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### RIC Report 004

### Discussion Document

### REPORT OF THE GEOLOGY, SOILS AND ARCHAEOLOGY TASK FORCE

TO THE RESOURCES INVENTORY COMMITTEE

### PREPARED BY

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Environmental Geology Section Ministry of Energy, Mines and and Petroleum Resources © The Province of British Columbia Published by the Resources Inventory Committee

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### PREAMBLE

This report is submitted to the Resources Inventory Committee (RIC) by the Geology, Soils and Archaeology Task Force.

The Resources Inventory Committee consists of representatives from various ministries and agencies of the Canadian and the British Columbia governments. First Nations peoples are represented in the Committee. RIC objectives are to develop a common set of standards and procedures for the provincial resources inventories, as recommended by the Forest Resources Commission in its report The Future of Our Forests.

To achieve its objectives, the Resources Inventory Committee has set up several task forces, including the Geology, Soils and Archaeology Task Force. The terms of reference for the Task Force were to review their inventory programs with emphasis on purpose, methods, standards and procedures of data collection and interpretation; to review current status of their data base; comment on its adequacy to meet current and future land management needs. This is the synoptic report of that work.

Funding of the Resources Inventory Committee work, including the preparation of this report, is provided by the Canada-British Columbia Partnership Agreement on Forest Resources Development: FRDA II - a four year (1991-1995) \$200 million program costshared equally by the federal and provincial governments.

### **ACKNOWLEDGEMENTS**

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### EXECUTIVE SUMMARY

The ability to undertake systematic geological, soil and archaeological inventories is extremely limited in the provincial government. Data are often not available, are not accessible or are not at sufficient detail to meet current needs. Data and map products relating to geology, soils and archaeology are in high demand from a diverse client base. Often, these resource managers make decisions without the aid of knowledge regarding these resources.

Earth science data are considered to be the foundation of all resource management and planning decisions. Information supplied by these inventories often dictates the quality of other related data bases and land management decision making models. Archaeological data are necessary as it represents a non-renewable, scientific and culturally significant resource protected by legislation and valued by society.

This report provides a number of recommendations that should be initiated in order to provide the basis for sound decisions and problem solving in the context of integrated and sustainable resource use and management. The main recommendations are:

- 1. Re-establishment of inventory capability in the province and enhancement of programs that are currently on-going. Of particular concern is the current lack of soil inventory capability in the province.
- 2. Management of inventory programs should be by a multi-ministry coordinating committee with strong commitments to multi-resource inventory and integration; this committee should be responsible for quality control of data.
- 3. Undertake regional level inventories (approx. scale 1:50,000) for the entire province; larger scale inventories to be undertaken as and when required.
- 4. Standardize, and make user friendly, all derivative and interpretive maps.
- 5. Provide the means of training inventory personnel.
- 6. All inventory maps and data (existing and future) should be made available in a GIS framework that is PC-compatible and in a format that can be used by all government agencies.
- 7. All data collected that are relevant to a particular inventory theme should be stored in a common data base.
- 8. All inventories should annually publish an index of map and data coverage, and implement procedures to ensure that other inventory programs are aware of their activities.
- 9. All maps and data must be timely and easily accessible.

### 1.0 INTRODUCTION AND PURPOSE OF THE REPORT

### 1.1 Background

The report prepared by the Forest Resources Commission entitled "The Future of Our Forests" (April 1991) expressed concern about the overall status of resource inventories and their ability to meet the current needs of planning processes and for problem solving on publicly managed lands. This concern resulted in the formation of the Forest Resources Inventory Committee (FRIC) that was charged with the responsibility of reviewing the status of current resource inventories and providing recommendations for addressing the concerns. During its early stages, FRIC recognized that confining its review to the forest land base was unrealistic and adopted a slight name change to reflect their concern for the entire Province. The committee is now referred to as the Resources Inventory Committee (RIC).

To assist RIC, several Task Forces were established to address the different kinds of resource inventories that have and are being undertaken as well as ones that will be needed in the future. Each of these Task Forces were required to assess specific inventory programs that provide the knowledge necessary to enable sound land management decisions in the context of sustainable development and integrated resource management. The Geology, Soils and Archaeology Task Force is one of these groups.

The objective of RIC is to address two critical issues:

- 1. What information is vital for effective land management, at what levels of detail and for what purposes?
- 2. How can this information most effectively be acquired in a manner that minimizes duplication, promotes cooperative data collection, and encourages broad application and long-term relevance?

### 1.2 The Organization of the Geology, Soils and Archaeology Task Force

The Geology, Soils and Archaeology Task Force (the Task Force), in a manner similar to other Task Forces, is made-up of several Task Groups. These Task Groups are: Bedrock Geology; Surficial Geology; Soils; and Archaeology. Each of these Task Groups was chaired by an individual representing the Ministry and Branch of government currently responsible for the inventory program. Members of the Task Groups were from all levels of government (federal, provincial, and regional), the private sector, and included those agencies or individuals who are users of the inventory information.

Each of the four Task Groups was required, on behalf of the Task Force, to undertake a review of their specific inventory programs with special emphasis on their purpose, methods, standards and procedures of data collection and interpretation. In addition, they were requested to review the current status of their data base and provide comment on its adequacy to meet current and future land management needs, including accessibility, availability and residence of the data.

The four Task Groups prepared individual reports addressing these, and other, objectives. These reports are available as supplementary reports (Annexes 1 to 4). The reader is encouraged to reference these 'stand alone' reports in order to gain a greater appreciation of the points raised by the Task Groups than is accomplished in this synoptic report.

### 1.3 Objectives of the Geology, Soils and Archaeology Task Force

The immediate tasks of the Task Force and hence the objectives of this report, are the following:

- 1. Review the current status of geological, soils and archaeological inventories in British Columbia, including areal coverage, scale (detail), adequacy of attributes collected and standards applied, interpretive products developed, ability of the data bases to meet current needs, and data accessibility and dissemination.
- 2. Identify future client needs and products to be generated from geological, soils and archaeological inventories, assess the adequacy of standards and procedures to meet these new requirements, and determine inventory methodology modifications needed to meet these future uses, including linkages with other resource inventories, data storage, analysis and interpretation.

The result of meeting these objectives are contained in this report. Following a presentation and review of the conclusions and recommendations at a combined Task Force - RIC Workshop, it is intended that two additional objectives will be met. They are:

- 1. Develop, where appropriate, common standards and procedures with other resource inventories for the collection, storage, analysis, interpretation and reporting of inventory data.
- 2. Test these procedures and standards in the field and, after verification, encourage and promote their application, including provision of training and extension, in both government and private data collection programs.

### 1.4 Organization of the Report

This report is organized specifically to address the two immediate objectives of the Task Force, thereby assisting RIC in carrying out its assigned responsibility. The recommendations and conclusions contained in the report are intended for presentation and debate at the proposed combined Task Force - RIC Workshop. To this end, the report has been designed to be brief, and to the point. Where more detailed background information and rationale are required, reference can be made to the individual Task Group reports contained in the Appendices.

### 2.0 PRESENT STATUS OF THE INVENTORY PROGRAMS

### 2.1 Introduction

Information contained in this section of the report deals with the following topics, relative to each of the four inventory programs being addressed:

- 1. What information is available?
- 2. Who collected the information and where can it be obtained?
- 3. What standards and procedures were employed in the collection of the data?
- 4. What is the approximate cost of the inventory program in terms of annual expenditure or on a cost per unit area basis?; note that this information is very limited and values provided are highly variable and difficult to substantiate.

Table 1 presents a synopsis of this information for each of the inventory programs. Areal coverage of the inventory programs are shown on Figures 1 to 5. When referring to Figure 1, it is important to note that it is not always possible to show levels of mapping detail (scale) or age of the information (some very old information is considered obsolete).

The following sections provide point form summaries regarding the current status and relevant issues of the four resource inventory programs. Not included in this discussions, but considered relevant to land management needs are geochemical maps, geophysical maps and stream chemistry data.

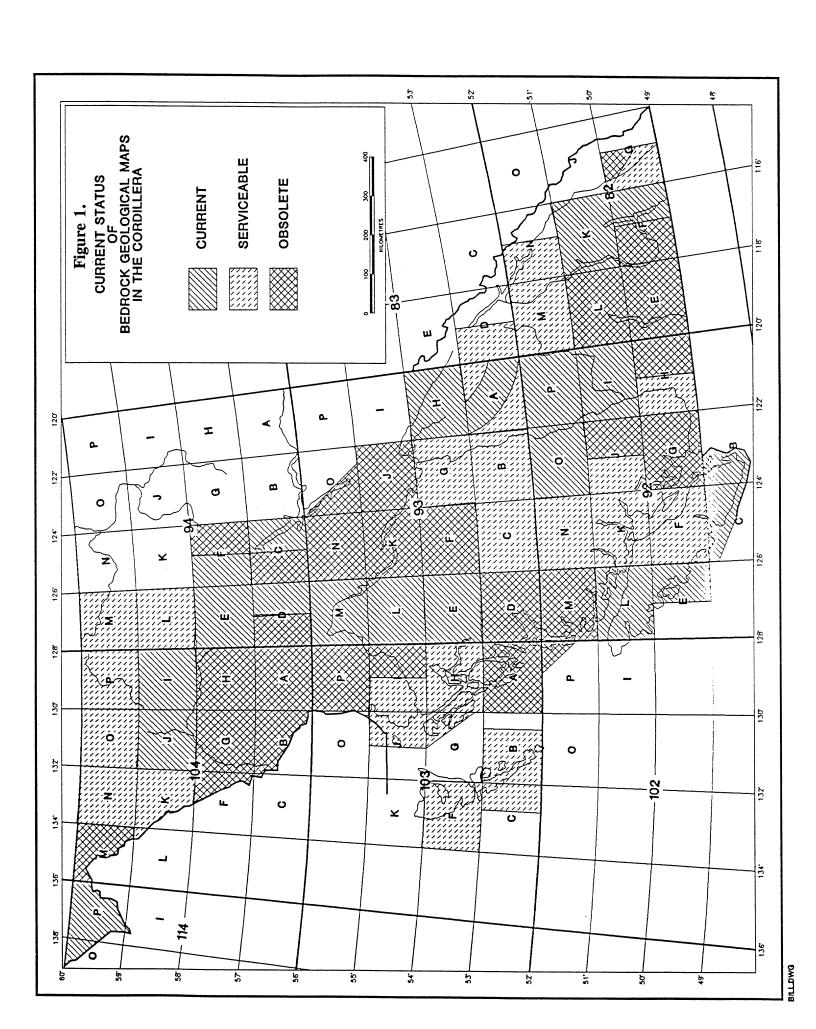
### 2.2. <u>Inventory Coverage (see Figure 1 to 5)</u>

### BEDROCK GEOLOGY

- Geological Survey of Canada and B.C. Geological Survey maps cover 90% of the province at 1:250,000 scale although several of these maps are considered obsolete; 9% of the province covered at 1:50,000 scale; very limited coverage at larger scales.
- Very little of the mapped data is in digital form; most is available as published or open-file paper maps.

### SURFICIAL GEOLOGY

- Approximately 70% of the province is mapped at various scales (mostly from 1:50,000 to 1:250,000); the bulk of this mapping is from older soils/landform products and not necessarily completely compatible with the current Terrain Classification System.
- Very little of the mapped information is in digital form; most maps, with the exception of some Geological Survey of Canada products are in unpublished manuscript form (paper prints).



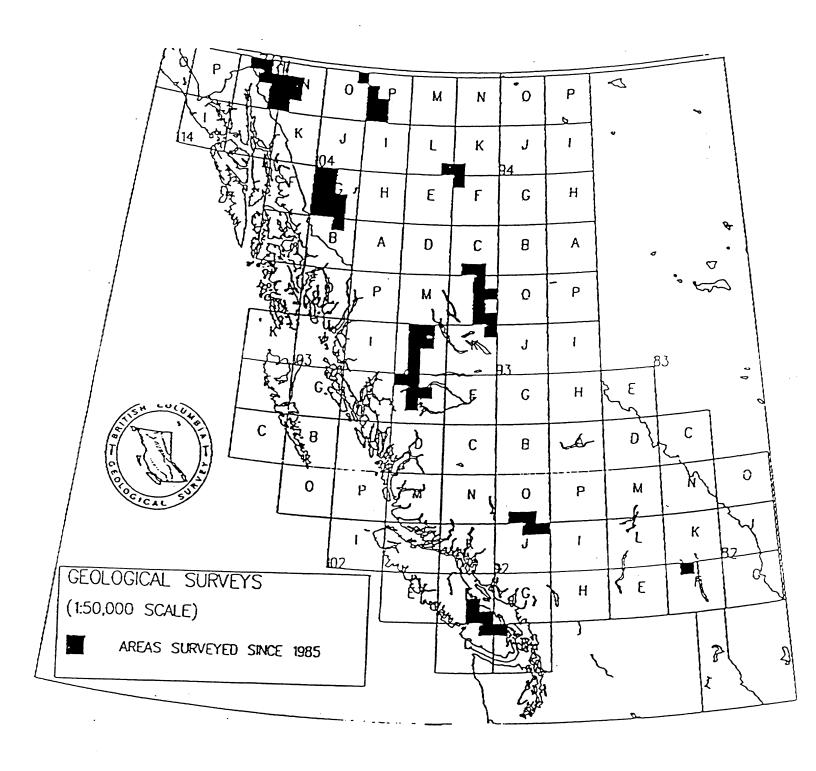


Figure 2. Bedrock Geology Map (B.C. Geological Survey)

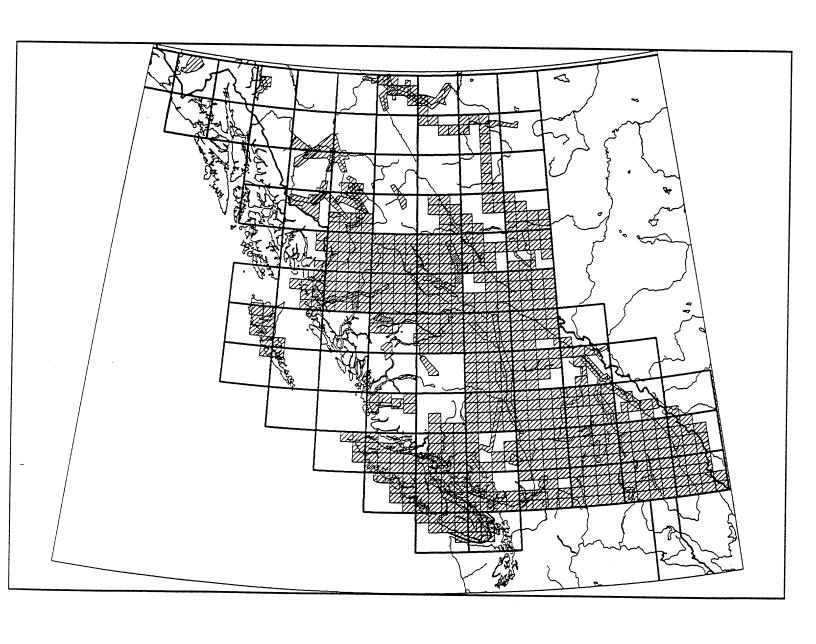
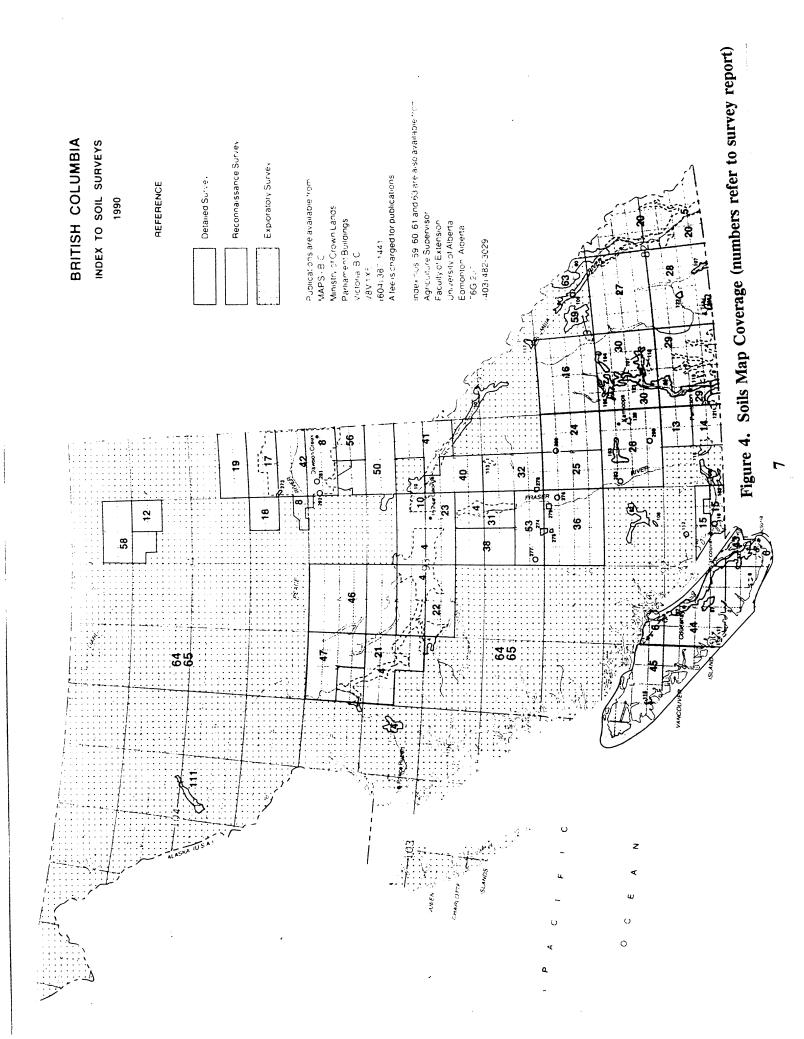


Figure 3. Surficial Geology Map Coverage (1:50,000 scale)



## Figure 4A. INDEX TO BRITISH COLUMBIA SOIL INVENTORY

Index No.	MAJOR SURVEYS Map Area	rS Scale	Year	Digital	Index No.	Мар Агеа	Scale	Year	Digital	<ol> <li>Manual For Describing ( The Canada Soil Inform</li> </ol>
-	Ower Fraser Valley (F)	1.63.3601	1030		1 2	Southern Vancount Island (A)	1.000001	100+		2. BC Soil Information Sy
۰ ،	Prince George (E)	1040401	970		ţ 4	Mothers Version (A)	1.100,000	1982	Cansis	
u et	Okanagan & Similkameen Valleys (F)	1.34 040	1040		Ç 4	Manage Biogr Ead Engar(A)	1:100 000*	1980		3. Land Capability Classifi
4	Quesnel Nechako Francois Lake &	1.126.7201	1954		4 4	Hazelton(A)	1.100,0002	1997		in British Columbia
,	Buckley-Terrace (E)		2		20	Waniti Biyer-Murray Biyer (A)	1.1000,000	1977		
2	Upper Kootenay & Elk River Valleys (A)	1:63 3601	1956		52	Okanagan-Similkameen Valleys (A)	1:20 000²	1986	CAPAMP	<ol> <li>The Canadian System or</li> </ol>
9	Southeast Vancouver Island &	1:63 3601	1959		23	Williams Lake-Alexis Creek (A)	1:100 0001	1988	CanSIS	Soil Survey Handbook
	Gulf Islands (E)	,			26	Deep Basin (C)	$1.50000^{2}$	1982	CAPAMP	
7	Upper Columbia River Valley (A)	1:63 3601	1961		22	Southeast Vancouver Island				6 Describing Ecosystems
8	Peace River (E)	1:1267201	1965			Duncan, Nanaimo (A)	1:20 0002	1985	CAPAMP	o. Describing Ecosystems
6		1:63 3601	1964			Parksville, Qualicum,				
9		1:126 7201	1970			Courtenay, Port Alberni (A)	1:20 0002	1989	CAPAMP	
Ξ	Tofino-Ucluelet Lowlands (A)	1:50 0001	1971		28	Fort Simpson Trail (A)	1:100 0002	1982		
12	Fort Nelson (A)	1:126 7201	1971		29	Glacier-Mt. Revelstoke Nat'l Parks (A)	1:500002	1984	CanSIS	
13		1:1267201	1974	CanSIS	8	Kootenay National Park (A)	1:50 0002	1984	CanSIS	
4		1:125 0001	1979	CanSIS	62	Pemberton Valley (A)	1:20 000 <sup>3</sup>	1980		EXPLANATIO
15	Langley-Vancouver				S	Yoho National Park (A)	1:500001	1977	CanSIS	
	Vol. 1 Soil map mosaics	1:25,0001	1980	CAPAMP	4	Soil Landscapes of B.C. (A)	1:6 000 0001	1978		Man
	of the Lower Fraser Valley				65	Soil Landscapes of Canada-B.C. (C,D)	1:1 000 0001		CanSIS	
	Vol. 2 Soil maps of Sunshine	1:50,000	1980	CAPAMP		SPECIALS	0			1 colour
	Coast and Coast Mountains						2			2 black & white
	Vol. 3 Description of Soils		1981	CAPAMP	101	North Okanagan (B)	1:31 6802	1960		3 photomosaic
	in Vols. 1 and 2				102	Chilliwack (B)	1:24 0002	1962		4 interim data available
	Vol. 5 Agricultural management		1984	CAPAMP	103	Ashçroft-Savona (B)	$1:31680^{2}$	1963		
	and cropping for soils				104	Eagle River Valley (B)	1:31 6802	1964		
	described in Vol. 3				105	Shuswap (B)	1:31 680 2	1965		
	Vol. 6 Detailed technical		1981	CAPAMP	106	Agassiz (B)	$1:24000^{2}$	1967		
,	descriptions of soils in Vol. 3				107	Creston (B)	1:31 6802	1971		is 3 speed Signed
<u>ه</u> ز	Seymour Arm (A)	1:100 000	1980		108	Alta Lake (B)	1:158402	1971		Information System
> 5	Hose Praine-Blueberry Hiver (C)	1:125 000*	1971		109	Town of Golden (B)	1:54002	1975		mornianon oystem
2 9	Haltway River (C)	1:125 000*	1973		110	Big Bend, Burnaby (B)	1:20 000²	1977		
2 6	Nig Creek-Big Arrow Creek (C)	1:125 000	1975		= :	Telegraph Creek (B)	1:50 0002	1978		
₹ 8	East Kootenay (A)	1:100 000'	1990	CanSIS	112	Mill-Woodfibre Creeks (A)	1:158401	1988	CanSIS	
, E	Mobolo Consolo (A)	1:125,000-	19/4	Ö	2 ;	Cariboo River Valley (B)	1:50 000	1979		
3 %	Necharo-François Lake (A) Prince George, McLeod Lake (A)	1:125,000:	1976	Cansis	411	Pend-D'Oreille Valley (E)	1:20 000	1980	0	
2 6	Bonaparte River-Capim Lake (A)	1:100,000	1009		110	Fower river valley (A)	1:15,000'	1988	Cansis	
25	Lact a Hache-Clinton (A)	1.125,000	1980	Cansis	1 2	Cascades (b)	1.100.000	1961		
S 2	Ashcroft (D)	1:100 0002	2	2	118	Collection Creek Valley (B)	1.50.000	1980		And a contract of an incompany
27	Lardeau (A)	1:100 0001	1980	CanSIS	119	Vaseaux Creek Vallev (B)	1.50.002	1980		Aconora incomandora
28	Nelson (A)	1:1000001	1980	CanSIS	120	Separation Lake (C)	1.20.0002	1980		Ministry of Fran
53	Penticton (C)	1:100 0002	1986	CAPAMP	121	Keremeos-Ashnola Creeks (B)	1:20 000²	1981		Integrated Best
႙	Vernon (C)	1:100 0002	1986	CAPAMP	122	Nelson City Watershed (B)	1:20 0002	1987	CAPAMP	777 Broughton
31	Quesnel (A)	1:100 0001	1982	CanSIS	123	North Okanagan Valley (C)	1:20 0002	1987	CAPAMP	Victoria, B.C., V
35	Horsefly (A)	1:100 0001	1984	CanSIS	273	Halfway Indian Reserve (B)	$1:31680^{2/3}$	1973		Tel. (604) 356-7
36	Taseko Lakes (A)	1:100 0001	1987	CanSIS	274	Anahim Indian Reserve (B)	1:16896 <sup>3</sup>	1973		
38	Nazko (A)	1:1000001	1988	CanSIS	275	Stoney Indian Reserve (B)	1:16896 <sup>3</sup>	1973		
9 :	Barkerville (A)	1:100 000	1985	CanSIS	276	Alkali Lake Indian Reserve (B)	1:16 896 <sup>3</sup>	1973		
£ ;	Jarvis Creek-Morkill Hiver (A)	1:100000	1987		277	Redstone Indian Reserve (B)	1:168963	1973		Agriculture Can
5 5	Fort St. John-Dawson Creek(A)	1:100 000	1986	CanSIS	278	Williams Lake Indian Reserve (B)	1:168963	1973		Land Resource
3	Guif Islands	1000 00.1	1001	ال المعادل	279	Toosey Indian Reserve (B)	1:168963	1973		6660 NW Marin
	Vol. 1 Sanspring (A)	1.20,000	/961	Cansis	20.0	Canim Lake Indian Heserve (B)	1:168963	1973		Vancouver, B.C
	Vol. 2 Galiano Valdes Thetis Kuper (A)	20,000	1080	Cansis	787	East Moberly Lake Indian Heserve (B)	1:95 0402	1973		Tel. (604) 224-4
	Vol. 4 Gabriola (A)	1:20,000	1990	CanSiS	283	west mobelly care indian reserve (b)	1:35.040*	1973		FAX (604) 666-
	Vol. 5 Sidney, James, Moresby, Portland (D) 1:20,0001	1.20.0001	5	CanSIS	368	roomain indan Reserve (B) Nicola-Mameet Indian Beserve (B)	1:14 080° 1:36 206³	1973		
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### SOIL SURVEY MANUALS

Scale   Ves   Digital   No   Map-Arian   No   Map-Arian   No   No   No   No   No   No   No   N	MAJOR SURVEYS				Index					Manual For Describing Soils in the Field.  The Canada Soil Information Sustain (Casello)	1978
1939   44   Southern Vancouver Island (A)   1:100 000' 1986   Can'SIS   1:100 000' 1982   Can'SIS   Can'	Map Area	Scale	Year	Digital	o N	Map Area	Scale	Year	Digital	THE CALIADA SOILINOTHANDI SYSTEM (CANSIS)	
1946   44 Marson Placet (1)   11:100 0007   1990   1991   14:100 0007   1994   45 Marson Placet (1)   11:100 0007   1995   1990   1995   199	Lower Fraser Valley (E)	1:63 3601	1939		4	Southern Vancouver Island (A)	1:100 0001	1985	CanSIS		1983
1936   40 Marson Pher For Frazer (A)   1:1000002   1992   1993   1995   50 Wappil Row-Murray River (A)   1:1000002   1997   1995   50 Wappil Row-Murray River (A)   1:10000002   1998   CAPAMP   1995   50 Wappil Row-Murray River (A)   1:2000002   1998   CAPAMP   1997   1995	George (E)	1:94 0401	1946		45	Northern Vancouver Island (B)	1.100.0002	1980			
1956   1954   41 Hazellon (A)   1:10000002   1994     1956   20 Wappil Row-Emplays (A)   1:2000002   1995     1951   25 Okanagan-Smilklamen Valleys (A)   1:2000002   1996     1951   25 Okanagan-Smilklamen Valleys (A)   1:2000002   1996     1952   25 Okanagan-Smilklamen Valleys (A)   1:200000   1996     1954   25 Okanagan-Smilklamen Valleys (A)   1:200000   1996     1955   25 Okanagan-Smilklamen Valleys (A)   1:200000   1996     1954   25 Okanagan-Smilklamen (C)   1:200000   1996     1955   25 Okanagan-Smilklamen (C)   1:200000   1996     1954   25 Okanagan-Smilklamen (C)   1:200000   1996     1955   25 Okanagan-Smilklamen (C)   1:200000   1996     1956   25 Okanagan-Smilklamen (C)   1:200000   1996     1957   25 Okanagan-Smilklamen (C)   1:200000   1996     1958   25 Okanagan-Smilklamen (C)   1:200000   1996     1959   25 Okanagan-Smilklamen (C)   1:200000   1996     1950   25 Okanagan-Smilklamen (C)   1:200000   1996     1950   25 Okanagan-Smilklamen (C)   1:200000   1996     1951   25 Okanagan-Smilklamen (C)   1:200000   1996     1952   25 Okanagan-Smilklamen (C)   1:200000   1996     1954   25 Okanagan-Smilklamen (C)   1:200000   1996     1955   25 Okanagan-Smilklamen (C)   1:200000   1996     1956   25 Okanagan-Smilklamen (C)   1:200000   1996     1957   25 Okanagan-Smilklamen (C)   1:200000   1996     1958   25 Okanagan-Smilklamen (C)   1:200000   1996     1959   25 Okanagan-Smilklamen (C)   1:200000   1996     1950   25 Okanagan-Smilklamen (C)   1:200000   1997     1950   25 Okanagan-Smilklamen (C)   1:200000   1997     1950   25 Okanagan-Smilklamen (C)   1:200000	agan & Similkameen Valleys (E)	1:742701	1949		46	Manson River-Fort Fraser (A)	1:100 0002	1982			1983
1956   S. Okanagan-Simikaneen Valleys (A)   1:000000' 1995   CAPAMP   1:00000' 1995   CAPAMP   1:00000' 1995   CAPAMP   1:00000' 1995   CAPAMP   1:00000' 1995   CAPAMP   CA	Quesnel, Nechako, François Lake &	1:126 7201	1954		47	Hazelton (A)	1:100 0002	1984		in British Columbia	
1956   S. Okanagan Smilkamenen Valleys (A)   1;20000° 1986 CAPAMP   1;954   S. Okanagan Smilkamenen Valleys (A)   1;20000° 1986 CAPAMP   1;954   S. Okanagan Smilkamenen Valleys (A)   1;20000° 1986 CAPAMP   1;954   S. Okanagan (B) Abanaga Valleys (A)   1;20000° 1982 CAPAMP   1;971   S. Okanagan (B) Abanaga Valleys (A)   1;20000° 1982 CAPAMP   1;971   S. Okanagan (B) Abanaga Valleys (A)   1;20000° 1982 CAPAMP   1;971   S. Okanagan (B) Abanaga (B)	Buckley-Terrace (E)				20	Wapiti River-Murray River (A)	1:1000 0002	1977			
1956   553   Williams Lake Abrasis Creek (A)   1:100000'   1988 CarAMP   1955   Southeast Vancouver Island   1:50000'   1:00000'   1:00000'   1:00000'   1:00000'   1:00000'   1:00000'   1:00000'   1:00000'   1:00000'   1:00000'   1:00000'   1:00000'   1:00000'   1:00000'   1:00000'   1:00000'   1:00000'   1:00000'   1:000000'   1:00000'	· Kootenay & Elk River Valleys (A)	1:63 3601	1956		25	Okanagan-Similkameen Valleys (A)	1:20 0002	1986	CAPAMP	4. The Canadian System of Soil Classification	1981
1965   57   Southeast Vancouver Island   1:500002   1982   CAPAMP   1971   19	Southeast Vancouver Island &	1:63 3601	1959		23	Williams Lake-Alexis Creek (A)	1:100 0001	1988	CanSIS		7007
1961   57 Southeast Vancouver Island   1200000   1965   197   1964   Parkswile Qualicum,   1964   Parkswile Qualicum,   1970   200 courtensty, Port Alberni (A)   1200000   1989   CAPAMP   1971   298   Gazenkine (A)   11000000   1989   CAPAMP   1971   298   Gazenkine (A)   11000000   1989   CAPAMP   1973   Canisis   69   Gazenkine (A)   11000000   1989   Canisis   62   Pent Simpson Trait (A)   11000000   1989   Canisis   62   Pent Simpson Trait (A)   11000000   1989   Canisis   63   Pent Simpson Trait (A)   11000000   1989   Canisis   64   Soil Landscapes of B.C. (A)   11000000   1972   Canisis   65   Soil Landscapes of Ganada B.C. (C.D.)   111000000   1972   Canisis   65   Soil Landscapes of Canada B.C. (C.D.)   111000000   1972   Canisis   65   Soil Landscapes of Canada B.C. (C.D.)   111000000   1972   Canisis   65   Soil Landscapes of Canada B.C. (C.D.)   111000000   1972   Canisis   65   Soil Landscapes of Canada B.C. (C.D.)   111000000   1972   Canisis   65   Soil Landscapes of Canada B.C. (C.D.)   111000000   1972   Canisis   65   Soil Landscapes of Canada B.C. (C.D.)   111000000   1972   Canisis   65   Soil Landscapes of Canada B.C. (C.D.)   111000000   1972   Canisis   65   Soil Landscapes of Canada B.C. (C.D.)   111000000   1972   Canisis   65   Soil Landscapes of Canada B.C. (C.D.)   111000000   1972   Canisis   65   Soil Landscapes of Canada B.C. (C.D.)   111000000   1972   Canisis   1110   Canado Cheer Valley (B)   11500000   1980   Canasis   11200000   1980   Canasis   11200000   1980   Canasis   112000000   1980   Canasis   1120000000   1980   Canasis   1120000000000000000000000000000000000	lands (E)	•			26	Deep Basin (C)	1:50 0002	1982	CAPAMP		1987
1965   Duncan Namanno (A)   120 0000° 1995   CAPAMP   1970   1985   CAPAMP   1970   1985   CAPAMP   1970   1970   1985   CAPAMP   1970   197	Columbia River Valley (A)	1:633601	1961		22	Southeast Vancouver Island				A Describing Ecoevatems in the Fig.	5
1974   Parkswiller   Parkswi	River (E)	1:1267201	1965			Duncan, Nanaimo (A)	$1:20000^{2}$	1985	CAPAMP	o. Describing Ecosystems in the ried	986
1970   So Guarden-Man,   120,0000° 1989   CAPAMP   1971   So Galacier-Ma. Revelstoke Nati Parks (A)   110,0000° 1984   CanSiS   1972   CanSiS   So Galacier-Ma. Revelstoke Nati Parks (A)   110,0000° 1984   CanSiS   CanSiS   So Kostenay Mational Park (A)   110,0000° 1994   CanSiS   CanSiS   So Kostenay Mational Park (A)   110,0000° 1994   CanSiS   Can	River Valley (A)	1:633601	1964			Parksville, Qualicum,					
1971   55 For Shipmen Trail (A)   1:100 0007   1984   CanSiS   60   Kootenay National Park (A)   1:50 00007   1984   CanSiS   60   Kootenay National Park (A)   1:50 00007   1984   CanSiS   62   Permètron Valley (A)   1:50 00007   1984   CanSiS   63   Permètron Valley (A)   1:50 00007   1975   CanSiS   63   Permètron Valley (A)   1:50 00007   1976   CanSiS   1980   CAPAMP   101   North Okanogan (B)   1:10 000007   1975   CanSiS   1981   CAPAMP   101   North Okanogan (B)   1:10 000007   1975   CanSiS   1982   CAPAMP   101   North Okanogan (B)   1:10 000007   1975   CanSiS   1971   CatSiS   110   Eagle River Valley (B)   1:10 000007   1977   CanSiS   1972   CanSiS   111   Telegraph Creek (B)   1:10 00007   1977   CanSiS   1974   CanSiS   111   Telegraph Creek (B)   1:10 00007   1978   CanSiS   112   Mill-Woodflibre Creeks (A)   1:10 00007   1980   CanSiS   113   Cantoo Chiever Valley (B)   1:10 00007   1980   CanSiS   114   Cantoo Chiever Valley (B)   1:10 00007   1980   CanSiS   115   Cantoo Chiever Valley (B)   1:10 00007   1980   CanSiS   115   Cantoo Chiever Valley (B)   1:10 00007   1980   CanSiS   115   Cantoo Chiever Valley (B)   1:10 00007   1980   CanSiS   115   Cantoo Chiever Valley (B)   1:10 00007   1980   CanSiS   115   Cantoo Chiever Valley (B)   1:10 00007   1980   CanSiS   115   Cantoo Chiever Valley (B)   1:10 00007   1980   CanSiS   115   Cantoo Chiever Valley (B)   1:10 00007   1980   CanSiS   115   Cantoo Chiever Valley (B)   1:10 00007   1980   CanSiS   115   Cantoo Chiever Valley (B)   1:10 00007   1980   CanSiS   115   Cantoo Chiever Valley (B)   1:10 00007   1980   CanSiS   115   Cantoo Chiever Valley (B)   1:10 00007   1980   CanSiS   115   Cantoo Chiever Valley (B)   1:10 00007   1980   CanSiS   115   Cantoo Chiever Valley (B)   1:10 00007   1980   CanSiS   115   Cantoo Chiever Valley (B)   1:10 00007   1980   CanSiS   115   Cantoo Chiever (B)   1:10 00007   1980   CanSiS   115   Cantoo Chiever (B)   1:10 00007   1980   CanSiS   115   CanSis   115   Cantoo Chiever (B)   1:10 00007   197	Fraser Valley (A)	1:126 7201	1970			Courtenay, Port Alberni (A)	$1:20000^{2}$	1989	CAPAMP		
1974 CanSiS 62   Glacire-Mi Invensione Nai'l Parks (A)   1:500000° 1994 CanSiS 62   Pemberton Valley (A)   1:500000° 1994 CanSiS 62   Pemberton Valley (A)   1:500000° 1977 CanSiS 62   Pemberton Valley (A)   1:500000° 1977 CanSiS 63   Yoho Mationary Park (A)   1:500000° 1977 CanSiS 63   Yoho Mationary Park (A)   1:500000° 1977 CanSiS 1996 CAPAMP   131 Andreapas of CanSiS 1991 CAPAMP   132 Ashproft-Savona (B)   1:31 660° 1963   131 660° 1963	-Ucluelet Lowlands (A)	1:50 0001	1971		28	Fort Simpson Trail (A)	1:100 0002	1982			
1974 CanSIS 60 Kooteray National Park (A)   1:50 0000° 1984 CanSIS 60 Kooteray National Park (A)   1:50 0000° 1980 CAPAMP 64 Soil Landscapes of B.C. (C.D)   1:00 0000° 1978 CanSIS 1980 CAPAMP 101 North Okanagan (B)   1:50 0000° 1978 CanSIS 1981 CAPAMP 101 North Okanagan (B)   1:31 600° 1960	elson (A)	1:126 7201	1971		23	Glacier-Mt. Revelstoke Nat'l Parks (A)	1:50 0002	1984	CanSIS		
1979   CanSiS   62	een (A)	1:1267201	1974	CanSIS	8	Kootenay National Park (A)	1:50 0002	1984	CanSIS		
1980   CAPAMP   63 Soil Landscapes of CL, (A)   15 00000'   1977   CanSiS     1981   CAPAMP   101   North Okanagan (B)   131 680'   1960   1960     1981   CAPAMP   101   North Okanagan (B)   131 680'   1960   1962     1981   CAPAMP   101   North Okanagan (B)   131 680'   1960   1962     1981   CAPAMP   101   North Okanagan (B)   131 680'   1962   1964     102   CAPAMP   103   Ashiptoric Savona (B)   131 680'   1964     1981   CAPAMP   104   Eagle River Valley (B)   131 680'   1964     1981   CAPAMP   105   Caston (B)   131 680'   1964     1982   CaPAMP   107   Creston (B)   131 680'   1967     1980   CanSiS   117   Capamato (B)   130 680'   1971     1990   CanSiS   117   Mill-Woodfibre Creeks (A)   130 680'   1971     1990   CanSiS   117   Mill-Woodfibre Creeks (B)   130 680'   1981     1980   CanSiS   118   Capamp   130 680'   1981     1980   CanSiS   119   Cascados (B)   130 680'   1973     1980   CanSiS   119   Vaseaux Creek (B)   130 680'   1973     1980   CanSiS   120   Capamp   120 680'   1973     1980   CanSiS   121   Capamp   120 680'   1973     1980   CanSiS   122   Anahim Indian Reserve (B)   130 680'   1973     1980   CanSiS   274   Anahim Indian Reserve (B)   130 680'   1973     1980   CanSiS   275   Stoney Indian Reserve (B)   130 680'   1973     1980   CanSiS   275   Stoney Indian Reserve (B)   130 680'   1973     1987   CanSiS   276   Anahim Indian Reserve (B)   130 690'   1973     1987   CanSiS   287   Anahim Indian Reserve (B)   130 690'   1973     1987   CanSiS   288   Canmin Indian Reserve (B)   130 690'   1973     1988   CanSiS   288   Canmin Indian Reserve (B)   130 690'   1973     1989   CanSiS   289   Anahim Indian Reserve (B)   130 690'   1973     1980   CanSiS   289   Stoney Indian Reserve (B)   130 690'   1973     1980   CanSiS   289   Stoney Indian Reserve (B)   130 690'   1973     1980   CanSiS   289   Stoney Indian Reserve (B)   130 690'   1974     1980   CanSiS   289   Stoney Indian Reserve (B)   130 690'   1974     1980   CanSiS   289   Stoney Indian Reserve (B)   130 690'   197	ton (A)	1:1250001	1979	CanSIS	62	Pemberton Valley (A)	1:20 000 <sup>3</sup>	1980		EXPLANATION OF DETAIL CODES	
1980   CAPAMP   64   Soil Landscapes of B.C.(A)   1:6 000 0001   1978	sy-Vancouver				ß	Yoho National Park (A)	1:500001	1977	CanSIS		
1980   CAPAMP   13   CAPAMP   14   CAPAMP   15   CAPAMP   15   CAPAMP   16   CAPAMP   16   CAPAMP   17   CAPAMP   17   CAPAMP   18   CAPAMP   19   CAPAMP	Soil map mosaics	1:25,0001	1980	CAPAMP	\$	Soil Landscapes of B.C. (A)	1:6 000 0001	1978			pod
1981 CAPAMP   101 North Okanagan (B)	Lower Fraser Valley			:	92	Soil Landscapes of Canada-B.C. (C,D)	1:1 000 0001		CanSIS		
1981 CAPAMP         101 North Okanagan (B)         1:31 680²         1960         2           1984 CAPAMP         102 Chiliwack (B)         1:24 000²         1962         4           1984 CAPAMP         103 Ashgrotk-Savona (B)         1:24 000²         1962         4           1981 CAPAMP         103 Fileswell (B)         1:31 680²         1967           1980 Capasiz (B)         1:24 000²         1965         1964           1971 Caston (B)         1:31 680²         1971         1971           1972 Caston (B)         1:24 000²         1972         1971           1973 Tall (B) Elgend, Burnaby (B)         1:50 000²         1973           1975 Tall (B) Elgend, Burnaby (B)         1:50 000²         1973           1976 CanSiS Tall (B) Elgend, Burnaby (B)         1:50 000²         1973           1977 Caston (B)         1:15 0000²         1980         CanSiS           1980 CanSiS Tall (B) Pewer (Alley (B))         1:150 000²         1981         CanSiS           1980 CanSiS Tall (B) Cantiley (B)         1:50 000²         1981         CAPAMP           1980 CanSiS S Tall (B) Cantiley (B)         1:20 000²         1981         CAPAMP           1980 CanSiS S Tall (B) Cantiley (B)         1:20 000²         1981         1:30 000²         1	Soil maps of Sunshine	1:50,000	1980	CAPAMP		SPECIAL SURVE	XS			colour	eport
1981 CAPAMP   101 Ashrord-Savona (B)   1:31680° 1956   1950   1	and Coast Mountains				•					black & white	orking report
1984 CAPAMP 102 Ashprort-Savona (B) 124 2000	Jescription of Soils		1981	CAPAMP	101	North Okanagan (B)	1:31 6802	1960		photomosaic C	1 map legend
1984   CAPAMP   103 Asprorticasavona (B)   131 6807   1964   1965   1964   1965   1964   1965   1964   1965   1964   1965   1964   106	. I and 2		,		102	Chilliwack (B)	1:24 0002	1962		interim data available D	ation
1981   CAPAMP   106	Agricultural management		1984	CAPAMP	103	Ashcroff-Savona (B)	1:31 680	1963			F
1981 CAPAMP 106 Alasawap (15) 131 680 1965 1980 107 Crestor (8) 1124 000 1967 1971 108 Ala Lake (8) 115 840 1971 1972 109 Town Golden (8) 115 840 1971 1973 110 Big Bend, Burnaby (8) 115 0000 1977 1974 111 Telegraph Creek (8) 115 0000 1977 1975 111 Telegraph Creek (9) 115 0000 1978 1976 CanSiS 112 Mill-Woodfibre Creeks (A) 115 0000 1979 1978 CanSiS 114 Pend-Dreille Villey (B) 115 0000 1980 1980 CanSiS 117 Cumman River Valley (B) 115 0000 1980 1980 CanSiS 119 Vaseaux Creek Valley (B) 115 0000 1981 1980 CAPAMP 121 Keremeos-Ashiolia Creeks (B) 116 0000 1987 1986 CAPAMP 122 Neison City Watershed (B) 116 0000 1987 1986 CAPAMP 122 Neison City Watershed (B) 116 0000 1987 1986 CAPAMP 122 Neison City Watershed (B) 116 0000 1987 1986 CAPAMP 122 Neison City Watershed (B) 116 0000 1987 1987 CanSiS 275 Stoney Indian Reserve (B) 116 0000 1973 1988 CanSiS 275 Stoney Indian Reserve (B) 116 0000 1973 1988 CanSiS 278 Milliams Lake Indian Reserve (B) 116 0000 1973 1988 CanSiS 280 Canmin Lake Indian Reserve (B) 116 0000 1973 1989 CanSiS 281 EastMoberly Lake Indian Reserve (B) 116 0000 1973 1989 CanSiS 282 West Midan Reserve (B) 116 0000 1973 1989 CanSiS 282 West Midan Reserve (B) 116 0000 1973 1989 CanSiS 282 West Midan Reserve (B) 116 0000 1973 1989 CanSiS 282 West Midan Reserve (B) 116 0000 1973 1989 CanSiS 282 West Midan Reserve (B) 116 0000 1973 1989 CanSiS 282 West Midan Reserve (B) 116 0000 1973 1989 CanSiS 282 West Midan Reserve (B) 116 0000 1973 1989 CanSiS 282 West Midan Reserve (B) 116 0000 1973 1989 CanSiS 283 Fountain Indian Reserve (B) 116 0000 1973	opping for soils				40.	Eagle Hiver Valley (B)	1:31 680	1964			
1991 CAPAMP         106 Agassiz (B)         1124 000° 1967           1990 Mala Lake (B)         113 680° 1971           1971 OF Creston (B)         115 400° 1971           1971 Mala Lake (B)         115 400° 1975           1972 Mala Lake (B)         115 6000° 1975           1973 Mala Lake (B)         115 0000° 1977           1974 Mala Mala Mala Mala Mala Mala Mala Mal	Jed In Vol. 3				305	Shuswap (B)	1:31 680 2	1965		letici (	
197         107 Creston (H)         131680°         1971           1971         109 Alfa Lake (B)         1:15 840°         1971           1973         109 Town Of Golden (B)         1:5400°         1971           1973         110 Big Bend, Burnaby (B)         1:50000°         1977           1975         111 Telegraph Creek (B)         1:50000°         1977           1974         112 Mill-Woodfiber Creeks (A)         1:50000°         1978           1986         CanSIS         114 Pend-D'Oreille Valley (B)         1:50000°         1979           1989         115 Cownord Rever Valley (B)         1:50000°         1981           1980         CanSIS         117 Cummins River Valley (B)         1:50000°         1981           1980         CanSIS         117 Cummins River Valley (B)         1:50000°         1981           1980         CanSIS         117 Cummins River Valley (B)         1:50000°         1981           1980         CanSIS         120 Separation Lake (C)         1:20000°         1987           1986         CAPAMP         121 Keramagan Valley (C)         1:20000°         1987           1986         CanSIS         274 Anahim Indian Reserve (B)         1:16 896°         1973           1987	Jetailed technical		1981	CAPAMP	106	Agassiz (B)	$1.24000^{2}$	1967		Cigra	
1971   109   Town of Golden (B)   1:15 840°   1971   1971   1972   110   Big Bend, Burnaby (B)   1:5400°   1975   110   Big Bend, Burnaby (B)   1:50 000°   1975   111   Telegraph Creek (B)   1:50 000°   1978   112   Cariboo Pluver Valley (B)   1:50 000°   1979   1:50 000°   1979   1:50 000°   1979   1:50 000°   1979   1:50 000°   1979   1:50 000°   1979   1:50 000°   1980   1:50 000°   19	Strons of soils in Vol. 3	4.400,0002	000		20,	Creston (B)	1:31 680	1971			Computer
1973         110         Big Band, Burnaby (B)         153,400-7         1973           1975         111         Telegraph Creek (B)         150,0002         1977           1975         111         Telegraph Creek (B)         150,0002         1978           1974         112         Mill-Woodfibre Creeks (A)         1:15,800         1978           1974         113         Carboo Blover Valley (B)         1:15,000         1979           1989         115         Power Mare Valley (B)         1:15,000         1981           1980         CanSIS         117         Cascades (B)         1:100,000         1981           1980         CanSIS         119         Cardew Valley (B)         1:100,000         1981           1980         CanSIS         119         Cardew Valley (B)         1:20,000         1981           1980         CanSIS         120         Separation Lake (C)         1:20,000         1981           1980         CanSIS         120         Separation Lake (C)         1:20,000         1981           1980         CanSIS         120         North Okanagan Valley (B)         1:20,000         1981           1980         CanSIS         273         Halfway Indian Reserve (B)	rairia, Bluebero, Biver (C)	1.100,000	1990		2 5	Alia Lake (b)	1:15840*	1971		į	anning
1975         110 Olymon Creek (A)         150 0000 1977           1976         111 Telegraph Creek (A)         150 0000 1976           1974         112 Alla Bend, Durding (B)         150 0000 1979           1974         113 Cariboo River Valley (B)         150 0000 1979           1976         CanSIS         114 Pend-D'Oreille Valley (E)         150 0000 1980           1989         115 Power River Valley (A)         1100 0000 1981           1980         CanSIS         117 Cummins River Valley (B)         150 0000 1981           1980         CanSIS         117 Cummins River Valley (B)         150 0000 1981           1980         CanSIS         117 Cummins River Valley (B)         150 0000 1981           1980         CanSIS         117 Cummins River Valley (B)         150 0000 1981           1980         CanSIS         120 Separation Lake (C)         150 0000 1987           1986         CAPAMP         121 Keremeos Ashnola Creek (B)         150 0000 1987           1986         CAPAMP         122 Nation City Watershed (B)         150 0000 1987           1986         CanSIS         273 Halfway Indian Reserve (B)         151 6896 1973           1987         CanSIS         274 Analymin Indian Reserve (B)         151 6896 1973           1987         Can	v Biver (C)	1.125,000	1070		2 :		1:5400*	1975			tandMan
1970         CanSIS         111         FineBapt Interest         111         FineBapt Interest         112         CanSIS         113         CanBood         1978         CanSIS           1 1976         CanSIS         114         Pend-D'Oreille Valley (B)         1:50000²         1988         CanSIS           1 1980         CanSIS         115         Power River Valley (B)         1:150000²         1981           1 1980         CanSIS         117         Cummins River Valley (B)         1:50000²         1981           1 1980         CanSIS         119         Vaseaux Creek Valley (B)         1:50000²         1980           1 1980         CanSIS         120         Separation Lake (C)         1:20 000²         1980           1 1980         CanSIS         120         Separation Lake (C)         1:20 000²         1980           1 1980         CanSIS         120         Northook August Valley (B)         1:20 000²         1980           1 1980         CanSIS         274         Anahim Indian Reserve (B)         1:16 896²         1973           1 1987         275         Alkali Lake Indian Reserve (B)         1:16 896²         1973           1 1987         278         West Moberty Lake Indian Reserve (B)         1:16	iy niver (C)	1.125,000	1975		2 :		1:20 000*	1977		Production	Ruino Imap
1936 CanSIS 113 Pend-D'Orelie Valley (B) 1:50000 <sup>2</sup> 1979 CanSIS 114 Pend-D'Orelie Valley (B) 1:50000 <sup>2</sup> 1979 CanSIS 115 Power River Valley (B) 1:50000 <sup>2</sup> 1980 CanSIS 116 Cascades (B) 1:100 0000 <sup>2</sup> 1981 CanSIS 117 Cummins River Valley (C) 1:50000 <sup>2</sup> 1981 CanSIS 118 Coldstream Creek Valley (B) 1:50000 <sup>2</sup> 1981 CanSIS 120 Separation Lake (C) 1:20000 <sup>2</sup> 1980 CanSIS 120 Separation Lake (C) 1:20000 <sup>2</sup> 1980 CanSIS 120 Separation Lake (C) 1:20000 <sup>2</sup> 1980 CanSIS 120 Nelson City Watershed (B) 1:20 000 <sup>2</sup> 1987 CAPAMP 122 North Okanagan Valley (C) 1:20 000 <sup>2</sup> 1987 CAPAMP 122 North Okanagan Valley (C) 1:20 000 <sup>2</sup> 1987 CanSIS 273 Haffway Indian Reserve (B) 1:16 896 <sup>2</sup> 1973 CanSIS 275 Stoney Indian Reserve (B) 1:16 896 <sup>2</sup> 1973 CanSIS 275 Alwain Indian Reserve (B) 1:16 896 <sup>2</sup> 1973 CanSIS 280 Canim Lake Indian Reserve (B) 1:16 896 <sup>3</sup> 1973 CanSIS 280 Canim Lake Indian Reserve (B) 1:16 896 <sup>3</sup> 1973 CanSIS 280 Canim Lake Indian Reserve (B) 1:16 896 <sup>3</sup> 1973 CanSIS 280 Canim Lake Indian Reserve (B) 1:16 896 <sup>3</sup> 1973 CanSIS 281 East Moberty Lake Indian Reserve (B) 1:16 896 <sup>3</sup> 1973 CanSIS 282 West Moberty Lake Indian Reserve (B) 1:16 896 <sup>3</sup> 1973 CanSIS 283 Fountain Indian Reserve (B) 1:16 896 <sup>3</sup> 1973 CanSIS 283 Rountain Indian Reserve (B) 1:16 896 <sup>3</sup> 1973 CanSIS 283 Rountain Indian Reserve (B) 1:16 896 <sup>3</sup> 1973 CanSIS 283 Rountain Indian Reserve (B) 1:16 896 <sup>3</sup> 1973 CanSIS 283 Rountain Indian Reserve (B) 1:16 896 <sup>3</sup> 1973 CanSIS 283 Rountain Indian Reserve (B) 1:36 200 <sup>3</sup> 1974 CanSIS 283 Rountain Indian Reserve (B) 1:36 200 <sup>3</sup> 1974 CanSIS 283 Rountain Indian Reserve (B) 1:36 200 <sup>3</sup> 1974 CanSIS 283 Rountain Indian Reserve (B) 1:36 200 <sup>3</sup> 1974 CanSIS 283 Rountain Indian Reserve (B) 1:36 200 <sup>3</sup> 1974 CanSIS 283 Rountain Indian Reserve (B) 1:36 200 <sup>3</sup> 1974 CanSIS 283 Rountain Indian Reserve (B) 1:36 200 <sup>3</sup> 1974 CanSIS 283 Rountain Indian Reserve (B) 1:36 200 <sup>3</sup> 1974 CanSIS 283 Rountain Indian Reserve (B) 1:36 200 <sup>3</sup> 1974 CanSIS 283 Rountain Indian Reserve (B) 1:36 200 <sup>3</sup> 1974 CanSIS 283 Rountain Indian Reserve (B) 1:36 200 <sup>3</sup> 1974 CanSIS 283 Ro	Solution Clock (C)	1.150.000	000	01340	- :	relegiabil Creek (b)	1:50,000-	8/61	0	Columbia	
1976         CanSIS         119         Power Biver Valley (L)         1:20 000         1973           1989         115         Power Biver Valley (A)         1:15 0000         1988         CanSIS           1980         CanSIS         117         Cummins River Valley (A)         1:100 00002         1981           1980         CanSIS         117         Cummins River Valley (C)         1:50 00002         1981           1980         CanSIS         119         Vaseaux Creek Valley (B)         1:50 00002         1980           1980         CanSIS         120         Separation Lake (C)         1:20 00002         1980           1986         CAPAMP         121         Keremeos-Ashnola Creek (B)         1:20 00002         1980           1986         CAPAMP         122         North Okanagan Valley (C)         1:20 00002         1987           1986         CAPAMP         122         North Okanagan Valley (C)         1:20 00002         1987           1987         CanSIS         273         Halfway Indian Reserve (B)         1:16 8963         1973           1987         CanSIS         275         Alkail Lake Indian Reserve (B)         1:16 8963         1973           1986         CanSIS         278 <td< td=""><td>Scena (A)</td><td>1:125,000</td><td>1974</td><td>Calibo</td><td>1 2</td><td>Mill: Woodillore Creeks (A)</td><td>1:15.840</td><td>1988</td><td>Cansis</td><td>(2000)</td><td></td></td<>	Scena (A)	1:125,000	1974	Calibo	1 2	Mill: Woodillore Creeks (A)	1:15.840	1988	Cansis	(2000)	
1989         115         Power River Valley (A)         1:15 00001         1988         CanSIS           1988         116         Cascades (B)         1:1000002         1981         CanSIS           1980         CanSIS         117         Cummins River Valley (B)         1:50 0002         1981           1980         CanSIS         119         Vaseaux Creek Valley (B)         1:50 0002         1980           1980         CanSIS         120         Separation Lake (C)         1:20 0002         1980           1986         CAPAMP         121         Keremeos-Ashnola Creeks (B)         1:20 0002         1987           1986         CAPAMP         122         Nelson City Watershed (B)         1:20 0002         1987           1986         CAPAMP         122         Nelson City Watershed (B)         1:20 0002         1987           1986         CanSIS         273         Halfway Indian Reserve (B)         1:16 8962         1973           1987         CanSIS         274         Anahim Indian Reserve (B)         1:16 8963         1973           1987         CanSIS         275         Aleka Indian Reserve (B)         1:16 8963         1973           1987         CanSIS         280         Canim Lake Indian R	(o-François Lake (A)	1:1250001	1976	CanSIS	11.0	Pend-D'Oreille Valley (E)	1:20,000²	1980			
1988         116         Cascades (B)         1100000²         1981           1980         CanSIS         117         Cummins River Valley (C)         1:50000²         1981           1980         CanSIS         119         Vaseaux Creek Valley (B)         1:50000²         1980           1980         CanSIS         120         1:50000²         1980           1986         CAPAMP         121         Keremeos-Ashnola Creeks (B)         1:20000²         1980           1986         CAPAMP         123         North Okanagan Valley (C)         1:20000²         1987         CAPAMP           1984         CanSIS         123         North Okanagan Valley (C)         1:20000²         1987         CAPAMP           1984         CanSIS         273         Halfway Indian Reserve (B)         1:16 896³         1973           1985         CanSIS         274         Anahim Indian Reserve (B)         1:16 896³         1973           1986         CanSIS         275         Akail Lake Indian Reserve (B)         1:16 896³         1973           1987         CanSIS         278         Williams Lake Indian Reserve (B)         1:16 896³         1973           1987         CanSIS         280         Canim Lake Indian Reserve	George-McLeod Lake (A)	1:100 0002	1989		115	Power River Valley (A)	1:150001	1988	CanSIS		
1980 CanSIS         117 Cummins River Valley (C)         1:50 0000²         1981           1980 CanSIS         118 Coldstream Creek Valley (B)         1:50 0002²         1980           1980 CanSIS         119 Vaseaux Creek Valley (B)         1:50 0002²         1980           1980 CanSIS         120 SparationLake (C)         1:20 0002²         1980           1986 CAPAMP         121 Keremeos-Ashnola Creeks (B)         1:20 0002²         1987           1986 CAPAMP         123 North Okanagan Valley (C)         1:20 0002²         1987           1984 CanSIS         273 Halfway Indian Reserve (B)         1:16 896³         1973           1986 CanSIS         274 Anahim Indian Reserve (B)         1:16 896³         1973           1986 CanSIS         275 Alvagi Lake Indian Reserve (B)         1:16 896³         1973           1987 CanSIS         275 Alvagi Lake Indian Reserve (B)         1:16 896³         1973           1987 CanSIS         278 Williams Lake Indian Reserve (B)         1:16 896³         1973           1987 CanSIS         280 Canim Lake Indian Reserve (B)         1:16 896³         1973           1988 CanSIS         281 East Moberly Lake Indian Reserve (B)         1:16 896³         1973           1989 CanSIS         282 West Moberly Lake Indian Reserve (B)         1:16 896³         1973	arte River-Canim Lake (A)	1:100 0002	1988		116	Cascades (B)	1:100 0002	1981	)		
1980 CanSIS 119 Vaseaux Creek Valley (B) 1:50 000 <sup>2</sup> 1980 1:20 000 <sup>2</sup> 1980 1:20 000 <sup>2</sup> 1981 1:20 000 <sup>2</sup> 1982 CanSIS 123 North Okanagan Valley (C) 1:20 000 <sup>2</sup> 1987 CAPAMP 1:20 Anahim Indian Reserve (B) 1:16 896 <sup>3</sup> 1973 1:16 896 1:16	Hache-Clinton (A)	1:125 0001	1980	CanSIS	117	Cummins River Valley (C)	1:50 0002	1981			
1980 CanSIS         119 Vaseaux Creek Valley (B)         1:50 0002         1980           1980 CanSIS         120 Separation Lake (C)         1:20 0002         1980           1986 CAPAMP         121 Keremeos-Ashnola Creeks (B)         1:20 0002         1981           1986 CAPAMP         122 Nelson City Watershed (B)         1:20 0002         1987         CAPAMP           1982 CanSIS         123 Haffway Indian Reserve (B)         1:31 680 <sup>2-3</sup> 1973         CAPAMP           1984 CanSIS         274 Anahim Indian Reserve (B)         1:16 896 <sup>3</sup> 1973         1:16 896 <sup>3</sup> 1973           1985 CanSIS         275 Alkali Lake Indian Reserve (B)         1:16 896 <sup>3</sup> 1973         1973           1986 CanSIS         278 Williams Lake Indian Reserve (B)         1:16 896 <sup>3</sup> 1973           1987 CanSIS         278 Williams Lake Indian Reserve (B)         1:16 896 <sup>3</sup> 1973           1987 CanSIS         280 Canim Lake Indian Reserve (B)         1:16 896 <sup>3</sup> 1973           1988 CanSIS         280 Canim Lake Indian Reserve (B)         1:16 896 <sup>3</sup> 1973           1989 CanSIS         281 East Moberly Lake Indian Reserve (B)         1:16 896 <sup>3</sup> 1973           1989 CanSIS         282 West Moberly Lake Indian Reserve (B)         1:14 080 <sup>3</sup> 1974 </td <td>h(D)</td> <td>1:100 0002</td> <td></td> <td></td> <td>118</td> <td>Coldstream Creek Valley (B)</td> <td><math>1:50000^2</math></td> <td>1980</td> <td></td> <td>Additional information about soil surveys may be o</td> <td>btained from:</td>	h(D)	1:100 0002			118	Coldstream Creek Valley (B)	$1:50000^2$	1980		Additional information about soil surveys may be o	btained from:
1980 CanSIS         120 Separation Lake (C)         1:20 0002         1980           1986 CAPAMP         121 Keremeos-Ashnola Creeks (B)         1:20 0002         1981           1986 CAPAMP         122 Nelson City Watershed (B)         1:20 0002         1987           1982 CAPAMP         123 Hafway Indian Reserve (B)         1:20 0002         1987           1984 CanSIS         273 Haffway Indian Reserve (B)         1:16 8963         1973           1985 CanSIS         276 Anahim Indian Reserve (B)         1:16 8963         1973           1985 CanSIS         276 Alkali Lake Indian Reserve (B)         1:16 8963         1973           1986 CanSIS         277 Redstone Indian Reserve (B)         1:16 8963         1973           1987 CanSIS         278 Williams Lake Indian Reserve (B)         1:16 8963         1973           1986 CanSIS         278 Williams Lake Indian Reserve (B)         1:16 8963         1973           1987 CanSIS         280 Canim Lake Indian Reserve (B)         1:16 8963         1973           1988 CanSIS         281 East Moberly Lake Indian Reserve (B)         1:16 8963         1973           1989 CanSIS         282 West Moberly Lake Indian Reserve (B)         1:14 0803         1973           1990 CanSIS         283 Foundain Indian Reserve (B)         1:14 0803         19	n (A)	1:100 0001	1980	CanSIS	119	Vaseaux Creek Valley (B)	1:50 0002	1980			
1986         CAPAMP         121         Keremeos-Ashnola Creeks (B)         1:20 0002         1981           1986         CAPAMP         122         Nelson City Watershed (B)         1:20 0002         1987         CAPAMP           1982         CanSIS         123         North Okanagan Valley (C)         1:20 0002         1987         CAPAMP           1984         CanSIS         273         Halfway Indian Reserve (B)         1:16 8963         1973           1985         CanSIS         274         Anahim Indian Reserve (B)         1:16 8963         1973           1985         CanSIS         276         Alkali Lake Indian Reserve (B)         1:16 8963         1973           1986         CanSIS         278         Williams Lake Indian Reserve (B)         1:16 8963         1973           1987         CanSIS         278         Williams Lake Indian Reserve (B)         1:16 8963         1973           1987         CanSIS         280         Canim Lake Indian Reserve (B)         1:16 8963         1973           1988         CanSIS         281         East Moberly Lake Indian Reserve (B)         1:16 8963         1973           1989         CanSIS         281         Fountain Indian Reserve (B)         1:14 08073         1974 <td>(<b>y</b>)</td> <td>1:1000001</td> <td>1980</td> <td>CanSIS</td> <td>120</td> <td>Separation Lake (C)</td> <td>1:20 0002</td> <td>1980</td> <td></td> <td>Ministry of Environment</td> <td></td>	( <b>y</b> )	1:1000001	1980	CanSIS	120	Separation Lake (C)	1:20 0002	1980		Ministry of Environment	
1986         CAPAMP         122         Nelson City Watershed (B)         1:20 0002         1987         CAPAMP           1982         CanSIS         123         North Okanagan Valley (C)         1:20 0002         1987         CAPAMP           1984         CanSIS         273         Haffway Indian Reserve (B)         1:12 6802         1973           1987         CanSIS         274         Anahim Indian Reserve (B)         1:16 8963         1973           1986         CanSIS         276         Alkali Lake Indian Reserve (B)         1:16 8963         1973           1986         CanSIS         278         Williams Lake Indian Reserve (B)         1:16 8963         1973           1987         CanSIS         278         Williams Lake Indian Reserve (B)         1:16 8963         1973           1986         CanSIS         280         Canim Lake Indian Reserve (B)         1:16 8963         1973           1987         CanSIS         280         Canim Lake Indian Reserve (B)         1:16 8963         1973           1988         CanSIS         281         East Moberly Lake Indian Reserve (B)         1:16 8963         1973           1989         CanSIS         282         West Moberly Lake Indian Reserve (B)         1:14 0803         1973 <td>on (C)</td> <td>1:100 0002</td> <td>1986</td> <td>CAPAMP</td> <td>121</td> <td>Keremeos-Ashnola Creeks (B)</td> <td><math>1.20000^{2}</math></td> <td>1981</td> <td></td> <td>Integrated Resource Management Bran</td> <td>ch Ch</td>	on (C)	1:100 0002	1986	CAPAMP	121	Keremeos-Ashnola Creeks (B)	$1.20000^{2}$	1981		Integrated Resource Management Bran	ch Ch
1982         CanSIS         123         North Okanagan Valley (C)         1:20 0002         1987         CAPAMP           1984         CanSIS         273         Halfway Indian Reserve (B)         1:31 68023         1973           1987         CanSIS         274         Anahim Indian Reserve (B)         1:16 8963         1973           1986         CanSIS         275         Alkali Lake Indian Reserve (B)         1:16 8963         1973           1986         CanSIS         278         Williams Lake Indian Reserve (B)         1:16 8963         1973           1987         CanSIS         279         Toosey Indian Reserve (B)         1:16 8963         1973           1987         CanSIS         280         Canim Lake Indian Reserve (B)         1:16 8963         1973           1987         CanSIS         280         Canim Lake Indian Reserve (B)         1:16 8963         1973           1988         CanSIS         281         East Moberly Lake Indian Reserve (B)         1:16 8963         1973           1989         CanSIS         282         West Moberly Lake Indian Reserve (B)         1:14 0803         1973           1990         CanSIS         283         Fountain Indian Reserve (B)         1:14 0803         1974	(O)	1:100 0002	1986	CAPAMP	122	Nelson City Watershed (B)	$1:20000^{2}$	1987	CAPAMP	777 Broughton Street	
1984         CanSIS         273         Halfway Indian Reserve (B)         1:31 68023         1973           1987         CanSIS         274         Anahim Indian Reserve (B)         1:16 8963         1973           1988         CanSIS         275         Alkait Lake Indian Reserve (B)         1:16 8963         1973           1987         277         Redstone Indian Reserve (B)         1:16 8963         1973           1987         279         Toosey Indian Reserve (B)         1:16 8963         1973           1987         CanSIS         280         Canim Lake Indian Reserve (B)         1:16 8963         1973           1988         CanSIS         281         East Moberly Lake Indian Reserve (B)         1:16 8963         1973           1989         CanSIS         281         East Moberly Lake Indian Reserve (B)         1:16 8963         1973           1989         CanSIS         281         West Moberly Lake Indian Reserve (B)         1:35 0402         1973           1989         CanSIS         282         West Moberly Lake Indian Reserve (B)         1:14 0803         1973           1990         CanSIS         299         Nicola-Mameet Indian Reserve (B)         1:36 2063         1974	el (A)	1:100 000	1982	CanSIS	123	North Okanagan Valley (C)	1:20 0002	1987	CAPAMP	Victoria, B.C., V8V 1X5	
1987         CanSIS         274         Anahim Indian Reserve (B)         1:168993         1973           1988         CanSIS         275         Stoney Indian Reserve (B)         1:168963         1973           1987         CanSIS         276         Akail Lake Indian Reserve (B)         1:168963         1973           1987         CanSIS         279         Toosey Indian Reserve (B)         1:168963         1973           1987         CanSIS         280         Canim Lake Indian Reserve (B)         1:168963         1973           1988         CanSIS         281         East Moberly Lake Indian Reserve (B)         1:168963         1973           1989         CanSIS         281         East Moberly Lake Indian Reserve (B)         1:168963         1973           1989         CanSIS         282         West Moberly Lake Indian Reserve (B)         1:350402         1973           1990         CanSIS         283         Fountain Indian Reserve (B)         1:140803         1973           1990         CanSIS         299         Nicola-Mameet Indian Reserve (B)         1:362063         1974	y(A)	1:100 000	1984	CanSIS	273	Halfway Indian Reserve (B)	$1:31680^{2/3}$	1973		Tel. (604) 356-7736	
1986         CanSIS         275         Stoney Indian Reserve (B)         1:16896³         1973           1985         CanSIS         276         Alkali Lake Indian Reserve (B)         1:16896³         1973           1987         277         Hodstone Indian Reserve (B)         1:16896³         1973           1986         CanSIS         278         Williams Lake Indian Reserve (B)         1:16896³         1973           1987         CanSIS         280         Canim Lake Indian Reserve (B)         1:16896³         1973           1988         CanSIS         281         East Moberly Lake Indian Reserve (B)         1:55040²         1973           1989         CanSIS         282         West Moberly Lake Indian Reserve (B)         1:35040²         1973           1990         CanSIS         283         Fountain Indian Reserve (B)         1:14080³         1973           1990         CanSIS         299         Nicola-Mameet Indian Reserve (B)         1:36206³         1974	Lakes (A)	1:100 0001	1987	CanSIS	274	Anahim Indian Reserve (B)	1:16896 <sup>3</sup>	1973			
1985         CanSIS         276         Alkali Lake Indian Reserve (B)         1:16 896³         1973           1987         277         Redstone Indian Reserve (B)         1:16 896³         1973           1986         CanSIS         278         Williams Lake Indian Reserve (B)         1:16 896³         1973           1987         CanSIS         280         Canim Lake Indian Reserve (B)         1:16 896³         1973           1988         CanSIS         281         East Moberly Lake Indian Reserve (B)         1:95 040²         1973           1989         CanSIS         282         West Moberly Lake Indian Reserve (B)         1:95 040²         1973           1990         CanSIS         283         Fountain Indian Reserve (B)         1:14 080³         1973           1990         CanSIS         299         Nicola-Mameet Indian Reserve (B)         1:36 206³         1974	( <b>a</b> )	1:1000001	1988	CanSIS	275	Stoney Indian Reserve (B)	1:16896 <sup>3</sup>	1973		JO	
1987	rille (A)	1:100 000'	1985	CanSIS	276	Alkali Lake Indian Reserve (B)	$1:16896^3$	1973			
1986         CanSIS         278         Williams Lake Indian Reserve (B)         1:16 896³         1973           1987         CanSIS         279         Toosey Indian Reserve (B)         1:16 896³         1973           1987         CanSIS         280         Canim Lake Indian Reserve (B)         1:16 896³         1973           1989         CanSIS         281         East Moberly Lake Indian Reserve (B)         1:95 040²         1973           1990         CanSIS         283         Fountain Indian Reserve (B)         1:14 080³         1973           CanSIS         299         Nicola-Mameet Indian Reserve (B)         1:36 206³         1974	reek-Morkill Hiver (A)	1:100 000	1987		277	Redstone Indian Reserve (B)	1:16 896 <sup>3</sup>	1973		Agriculture Canada	
279 Toosey Indian Reserve (B) 1:16 896* 1973 1987 CanSIS 280 Canim Lake Indian Reserve (B) 1:16 896* 1973 1988 CanSIS 281 East Moberly Lake Indian Reserve (B) 1:95 040² 1973 1989 CanSIS 282 West Moberly Lake Indian Reserve (B) 1:95 040² 1973 1990 CanSIS 283 Fountain Indian Reserve (B) 1:14 080³ 1973 CanSIS 299 Nicola-Mameet Indian Reserve (B) 1:36 206³ 1974	John-Dawson Creek(A)	1:100 000	1986	CanSIS	278	Williams Lake Indian Reserve (B)	$1:16896^3$	1973		Land Resource Research Unit	
1987 CanSIS 280 Canim Lake Indian Reserve (B) 1:16 896 <sup>-3</sup> 1973 1988 CanSIS 281 East Moberly Lake Indian Reserve (B) 1:95 040 <sup>-2</sup> 1973 1989 CanSIS 282 West Moberly Lake Indian Reserve (B) 1:95 040 <sup>-2</sup> 1973 1990 CanSIS 283 Fountain Indian Reserve (B) 1:14 080 <sup>-3</sup> 1973 CanSIS 299 Nicola-Mameet Indian Reserve (B) 1:36 206 <sup>-3</sup> 1974	Inds		!	;	279	Toosey Indian Reserve (B)	1:16896³	1973		6660 NW Marine Drive	
1988	altspring (A)	1:20,000	1987	CanSIS	580	Canim Lake Indian Reserve (B)	1:16896 <sup>3</sup>	1973		Vancouver, B.C. V6T 1X2	
1969 CanSis 282 West Mobelly Lake Indian Reserve (B) 1:95 040° 1973 1990 CanSis 283 Fountain Indian Reserve (B) 1:14 080³ 1973 CanSis 299 Nicola-Mameet Indian Reserve (B) 1:36 206³ 1974	ender, Mayne, Saturna (A)	1:20,000	1988	Cansis	281	East Moberly Lake Indian Reserve (B)	1:95 0402	1973		Tel. (604) 224-4355	
CanSis 299 Nicola-Mameet Indian Reserve (B) 1:34 0807 (CanSis 299 Nicola-Mameet Indian Reserve (B) 1:36 206 <sup>3</sup> (CanSis 299 Nicola-Mameet Indian Reserve (B) 1:36 206 <sup>3</sup> (CanSis 2008)	aliano, Valdes, Thetis, Kuper (A)	1:20,000	1989	CanSiS	282	West Moberly Lake Indian Reserve (B)	1:95 0402	1973		FAX (604) 666-4994	
	acricia (A)	1.20,000	286	Callolo	3 6	Fountain Indian Reserve (B) Nicola-Mamoot Indian Dococo (B)	1:14 080	19/3			
	and, carries, moresoft, contain (c)	2000		200	667	ACOIA-MAINEEL MOIAN DESERVE (D)	-30 200-	19/4			

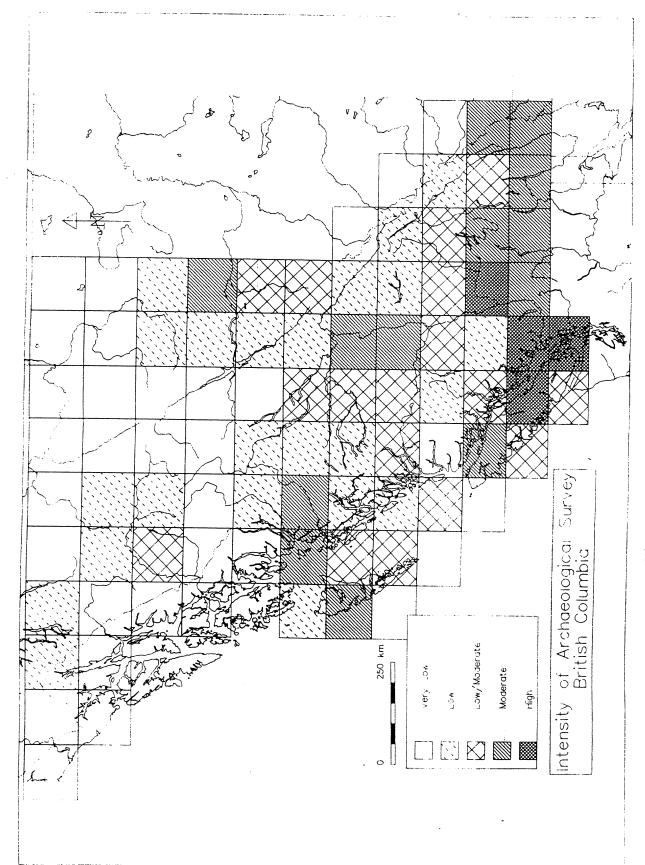


Figure 5. Intensity of Archaeological Survey

		Table 1. Current Stat	Current Status of Inventories		
Current Status Inventory Type	Information Available	Where Information Can Be Obtained	Past and Present Producers of Information	Standards and Procedures Employed in Data Collection	Estimated Expenditure or Survey Cost
1. Bedrock Geology	<ul> <li>Raw data in files and notebooks.</li> <li>Field Maps in non-digital format.</li> <li>Interpretive Geological maps in non-digital format; often includes reports.</li> <li>Derivative Maps in non-digital format; may include reports.</li> <li>90% of B.C. mapped at 1:250,000; 9% mapped at 1:50,000; very limited coverage at large scales.</li> </ul>	B.C. Geological Survey. Geological Survey of Canada.	<ul> <li>B.C. Geological Survey.</li> <li>Geological Survey of Canada.</li> <li>Mineral Exploration Industry.</li> <li>U.B.C.</li> <li>U.Vic.</li> <li>MDRU</li> <li>MoTH</li> <li>B.C. Hydro</li> </ul>	<ul> <li>G.S.C. Guide to Authors.</li> <li>B.C.G.S. uses standard field forms.</li> <li>Style Guide to be published by B.C.G.S.</li> <li>Standards for Assessment Reports (Mineral Tenure Act)</li> </ul>	Current Expenditures: Current costs are approximately \$2 to \$3/ha for 1:50,000 mapping.
2. Surficial Geology	<ul> <li>Raw data in files, notebooks and on aerial photography.</li> <li>Landform Maps combined with Soil Maps.</li> <li>Surficial Geology and Terrain Maps in non-digital form; often includes reports.</li> <li>Derivative and Interpretive Maps in non-digital form; may include reports.</li> <li>Approximately 70% of B.C. mapped at various scales; however, this is mostly part of the earlier soils/landform mapping program and the data is not necessarily compatible with the current Terrain Classification System.</li> </ul>	B.C. Geological Survey Maps-B.C. Geological Survey of Canada. Ministry of Environment, Lands and parks - Integrated Management Branch (limited).	<ul> <li>B.C. Geological Survey</li> <li>Geological Survey of Canada</li> <li>Canada and B.C. Land Inventory Program; Ministry of Environment, Lands and Parks</li> <li>Ministry of Forests</li> <li>Ministry of Transportation and Highways</li> <li>Forest and Mining Industry</li> <li>B.C. Hydro</li> <li>Consultants</li> </ul>	Terrain Classification System.     G.S.C. Guide to Authors.     Standard field data collection forms.	Current costs are approximately \$3 to \$7/ha for 1:20,000 mapping and \$0.5 to \$2/ha for 1:50,000 mapping.

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		Table 1. Current Stat	1. Current Status of Inventories		
Current Status Inventory Type	Information Available	Where Information Can Be Obtained	Past and Present Producers of Information	Standards and Procedures Employed in Data Collection	Estimated Expenditure or Survey Cost
3. Soils 4. Archaeology	<ul> <li>Raw data in files, notebooks and on aerial photography.</li> <li>Morphological data on field forms and in computer files.</li> <li>Laboratory data on hard-copy and computer files.</li> <li>Soils and Soil/Landform maps in digital and non-digital form; often includes reports.</li> <li>Derivative and Interpretive maps usually in non-digital form; form; may include reports.</li> <li>Approximately 50% of B.C. mapped at various scales; very small scale coverage of whole province.</li> <li>17,000 records on file in B.C. Archaeological Site Inventory</li> </ul>	Agriculture Canada,     B.C. Land Resource Unit.     Maps-B.C.     Ministry of     Environment, Lands and Parks; Integrated Management Branch (limited).      Archaeology Branch, Ministry of Tourism	<ul> <li>B.C. Soil Survey.</li> <li>Canada/B.C. Land Inventory Program; Ministry of Environment, Lands and Parks.</li> <li>Ministry of Forests.</li> <li>Ministry of Agriculture, Fisheries and Food.</li> <li>B.C. Hydro.</li> <li>Forest and Mining Industry.</li> <li>Consultants.</li> <li>(No current provincial soil inventory program)</li> <li>Archaeology Branch, Ministry of Tourism and Min</li></ul>	National and International soil description and classification methods and procedures.     Canadian System of Soil Classification.     Describing Ecosystems in the Field.     Standard field data collection forms.     Standard data entry and verification procedures for computer files.     Four main publications outline	• Costs are conservatively estimated at approximately \$4 to \$8/ha for 1:20,000 mapping and \$1 to \$3/ha for 1:50,000 mapping.  (field costs only)
	<ul> <li>database.</li> <li>Less than 10% of B.C. has been surveyed for archaeological potential.</li> <li>Current inventory is estimated to contain 15% to 25% of the total sites in the province.</li> <li>Some additional information available from Royal B.C. Museum, and Parks Canada.</li> <li>Approximately 1000 survey and excavation reports in library.</li> </ul>	and Ministry Responsible for Culture  Royal B.C. Museum  Parks Canada  Canadian Heritage Information Network (federal); available through Archaeology Branch.	Ministry Responsible for Culture.  Royal B.C. Museum  Parks Canada  B.C. Hydro  Consultants  Private collections  Academic community	standards and procedures. All are published by the Archaeology Branch.  1. Resource Management Handbook 2. Impact Assessment Guidelines 3. Site Inventory Form Guide 4. Site Inventory Form	by their cirents, and the academic community but working under permit to the Archaeology Branch; actual costs are unknown.

### SOILS

- Approximately 50% of the province is mapped at various scales; these scales range from 1:25,000 and larger in highly selected areas (e.g. lower Fraser Valley, Okanagan, east coast of Vancouver Island) with the remainder at 1:50,000 to 1:125,000; 1:1,000,000 (overview) maps currently in preparation for the entire province. Most maps are accompanied by reports.
- Approximately one-half of the maps are available in published (colour) format; remainder are in unpublished manuscript form (paper prints); a few are on air photo mosaic bases.
- Some maps are digitized in various formats either as line work only or as full digital files linked to attribute lists; field and laboratory data mostly stored on computer files but not readily accessible although some is available in hard copy.

### **ARCHAEOLOGY**

- B.C. Archaeological Site Inventory database available in hard copy and digital format. Site maps and 1:50,000 location maps available in hard copy only.
- Less than 10% of the province surveyed for archaeological potential.
- Bibliographic listing of all files, surveys and reports available in electronic format and hard copy (publications).

### 2.3 Past and Present Producers of Information

### BEDROCK GEOLOGY

- Current data gathered, mapped and stored mainly by the Geological Survey of Canada at 1:250,000 and the B.C. Geological Survey Branch at 1:50,000.
- Other originators of data that are publicly available (through EMPR) are the mineral exploration industry, universities, federal and provincial research institutions, crown corporations and the Ministry of Transportation and Highways.
- All mapped data can be obtained from either the B.C. Geological Survey Branch (EMPR) or the Geological Survey of Canada.

### **SURFICIAL GEOLOGY**

 The majority of historical surficial geological mapping was produced by the federal/provincial soil survey program as part of the Canada/B.C. Land Inventory Program (CLI/BCLI) and the surficial geology program of the previous Resource Analysis Branch (Ministry of Environment).

- The Geological Survey of Canada has also produced surficial geology maps generally at 1:250,000 scale for about one-half of the Province.
- The Geological Survey Branch of the Ministry of Energy, Mines and Petroleum Resources is now the principal provincial agency coordinating surficial geology inventory.
- Some of the published mapped data can be obtained from the Geological Survey Branch (EMPR) or the Geological Survey of Canada; in addition, maps can presently be obtained from Maps-BC and Crown Publications.

### **SOILS**

- Data gathered, mapped and stored mainly by the Ministry of Environment, Lands and Parks, Integrated Management Branch and the Land Resource Unit of Agriculture Canada. A substantial number of older data and maps were generated by the B.C. Ministry of Agriculture.
- Most mapped data available from Maps-B.C. (Ministry of Crown Lands).
- B.C. Soil Information System (BCSIS) is a computer file that contains extensive soils information (currently archived).
- Those maps and associated data bases that are in digital form (CAPAMP), are not easily accessible.

### **ARCHAEOLOGY**

- Most information gathered by consultants and academics working under permit to the Archaeology Branch.
- All information available from the Archaeology Branch.

### 2.4 Standards and Procedures Employed

### **BEDROCK GEOLOGY**

- All data collected, mapped and interpreted conforms to standards established provincially and federally as well as those legislated for industry.
- Since 1985 all data collected in digital format by Geological Survey Branch (1:50,000).
- All mappers and interpreters are trained professional geologists or are under the direction of a professional who is a member of the B.C. Association of Professional Engineers and Geoscientists.

- Since 1985 data is considered by independent review to be of above average quality.
- Provincial mapping standards are currently being updated.
- Provincial bedrock maps are verified by managers in the Geological Survey Branch and by peer review.

### SURFICIAL GEOLOGY

- All mappers and interpreters are trained professionals or are under the direction of a professional.
- Data produced using the Terrain Classification System is of above average quality, soils/landform maps lack Quaternary information.
- All mapping has conformed to provincial, national, and in some cases, international standards and procedures.
- Standards and procedures are published and are currently being updated.

### **SOILS**

- All mapping has conformed to provincial and national (and in some cases, international) standards and procedures applicable at the time.
- Standards and procedures are published (e.g. Canadian System of Soil Classification).
- Standard field data collection procedures are contained in "Describing Ecosystems in the Field".
- All current maps and data are verified by survey chief prior to issue and by provincial correlator.
- Mapping and interpretations undertaken by consultants are usually of good quality and often verified by provincial correlator.
- All mappers and interpreters are trained professionals, or are under the direction of a professional.
- Existing data is generally of above average quality and well correlated throughout the province.

### **ARCHAEOLOGY**

- Standards and procedures that must be followed as part of the permit requirements are published by the Archaeology Branch.
- Standard field data collection forms are used.
- All work is undertaken by trained professionals or under the direction of a trained professional.
- Majority of information in existing data base is of high quality.

### 2.5 <u>Cost of Inventory</u>

The following information on inventory costs is considered to be an estimate only due to the fact that the inventories have been undertaken over many years and costs are highly variable depending on the location and nature of the inventory.

### BEDROCK GEOLOGY

- Current expenditure for 1:50,000 scale inventory is approximately \$2 to \$3/ha.
- The estimated replacement value of existing 1:50,000 scale bedrock inventory is calculated as:

The cost to replace existing 1:250,000 inventory is uncertain but very high; 95% of the province is covered, but a significant portion of the coverage is obsolete.

### **SURFICIAL GEOLOGY**

• Costs for 1:50,000 inventory are conservatively approximated at \$0.5 to \$2/ha and for 1:20,000 inventory at \$3 to \$7/ha.

• The estimated replacement value of existing 1:50,000 surficial geology maps is calculated as:

Area of province	90	million ha
Area covered 70% of province =	= 63	million ha
Average cost		\$1/ha
Replacement value		\$63M

### **SOILS**

- Costs for 1:50,000 inventory are approximated at \$1 to \$3/ha and for 1:20,000 inventory at \$4 to \$8/ha.
- The estimated replacement value of existing 1:50,000 scale soil maps and data bases is calculated as:

Area of province.	•											90	0	m	illi	on	ha
Area covered		5	09	6	of	pr	ov	in	CE	•	=	4.	5	m	illi	on	ha
Average cost																\$3,	/ha
Replacement value															\$	135	5M

### **ARCHAEOLOGY**

- No costs are available since the majority of the inventory is undertaken by consultants working under permit to the Archaeology Branch; costs are usually born by a project proponent.
- The cost to complete the 1:50,000 inventory of the province is estimated at \$15M.

### 3.0 CURRENT USERS OF GEOLOGY, SOILS AND ARCHAEOLOGICAL INVENTORY INFORMATION

Earth science data and information are essential elements in providing and maintaining (sustainability) basic human needs and economic development opportunities. The other two basic elements are water and climate. Such data are the basic underpinning and framework for all resource planning and management. They strongly influence the quality of other resource inventories and their use. Archaeological data and information contain the only source of evidence for human activity in the province from 10,000 years ago to the last 200. The resource is highly complex, often hidden (buried) and easily destroyed. Archaeological data is valued by both aboriginal and non-aboriginal society as windows on the past. The resource is protected by the Heritage Conservation Act and forms the basis of the provincial governments fiduciary obligations towards the native community. Archaeological site distribution is essential to aboriginal land claims cases. There is increasing pressure from native and non-native groups to improve the management of the resource, which will depend on improving the archaeological inventory.

As a result of this, the four inventory types, with perhaps a greater influence by the geology and soil components, are utilized by a diverse client base for purposes such as land allocation, land management, impact assessment, environmental protection and management, economic development and disaster preparedness.

Figure 6 approximates the degree of use made by various user groups of each of the four inventory types. These user groups were identified in the reports prepared by the individual Task Groups and include not only user groups but also, in some cases, generators of specific inventory data. It is important to note that some of these user groups may use only specific parts of an overall inventory data-set and often need only derivative or interpretive information.

Current trends indicate that much more extensive use of these data-sets will occur in the future, depending in large measure on how the data is presented. An estimate of future use is also presented in Figure 6.

# BEDROCK GEOLOGY

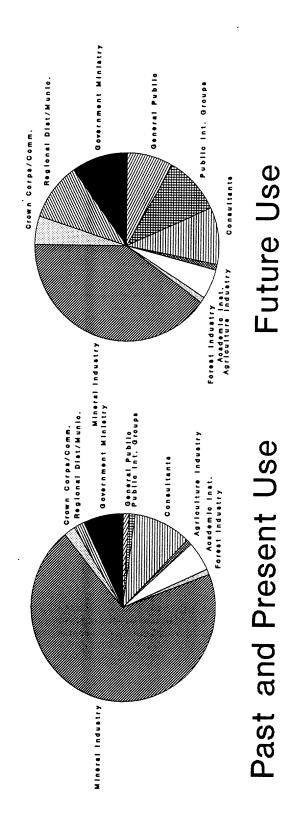
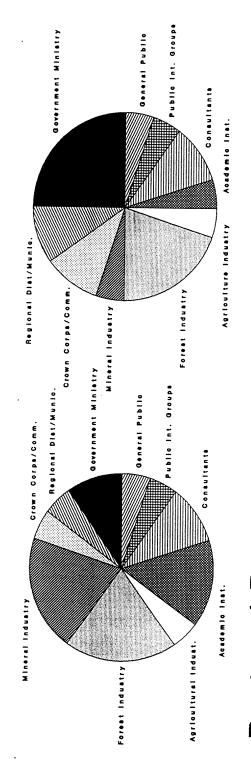


Figure 6. Past and Present Use and Future Use of Inventory Information

# SURFICIAL GEOLOGY

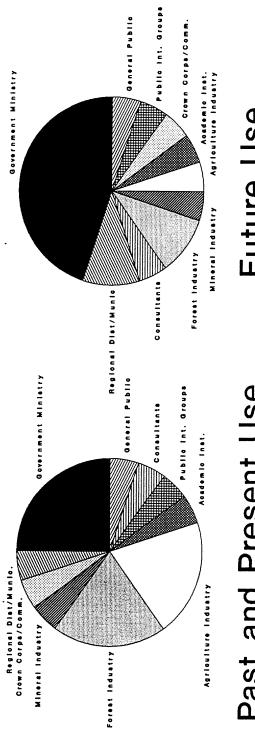


Past and Present Use

Future Use

Past and Present Use and Future use of Inventory Information (cont'd) Figure 6.

### SOILS

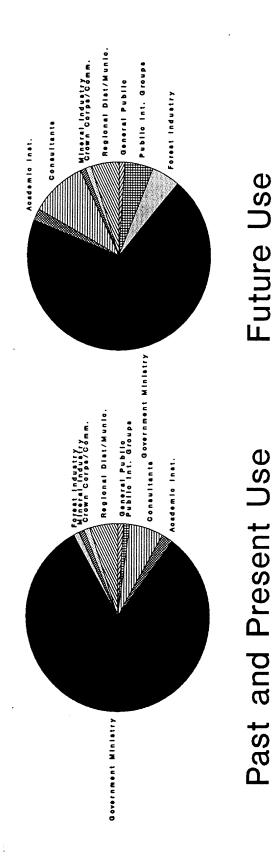


Past and Present Use

Future Use

Past and Present Use and Future use of Inventory Information (cont'd) Figure 6.

## ARCHAEOLOGY



Past and Present Use and Future use of Inventory Information (cont'd) Figure 6.

### 4.0 RECOMMENDATIONS REGARDING INFORMATION REQUIREMENTS FOR EFFECTIVE LAND MANAGEMENT

The four Task Group reports prepared a series of recommendations regarding the status of their particular inventory, its ability to meet the needs of land management decision making, and changes or modifications that are necessary, and vital, to meet these needs.

While a wide array of recommendations pertinent to a particular inventory type are outlined in the individual Task Group reports, there are a number of common themes among the four groups.

The recommendations pertaining to information that is vital for effective land management are presented as follows (no order of priority implied):

### **RECOMMENDATION 1**

Geology and soils data and information is the underpinning and framework for all resource planning and management. Archaeological data and information is essential for management and protection of this non-renewable resource. Any diminishment in these programs will have a direct and immediate impact on the quality of decision making. At present, due to past funding cutbacks and reassignment of personnel, these inventory programs are incapable of meeting current needs and demands. For example, the province does not currently have the capability of undertaking a soil survey program. These programs must be reinstated or enhanced in order to meet current and future demands.

### **RECOMMENDATION 2**

Each inventory program must have a central agency or authority responsible for the establishment and maintenance of standard procedures, methods, reliability and quality control of products that, at the very least, meet a minimum level of professional quality.

The inventory programs should be managed by a multi-agency coordinating committee with strong commitments to multi-resource inventory and integration.

If standards have been achieved and agreed upon, while it is preferred it is considered not necessary to centralize geology and soils inventory capability within one agency of government so long as strong coordination and correlation with the responsible agency is maintained. However, due to the sensitive nature of archaeological sites, it is necessary to maintain a central repository with controlled access to information.

### **RECOMMENDATION 3**

Geology, soils and archaeological inventory data although basic requirements, are only some of the elements needed for effective land management decision making. These data sets must be integrated with other natural and cultural resource data bases (e.g. climate, vegetation, water, wildlife, etc.) in order to provide the means of achieving sustainable development. Provincial data bases with cross-agency applications should be in easily transportable form to aid data sharing and encourage wider use of the data (see recommendations in chapter 5).

### **RECOMMENDATION 4**

Given that the needs of land management decision-making cannot always be determined in advance, and that inventories of the type discussed here require substantial lead time to complete, it is necessary to maintain an on-going inventory program aimed at regional (1:250,000 scale) and sub-regional (1:50,000 scale) levels. These inventory programs would mainly provide information for use in policy and regional and sub-regional level planning.

### **RECOMMENDATION 5**

The capability for larger scale inventory programs (e.g. 1:20,000 and larger) should be available and undertaken where required for detailed land management decision making. These local level or operational scale inventories should be undertaken, where landscape conditions, population pressures or conflicting land uses dictate their needs. Due to the discrete nature of archaeological resource distribution, it is more efficient to undertake inventories with 100% ground coverage in areas of moderate to high potential than produce large scale archaeological sensitivity maps based on predictive modelling.

### **RECOMMENDATION 6**

The standardization of procedures, methods and products is required for interpretive and derivative maps produced from the basic geological and soils inventory products. User groups are, in most cases, unable to use basic inventory maps and data. They require interpretive and derivative maps that answer their specific questions with an assured level of reliability and quality control. The agency responsible for a particular inventory type should be supported to develop these products.

### **RECOMMENDATION 7**

There is a very serious shortfall in terms of suitably qualified and experienced personnel to undertake inventory programs. Government agencies, colleges and universities should be encouraged to embark on training programs to ensure the necessary supply of trained personnel.

### 5.0 RECOMMENDATIONS FOR DATA ACQUISITION, SYSTEM DESIGN AND DISTRIBUTION

Each of the four Task Groups outlined a series of recommendations regarding methods of data collection, data storage and manipulation, and ways to promote the co-operative use of the information. In addition, recommendations were discussed in regard to providing inventory data and map products that user groups are able to apply to their needs.

These recommendations are as follows:

### **RECOMMENDATION 1**

The demands of user groups require that all map (polygon) and attribute data as well as laboratory data be stored and made available in a government-wide compatible GIS framework; all line work and data should be capable of being downloaded onto a PC-compatible computer. Hard copies of maps and reports should be made available to all user groups.

### **RECOMMENDATION 2**

Some computer data files (e.g. soils and surficial geology) are in an archived state. This information should be retrieved and made available. In addition, the capability should exist to incorporate new data.

### **RECOMMENDATION 3**

Several agencies are collecting data of a similar nature (e.g. the Ministry of Transportation and Highways collects bedrock and surficial geological data and the Ministry of Forests collects soils information).

All such information should be collected and stored within standardized format to ensure greater use of the information and avoid duplication. Quality control of the data must be ensured by the agency responsible as coordinated through a multi-ministry communications committee.

### **RECOMMENDATION 4**

All agencies responsible for a particular inventory initiative should be required to annually publish an index of map and data coverage. In addition, these same agencies should be required to annually publish, in advance, their field and mapping programs for the coming year. Each of these products should be made available to all concerned agencies, industry, educational institutions and consultants.

### **RECOMMENDATION 5**

The distribution of provincial maps and data is currently unacceptable. It is recommended that the supply of currently available mapped information and reports, including digital information must be made timely and easily accessible.

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