AVALANCHE NEWS NO. 29

FEBRUARY 1989

EDITORIAL NOTE

The intention of AVALANCHE NEWS is to assist communication between persons and organizations engaged in snow avalanche work in Canada. Short articles cover reports of accidents, upcoming and past events, new techniques and equipment, publications, personal news, activities of organizations concerned with avalanche safety, education and research.

The editor welcomes and expects contributions; all reasonable comments and discussions will be printed. The articles in AVALANCHE NEWS reflect the views of the authors, and only when it is specifically stated do they represent the opinion of the Canadian Avalanche Association.

No paid advertisements are carried. Suppliers who wish to draw attention to their products should send information to the editor who will publish a note when the equipment has value in avalanche work and safety.

AVALANCHE NEWS is issued three times per year, usually in February, June and October. There is no subscription fee. Requests for copies and notifications of changes of address should be sent to the publisher.

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AVALANCHE NEWS
Canadian Avalanche Association, 3650 Wesbrook Mall, Vancouver B.C., V6S 2L2

GUIDELINES FOR WEATHER, SNOWPACK AND AVALANCHE OBSERVATIONS

by Committee on Observation Guidelines
Canadian Avalanche Association

On May 5th, 1988, the members of the Canadian Avalanche Association re-elected the Committee on Observation Guidelines and assigned it the task of re-editing the Guidelines for Weather, Snowpack and Avalanche Observations (Technical Memorandum No. 132, National Research Council Canada).

The members of the Canadian Avalanche Association voted that the Guidelines should be a reference text that describes observations and techniques of measurement, rather than a code of practice.

The Committee members (Walter Schleiss, Herbert Bleuer, Janice Johnson, Roger McCarthy, and Peter Schaerer) have drafted a revised edition of the Guidelines with this objective in mind. The revisions do not include changes to the type of observations; measuring techniques; classification of weather elements, snow, and avalanches; and recording format. The Committee, however, clarified numerous definitions and descriptions and made editorial improvements.

The significant changes proposed by the Committee (headings and pages refer to the 1986 edition of the Guidelines) are presented below. The Committee members have the complete amended text available for inspection. Copies may be requested from Peter Schaerer.

The Committee recommends that users consider the proposed changes and submit their objections and comments to one of the Committee members by April 26, 1989. The Committee intends to settle controversial issues prior to the Annual General Meeting of the Canadian Avalanche Association; it is hoped that the revised Guidelines will be available in print for the winter of 1989-1990.

Foreword (Page i)

The whole page was deleted.

Abstract (Page ii)

On the second line the word "recommended" was deleted.

Introduction (Pages iv and v)

The first paragraph was amended as follows:

"The objectives of this publication are to describe the terminology and techniques for taking and recording observations of the weather, snowpack, and avalanches. The guidelines describe the important (but not all) observations that are applied for evaluating snow stabilities

and avalanche hazards. Other observations include ski testing, results of the application of explosives, previous slope use, local effects of wind, incoming and outgoing radiation, probing by probe and ski pole, settlement of the snowpack, loading tests, shear tests, and acoustic emissions. Many of these other observations have no formal data collection procedure and are carried out as required."

Editorial changes only were made to the other paragraphs of the Introduction.

Chapter: Snow and Weather Observations (Page 1)

The text was amended as follows:

1. Objectives

"The snow and weather observations are a series of meteorological and snowpack measurements made at a properly instrumented study plot (see Chapter "Observation Sites"). Taken at regular intervals, the data provide the basis for recognizing changes in the stability of the snow cover and for reporting the state of the weather to the weather office. On a long-term basis, the observations are used to improve the ability to forecast the avalanche hazard and to increase knowledge of the climate of the area. The observations should be taken regularly, be complete, accurate, and recorded in an uniform manner."

2. Types of Observations

"Observations taken at regular daily times are referred to as standard observations. Preferably they should be carried out twice daily at 0700 and 1600 hours, but the type of operation and availability of observers might require different frequencies and times.

Observations between the standard times are referred to as interval observations. They are taken when the snow stability is changing rapidly, for example, during a heavy snowfall. Interval observations may contain a few selected observations only or a whole set of standard observations."

3. Equipment

"A weather study plot usually contains the following equipment:

- Screen for housing thermometers (height adjustable)
- Maximum thermometer
- Minimum thermometer
- Two snow boards (about 400 mm x 400 mm), designated as New Snow Board and as Storm Board
- Snow stake = snow depth marker (graduated in cm) with levelling stick

- Ruler (graduated in cm)
- Snow sampling tube and weigh scale (graduated in g), or precipitation gauge
- Knife or plate for cutting snow samples
- Field book of water-resistant paper

The following additional equipment is useful:

- Hygro-thermograph with screen
- Recording precipitation gauge or rain gauge
- 1 to 3 additional snow boards
- First section of a ram penetrometer
- Barograph (in the office) or barometer-altimeter
- Anemometer at a separate wind station with radio or cable link to a recording instrument
- Box as shelter for the equipment
- Small broom
- Snow shovel"

4. Procedure

Editorial changes only were made to Sections 4.1 - 4.6

4.7 Depth of Snowfall

"The depth of snowfall is observed on boards which have been placed on the snow surface. The snowfall should be measured on a new snow board and a storm board. Additional boards - for example, interval, 24-hour, or shoot - may be used as required by the operation.

Measure with a ruler, at several spots, the depth of snow on the boards. Average the measurements and record to the nearest centimetre. Record "T" (Trace) when the depth is less than 0.5 cm. Treat surface hoar on the boards as snowfall.

After sampling for the weight of new snow (when required), remove the snow from the appropriate boards and re-position them on the surface.

Definition of Boards

a) Interval

The accumulation of snow on the board refers to periods shorter than the time between standard observations. The board is cleared at the end of every set of observations.

b) New Snow (HN)

New snow is the depth of snow that has been deposited since the last standard observation. The board is cleared at the end of each standard observation.

c) 24-hour

The board holds the snow that has been deposited over a 24-hour period. It is cleared at the end of the morning standard observation.

d) Storm

Storm snowfall is the depth of snow that has been deposited since the beginning of a storm. The storm board is cleared at the end of a standard observation prior to the next storm and after useful settlement observations have been obtained. The symbol "CL" is added to the recorded data when the storm board is cleared.

e) Shoot

The board holds the snow that has accumulated since the last time avalanches were controlled by explosives."

Editorial changes only were made to Sections 4.8 - 4.11

4.12 Rain (Page 6)

"Measure the amount of rain that has accumulated in the rain gauge in tenths of millimetres.

Comment: The rain gauge should be placed on the ground or on the snow surface when rainfall is likely to occur."

Editorial changes only to Sections 4.13 - 4.17

Chapter: Snow Profile (Page 11)

Significant changes are as follows:

"2. Location

(a) Study Plot

Regular snow profile observations are carried out at study plots (see Chapter "Observation Sites") by excavating snow pits progressively in a line marked with 2 poles. Each observation pit should be a distance about equal to the snow depth, but at least 1 m from the last one. After each observation the location of the extreme edge of the pit is marked with a pole.

The snow profile observation line should be selected and marked before the winter and the ground between the marker poles cleared of brush and large rocks.

3. Frequency of Observations

No firm rules can be set on how frequently snow profiles should be observed. The frequency is dependent on the climate, the terrain, and the type of avalanche control. Profiles should be observed at regular intervals and, in addition, whenever changes of the snow conditions are suspected.

4. Equipment

The following equipment is used for snow profile observation:"

(No changes to listed equipment)

Editorial changes were proposed for the remainder of the Chapter "Snow Profile". Guidelines were added for plotting the hand hardness as a bar diagram.

Chapter: Test Snow Profile (Page 22)

A new section was added after Section 2:

3. Frequency of Observations

"No firm rule can be set about the frequency of test snow profile observations. The number of profiles should be adequate to supplement other observations relating to snow stability."

Chapter: Observation Sites (Page 34)

The recommendations were downgraded into guidelines by replacing "must" by "should" wherever it occurred.

Chapter: Observation of Avalanches (Page 36)

The text was re-written as follows:

1. Objectives

"Observations and records of avalanche occurrences have the following applications:

a) Information about avalanche occurrences and non-occurrences in association with other observations assists in evaluating the snow stability.

b) The observations identify areas where avalanches have released earlier in the winter, therefore where the snow stability may differ from that on undisturbed slopes.

c) The data are essential when protective works and facilities are planned, when the effectiveness of control measures is assessed, and when forecasting models are developed by correlating past weather and snow conditions with avalanche occurrences.

All avalanches that are significant to the operation should be recorded. Noting the non-occurrence of avalanches may also be important for snow stability evaluation.

2. Identification of Avalanche Paths

Avalanche paths should be identified by a key name, number, aspect, or a similar identifier which should be referred to on lists, maps, or photographs. At roads, railway lines, and power lines, it is convenient to refer avalanche paths to the running kilometre. The names of paths may have any length, but for data storage it is recommended that they be abbreviated to not more than 10 characters.

Sub-zones of avalanche starting zones that can produce avalanches independently and often are separate targets for explosive control may also be identified.

3. Basic Observations

All operations should make a set of basic observations which are best recorded on the left-hand page of the field book (see sample page) or on photographs. The right-hand page may be used for comments and additional observations."

List of observations unchanged:

Date; Time; Path; Size; Moisture Content; Terminus; Comments.

"4. Additional Observations

4.1 Selection

Additional observations may be selected as applicable from those listed in this section. Certain additional observations are valuable in areas where avalanches either are controlled or affect traffic and communication lines.

For operations that control avalanches by explosives:

Type of trigger;
Number of explosive charges;
Size of charges;
Location of avalanche start;
Type of snow failure;
Sliding surface;

Number, size, and location of charges applied when no avalanche resulted or charges misfired.

For operations of highways, railways, mine and forestry roads:

Length of road buried and depth of snow on the road;
Distance of the toe of the avalanche.

For ski areas:

Type of trigger;
Location of avalanche start;
Type of snow failure;
Sliding surface;
Width and thickness of slab avalanches at their crown."

List of observations and coding unchanged:

Trigger; Number of Explosive Charges; Size of Explosive Charges; Location of Avalanche Start; Type of Snow Failure; Sliding Surface; Slab Width; Slab Thickness; Deposit on Road; Distance Toe; Total Deposit.

INTERNATIONAL COMMISSION FOR ALPINE RESCUE

Report on the business of the Avalanche Subcommission at the 1988 Meeting of the Delegates, October 20-23, 1988 at Gunten, Switzerland

by Peter Fuhrmann
Canadian Parks Service, Banff

The following notes are not official minutes of the meeting.

The meeting was chaired by Francois Valla; all statistics had been compiled and accidents which were of special interest were discussed in detail and conclusions were drawn. Data were available from each member country except Spain. The enclosed list contains the number of fatalities in each country.

There are presently 1,100 trained rescue dogs within all member IKAR countries.

Fifteen accidents were discussed in detail and documented with slides and maps. An example is the accident at Mont Blanc involving a group of 40 persons. The entire group was caught in a slide. Thirty-nine persons were roped together and the other one was single who had joined the party. Even though many of the 39 persons were completely buried, they were found quickly

because many of the 39 persons were completely buried, they were found quickly because they were all roped together. The single person who had not been roped to the party did not survive.

The commission recommended that some kind of "quality stamp" should be standard for all safety equipment, including rescue and general equipment. It was not clear if this should be done through the normal approval system of the UIAA, DIN norm system, or just what route should be followed. It was recommended that whatever is done should be done in cooperation with the UIAA. A work group was established to meet in December 1988 to develop a program.

Work on the Glossary, to be published in six languages, continues. It is now in final form and 1,500 words have been included. Presently, there is a need for printing and computer selection. The Vanni Eigenmann Foundation has donated 10,000 SFr to accomplish this work. It is expected that the printed Glossary will be presented at the next IKAR meeting in 1989.

The Avalanche Symposium normally held in Davos cannot be organized by the Swiss Institute for Snow and Avalanche Research in 1991. The Institute will assist in various capacities but the organization has to be undertaken by someone else. At present the IKAR is seeking an organizing committee.

The problem that exists between helicopter use in avalanche accidents and the operational requirements of dogmaster was discussed in detail.

Transceivers, as well as other detection devices, were scrutinized, and a norm with a higher performance level is being sought . There is a need for specialists to judge the progress of this subject, and IKAR representation will simply be on a federal level.

The necessity of further and better communications with those travelling in avalanche terrain was expressed. There are still a large number of skiers who go beyond the boundaries of fenced areas. While some carry transceivers, others do not. RECCO is not a piece of equipment for self-party rescue as it can only be utilized by an organized rescue team. It was noted again that some users carry their transceivers in their packs in the OFF position, thus negating their effectiveness. Main emphasis was placed on educating travellers and on avoidance of avalanche accidents. For the organized rescue party, the dog is still the best means of finding an unmarked avalanche victim quickly and efficiently.

The development of the Hohenester Balloon has come to a standstill. A pillow was developed in Munich from the round balloon, but the unit is too heavy, complex, and impractical at present. No future development is foreseen, unless a breakthrough occurs so that a much lighter and less complex unit can be produced.

IKAR - CISA AVALANCHE SUBCOMMISSION
Number of Avalanche Fatalities
1987 - 1988

Country	Ski tourers	Mountain climbers without skis	Skiers outside controlled areas	Skiers within controlled areas	Persons caught in buildings	Others	Total number of fatalities	Number of avalanche dogs	Total number of accidents with /without fatalities
Switzerland	13	2	6	1	1	1	24	312	14
France	12	2	7	3	-	-	24	155	35
Austria	18	1	9	1	6	2	37	246	58
Italy	24	6	6	2	-		38	101	501
Germany	-	-	-	-	-	-	0	47	16
Yugoslavia	-	-	-	-	-	-	0	34	3
Liechtenstein	-	-	-	-	-	-	0	2	0
Poland	-	5	-	-	-	-	5	14	10
USSR	4	-	-	-	-	-	4	17	4
Spain									
Norway	2	-	1	-	-	1	4	90	-
Bulgaria	-	1	-	-	-	-	1	31	3
Canada	4	-	1	-	-	2	7	38	34
USA	6	-	-	-	-	-	6	40	-
UK	-	-	-	-	-	-	0	40	-
Total	83	17	30	7	7	6	150	1167	678
Percent	55	11	20	5	5	4	100		

CANADIAN AVALANCHE RESCUE DOG ASSOCIATION (C.A.R.D.A.)

by Rod Pendlebury, President

Over the past year, membership in C.A.R.D.A. has grown substantially to include Parks Canada and R.C.M.P. dogmasters and several new members from the avalanche community at ski areas and heli-ski operations. Winter training courses were held at Island Lake Lodge near Fernie, B.C. and were well attended and very successfull. The AVD 1 course (Avalanche Dog Level 1), December 3 - 10, 1988, instructed by Dale Portman, Canadian Parks Service, Jasper, and Rod Pendlebury, C.A.R.D.A., Fernie, B.C., produced four new AVD 1 dog teams. Local CPR instructors and a veterinarian assisted during the course.

A combined AVD 2 and AVD 3 course was conducted January 7 - 14, 1989, under the instruction of Cpl. Gordon Burns, R.C.M.P., Cranbrook; Norbert Hengge, Bergwacht, West Germany; and Hans Fuhrer, Canadian Parks Service, Kootenay National Park, with assistance from CPR and Hypothermia expert Bruce Brink, Canadian Coast Guard, Vancouver. Two of the dog and handler teams have achieved Provincial Emergency Program certification and AVD 3 status and four teams successfully completed the AVD 2 level tests.

CARDA is a non-profit, charitable organization working to develop a network of avalanche search and rescue dog teams in Canada. Donations are tax deductible, and interested persons can support CARDA's efforts and receive their quarterly newsletter by joining as associate members ($20 per year). See addresses in the list of Avalanche Resource Agencies.

PUBLICATIONS

P. Schaerer

The Yield of Avalanche Snow at Rogers Pass, British Columbia, Canada.

Journal of Glaciology, Vol. 34, No. 117, 1988, pp. 188-193. Reprinting by National Research Council Canada, paper NRCC 29319.

The annual mass of snow moved by avalanches was observed at 45 avalanche paths over a period of 19 years by measuring the volume and density of each individual avalanche. For the data set, the percentage of snow removed annually by avalanches (the yield ratio) had a mean value of 11.2% and a 30-year maximum of 30.9%. The yield ratio varied strongly among avalanche paths and yearly and the variations could not be explained satisfactorily. Paths controlled by artillery proved to give slightly more avalanche snow (average yield ratio 11.8%) than uncontrolled paths (10.9%).

High yield values are usually associated with large avalanches triggered by major weather events in the late part of the winter.

FILMS

AVALANCHE AWARENESS
A Question of Balance

Submitted by Alliance Communications, Inc.

Just out from Alliance Communications, Avalanche Awareness: A Question of Balance, a half-hour film for mountaineers, skiers, snowshoers, and snowmobilers covering the fundamentals of avalanche safety.

Written by internationally-known avalanche experts and shot by an award-winning cinematographer, this program brings together state-of-the-art avalanche safety knowledge in a clear, straight-forward way.

The film uses spectacular live footage, interviews, and computer animations to explain the three basic factors that affect snow stability - weather, terrain and snowpack. It teaches methods for recognizing, evaluating, and avoiding avalanche hazards and techniques for safe winter travel, route finding and rescue.

Avalanche Awareness was written by Betsy Armstrong and Knox Williams, co-authors of The Avalanche Book and Snowy Torrents: Avalanche Accidents in the United States, 1972-1979; Chuck Tolton, Avalanche Advisor to the National Ski Patrol Professional Division; and Dr. Richard Armstrong, a prominent snow scientist from the National Snow and Ice Data Center at the University of Colorado.

Avalanche Awareness: A Question of Balance was sponsored by the American Association of Avalanche Professionals and the Colorado Mountain Club Foundation, produced in cooperation with the National Ski Areas Association. It is endorsed by the U.S. Forest Service.

Cost: VHS .... $30US 16mm $400US

FOR MORE INFORMATION CONTACT:

Alliance Communications, Inc.
3250 Sacramento Street
San Francisco, CA 94115
(Phone) 415-921-4920 (Fax) 415-921-8963

Review copies and publicity photos available on request.

AVALANCHE INVOLVEMENT REPORTS

by Peter Schaerer
National Research Council of Canada

The Avalanche Research Centre of the National Research Council continues to collect information about all encounters of persons, equipment, and structures with avalanches in Canada. The objective is to obtain statistics about the extent and type of avalanche problems in Canada. Summaries of the data will draw attention to avalanche dangers and assist in the development of safety measures. Although fatal accidents receive most attention and make the media, it is equally important to know the number of close calls and the circumstances of lucky escapes. Summaries of avalanche involvements are published annually in the June issue of Avalanche News. A summary of the involvements 1969 - 1987 was printed in the Canadian Alpine Journal, Vol. 71, 1988.

The collection of information on avalanche involvements requires the cooperation of everyone in the avalanche business and those travelling in terrain subject to avalanches. We wish to request that anybody who has been involved with an avalanche, or has witnessed or heard about an avalanche encounter, transmit the information in writing or by word of mouth to the Avalanche Research Centre of the National Research Council of Canada. A short form has been designed for this purpose and is attached to this issue of Avalanche News. The form, together with explanations on how to fill it out, was also printed in the Guidelines for Weather, Snowpack, and Avalanche Observations. For reporting an involvement, detach the form or copy it. You may request additional copies from me, simply write down the information on a piece of paper and submit it, telephone, or mention it during a conversation. The message is important, but not the format.

No names need to be mentioned, not even the location needs to be specific. All the information is kept confidential and will be released in summary form only.

For reporting an avalanche, the following are addresses of the National Research Council:

P.O. Box 2759
Revelstoke, BC
V0E 2S0

Telephone: (604) 837-2435 (Paul Anhorn)

3650 Wesbrook Mall
Vancouver, BC
V6S 2L2

Telephone: (604) 666-6741 (Peter Schaerer)
(604) 666-8046 (Dave McClung)

EMPLOYMENT OPPORTUNITY

North Coast Road Maintenance Ltd., would like to hear from avalanche people interested in working in the Terrace area.

We are a new company anchored with a three year government contract for Highway Maintenance.

Besides a working knowledge of snow, special interest would be given to candidates with a background in survey, heavy equipment, or road construction.

For more information please contact:

Mr. Michael Zylicz
General Manager

North Coast Road Maintenance Ltd.

4544 Lakelse Avenue
P.O. Box 1020
Terrace, British Columbia

Telephone: (604) 638-8300

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SHORT REPORT OF AVALANCHE INVOLVEMENT

DATE _____ TIME _____

LOCATION _____

AVALANCHE Size _____ Dry _____ Moist _____ Wet _____

NUMBER OF PERSONS Total number of persons in party _____

Caught _____ Partially Buried _____ Buried _____

Number of those who were injured _____ Killed _____

ACTIVITY OF THE PERSONS _____

NUMBER OF VEHICLES Trapped _____ Partially Buried _____ Buried _____

Damaged _____

Type of Vehicles _____

STRUCTURES DAMAGED _____

_____ Cost _____

ESTIMATED DEPTH OF BURIAL _____ ESTIMATED DURATION OF BURIAL _____

NAME AND ADDRESS OF REPORTER (Who can be contacted for further information):

Insert the form in an envelope, or fold it and staple it, or tape the edges. Mail to:

Avalanche Centre
National Research Council
3650 Wesbrook Mall
Vancouver, BC V6S 2L2

AVALANCHE

RESOURCE AGENCIES

1. AVALANCHE CONDITIONS, SEARCH AND RESCUE
2. SEARCH AND RESCUE
3. EDUCATION
4. WEATHER OFFICES

AVALANCHE RESOURCE AGENCIES

FEBRUARY 1989

1. AVALANCHE CONDITIONS, SEARCH AND RESCUE

The following agencies and individuals maintain continuous observations of the snow stability and avalanche hazards in their areas. They are also equipped for search and rescue work.

Canadian Parks Service

Banff National Park

Correspondence:

The Chief Warden
Banff National Park
P.O. Box 900
BANFF, ALBERTA TOL 0C0

Information concerning avalanche conditions:

Taped message on telephone:	at Banff	403-762-3600
	at Calgary	403-292-6600
Banff Wardens' office (open 24 hours per day)		403-762-4506
Lake Louise Wardens' office		403-522-3866

Avalanche control offices at:

Sunshine Village	Telephone:	403-762-2693
Lake Louise	Telephone:	403-522-3982
Mt. Norquay	Telephone:	403-762-2640

Emergency telephone: 403-762-4506 (same as Banff Wardens' No.)

Jasper National Park

The Chief Warden
Jasper National Park
P.O. Box 10
JASPER, ALBERTA TOE 1E0

Warden Office (during office hours)	Telephone:	403-852-6156/6157
(24 hours)	Telephone:	403-852-6161

Taped message provided by the Alberta Avalanche Safety Association:

at Edmonton	403-466-4636
in Alberta outside Edmonton	1-800-772-2434

Mount Revelstoke and Glacier National Parks

Correspondence:

The Superintendent
Mount Revelstoke and Glacier National Parks
P.O. Box 350
REVELSTOKE, B.C. V0E 2S0

Information concerning avalanche conditions:

Parks office at Revelstoke	Telephone:	604-837-5155
Information office at Rogers Pass	Telephone:	604-837-6274

Search and rescue:

The Chief Warden, Revelstoke	Telephone:	604-837-5155
Wardens' office, Rogers Pass	Telephone:	604-837-6274

Yoho National Park
Box 99
FIELD, B.C. V0A 1G0 Telephone: 604-343-6324
Attention: Chief Park Warden

Kootenay National Park
Box 220
RADIUM HOT SPRINGS, B.C. V0A 1M0 Telephone: 604-347-9361
Attention: Chief Park Warden

Waterton Lakes National Park

Correspondence:

The Superintendent
Waterton Lakes National Park
WATERTON, ALBERTA T0K 2M0
Attention: Chief Park Warden

Information concerning avalanche conditions:

Warden office (office hours)	Telephone:	403-859-2477
Taped telephone message	Telephone:	403-859-2445
Emergency (24 hours)	Telephone:	403-859-2636

Kluane National Park
Haines Junction
YUKON Y0B 1L0 Telephone: 403-634-2251
Attention: Chief Park Warden

British Columbia Ministry of Transportation and Highways

Geoff Freer, Head
Snow Avalanche Section
940 Blanshard Street
VICTORIA, B.C. V8W 3E6 Telephone: 604-387-6361

Janice Johnson
Snow Avalanche Section
940 Blanshard Street
VICTORIA, B.C. V8W 3E6 Telephone: 604-387-6361

Randy Stevens
Snow Avalanche Section
940 Blanshard Street
VICTORIA, B.C. V8W 3E6 Telephone: 604-387-6361

District Avalanche Technicians:

Ed Campbell
Box 579
HOPE, B.C. V0X 1L0 Telephone: 604-869-2401

Jack Bennetto
Bag 4500
MERRITT, B.C. V0K 2B0
Telephone: 604-378-9359
(winter only) 378-4648
(winter only) 378-6449

Scott Aitken
Box 460
LILLOOET, B.C. V0K 1V0 Telephone: 604-256-4255

John Tweedy
P.O. Box 580
CRESTON, B.C. V0B 1G0
Telephone: 604-428-3242
(winter only) 428-3270

Bruce Allen
1100 West 2nd Street
REVELSTOKE, B.C. V0E 2S0
Telephone: 604-837-7646
or 604-837-7685

Tony Moore
P.O. Box 490
STEWART, B.C. V0T 1W0 Telephone: 604-636-2625

Snow Avalanche Technicians:

Gordon Bonwick
Snow Avalanche Section
940 Blanshard Street
VICTORIA, B.C. V8W 3E6 Telephone: 604-387-6361

Dave Smith
Snow Avalanche Technician
Kootenays Region
310 Ward Street
NELSON, B.C. V1L 5S4 Telephone: 604-354-6429

Snow Avalanche Technician
North West Region
400 - 4546 Park Avenue
TERRACE, B.C. V8G 1V4 Telephone: 604-638-3340
(effective April 1, 1989)

British Columbia Ministry of Parks

Parks & Outdoor Recreation
East Kootenay District
Box 118
WASA, B.C. V0B 2K0 Telephone: 604-422-3212

Parks & Outdoor Recreation
West Kootenay District
RR #3 NELSON, B.C. V1L 5P6 Telephone: 604-825-4421

Parks & Outdoor Recreation
(Alice Lake)
Box 220
BRACKENDALE, B.C. V0N 1H0 Telephone: 604-898-3678

Alberta Recreation and Parks

Kananaskis Country Region
Box 280
CANMORE, ALBERTA T0L 0M0

Lloyd Gallagher - Alpine Specialist,
Public Safety Co-ordinator Telephone: 403-678-5508

George Field - Alpine Specialist Telephone: 403-678-5508

Jock Richardson - Snow Study Observer Telephone: 403-678-5508

Gavin More - Environmental Management
Specialist Telephone: 403-678-5508

Peter Lougheed Provincial Park (7 days a week - 0800-1630)	Telephone: 403-591-7222
Bow Valley Provincial Park (M to F 0800-1630, weekends on call)	Telephone: 403-673-3663
Elbow District (M to F 0800-1630, weekends on call)	Telephone: 403-949-3754
Avalanche Hazard Forecast taped telephone message	Telephone: 403-591-7788

Ski Areas

Whistler Mountain Whistler Mountain Ski Corporation Box 67 WHISTLER, B.C. V0N 1B0 Attention: Brian Leighton	Telephone: 604-932-3434
Red Mountain Ski Area Box 939 ROSSLAND, B.C. V0G 1Y0 Attention: Terry Miller	Telephone: 604-362-7384
Fernie Snow Valley Ski Ltd. Box 788 FERNIE, B.C. V0B 1M0 Attention: Dave Aikens	Telephone: 604-423-9221 (main office) 423-4655
Mt. Washington Ski Resort Ltd. P.O. Box 217 CAMPBELL RIVER, B.C. V9W 5B1 Attention: Harry Piercy	Telephone: 604-338-1386
Whitewater Ski Resort Ltd Box 60 NELSON, B.C. V1L 5P7 Attention: Roy Hemming	Telephone: 604-354-4944
Blackcomb Mountain P.O. Box 98 WHISTLER, B.C. V0N 1B0 Attention: Wayne Flann	Telephone: 604-932-3141
Marmot Basin Ski Lifts Ltd. P.O. Box 1300 JASPER, ALBERTA T0E 1E0 Attention: Ken Hammell	Telephone: 403-852-3816

Helicopter and Snowcat Ski Operators

Hans Gmoser, Mark Kingsbury, Kobi Wyss
Canadian Mountain Holidays
Box 1660
BANFF, ALBERTA TOL 0C0 Telephone: 403-762-4531

Ernst Buehler
Canadian Mountain Holidays, Cariboos Telephone: 604-565-0378

Danny Stoffle or Stefan Eder
Canadian Mountain Holidays, Valemount Telephone: 604-566-4487

Dominic Neuhaus
Canadian Mountain Holidays, Monashees Telephone: 604-834-7223

Buck Corrigan
Canadian Mountain Holidays, Revelstoke Telephone: 604-837-2107

Colani Bezzola
Canadian Mountain Holidays, Bobbie Burns Telephone: 604-346-3366

Walter Bruns
Canadian Mountain Holidays, Bugaboos Telephone: 604-346-3366

Franz Fux
Canadian Mountain Holidays, Gothics Telephone: 604-837-4204

Panorama Heli-Skiing
Box 7000
INVERMERE, B.C. V0A 1K0 Telephone: 604-342-6941

Rudi Gertsch
Purcell Helicopter Skiing
Box 1530
GOLDEN, B.C. V0A 1H0 Telephone: 604-344-5410

Peter Schlunegger
Selkirk-Tangiers Heli-Skiing
REVELSTOKE, B.C. V0E 2S0 Telephone: 604-837-5271

Allan Drury
Selkirk Wilderness Skiing
MEADOW CREEK, B.C. V0G 1N0 Telephone: 604-366-4424

Mike Wiegele
Wiegele Helicopter Skiing
P.O. Box 159
BLUE RIVER, B.C. V0E 1J0 Telephone: 604-673-8381

Wiegele Helicopter Skiing
P.O. Box 249
BANFF, ALBERTA TOL 0C0 Telephone: 403-762-5548

Whistler Heliskiing
P.O. Box 368
WHISTLER, B.C. V0N 1B0

Telephone: 604-932-4105
Fax: 604-932-2578

Kootenay Helicopter Skiing
P.O. Box 717
NAKUSP, B.C. V0G 1R0

Telephone: 604-265-3121

Mining Companies

Crows Nest Resources Ltd.
Line Creek Mine (Upper Elk Valley)
P.O. Box 2003
SPARWOOD, B.C. V0B 2G0

Telephone: 604-425-2555 (24 hours)

Attention: Rick Schroeder

Telephone: 604-423-6306

2. SEARCH AND RESCUE

The following agencies and individuals can assist in search and rescue work.

Dogs for Avalanche Search - Parks Canada

Dale Portman
Jasper National Park
JASPER, ALBERTA T0E 1E0

Telephone: 403-852-6156 (Bus)
403-852-5071 (Res)
(after 1630) 852-6161 (Pager)

Gordon Peyto
Glacier National Park
REVELSTOKE, B.C. V0E 2S0

Telephone: 604-837-6274 (Bus)
604-344-5041 (Res)

Scott Ward
Banff National Park
BANFF, ALBERTA T0L 0C0

Telephone: 403-762-4506 (24 hrs)
403-678-5554 (Res)

Dogs for Avalanche Search - R.C.M.P.

The followings dogs and their masters have received special avalanche training:

Chilliwack Sub/Division

Cpl. Terry Barter

Telephone: 604-792-4611

Cranbrook Detachment

Cpl. Gordon Burns

Telephone: 604-489-3471

Courtenay Sub/Division

Cpl. Jim Brewin — Telephone: 604-338-7421

Fort St. John Detachment

Cst. Al Soneff — Telephone: 604-785-6617

Kamloops Sub/Division

Cpl. Wayne Murphy — Telephone: 604-372-5511

Nelson Detachment

Cpl. C. H. Brandt — Telephone: 604-354-4104

Penticton Detachment

Cpl. Gary McCormick — Telephone: 604-492-3300

Terrace Detachment

Cpl. Lothar Bretfeld — Telephone: 604-638-0333

Vernon Detachment

Cpl. Tim Boal — Telephone: 604-545-7171

The following detachments will take information and pass it on to the Alberta Provincial Parks:

R.C.M.P., Peter Lougheed (Kananaskis) Provincial Park — Telephone: 403-591-7707

R.C.M.P., Canmore — Telephone: 403-678-5516

R.C.M.P., Banff — Telephone: 403-762-2226

Dogs for Avalanche Search - B.C. Provincial Emergency Program

Doug Fenton (CARDA AVD 3)
VANCOUVER, B.C.
Telephone: 604-979-4068 (Bus)
Telephone: 604-263-2680 (Res)

Russ Hendry (CARDA AVD 3)
INVERMERE, B.C.
Telephone: 604-342-4200 (Bus)
Telephone: 604-342-3894 (Res)

Canadian Avalanche Rescue Dog Association

Peter Crawford (AVD 2)
WHISTLER, B.C. Telephone: 604-932-4037 (Res)

Duncan Daniels (AVD 2) Telephone: 403-297-6115 (Bus)
CALGARY, ALBERTA Telephone: 403-242-5702 (Res)

Tim Quinn (AVD 2)
BLUE RIVER, B.C. Telephone: 604-673-8273 (Res)

Yvonne Thornton (AVD 2) Telephone: 604-932-3434 (Bus)
WHISTLER, B.C. Telephone: 604-932-5196 (Res)

Willi Schneider
3007 Pasture Crescent
PORT COQUITLAM, B.C. V3C 2C3 Telephone: 604-464-0760

L. Douglas Fenton
Secretary-Treasurer
1913 W 42nd Avenue
VANCOUVER, B.C. V6M 2B2 Telephone: 604-263-2680

Provincial Emergency Program (Ministry of Solicitor General)

The British Columbia Provincial Emergency Program co-ordinates most local search and rescue groups in the Province. Enquiries can be directed to:

M.C. Stewart, Director
Provincial Emergency Program
3287 Oak Street
VICTORIA, B.C. V8X 1P8 Telephone: 604-387-5956

Emergency toll-free Telephone: 1-800-663-3456 (24 hours)

Zone Managers are located at:

Victoria Zone

Mr. N. Coward
3287 Oak Street
VICTORIA, B.C. V8X 1P8 Telephone: 604-387-5956 (24 hrs)

Vancouver Zone

Mr. J. Consiglio (John)
207-815 Hornby Street
VANCOUVER, B.C. V6Z 2E6 Telephone: 604-660-3723 (24 hrs)

Chilliwack Zone

Mr. F. Clegg (Frank)
403 - 9200 Mary Street
CHILLIWACK, B.C. V2P 4H6 Telephone: 604-795-6408 (24 hrs)

Kelowna Zone

S. Patch
1917 Kent Street
KELOWNA, B.C. V1Y 7S6 Telephone: 604-861-7328 (24 hrs)

Kamloops Zone

Mr. M.E. Dyer (Murray)
455 Columbia Street
KAMLOOPS, B.C. V2C 6K4 Telephone: 604-372-3213 (24 hrs)

Nelson Zone

G. Hartley
310 Ward Street
NELSON, B.C. V1L 5S4 Telephone: 604-354-6399 (24 hrs)

Prince George Zone

Mr. B. Kelly (Bob)
505 - 280 Victoria Street
PRINCE GEORGE, B.C. V2L 4X3 Telephone: 604-565-6130 (24 hrs)

Terrace Zone

Mr. A. Waddy (Al)
203 - 3219 Eby Street
TERRACE, B.C. V8G 4R3 Telephone: 604-638-3514 (24 hrs)

Courtenay Zone

Mr. B. Akehurst (Barry)
368B 11th Street
COURTENAY, B.C. V9N 8H5 Telephone: 604-334-2778 (24 hrs)

3. EDUCATION

Avalanche Centre, National Research Council

Peter Schaerer, David McClung
3650 Wesbrook Mall Telephone: 604-666-6741
VANCOUVER, B.C. V6S 2L2 604-660-8046

Technical information.

Selkirk College

2001 Silver King Road
NELSON, B.C. V1L 1C8 Telephone: 604-352-6601

Courses for professional staff.

Federation of Mountain Clubs of British Columbia

336 - 1367 W. Broadway
VANCOUVER, B.C. V6H 4AG Telephone: 604-737-3053

Awareness courses: a) Avalanche Safety 1 (Introduction)
b) Avalanche Safety 2 (Refresher).

Basic Avalanche Safety Manual.

Canadian Ski Patrol System

T. Simper
National Avalanche Training Officer
14 Knowles Place, Box 1117
OKOTOKS, ALBERTA TOL 1TO Telephone: 403-938-2131

Alberta Avalanche Safety Association

Jack de Bruyn
8711-62nd Street
EDMONTON, ALBERTA T6B 1N5 Telephone: 403-466-6435

Backcountry Avalanche Hazard Forecast Telephone: 403-466-4636
Telephone: 1-800-772-2434

Nordic Ski Institute

Box 1050
CANMORE, ALBERTA TOL 0M0 Telephone: 403-678-4102

Awareness courses.

Ptarmigan Tours

Box 11
KIMBERLEY, B.C. V1A 2Y5 Telephone: 604-422-3270
Telephone: 604-427-2838

Awareness courses.

Avalanche Films

"Avalanche" - 50 minutes

Industrial Services Section
Ministry of Health
500 Lougheed Highway
PORT COQUITLAM, B.C. V3C 1J0
Telephone: 604-521-1911 (Loc. 281)

"The Snow War" - 25 minutes

National Film Board
1412 Douglas Street
VICTORIA, B.C. V8W 1T2
Telephone: 604-388-3868

National Film Board
100 - 1045 Howe Street
VANCOUVER, B.C. V6Z 2A9
Telephone: 604-666-0716 or 604-666-0718

"AVALANCHE" - 12 minutes (video)

Kananaskis Country Region
Box 280
CANMORE, ALBERTA TOL 0M0
Telephone: 403-678-5508

4. WEATHER OFFICES

Atmospheric Environment Service

Correspondence and equipment:

P. Pender
Regional Director
1200 West 73rd Avenue
VANCOUVER, B.C. V6P 6H9
Telephone: 604-666-8090

G.E. Wells
Pacific Weather Centre
1200 West 73rd Avenue
VANCOUVER, B.C. V6P 6H9
Telephone: 604-666-0523

E. Coatta
Climate Information
1200 West 73rd Avenue
VANCOUVER, B.C. V6P 6H9
Telephone: 604-666-2980

Alberta Weather Office
Edmonton International Airport
EDMONTON, ALBERTA T5J 2T2
Telephone: 403-437-1250

LIST OF WEATHER OFFICES IN BRITISH COLUMBIA

LOCATION		TELEPHONE (604)	OPEN HOURS (local time)
Vancouver		666-1083	24 hours
	Tape	666-1081 (Mtn. Fcst)	
	Tape	666-1087	
Victoria		356-6629/6630	24 hours
	Tape	656-3978	
Prince George		963-7552	0345-2115
	Tape	963-9330	
Kelowna		765-6598	0430-0000
	Tape	765-1881 (Mtn. Fcst)	Seasonal
	Tape	765-4027	
Kamloops		376-0727	0630-1700
	Tape	376-3044	
Fort Nelson		774-2302	0200-1700
	Tape	774-6461	
Fort St. John		785-4304	0700-1700
		785-6322	
Castlegar		365-3131	0630-1600
Port Hardy		949-6559	0715-1715
Penticton		492-0539	0700-1700 (M-F) 0800-1600 (S&S)
Terrace		635-3224	0710-1710
Pacific Weather Centre		666-2728	24 hours

(The Pacific Weather Centre is the main contact during hours when the local weather offices are closed. Unless otherwise indicated, all taped messages are for a general forecast.)

BANFF, ALBERTA	Tape	403-762-2088	0600-1700
WHITEHORSE, YUKON		403-668-2293	24 HOURS
ALBERTA WEATHER CENTRE		403-468-7931	24 HOURS

CHANGES

Changes, additions, or deletions to this list should be reported to the Snow Avalanche Section, British Columbia Ministry of Transportation and Highways.