application of development guidelines outlined in Section 6 - Development Permit Guidelines.*

## **Suburban Residential**

- 3.1.7 *Retain the existing developed areas designated Suburban Residential on Map 1 - Land Use Plan as predominantly single family neighbourhoods.*

- 3.1.8 *Permit single family residential development within the Suburban Residential designation on community water service at a minimum lot size of 0.4 hectare. For residential development without community water service the minimum lot size shall be 1.0 hectare for lands designated Suburban Residential.*

### **Low Density Single Family Residential**

- 3.1.9 *Permit single family and duplex residential development in areas designated Low Density Single Family Residential on Map 1 - Land Use Plan.*
- 3.1.10 *New residential development within the Low Density Single Family Residential designation shall be on full community services at minimum lot sizes ranging from 0.05 - 0.1 hectare, subject to specific slope and geotechnical conditions, for single family dwelling subdivisions and a maximum density of 12 units per hectare (developable area) for duplex developments.*

### **Low Density Multi-Family Residential**

- 3.1.11 *Allow multi-family housing in the form of townhouses, duplexes, and other forms of innovative multi-family housing (eg. stacked and side-by-side housing developments), in undeveloped areas designated as Low Density Multi-Family Residential on Map 1 - Land Use Plan.*
- 3.1.12 *Permit a maximum density of 25 units per hectare (developable area) for new residential development within the Low Density Multi-Family Residential designation. The density calculation shall not include lands considered undevelopable due to steep slopes (greater than 50%) and hazards and environmentally sensitive areas as shown on Map 2 - Developable Areas.*
- 3.1.13 *Single family dwellings shall be permitted in areas designated Low Density Multi-Family Residential on Map 1 - Land Use Plan. The minimum lot size in new subdivisions for single family housing under this description shall be of 2.0 hectares.*
- 3.1.14 *Require new residential development in the Low Density Multi-Family Residential designation to be provided with community services, including roads, storm drainage, water and sanitary sewer.*

- 3.1.15 *Encourage cluster development for new residential development in the plan area. A comprehensive site plan for multi-family cluster development shall be prepared indicating open space areas as well as the location, type and density of proposed housing.*
- 3.1.16 *Ensure the appropriate form and character of multi-family development through the application of development guidelines outlined in Section 6 - Development Permit Guidelines.*

## 3.2 Parks and Open Space

The form of development on Chilliwack Mountain in the past has been primarily large lot (low density) residential subdivisions. This form of development has essentially resulted in the passive park space needs for residents being contained within each individual lot. There has not been a great demand placed on the District for provision of natural open space and neighbourhood or community parks, nor have these past developments taken advantage of the distinctive natural setting of the plan area by designating parks and open space for community use. The planning process for Chilliwack Mountain has identified the value and importance of the natural features present (such as the varied topography, vegetation, watercourses and ravines, wildlife habitat and scenery) in the plan area for existing and future residents, as well as for other District residents. The natural open space system for Chilliwack Mountain provides for areas that are to remain free from urban development. Natural open space areas include lands which are to be protected due to environmental sensitivity, for protection from steep slope and potential hazardous conditions, and to conserve scenic value. Within the natural open space system, designations for environmental reserves and conditional environmental reserves provide more specific preservation and protection of environmental features.

A number of locations for parks are indicated in areas suitable for park facility development. Community parks in two settings are proposed for the plan area. In addition, it is expected that with the future development of portions of Chilliwack Mountain at urban levels, there will be a need for neighbourhood parks to service the expected population. The preservation of natural open space and the provision of community and neighbourhood parks will also require a connecting trail and walkway system to be formalized to service the plan area.

### Objectives

Council's objectives are to:

- *Ensure a suitable level of public park space is designated in the plan area to accommodate the needs of the estimated future population of Chilliwack Mountain.*
- *Preserve and protect significant environmentally sensitive features and natural open space within the plan area.*
- *Provide for a system of trails and walkways for passive recreation opportunities and to function as linkages between parks, natural areas and neighbourhoods on the mountain.*

## Policies

Council's policies with respect to parks and open space are to:

- 3.2.1 *Provide for parks, trails and open space areas within the Chilliwack Mountain community by developing the parks and open space system as designated on Map 3 - Parks and Open Space. Future park locations and trails are shown conceptually; the exact location will be determined at the time of development.*
- 3.2.2 *Identify natural open space areas, including environmental reserves, that are to remain free from urban development to allow for preservation of environmentally sensitive features, informal recreation opportunities, to avoid potentially hazardous conditions, and to retain scenic quality.*
- 3.2.3 *Develop all levels of parks for predominantly passive recreation purposes acknowledging the hillside terrain conditions which exist in the majority of the plan area.*
- 3.2.4 *Implement park facilities in accordance with standards set out in the District's Official Community Plan Bylaw 1990, No. 1449 and in the District's Recreational Open Space Study (1990).*
- 3.2.5 *Acquire parkland through dedications as part of new subdivision development and/or through use of cash-in lieu park funds pursuant to the Municipal Act, as well as through the use of development cost charges for parks. The District will encourage dedication of parks and open space through any Comprehensive Development zoning process.*

## Community Parks

- 3.2.6 *Consider the provision of two future community parks in the plan area as shown on Map 3 - Parks and Open Space, which are accessible both to residents of Chilliwack Mountain and the District. One of these parks is to be located at the summit of Chilliwack Mountain and offers a unique natural setting and panoramic views of the Fraser Valley, the other to be located at the confluence of the Fraser River and Chilliwack Creek at the base of the mountain, offering a natural riverfront setting.*

- 3.2.7 *Develop community parks for passive recreation use which are accessible by public road and trails, and are approximately 4.0 hectares in size.*

### **Neighbourhood Parks**

- 3.2.8 *Provide for a neighbourhood level of parkland in new development areas to service the future population at a level of approximately 0.8 hectares per 1,000 population.*
- 3.2.9 *Develop neighbourhood parks to offer a passive recreation opportunity for residents of the surrounding neighbourhood and to take advantage of natural features and views from the mountain. Retain natural vegetation as necessary to complement the natural landscape and soften the impact of residential development.*
- 3.2.10 *Locate neighbourhood parks in prominent visible sites with frontage on a public road, to provide an accessible focal point in the neighbourhood. Approximate locations for future neighbourhood parks are shown on Map 3 -Parks and Open Space.*

### **Open Space and Trail Network**

- 3.2.11 *Retain lands designated as Natural Open Space on Map 3 - Parks and Open Space free from urban levels of development to allow for preservation of areas with environmental sensitivity, for protection of development from steep slopes and potentially hazardous conditions, and to conserve scenic value.*
- 3.2.12 *Provide for the designation of areas of high environmental sensitivity as an Environmental Reserve on Map 3 - Parks and Open Space to preserve and protect features of high environmental sensitivity including the Fraser River/Chilliwack Creek riparian corridor and the mountain beaver habitat.*
- 3.2.13 *Ensure impacts of development are mitigated through a Conditional Environmental Reserve designation on Map 3 - Parks and Open Space for the wildlife corridor/saddle area identified as having medium environmental sensitivity.*
- 3.2.14 *Allow lands designated Natural Open Space, Environmental Reserve, and Conditional Environmental Reserve to remain in private ownership provided a covenant is registered under Section 215 of the Municipal Act to allow the municipality to restrict land use on parcels within these designations.*

- 3.2.15 *Preserve and protect environmentally sensitive areas which contain identified threatened or endangered flora and fauna, watercourses and riparian corridors, wildlife habitat, and unstable or steeply sloped areas, in accordance with development guidelines established in Section 6 - Development Permit Guidelines.*
- 3.2.16 *Allow for additional lands to be designated as Natural Open Space on Map 3 - Parks and Open Space through the development approvals process where through more detailed assessment further lands are identified as containing environmentally sensitive features, steep slopes, hazardous conditions or recreation/trail opportunity.*
- 3.2.17 *Establish a trail system as identified conceptually on Map 3 - Parks and Open Space to function as natural pedestrian walkways and bicycle path linkages between natural open space areas, parks, viewpoints and neighbourhoods, as well as offering passive recreation opportunities for a range of ability levels.*
- 3.2.18 *Develop additional contiguous open space linkages in existing and future development areas through the provision of pedestrian sidewalks and bicycle routes along public roads (including widened paved shoulders in existing developed areas) as outlined in Section 4 of this plan.*
- 3.2.19 *Prepare a strategy for the acquisition, design and development of the trail system. This should include the active participation of local community groups for implementation of the trails.*
- 3.2.20 *Implement a system of maps, signage and interpretive information to guide and educate trail users.*
- 3.2.21 *Selectively provide staging areas for District residents to park their vehicles and gain access to the trail and park system.*

### 3.3 Agricultural and Rural

Agricultural activities comprise a very limited amount of the land use in the plan area. There is one parcel on the north side of the mountain and fronting on the Fraser River which is contained within the Agricultural Land Reserve (ALR). Rural parcels are also situated on the southwestern and southeastern peripheries of Chilliwack Mountain. These are typically larger parcels occupied by a single family dwelling. Rural lands at the base of the mountain represent a compatible transition land use with the ALR lands that are in proximity to the south plan area limits. The lands that are identified as agricultural or rural in this plan are not likely to be used for urban development purposes in the future, either due to an ALR designation, lack of community servicing, or location and topographic conditions which mitigate against further development of these lands. A portion of the existing agricultural parcel has been identified conceptually as a future Community Park location in the policies of Section 3.2 of this plan. Rural lands policies will continue to respect the character and unserviced condition of these properties.

#### Objectives

Council's objectives are to:

- *Preserve lands in rural use within appropriate locations in the plan area.*
- *Support consideration of a future redesignation of lands currently within the Agricultural Land Reserve for community park purposes.*

#### Policies

Council's policies with respect to rural and agricultural are to:

- 3.3.1 *Retain the existing rural and agricultural lands within the plan area in a Rural designation on Map 1 - Land Use Plan.*
- 3.3.2 *Support the range of uses outlined in the Agricultural Land Commission Act, including rural residential and farming uses, for lands contained within the Agricultural Land Reserve and designated Rural in this plan.*
- 3.3.3 *Permit rural residential land uses for lands not contained within the ALR and designated Rural on Map 1 - Land Use Plan including one single family dwelling on an unserviced parcel of minimum 2.0 hectares in size.*

**4.1 Transportation**

The proposed transportation system for Chilliwack Mountain is planned to facilitate the safe and efficient movement of people, while minimizing the adverse impacts on the existing community. The primary roadway network shown on Map 4 - Roadway Network illustrates the proposed roadway network and classifications for the Chilliwack Mountain area within the context of other District roadways as identified in the Official Community Plan.

The Chilliwack Mountain plan area is situated on the west side of two arterial routes which serve District and inter-municipal travel. Lickman Road is a north-south arterial corridor providing access to significant local area routes, such as Industrial Way and Yale Road. Lickman Road also serves an important function connecting local and District travel to and from the Trans-Canada Highway. Plans for a possible upgrade will be reviewed as part of the broader context of transportation initiatives in the District. Wolfe Road and Schweyey Road form an east-west arterial connection between the Chilliwack Mountain area and the downtown. Based on traffic volumes reported in background studies, the combined arterial route which is joined by Chilliwack Mountain Road serves a high portion of travel between the highway and the downtown area.

Within the plan area an alternate minor collector route to access the area is proposed along the south side of the mountain. The connection to Lickman Road and Chilliwack Mountain Road will serve the high proportion of travel anticipated to continue south toward the highway or to Yale Road serving other parts of the District. The existing topography along the southern portion of the mountain will likely force the proposed road toward maximum allowable grades, particularly in the initial section moving west from the Lickman Road/Chilliwack Mountain road connection. Roadway layout, design standards and provision for alternative modes of travel should be maintained as a priority through this section of road, while balancing the economical and practical implications.

A north-east/south-west local roadway is also designated to carry traffic from the future development areas to the collector system at the southern edge and to Grandview Drive in the north. The grade changes through this area will likely result in slightly lower design speeds as a result of the curvilinear roadway. A similar curved local roadway is indicated to serve individual driveways and to provide connections to the proposed collector roadway immediately south. Although the internal roadway connects to the existing residential streets,

it is projected that the predominant direction of travel demand and availability of an alternate route off the mountain will minimize any adverse impacts on the existing system.

## Objectives

Council's objectives are to:

- *Provide the Chilliwack Mountain plan area with a transportation network which offers mobility for all modes of travel, accommodates future traffic conditions, and is consistent with the objectives of the District's Official Community Plan.*
- *Develop a transportation system which is economically practical and achievable, balancing the goals of community safety and accessibility, and minimizing adverse impacts on the natural mountain setting.*
- *Support the completion of a continuous internal road network connecting the existing and future development areas of Chilliwack Mountain to provide an enhanced sense of community for residents within the plan area.*
- *Ensure the development of roads and cross sections which meet the requirements for vehicular traffic but also emphasizes the creation of a safe environment for pedestrians and cyclists.*

## Policies

Council's policies with respect to the transportation system are to:

- 4.1.1 *Develop a transportation network that is consistent with the District's system of classifying roads based on the differing function and design requirements of the study area roadways (refer to Map 4 - Roadway Network).*
- 4.1.2 *Provide for a transportation network with the following major functions and design characteristics:*
  - a) *Collector Roadway*
    - *Maintain the direct connection from the existing residential community on the north side of the plan area as a primary route to the arterial*

*roadway system.*

- *Serve the local roadway network which exists within the Chilliwack Mountain area.*
- *Provide for a maximum desirable grade of 10%.*
- *Provide one travel lane in each direction of 4.3 metres to accommodate shared vehicle and pedestrian activity.*
- *Provide for a maximum right-of-way of 20 metres and 9.0 metres of paved area.*
- *Design speed of 60 km/hr.*
- *Restrict parking along roadway to emergency purposes only.*

*b) Minor Collector Roadway*

- *Provide connection between development areas on the south side of the plan area and the arterial roadway.*
- *Permit direct access to residential driveways.*
- *Provide for a maximum desirable grade of 10% and 2% for 30 metres of approach to the arterial roadway intersection.*
- *Provide one travel lane in each direction with sufficient area for vehicles to stop for emergencies in the westbound direction, or on the incline of the grade.*
- *Provide for a maximum right-of-way of 20 metres and 11.2 metres of paved area, permitting 4.3 metre lanes for vehicles and cyclists and 2.6 metres for emergency parking only along the westbound lane.*
- *Design speed of 60 km/hr.*
- *Restrict curb parking along roadway.*

- *Provide barrier curb and sidewalk along the south side of the roadway to allow safe pedestrian movement within and to external areas of the planned community.*

c) *Local Roadway*

- *Provide connection to residential driveways and collector system.*
- *Provide for a maximum 12% gradient along roadway and 2% for 20 m on approach to minor collector roadway.*
- *Provide for one travel lane in each direction of 4.3 m to accommodate shared vehicle and pedestrian activity.*
- *Maximum right-of-way width is 20 metres.*
- *Design speed of 50 km/hr.*
- *Restrict curb parking along roadway.*
- *Provide a pedestrian sidewalk on one side of the roadway.*

4.1.3 *Design intersection of proposed minor collector roadway and Lickman Road/Chilliwack Mountain Road to ensure effective and safe operation on all approaches.*

4.1.4 *Conduct a study toward the development of plans to accommodate increased traffic volumes at the intersections of Lickman Road with Yale Road/Industrial Way and with both highway interchange ramps as part of the broader transportation initiatives for the District.*

4.1.5 *Redesign intersection of Schweyey Road and Chilliwack Mountain Road to accommodate growth in travel and to adequate design standards, including sight distances.*

4.1.6 *Provide pullouts for emergency parking, service/maintenance vehicles, and snow removal where local, non-gated intersections are not present.*

- 4.1.7 *Design pullout areas with rolled curbs and paving stone to differentiate these areas from the roadway and to discourage parking in these areas.*
- 4.1.8 *Implement aggressive low maintenance landscaping plans on cut and fill slopes within the right-of-way.*
- 4.1.9 *Where cut and fill sections require retaining structures greater than 2 metres in height, stepped structures should be provided with landscaping treatment to soften the visual impact of the structure.*
- 4.1.10 *Consider the use of coloured pigments, stamped surfaces or other decorative treatments for curbs, gutters and sidewalks to harmonize with the surrounding environment.*
- 4.1.11 *Where cut and fill limits exceed the maximum right-of-way limits, protect the additional lands required by a statutory right-of-way.*
- 4.1.12 *Apply transit-supportive design principles for development to support safe and efficient pedestrian access to bus stops located along the proposed collector roadway.*

## 5.1 Water

Community water servicing is currently provided to most of the plan area, specifically the existing residential subdivisions of Old Orchard Estates, Chilliwack Mountain Estates, Panorama Heights, Maple Hill, and Sunrise Estates. Water service to these existing developed areas consists of four reservoirs, a booster pump station, three major pump stations and a watermain distribution system. Trunk watermain service is drawn from the valley floor via a main on Lickman Road for the majority of the developed areas, and from the Aitken Road watermain for the Sunrise Estates and Maple Hill subdivisions on the east side of the plan area. Existing lots along Old Orchard Road in the northwest which are currently drawing water from springs, creeks and private wells would be encouraged to connect to a community water distribution system when it is extended to this part of the plan area.

There are four different service zone areas identified for the mountain, which are shown on Map 5 - Water Servicing. These service zones delineate areas which will be serviced by each of the four reservoirs. Within each service zone, there may be more than one pressure zone. Pressure reducing valves will be required to maintain line pressures below 900 Kpa.

Most of the existing development in the plan area is confined to Zones 3 and 4, while future development areas are included in Zones 3 and 4, but also in the Zone 2 area. Only limited existing and future development is located in Zone 1. To service the anticipated ultimate population range of between 4,000 to 5,000 people in the plan area, the major works necessary to accommodate future development include a new reservoir and pump station in Zone 4, expansion of the volume for existing reservoirs in Zones 2 and 3, the upgrading of all existing pump stations including the extension of three-phase power, twinning of some existing watermains, and the provision of new watermain distribution systems to proposed development areas.

Watermain and reservoir sizing is primarily governed by the provision of sufficient fire flow. In accordance with District standards and the Fire Underwriters Survey, fire flow rates will increase from 60 L/s for single family housing to 150 L/s for the multi-family housing being proposed. In addition, flow durations increase from 1.5 hours to 2 hours. Therefore, multi family housing has tripled the reservoir volumes and nearly doubled watermain sizes from that required for single family housing. Not providing sufficient fire flows for future developments may jeopardize the ability of homeowners to obtain and/or claim insurance.

A review of the Districts water supply model indicates that the existing off-site water supply system has the capacity to supply water for 14,000 people on Chilliwack Mountain. Therefore, no off-site water works will be required to service future developments on the mountain.

## Objectives

Council's objectives are to:

- *Provide for a community water system to service the existing and future development for the Chilliwack Mountain plan area.*
- *Ensure that an urban level of water service is provided by the applicants or proponents of new developments.*
- *Ensure that sufficient fire flow protection is provided to all developments in the plan area.*

## Policies

Council's policies with respect to water servicing are to:

- 5.1.1 *Plan for a community water system in the Chilliwack Mountain area to ultimately supply water to a population range of 4,000 to 5,000 people.*
- 5.1.2 *Implement a water system which provides fire flow protection in accordance with District and Fire Underwriters Survey standards.*
- 5.1.3 *Ensure the community water system is developed to allow for the water distribution upgrading and expansion required by existing and proposed development as shown on Map 5 - Water Servicing.*
- 5.1.4 *Require new development in Chilliwack Mountain to be provided with community water service.*
- 5.1.5 *Provide community water service to the existing residential development on Old Orchard Road at the request of landowners or as required by the Ministry of Health through creation of a Specified Area.*

## 5.2 Sanitary Sewer

The present level of sanitary servicing to the plan area is limited. The only part of the mountain currently serviced by community sanitary sewer is the lower half of the Sunrise Estates development and the recent Maple Hill duplex development immediately south east of Sunrise Estates. The remainder of the existing developed areas on Chilliwack Mountain operate on private individual septic systems.

The existing sanitary trunk line servicing the east end of the plan area involves a series of gravity sewers and force mains draining south along Aitken Road which discharges into Pump Station (PS) 14 at Yale Road West. In 1995, the District constructed a 250 mm diameter sewer on Lickman Road from Chilliwack Mountain Road to the existing 300 mm diameter sewer at Yale Road West. This installation was part of the Lickman Road reconstruction and is intended to service future development on Chilliwack Mountain. These existing trunk lines are shown on Map 6 - On-Site Sanitary Servicing and Map 7 - Off-Site Sanitary Servicing.

The existing 300 mm diameter main on Yale Road West drains east, and also discharges into PS 14 at Aitken Road. From PS 14, the trunk line continues east along Yale Road West with a series of gravity sewers and forcemains to PS 10, and then north along the west edge of the City centre to the existing Sewage Treatment Plant (STP) on Wolfe Road. Improvements to the trunk sewer, P.S. 10 and trunk forcemain, as identified for Promontory, Eastern Hillside and Ryder Lake, will ensure sufficient capacity for Chilliwack Mountain to the STP. In addition, the expansion program of the existing STP will provide sufficient capacity to accommodate the ultimate population for Chilliwack Mountain.

The on-site sanitary strategy will be to service only future developments. Those lots currently employing septic systems will remain on septic service, with the exception of Sunrise Estates. Sanitary service should be extended to the upper levels of Sunrise Estates in accordance with Ministry of Health comments. Without servicing Chilliwack Mountain Estates, the plan area is bisected into two distinct areas. One service area is on the east face of the mountain, which includes Sunrise Estates, Maple Hill and the undeveloped properties on the north side of the mountain. This area will be serviced by the existing sanitary trunk line on Aitken Road. The second service area is comprised of development on the south face of the mountain, which is to be serviced by the new sewer on Lickman Road.

Development at the extreme west end of the mountain will be both difficult and costly to service. Based on the fact that only limited single family units are possible, no trunk servicing is required to extend into this property. If the developer finds it cost effective to provide this area with sanitary service, sewage could be pumped to the east without requiring

further infrastructure requirements downstream. Otherwise, septic systems may be employed subject to sufficient geotechnical conditions and Ministry of Health approval.

In the *Background Report* completed in May 1995, two alternate off-site sewer routes were considered in providing servicing to the ultimate population of Chilliwack Mountain. One alternative was to upgrade the existing infrastructure on Aitken Road and Yale Road West (refer to Map 7 - Off-Site Sanitary Servicing). The second alternative was to construct a new forcemain from Sunrise Estates directly to the STP via Schweyey Road and Wolfe Road (see Map 8 - Alternate Off-Site Sanitary Servicing). These alternate routes were reviewed prior to the installation of the Lickman Road sewer and was based on servicing both the existing and future developments on Chilliwack Mountain. Based on the information available at that time, the second alternative (new forcemain on Schweyey and Wolfe Road) appeared to be more economically viable for the ultimate population, when only the total construction costs were compared.

However, the recent construction of the Lickman Road sewer and the revised servicing plan has altered the phasing and implementation strategy, giving alternative one much greater flexibility with respect to incremental phasing as well as a lower total cost. Revised cost estimates for each alternative indicate that constructing a new sewer via Schweyey Road would cost upwards of \$1,200,000, while off-site costs to upgrade the existing infrastructure is estimated at \$740,000, assuming that L.S 10 and the trunk sewer has capacity; both costs allowing 25 percent for engineering and contingencies. In addition, the construction of a new force main along Schweyey Road would require the full capital expenditure prior to development, making this a less favourable alternative. Therefore, upgrading of the existing infrastructure, as presented on Map 7 - On-Site Sanitary Servicing, may be the preferred option. However, Map 8 - Alternate Off-Site Sanitary Servicing describes off-site works required if the alternate route is chosen.

While the existing infrastructure was not designed to accommodate urban development on the mountain, current flows appear to be below system capacity. Following a review of pump operation records supplied by the District, existing flows at each P.S. have been estimated and shown in Section 7.7.3. They have been estimated from the average daily hours of operation of each pump station. It is strongly recommended that the District undertake a flow monitoring program in 1996 for P.S. 13, 14, and 19 to confirm the actual existing flows. This will accurately identify their remaining capacities and allow confirmation of the implementation strategy.

Assuming that flows from the industrial/commercial parcels upstream of P.S. 13 do not increase prior to the development of Chilliwack Mountain, it is estimated that the existing

infrastructure could support residential development for up to 350 people on the north face and a total population of 930 before any off-site works are required. However, in order to support the ultimate development conditions, as described in the OCP, major upgrades will be required.

## Objectives

Council's objectives are to:

- *Provide for a community sanitary sewer system to service the future development of the Chilliwack Mountain plan area.*
- *Use the District Sewage Treatment Plant for treatment and disposal of sewage from new development in the plan area.*
- *Ensure that an urban level of sanitary service is provided by applicants or proponents of new developments.*

## Policies

Council's policies with respect to sanitary servicing are to:

- 5.2.1 *Ensure that a community sanitary sewer system is provided for new development in the plan area as shown on Map 6 - On-Site Sanitary Servicing.*
- 5.2.2 *Continue with the phased expansion of the District Sewage Treatment Plant to meet the anticipated capacity demand of the Chilliwack Mountain plan area.*
- 5.2.3 *Continue with upgrading of the trunk sewer, trunk forcemain and P.S. 10, as identified for Promontory, Eastern Hillsides and Ryder Lake.*
- 5.2.4 *Utilize the existing off-site sewer infrastructure for interim service.*
- 5.2.5 *Place priority on upgrading the existing off-site sewer infrastructure to service the ultimate population of Chilliwack Mountain. These works are described on Map 7 - Off-Site Sanitary Servicing.*

- 5.2.6 *Undertake a flow monitoring program in 1996 for P.S. 13, 14 and 19 to determine the actual existing flow rates and confirm the implementation strategy presented in Section 7.7.3.*
- 5.2.7 *Consider the construction of a new off-site sewer via Schweyey Road as a less favourable alternative to upgrading the existing infrastructure. These works are described on Map 8 - Alternate Off-Site Sanitary Servicing.*
- 5.2.8 *Require new development in Chilliwack Mountain to plan and construct the necessary sewer infrastructure for proposed developments including connection to the District Sewage Treatment Plant.*
- 5.2.9 *Extend sanitary servicing into the upper levels of the Sunrise Estates development.*
- 5.2.10 *Permit the proposed single family development at the west end of the plan area to be serviced by septic systems, subject to suitable geotechnical and hydrogeologic conditions and Ministry of Health approval.*

### 5.3 Storm Drainage

Based on available topographic mapping approximately 225 hectares (38%) of the study area drains south to the agricultural lowlands, while the remaining 364 hectares (62%) drains north directly to the Fraser River. The drainage divide separating these area is shown on Map 9 - Storm Drainage.

The majority of the northern catchment is already developed as rural residential, while the southern catchment remains in a nearly undeveloped state. Future development parcels considered in this plan comprise only 24% of the northern catchment, while representing 72% of the southern catchment. However, since much of the proposed parcels have limited development potential, these percentages are reduced to 10% and 15% respectively, if only the developable areas are considered.

Drainage within the existing rural developments is characterized by road side ditches and culverts, using existing creeks as discharge points. The Sunrise Estates development employs storm sewers to convey runoff to the valley floor and discharges into Chilliwack Creek. The Maple Hill development has also implemented a stormwater control pond and wetland to provide both quantity and quality control prior to discharge into the Chilliwack Mountain Road outfall ditch.

Within the northern catchment some existing drainage problems exist on Old Orchard Road as a result of narrow ditch sections. The valley floor on the south side of the mountain experiences regular flooding. The District recognizes the need to dredge lowland ditches and plans to carry out this work as part of their maintenance program.

Proposed developments along Chilliwack Mountain Road on the north face of the mountain (east of I.R. #8) will have the opportunity to discharge uncontrolled to the Fraser River, by providing a sufficient trunk drainage path across Chilliwack Mountain Road directly to the river. Likewise, proposed rural development at the west end of the mountain along Old Orchard Road may be permitted to discharge uncontrolled providing a sufficient drainage path is constructed beneath the Old Orchard Road to the river. Without major off-site drainage works, all other developments on the mountain will increase the risk of frequent flooding to downstream lands, thereby requiring stormwater control.

Where required, stormwater management facilities should be constructed to reduce the 1:2 year and 1:10 year runoff to predevelopment levels. If topography does not allow on-site surface detention, other methods shall be employed, such as oversized pipes and underground storage tanks.

With the current flooding problem on the valley floor in this area, and the high cost of controlling the 1:100 year runoff, this is seen as an emergency flow condition and controlling runoff which exceeds the 1:10 year event is not required. However, all major drainage routes should be designed for the 1:100 year runoff in order to safely convey the major runoff down off the mountain.

It is expected that the multi family housing and associated parking will be constructed in a fashion which will allow runoff from impervious surfaces to be collected into a storm sewer system. A trunk sewer aligned along the internal minor collector road will collect the **controlled** 1:10 year runoff from each housing cluster and convey the runoff to the base of the mountain at Lickman Road. The trunk sizes shown on Map 9 are approximate and are based on a critical pipe slope of 2 percent. Final sizing requires further calculation once development conditions and trunk sewer alignments are confirmed. The controlled runoff will discharge to the upgraded drainage works on Chilliwack Mountain Road, east of Lickman Road. Runoff exceeding the 1:10 year event will be conveyed along the minor collector road by employing curbing to contain the major flow within the roadway. Driveway entrances should be designed to ensure that this flow is maintained within the roadway. If this can not be achieved, underground piping will be required to control the major flow. Similarly, driveways on the uphill side of public roads should have sufficient drainage to prevent direct discharge onto the road; which causes serious icing problems in the winter.

Developments which are not able to discharge to the trunk sewer, but require to discharge to existing watercourses within the study areas should be reviewed in further detail to assess the sensitivities of the watercourse. Additional drainage works may be required for these lands to ensure that the major runoff can be safely conveyed off the mountain.

Runoff from undeveloped lands should not be collected within the sewer system. This runoff should continue to drain to the existing watercourses. The intent of the sewer system is to provide control and conveyance for the **developed lands only** and is not intended to divert runoff from the undeveloped lands. Drainage boundaries and base flows should be maintained to existing watercourses wherever possible. The actual extent of development is not yet known, however an approximate trunk sewer size has been shown on Map 9 - Storm Drainage, assuming the developable land is maximized.

Road side ditches will be required on the up-hill side of rural sections and should have the capacity for rock fall and soil catchment. Where slopes exceed 3 percent grade, these ditches should be sufficiently armoured to minimize velocities and prevent erosion.

With the impervious surfaces being concentrated into dense clusters, grit chambers should be employed within each housing cluster to reduce sediment loadings into the trunk sewer. The Stormceptor system, as supplied by Lafarge Construction Material, should be given strong consideration. The advantage over conventional chambers is that an internal bypass prevents the sediments from being flushed out during high runoff events.

Again, surficial soils on the mountain are typically characterized by silts that become highly erodible when disturbed. It will be imperative that detailed erosion control measures be implemented prior to any construction activity. These measures shall remain in place until all construction within the catchment is completed and sufficient ground cover has been re-established.

## **Objectives**

Council's objectives are to:

- *Prevent increased flooding and erosion of downstream lands during frequent storm events.*
- *Protect drainage characteristics of environmentally sensitive areas.*
- *Ensure adequate drainage for individual developments within the Plan area.*
- *Protect the environment and water quality for fish and wildlife.*

## **Policies**

- 5.3.1 *Require detailed stormwater drainage plans prior to development approval.*
- 5.3.2 *Post-development flows to all existing on-site watercourses should be maintained at or below the pre-development levels for the 1:2 and 1:10 year events.*
- 5.3.3 *Provide a trunk sewer alignment along the internal minor collector road to service the majority of development on the south face of the mountain, as shown on Map 9 - Storm Drainage. This sewer should be sized for the 1:10 year runoff and service only the developed lands.*

- 5.3.4 *Runoff from undeveloped lands should not be collected in the storm sewer system. This runoff should continue to discharge to existing watercourses, maintaining existing drainage boundaries and base flows wherever possible.*
- 5.3.5 *Stormwater control shall be provided on-site by the developer. The method of storage shall be determined by the developer to suit the topographic and proposed development conditions, but shall be approved by the District.*
- 5.3.6 *Require that major flow routes are provided to convey the 1:100 year runoff and ensure the risk of flooding and damage to downstream properties is not increased.*
- 5.3.7 *Ensure that the cross section of the internal minor collector road has sufficient capacity to convey the 1:100 year major runoff rates.*
- 5.3.8 *Require driveway entrances on the uphill sides of public roadways to have sufficient drainage to prevent frequent runoff from discharging directly to the road surface.*
- 5.3.9 *Require driveway entrances on the downhill side of public roadways to be designed to ensure that major runoff remains within the roadway.*
- 5.3.10 *Require that grit removal be provided in all multi-family developments prior to discharge into the trunk sewer or receiving watercourses.*
- 5.3.11 *Require detailed erosion control plans be approved by the District prior to any construction activities.*
- 5.3.12 *Ensure development does not impact riparian zones and disallow the disturbance to natural watercourses.*
- 5.3.13 *Require ditching on the uphill side of all rural road sections. These ditches should be designed to convey the major runoff and have capacity for rock fall and soils catchment. In addition, sufficient armouring should be provided to reduce velocities and prevent erosion.*
- 5.3.14 *Road crossings of existing watercourses shall provide culvert passage for the 1:200 year maximum daily discharge, in accordance with Section 7 of the Water Act.*

## 5.4 Utilities

BC Gas, Tel and Hydro were all consulted on the requirement to extend utility services to the proposed development areas. While all three agencies indicated that minor on-site upgrading would be required there are no significant constraints anticipated. BC Gas has had a preliminary plan for a few years to service the entire mountain. Three phase power exists at the east end of the mountain which will need extending to service the on-site pump stations.

### Objectives

Council's objectives are to:

- *Provide for BC Tel, BC Gas and BC Hydro servicing to the future development of the Chilliwack Mountain plan area.*

### Policies

Council's policies with respect to utility servicing are to:

- 5.4.1 *Extend 3 phase power to service both expanded and new pump stations.*
- 5.4.2 *The Comprehensive Development Plan should be circulated to the utility agencies to allow them to revise their strategies.*
- 5.4.3 *All utilities extended within the study area should be underground.*

**6.1 Designation of Development Permit Area**

The District of Chilliwack designates the entire Chilliwack Mountain plan area as a Development Permit Area pursuant to Section 945 (4) of the Municipal Act, as shown on Map 10 - Development Permit Area No. 9-6C.

The Development Permit Area designation for Chilliwack Mountain is established in accordance with the following:

- For protection of the natural environment pursuant to Section 945 (4)(a) of the Municipal Act.
- For the protection of development from hazardous conditions pursuant to Section 945 (4)(b) of the Municipal Act.
- For the establishment of objectives and the provision of guidelines for the form and character of multi-family residential development pursuant to Section 945 (4)(e) of the Municipal Act.

## 6.2 Protection of the Natural Environment

The guidelines presented in this section provide direction for the protection of natural features and environmentally sensitive areas within and adjacent to the Development Permit Area, and as designated on Map 10 - Development Permit Area No. 9-6C. The goal of these guidelines is to ensure that any development occurs in a manner that protects the form and function of those natural features and environmentally sensitive areas that have high biological, ecological, geologic, hydrologic and community value and require protection from the impacts of development.

Background research and site surveys were conducted and a report prepared by ECL Envirowest Consultants Ltd. This work was documented in *Chilliwack Mountain Comprehensive Development Plan - Background Report*, Urban Systems (1995). It describes the environmentally sensitive features, areas and conditions of the plan area.

### 6.2.1 Special Conditions

The special conditions which justify guidelines for protection of the natural environment for the Chilliwack Mountain Development Permit Area are that there are areas and features of particular environmental sensitivity, including riparian zones and associated water courses, fish and wildlife habitats, forest cover and understorey communities, and the possible existence of threatened or endangered species.

The objectives of Development Permit Area No. 9-6C, Protection of the Natural Environment, are as follows:

- To protect the fisheries resource of fish bearing creeks and tributaries thereof;
- To minimize the impact of development on natural features and environmentally sensitive areas;
- To protect and wildlife and wildlife habitat in and adjacent to the area;
- To protect watersheds;
- To retain areas of high scenic value to the Development Permit Area and the community as a whole.

### 6.2.2 Guidelines

The following guidelines shall apply to Development Permit Area No. 9-6C, for the protection of the natural environment:

- 1) For fish-bearing water courses and riparian zones, a minimum setback of 15.0 metres shall be provided from top of bank, within which the terrain and vegetation shall be protected from disturbance and retained in its natural state, save and except any trail development approved by the District Director of Development;
- 2) For ephemeral water courses and riparian zones, a minimum setback of 9.0 metres shall be provided from top of bank, within which the terrain and vegetation shall be protected from disturbance and retained in its natural state, save and except any trail development approved by the District Director of Development;
- 3) For riparian zones and habitat areas containing threatened wildlife species, (MOELP red-listed), a minimum setback of 15.0 metres shall be provided from the top of bank within which the terrain and vegetation shall be protected from disturbance and retained in its natural state;
- 4) Developed crossings of permanent and ephemeral water courses may be permitted, provided their quantity and impact on the natural environment is minimized. Where crossings occur they shall be multi-purpose, accommodating a variety of uses (e.g., road, utilities, pedestrians circulation);
- 5) Prior to subdivision approval a visual inventory and analysis shall be conducted on the site and surrounds by a registered Landscape Architect or a registered Professional Forester and submitted to the District;
- 6) Prior to construction, all areas to be protected in their natural state shall be fenced off and signed to prevent access to, disturbance of an dumping on said lands;
- 7) Encourage preservation of natural vegetation or existing site tree cover, except as required for the sensitive development of land uses and infrastructure and the removal of hazard trees or conditions;
- 8) Prior to subdivision approval a tree survey and management plan shall be prepared by a registered Professional Forester, identifying trees proposed to be cut, vegetation protection areas and the location, size and species of replacement trees to be planted;
- 9) A stormwater management plan must be submitted to the satisfaction of the District Engineer and must provide on-site drainage so as not to adversely affect adjacent properties. Further, all post development water flows into the storm drainage system must not exceed pre-development flows;
- 10) Erosion and Sediment Control Plans must be approved prior to the commencement of construction.

## 6.3 Hazards

The guidelines presented in this section provide direction for the protection of natural resources and developed property and infrastructure within and adjacent to the Development Permit Area, and as designated on Map 10 - Development Permit Area No. 9-6C. The goal of these guidelines is to ensure that any development occurs in a manner that reduces, or does not increase, the potential occurrence of hazardous events, is safe for life and property and maintains and protects the natural environment.

Research and an overview assessment of the study area were conducted and included in a report prepared by Thurber Engineering Ltd. This work is documented in *Chilliwack Mountain Comprehensive Development Plan — Background Report*, Urban Systems (1995). It describes geotechnical conditions including topography, soil, bedrock and potential debris fan areas.

### 6.3.1 Special Conditions

The special conditions which justify guidelines for hazard areas and conditions for the Chilliwack Mountain Development Permit Area are that there are areas of steep (in excess of 30 percent) slope, existing wildland forest cover, thin layers of soil on bedrock, poorly drained areas and the potential for flooding, sub-surface piping, subsidence, debris flows and erosion, and debris fan areas at the base of the mountain in several locations.

The objectives of Development Permit Area No. 9-6C, Hazards, are as follows:

- 1) To protect life and property from hazardous events by restricting the use of land that is subject to hazardous conditions;
- 2) To maintain the integrity of natural drainage courses and manage stormwater events;
- 3) To protect fisheries and wildlife habitat.

### 6.3.2 Guidelines

The following guidelines shall apply to Development Permit Area No. 9-6C, for hazardous areas and conditions:

- 1) Development shall not be permitted in areas subject to potential damage from debris flows, slumping, subsidence, flooding or erosion unless properly engineered protection measures are incorporated;

- 2) Development on hillside (steep slope areas) and geotechnical hazard areas shall require a geotechnical report prepared by a Professional Engineer with experience in geotechnical engineering;
- 3) Stream crossings and roadway construction adjacent to major creeks shall meet the satisfaction of the Department of Fisheries and Oceans and the Ministry of Environment, Lands and Parks and shall be designed to accommodate flows and retain the stream bed in a natural condition;
- 4) Land with a natural slope greater than 30 per cent shall be maintained free of urban development and in its natural state unless proven otherwise by geotechnical report, save and except any trail development or necessary infrastructure approved by the District Director of Development;
- 5) Development at the tops of hills or escarpments shall be setback from the ridgeline or topographic break a minimum of 15 metres, save and except any trail development approved by the District Director of Development;
- 6) Prior to subdivision approval a study, identifying the following, shall be prepared by qualified persons and submitted to the District:
  - stormwater management plan;
  - site survey and topographic analysis; and
  - geotechnical conditions and constraints.
- 7) Road design shall minimize the potential danger of erosion, landslide and flooding. The following techniques may apply where appropriate:
  - follow natural contours;
  - allow split level, one-way streets;
  - allow flexibility in the placement of lot lines to accommodate "traversing driveways;"
  - use narrow pavement widths, within the limits of public safety, by the use of off-street parking in bays and clusters.
- 8) Hillside development shall employ environmentally sound techniques in engineering and architecture such as:
  - grading to complement natural land forms to minimize terracing (cut and fill);
  - use of indigenous materials in landscaping;
  - placement, grouping and shaping of man-made structures to complement the natural landscape; and
  - encourage a variety of building type clustered to maximize the amount of open space and natural features.
- 9) To minimize the potential hazard of wildfire for development within the wildland/urban interface in Chilliwack Mountain, new development will be reviewed subject to the Provincial advisory document: "Beware and Prepare Community Planner."

## 6.4 Multi-family Residential Development

The guidelines presented in this section provide direction for the development of multiple-family dwellings within the areas designated on Map 10 - Development Permit Area No. 9-6C. The purpose of these guidelines is to encourage a high standard of development, which addresses issues relating to form and siting, to ensure new development is compatible with the natural landscape and acknowledges the hillside topography and existing development within Chilliwack Mountain.

### 6.4.1 Special Conditions

The special conditions which justify guidelines for multiple family residential developments are that there are areas of natural landscape and hillside topography which define the visual landscape and character of Chilliwack Mountain which should be considered by new development of multiple family dwellings.

The objectives of Development Permit Area No. 9-6C are as follows:

- 1) To maintain a development density that can meet the housing demand in Chilliwack and support all necessary infrastructure improvements;
- 2) To enhance housing opportunities in Chilliwack;
- 3) To encourage diversified housing types for a balanced population mix;
- 4) To maintain the character and amenity of existing single family homes;
- 5) To allow an appropriate transition between existing and new built forms;
- 6) To promote a high quality of innovative residential building design;
- 7) To minimize the impact of new multiple-family residential developments on existing single family homes;
- 8) To minimize impacts on view vistas enjoyed by existing single family homes;
- 9) To minimize alteration of the visual landscape of Chilliwack Mountain as seen from a distance looking towards Chilliwack Mountain;
- 10) To minimize impacts on existing natural features and environmentally sensitive areas;
- 11) To minimize alteration to the existing natural topography and wherever possible, avoid development on steep slopes.

### 6.4.2 Guidelines

The following development guidelines shall apply to Development Permit Area No. 9-6C for the development of multi-family dwellings:

## **Siting and Servicing of Buildings**

- 1) No development shall be allowed in areas subject to potential damage from debris torrents, flooding or flooding erosion unless properly engineered protection measures are incorporated as outlined in Section 6.3.2.
- 2) Site development on hillside areas shall be designed and inspected by a Professional Engineer with experience in geotechnical engineering and an Architect with experience in hillside development. Refer to Section 6.3.2 guidelines.
- 3) Roads and driveways serving the proposed development shall be designed and inspected by a Professional Engineer with experience in geotechnical engineering. Refer to Section 6.3.2 guidelines.
- 4) Hillside development should employ environmentally sound techniques in engineering and architecture including:
  - grading to complement natural land forms to minimize terracing (cut and fill);
  - use of indigenous materials and landscaping;
  - placement, grouping and shaping of man-made structures to complement the natural landscape;
  - encourage a variety of building types which incorporate clustering to maximize the amount of open space and natural areas; and
  - preservation of existing trees.
- 5) Changes to existing terrain through grading for new developments should be kept to a minimum to retain the hillside character.
- 6) Hillside development should complement or enhance the aesthetic qualities of the natural landscape; wherever possible, skylines and ridgelines, topographic community and tree and shrub masses should be preserved, and all man-made structures should be properly positioned, scaled and designed so as not to dominate the general hillside landscape. A site plan addressing these concerns shall accompany the application for development permit.
- 7) Buildings should not be located on visually prominent ridgelines, hill crests or topographic and roof lines should be located below the ridge line so that views to the natural ridge line are maintained.
- 8) Clustering of multiple-family residential development in the form of side-by-side stacked townhouses, duplexes and small apartments is strongly encouraged for steeper sites and sites which possess significant natural and environmentally sensitive areas in order to preserve natural features and create landscape buffers between developments.
- 9) New development should be oriented to best utilize natural light and maximize views of the valley floor and mountains beyond.
- 10) New development should respect views of the valley floor and mountains beyond enjoyed by existing single family dwellings.
- 11) Innovative forms of multi-family (eg. stepped or side-by-side) low rise buildings may be acceptable on plateau sites or on the uphill side of the slope if cut into the slope.
- 12) Fencing should not be allowed in areas where it would interfere with the movement of wildlife.
- 13) Street light fixtures shall be selected, located and installed to cast light only within the road right-of-way.

- 14) Roads and utility corridors shall be developed below and parallel to ridgelines and knolls. Crossings of ridgelines may be reconsidered at low points and areas of limited visibility.

### **Form, Massing and Character of Buildings**

- 15) Individual buildings should be designed to blend with the natural terrain and preserve the character and profile of the existing slope.
- 16) Buildings that step up or down the hill should have storeys staggered to follow the natural grade.
- 17) Uphill buildings should cut into the hillside to reduce the effective visual bulk and reduce the height of retaining walls.
- 18) Setbacks for downhill units should minimize the front yard setback to reduce the effective height of the building.
- 19) Avoid use of massive stilts and other understructure construction, and the exposure of foundation walls, to ensure protection of visual sensitivity of the mountain face.
- 20) Long unbroken building lines and roof lines should be avoided by incorporating the following techniques:
  - (i) Off-setting, modulating and articulation of wall lines along building elevations to allow smaller building sections to stand out by incorporating elements of shadow and depth; and
  - (ii) Implementing steeper roof pitches and stepping down of roof lines to vary the height and roof line of buildings.
- 21) Building materials and finishes should be compatible with adjacent existing lower density residential development unless it is on highly visible slope, then it should be compatible with natural landscape.
- 22) Garbage and utility areas and parking areas should be screened with landscaping and/or fencing in a manner which is compatible with existing natural features and new development.
- 23) Site layout, landscaping, parking and storage areas and building designs should consider safety and security of users and passers by.
- 24) Buildings visible from the valley floor shall have an external appearance that has minimal contrast with surrounding natural vegetation and terrain.
- 25) Buildings at the upper edge or crest of hills/slopes should be staggered and lower in elevation and stepped to permit uphill views out and reduce visual impact from the valley floor; and
- 26) Discourage reflective glass and highly visible facades with large areas of glass.

### **Open Space**

- 27) Natural features between development clusters should be preserved by incorporating open space and landscape buffers.
- 28) Where possible, natural vegetation and stands of trees should be preserved or enhanced with new plantings. All disturbed open spaces should be reclaimed to a "naturalized" condition or landscaped.
- 29) Landscaping should be used as a visual buffer to screen development from critical viewpoints, between buildings and along roads.

- 30) An envelope for the building and associated improvements should be established, beyond which tree removal and alteration of the natural landscape should be minimized.
- 31) Pedestrian trails in natural open spaces should have directional and interpretive/educational signage to discourage environmental disturbance (eg., trail blazing, trampling, collecting, harassing, etc.).

### **Access and Parking**

- 32) Building and access road alignments should run parallel to the natural contours to minimize site impacts.
- 33) Combinations of collective private driveways and cluster common off-street parking areas are encouraged and should be configured to fit and complement the natural topography.
- 34) Parking for uphill townhouse units should consist of attached garages to allow reduced building height. Similarly, parking on the top of downhill units should be encouraged to minimize site disruption.
- 35) Large or expansive parking areas associated with development should not be allowed.

The Chilliwack Mountain Comprehensive Development Plan (CDP) provides a general statement of the principles, objectives and policies for the land use and servicing of the plan area. There is a need to provide for the implementation of the objectives and policies of the plan through a framework of methods and tools for implementing the plan. The following section outlines these methods for implementation.

### **Amendment to the Official Community Plan**

- 7.1 The adoption of the Chilliwack Mountain Comprehensive Development Plan by the District as an “Area Plan” amendment to the District of Chilliwack Official Community Plan Bylaw 1990, No. 1449, will allow for the policies of the Area Plan to provide specific direction for the land use and servicing of the Chilliwack Mountain plan area.
- 7.2 Designation of the entire plan area of Chilliwack Mountain as a Development Permit Area pursuant to Section 945 (4) of the Municipal Act permits the District to control development for the protection of the natural environment, the protection of development from hazardous conditions, and the establishment of objectives and provision of guidelines for multi-family development. Through the Development Permit Area designation the District can provide guidelines and require the issuance of Development Permits for the following activities prior to their commencement:
- subdivision of land;
  - construction of, addition to, or alteration of any dwelling unit or any building exceeding a floor area of 60 square metres;
  - excavation, removal or relocation of soil or rock, channel alteration or any activity that may affect existing watercourses; and
  - tree removal except as specifically permitted by the District to facilitate surveying and road planning.
- 7.3 The District should repeal the Schedule 9-6C of the Official Community Plan and replace it with Map 10 - Development Permit Area No. 9-6C of this CDP to ensure the new Section 6 guidelines of the Area Plan amendment are applicable to the plan area. This will allow the District to require a Development Permit to be issued prior to commencement of development in the designated DPA for Chilliwack Mountain.

## Zoning Bylaw

7.4 The District's Zoning Bylaw 1993, No. 1841, is a key implementation tool for the Chilliwack Mountain CDP. Zones to regulate land use and density within the broad land use designations provided in this Area Plan amendment are contained in the Zoning Bylaw. Amendments to the Zoning Bylaw to accommodate proposed development can be carried out to apply the appropriate zoning category to a parcel. For larger parcels of proposed residential developments, or mixed-use developments, a Comprehensive Development Zone may be considered through amendment of the District Zoning Bylaw, and as provided for in the District's Official Community Plan.

The process for rezoning, or amendment to the District Zoning Bylaw, to allow implementation of the Area Plan land use policies and for development to proceed in accordance with this Area Plan, includes the following steps:

- Application for rezoning is submitted by landowner ;
- District reviews the application and reports to Council;
- Council may authorize preparation of amending bylaw;
- First reading and then Public Hearing held by District;
- Information review and Council may give final adoption to bylaw;
- Landowner may then proceed to Development Permit application stage.

## Financing

7.5 Preliminary capital cost estimates have been prepared for the provision of major components of infrastructure services including transportation, water, sanitary sewer, and storm drainage. Improvements to on-site and off-site infrastructure services to accommodate proposed developments will be undertaken by the applicants or developers of parcels within the plan area. The cost estimates (inclusive of Engineering and Contingencies) for improvements are summarized in the following table and discussed in the corresponding servicing sections below.

## Servicing Cost Estimate

| Infrastructure Services | Total                     |
|-------------------------|---------------------------|
| Water                   | \$5,700,000 <sup>1</sup>  |
| Sanitary Sewer          | \$2,800,000 <sup>2</sup>  |
| Storm Drainage          | \$2,500,000 <sup>3</sup>  |
| Roads                   | \$14,000,000 <sup>4</sup> |
| Total Servicing         | \$25,000,000              |

7.6 A financing strategy for the major infrastructure services to be extended to the plan area should be conducted once decisions have been made on the alternatives for major improvements (eg. sanitary sewer twinning, the extent of road intersection improvements). Applicable Development Cost Charges (DCC's) as contained in the District's DCC's Bylaw should be determined as part of this strategy.

### Staging and Servicing

7.7 The staging of future development for the plan area, description of the required infrastructure servicing improvements, and implementation methods are set out in the following sections. The phasing of new development is anticipated to build sequentially on the installation of infrastructure services in the plan area.

#### 7.7.1 Transportation

- .1 The proposed on-site roadways will have sufficient capacity to accommodate projected traffic flows from existing and proposed development. Provisions of a minor collector roadway on-site should proceed as part of the initial development plan for the area in order to ensure an alternative route off the mountain area.

---

<sup>1</sup>Cost represents proposed works as described on Map 5 and in Section 7.7.2.

<sup>2</sup>Cost represents proposed works as described on Maps 6 and 7 and in Section 7.7.3.

<sup>3</sup>Cost represents proposed works as shown on Map 9.

<sup>4</sup>Cost represents proposed on-site works as described on Map 4 and in Section 7.7.1.

- .2 Upgrades to the alignment and configuration of both intersections of Lickman Road/ Chilliwack Mountain Road and the proposed minor collector as well as Schweyey Road and Chilliwack Mountain Road will be required to accommodate additional travel through this area. Design standards of the District or Transportation Association of Canada should be used as the guideline.
- .3 Upgrades to the existing substandard sections of Chilliwack Mountain Road (including improvements to the alignment and width of paved surface through the I.R. # 8 area) and Schweyey Road to Wolfe Road should also be carried out to ensure traffic from existing and future development is accommodated.
- .4 Off-site improvements to the intersection of Lickman Road and Yale Road/Industrial Way should be provided early in the development process to accommodate existing traffic conditions and the additional vehicular travel to/from the proposed development on Chilliwack Mountain. In addition to the provision of traffic control signals and improvements to the intersection lane geometry, intersection upgrades should incorporate standards to adequately accommodate truck turning movements and attempt to minimize the influence of site access/egress at the intersection through the provision of curbs and possible restrictions.
- .5 The Lickman Road and Trans Canada Highway interchange ramps will require a study to consider upgrades needed to accommodate existing and projected increases in travel as a result of development related traffic. These improvements should be assessed through a detailed operational and design review of both ramp configurations on the north and south sides of the highway.

#### 7.7.2 Water

- .1 The existing water system infrastructure on the valley floor has sufficient capacity to supply water for the future developments on Chilliwack Mountain. No off-site upgrading is required.
- .2 The highest priority should be placed on upgrading the existing infrastructure prior extending the system into new development areas.

The following tables summarize the required expansions to the existing pump stations and reservoirs.

### Pump Station Upgrading

| Pump Station    | Existing Capacity | Expansion Capacity | Required Capacity |
|-----------------|-------------------|--------------------|-------------------|
| Booster Station | 10.2 L/s          | 25 L/s             | 67 L/s            |
| PS A            | 10.2 L/s          | 25L/s              | 67 L/s            |
| PS B            | 9.1 L/s           | 13.8 L/s           | 42 L/s            |
| PS C            | 3.3 L/s           | 8.7 L/s            | 24 L/s            |

Note: Expansion capacity can be obtained with minor upgrades (ie. additional pumps).

### Reservoir Expansions

| Reservoir | Total Storage Required | Existing Storage Available | Additional Required Storage |
|-----------|------------------------|----------------------------|-----------------------------|
| Zone 2    | 1550 m <sup>3</sup>    | 182 m <sup>3</sup>         | 1368 m <sup>3</sup>         |
| Zone 3    | 1400 m <sup>3</sup>    | 260 m <sup>3</sup>         | 1140 m <sup>3</sup>         |
| Zone 4    | 400 m <sup>3</sup>     | 260 m <sup>3</sup>         | 140 m <sup>3</sup>          |

Note: Required Storage (140 m<sup>3</sup>) for zone 4 is only required if upgrading fire flow is desired. This existing reservoir will not service new development.

- .3 Twinning of approximately 3600 metres of existing watermain with 150 mm diameter main is required, as shown on Map 5 - Water Servicing.
- .4 In addition to the upgrading of the existing infrastructure, the construction of a new pump station and reservoir is required to service Zone 4B. A Pump Station located at the intersection is required at the intersection of Grand View and Bracken Drive with a design capacity of 20 L/s. The reservoir is required at the highest elevation within Zone 4B with a total capacity of 1450 m<sup>3</sup>.

- .5 Following the expansion of the Zone 2 reservoir, the upper portion of Sunrise Estates will be fed from the existing 150 mm diameter watermain along the south boundary of IR. #8. Followed by which the pump station and reservoir within Sunrise Estates would be decommissioned.
- .6 The District will be required to extend the watermain along Old Orchard Road and Chilliwack Mountain Road through local improvement, since they will service existing lots. The remainder of the proposed watermains will be developer constructed.

### 7.7.3 Sanitary Sewer

- .1 Prior to development on the north face of the mountain, the following on-site works are required:
  - 15 L/s Pump Station on Chilliwack Mountain Road at the north boundary of Sunrise Estates.
  - 200 mm diameter gravity trunk line on Chilliwack Mountain Road from the noted Pump Station to the proposed developments.
- .2 The District should restrict sewer sizes to those shown on Map 6 - On-Site Sanitary Servicing.
- .3 The proposed single family development at the west end of the mountain may choose to pump sewage west to the future collector sewer if the developer finds it cost effective. It is anticipated that the costs will be prohibitive and this parcel may be permitted to be serviced by septic systems, subject to suitable geotechnical and hydrogeologic conditions and Ministry of Health approval.
- .4 Assuming that flows do not increase from the commercial/industrial parcels on Yale Road West and Aitken Road prior to development of Chilliwack Mountain, the existing infrastructure could support an estimated 350 persons on the north face and an estimated total of 930 persons on the mountain before requiring any off-site works.

- .5 Again, assuming flows from the commercial/industrial parcels do not increase, the following table describes the phasing schedule for upgrading of the existing infrastructure. Only those items which will require future upgrading have been shown.

### Phasing Schedule of Existing Off-Site Infrastructure

| Item                        | Existing Flow (1995) | Existing Capacity | Population which could be supported |
|-----------------------------|----------------------|-------------------|-------------------------------------|
| Lickman Rd. sewer           | 0 L/s                | 31 L/s            | 1960                                |
| Yale Rd sewer up to LS 14   | 5 L/s est.           | 33 L/s            | 1770                                |
| Aitken Rd sewer up to LS 19 | 10 L/s est.          | 19 L/s            | 570                                 |
| Aitken Road Forcemain       | 10 L/s est.          | 30 L/s            | 1260                                |
| Pump Station 19             | 10 L/s est.          | 15.5 L/s          | 350                                 |
| Pump Station 14             | 15 L/s est.          | 31.5 L/s          | 1040                                |
| Pump Station 13             | 20 L/s est.          | 34.7 L/s          | 930                                 |

Note: Populations shown exclude the existing population in Maple Hill and Sunrise Estates.

- .6 The district should undertake a monitoring program of P.S. 13, 14 and 19 to validate the estimated existing flows.
- .7 With minimal cost, PS 19 and PS 13 could be expanded to service a total of 570 people on the north face and a total population of 1040 on the mountain.
- .8 The final decision of whether to upgrade the existing infrastructure or construct a new forcemain via Schweyey Road should be made once the additional serviced population reaches 1,000.
- .9 In order to service ultimate development conditions on the mountain and valley floor, the following off-site works will be required to the existing infrastructure, assuming that L.S. 10 and the existing trunk sewer will have capacity.

**Summary of Off-Site Sanitary Works  
for Ultimate Development Conditions**

| Item                        | Expandable Capacity* | Ultimate Capacity | Required Works            |
|-----------------------------|----------------------|-------------------|---------------------------|
| Lickman Road Sewer          | 31 L/s               | 40 L/s            | Twin with 200mm sewer     |
| Yale Rd Sewer up to PS 14   | 33 L/s               | 45 L/s            | Twin with 200mm sewer     |
| Aitken Rd Sewer up to LS 19 | 19 L/s               | 25 L/s            | Twin with 200mm sewer     |
| Aitken Road Forcemain       | 30 L/s               | 45 L/s            | Twin with 150mm F.M.      |
| Pump Station 19             | 29.4 L/s             | 45 L/s            | Upgrade PS (12 HP approx) |
| Pump Station 13             | 58 L/s               | 113 L/s           | Upgrade PS (30 HP approx) |
| Pump Station 14             | 31.5 L/s             | 87 L/s            | Upgrade PS (20 HP approx) |

\* Expandable Capacity refers to the total capacity under current conditions or with minor modifications (ie. additional pumps in Pump Stations).

Note: Refer to Map 7- Off-Site Sanitary Servicing for further description.

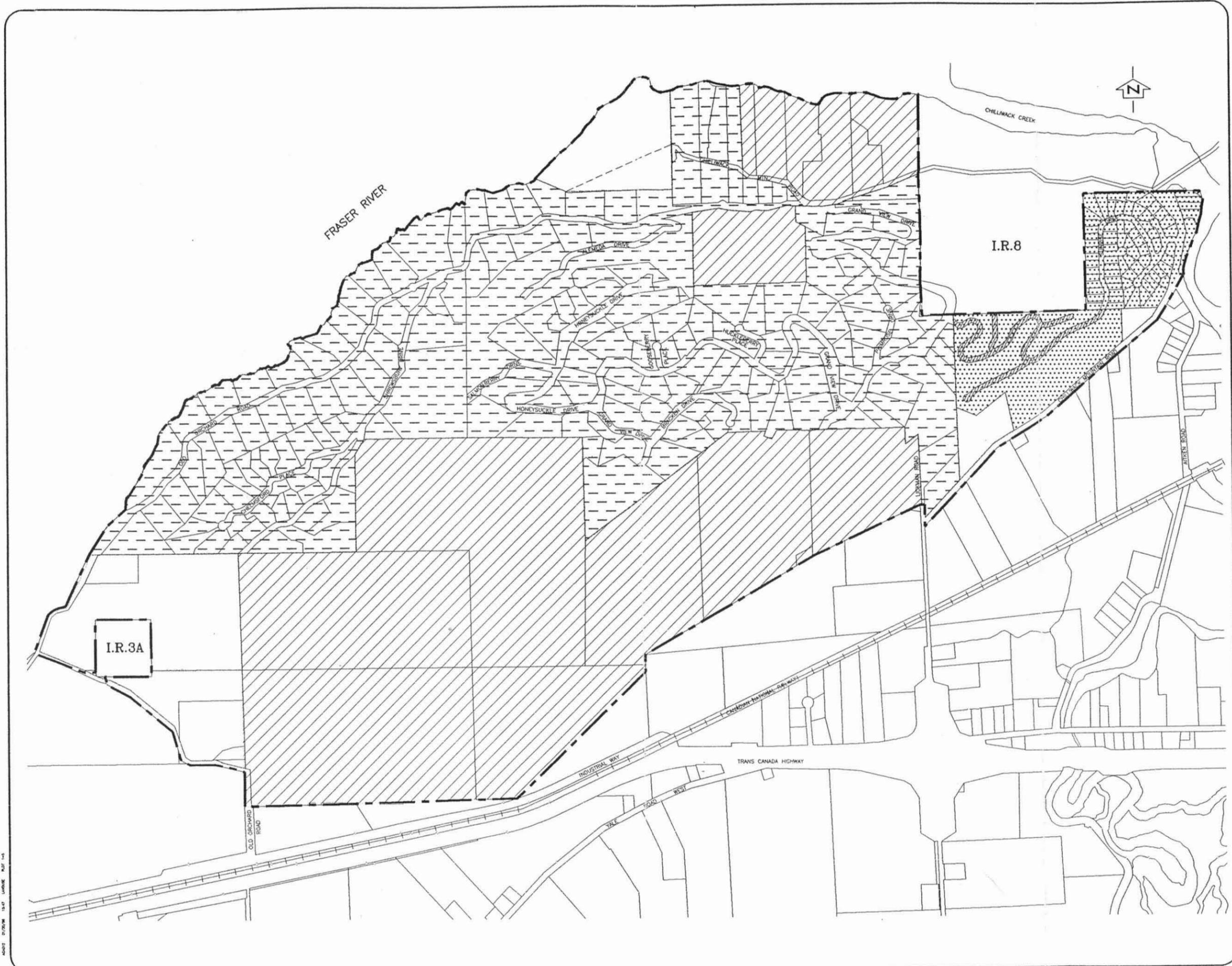
- .10 The less favourable alternative to providing the works described in 7.7.3.8 would be to implement the new off-site works as described on Map 8 - Alternative Off-Site Sanitary Servicing.

7.7.4 Storm Drainage

- .1 Stormwater detention facilities shall be planned and provided by the developer at the time of development.
- .2 Trunk sewers shall be implemented prior to residential development. Development shall not proceed until all off-site works are in place to satisfy the policies noted in Section 5.3.
- .3 The sizing of trunk sewers shown on Map 9 should be refined. Because there are some uncertainties in how the storm water will be handled from site to site, trunk sizes should be refined with further

calculation once development conditions and sewer alignments are confirmed.

- .4 Culvert crossings of the existing watercourses will be carried out as part of the roadwork activities.
- .5 Sediment and erosion control measures shall be installed, inspected and approved by the District prior to the clearing of land.



# CHILLIWACK MOUNTAIN

COMPREHENSIVE DEVELOPMENT PLAN

## LAND USE PLAN

**LEGEND**

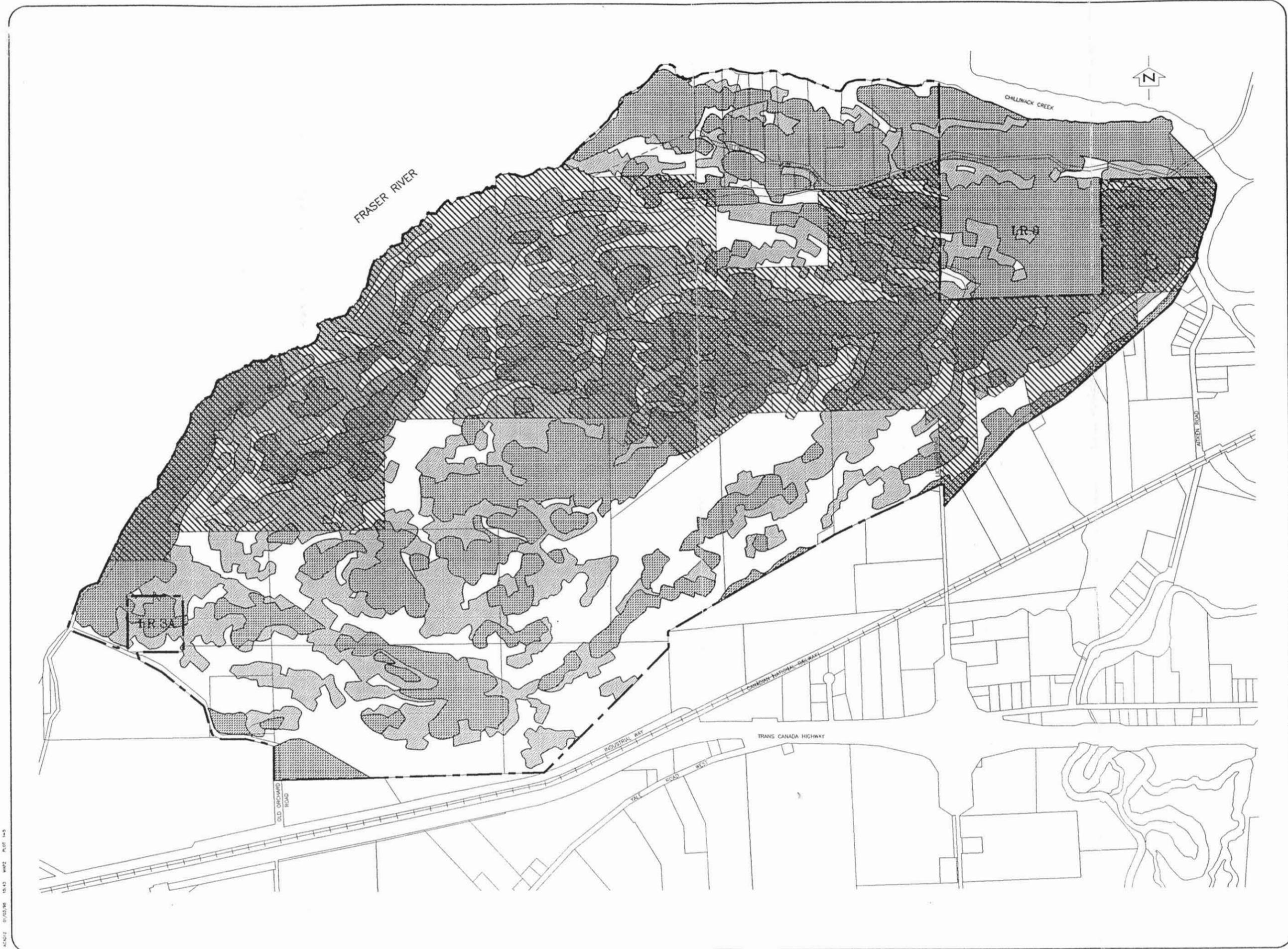
-  RURAL
-  LOW DENSITY SINGLE FAMILY RESIDENTIAL
-  LOW DENSITY MULTI FAMILY RESIDENTIAL
-  SUBURBAN RESIDENTIAL
-  PLAN AREA BOUNDARY

### MAP 1

DATE: JANUARY 1996

PREPARED BY:  
**URBAN SYSTEMS**

AUGUST 2000/01 15.00 LARGEST PLAN 1:5



# CHILLIWACK MOUNTAIN

COMPREHENSIVE DEVELOPMENT PLAN

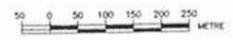
## DEVELOPABLE AREAS

### LEGEND

-  DEVELOPABLE AREA (0-30%)
-  DEVELOPABLE AREA (30-50%)
-  UNDEVELOPABLE AREA (> 50%)
-  EXISTING DEVELOPED AREA
-  PLAN AREA BOUNDARY

## MAP 2

DATE: JANUARY 1986



PREPARED BY:  
**URBAN SYSTEMS**



# CHILLIWACK MOUNTAIN

COMPREHENSIVE DEVELOPMENT PLAN

## PARKS & OPEN SPACE

### LEGEND

-  COMMUNITY PARKS
-  NEIGHBOURHOOD PARKS
-  TRAILS & WALKWAYS
-  NATURAL OPEN SPACE
-  ENVIRONMENTAL RESERVE
-  CONDITIONAL ENVIRONMENTAL RESERVE
-  EXISTING DEVELOPED AREAS
-  PLAN AREA BOUNDARY

## MAP 3

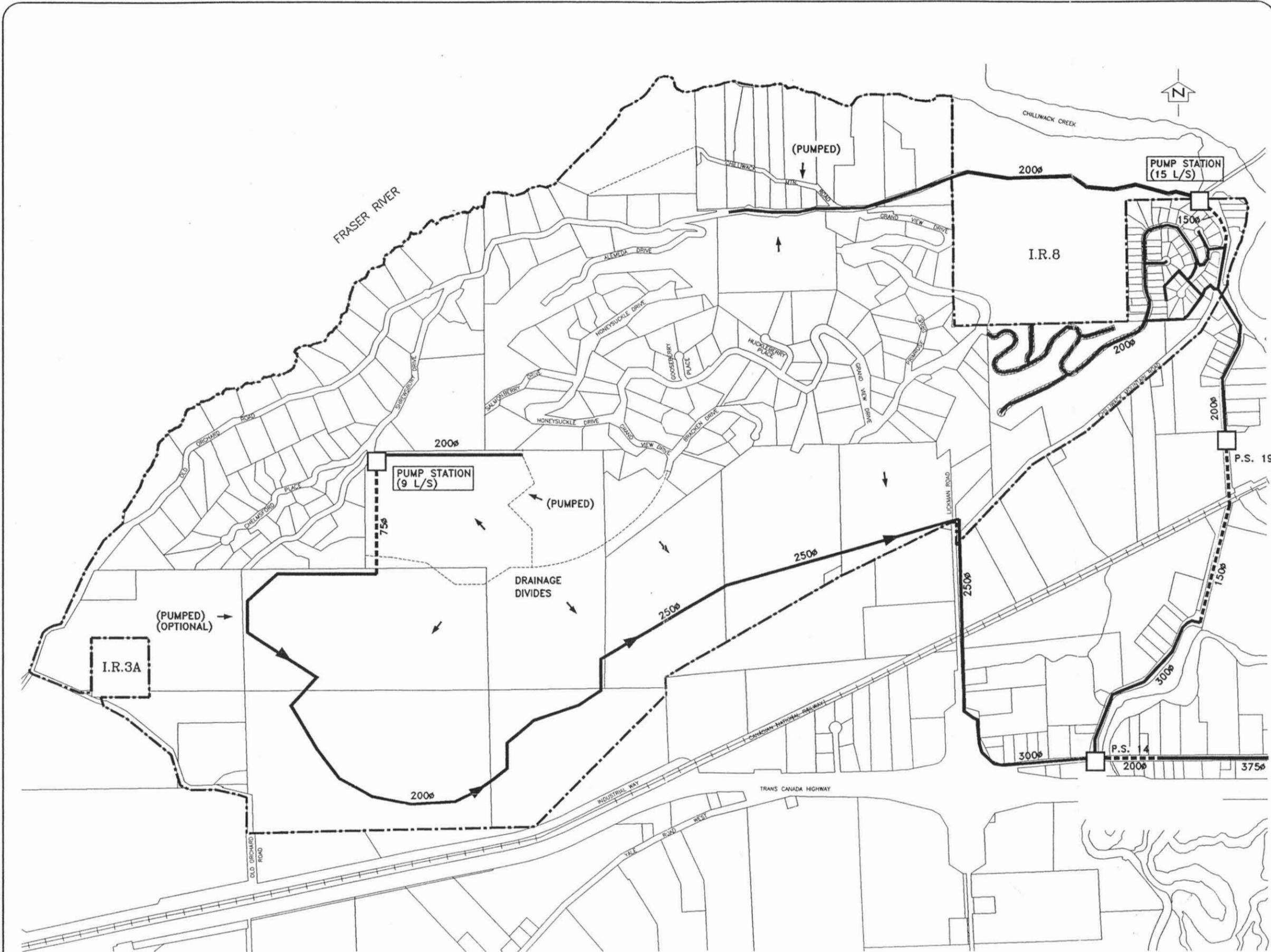
DATE: JANUARY 1996



Prepared by  
**URBAN SYSTEMS**







# CHILLIWACK MOUNTAIN

COMPREHENSIVE DEVELOPMENT PLAN

## ON-SITE SANITARY SERVICING

### LEGEND

- EXISTING SEWER (GRAVITY TRUNK)
- EXISTING SEWER (FORCEMAIN)
- PROPOSED SEWER (GRAVITY TRUNK)
- PROPOSED SEWER (FORCEMAIN)
- PUMP STATION
- PLAN AREA BOUNDARY

### MAP 6

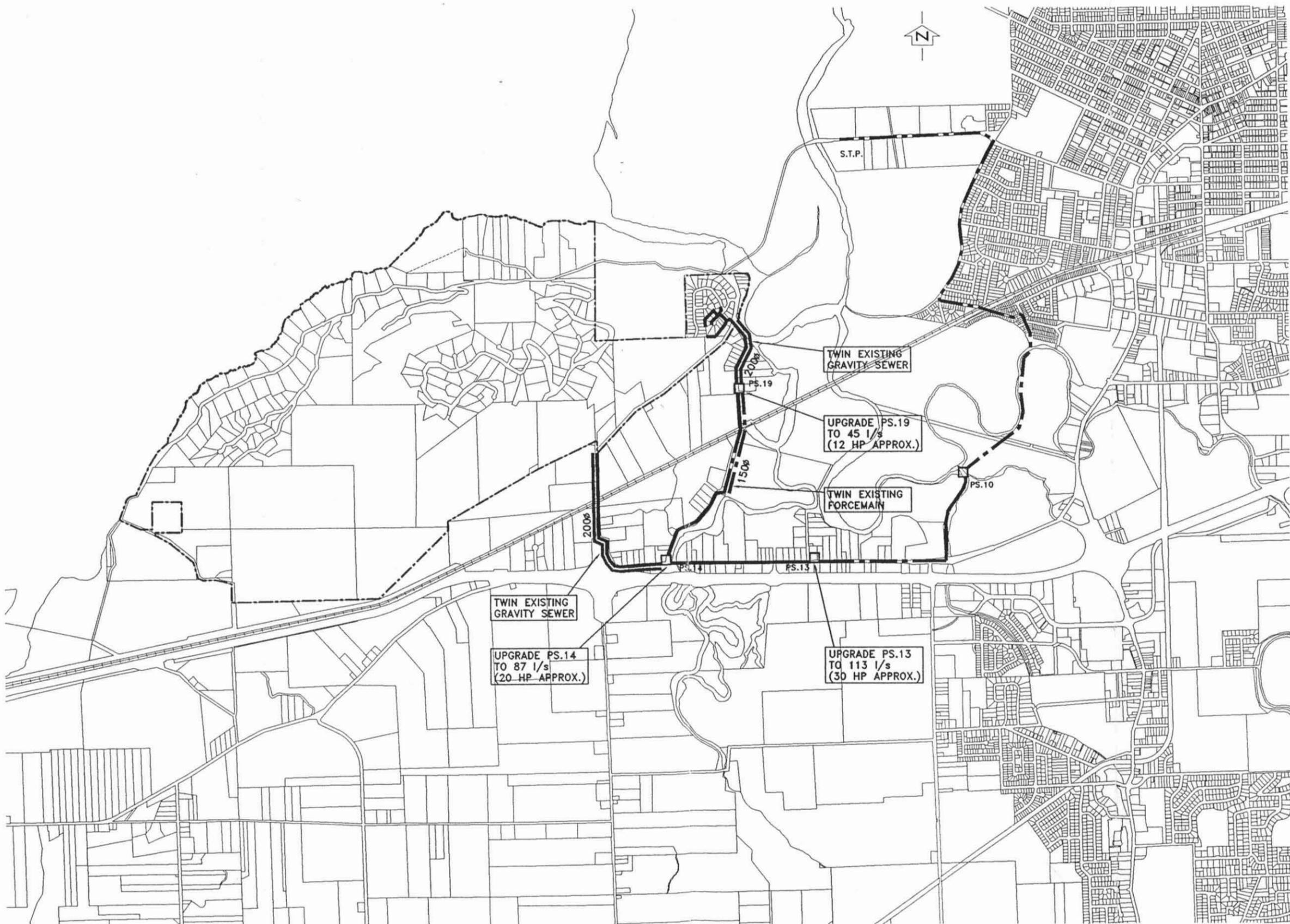
DATE: JANUARY 1998

PREPARED BY: **URBANSYSTEMS**

# CHILLIWACK MOUNTAIN

COMPREHENSIVE DEVELOPMENT PLAN

## OFF-SITE SANITARY SERVICING



**LEGEND**

|  |                        |
|--|------------------------|
|  | EXISTING FORCEMAIN     |
|  | EXISTING GRAVITY SEWER |
|  | EXISTING LIFT STATION  |
|  | PS.13                  |
|  | SERVICE AREA           |
|  | PROPOSED FORCEMAIN     |
|  | PROPOSED GRAVITY SEWER |
|  | PLAN AREA BOUNDARY     |

### MAP 7

DATE: JANUARY 1996



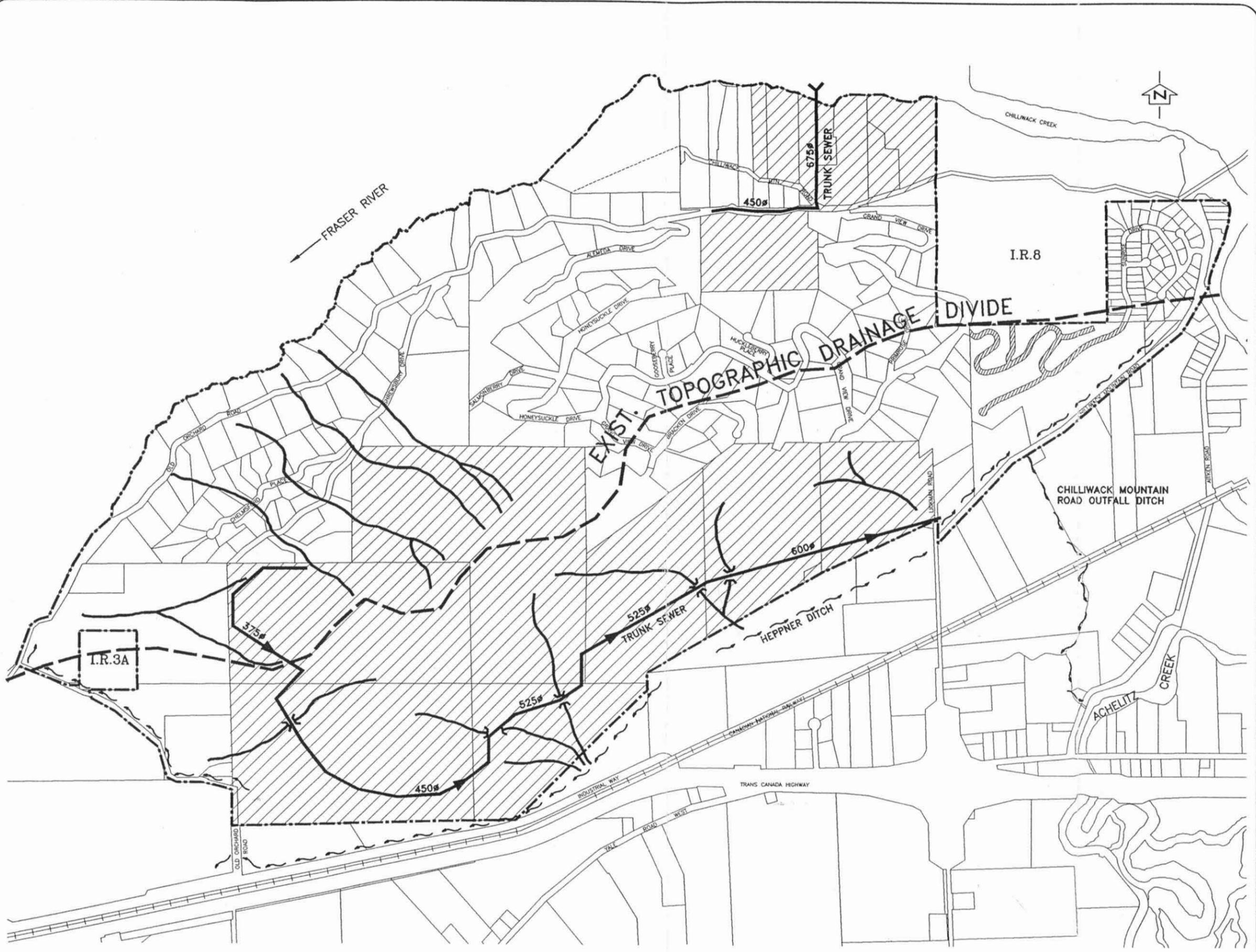
PREPARED BY:  
**URBANSYSTEMS**



# CHILLIWACK MOUNTAIN

COMPREHENSIVE DEVELOPMENT PLAN

## STORM DRAINAGE



LEGEND

- PROPOSED DEVELOPMENT AREAS
- PLAN AREA BOUNDARY
- EXISTING WATERCOURSE WITHIN PROPOSED DEVELOPMENT AREA
- TRUNK SEWER
- PLAN AREA BOUNDARY

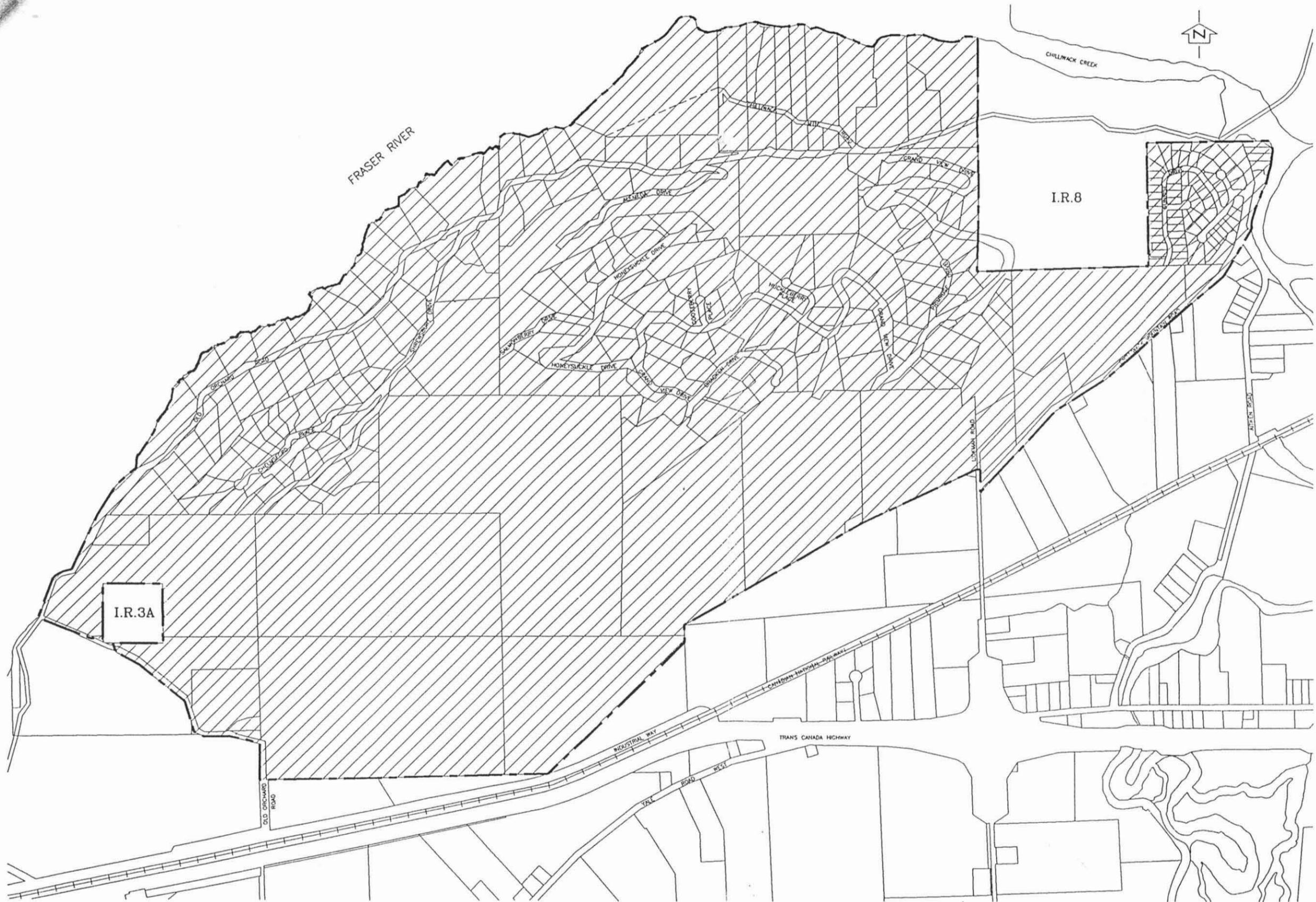
### MAP 9

DATE: JANUARY 1996

PREPARED BY: **URBANSYSTEMS**

NOTE: TRUNK SIZES ARE SHOWN APPROXIMATE. SIZES SHOWN ARE BASED ON A PIPE SLOPE OF 2%. ACTUAL FLOWS AND PIPE SIZES WILL BE DETERMINED ONCE A FINAL TRUNK ALIGNMENT IS DETERMINED.

SCALE: 1" = 100' STATION: 142



# CHILLIWACK MOUNTAIN

COMPREHENSIVE DEVELOPMENT PLAN

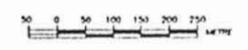
DEVELOPMENT PERMIT AREA NO. 9 - 6C

## LEGEND

-  D.P.A.# 9 - 6C
-  PLAN AREA BOUNDARY

MAP 10

DATE: FEBRUARY 1996

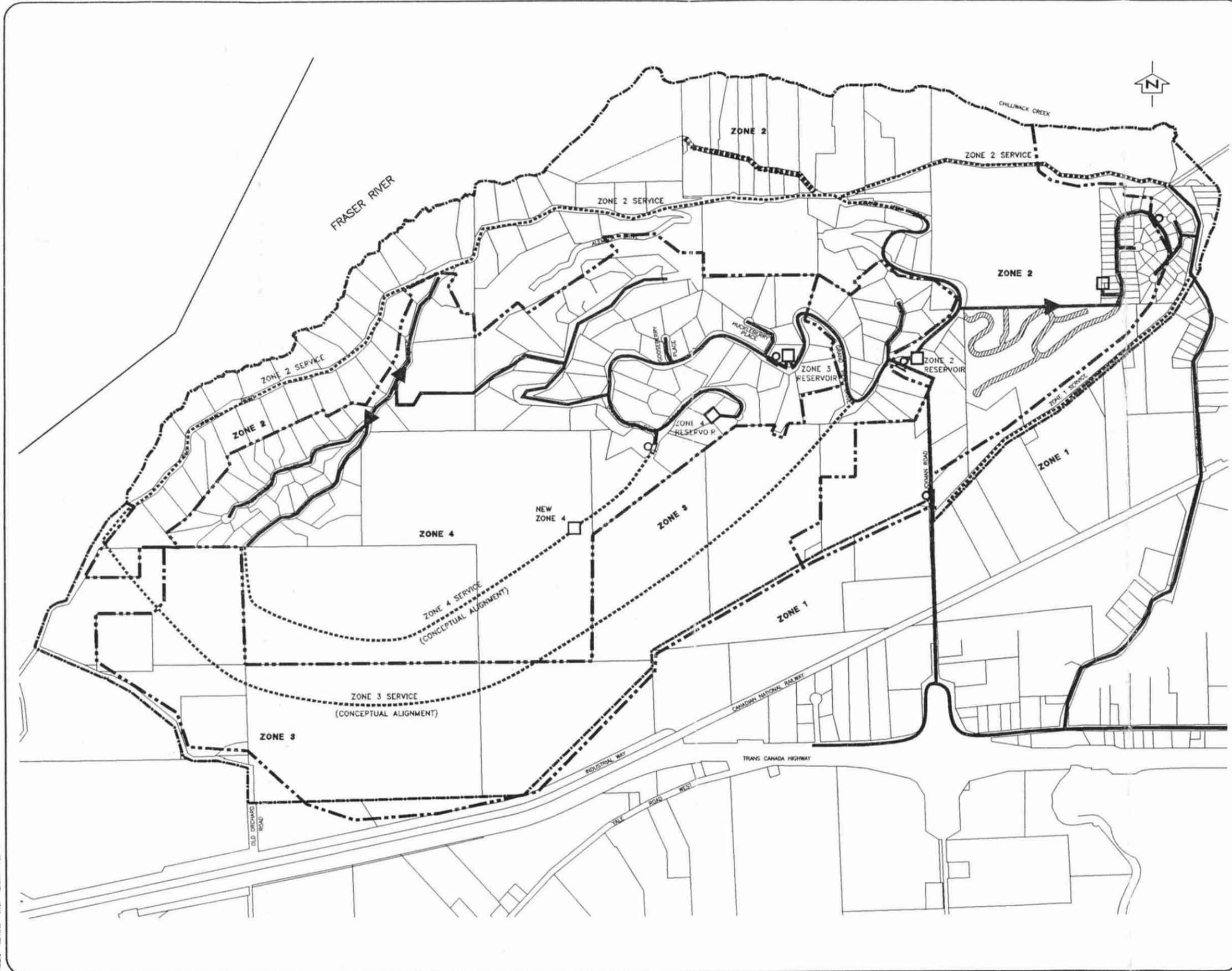


PREPARED BY: URBAN SYSTEMS

45072 22/1/96 11:42 BAKK PLOT 1-4

Plotted by:

DATE: 09/17/85 07:37 REVISED: PAGE 141



# CHILLIWACK MOUNTAIN

COMPREHENSIVE DEVELOPMENT PLAN

WATER SERVICING

LEGEND

- ZONE BOUNDARY
- EXISTING WATERMAIN
- EXISTING RESERVOIR
- ⊠ EXISTING PUMP STATION
- ➔ PRV STATION
- PROPOSED WATERMAIN
- PROPOSED RESERVOIR
- ⊠ PROPOSED PUMP STATION

DATE: SEPTEMBER 1985

SCALE: 1:5000

PREPARED BY: URBAN SYSTEMS