



# MANAIR

## Manual of Standards and Procedures for Aviation Forecasts

**Eighth Edition, Amendment 15**

**July 2026**

This edition supersedes, on July 9<sup>th</sup> 2026, all previous versions of MANAIR.



Cat. No.: En58-29E-PDF  
ISSN: 2819-1005

EC22036

Unless otherwise specified, you may not reproduce materials in this publication, in whole or in part, for the purposes of commercial redistribution without prior written permission from Environment and Climate Change Canada's copyright administrator. To obtain permission to reproduce Government of Canada materials for commercial purposes, apply for Crown Copyright Clearance by contacting:

Environment and Climate Change Canada  
Public Information Centre  
Place Vincent Massey building  
351 St-Joseph boulevard  
Gatineau, Quebec K1A 0H3  
Toll Free: 1-800-668-6767  
Email: [enviroinfo@ec.gc.ca](mailto:enviroinfo@ec.gc.ca)

© His Majesty the King in Right of Canada, as represented by the Minister of Environment and Climate Change, 2026

Aussi disponible en français.

## Foreword

The *Manual of Standards and Procedures for Aviation Weather Forecasts* (MANAIR) specifies procedures, practices and formats to be used in the preparation of aviation weather forecasts. It serves as a precise standard for the operational meteorologist who produces Canadian aviation weather forecasts. It also provides necessary information for those who deliver aviation weather services.

This manual is used within Environment and Climate Change Canada (ECCC) as a standard for operational meteorologists producing aviation weather forecasts, and for informational purposes for users who deliver Canadian aviation weather services. Revisions and amendments will be issued when warranted. All holders of the manual are responsible for keeping their copies current. When revisions and amendments have been entered, they are recorded on the page headed Record of Amendments.

Inquiries on the content of this manual should be directed to the Meteorological Service of Canada through appropriate channels.

## Record of Amendments

| Number | Effective date | Entered by        | Date of entry  |
|--------|----------------|-------------------|----------------|
| 1      | July 2022      | Gilles Ratté      | July 2022      |
| 2      | November 2023  | Claudine Larocque | September 2023 |
| 3      | March 2024     | Claudine Larocque | March 2024     |
| 4      | July 2024      | Claudine Larocque | July 2024      |
| 5      | December 2024  | Claudine Larocque | December 2024  |
| 6      | February 2025  | Claudine Larocque | February 2025  |
| 7      | April 2025     | Jessica Howell    | April 2025     |
| 8      | June 2025      | Jessica Howell    | June 2025      |
| 9      | August 2025    | Jessica Howell    | August 2025    |
| 10     | October 2025   | Jessica Howell    | October 2025   |
| 11     | November 2025  | Jessica Howell    | November 2025  |
| 12     | January 2026   | Jessica Howell    | January 2026   |
| 13     | March 2026     | Jessica Howell    | March 2026     |
| 14     | May 2026       | Jessica Howell    | May 2026       |
| 15     | July 2026      | Jessica Howell    | July 2026      |
|        |                |                   |                |

## Record of revisions

Significant and substantial revisions to MANAIR Eight edition are listed below with a description of the changes. The Record of revisions is updated whenever amendments are issued.

| Section               | Description of revisions                                                                                      | Effective date |
|-----------------------|---------------------------------------------------------------------------------------------------------------|----------------|
| Record of revisions   | Addition of the page «Record of revisions»                                                                    | July 2022      |
| 2.6.11.1 section 4)   | Removal of ice pellet showers (SHPL) as a weather phenomenon for compliancy with WMO No. 306 Manual on Codes. | November 2023  |
| 2.6.11.2.1, 2.9.5.2   | Weather element GS referred as snow pellets and/or small hail in all instances                                | November 2023  |
| Appendix A            | Limits for CYYQ and CYQI                                                                                      | March 2024     |
| 2.6.11 and 2.6.11.2.2 | SA only allowed with BL or DR                                                                                 | July 2024      |
| 4.9.1.2.3             | Corrected typo LYRS should be LYR                                                                             | July 2024      |
| 4.9.1.3.1             | Added definition for intermittent                                                                             | July 2024      |
| Appendix A            | Limits for CYGQ, CYYY and CYVV, notes updated                                                                 | July 2024      |
| Appendix A            | Limits for CYBR, CYAZ, CYQH, name for CYHU                                                                    | December 2024  |
| Appendix A            | Limits for CYYL                                                                                               | February 2025  |
| Appendix A            | Limits for CYAB, CYDL, CYMX and CYSF                                                                          | April 2025     |
| Appendix A            | Limits for CYSP, CZMT                                                                                         | June 2025      |
| Appendix A            | Limits for CYGP                                                                                               | August 2025    |

|               |                                                                             |               |
|---------------|-----------------------------------------------------------------------------|---------------|
| Appendix A    | Limits for CYOW                                                             | October 2025  |
| Appendix A    | Limits for CYQZ, CYOO, and CYGV                                             | November 2025 |
| Appendix A    | Limits for CYCD, CYXZ                                                       | January 2026  |
| Appendix A    | Limits CYXU                                                                 | March 2026    |
| Appendix A, D | CYDN Limits. Obsolete aviation reference sites removed from the list in D.7 | May 2026      |
| Appendix A    | Limits for CYLW                                                             | July 2026     |

# Table of Contents

|                  |                                                                          |             |
|------------------|--------------------------------------------------------------------------|-------------|
| <b>Chapter 1</b> | <b>Introduction .....</b>                                                | <b>1–1</b>  |
| 1.1              | Purpose of manual .....                                                  | 1–1         |
| 1.2              | Word meaning .....                                                       | 1–1         |
| 1.3              | Applicability .....                                                      | 1–1         |
| 1.4              | Responsibility for the aviation weather program .....                    | 1–2         |
| 1.5              | Aviation weather forecast production .....                               | 1–3         |
| 1.6              | Aeronautical Meteorological Forecaster (AMF) .....                       | 1–3         |
| 1.7              | Form of forecasts .....                                                  | 1–3         |
| 1.8              | Components and types of routine aviation forecasts .....                 | 1–4         |
| <b>Chapter 2</b> | <b>Aerodrome forecast (TAF) .....</b>                                    | <b>2–6</b>  |
| 2.1              | Definition .....                                                         | 2–6         |
| 2.2              | Aeronautical Meteorological Forecaster (AMF) responsibility .....        | 2–6         |
| 2.3              | Observational requirements .....                                         | 2–6         |
| 2.4              | Time references .....                                                    | 2–7         |
| 2.5              | Format of the Canadian Aerodrome Forecast (TAF) .....                    | 2–8         |
| 2.6              | TAF Forecast preparation and coding .....                                | 2–12        |
| 2.7              | Aerodrome advisories .....                                               | 2–31        |
| 2.8              | Updated forecasts .....                                                  | 2–32        |
| 2.9              | TAF amendments .....                                                     | 2–32        |
| 2.10             | Cancellation of TAFs .....                                               | 2–36        |
| 2.11             | Corrections .....                                                        | 2–39        |
| 2.12             | Examples of TAFs .....                                                   | 2–39        |
| <b>Chapter 3</b> | <b>Forecasts in digital form of the wind and temperature aloft .....</b> | <b>3–44</b> |
| 3.1              | Purpose .....                                                            | 3–44        |
| 3.2              | Content and issuing offices .....                                        | 3–44        |
| 3.3              | Issue times and periods of use .....                                     | 3–45        |
| 3.4              | Format .....                                                             | 3–46        |
| <b>Chapter 4</b> | <b>Graphic Area Forecast (GFA) .....</b>                                 | <b>4–48</b> |
| 4.1              | Definition .....                                                         | 4–48        |
| 4.2              | Purpose .....                                                            | 4–48        |
| 4.3              | Issue and valid times .....                                              | 4–48        |
| 4.4              | Domain .....                                                             | 4–48        |
| 4.5              | Units .....                                                              | 4–49        |
| 4.6              | Map projection, scale and background .....                               | 4–49        |
| 4.7              | Characters, abbreviations and symbols .....                              | 4–50        |
| 4.8              | Page layout .....                                                        | 4–51        |
| 4.9              | Content of the GFA .....                                                 | 4–54        |
| 4.10             | Amended GFA .....                                                        | 4–72        |
| 4.11             | Corrected GFA .....                                                      | 4–72        |

|                   |                                                                                                             |              |
|-------------------|-------------------------------------------------------------------------------------------------------------|--------------|
| <b>Chapter 5</b>  | <b>SIGMET Information .....</b>                                                                             | <b>5–73</b>  |
| 5.1               | Definition .....                                                                                            | 5–73         |
| 5.2               | Domain .....                                                                                                | 5–73         |
| 5.3               | Projection .....                                                                                            | 5–73         |
| 5.4               | Language .....                                                                                              | 5–73         |
| 5.5               | Units .....                                                                                                 | 5–73         |
| 5.6               | Types of SIGMET .....                                                                                       | 5–74         |
| 5.7               | Structure of the SIGMET message .....                                                                       | 5–74         |
| 5.8               | Format of SIGMET .....                                                                                      | 5–75         |
| <b>Chapter 6</b>  | <b>AIRMET Information .....</b>                                                                             | <b>6–101</b> |
| 6.1               | Definition .....                                                                                            | 6–101        |
| 6.2               | Domain .....                                                                                                | 6–101        |
| 6.3               | Projection .....                                                                                            | 6–101        |
| 6.4               | Language .....                                                                                              | 6–101        |
| 6.5               | Units .....                                                                                                 | 6–102        |
| 6.6               | Types of AIRMET .....                                                                                       | 6–102        |
| 6.7               | Structure of the AIRMET message .....                                                                       | 6–102        |
| 6.8               | Format of AIRMET .....                                                                                      | 6–103        |
| <b>Chapter 7</b>  | <b>Significant weather prognostic charts .....</b>                                                          | <b>7–120</b> |
| 7.1               | Definition .....                                                                                            | 7–120        |
| 7.2               | Issuing centres .....                                                                                       | 7–120        |
| 7.3               | CMAC prognostic charts .....                                                                                | 7–120        |
| 7.4               | Examples of forecasts in chart form .....                                                                   | 7–124        |
| <b>Chapter 8</b>  | <b>Definitions .....</b>                                                                                    | <b>8–125</b> |
| <b>Appendix A</b> | <b>Aerodrome Forecast (TAF)—Supplement to Chapter 2 .....</b>                                               | <b>1</b>     |
| <b>Appendix B</b> | <b>Forecasts in digital form of the winds and the temperatures aloft—<br/>Supplement to Chapter 3 .....</b> | <b>1</b>     |
| <b>Appendix C</b> | <b>Graphic Area Forecast (GFA)—Supplement to Chapter 4 .....</b>                                            | <b>1</b>     |
| C.1               | GFA domain names .....                                                                                      | 1            |
| C.2               | Examples of GFA content .....                                                                               | 2            |
| C.3               | Guidelines for GFA correction .....                                                                         | 4            |
| C.4               | Examples of GFA .....                                                                                       | 5            |
| <b>Appendix D</b> | <b>SIGMET information—Supplement to Chapter 5 .....</b>                                                     | <b>1</b>     |
| D.1               | Canadian SIGMET information domain .....                                                                    | 1            |
| D.2               | Abbreviations and decode used in SIGMET .....                                                               | 2            |
| D.3               | SIGMET Bulletin scheme .....                                                                                | 5            |
| D.4               | Alphanumeric sequence .....                                                                                 | 6            |
| D.5               | Meteorological phenomena to be included in SIGMET .....                                                     | 7            |
| D.6               | Resolution .....                                                                                            | 8            |
| D.7               | Aviation reference sites used in National SIGMET .....                                                      | 10           |

|                                                                   |          |
|-------------------------------------------------------------------|----------|
| D.8 Examples of SIGMET messages .....                             | 27       |
| <b>Appendix E AIRMET information—Supplement to Chapter 6.....</b> | <b>1</b> |
| E.1 Canadian AIRMET information domain.....                       | 1        |
| E.2 Abbreviations and decode used in AIRMET .....                 | 2        |
| E.3 AIRMET Bulletin scheme .....                                  | 5        |
| E.4 Alphanumeric sequence .....                                   | 6        |
| E.5 Meteorological phenomena to be included in AIRMET .....       | 7        |
| E.6 Resolution .....                                              | 8        |
| E.7 Aviation reference sites used in National AIRMET.....         | 9        |
| E.8 Examples of AIRMET messages .....                             | 10       |

# Chapter 1 Introduction

## 1.1 Purpose of manual

This manual is incorporated as a regulatory standard by reference from *Canadian Aviation Regulations* (CAR) 804.01(1)(b). It specifies procedures, practices and formats to be used in the preparation of aviation weather forecasts in Canada. It expands upon the International Standards and Recommended Practices as stated in the International Civil Aviation Organization (ICAO) Annex 3 to the *Convention on International Civil Aviation - Meteorological Service to International Air Navigation* as referenced by CAR 804.01(1)(a). The standards in Annex 3 are superseded, domestically, by State differences filed by Canada against the Annex in accordance with CAR 800.01(2). The standards in this manual have equal weight with the standards in Annex 3 or those formed by Canadian State differences to the Annex but they take precedence over recommended procedures established in Annex 3.

## 1.2 Word meaning

The bolded word "**shall**" is used in this manual to indicate that instructions are mandatory, or must be followed. The word "should" is used to denote a recommended practice, or a good way to do something.

## 1.3 Applicability

This manual has been produced in conjunction with Transport Canada (TC), NAV CANADA, and the Department of National Defence (DND) and **shall** be used by people involved in the production and delivery of aviation weather forecasts serving all categories of aviation: civil or military, domestic, trans-border (Canada-United States) or international.

## 1.4 Responsibility for the aviation weather program

The Minister of Transport is responsible for the development and regulation of civil aeronautics and the supervision of all matters connected with civil aeronautics. The responsibility for the provision of civil aviation weather services in Canadian airspace and any other airspace in respect of which Canada has the responsibility for the provision of air traffic control services, has been designated to NAV CANADA. NAV CANADA also specifies the location and frequency of aviation weather observations and forecasts, and is responsible for the dissemination of this information for aviation purposes.

**Note:** In special circumstances, the Minister of Transport may authorize a private company to issue aviation weather forecasts for specific aerodromes.

The Minister of National Defence is responsible for the development and regulation of military aeronautics and the supervision of all matters connected with military aeronautics. The responsibility for the provision of military aviation weather services in Canada rests with the Director, Meteorology and Oceanography (DMetOc).

**Note:** Specific exemptions may be authorized by DMetOc in special circumstances when it is essential to conform to the standards or procedures of DND or an allied command (e.g North American Aerospace Defense Command (NORAD) or North Atlantic Treaty Organization (NATO)).

The International Civil Aviation Organization (ICAO) has designed the World Area Forecast System (WAFS) to provide forecasts of enroute meteorological conditions of the greatest possible accuracy and in a standardized form for international civil flight operations.

In accordance with the standards set by the World Meteorological Organization (WMO) and ICAO, aviation weather forecasts provided by the Meteorological Service of Canada (MSC) are prepared by certified aeronautical meteorological forecasters (AMF) as defined in 1.6.

## **1.5 Aviation weather forecast production**

Aviation weather forecasts are produced by:

Environment and Climate Change Canada (ECCC):

- Environment and Climate Change Canada, MSC has been contracted, by NAV CANADA, the responsibility for the production of civil aviation weather forecasts.
- ECCC/MSC, under the provisions of a Memorandum of Understanding with DND, provides similar services.

Private meteorological suppliers:

- Any private company authorized by TC or DND to issue aviation forecast for specific aerodromes.

## **1.6 Aeronautical Meteorological Forecaster (AMF)**

An Aeronautical Meteorological Forecaster (AMF) is a meteorologist who meets, at a minimum, the definition and top-level competency standards as defined in the *Manual on the Implementation of Education and Training Standards in Meteorology and Hydrology, Volume I, Meteorology* (WMO-No. 1083), as they pertain to aeronautical meteorology, and who is continuously and actively responsible for the content of any aviation weather forecast service. Additional AMF competencies may be required by the service provider, which are in keeping with Canadian regulations.

## **1.7 Form of forecasts**

Forecasts are issued in one of two forms designed to satisfy internationally agreed upon requirements. The designated formats are identified below.

### **1.7.1 Chart / graphical**

Forecasts in chart or graphical form depict forecast conditions over large areas with greater clarity than forecasts in alphanumerical form. Specifications of this form are given in chapters 4 and 7.

### **1.7.2 Alphanumeric code**

Forecasts in alphanumeric code are used when required by international standards (e.g. aerodrome forecasts (TAFs) in code) or when chart forms are unsuitable.

## 1.8 Components and types of routine aviation forecasts

Because of differing requirements for detail and accuracy, aviation forecasts are separated into forecasts of aerodrome conditions and forecasts of enroute conditions. Each of these forecasts may be issued in one or more of the forms detailed in 1.7.

### 1.8.1 Aerodrome forecasts

These are normally issued for periods of 12, 24 or 30 hours at regular intervals (normally every six hours). These forecasts are issued for specified aerodromes in alphanumeric code (TAF).

### 1.8.2 Forecasts of enroute weather

Forecasts of enroute weather **shall** be issued, as described:

- **Graphic Area Forecasts (GFA):** For aircraft operating over short or medium ranges (less than 1,000 nautical miles) and at altitudes below 24,000 feet, area forecasts are issued at regular intervals (normally every six hours). Detailed specifications of GFA are given in Chapter 4.
- **Significant weather forecasts:** For planning operations of aircraft over longer ranges and at altitudes between 700 hPa and 400 hPa (10,000 feet to 24,000 feet), routine forecasts of weather of significance to such operations are produced in chart form as described in Chapter 7.
- **SIGMET:** Information message to advise pilots of the occurrence or expected occurrence of specified weather phenomena, which may affect the safety of aircraft operations, and the development of those phenomena in time and space. Details of specifications of SIGMET are given in Chapter 5.
- **AIRMET:** Information message to advise pilots of the occurrence or expected occurrence of specified weather phenomena which may affect the safety of aircraft operations, which were not already included in the GFA, and the development of those phenomena in time and space. Details of specifications of AIRMET are given in Chapter 6.
- **Upper Winds and Temperatures (FB):** Forecast of winds and temperatures aloft produced at six-hour intervals in numerical form for defined levels below 24,000 feet. Details of FB specifications are provided in Chapter 3.

This page intentionally left blank

## Chapter 2 Aerodrome forecast (TAF)

### 2.1 Definition

The aerodrome forecast (TAF) is the forecaster's best judgment of the most probable weather conditions expected to occur at an aerodrome together with their most probable time of occurrence. It is designed to meet the preflight and in-flight requirements of flight operations. Aerodrome forecasts are intended to relate to weather conditions for flight operations within six statute miles (roughly five nautical miles) of the centre of the runway complex depending on local terrain. Certain specified weather phenomena, when expected within the vicinity of the aerodrome, are also included in a TAF.

### 2.2 Aeronautical Meteorological Forecaster (AMF) responsibility

An AMF responsible for the production of TAFs for Canada **shall** produce those forecasts using the standards and recommended practices concerning weather forecasts and observations identified in the Canadian Aviation Regulations (CAR).

### 2.3 Observational requirements

Aerodrome forecasts are issued for aerodromes for which regular hourly and special weather reports meeting standards for observations, as stated in the *Manual of Surface Weather Observation Standards* (MANOBS), are available. Aerodrome forecasts based on automated observations **shall** be issued only for acceptable Automated Weather Observation System (AWOS) sites. They are recognizable by the label “**AUTO**” in the corresponding METAR or SPECI report.

#### 2.3.1 Parameters required to establish a TAF service

The meteorological parameters required to establish a TAF service are the following:

- sky condition
- visibility
- present weather and obstructions to vision
- air temperature
- dew point temperature
- wind speed, direction and character
- mean sea level (MSL) pressure

Regular hourly and special weather observations are only one of the data sources available to forecasters. Therefore, when it comes to maintaining an already established aerodrome forecast, no single element is necessarily critical.

After analyzing available data from other sources (e.g. satellite imagery, radar pictures, webcam data), if, in the forecaster's judgment, one missing observation or a missing element will have no impact on the quality of the aerodrome forecast, the forecast can be maintained.

## 2.4 Time references

All time references **shall** be stated in Coordinated Universal Time (UTC).

### 2.4.1 Issue time

The issue time of an aerodrome forecast is the time that it is released to the telecommunication system. To facilitate flight planning, aerodrome forecasts **shall** be transmitted on the telecommunication system as close as possible to, but not later than 20 minutes prior to the beginning of their period of validity.

For those aerodromes which do not have a 24-hour observing program, two consecutive hourly observations immediately prior to the issue time of the forecast are required before issuing a forecast. Depending on the valid period of the forecast, the above situation can be accomplished in one of two ways:

- 1) After receiving the second hourly observation, the TAF is issued as soon as possible, for example, 15 minutes after the second observation is received. The period of validity of such a TAF is backdated to begin on the whole hour prior to the issue time of the forecast. The forecast, however, is valid from the time that it is received. For example, after receiving the 13Z and 14Z observations for Fort Good Hope, the TAF is issued as:  
**TAF CYGH 201410Z 2014/2101 ...**
- 2) After receiving the second hourly observation, the TAF is issued approximately 40 minutes after the hour of the observation. In this case, the period of validity of such a TAF is postdated to begin on the whole hour following the issue time of the forecast. For example, after receiving the 10Z and 11Z observation for Muskoka, a TAF is issued as:  
**TAF CYQA 201140Z 2012/2100 ...**

If two consecutive hourly observations are not available immediately prior to the issue time of a TAF, a nil TAF **shall** be issued, e.g. **TAF CYTS 051640Z NIL** followed by **NO OBS** included in the remarks section. Alternatively, if only one observation is available, the nil TAF would read **TAF CYTS 051640Z NIL** followed by **INSUFFICIENT OBS** included in the remarks section.

In exceptional circumstances (e.g. where there is a nearby weather station providing routine hourly and special weather reports) forecasts may be issued after receipt of the first hourly report.

TAFs are normally scheduled to be updated six hours after the previous issue time. Under no circumstance **shall** a TAF be scheduled more than seven hours after the previous issue time.

#### **2.4.2 Time of validity**

An aerodrome forecast **shall** be valid from the moment it is issued (e.g. a TAF with an indicated period of validity from 11Z to 23Z issued at 1040Z is considered to be valid from 1040Z) until it is amended, or until the next scheduled TAF for the same aerodrome is issued, or until the valid period is ended with no new TAFs issued, whichever comes first.

**Note:** When a new TAF is issued, it automatically cancels the previous one.

### **2.5 Format of the Canadian Aerodrome Forecast (TAF)**

The information included in a Canadian aerodrome forecast (TAF) is presented in a fixed order as described in 2.5.1 and 2.5.2. For a description of the WMO international TAF code, refer to the *Manual on Codes, Volume I.1 - Part A – Alphanumeric Codes* (WMO-No. 306).

### 2.5.1 Telecommunication header

TAF bulletins begin with a WMO abbreviated telecommunication header (as required by the *Manual on Global Telecommunication System* [WMO-No. 386]). The normal source input header for a TAF bulletin is of the following form “**FTCNii CWA0 ddhh00 (BBB)**” where:

- **ii** is the bulletin number, as listed in Appendix A for each TAF;
- **CWA0** refers to the Canadian Centre for Meteorological and Environmental Prediction/Network Operations (CCMEP/NETOPS) as the centre compiling the bulletins;
- **ddhh00** is the date and time, in whole hours UTC, that precedes the time of entry to the collection circuit of a regular forecast issue, as required by the Global Telecommunication System (GTS) of the WMO (e.g. **FTCN32 CWA0 101800**); and
- **BBB** is an indicator used for amendments, corrections, or delayed bulletins and will be added automatically by the national bulletin preparation software to all TAFs scheduled for transmission to the GTS. The inclusion of this term is required by international protocol, as outlined in the *Manual on the Global Telecommunication System, Volume I, Attachment II-12 – Instructions for the Use of the Indicator BBB* (WMO-No. 386), **BBB** will take the form **AA(x)** for amendments (including corrections) and **RR(x)** for delayed bulletins. The letter **(x)** will take the value of “**A**” for the first amendment or delayed bulletin, the value “**B**” for the second and so on (e.g. **FTCN32 CWA0 201800 AAA**, **FTCN33 CWA0 182100 RRA**, etc.) up to and including “**X**”. If more than 24 **BBB** indicators have to be used for the sequences, then **x = X** should continue to be used. **x = Y** should be used when a system failure causes loss of the record of the sequence of character values. **x = Z** should be used when bulletins are prepared or compiled more than 24 hours after the time of observation.

Delayed bulletins are used to transmit TAFs normally contained in a regularly scheduled bulletin after that initial bulletin has been transmitted or for a subsequent or additional issuance of a bulletin whose “**FTCNii CWA0 ddhh00**” would not be unique without a **BBB** field and **AA(x)** does not apply.

Regularly scheduled bulletins, as well as delayed and amendment bulletins, can contain one or more TAFs. In most instances however, a regularly scheduled bulletin will typically contain multiple TAFs whereas amendment bulletins will typically contain just one.

**Note:** The time that appears in the telecommunication header **shall** always be in whole hours Universal Coordinated Time (UTC) preceding the transmission time. This rule is outlined in the *Manual on the Global Telecommunication System, Volume I – Global Aspects, Part II*, p. 2.3.2.2 (WMO-No. 386). In Canada, the transmission time is interpreted to be the time at

which the regular issue of a forecast is published. Delayed and updated bulletins are also considered regular forecast issue as opposed to amendments and cancellations, which modify the content of a previously published bulletin with an already established transmission time.

### 2.5.2 Symbolic form

The symbolic form of a Canadian aerodrome forecast in TAF code is:

TAF bbb CCCC YYGGggZ {NIL or Y<sub>1</sub>Y<sub>1</sub>G<sub>1</sub>G<sub>1</sub>/Y<sub>2</sub>Y<sub>2</sub>G<sub>2</sub>G<sub>2</sub> {CNL or dddffGf<sub>m</sub>f<sub>m</sub>KT  
 WSh<sub>x</sub>h<sub>x</sub>h<sub>x</sub>/ddffKT VVVV {w'w' or NSW} {N<sub>s</sub>N<sub>s</sub>N<sub>s</sub>h<sub>s</sub>h<sub>s</sub>h<sub>s</sub> or VVh<sub>s</sub>h<sub>s</sub>h<sub>s</sub> or SKC}  
 PROBC<sub>2</sub>C<sub>2</sub> Y<sub>b</sub>Y<sub>b</sub>G<sub>b</sub>G<sub>b</sub>/Y<sub>e</sub>Y<sub>e</sub>G<sub>e</sub>G<sub>e</sub>  
 TEMPO Y<sub>b</sub>Y<sub>b</sub>G<sub>b</sub>G<sub>b</sub>/Y<sub>e</sub>Y<sub>e</sub>G<sub>e</sub>G<sub>e</sub>  
 {BECMG Y<sub>b</sub>Y<sub>b</sub>G<sub>b</sub>G<sub>b</sub>/Y<sub>e</sub>Y<sub>e</sub>G<sub>e</sub>G<sub>e</sub>} or {FMYYGGgg}}}  
 RMK

**Note (1):** Groups included in braces { } and separated by the word “or” represent mutually exclusive options.

**Note (2):** Each individual time period beginning with FMYYGGgg shall start a new line and indented four spaces, while continuation lines shall be indented five spaces.

**Note (3):** The length of a line shall not exceed 69 characters. A period is not required at the end of every TAF. An equal “=” sign, indicates the end of the message to comply with the GTS rules.

#### 2.5.2.1 Partial program format

For an aerodrome operating a partial observing program (e.g. no nighttime observations), an appropriate remark shall be included in the last regular issue of the TAF as follows:

- NXT FCST WILL BE ISSUED AT YYGGggZ (e.g. NXT FCST WILL BE ISSUED AT 181000Z)
- NO FCST ISSUED UFN

Where:

- YY is the date in which the next TAF will be issued; and
- GGgg is the time (UTC, hour and minutes) at which the next TAF will be issued.

**Note:** If, for unexpected reasons, the observing program should end earlier or start later than expected, a cancelled or nil TAF shall be issued as described in 2.10.1.

### 2.5.3 Definition of symbols

Only a broad overview of the description of the terms is provided in this section. More details regarding the preparation and the coding of aerodrome forecast are provided in 2.6.

**Table 1:** Definition of symbols

| Symbol                                                                                                                                                     | Description                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| TAF                                                                                                                                                        | Bulletin identifier (refer to 2.6.1).                             |
| Bbb                                                                                                                                                        | Amendment or correction indicator (refer to 2.6.2).               |
| CCCC                                                                                                                                                       | International aerodrome identifier (refer to 2.6.3).              |
| YYGGggZ                                                                                                                                                    | Date/time (UTC) of origin of the TAF (refer to 2.6.4).            |
| NIL                                                                                                                                                        | Missing forecast identifier (refer to 2.6.5)                      |
| Y <sub>1</sub> Y <sub>1</sub> G <sub>1</sub> G <sub>1</sub> /Y <sub>2</sub> Y <sub>2</sub> G <sub>2</sub> G <sub>2</sub>                                   | Date and period of validity of the forecast (refer to 2.6.6).     |
| CNL                                                                                                                                                        | Cancelled forecast identifier (refer to 2.6.7)                    |
| dddffGf <sub>m</sub> f <sub>m</sub> KT                                                                                                                     | Surface wind speed and direction with gusts (refer to 2.6.8)      |
| WSH <sub>x</sub> h <sub>x</sub> h <sub>x</sub> /dddffKT                                                                                                    | Low level wind shear group (refer to 2.6.9)                       |
| VVVV                                                                                                                                                       | Horizontal prevailing visibility at the surface (refer to 2.6.10) |
| w'w'                                                                                                                                                       | Significant forecast weather (refer to 2.6.11)                    |
| NSW                                                                                                                                                        | Abbreviation for no significant weather (refer to 2.6.12)         |
| N <sub>s</sub> N <sub>s</sub> N <sub>s</sub> h <sub>s</sub> h <sub>s</sub> h <sub>s</sub>                                                                  | Cloud group (refer to 2.6.13.1&2)                                 |
| VVh <sub>s</sub> h <sub>s</sub> h <sub>s</sub>                                                                                                             | Vertical visibility (refer to 2.6.13.3)                           |
| SKC                                                                                                                                                        | Abbreviation for sky clear (refer to 2.6.13.4)                    |
| PROBC <sub>2</sub> C <sub>2</sub> Y <sub>b</sub> Y <sub>b</sub> G <sub>b</sub> G <sub>b</sub> /Y <sub>e</sub> Y <sub>e</sub> G <sub>e</sub> G <sub>e</sub> | Probability group (refer to 2.6.14)                               |
| TEMPO Y <sub>b</sub> Y <sub>b</sub> G <sub>b</sub> G <sub>b</sub> /Y <sub>e</sub> Y <sub>e</sub> G <sub>e</sub> G <sub>e</sub>                             | Temporary change group indicator (refer to 2.6.15)                |
| FMYYGGgg                                                                                                                                                   | Rapid and permanent change group indicator (refer to 2.6.16.1)    |
| BECMG Y <sub>b</sub> Y <sub>b</sub> G <sub>b</sub> G <sub>b</sub> /Y <sub>e</sub> Y <sub>e</sub> G <sub>e</sub> G <sub>e</sub>                             | Gradual but permanent change group indicator (refer to 2.6.16.2)  |
| RMK                                                                                                                                                        | Remarks (refer to 2.6.17)                                         |

## 2.6 TAF Forecast preparation and coding

The description of forecast conditions **shall** always contain, as a minimum, information about the following elements:

- wind
- visibility
- weather
- cloud

### 2.6.1 Aerodrome forecast message identifier (TAF)

The code name “TAF” (Aerodrome Forecast) **shall** be included at the beginning of each TAF (e.g. TAF CYUL 191635Z 1917/2017...).

### 2.6.2 Amendment/Correction indicator (bbb)

The indicator “bbb” takes the form of “AMD” and is used for both amendments and corrections and is placed after the term TAF followed by one space (e.g. TAF AMD CYUL...).

### 2.6.3 Location identifier group (CCCC)

The group “CCCC” is the international four-letter aerodrome identifier (for a full list of international identifiers, see ICAO Document 7910: *ICAO Location Indicators* (DOCS 7910). For Canadian aerodromes the first letter of this group is always a “C” (e.g. TAF CYUL...).

### 2.6.4 Date/Time group (YYGGggZ)

The day/time group “YYGGggZ” is the date and time of issue of the forecast in UTC (e.g. TAF CYUL 191640Z ...). This term will be inserted automatically by the national bulletin preparation software once the forecaster sends the forecast.

### 2.6.5 Missing forecast indicator (NIL)

A nil TAF shall include the term “NIL” following the day and time of issue of the forecast. All subsequent TAF groups, except for remarks, shall be omitted.

### 2.6.6 Date and period of validity group (Y<sub>1</sub>Y<sub>1</sub>G<sub>1</sub>G<sub>1</sub>/Y<sub>2</sub>Y<sub>2</sub>G<sub>2</sub>G<sub>2</sub>)

The group “Y<sub>1</sub>Y<sub>1</sub>G<sub>1</sub>G<sub>1</sub>/Y<sub>2</sub>Y<sub>2</sub>G<sub>2</sub>G<sub>2</sub>” represents the period of validity of the forecast, where:

- Y<sub>1</sub>Y<sub>1</sub>G<sub>1</sub>G<sub>1</sub> is the date and hour (UTC) of the beginning of the period of validity; and
- Y<sub>2</sub>Y<sub>2</sub>G<sub>2</sub>G<sub>2</sub> is the date and hour (UTC) of the end of the period of validity (e.g. TAF CYUL 191740Z 1918/2018).

This group will be inserted for all TAF bulletins except for nil TAFs. For most TAFs, the period of validity will begin at the current or upcoming hour. For cancelled TAFs, the beginning of the

period of validity will correspond to the beginning of the period of validity of the last issued valid TAF, which means that the valid period may start prior to the current hour.

### 2.6.7 Cancelled forecast indicator (CNL)

A cancelled TAF shall include the term “CNL” following the date and period of validity group of the forecast that is being cancelled. All subsequent TAF groups, except for remarks, shall be omitted.

### 2.6.8 Wind group (dddffG<sub>f<sub>m</sub></sub>f<sub>m</sub>KT)

The mean direction and speed of the forecast wind **shall** be indicated by “dddff” where **ddd** is the wind direction given to the nearest 10 degrees true, and **ff** is the wind speed given in knots. Except as stated below, the group **dddff** is immediately followed, without a space, by the letter code indicator **KT** to indicate the wind speed unit (knots).

When it is forecast that the maximum wind speed (gust, symbol **G**) will exceed the mean speed by 10 KT or more, the maximum wind speed **shall** be indicated by adding **G<sub>f<sub>m</sub></sub>f<sub>m</sub>** between **dddff** and **KT**. There is no space either before or after **G<sub>f<sub>m</sub></sub>f<sub>m</sub>** (e.g. **32020G30KT**).

The code “ddd” should normally be encoded as variable (**VRB**) only when the mean wind speed is three knots or less (e.g. **VRB03KT**). A variable wind at higher speeds may also be indicated during strong convective activity (e.g. when a thunderstorm passes over an aerodrome).

A north wind of 20 KT **shall** be indicated as **36020KT**, while a calm wind **shall** be indicated as **00000KT**.

For wind speeds (mean and/or maximum gust) of 100 KT or greater, the exact value of the speed **shall** be given using three digits instead of two digits (e.g. **320105G130KT**).

### 2.6.9 Low level wind shear group (WSh<sub>x</sub>h<sub>x</sub>h<sub>x</sub>/dddffKT)

While the main effect of turbulence is related to erratic changes in altitude and/or behavior of the aircraft, the main effect of wind shear is the rapid gain or, more critical, loss of air speed. Therefore, for forecasting purposes, any cases of non-convective low level wind shear within 1,500 feet AGL will be labeled as WS. This group is not part of the international code but it is used in North American TAFs (this difference has been filed with the ICAO by Canada).

The low level wind shear group **shall** be included in a TAF whenever the forecaster has strong evidence to expect significant, non-convective wind shear which could adversely affect aircraft operation within 1,500 feet AGL.

To a large extent, wind shear is an element which, for the time being, cannot be satisfactorily observed from the ground. As a result, aircraft observations and radiosonde reports represent the only available evidence. However, the following guidelines could be used at the forecaster's discretion to establish whether significant non-convective wind shear hazardous to aircraft exists:

- 1) Vector magnitude exceeding 25 KT within 500 feet AGL
- 2) Vector magnitude exceeding 40 KT within 1,000 feet AGL
- 3) Vector magnitude exceeding 50 KT within 1,500 feet AGL
- 4) A pilot report of loss or gain of indicated air speed of 20 KT or more within 1,500 feet AGL

The low level wind shear group, when included, **shall** be encoded as `WS $h_xh_xh_x$ /dddffKT` where:

- `WS` means low level wind shear;
- `$h_xh_xh_x$`  represents the height (above ground) of the layer in which the low level wind shear is expected (e.g. `015` means 1500 feet above ground);
- `ddd` is the wind direction at level  `$h_xh_xh_x$`  (e.g. `240` means 240 degrees); and
- `ffKT` is the wind speed, in knots (KT), at level  `$h_xh_xh_x$`  (e.g. `45KT`).

**Note:** When the wind speeds at  `$h_xh_xh_x$`  is expected to be 100 KT or higher, a three-digit figure **shall** be used (e.g. `120KT`). Wind gusts **shall not** appear in this group.

### 2.6.10 Visibility group (`VVVV`)

The horizontal prevailing visibility group "`VVVV`" **shall** always be indicated in statute miles and fractions up to three miles, then in whole miles up to six miles (e.g. `2 1/2SM SHSN`, meaning visibility two and a half statute miles in light snow shower). The letters `SM` (statute miles) **shall** be added without a space to each forecast visibility to identify the unit.

Visibility values allowed are the following:

- 1) 0 to 3/4SM (in increments of one eighth [1/8] statute mile)
- 2) 3/4SM to 2 1/2SM (in increments of one quarter [1/4] statute mile)
- 3) 3SM to 6SM (in increments of one [1] statute mile)
- 4) P6SM (for visibility greater than six [6] statute miles)

When whole miles and fractions of a mile are used in combination, a space **shall** be placed between the whole mile and the fraction (e.g. `1 1/2SM`; `2 1/2SM`).

### 2.6.11 Significant weather group (w'w')

The significant weather group “w'w' ” is comprised of weather phenomena which may contain one or more forms of precipitation, obscuration or other (refer to Table 2, columns 3 to 5). Weather phenomena are preceded by one or more qualifiers, one of which describes the intensity or the proximity to the station of the phenomena. The other qualifier is a descriptor and describes the weather phenomena (refer to Table 2, columns 1 to 2).

**Table 2:** Significant present and forecast weather

| Qualifier<br>Intensity or<br>proximity<br>Column 1                                   | Qualifier<br>Descriptor<br>Column 2                                                                                                                                                                                                       | Weather<br>phenomena<br>Precipitation<br>Column 3                                                                                                                                                                     | Weather<br>phenomena<br>Obscuration<br>Column 4                                                                                                                                                                                                                                                | Weather<br>phenomena<br>Other<br>Column 5                                                                                                                                                                                                                                                                                                                    |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| - Light<br><b>Moderate</b><br>(no qualifier)<br>+ Heavy<br><b>VC</b> In the Vicinity | <b>MI</b> Shallow<br><b>BC</b> Patches<br><b>PR</b> Partial<br>(covering part of<br>the aerodrome)<br><b>DR</b> Low Drifting<br><b>BL</b> Blowing<br><b>SH</b> Shower(s)<br><b>TS</b> Thunderstorm<br><b>FZ</b> Freezing<br>(supercooled) | <b>DZ</b> Drizzle<br><b>RA</b> Rain<br><b>SN</b> Snow<br><b>SG</b> Snow Grains<br><b>IC</b> Ice Crystals<br>(Vis ≤ 6 SM)<br><b>PL</b> Ice Pellets<br><b>GR</b> Hail<br><b>GS</b> Small hail<br>and/or snow<br>pellets | <b>BR</b> Mist<br>(Vis ≥ 5/8 SM)<br><b>FG</b> Fog<br>(Vis < 5/8 SM)<br><b>FU</b> Smoke<br>(Vis ≤ 6 SM)<br><b>DU</b> Dust<br>(Vis ≤ 6 SM)<br><b>SA</b> Sand<br>(Vis ≤ 6 SM<br>shall be used<br>with BL)<br><b>HZ</b> Haze<br>(Vis ≤ 6 SM)<br><b>VA</b> Volcanic Ash<br>(with any<br>visibility) | <b>PO</b> Dust/Sand<br>Whirls (dust<br>devils)<br><b>SQ</b> Squalls<br><b>+FC</b> Tornado or<br>waterspout<br><b>FC</b> Funnel<br>Cloud(s)<br><b>SS</b> Sandstorm<br>(Vis 1/2 SM and<br>3/8 SM)<br><b>+SS</b> Sandstorm<br>(Vis 1/4 SM or<br>less)<br><b>DS</b> Dust storm<br>(Vis 1/2 SM and<br>3/8 SM)<br><b>+DS</b> Dust storm<br>(Vis 1/4 SM or<br>less) |

**Note:** Precipitation intensity refers to all forms combined.

**Note:** The forecast w'w' group(s) **shall** be indicated by considering columns 1 to 5 in the previous table in sequence, that is, intensity followed by weather phenomena (e.g. **+SHRA** for heavy shower of rain).

A **w'w'** group **shall** be indicated by selecting appropriate items from column 1 to 5 of Table 2 (in sequence) which describe the forecast weather. The **w'w'** group **shall** be ordered as follows:

- 1) first, if appropriate, the qualifier for intensity or proximity; followed without a space by, if appropriate,
- 2) the abbreviation for the descriptor; followed without a space by
- 3) the abbreviation for the forecast weather phenomenon or combination thereof.

The **w'w'** group **shall** be omitted if no significant weather is expected. The **w'w'** group **shall** also be omitted after a change group of the form **TEMPO/BECMG Y<sub>b</sub>Y<sub>b</sub>G<sub>b</sub>G<sub>b</sub>/Y<sub>e</sub>Y<sub>e</sub>G<sub>e</sub>G<sub>e</sub>** when it is not expected to differ from the preceding value. For example **...3SM BR SKC BECMG 0815/0816 BKN020 ...** This implies that the visibility/weather group **3SM BR** remains unchanged after the **BECMG**.

When two or three weather elements are indicated, the combined weather group will be considered as one entity. When one element is expected to change, the entire group **shall** be repeated. For example: **...4SM BR ... TEMPO 4SM -RA BR...** The **BR** is repeated because another element, namely **-RA**, is introduced. In addition, the visibility is also repeated because it is considered to be an integral part of the weather group.

In case of a “significant change” in visibility, the entire weather group **shall** also be repeated. A significant change (visibility, weather, cloud amounts, etc.) is a change for which, under normal circumstances, an amendment would be required.

In this example **...3SM -RA BR TEMPO 2108/2112 1SM -RA BR... -RA** and **BR** are indicated before and after the change group **TEMPO**, because a significant change in visibility is forecast.

Similarly, in the case of **...5SM -RA BR TEMPO 2108/2112 4SM -SN BR...**, the **BR** is repeated because a significant change in precipitation is forecast.

### 2.6.11.1 Qualifiers and descriptors

- 1) The “intensity qualifier” (Table 2 column 1) refers to the total precipitation of the weather group and is coded as plus “+” or minus “-”, meaning heavy or light as described in MANOBS. When the intensity of the phenomena is expected to be moderate, no indicator sign **shall** be indicated in the group.
- 2) In “precipitation types” where the intensity is not applicable such as ice crystals (IC), no intensity **shall** be included in the TAF. The intensity qualifier **shall** be indicated only with the following:
  - precipitation
  - dust storm or sandstorm (DS/SS)

**Note:** When associated with the proximity (VC) indicator or with the qualifiers BL and DR, the intensity of precipitation **shall not** be specified.

- 3) The “proximity (VC) qualifier” (Table 2, column 1) is used only when the following phenomena are expected to occur at a distance greater than 6 statute miles up to 10 statute miles from the centre of the runway complex (within roughly 5 to 9 nautical miles) except in the case of hub airports mentioned below, :
  - dust storm (DS)
  - sandstorm (SS)
  - fog (FG)
  - funnel cloud(s), tornado(es) or waterspout(s) (FC)
  - thunderstorm (TS)
  - shower (SH)
  - dust/sand whirls (PO)
  - blowing dust/sand/snow (BLDU/BLSA/BLSN)
  - volcanic ash (VA)

VCTS can be used in TAFs to describe air mass thunderstorm situations where there is high regional confidence of occurrence, but a corresponding low probability at the aerodrome. In situations where the terminal area covers a large region, as it is the case for the four Canadian hubs (CYYZ, CYVR, CYUL and CYYC), VC can be used with TS to describe organized thunderstorms occurring and/or expected to affect areas of importance (e.g. approaches, departures, terminal area entry fixes, etc. ) within the terminal area (±45SM /±40NM radius) but not the aerodrome itself.

- 4) “Descriptors” (Table 2, column 2): Not more than one descriptor **shall** be included in any **w’w’** group (e.g. **-FZDZ**). When more than one group is indicated, only one descriptor per group may be used (e.g. **-FZDZ**, **SHSNRA**, etc.).
- The descriptors shallow (**MI**), patches (**BC**) and partial (**PR**) **shall** be used only to forecast fog (**FG**). For example:
    - the term **MIFG** is used when the visibility within the fog layer between the ground and two metres above the ground level is expected to be less than 5/8 SM while the visibility above that layer is greater than 5/8 SM;
    - the term **BCFG** is used to forecast fog patches covering only part of the aerodrome and the visibility in the fog patch is expected to be less than 5/8 SM with the fog layer extending at least to two meters above ground level; and
    - the term **PRFG** (fog bank) **shall** be used to forecast fog covering a substantial part of the aerodrome while the remainder of the aerodrome is expected to be free of fog.
    - **MIFG**, **BCFG** and **PRFG** are to be used in association with visibility of P6SM only.
  - The descriptors low drifting (**DR**) **shall** be used only in combination with dust (**DU**), sand (**SA**) or snow (**SN**) when these are raised by the wind to less than two meters above the ground.
  - The descriptor **BL** (blowing) **shall** be used only in combination with **DU**, **SA** or **SN** to forecast dust, sand or snow raised by the wind to a height of two meters or more above the ground.

**Note:** When **SN** and **BLSN** are expected together, they **shall** be indicated in separate **w’w’** groups (e.g. **5SM -SN BLSN**).

- Shower (**SH**) **shall** be used only in combination with VC or one or more of the precipitation types, rain (**RA**), snow (**SN**), , snow pellets (**GS**), and/or hail (**GR**).
- Thunderstorm (**TS**) must either be stated alone or in combination with one or more of the precipitation types **RA**, **SN**, **GS**, and **GR**.
- Super-cooled, freezing (**FZ**) is used in combination with the weather types **FG** (e.g. **FZFG** when the visibility is expected to be less than 5/8 of a mile and the temperature is expected to be below freezing, except when the fog is composed entirely of ice crystals), drizzle (**DZ**), and **RA** (e.g. **-FZRA**).

**Note:** For a more detailed description of the above terms refer to the *Manual of Surface Weather Observation Standards* (MANOBS).

The various TAF constructs for thunderstorms and their implied meanings are outlined in the following table.

**Table 3:** Thunderstorm probability definitions

| Descriptor  | Probability of Occurrence at the Airport | Notes                                                                                                                               |
|-------------|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| MAIN TSRA   | 60 - 100%                                | High confidence, positive forecast of persistent CBs at the airport.                                                                |
| TEMPO TSRA  | 40 - 60%                                 | High confidence, positive forecast of temporary CBs at the airport.                                                                 |
| PROB40 TSRA | 40%                                      | Moderate to high probability forecast of CB at the airport.                                                                         |
| PROB30 TSRA | 30%                                      | Moderate probability forecast of CB at the airport.                                                                                 |
| TEMPO VCTS  | Approximately 20%                        | High confidence, positive forecast of disorganized air mass CBs in the region.<br>Low probability of CB directly impacting airport. |

## 2.6.11.2 Weather phenomena (Table 2, columns 3 to 5)

### 2.6.11.2.1 Precipitation

Types of “Precipitation” (Table 2, column 3) which are allowed in the TAF are the following:

- drizzle (**DZ**)
- rain (**RA**)
- snow (**SN**)
- snow grains (**SG**)
- ice crystals or diamond dust (**IC**) when the visibility is expected to be 6 SM or less
- ice pellets (**PL**)
- hail (**GR**)
- snow pellets and/or small hail (**GS**)

When more than one type of precipitation (Table 2, column 3) is forecast, the appropriate abbreviations **shall** be combined in a single group, according to regulations stated in this section, with the predominant type of precipitation being stated first. Not all precipitation types can be combined. Only **RA**, **SN**, **SG**, **PL**, **GR**, and **GS** (e.g. **SGPL**, **SNRA**, **PLSN**, etc.) can be combined, while **DZ** and **IC** cannot (e.g. **RADZ**, **SNIC**, etc. are not allowed). In such a single group, the intensity **shall** refer to the total precipitation (**-SHSNRA**) where **SN** is the predominant type of precipitation.

When more than one significant weather phenomenon other than a precipitation combination mentioned above is forecast, separate **w'w'** groups, but not more than three, **shall** be included in the forecast in accordance with Table 2 (e.g. **-FZDZ -SGSN BR**, etc.).

### 2.6.11.2.2 Obscuration

Obscuring phenomena (Table 2, column 4) are forecast whenever the prevailing visibility is expected to be six statute miles or less. The only exception is volcanic ash (**VA**) which, when expected, **shall** always be indicated regardless of visibility.

The obscuration **SA** (sand) **shall** only be used in combination with **BL** or **DR**.

### 2.6.11.2.3 Other

Other weather phenomena (Table 2, column 5) are classified as:

- dust/sand whirls (PO)
- squalls (SQ)
- funnel clouds(s) (FC)
- tornadoes or waterspouts (+FC)
- sandstorm (SS)
- dust storm (DS)

### 2.6.12 Alternative term NSW

The abbreviation “NSW” (no significant weather) is an alternate term for *w'w'*. It is used to replace the *w'w'* group after a change group of the form TEMPO/BECMG

$Y_b Y_b G_b G_b / Y_e Y_e G_e G_e$  to indicate the end of significant weather phenomena indicated in the *w'w'* group prior to the change. The term NSW **shall not** be used in the initial forecast period.

### 2.6.13 Cloud and obscuration groups ( $N_s N_s N_s h_s h_s h_s$ and $VV h_s h_s h_s$ )

The cloud or obscuration group “ $N_s N_s N_s h_s h_s h_s$ ” or “ $VV h_s h_s h_s$ ” **shall** be used in the initial time period and in any subsequent FM group(s) to indicate cumulative cloud amounts  $N_s N_s N_s$  and the height above ground  $h_s h_s h_s$  of the base of cloud layers in units of 100 feet. When the sky is totally obscured, the cloud group is replaced with the vertical visibility group  $VV h_s h_s h_s$ . In the absence of clouds, the term SKC (sky clear) **shall** be used.

#### 2.6.13.1 Cloud amount ( $N_s N_s N_s$ )

The cloud amount “ $N_s N_s N_s$ ” **shall** be given as SKC, FEW, SCT, BKN, and OVC as indicated in Table 4.

The code “ $N_s N_s N_s$ ” represents the total (cumulative) amount of cloud that the forecaster expects to occur at the level up to and including  $h_s h_s h_s$ .

The group “ $N_s N_s N_s h_s h_s h_s$ ” is limited to a maximum of three significant layers of cloud. The only exception is for cumulonimbus clouds (CB), which **shall** always be indicated when expected.

In case of a significant change in a cloud layer, the entire cloud group, including those cloud layers not expected to change, **shall** be repeated. A significant change in the clouds is intended to mean a change for which an amendment would be required.

**Table 4:** Sky cover terms

| Abbreviation | Cloud amount in oktas |
|--------------|-----------------------|
| SKC          | No cloud              |
| FEW          | Trace to 2 inclusive  |
| SCT          | 3 to 4 inclusive      |
| BKN          | 5 to 7 inclusive      |
| OVC          | 8                     |

Towering cumulus (TCU) and altocumulus castellanus (ACC) **shall** not be forecast. Only CBs **shall** be forecast. When expected, a CB cloud **shall** be indicated by adding the letter abbreviation “CB” to the cloud group without a space (e.g. ...BKN020CB...).

#### 2.6.13.2 Cloud height (h<sub>s</sub>h<sub>s</sub>h<sub>s</sub>)

The code “h<sub>s</sub>h<sub>s</sub>h<sub>s</sub>” represents the height of the base of the cloud layers, or the vertical visibility in a surface based layer in hundreds of feet above the ground. Cloud height (h<sub>s</sub>h<sub>s</sub>h<sub>s</sub>) **shall** be forecast according to the following intervals:

- 1) 100-foot increments from the surface to 1,500 feet
- 2) 500-foot increments from 1,500 feet to 3,000 feet
- 3) 1,000-foot increments above 3,000 feet

#### 2.6.13.3 Vertical visibility group (VVh<sub>s</sub>h<sub>s</sub>h<sub>s</sub>)

When the sky is expected to be obscured, the group “VVh<sub>s</sub>h<sub>s</sub>h<sub>s</sub>” **shall** be used in lieu of N<sub>s</sub>N<sub>s</sub>N<sub>s</sub>h<sub>s</sub>h<sub>s</sub>h<sub>s</sub>. In this case, VV is the indicator for vertical visibility and h<sub>s</sub>h<sub>s</sub>h<sub>s</sub> is the value of the vertical visibility in units of 100 feet, e.g. VV005, meaning vertical visibility is five hundred feet or obscured ceiling at five hundred feet above ground level (AGL).

#### 2.6.13.4 Alternative term SKC

The term sky clear “SKC” **shall** be used in Canada to forecast the absence of cloud or obscuration at the beginning of any self-contained part period. The reason for this practice is to avoid giving the impression that the group was inadvertently left out. In addition, the term SKC **shall** be used to replace the cloud or vertical visibility group after a change of the form TEMPO/BECMG Y<sub>b</sub>Y<sub>b</sub>G<sub>b</sub>G<sub>b</sub>/Y<sub>e</sub>Y<sub>e</sub>G<sub>e</sub>G<sub>e</sub> to indicate that the cloud or the obscuration is no longer expected.

#### 2.6.14 Probability group (**PROBC<sub>2</sub>C<sub>2</sub> Y<sub>b</sub>Y<sub>b</sub>G<sub>b</sub>G<sub>b</sub>/Y<sub>e</sub>Y<sub>e</sub>G<sub>e</sub>G<sub>e</sub>**)

In order to indicate the probability of occurrence of an alternative value(s) of a forecast condition, the group **PROBC<sub>2</sub>C<sub>2</sub> Y<sub>b</sub>Y<sub>b</sub>G<sub>b</sub>G<sub>b</sub>/Y<sub>e</sub>Y<sub>e</sub>G<sub>e</sub>G<sub>e</sub>** will be stated immediately before the alternative value(s).

The code “**C<sub>2</sub>C<sub>2</sub>**” represents the numerical probability, in percent, of the alternative value of the weather condition. There is no space between **PROB** and **C<sub>2</sub>C<sub>2</sub>**. Only the values **30** and **40** **shall** be allowed to indicate the probability 30% and 40% respectively.

A probability of less than 30% of actual values deviating from those forecast is not considered to justify the use of the group **PROBC<sub>2</sub>C<sub>2</sub>**. When the probability of an alternative value is 50% or more, this **shall** be indicated by the use of **BECMG**, **TEMPO**, or **FM** as appropriate.

The probability group **shall** be used to forecast weather phenomena that may adversely affect aircraft operations. These include the following:

- thunderstorms and associated phenomena
- freezing precipitation, ice pellets, and snow grains
- low level wind shear (within 1500 feet AGL)
- ceiling and visibility values important to aircraft operations (e.g. thresholds such as alternate and lowest approach limits)

Only one **PROBC<sub>2</sub>C<sub>2</sub>** group is allowed per self-contained part period. The probability group **PROBC<sub>2</sub>C<sub>2</sub>** **shall not** be used as a direct modifier of **BECMG** or **TEMPO**

**Y<sub>b</sub>Y<sub>b</sub>G<sub>b</sub>G<sub>b</sub>/Y<sub>e</sub>Y<sub>e</sub>G<sub>e</sub>G<sub>e</sub>** (e.g. ...**PROB40 TEMPO 0915/0918** ... or ...**PROB30 BECMG 0915/0916** ...is not allowed).

The combination **FM** (condition A) **PROB** (condition B) **BECMG** (condition C) is allowed, provided that the time period of the **PROB** group ends on or before the time the **BECMG** group begins, e.g. (condition A) **PROB40 0918/0922** (condition B) **BECMG 0922/0923** (condition C). The combination **FM** (condition A) **PROB** (condition B) **TEMPO** (condition C) is not allowed.

The time period of the **PROB** group cannot cross two self-contained part periods, i.e., the combination ... **FM271900** (condition A) **PROB 2719/2723** (condition B) **FM272200Z** (condition C)... is not allowed.

An exception to this rule, however, is allowed when hours and fraction of one-hour are used in the **FM** group. For example, the combination ....(condition A) **PROB 2718/2720** (condition B) **FM271930** (condition C) ... is allowed to indicate that the fluctuation in the weather condition stated in the **PROB** group will last until the beginning of the next self-contained part period, in this case, **271930Z**.

Similarly, the combination ... **FM271930** (condition A) **PROB 2719/2723** (condition B) ... is allowed to indicate that the fluctuation in the weather condition stated in the **PROB** group is expected to start at the beginning of the self-contained part period, in this case, **271930Z**.

**Note:** The reason for the above exceptions is that in a **PROB** group only whole hours are allowed to identify the period during which the possibility of some weather event may occur. In both the above cases, the overlap **shall** be less than one hour. This practice will give forecasters greater flexibility in the use of **PROB** in conjunction with an **FM** group not starting on a whole hour.

In any of the above and following examples, the ending of a group is to be understood as one minute prior to the time stated. For example, (condition A) **PROB30 2718/2721** (condition B) **BECMG 2723/2724** (condition C) is to be understood as a 30% probability of condition B existing from **271800Z** to **272059Z** and a permanent change from condition A to condition C between **272300Z** and **272359Z**.

### 2.6.15 Transitory change group **TEMPO** $Y_bY_bG_bG_b/Y_eY_eG_eG_e$

The transitory change group “**TEMPO**  $Y_bY_bG_bG_b/Y_eY_eG_eG_e$ ” **shall** be used when a temporary fluctuation in some or all of the elements forecast is expected to occur during the period  $Y_bY_bG_bG_b$  to  $Y_eY_eG_eG_e$ . This group **shall** be used only when the modified forecast condition is expected, in each instance, to last less than one hour and, if expected to recur, will not cover more than half of the forecast period during which the modified condition is expected to occur, i.e. the period indicated by  $Y_bY_bG_bG_b/Y_eY_eG_eG_e$ . When the modified forecast condition is expected to last more than one hour, a new change group of the form **FM** or **BECMG** **shall** be used. This transitory group **shall** be followed by a description of only those elements for which a change is forecast to occur. In other words, when an element is not indicated after **TEMPO**  $Y_bY_bG_bG_b/Y_eY_eG_eG_e$ , it **shall** be considered to be the same as it was prior to  $Y_bY_bG_bG_b$ .

Example: ...**FM271100** **VRB03KT** **3SM** **-RA BR** **OVC020** **TEMPO 2712/2715** **1SM** **-RA BR** **FM271500**

In the above example, the cloud group **OVC020** is not repeated after **TEMPO** because it is forecast to remain unchanged. On the other hand, the weather group **-RA BR** is repeated after **TEMPO** because a significant change in the visibility is forecast.

The time period “ $Y_bY_bG_bG_b/Y_eY_eG_eG_e$ ” **shall** always be stated following **TEMPO**, even in those cases where it spans the same time period as the self-contained part period (e.g. ...**FM271500** (condition A) **TEMPO 2715/2720** (condition B) **FM272000** ...)

The time period of the **TEMPO** group cannot cross two self-contained part periods, e.g., the combination ... **FM271900** (condition A) **TEMPO 2721/2801** (condition B) **FM272300** (condition C)... is not allowed.

An exception to this rule, however, is allowed when hours and fraction of one-hour are used in the **FM** group. For example, the combination ... (condition A) **TEMPO 2718/2720** (condition B) **FM271930** (condition C) ... is allowed to indicate that the fluctuation in the weather condition stated in the **TEMPO** group will last until the beginning of the next self-contained part period, in this case, **271930Z**.

Similarly, the combination ... **FM271930** (condition A) **TEMPO 2719/2723** (condition B) ... is allowed to indicate that the fluctuation in the weather condition stated in the **TEMPO** group is expected to start at the beginning of the self-contained part period, in this case, **271930Z**.

**Note:** The reason for the above exceptions is that in a **TEMPO** group only whole hours are allowed to identify the period during which some weather fluctuations are expected. In both the above cases, the overlap **shall** be less than one hour. This practice will give forecasters greater flexibility in the use of **TEMPO** in conjunction with a **FM** group not starting on a whole hour.

The combination **FM** (condition A) **TEMPO** (condition B) **PROB** (condition C) is allowed, provided that the time period specified in the **PROB** group is the same as or a subset of the time period specified in the **TEMPO** group. For example: **FM** (condition A) **TEMPO 2719/2723** (condition B) **PROB30 2720/2723** (condition C)..., or the **PROB** group begins at the same time or after the **TEMPO** group ends. For example: **FM** (condition A) **TEMPO 2715/2720** (condition B) **PROB30 2720/2723** (condition C). Only one such combination per self-contained part period is allowed.

The combination **FM** (condition A) **TEMPO** (condition B) **BECMG** (condition C) is allowed, provided that the weather condition specified in the **BECMG** group is forecast to occur after the time period specified in the **TEMPO** group (e.g. [condition A] **TEMPO 2718/2722** [condition B] **BECMG 2723/2801** [condition C]).

An exception to the above rule is allowed when a change in wind speed and/or direction is the only change expected in the **BECMG**. In such cases, a **BECMG** group embedded in a larger **TEMPO** group can be used. For example, the combination: **FM** (condition A) **TEMPO 2714/2721** (condition B) **BECMG 2719/2720 30015KT** ...is allowed. Only one combination of **TEMPO** and **BECMG** is allowed per self-contained part period. In the **TEMPO/BECMG** combination the **TEMPO** group **shall** come first. In other words, the combination ... (condition B) **BECMG** (condition C) **TEMPO** (condition D) is not allowed.

Normally, only one **TEMPO** group should be used per self-contained part period. A maximum of two **TEMPO** groups may be used when the following conditions are met: neither of them are used in combination with a **BECMG** or **PROB** group, only one weather element is changing in each **TEMPO** and that their timings do not overlap. For example: **FM271000** (condition A) **TEMPO 2714/2717 OVC010** **TEMPO 2717/2720 4SM -SHSN**. In this case the visibility and the weather are considered only one element, because when the visibility changes, the weather responsible for the change **shall** also be stated even if it remained the same.

The triple combination of the groups **TEMPO** ... **PROB** ... **BECMG** is not allowed. For example, **FM** (condition A) **TEMPO 2715/2720** (condition B) **PROB30 2717/2720** (condition C) **BECMG 2721/2722** (condition C) is not allowed.

## 2.6.16 Change groups **FMYYGGgg** and **BECMG Y<sub>b</sub>Y<sub>b</sub>G<sub>b</sub>G<sub>b</sub>/Y<sub>e</sub>Y<sub>e</sub>G<sub>e</sub>G<sub>e</sub>**

These groups **shall** be used when, during the entire period of the forecast (Y<sub>1</sub>Y<sub>1</sub>G<sub>1</sub>G<sub>1</sub> to Y<sub>2</sub>Y<sub>2</sub>G<sub>2</sub>G<sub>2</sub>), a permanent change in some or all of the elements forecast is expected to occur at an intermediate time YYGGgg or during the period Y<sub>b</sub>Y<sub>b</sub>G<sub>b</sub>G<sub>b</sub> to Y<sub>e</sub>Y<sub>e</sub>G<sub>e</sub>G<sub>e</sub>.

### 2.6.16.1 FMYYGGgg

The period of validity of a TAF may be divided into two or more self-contained part periods. Such divisions, when required, **shall** be done with the use of the group “FMYYGGgg” where:

- **FM** is the abbreviation for “from”; and
- **YYGGgg** is the date, hour and minutes in UTC at which the permanent change is expected.

The group **FMYYGGgg** is used to indicate a permanent change (typically over a period of one hour or less) of meteorological conditions expected to occur at time **GGggZ** on day **YY**.

Most often, the “gg” will take the form “00”, indicating a whole hour. However, the timing of changes should be as detailed as the supporting data and forecaster knowledge will allow. If a forecaster can determine a change and/or events to a finer resolution, particularly in the early hours of the forecast period, then the use of the “gg” to indicate timing to some fraction of an hour is encouraged (e.g. **FM271830**, **FM081215**).

When the group **FMYYGGgg** is used, all forecast conditions given before this group are superseded by the conditions indicated after the group. In other words, a complete forecast will follow and all weather elements **shall** be indicated.

When hours and minutes are used to begin a new self-contained part period (e.g. **FM261930**), any group of the form **PROB/TEMPO** used after the **FM** group and intended to start at the same time as the **FM** group, **shall** be indicated as starting on the whole hour before the fraction of the hour stated in the **FM** group. For example, **FM081230** (condition A) **TEMPO 0812/0816** (condition B)...meaning that the group **TEMPO** starts at 1230Z rather than at 1200Z. Similarly, a group of the form **PROB/TEMPO** used before such a **FM** group and intended to end with the beginning of the new **FM** group **shall** be indicated as ending on the whole hour after the fraction of the hour stated in the new **FM** group. For example: ... (condition A) **TEMPO 0818/0820** (condition B) **FM081930** (condition C) ... meaning that the group **TEMPO** ends at 1930Z rather than 2000Z. The same reasoning applies to the **PROB** group.

For the sake of clarity, each **FM** group will start a new forecast line with the proper indentation. This is done automatically by the national bulletin preparation software.

**Note:** Forecasters are encouraged to subdivide the valid period of the TAF using **FMYYGGgg** as often as possible rather than using the forecast change indicator **BECMG**. The rationale behind this is that a **FMYYGGgg** group is a more complete group, therefore more effective and useful to users.

#### 2.6.16.2 **BECMG Y<sub>b</sub>Y<sub>b</sub>G<sub>b</sub>G<sub>b</sub>/Y<sub>e</sub>Y<sub>e</sub>G<sub>e</sub>G<sub>e</sub>**

The change group “**BECMG Y<sub>b</sub>Y<sub>b</sub>G<sub>b</sub>G<sub>b</sub>/Y<sub>e</sub>Y<sub>e</sub>G<sub>e</sub>G<sub>e</sub>**” **shall** indicate a gradual evolution of meteorological conditions between time Y<sub>b</sub>Y<sub>b</sub>G<sub>b</sub>G<sub>b</sub> and time Y<sub>e</sub>Y<sub>e</sub>G<sub>e</sub>G<sub>e</sub>. The duration of the period from Y<sub>b</sub>Y<sub>b</sub>G<sub>b</sub>G<sub>b</sub> to Y<sub>e</sub>Y<sub>e</sub>G<sub>e</sub>G<sub>e</sub> should normally not exceed two hours and **shall** never exceed four (e.g. ...**BECMG 1721/1722** ... or ... **BECMG 1722/1800**...)

This permanent change group **shall** be followed by a description of only those weather elements for which a change is forecast to occur. In other words, if a weather element is not indicated after **BECMG Y<sub>b</sub>Y<sub>b</sub>G<sub>b</sub>G<sub>b</sub>/Y<sub>e</sub>Y<sub>e</sub>G<sub>e</sub>G<sub>e</sub>**, it **shall** be considered to be the same as it was prior to Y<sub>b</sub>Y<sub>b</sub>G<sub>b</sub>G<sub>b</sub>.

**Note:** The forecaster **shall** exercise judgment when deciding to use the change group **FMYYGGgg** or **BECMG Y<sub>b</sub>Y<sub>b</sub>G<sub>b</sub>G<sub>b</sub>/Y<sub>e</sub>Y<sub>e</sub>G<sub>e</sub>G<sub>e</sub>**. As a rule, to keep the forecast clear and unambiguous, using the change group **BECMG Y<sub>b</sub>Y<sub>b</sub>G<sub>b</sub>G<sub>b</sub>/Y<sub>e</sub>Y<sub>e</sub>G<sub>e</sub>G<sub>e</sub>** should be kept at a minimum and confined to those cases where only one or at most two weather elements are expected to change. In those cases where more than two weather elements are expected to change, the permanent change group **FMYYGGgg** should be used to start a new self-contained part period.

Normally, only one **BECMG** group should be used in the same self-contained part period. A maximum of two **BECMG** groups are allowed in a self-contained part period when only one weather element at a time is changing.

Example: ...(condition A) **BECMG 1713/1715 1SM BR BECMG 1715/1717 4SM BR** ... or (condition A) **BECMG 1714/1715 34015KT BECMG 1717/1718 4SM -SHSN** ...

In this case, the visibility and the weather are considered only one element; when the visibility changes, the weather responsible for the change **shall** always be stated even if it remained the same.

The combinations of **BECMG/PROB** and **BECMG/TEMPO** are not allowed. For example, **FM** (condition A) **BECMG** (condition B) **PROB/TEMPO** (condition C) are not allowed. Refer to 2.6.12 and 2.6.13 for the use of **BECMG** when it follows a **PROB** or **TEMPO** group respectively.

## 2.6.17 Remarks (**RMK**)

Remarks should be included at the end of a TAF preceded by the designator “**RMK**”.

### 2.6.17.1 Valid TAF remarks

The following remarks are authorized when a regularly scheduled TAF is issued or when amending an existing TAF as appropriate:

- 1) **FCST BASED ON AUTO OBS**
- 2) When one or more sensors are non-representative of the current weather but there are other means of obtaining the pertinent information:
  - **AUTO OBS REP NON-REPRESENTATIVE WIND**
  - **AUTO OBS REP NON-REPRESENTATIVE VIS**
  - **AUTO OBS REP NON-REPRESENTATIVE CLD**
  - **AUTO OBS REP NON-REPRESENTATIVE T**
  - **AUTO OBS REP NON-REPRESENTATIVE DP**
  - **AUTO OBS REP NON-REPRESENTATIVE PCPN**
  - **AUTO OBS NON-REPRESENTATIVE OF CRNT WX**
- 3) When one or more sensors are inoperative but there are other means of obtaining the pertinent weather information, the forecaster can maintain the TAF in effect by adding the proper remark:
  - **WIND SENSOR INOP**
  - **VIS SENSOR INOP**
  - **CLD SENSOR INOP**
  - **PCPN SENSOR INOP**
  - **T SENSOR INOP**
  - **DP SENSOR INOP**
  - **FCST BASED ON OBS BY OTHER SRCS**
- 4) Remark stating the next scheduled issue of a TAF
  - **NXT FCST BY YYGGggZ**, where **YY** is the date, **GG** is the UTC hour and **gg** is ‘00’ minutes.

**Note:** Remarks listed in 2) and 3) above should be included when forecasters are confident of the weather condition at the aerodrome and that it is safe not to cancel the TAF. The last remark from list 3) can be used when two or more sensors are not reporting or reporting non-representative observations. When two or more TAF elements are not being reported or reported with non-representative data, the forecaster should err on the side of caution and cancel the TAF.

If, for any reasons, forecasters are not confident of the actual weather condition at the aerodrome and/or consider that the one missing/non-representative element is critical to issuing the TAF, they should cancel it using the remarks stated in 2.6.17.2 section 2) and 3).

#### **2.6.17.2 Cancelled or nil TAF remarks**

The following remarks are authorized as appropriate when a cancelled or a nil TAF is issued:

- 1) Remarks stating lack of observations:
  - NO OBS
  - INSUFFICIENT OBS (for nil TAFs only)
- 2) Remarks stating that the observations reported cannot be used to issue a valid TAF:
  - WIND SENSOR MALFUNCTION
  - VIS SENSOR MALFUNCTION
  - CLD SENSOR MALFUNCTION
  - T SENSOR MALFUNCTION
  - PCPN SENSOR MALFUNCTION
  - SENSORS MALFUNCTION
- 3) Remarks stating which missing observation element is required to issue a valid TAF:
  - WIND SENSOR INOP
  - VIS SENSOR INOP
  - CLD SENSOR INOP
  - PCPN SENSOR INOP
  - T SENSOR INOP
  - SENSORS INOP
- 4) Remarks stating other reasons for the lack of TAF:
  - WX CNTR CONTINGENCY
  - END OF FLY PROGRAM

### 2.6.17.3 Aerodrome advisory remarks

The following remarks are authorized as appropriate when an aerodrome advisory is issued:

- **ADVISORY OFFSITE**
- **ADVISORY OBS INCOMPLETE**
- **ADVISORY NO SPECI**

## 2.7 Aerodrome advisories

Aerodrome advisories may be issued in place of aerodrome forecasts, for the reasons outlined in the following sections. Their advisory status will be indicated with a remark in the remark section.

### 2.7.1 Offsite (**OFFSITE**)

To be used when the forecast is based on observations that are not always considered to be representative of the actual weather conditions at the airport. In normal situations, an observation **shall** be considered representative of the weather conditions at the aerodrome if it is taken within 1.6 NM (3 km) of the geometric centre of the runway complex.

In cases where the 1.6 NM (3 km) criteria does not apply because of local characteristics, the representativeness of an observation **shall** be determined and approved by Transport Canada for civilian aerodromes, or by the Director of Meteorology and Oceanography for military aerodromes.

The words “**ADVISORY OFFSITE**” **shall** appear in the remark section after the abbreviation “**RMK**” (e.g. **TAF ... RMK ADVISORY OFFSITE. NXT FCST BY 221800Z=**).

### 2.7.2 Observation incomplete (**OBS INCOMPLETE**)

The term “**OBS INCOMPLETE**” is to be used when the forecast is based on observations with missing or incomplete data on a regular basis (e.g. MSL pressure not reported).

The words “**ADVISORY OBS INCOMPLETE**” **shall** appear in the remark section after the abbreviation “**RMK**” (e.g. **TAF ... RMK ADVISORY OBS INCOMPLETE. NXT FCST BY 221800Z=**).

### 2.7.3 No specials (**NO SPECI**)

The term “**NO SPECI**” is to be used when the forecast is based on observations from a station with a limited observing program that does not issue special weather observations.

The words “**ADVISORY NO SPECI**” **shall** appear in the remark section after the abbreviation “**RMK**” (e.g. **TAF ... RMK ADVISORY NO SPECI. T SENSOR INOP. NXT FCST BY 221800Z=**).

## 2.8 Updated forecasts

An updated forecast is a forecast issued on a scheduled basis which replaces the previous TAF without extending its period of validity. Updated forecasts are issued at the request of NAV CANADA usually for major, high traffic aerodromes. Normally, updated TAFs are issued for aerodromes whose regular TAFs have a period of validity of 24 or 30 hours; however, this is not a necessary condition. Updated TAFs, since they are more recent forecasts, are intended to provide more accurate information than their predecessors, especially in the short range, and will normally be scheduled for issuance three hours following each regular TAF issue. In some cases NAV CANADA may decide that at certain times of the day, due to low traffic volume, the issuance of updated TAFs is not required (e.g. overnight).

An updated TAF does not extend the period of validity of the TAF that it supersedes. For example, if a 24 hour TAF covering a period from 041200Z to 051200Z is updated at 041440Z, the updated TAF **shall** indicate a period of validity as 0415/0512 (i.e. 041500-051200Z). As with other TAFs, an updated TAF is valid from the time it is issued until it is amended or until it is superseded by the next issue of the regular TAF for the same aerodrome.

In preparing both regular and updated TAFs, forecasters should attempt to provide as much precision as supporting data will allow to the first six hours of its period of validity. In particular, forecasters are encouraged to time the start of new part-periods as precisely as possible (i.e. using hours and minutes as described in 2.6.16.1).

## 2.9 TAF amendments

A TAF **shall** be amended when the forecast conditions are no longer representative of the actual or expected conditions according to criteria listed in 2.9.5.

TAF amendment response time and performance thresholds **shall** be agreed upon between the meteorological service provider and its client. The meteorological service provider **shall** demonstrate performance against the established thresholds. TAF performance relative to these targets is to be reviewed, deviations investigated and continuous improvement implemented.

The time in the telecommunication header of an amended TAF **shall** indicate the whole hour (UTC) that precedes the time of entry to the collection circuit of the last regularly scheduled bulletin containing that TAF (refer to 2.5.1).

The date/time group **YYGGggZ** in the bulletin, however, **shall** indicate the date and time of origin of the amended TAF. For example, a first amendment of a regular TAF for CYYZ issued at 1845Z on the 21st day of the month **shall** be issued as:

**TAF AMD CYYZ 211845Z 2118/2300...**

An amended forecast covers the remaining period of the original forecast and is identified by **AA(X)** in the telecommunication header (refer to 2.5.1) and by the prefix **TAF AMD** in place of **TAF** on the following line.

### **2.9.1 Responsibility for issuing amended TAFs**

A forecaster must use initiative, discretion, and good judgment in determining when amendments should be issued. It must be emphasized that both the responsibility and the authority for issuing amendments rest with the forecaster and the supervising meteorologist.

TAFs should be amended whenever they become, in the forecaster's judgment, unrepresentative of existing or expected weather conditions. Furthermore, forecasters should strive to issue amended TAFs proactively rather than reactively.

### **2.9.2 Amendments based on **PROB C<sub>2</sub>C<sub>2</sub> Y<sub>b</sub>Y<sub>b</sub>G<sub>b</sub>G<sub>b</sub>/Y<sub>e</sub>Y<sub>e</sub>G<sub>e</sub>G<sub>e</sub>****

The group "**PROB C<sub>2</sub>C<sub>2</sub> Y<sub>b</sub>Y<sub>b</sub>G<sub>b</sub>G<sub>b</sub>/Y<sub>e</sub>Y<sub>e</sub>G<sub>e</sub>G<sub>e</sub>**" may be used to state the probability of occurrence of a weather phenomenon significant to aviation. If low ceilings and/or visibility conditions introduced by this probability group are observed and are considered to be a short lived phenomenon that will last for less than one-half hour and not expected to recur, it is not necessary to amend the TAF. In other cases (i.e. **TS**, **GR**, **FC**, **+FC**, **FZRA**, **FZDZ**, **PL**, **SG** and **L LVL WS**) or when the phenomenon is expected to last for a longer period or to recur, an amendment is always required regardless of their duration.

### **2.9.3 Amendments based on human/machine mix**

There is no requirement to amend or update a TAF solely due to a change in the type of observations.

### **2.9.4 Amendments to aerodrome advisories**

Aerodrome advisories are to be amended according to the amendment criteria set out in 2.9.5.

### **2.9.5 Amendment criteria**

An amendment **shall** be issued when the actual or expected weather condition is in a different category than the forecast condition.

A weather category is defined by the lower of either the ceiling or the visibility.

### 2.9.5.1 Cloud and visibility

The principal weather categories are delineated by the following thresholds:

- 1) Ceiling 2,500 feet and visibility six miles (generally representative of non-alternate IFR threshold)
- 2) Ceiling 1,000 feet and visibility three miles (threshold between VFR and IFR)
- 3) Alternate limits for the aerodrome
- 4) IFR approach limits for the aerodrome
- 5) Additional limits as determined by other responsible parties

Limits for categories three, four and five are provided by NAV CANADA, DND or other responsible parties in line with TC regulation. These limits are published in Appendix A of this manual which gets updated in MANAIR Circulars several times a year between MANAIR publications.

For amendment purposes, each of the above thresholds are part of and included in the category immediately above the threshold. This means that for deteriorating conditions, a change in category occurs when either the ceiling or the visibility crosses the threshold value leading to the next lower category. On the other hand, for improving conditions, both ceiling and visibility must cross the threshold values leading to the next higher category.

**Note:** A TAF does not need to be amended for changes in ceiling or visibility when both the forecast and observed values are less than the lowest published landing minima for the aerodrome. This rule is valid provided that the lowest approach limits for the aerodrome are not higher than the IFR threshold (1000 feet/3 statute miles). In such cases, an amendment is required when the weather condition crosses the IFR threshold. For example, if the lowest approach limit of an aerodrome is 1500/4 and the TAF calls for 1200/3, an amendment is needed if the weather condition lowers to below 1000/3.

### 2.9.5.2 Weather and visibility

- 1) Thunderstorms, hail, tornado, funnel clouds, and waterspouts: An amendment **shall** be issued when thunderstorms, hail, tornado, funnel clouds or waterspouts are observed or expected to occur and were not forecast or when they were forecast and subsequently no longer expected to occur. These rules apply with no exception, regardless of the value of the visibility and the duration of the phenomenon.

- 2) Freezing precipitation, freezing fog, ice pellets, and snow grains: An amendment **shall** be issued when freezing precipitation, freezing fog, ice pellets, or snow grains at the surface are observed or expected to occur and are not forecast or when they are forecast and subsequently no longer expected to occur. These rules apply with no exception, regardless of the value of the visibility and the duration of the phenomenon.
- 3) Rain, snow, snow pellets (or small hail), ice crystals and drizzle: An amendment **shall** be issued when rain, snow, snow pellets, ice crystals or drizzle, lowering visibility to less than six statute miles, is observed or is expected to occur and is not forecast. Similarly, an amendment **shall** also be issued when the same type of precipitation, lowering visibility to less than six statute miles, is forecast and subsequently is no longer expected to occur. When the visibility remains six statute miles or greater before and after the onset of precipitation, there is no need to amend a TAF for the onset or cessation of rain, snow, snow pellets, ice crystals or drizzle.
- 4) Precipitation state change: When precipitation, listed in 3 above, is observed and the state of the precipitation (liquid or solid) is not the same as forecast, then an amended forecast is required, provided that the visibility due to precipitation is reduced to less than six statute miles. Similarly, when precipitation of the forecast state is not occurring and is no longer expected to occur, then an amended forecast is required provided that the visibility was originally forecast to be less than six statute miles.
- 5) Obscurations and blowing snow: When a change in visibility due to an obscuring phenomenon or blowing snow is observed or is expected to occur and is not forecast, a TAF amendment is required only if the visibility lowers to less than six statute miles. Similarly, when such a change is forecast and subsequently is no longer expected to occur, an amended TAF is required provided that the visibility was originally forecast to be less than six statute miles. The only exception is volcanic ash which requires an amendment, when not forecast, regardless of the value of the visibility. All other obscuring phenomenon (BR, FG, FU, DU, BLDU, SA, BLSA, HZ) as well as BLSN are considered equivalent given the same visibility.
- 6) Sand storms, dust storms and squalls: An amendment **shall** be issued when these weather phenomena are observed or expected to occur and were not forecast or when they were forecast and subsequently no longer expected to occur. These rules apply with no exception, regardless of the value of the visibility and the duration of the phenomenon.

### 2.9.5.3 Winds

An amendment **shall** be issued when:

1) Speed

- the observed speed is double or more, or half or less of the forecast value and either the observed or forecast value is greater than 15 KT; or
- the difference between the observed and forecast speed is 20 KT or more.

2) Direction

- the observed direction differs by at least 45 degrees from the forecast value for all observed speeds greater than 15 KT.

### 2.9.5.4 Low level wind shear

An amendment **shall** be issued when a strong wind shear (as defined in 2.6.7) was not forecast but subsequently occurs or is expected to occur or when it was forecast but subsequently is no longer expected to occur. In addition, if the forecast wind speed, direction, or height of the wind shear layer is not representative of the actual condition, the forecaster can amend the TAF at their discretion.

## 2.10 Cancellation of TAFs

When a TAF must be cancelled, it **shall** be done by the issuance of an amended TAF. The format and reasons for cancelling TAFs are stated in 2.10.1 and 2.10.2. The reason for the cancellation **shall** be included in the remark section of the TAF. The list of allowable remarks is stated in 2.6.17.

Once a TAF for an aerodrome has been cancelled due to missing/insufficient observations or missing/incorrect elements, the TAF service **shall** not be reinstated until one hourly observation is received in VFR conditions or two consecutive hourly observations are received in below VFR conditions. In both cases, the forecast **shall** be issued within 20 minutes after the appropriate observation is received.

However, until the conditions previously stated have been met and problems with the missing/insufficient observations have been resolved, any following regular scheduled issue of that TAF **shall** be issued as a nil TAF.

### 2.10.1 Cancellation for missing observations

In the event that scheduled hourly observations are not received, the forecaster **shall** determine the reason for the missing observations.

If the observations were not received because of a telecommunication problem, the forecaster **shall** make every reasonable effort to obtain them, whenever possible, by alternative means. If two consecutive hourly observations from an aerodrome cannot be obtained, the TAF for that aerodrome **shall** be cancelled.

1) For an existing TAF:

When an existing TAF must be cancelled because of a lack of weather observations, an amended TAF to cancel the existing one **shall** be issued. As opposed to the format of a regular amendment, the validity period of a cancelled TAF covers the same period as the last issued TAF for that aerodrome. This indicates that the previously issued TAF is no longer valid. For example:

TAF AMD CYQG 052035Z 0518/0618 CNL  
RMK NO OBS. NXT FCST BY 060000Z=

2) For the first TAF of the day at an aerodrome with a partial program:

When weather observations are not available or are insufficient for issuing the first TAF of the day at an aerodrome operating under a partial program (less than 24 hours per day), the first regular TAF of the day **shall** be issued as a nil TAF according to the two following formats as appropriate:

TAF CYPQ 101140Z NIL  
RMK NO OBS. NXT FCST BY 101800Z=

*or*

TAF CYPQ 101140Z NIL  
RMK INSUFFICIENT OBS. NXT FCST BY 101800Z=

### 2.10.2 Cancellation due to unreliable or missing AWOS observation element(s)

A forecaster may cancel a TAF for an aerodrome equipped with a stand-alone AWOS site when:

- 1) The observation of any critical element is missing or believed to be incorrect or affected by a mechanical malfunction for two hours; and
- 2) All attempts have failed to determine a reasonable inferred value(s) based on sound meteorological knowledge and techniques.

As stated in 2.3.1, no single element is necessarily critical. After analyzing available data from other sources (e.g. satellite imagery, radar pictures), if, in the forecaster's judgment, missing one element (other than dew point temperature and MSL pressure) will have a negative impact on the quality of the aerodrome forecast, the forecast should not be maintained. In the above circumstances, the TAF **shall** contain a brief explanation for its cancellation in the remark section according to the following:

a) In the event the forecast is cancelled due to missing element(s) and forecaster's inability to infer a reasonable value, the TAF **shall** include one of the following statements:

- CLD SENSOR INOP
- VIS SENSOR INOP
- PCPN SENSOR INOP
- T SENSOR INOP
- WIND SENSOR INOP
- SENSORS INOP

Example:

TAF AMD CYTL 201910Z 2018/2102 CNL

RMK CLD SENSOR INOP. NXT FCST BY 202000Z=

**Note:** The last statement in the previous list **shall** be used when more than one of the sensors is inoperative.

b) In the event the forecast is cancelled due to sensor malfunction or incorrect observation element(s) and forecaster inability to infer a reasonable value, the TAF **shall** include one of the following statements:

- CLD SENSOR MALFUNCTION
- VIS SENSOR MALFUNCTION
- PCPN SENSOR MALFUNCTION
- T SENSOR MALFUNCTION
- WIND SENSOR MALFUNCTION
- SENSORS MALFUNCTION

Example:

TAF AMD CYTL 281615Z 2814/2902 CNL

RMK VIS SENSOR MALFUNCTION. NXT FCST BY 282000Z=

**Note:** The last phrase in the previous list **shall** be used when more than one of the sensors are malfunctioning or more than one of the elements are deemed to be incorrect.

If a forecaster is capable of inferring a reasonable value for the current weather, and this is in agreement with the current TAF but differs from the AWOS observation, the forecaster does not have to cancel the TAF. In such a situation, the forecaster **shall** amend the TAF to include an explanatory note in the remark section justifying the difference between the AWOS observation and the TAF as indicated in 2.6.17.1.

## 2.11 Corrections

When typographical errors and/or forecast text omissions are made in the original TAF and are such that the information content of the TAF is unclear or subject to misinterpretation, the TAF **shall** be corrected by sending an amendment. Corrections to Canadian TAFs are handled as regular amendments.

As such, the rules pertaining to amendments outlined in 2.9 and to the telecommunication header for amendments outlined in 2.5.1 apply.

## 2.12 Examples of TAFS

Example (1):

FTCN24 CWAQ 101300

TAF CYTL 101340Z 1014/1102 24010KT P6SM BKN030 TEMPO 1018/1020  
5SM -SHRA BR

FM102000 24005KT P6SM SKC

RMK FCST BASED ON AUTO OBS. NXT FCST BY 102000Z=

Example (2):

FTCN24 CWAQ 101300 AAA

TAF AMD CYTL 101530Z 1014/1102 CNL

RMK VIS SENSOR MALFUNCTION. NXT FCST BY 102000Z=

Example (3):

FTCN34 CWAQ 011700

TAF CYWG 011740Z 0118/0218 28015KT P6SM -SNRA SCT015 OVC040 TEMPO  
0118/0124 2SM -SNRA BR OVC015

FM020000 28015KT P6SM BKN030 BKN250 TEMPO 0200/0203 P6SM -SHRA

FM021000 30015KT P6SM SKC

RMK NXT FCST BY 020000Z=

**Note:** If an updated TAF were scheduled for CYWG, then the remark in the above example would say: NXT FCST BY 012100Z.

Example (4):

FTCN35 CWA0 021700

TAF CYYZ 021740Z 0218/0324 30015G25KT P6SM SCT015 OVC025 PROB30

0218/0223 3SM TSRA BKN015CB

FM022300 30010G20KT P6SM SKC

FM031000 VRB03KT 4SM BR SKC TEMPO 0310/0313 3/4SM BR

BECMG 0314/0316 P6SM NSW

RMK NXT FCST BY 022100Z=

Example (5):

FTCN39 CWA0 021100

TAF CYYR 021140Z 0212/0312 VRB03KT 2SM BR BKN025

FM021230 27015KT P6SM SKC

RMK NXT FCST BY 021800Z=

Example (6):

FTCN38 CWA0 020500

TAF CYQX 020540Z 0206/0306 13005KT 1SM -DZ BR OVC005 TEMPO 0206/0210

1/4SM DZ FG VV002

FM021300 31005KT 4SM BR SKC TEMPO 0302/0306 3/4SM BR SCT005

RMK NXT FCST BY 021200Z=

Example (7):

FTCN32 CWA0 151700 AAC

TAF AMD CYEG 151912Z 1519/1618 27015G35KT 3SM -TSRA SCT008 OVC015CB

TEMPO 1520/1523 VRB25G45KT 1SM TSRAGS OVC008CB PROB30

1520/1523 1/2SM +TSRAGR

FM160000 33015G25KT P6SM SKC

BECMG 1609/1610 33005KT

RMK NXT FCST BY 152100Z=

Example (8):

FTCN36 CWA0 231400 AAA  
TAF AMD CYUL 231515Z 2315/2412 30015KT 2SM -SHSN OVC010  
FM231615 27015KT P6SM BKN030 OVC060 TEMPO 2321/2405 4SM -SHSN  
FM240500 27015KT P6SM SKC  
BECMG 2409/2411 00000KT  
RMK NXT FCST BY 231800Z=

**Note:** Example (8) represents the first amendment since the last regular forecast update.

Example (9):

FTCN36 CWA0 051100  
TAF CYFB 051140Z 0512/0612 04025G45KT WS015/12060KT P6SM SKC  
FM051330 36010G20KT P6SM SCT030 TEMPO 0518/0522 3SM -SHSN BKN030  
FM060000 36005KT P6SM SKC  
RMK NXT FCST BY 051800Z=

Example (10):

FTCN36 CWA0 090500  
TAF CYOW 090540Z 0906/1006 04015KT 1SM -FZRA -SN OVC010  
FM090730 27015G25KT P6SM SCT010 OVC025 TEMPO 0913/1005 P6SM -SHRA  
RMK NXT FCST BY 090900Z=

Example (11):

FTCN39 CWA0 171100 AAA  
TAF AMD CYZX 171152Z 1712/1812 00000KT 1SM BR SKC  
FM171315 VRB03KT 3SM BR SKC BECMG 1713/1715 P6SM NSW SCT020  
FM180600 VRB03KT 2SM BR SKC TEMPO 1809/1811 1/4SM FG VV001  
RMK NXT FCST BY 171800Z=

**Note:** Example (11) represents the first amendment issued since the last regular issue of the forecast. “AMD” is used in the body of the forecast.

Example (12):

FTCN38 CWA0 151300  
TAF CYEU 151340Z 1514/1602 32010KT P6SM SKC  
FM151720 32015G25KT P6SM FEW025 TEMPO 1517/1521 BKN025  
RMK ADVISORY OFFSITE. NXT FCST BY 152000Z=

Example (13):

FTCN35 CWAO 181700  
TAF CYYZ 181740Z 1818/1924 24010KT 6SM HZ BKN250  
FM181930 32015G25KT P6SM SKC  
BECMG 1822/1823 30005KT BKN025  
RMK NXT FCST BY 182100Z=

Example (14):

FTCN35 CWAO 101100 AAB  
TAF AMD CYHM 101215Z 1012/1112 20010KT 6SM HZ BKN250  
FM101700 22015KT 6SM -SN BKN030 TEMPO 1017/1020 5SM -FZRA -SN  
FM102100 23005KT P6SM SKC  
RMK NXT FCST BY 101800Z=

Example (15):

FTCN31 CWAO 192000  
TAF CYVR 192040Z 1921/2024 26015KT 3SM BR BKN020 TEMPO 1921/1923 1SM  
-SHRA BR  
FM200300 24005KT 3SM BR SCT020  
FM200700 VRB03KT 1 1/4SM BR SCT004 TEMPO 2009/2011 1/2SM FG BKN004  
BECMG 2013/2015 5SM BR  
FM201600 24010KT P6SM SKC  
RMK NXT FCST BY 200000Z=

**Note:** The TAF in example (15) is an updated forecast.

Example (16):

FTCN35 CWAO 151700  
TAF CYVV 151740Z 1518/1603 24045G70KT P6SM SQ BKN030  
FM151930 32020G40KT P6SM BKN030 TEMPO 1520/1523 P6SM -SHRA  
RMK NXT FCST BY 160000Z=

Example (17):

FTCN35 CWAO 171100  
TAF CYQG 171140Z 1712/1812 26015KT 6SM -FZRA BR SCT010CB OVC020  
TEMPO 1712/1715 4SM TS -FZRA BR  
FM171500 34010G20KT P6SM OVC015 TEMPO 1717/1722 4SM -SHSN OVC025  
FM172300 34005KT P6SM SKC  
RMK NXT FCST BY 171800Z=

Example (18):

FTCN31 CWAO 202300

TAF CYAZ 202340Z 2100/2103 26010KT 5SM HZ FEW030

BECMG 2001/2002 P6SM NSW SKC

RMK NXT FCST WILL BE ISSUED AT 211445Z=

Example (19):

FTCN35 CWAO 201300

TAF CYPQ 201340Z NIL

RMK INSUFFICIENT OBS. NXT FCST BY 202000Z=

## Chapter 3 Forecasts in digital form of the wind and temperature aloft

### 3.1 Purpose

Forecasts in digital form of the winds and the temperatures aloft (FBCN) are prepared to meet aeronautical requirements for flight planning and to complete documentation for flights within Canada and between Canada and the United States, Greenland, Mexico and the Caribbean. The FB wind and temperature forecasts are a replacement of the FD forecasts. However, FD forecasts will remain available for a transitional period. The differences between the FD and FB forecasts include four issues per day instead of two; changes to the period of use and format changes to the headers.

### 3.2 Content and issuing offices

Objective forecasts of upper wind and temperature are issued by the Canadian Centre for Meteorological and Environmental Prediction (CCMEP) for the locations listed in Appendix B.

The CCMEP issues the [FBCN31](#), [FBCN33](#) and [FBCN35](#) CWAQ messages for the 3,000-foot; 6,000-foot; 9,000-foot; 12,000-foot and 18,000-foot levels above sea level (ASL). The 3,000-foot level is omitted when the terrain elevation is greater than 1,500 feet.

Note that the FB forecasts are based on a Numerical Weather Prediction (NWP) model. Because NWP models cannot fully resolve all terrain features, there can be, in areas of highly variable terrain (e.g. mountainous areas) instances of significant difference between actual and model station elevation. There are cases where the actual station elevation lies below 1,500 feet, but the model elevation for that station lies close to or above 3,000 feet. In such cases, the 3,000-foot forecasts are omitted. These cases are clearly noted in Appendix B.

Temperatures are never forecast for the 3,000-foot level.

The U.S. National Weather Service (NWS) issues objective forecasts of upper winds and temperatures for the same locations as the CCMEP, but for the 24,000-foot, 30,000-foot, 34,000-foot, 39,000-foot, 45,000-foot and 53,000-foot levels. These forecasts are transmitted under the headers [FBCN31](#), [FBCN33](#) and [FBCN35](#) [KWNO](#).

### 3.3 Issue times and periods of use

Wind and temperature forecasts in digital form (FB) are prepared four times daily and are based on 0000 UTC, 0600 UTC, 1200 UTC and 1800 UTC data, respectively. When FB are generated, 6, 12, 18, 24, 30 and 36-hour forecasts are created. The 6-hour, 12-hour and 24-hour forecasts become respectively the [FBCN31](#), [FBCN33](#) and [FBCN35](#) messages, and are transmitted via the ECCC telecommunications network.

The 12-hour, 18-hour and 30-hour forecasts are kept as backups in case of computer problems in the subsequent forecast cycle. The 18-hour, 24-hour and 36-hour forecasts are also kept as back-ups; they are used when computer problems affect two consecutive forecast cycles.

Each of the 6-hour, 12-hour and 24-hour forecasts (or their backups when applicable), though valid for a particular time (denoted as “Valid Time”), applies to a specific period, called “Period of Use.” The following table gives the times of issue, the valid times and the periods of use of each forecast.

**Table 5:** Issue times and periods of use

| Header      | Observation time (UTC) | Approximate issue time (UTC) | Valid time (UTC) | Period of use (UTC) |
|-------------|------------------------|------------------------------|------------------|---------------------|
| FBCN31 CWA0 | 0000                   | 0320                         | 0600             | 0200-0900           |
| FBCN33 CWA0 | 0000                   | 0330                         | 1200             | 0900-1800           |
| FBCN35 CWA0 | 0000                   | 0330                         | 0000             | 1800-0600           |
| FBCN31 CWA0 | 0600                   | 0920                         | 1200             | 0800-1500           |
| FBCN33 CWA0 | 0600                   | 0930                         | 1800             | 1500-0000           |
| FBCN35 CWA0 | 0600                   | 0930                         | 0600             | 0000-1200           |
| FBCN31 CWA0 | 1200                   | 1520                         | 1800             | 1400-2100           |
| FBCN33 CWA0 | 1200                   | 1530                         | 0000             | 2100-0600           |
| FBCN35 CWA0 | 1200                   | 1530                         | 1200             | 0600-1800           |
| FBCN31 CWA0 | 1800                   | 2120                         | 0000             | 2000-0300           |
| FBCN33 CWA0 | 1800                   | 2130                         | 0600             | 0300-1200           |
| FBCN35 CWA0 | 1800                   | 2130                         | 1800             | 1200-0000           |

**Note (1):** Although their headers indicate a later time, the **FBCN31**, **FBCN33** and **FBCN35 CWAO** forecasts are normally available on ECCC circuits towards 0300 UTC (forecasts based on 0000 UTC data), 0900 UTC (forecasts based on 0600 UTC data), 1500 UTC (forecasts based on 1200 UTC data) and 2100 UTC (forecasts based on 1800 UTC data).

**Note (2):** The headers in the **FBCN31**, **FBCN33** and **FBCN35 KWNO** forecast bulletins generally indicate the issue time.

### 3.4 Format

The symbolic form of the forecast is “**ddfftt**”, where **dd** is the wind direction in tens of degrees with respect to true north, **ff** is the wind speed in knots, and **tt** is the temperature in degrees Celsius.

Wind speeds from 100 KT to 199 KT are indicated by subtracting 100 from the speed and adding 50 to the direction (e.g. 240 degrees at 130 KT is coded **7430**). Speeds in excess of 199 KT are coded as if they were of 199 KT (e.g. winds from 90 degrees at 210 KT are coded **5999**, as would winds of 199 KT). Finally, wind speeds less than five knots are indicated by **9900**.

The sign of the temperature is indicated as plus “+” or minus “-”, for levels below 24,000 feet. Above 24,000 feet, the sign of the temperature is not indicated.

The CMC issues its regular FBCN bulletins in the following format:

**FBCN31 CWAO 090320**

**DATA BASED ON 090000Z**

**VALID 090600Z FOR USE 0200-0900Z.**

|     | 3000 | 6000    | 9000    | 12000   | 18000   |
|-----|------|---------|---------|---------|---------|
| YVR | 2118 | 2322+04 | 2435+01 | 2447-08 | 2456-18 |
| YYF | 1818 | 2125+03 | 2136+01 | 2129-07 | 2134-19 |

The NWS issues its FBCN bulletins in the format of the following example:

FBCN31 KWNO 090158

FD1CN1

DATA BASED ON 090000Z

VALID 090600Z FOR USE 0200-0900Z. TEMPS NEG ABV 24000 FT

|     |         |        |        |        |        |        |
|-----|---------|--------|--------|--------|--------|--------|
|     | 24000   | 30000  | 34000  | 39000  | 45000  | 53000  |
| YVR | 0815-28 | 092043 | 081848 | 051249 | 331449 | 340653 |
| YYF | 1315-27 | 132043 | 132050 | 121151 | 280750 | 280652 |

**Note:** the FBCN KWNO bulletins contain an AWIPS header for internal NWS use on the second line of the forecast bulletin.

When an FB is issued based on a backup forecast (refer to 3.3), the first line of the FB is modified by adding the remark “**COMPUTER INOPERATIVE ON DDTTTT DATA**”, where **DDTTTT** represents the date and time of the data on which the **FBCN31**, **FBCN33** and **FBCN35** bulletins would have been based under normal circumstances (refer to table 5).

Consequently, when a bulletin is based on backup forecasts, the CCMEP indicates the situation as shown in the following example:

FBCN31 CWA0 150320

COMPUTER INOPERATIVE ON 150000Z DATA

DATA BASED ON 141200Z

VALID 150600Z FOR USE 0200-0900Z.

|     |      |         |         |         |         |
|-----|------|---------|---------|---------|---------|
|     | 3000 | 6000    | 9000    | 12000   | 18000   |
| YVR | 0608 | 0710-05 | 0419-07 | 0227-11 | 3641-18 |
| YYF | 0308 | 0411-07 | 0316-12 | 0225-15 | 0130-21 |

## Chapter 4 Graphic Area Forecast (GFA)

### 4.1 Definition

A graphic area forecast (GFA) consists of six charts:

- two valid at  $T_0+0$  hr (the beginning of the forecast period);
- two valid at  $T_0+6$  hr (six hours into the forecast period); and
- two valid at  $T_0+12$  hr (the end of the forecast period).

Of the two charts valid at each time, one shows the clouds and weather portion; the other shows the icing, turbulence and freezing level for the same time and area.

In addition, the  $T+12$  clouds and weather chart contains a worded instrument flight rules (IFR) outlook extending over the subsequent 12-hour period. For a full description of these charts, refer to 4.9 and C.2 of Appendix C.

### 4.2 Purpose

Ascent and descent planning information for higher performance aircraft is an important but secondary function of the GFA. The GFA is designed primarily to meet general aviation and regional air carrier requirements for pre-flight route planning in Canada. Each panel graphically describes the most probable meteorological conditions expected to occur between the surface and 24,000 feet over a given area at a specified time.

### 4.3 Issue and valid times

A GFA is issued to reach users approximately half an hour before the beginning of the forecast period (that is, half an hour before  $T_0$ ).

A GFA is issued at 2330, 0530, 1130 and 1730 UTC, and issues are valid at 0000, 0600, 1200 and 1800 UTC respectively. Each GFA issue includes a 0, 6 and 12 hour forecast as well as an IFR outlook for the subsequent 12 hours.

### 4.4 Domain

There are seven GFA domains which cover the entire domestic airspace as well as a portion of Gander oceanic airspace for which Canada has the responsibility for the provision of air traffic control services. Refer to C.1 of Appendix C for the map of the seven GFA domains.

## 4.5 Units

Units to be used in the GFA are the conventional ones used in North America as listed:

- horizontal distance: measured in nautical miles (NM)
- speed: measured in knots (KT)
- atmospheric pressure: measured in hectopascals (hPa)
- wind direction: measured in degrees true
- horizontal visibility: measured in statute miles and fractions of statute miles (SM)
- cloud height: measured in hundreds of feet above sea level (ASL), with the exception of ceilings which are above ground level (AGL)
- base and top of areas of icing and turbulence: measured in hundreds of feet ASL
- freezing level: measured in hundreds of feet ASL
- time: measured in UTC (Z) with midnight indicated by the numerals zero and zero “00”

## 4.6 Map projection, scale and background

As per the *Technical Regulations*, Volume II, Meteorological Service for International Air Navigation, section [C.3.3] 3.2.2 (WMO-No. 49), the map **shall** use the polar stereographic projection true at 60 degrees latitude north.

For clarity, the map background contains the following features:

- provincial, federal and territorial boundaries
- oceans, coastlines and major lakes
- Canadian airports for which a TAF is issued (indicated as a black circle)

The scale of the map is chosen to allow the map to fit in the appropriate space on the chart. All charts include a scale bar in their corresponding legend box to help users determine approximate distances on the map.

## 4.7 Characters, abbreviations and symbols

The number and type of characters, abbreviations and symbols allowed in the GFA are limited to those familiar to and fully understood by all users of the product. These are described in the TP 14371, *Transport Canada Aeronautical Information Manual* (TC AIM), and they are already used in other graphical products (such as SIG WX prognoses) currently issued for the aviation industry.

### 4.7.1 Abbreviations

A GFA is prepared in abbreviated English language using approved MSC abbreviations as published in the *Manual of Word Abbreviations* (MANAB). If an abbreviation is not defined, plain English **shall** be used.

### 4.7.2 Symbols

The following is the list of symbols allowed in a GFA:

- fronts (cold, warm, stationary, surface and upper)
- troughs
- high and low pressure centres
- frontal waves
- surface and upper troughs
- direction-of-motion arrows
- freezing rain and freezing drizzle
- ice pellets
- wind barbs
- icing (moderate and severe)
- turbulence (moderate and severe)
- thunderstorms
- tropical cyclones (storm and hurricane)
- volcanoes
- radioactive releases

Refer to C.2 of Appendix C for examples of symbols.

## 4.8 Page layout

The page layout displays the title box, the legend box and the comments box in a column along the right-hand side of the chart. The remainder of the page depicts significant clouds and weather or icing, turbulence and freezing level.

### 4.8.1 Title box

The title box must include: chart name; four-letter ID of the centre transmitting the charts (CWAQ refers to the Canadian Centre for Meteorological and Environmental Prediction/Network Operations (CCMEP/NETOPS)); date and time of issue; the name of the GFA region; chart type; and valid date and time of the chart. This box must be placed in the upper right-hand corner of the chart.

Example of a title box for a clouds and weather chart:

|                    |                  |
|--------------------|------------------|
| GFACN33 CWAQ       |                  |
| REGION             |                  |
| ONTARIO – QUÉBEC   |                  |
| CLOUDS AND WEATHER |                  |
| NUAGES ET TEMPS    |                  |
| ISSUED AT          | 25/06/2021 1732Z |
| EMIS A             |                  |
| VALID AT           | 26/06/2021 0600Z |
| VALIDE A           |                  |

Example of a title box for an icing, turbulence and freezing levels chart:

|                  |                  |
|------------------|------------------|
| GFACN33 CWAQ     |                  |
| REGION           |                  |
| ONTARIO – QUÉBEC |                  |
| ICE TURB & FZLVL |                  |
| ISSUED AT        | 25/06/2021 1732Z |
| EMIS A           |                  |
| VALID AT         | 26/06/2021 0600Z |
| VALIDE A         |                  |

### 4.8.2 Legend box

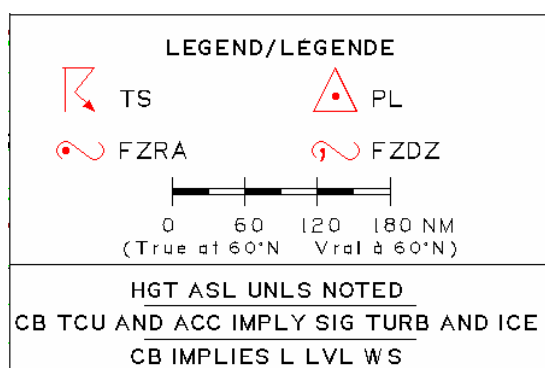
The legend box includes the less common symbols used in the depiction itself. In addition, this box must include a scale bar to help users determine distances on the chart. This box is as wide as the title box and is located immediately below it. Just underneath the legend box are the following three standard phrases:

HGTS ASL UNLS NOTED

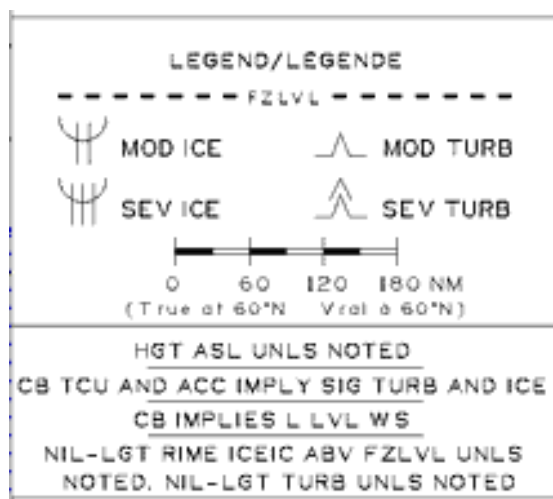
CB TCU AND ACC IMPLY SIG TURB AND ICE

CB IMPLIES L LVL WS

Example of a legend box for a clouds and weather chart:



Example of a legend box for an icing, turbulence and freezing levels chart:



### 4.8.3 Comments box

The comments box provides any information that forecasters consider important (such as formation or dissipation of fog that decreases or increases the visibility from one category to another).

The box may also be used to describe elements that, if added to the depiction, would clutter the chart. Furthermore, the comments box of the  $T_0+12$  hr clouds and weather chart also includes a 12-hour IFR outlook statement.

Example of a comment box for a clouds and weather chart:

| COMMENTS / COMMENTAIRES                                                                                                                                                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PTCHY 3-5SM FU DNWND FSTFR<br>OVR NRN ON EXC LCA 1/2SM FU VC<br>FSTFR.                                                                                                 |
| A: 25 OVC 60. P6SM. PTCHY 1/2SM<br>-DZ FG CIGS 4 AGL.                                                                                                                  |
| B: OCNL TCU 180 2SM SHRA CIGS 8<br>AGL. ISOL CB 340 1 1/2SM TSRA<br>BR MNLY SRN SECN                                                                                   |
| ----- IFR OTLK -----<br>VALID: 12-24Z. 01 JUL/JUL 2021<br>CIGS/VIS SHRA BR CNTRL ON/CNTRL<br>QC. CIGS/VIS RASN NRN<br>HSNBA/NUNAVIK. CIGS/VIS FG/BR<br>LKSUPR/NERN ON. |

Example of a comment box for an icing, turbulence and freezing levels chart:

| COMMENTS / COMMENTAIRES                      |
|----------------------------------------------|
| COR: ADDED MISG WSPD TO L LVL<br>JET NRN QC. |

## **4.9 Content of the GFA**

A description of the content of the GFA is given in this section. Examples of GFA content are given in C.2 and C.4 of Appendix C.

### **4.9.1 Clouds and weather chart**

The clouds and weather chart includes clear and concise information on cloud layers and surface-based phenomena, visibility, weather and obstructions to vision at the valid time of the chart. In addition, this chart includes all relevant synoptic features present and responsible for the weather, indicating their speed and direction of motion at the valid time.

This chart must contain the following:

- 1) Title box
- 2) Legend box
- 3) Comments box, which includes the IFR outlook only on the  $T_0+12$  hr depiction
- 4) CLDS and WX indicating:
  - synoptic features
  - speed and direction of motion of synoptic features at the valid time
  - organized areas of clouds
  - organized areas of precipitation
  - organized areas of obstruction to vision
  - visibility, weather and obstructions to vision
  - isobars
  - strong surface winds and gusts
  - IFR outlook only on the  $T_0+12$  hr chart

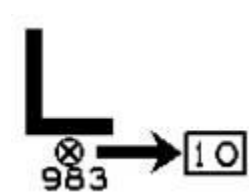
|                    |          |
|--------------------|----------|
| Clouds and weather | Title    |
|                    | Legend   |
|                    | Comments |

**Figure 1:** GFA clouds and weather chart

**4.9.1.1 Synoptic features**

Synoptic features, such as lows, highs, fronts and troughs are indicated with the corresponding symbolic representation used in surface analyses. When the motion of a main synoptic feature is expected to be five knots or more, it is indicated by an arrow for the direction, with the speed in knots enclosed in a box as follows.

Example: Synoptic features



When the motion of a main synoptic feature is expected to be slower than five knots, the term STNR, for stationary, is used.

### 4.9.1.2 Clouds

#### 4.9.1.2.1 Cloud area and amount

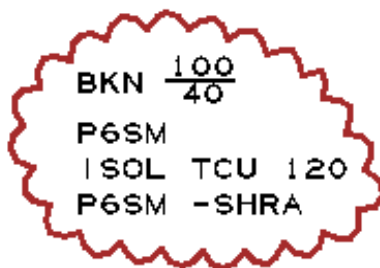
A brown scalloped border encloses organized areas of broken (BKN) or overcast (OVC) cloud between the surface and 24,000 feet. However, when convective clouds are expected (such as TCU, ACC and CB), tops are stated, when known, even if they extend above the 24,000-foot level. Significant cloud layers are based on the amount at each level, not on the summation amount. They are stated using the abbreviations allowed by the *Manual of Word Abbreviations* (MANAB). When the main cloud deck contains more than one significant cloud layer, the cloud amount description depends on the spacing between the layers. When it is less than 2,000 feet, the descriptor represents the summation amount across all the layers, and the term LYR is included immediately after it. When the spacing is 2,000 feet or greater, each layer is stated, with its own descriptor that applies only to that layer. Altitudes of bases and tops of all layers are given, together with the amount. Cirrus clouds are not mentioned in the GFA. Sky conditions are indicated alphanumerically (e.g. SCT).

**Table 6:** Cloud amount definition

| Abbreviation | Definition                                 |
|--------------|--------------------------------------------|
| SKC          | Sky completely free of cloud               |
| FEW          | Cumulative coverage is 1-2 oktas inclusive |
| SCT          | Cumulative coverage is 3-4 oktas inclusive |
| BKN          | Cumulative coverage is 5-7 oktas inclusive |
| OVC          | Cumulative coverage is 8 oktas             |

In areas where there are no organized clouds and the visibility is expected to be greater than six statute miles (P6SM), the terms SKC, FEW or SCT (whichever one is appropriate) are used.

Example of organized broken clouds with embedded convective clouds:



#### **4.9.1.2.2 Cloud type**

Cloud type is not indicated with the exception of convective clouds (CU, TCU, ACC and CB) which are always indicated regardless of amount.

#### **4.9.1.2.3 Cloud base and top**

The height of both the base and top of clouds are indicated. All heights are stated in hundreds of feet (for example, 2 means 200 feet, 40 means 4000 feet). Unless otherwise specified, all heights in the depiction are the vertical distances above sea level (altitudes). This rule is defined on all graphic charts by including the note **HGT ASL UNLESS NOTED** at the bottom of the legend box.

When, in a particular case, heights are given with respect to ground level instead of sea level, this situation is clearly stated by using the ceiling designator **CIGS** with the indicator **AGL** (above ground level).

Example: **LCA CIGS 5 AGL**

In mountainous areas, the ceiling designator should be used with caution. Instead, when low layers of cloud are expected to obscure portions of mountainous terrain, statements such as **HYR TRRN OBSCD**, **MT OBSCD ABV 30**, **MT TOPS OBSCD** and **ALL PASSES CLSD** may be added to emphasize the expected conditions.

Ranges of variability in the altitudes of cloud bases should not be stated when the bases are expected to be 2,500 feet or more above the highest terrain in the area. Bases and tops are stated for all cloud layers, provided there is a minimum spacing of 2,000 feet between cloud layers.

When convective clouds are expected (such as TCU, ACC and CB), tops are stated, even if they extend above the 24,000-foot level. These tops being usually quite variable only the upper limit of the convective clouds is forecast unless different convective cloud types have a different spatial coverage. In addition, only the most likely time for significant development to start is forecast.

By convention, the base and top of clouds are indicated immediately in the form of a fraction whose denominator is the base and the numerator is the top of the cloud, both in hundreds of feet above sea level. When an organized area of clouds exists in layers with little separation, then the term LYR can be used to describe them.

Example of cloud description:

|         |                  |
|---------|------------------|
| BKN LVR | <u>160</u><br>80 |
| SCT     | <u>60</u><br>30  |

#### 4.9.1.2.4 Convective clouds

As mentioned in 4.9.1.2.3 unlike other types of cloud, convective cloud tops are always explicitly stated, even when they extend above the 24,000-foot level. The type of convective cloud is also stated, regardless of whether or not it is the main cloud or embedded within another cloud deck. As well, if CBs are present with thunderstorms, the appropriate symbol (TS) is added to the area. In dealing with convective clouds and the precipitation associated with them, a qualifier may be used to specify the amount of cloud and another may refer to the visibility associated with the precipitation generated by the convective cloud. However, in most cases, the qualifier will be the same and does not need to be repeated. In the description **ISOL TCU 180 2SM -SHSN**, the descriptor **ISOL** is not repeated for the **SHSN**, it is implied that both the TCUs and the snow showers are isolated. In those cases when **ISOL**, **OCNL** or **FRQ** convective clouds are embedded in a larger area of clouds, the base of the clouds is not stated, only the top. However, if only a convective cloud is present, both the base and the top must be stated, as would be with non-convective cloud.

The following qualifiers regarding convective clouds and associated showers are used in a GFA according to the following spatial coverage definitions when the cloud is in association with another main cloud description.

**Table 7:** Convective cloud qualifiers description and coverage

| Abbreviation | Description | Coverage                       |
|--------------|-------------|--------------------------------|
| ISOL         | Isolated    | 25% or less                    |
| OCNL         | Occasional  | Greater than 25% and up to 50% |
| FRQ          | Frequent    | Greater than 50%               |

Under certain circumstances, a spatial qualifier is used without associating it to an enclosed area. In such a case, a reference is made to the geographical location where the phenomenon is expected to occur

Example: **OVR XTRM NRN SECN ISOL TCU 180 P6SM -SHRA**

#### 4.9.1.2.5 Surface-based layers

Surface-based layers are described by stating the vertical visibility in hundreds of feet.

Example (1): **OVR/VC LKSUPR LCA 1/4SM BLSN CIGS 0 AGL**

If the top of the surface-based layer is well defined, then it is stated in a similar fashion.

Example (2): **XTNSV 1/4-1SM FG/BR CIGS 0-2 AGL TOP 15**

#### 4.9.1.3 Weather, visibility and obstruction to vision

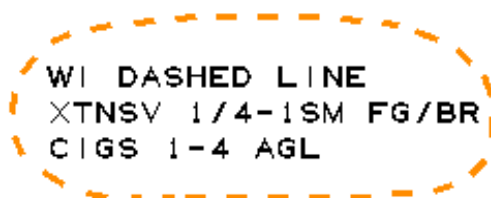
The following qualifiers regarding restriction to visibility, non-convective precipitation and ceilings may be used in a GFA according to the following spatial coverage definitions.

**Table 8:** Non-convective weather qualifiers description and coverage

| Abbreviation | Description | Coverage                       |
|--------------|-------------|--------------------------------|
| LCA          | Local       | 25% or less                    |
| PTCHY        | Patchy      | Greater than 25% and up to 50% |
| XTNSV        | Extensive   | Greater than 50%               |

The percentage of the area coverage specified by a qualifier refers to the area where the actual weather phenomenon is expected to occur. For instance, the following example means that more than 50% of the area enclosed within the dashed orange line is forecast to have a visibility lowered to 1/4-1SM by mist or fog.

Example of lowered cloud and visibility due to mist or fog:

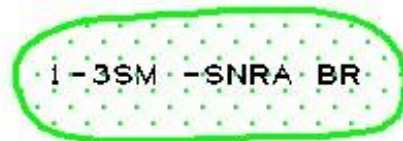


Alternatively, a spatial qualifier may be used without associating it to an enclosed area. In such case, a reference is made to the geographical location (e.g. over SWRN SK) where the phenomenon is expected to occur.

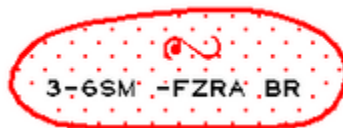
#### 4.9.1.3.1 Precipitation

- 1) **Continuous precipitation:** Areas of continuous precipitation that are XTNSV are enclosed in continuous green lines with the inside area stippled. Red is used instead of green for freezing precipitation. The description of the precipitation and the visibility is stated inside the area.

Example (1): Continuous precipitation

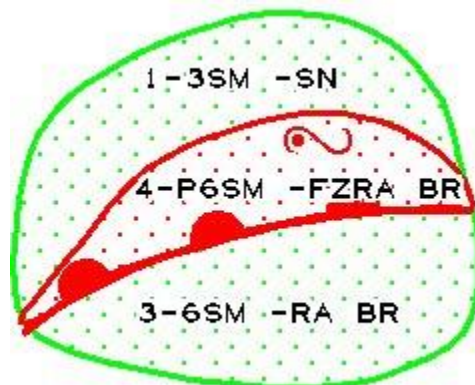


Example (2): Continuous freezing precipitation



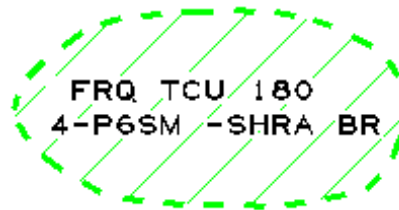
- 2) **Contiguous areas of different types of continuous precipitation:** An area of continuous precipitation containing marked changes in precipitation types is separated by either a solid green or red line depending on the precipitation type change.

Example: Contiguous areas of different types of continuous precipitation



- 3) **Convective or intermittent precipitation:** Areas of convective or organized but intermittent precipitation are enclosed in a dashed green line with the area hatched. This is used when associated with convective clouds described as FRQ, BKN or OVC which represent a greater than 50% coverage of the area. Similarly for intermittent, it refers to an XTNSV area of stratiform precipitation that is not continuous, also representing a greater than 50% coverage of the area. The description of the precipitation and the visibility is stated inside the area.

Example: Convective or intermittent precipitation



An area of intermittent precipitation containing marked changes in precipitation types is treated in a manner similar to continuous precipitation. The only difference is the use of a dashed line to separate the precipitation types.

- 4) **Disorganized precipitation:** Disorganized precipitation is indicated alphanumerically without the use of an enclosed area, either at the location of expected occurrence or by specifying the location. For example:

ALG TROF ISOL TCU 150 P6SM -SHRA

ONSHR FLO LKSUPR OCNL TCU 150 1/2-2SM SHSN/-SHSN

IN VLYS LCA 4SM -FZRA BR

#### 4.9.1.3.2 Visibility

The visibility, in statute miles, is always included. When the visibility is expected to be greater than six miles, it is indicated as **P6SM**.

#### 4.9.1.3.3 Obstruction to vision

A significant area with visibility restricted to six statute miles or less is depicted by an enclosed dashed orange line with the description stated inside the area or in the comment box. If this area is also affected by precipitation, it is not depicted separately because the obstruction to vision is already included in the precipitation group (e.g. [1/2-2SM -RA FG/BR](#)).

Example: Obstruction to vision depiction



For unorganized obstruction to vision, a description is either put directly on the chart or in the comments box.

Example: **ALG CST LWR N SHR QC LCA 3/4SM BR**

### **Smoke from forest fires**

The main aviation hazard posed by forest fires is reduced visibility due to smoke. The actual and forecast extent of the area affected by smoke from a forest fire can be difficult to determine. A statement about reduced visibility due to smoke is included in the following comment.

Example: **PTCHY 3-5SM FU DNWIND FSTFR E OF PRINCE RUPERT EXC LCA 1/2SM FU VC FSTFR.**

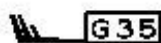
The extent of the area affected by reduced visibility due to smoke from a forest fire may also be depicted by an orange dashed line used for obstructions to vision.

#### **4.9.1.4 Isobars**

Isobars are included on the clouds and weather chart only. They are depicted as solid black lines with units in hectopascal (hPa), drawn every four hectopascal using 1000 hPa as a reference.

#### **4.9.1.5 Strong surface winds**

The direction and speed of strong surface winds are indicated by using wind barbs for wind speed and direction for all areas where winds are expected to have a mean sustained speed of at least 20 KT. Wind gusts are indicated when speeds of at least 10 KT greater than the mean sustained winds are forecast. The gusts are indicated by the letter “G”, followed by the gust speed in knots, enclosed in a box, as indicated by the following symbol.



When accompanied by strong gusts, mean sustained winds of less than 20 KT may also be indicated in the GFA, at the forecaster’s discretion, if moderate mechanical turbulence is expected to occur as a result of the wind gusts.

#### **4.9.1.6 IFR outlook**

The outlook is included in the comments box as part of the T<sub>0</sub>+12 hr clouds and weather chart. It should be fairly general and indicate the areas where organized IFR weather is expected within the subsequent 12 hours. In addition, it should state the cause of the IFR weather, along with weather hazards, if any. For example, if IFR ceilings were expected over eastern New Brunswick, the IFR outlook would say **CIGS/VIS RA/SN/BLSN/BR ERN NB.**

#### **4.9.1.6.1 Tropical cyclones**

Tropical cyclones, when expected in a GFA domain, will be described following the guidance of the Canadian Hurricane Centre of the MSC in collaboration with the designated ICAO Tropical Cyclone Advisory Centre. Examples of tropical cyclone depiction are found in C.2 of Appendix C.

#### **4.9.1.6.2 Volcanic ash**

Volcanic ash, when expected in a GFA domain, will be described following the guidance of a designated ICAO Volcanic Ash Advisory Centre (VAAC).

Volcanic ash is not depicted in a GFA. When it is expected within a GFA domain, it is mentioned in the comment box of the CLDS & WX CHART in the following format.

##### **VOLCANIC ERUPTION**

NAME OF VOLCANO - COUNTRY

LOCATION OF VOLCANO - (LAT/LONG IN DEGREES AND TENTHS OF A DEGREE)

FIRST ERUPTION (xxxxZ day/month/year)

STATUS OF THE ERUPTION (CONTINUING OR ENDED)

**CHECK SIGMETS FOR VOLCANIC ASH POSITION**

Example: Volcanic ash comment box

##### **VOLCANIC ERUPTION**

EYJAFJALLAJOKULL - ICELAND

N6337 W01937

FIRST ERUPTION 1826Z 14/04/2012

CONTINUING

**CHECK SIGMETS FOR VOLCANIC ASH POSITION**

Additionally, if the volcano at source of the event lies within a GFA domain, a volcanic eruption symbol is placed at the approximate location of the volcano on the chart. An example of the volcanic eruption symbol is found in C.2 of Appendix C.

#### **4.9.1.6.3 Radioactive cloud (release)**

Radioactive cloud (release), if expected in a GFA domain, will be described following the guidance of the Canadian Centre for Meteorological and Environmental Prediction of the MSC which is a designated WMO Regional Meteorological Specialized Centre (RMSC).

Radioactive cloud (release) is not depicted in a GFA, but, when expected within a GFA domain, is mentioned in the comment box of the CLDS & WX CHART in the following format:

##### **RADIOACTIVE RELEASE**

NAME OF SITE - COUNTRY

LOCATION OF SITE - (LAT/LONG IN DEGREES AND TENTHS OF A DEGREE)

FIRST RELEASE (xxxxZ day/month/year)

STATUS OF RELEASE (CONTINUING OR ENDED)

**CHECK SIGMETS FOR RADIOACTIVE CLOUD POSITION**

Example: Radioactive cloud release comment box

##### **RADIOACTIVE RELEASE**

DARLINGTON, ON. CANADA

N4352 W07843

FIRST RELEASE 1826Z 14/04/2012

ENDED

**CHECK SIGMETS FOR RADIOACTIVE CLOUD POSITION**

Additionally, if the radioactive release source lies within a GFA domain, a radioactive release symbol is placed at the approximate location of the source on the chart. An example of the radioactive release symbol is found in C.2 of Appendix C.

#### 4.9.2 Icing, turbulence and freezing level chart

The icing, turbulence and freezing level chart is used to depict areas of moderate to severe non-convective icing and non-convective turbulence, along with the type, intensity, and base and top of layers. Otherwise, a general statement about icing and turbulence found in the comments box is applicable.

This chart must contain the following:

- 1) Title box
- 2) Legend box
- 3) Comments box
- 4) Icing (**ICE**), turbulence (**TURB**) and freezing level (**FZLVL**) indicating:
  - synoptic features described in the clouds and weather chart
  - speed and direction of motion of synoptic features at the valid time
  - areas of icing
  - areas of turbulence and low level wind shear
  - freezing level contours

|                           |          |
|---------------------------|----------|
| <b>ICE – TURB – FZLVL</b> | Title    |
|                           | Legend   |
|                           | Comments |

**Figure 2:** GFA icing, turbulence and freezing level chart

The following qualifiers regarding icing and turbulence may be used in a GFA according to the following special coverage definitions:

**Table 9:** Icing and turbulence qualifiers description and coverage

| Abbreviation | Description | Coverage                       |
|--------------|-------------|--------------------------------|
| LCA          | Local       | 25% or less                    |
| PTCHY        | Patchy      | Greater than 25% and up to 50% |
| XTNSV        | Extensive   | Greater than 50%               |

#### 4.9.2.1 Icing (ICE)

Areas of moderate or severe non-convective icing are depicted by an enclosed continuous blue line with coarse stippling in blue. The intensity and type of icing, as well as the base and top of the icing layer is described in text and by means of their corresponding symbols.

Symbol indicating moderate icing:



Symbol indicating severe icing:



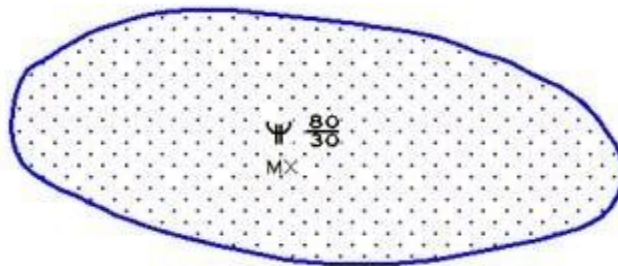
The base and top of the icing layer are in the form of a fraction, the denominator of which represents the base and the numerator representing the top of the icing layer in hundreds of feet ASL.

In this example, the base of the icing layer is at the surface while the top is at 2,000 feet above sea level:

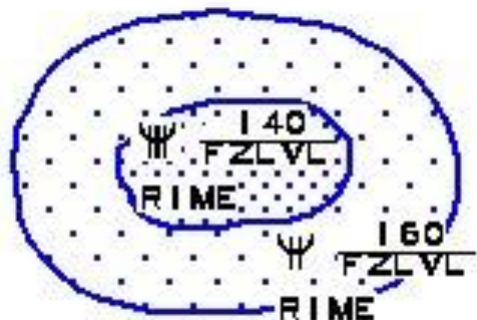
$\frac{20}{SFC}$

The types of icing are: **RIME**, **MX** (mixed) or **CLR** (clear).

Example of a depiction of mixed icing:



Areas of severe icing are indicated with a denser stippling. When an area of severe icing is contained within another area of moderate icing, the area of severe icing will be depicted with a denser stippling as indicated in this example:



Light icing is indicated in the comment box rather than on the chart itself. If icing is forecast to occur during only part of the GFA period, the predicted time of occurrence of the icing is indicated in the comments box of the appropriate chart.

Icing intensity is indicated according to the rate of ice accretion. Since no satisfactory instrument has been installed on commercial aircraft to directly measure the rate of ice accretion on an airframe, the following expressions must be interpreted qualitatively, according to the effect of ice formation on the flying characteristics of the aircraft, as described next.

Light (**LGT**) icing: The rate of ice accretion is such that flying for prolonged periods (over one hour) without using de-icing equipment may create a problem. Occasional use of de-icing or anti-icing equipment removes or prevents ice accretion. If de-icing or anti-icing equipment is used, no problem occurs.

Moderate (**MOD**) icing: The rate of ice accretion is such that even short encounters become potentially hazardous. De-icing or anti-icing equipment must be used or a diversion is necessary.

Severe (**SEV**) icing: The rate of ice accretion is such that de-icing or anti-icing equipment fails to reduce or control the hazard. Immediate diversion is necessary.

#### 4.9.2.2 Turbulence (TURB)

Areas of moderate or severe non-convective turbulence are depicted by an enclosed continuous red line with coarse cross-hatching. The intensity and type of turbulence, as well as the base and top of the turbulence layer is described in text and by means of their corresponding symbols.

Symbol indicating moderate turbulence:



Symbol indicating severe turbulence:



The base and the top of the turbulence layer is in the form of a fraction, the denominator of which represents the base and the numerator representing the top of the turbulence layer in hundreds of feet ASL.

The following example indicates that the base of the turbulence layer is 18 000 feet, while the top is at 26 000 feet, above sea level:

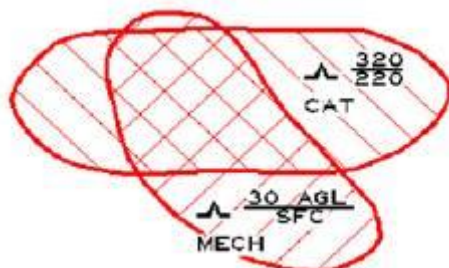
$$\frac{260}{180}$$

The types of turbulence are:

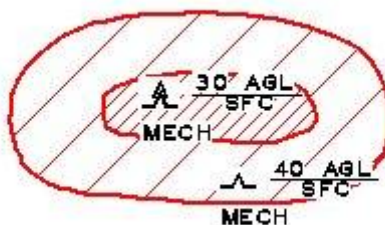
- clear air turbulence (CAT)
- mechanical (MECH)
- lee waves (MTW)
- low level jet (L LVL JET)
- low level wind shear (L LVL WS)

Lower level turbulence is depicted by the use of positive cross-hatching while higher level turbulence, by the use of negative cross-hatching.

Example: High and low level turbulence



Severe turbulence is depicted with dense cross-hatching. The following example shows the severe turbulence surrounded by a larger area of moderate turbulence:



Light turbulence is indicated in the comment box rather than on the chart itself.

The intensity of the turbulence is defined according to its effects on flying, as follows:

Light (**LGT**) turbulence: Such turbulence momentarily causes slight erratic changes in altitude and/or attitude (pitch, roll, and yaw).

Moderate (**MOD**) turbulence: Such turbulence is similar to light turbulence but of greater intensity. Changes in altitude and/or attitude occur, but the aircraft remains in positive control at all times. This turbulence usually causes changes in indicated air speed.

Severe (**SEV**) turbulence: Such turbulence causes large abrupt changes in altitude and/or attitude. It usually causes large variations in indicated air speed and the aircraft may be momentarily out of control.

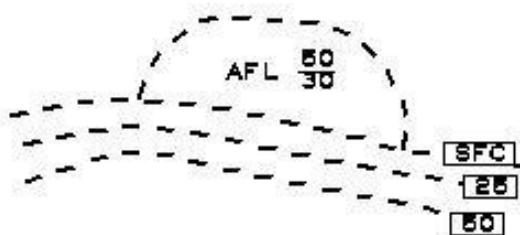
A low level jet (**L LVL JET**), when reaching 50 KT or more is included in the GFA. It may be included at speeds between 35 KT and 45 KT when, upon the forecaster's judgment, significant turbulence or shear is expected. **L LVL JET** is rounded to the nearest 5 KT and is depicted as follows:



#### 4.9.2.3 Freezing level (**FZLVL**)

Freezing level contours are indicated on a GFA by dashed lines. The height of the freezing level is indicated using the standard heights in hundreds of feet above sea level (e.g. **SFC**, **25**, **50**, **75**, **100**, etc., meaning, surface, 2,500 feet, 5,000 feet, 7,500 feet, 10,000 feet, etc.).

When more than one freezing level is forecast in the vertical, only the lowest level needs to be indicated, unless meteorological conditions are expected to be relevant to aviation safety (for example: freezing precipitation aloft). An above freezing layer (AFL) is depicted in a defined area as shown:



Temporal changes in the freezing level, when significant, should be indicated in the comment box of the chart: **FZLVL 20 LWRG TO SFC AFT 03Z**

## 4.10 Amended GFA

Once issued, a SIGMET or AIRMET message automatically amends the current and relevant GFA. The remark (**RMK**) found in the National version of those messages indicate the GFA region(s) the SIGMET or AIRMET applies to (refer to 5.8.3.8 and 6.8.3.8).

## 4.11 Corrected GFA

A correction to a GFA is issued for the following events:

- 1) Any unforecast weather phenomena not requiring an AIRMET (i.e. below AIRMET criteria threshold) or any other unforecast weather phenomena that, according to the forecaster, should be depicted in the GFA.
- 2) Forecast weather phenomena (in the GFA) that fails to occur:
  - removal of forecast weather phenomena in the GFA chart that are no longer occurring or no longer expected to occur.
- 3) A significant error made in a GFA chart:
  - a significant error is one which, if uncorrected, would result in an erroneous interpretation of the GFA and create a potential hazard to aviation.

For detailed guidance on GFA correction, refer to C.3 of Appendix C. Information about the nature of the correction made to the chart is included in the comments box.

Corrections are issued with the term CCX at the end of the first line of the title box, as follows:

**GFACN31 CWA0 CCX**

In the above example, **X** is a letter that may range from A to Z. The first correction would be “**CCA**”, the second “**CCB**”, the third “**CCC**” and so on.

## Chapter 5 SIGMET

### 5.1 Definition

SIGMET: Information message issued by a meteorological watch office (MWO) to advise pilots of the occurrence or expected occurrence of specified weather phenomena, which may affect the safety of aircraft operations, and the development of those phenomena in time and space.

### 5.2 Domain

The message **shall** describe designated hazardous weather phenomena up to and including 60,000 feet (**FL600**) for the Canadian Flight Information Regions (FIR) and by international agreement, the Gander Oceanic flight information region. Refer to D.1 of Appendix D for the map of the Canadian SIGMET information domain.

### 5.3 Projection

As per *Technical Regulations (WMO-No. 49)*, Volume II, Meteorological Service for International Air Navigation, section [C.3.3] 3.2.2, the depiction of the location of the phenomenon **shall** use the polar stereographic projection true at 60 degrees latitude north with lines between coordinate points as orthodromes (great circles).

### 5.4 Language

SIGMET information is prepared in abbreviated English language using approved MSC abbreviations as published in *Manual of Word Abbreviations* (MANAB). Abbreviations to be used in SIGMET messages are given in D.2 of Appendix D.

### 5.5 Units

The only units explicitly stated are:

- nautical miles (**NM**) for a distance associated to the abbreviation **WI** (within)
- knots (**KT**) for speed
- Zulu (**Z**) for time in UTC, with midnight being indicated by the numerals zero and zero “00”
- Heights are stated in flight levels corresponding to hundreds of feet and preceded by the abbreviation **FL**.

## 5.6 Types of SIGMET

Although ICAO Annex 3 provides one general SIGMET format, which encompasses all of the specified weather phenomena, it is convenient to distinguish between three types of SIGMET, as follows:

- WS SIGMET for TS, TURB, ICE, MTW, L LVL WS, DS, SS, RDOACT CLD
- WV SIGMET for volcanic ash (VA)
- WC SIGMET for tropical cyclones (TC)

The type of SIGMET can be identified through the data type designator included in the WMO abbreviated heading of the SIGMET message as explained in 5.7.

## 5.7 Structure of the SIGMET message

A SIGMET message consists of:

- WMO heading - all SIGMET are preceded by an appropriate WMO heading;
- First line - containing location indicators of the relevant ATS unit serving the FIR and MWO, alphanumeric identification and period of validity;
- Meteorological part - containing meteorological information concerning the phenomenon for which the SIGMET is issued; and
- Equal sign “=” - indicates the end of the message.

The first two parts of the SIGMET message are common for all SIGMET types. The content and format of the meteorological part is different depending on the type of SIGMET.

Therefore, in the following paragraphs, the meteorological part of the WS, WV and WC types of SIGMET is described separately.

## 5.8 Format of SIGMET

**Note:** In the following text, square brackets [ ] are used to indicate an optional or conditional element, and angled brackets < > are used for symbolic representation of a variable element, which in the real SIGMET accepts concrete alphanumeric values.

### 5.8.1 WMO header

The *Manual on the Global Telecommunication System* (WMO-No. 386) recommends the use of the following abbreviated headings for bulletins containing meteorological information.

**Table 10:** Description of symbolic form  $T_1T_2A_1A_2ii$  CCCC YYGGgg [CCx]

| Symbol   | Interpretation                                                                                                       |
|----------|----------------------------------------------------------------------------------------------------------------------|
| $T_1$    | Data type designator (refer to 5.8.1.1)                                                                              |
| $T_2$    | Data type designator (refer to 5.8.1.1)                                                                              |
| $A_1A_2$ | Geographical designator (where the message applies to, not the issuing country) (refer to 5.8.1.2)                   |
| ii       | Bulletin number (refer to 5.8.1.3)                                                                                   |
| CCCC     | International four-letter location indicator of the centre originating or compiling the bulletins (refer to 5.8.1.4) |
| YYGGgg   | International date-time group                                                                                        |
| CCx      | Correction identifier (refer to 5.8.1.5)                                                                             |

#### 5.8.1.1 Data type designator

$T_1$ : W for Warnings (WMO-No. 386, table A, A.II 5/2)

$T_2$ : S for SIGMET (WMO-No. 386, table B1, A.II-5/6)

$T_2$ : C for Tropical Cyclone (WC SIGMET)

$T_2$ : V for Volcanic Ash (WV SIGMET)

#### 5.8.1.2 Geographical designator

The geographic designator indicates where the meteorological information applies to, not the issuing country.

$A_1A_2$ : CN for Canada (all FIRs but CZQX Oceanic) (WMO-No. 386, table C1, A.II-5/9)

$A_1A_2$ : NT for North Atlantic area (CZQX Oceanic) (WMO-No. 386, table C1, A.II-5/12)

### 5.8.1.3 Bulletin number

ii: number with two digits

- 01–19 for global distribution
- 20–39 for inter-regional distribution (as per WMO regions)

### 5.8.1.4 International four-letter location indicator of the centre originating or compiling the bulletins

**CCCC:** As standardized practice, all SIGMET messages issued by Canada will be under CWAQ which refers to the Canadian Centre for Meteorological and Environmental Prediction /Network Operations (CCMEP/NETOPS) as the centre compiling the bulletins.

### 5.8.1.5 Correction identifier

**CCx:** Since there are no provisions in ICAO documentation for correcting a SIGMET, the correction identifier will not be used. Refer to 5.8.6 for details.

### 5.8.1.6 Bulletin scheme

SIGMET messages will be issued in a set of two bulletins. The first is aimed at international distribution while the second will contain additional information for national purposes. Refer to D.3 of Appendix D for the full bulletin scheme.

**Table 11:** Example of a bulletin scheme

| FIR  | FIR name | Type        | International (ICAO) | National    |
|------|----------|-------------|----------------------|-------------|
| CZYZ | TORONTO  | SIGMET      | WSCN04 CWAQ          | WSCN24 CWAQ |
| CZYZ | TORONTO  | SIGMET (TC) | WCCN04 CWAQ          | WCCN24 CWAQ |
| CZYZ | TORONTO  | SIGMET (VA) | WVCN04 CWAQ          | WVCN24 CWAQ |

## 5.8.2 First line—**CCCC SIGMET [n]nn VALID YYGGgg/YYGGgg CCCC-**

**Table 12:** Description of **CCCC SIGMET [n]nn VALID YYGGgg/YYGGgg CCCC-**

| Symbol        | Interpretation                                                                                                                                        |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| CCCC          | ICAO location indicator of the ATS unit serving the FIR to which the SIGMET refers                                                                    |
| SIGMET        | Message identifier                                                                                                                                    |
| [n]nn         | Daily alphanumeric sequence (refer to 5.8.2.1)                                                                                                        |
| VALID         | Period of validity indicator                                                                                                                          |
| YYGGgg/YYGGgg | Validity period of SIGMET given by date/time group of the beginning and date/time group of the end of the period (refer to 5.8.2.2)                   |
| CCCC-         | ICAO location indicator of the MWO originating the message, and a hyphen “-” (without a space); separating the preamble from text (refer to 5.8.2.3). |

### 5.8.2.1 Daily alphanumeric sequence

- 1) A SIGMET message **shall** be identified by a letter: Letter attribution rules and the lettering scheme are defined in D.4 of Appendix D.
- 2) A SIGMET message letter **shall** be numerically sequenced:
  - numbering of a SIGMET message letter begins at one;
  - the number is incremented by one when updating the message, including cancellation;
  - the sequence number **shall** correspond with the number of SIGMET messages issued for an event within a FIR since 0000Z on the day concerned; and
  - the numbering is thus reset at 0000Z (messages are not updated at 0000Z for the sole purpose of resetting the number).

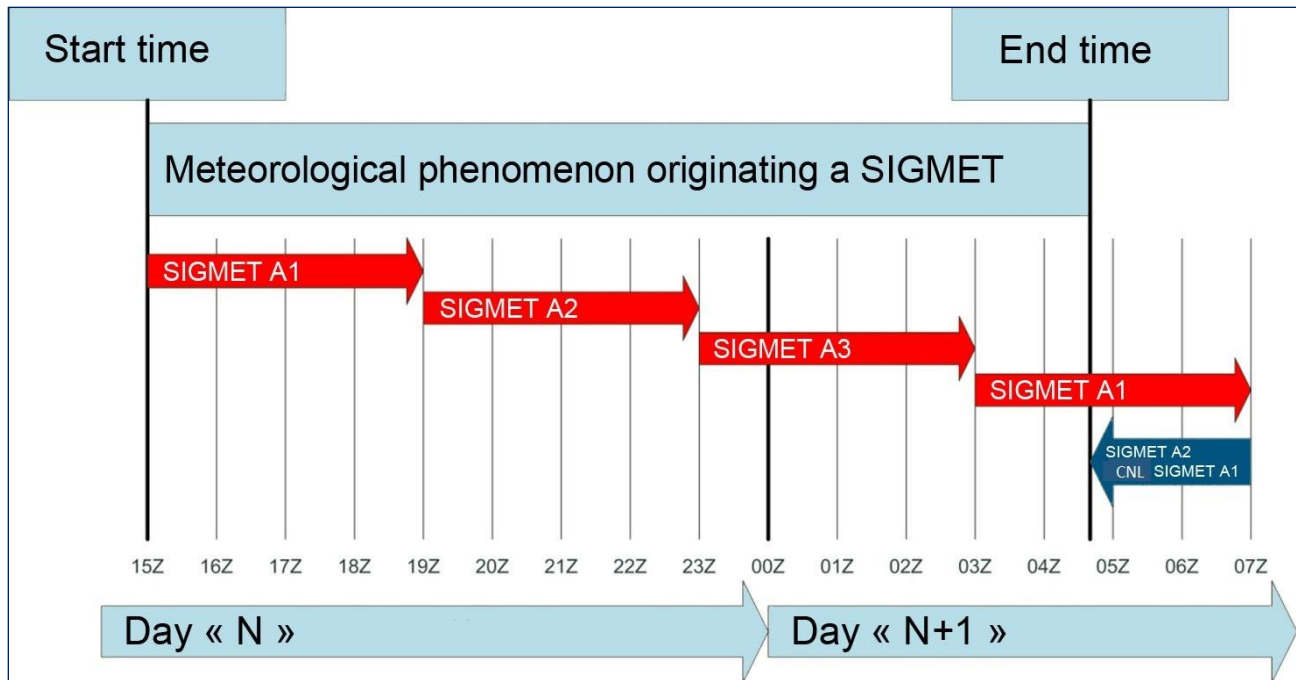


**Figure 3:** Diagram of numeric sequence of SIGMET messages.

Example: **CZUL SIGMET M3 VALID 161220/161620 CWUL-**

### 5.8.2.2 Validity period and lead time of SIGMET

**Table 13:** Validity period and lead time of SIGMET

| Symbol | Lead time – up to (hours) | Validity period (hours) |
|--------|---------------------------|-------------------------|
| WS     | 4                         | 4                       |
| WV     | 12                        | 6                       |
| WC     | 12                        | 6                       |

- 1) The period of validity of a WS SIGMET is four hours.
- 2) The period of validity of a WV SIGMET and a WC SIGMET is six hours.
- 3) In the case of a SIGMET for an ongoing phenomenon:
  - the date/time group indicating the start of the SIGMET period will be rounded back to five minutes from the filing time (date/time group in the WMO heading).

- 4) In the case of a SIGMET for an expected phenomenon (forecast event):
- the beginning of the validity period will be the time of the expected commencement (occurrence) of the phenomenon;
  - for a WS SIGMET, the lead time (the time of issuance of the SIGMET) can be up to four hours before the start of the validity period (i.e. expected time of occurrence of the phenomenon);
  - for a WV SIGMET and a WC SIGMET, the lead time can be up to 12 hours before the start of the validity period; and
  - a SIGMET for an expected phenomenon is issued only for the first appearance of an event in Canadian airspace (i.e. moving in from a foreign airspace or onset inside a Canadian FIR). A phenomenon moving from one Canadian FIR to another is treated as an ongoing phenomenon. No forecast event SIGMET message would be issued for the FIR in which the event is moving.

Example (1): For an ongoing phenomenon:

WSCN05 CWA0 161221

CZUL SIGMET M3 VALID 161220/161620 CWUL-

Example (2): For an expected phenomenon (expected time of occurrence 0315Z):

WSCN01 CWA0 040115

CZVR SIGMET U1 VALID 040315/040715 CWEG-

#### **5.8.2.3 Meteorological Watch Office (MWO)**

- CWUL for Canadian Meteorological Aviation Center - East (CMAC-E) in Montréal.
- CWEG for Canadian Meteorological Aviation Center - West (CMAC-W) in Edmonton.

### 5.8.3 Format of the meteorological part of a WS SIGMET

The meteorological part of a WS SIGMET consists of nine elements (the following table has been divided into two parts due to horizontal space constraints).

**Table 14:** Meteorological elements of a WS SIGMET

| Element 1<br>Location indicator of the FIR | Element 2<br>Name of the FIR | Element 3<br>Description of the phenomenon | Element 4<br>Observed or forecast | Element 5<br>Location                   |
|--------------------------------------------|------------------------------|--------------------------------------------|-----------------------------------|-----------------------------------------|
| <CCCC>                                     | <name> FIR                   | <Phenomenon>                               | OBS [AT <GGggZ>]<br>FCST          | Geographical location of the phenomenon |

| Element 6<br>Level                        | Element 7<br>Movement or expected movement | Element 8<br>Change in intensity | Element 9<br>Remark |
|-------------------------------------------|--------------------------------------------|----------------------------------|---------------------|
| FL<nnn/nnn><br>SFC/FL<nnn><br>TOP FL<nnn> | MOV <direction, speed> KT<br>or STNR       | INTSF or WKN or NC               | RMK                 |

#### 5.8.3.1 Location indicator and name of the FIR (element 1 and 2)

Example (1): **CZUL MONTREAL FIR**

Example (2): **CZVR VANCOUVER FIR**

#### 5.8.3.2 Description of the phenomenon (element 3)

The description of the phenomenon consists of a qualifier and a phenomenon abbreviation. SIGMETs are issued for the following phenomena (with only one phenomenon in each SIGMET):

- Thunderstorms (**TS**) - **FRQ** or **SQL**, with POSS hail, tornado/waterspout as necessary
- Turbulence (**TURB**) - only **SEV**
- Icing (**ICE**) - only **SEV** with or without **FZRA**
- Mountain waves (**MTW**) - only **SEV**
- Low Level wind shear (**L LVL WS**) – only **SEV**
- Dust storm (**DS**) - only **HVY**
- Sand storm (**SS**) - only **HVY**
- Radioactive cloud (**RDOACT CLD**<sup>1</sup>)

**Note (1):** Different rules apply to RDOACT CLD SIGMET. Refer to 5.8.3.9 for details.

The appropriate abbreviations and combinations thereof, and their meaning are given in D.5 of Appendix D.

### 5.8.3.3 The phenomenon is either observed or forecast (element 4)

**OBS** [AT <GGggZ>] or **FCST**

The abbreviation **OBS** is used when:

- there has been a recent<sup>1</sup> direct observation of the phenomenon (e.g. METAR, PIREP); or
- there has been a recent<sup>1</sup> indirect observation of the phenomena (i.e. remote sensing imagery) or the observation of a meteorological element (e.g. strong wind, freezing precipitation), which leads the forecaster to believe that the phenomenon is occurring.

**OBS** is optionally followed by the time group in the form of **AT <GGggZ>**, where **GGgg** is the time of the observation in hours and minutes UTC. If the exact time of the observation is not known, the time is not included. No additional information will be given, e.g. aircraft type reporting the phenomenon.

**Note (1):** recent means normally within a two hour period preceding the issuance time of the SIGMET and in no circumstance more than three hours preceding the issuance time of the SIGMET.

The use of **FCST** occurs if either:

- the phenomenon is not directly or indirectly observed but there is strong meteorological evidence (i.e. numerical guidance) to suggest that the phenomenon is occurring; or
- the phenomenon is expected. In other words, there is meteorological evidence (i.e. numerical guidance) to suggest that the phenomenon will be occurring within the prescribed lead time (refer to 5.8.2.2).

When **FCST** is used, it is assumed that the time of the occurrence or commencement of the phenomenon coincides with the beginning of the period of validity in the first line of the SIGMET.

Example (1): **OBS AT 0140Z**

Example (2): **FCST**

#### 5.8.3.4 Location of the phenomenon (element 5)

The location of the phenomenon is depicted as an area using coordinate points:

- the description always begins with the abbreviation WI (within);
- the area can be described as a circle, a line or a polygon; and
- distances are in nautical miles (NM), direction to one of the eight points of compass (octants<sup>1</sup>).

**Note (1):** Refer to D.6 of Appendix D for details.

**Table 15:** Maximum coordinate points by SIGMET shape

| Description          | Recommended maximum number of coordinate points |
|----------------------|-------------------------------------------------|
| Circle <sup>1</sup>  | 1                                               |
| Line <sup>2</sup>    | 4                                               |
| Polygon <sup>3</sup> | 7                                               |

**Note (1):** A radial distance is used to define the size of the circle.

**Note (2):** The line is defined by the entire width of an area centered on a line between two or more points.

**Note (3):** Polygons must be closed. The last coordinate point is a repeat of the first one.

Coordinate points:

- 1) The international (ICAO) SIGMET message describes a coordinate point using a latitude and longitude only (resolution defined in D.6 of Appendix D).
- 2) The national SIGMET message describes a coordinate point using a latitude and longitude. Additionally, an equivalent description with respect to an aviation reference site<sup>3</sup> is given corresponding to an approximation of the coordinate point in latitude and longitude.

There are two exceptions to this rule:

- 1) Any coordinate point located within Gander Oceanic FIR will be described in latitude and longitude only. These points will be limited to the resolution as defined in D.6 of Appendix D.
- 2) Any coordinate point north of N72°00' will be described with respect to an aviation reference site only if within a 90 nautical mile radius of that site. Otherwise the coordinate point will be represented in latitude and longitude only. This is due to the sparse number of aviation reference sites over northern Canada.

**Table 16:** Format for coordinate points

| National or International | Symbolic form                                                                            | Examples                 |
|---------------------------|------------------------------------------------------------------------------------------|--------------------------|
| International (ICAO)      | Nnnnn Wnnnnn                                                                             | N4502 W07345             |
| National                  | /Nnnnn Wnnnnn/[Distance <sup>1</sup><br>Direction <sup>2</sup> ] Identifier <sup>3</sup> | /N4502 W07345/25 SW CYUL |

**Note (1):** Distance is in nautical miles (NM) with units not explicitly stated.

**Note (2):** Direction to the eight point compass (octants). Refer to D.6 of Appendix D for details.

**Note (3):** Refer to D.7 of Appendix D for the list of available aviation reference sites.

**Table 17:** Examples of coordinate points

| Description | International (ICAO)                                                                                               | National                                                                                                                                                                                                       |
|-------------|--------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Circle      | WI 45NM OF N4643 W07345                                                                                            | WI 45NM OF /N4643 W07345/75 N CYUL                                                                                                                                                                             |
| Line        | WI 30NM WID LINE BTN N4459<br>W07304 - N4855 W07253 - N5256<br>W06904                                              | WI 30NM WID LINE BTN /N4459<br>W07304/45 SE CYUL - /N4855<br>W07253/30 NW CYRJ - /N5256<br>W06904/75 W CYWK                                                                                                    |
| Polygon     | WI N4502 W07345 - N4907<br>W07331 - N5345 W06943 - N5256<br>W06758 - N4848 W07149 - N4508<br>W07206 - N4502 W07345 | WI /N4502 W07345/25 SW CYUL -<br>/N4907 W07331/60 SE CYMT - /N5345<br>W06943/150 E CYAH - /N5256<br>W06758/45 W CYWK - /N4848<br>W07149/25 NE CYRJ - /N4508<br>W07206/25 SW CYSC - /N4502<br>W07345/25 SW CYUL |

### 5.8.3.5 Flight level and extent (element 6)

FL<nnn/nnn>

SFC/FL<nnn>

TOP FL<nnn>

The location and extent of the phenomenon in the vertical is given by one or more of the above abbreviations, as follows:

- A layer FL<nnn/nnn>, where the lower level is reported first; this is used particularly in reporting turbulence and icing
- A layer with reference to one FL using SFC/FL<nnn>
- The level of the tops of the TS clouds using the abbreviation TOP

Example (1): SEV TURB...FL220/270

Example (2): SEV ICE (FZRA)...SFC/FL030

Example (3): **FRQ TS...TOP FL340**

#### 5.8.3.6 Movement or expected movement (element 7)

**MOV** <direction, speed>**KT** or **STNR**

Direction of movement is given with reference to one of the sixteen points of compass (radials<sup>1</sup>). Speed is given in knots (KT). The abbreviation **STNR** is used if no significant movement is expected.

**Note (1):** Refer to D.6 of Appendix D for details.

Example: **MOV SSE 15KT**

#### 5.8.3.7 Change in intensity (element 8)

The expected evolution of the phenomenon's intensity is indicated by one of the following abbreviations:

- **INTSF** - intensifying
- **WKN** - weakening
- **NC** - no change

#### 5.8.3.8 Remark (element 9)

The remark (**RMK**) is found only in the National SIGMET message. It begins on a new line. The purpose is to allow additional information of national interest to be conveyed in the SIGMET message. Items listed in the remark line will be separated by a forward slash (/).

- The GFA region(s) the SIGMET message applies to (refer to Figure 4)
- Cross-referencing SIGMET messages when a phenomenon straddles one or several FIR boundaries (refer to Figure 4)
- For a phenomenon that has moved out of an FIR, the cancelled SIGMET message will refer to the continuing SIGMET message in neighbouring FIR(s) within Canada's Area of Responsibility (AOR), (refer to Figure 5)
- Additionally, for a phenomenon that has moved out of an FIR, the continuing SIGMET message in neighbouring FIR(s) within Canada's AOR will refer to the cancellation SIGMET message.

#### Symbolic form

**RMK** [**GFACN**<nn>] / [**CCCC** <name> **FIR SIGMET**[n]nn]<sup>1</sup>

**Note (1):** Refer to 5.8.3.1 and 5.8.2.1 for the description.

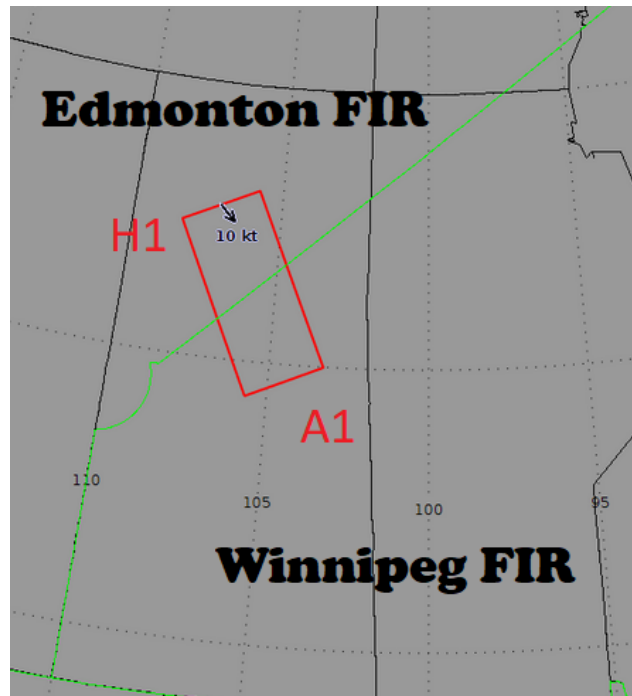


**Figure 4:** SIGMET phenomenon covering two FIRs

The above phenomenon requires two SIGMET messages, one per FIR. The meteorological part will be identical in both messages (1) and (2) below:

Message (1):

WSCN22 CWA0 161220  
CZEG SIGMET H1 VALID 161220/161620 CWEG-  
CZEG EDMONTON FIR «meteorological part»  
RMK GFACN32/CZWG WINNIPEG FIR SIGMET A1=

Message (2)

WSCN23 CWA0 161220  
CZWG SIGMET A1 VALID 161220/161620 CWEG-  
CZWG WINNIPEG FIR «meteorological part»  
RMK GFACN32/CZEG EDMONTON FIR SIGMET H1=

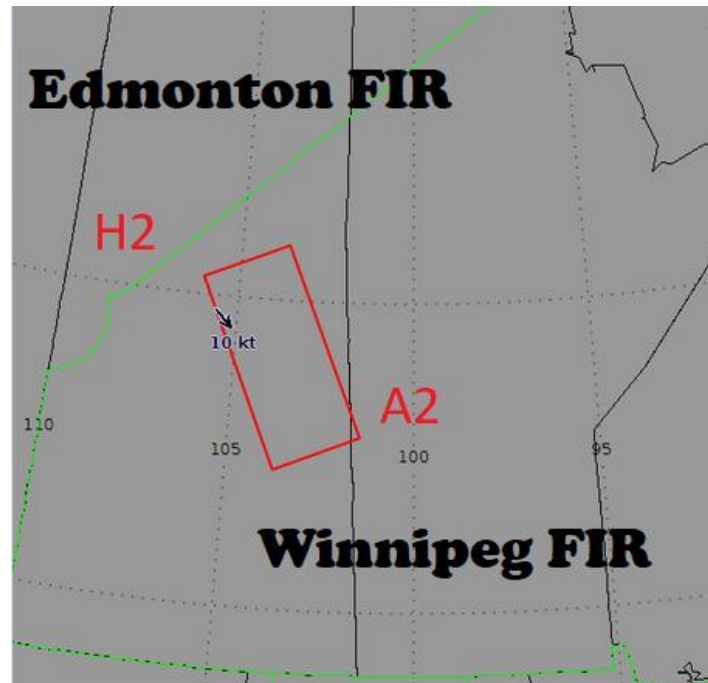


**Figure 5:** SIGMET phenomenon now within only one FIR

The above phenomenon is a continuation of Figure 4. In other words, the area has moved southeastward with time. The following SIGMET A2 is an update of A1 while SIGMET H2 is a cancellation of H1 since the phenomenon no longer affects the Edmonton FIR.

Message (1):

WSCN22 CWA0 161530

CZEG SIGMET H2 VALID 161530/161620 CWEG-

CZEG EDMONTON FIR CNL SIGMET H1 161220/161620

RMK GFACN32/CZWG WINNIPEG FIR SIGMET A2=

Message (2):

WSCN23 CWA0 161530

CZWG SIGMET A2 VALID 161530/161930 CWEG-

CZWG WINNIPEG FIR «meteorological part»

RMK GFACN32/CZEG EDMONTON FIR SIGMET H2=

### 5.8.3.9 RDOACT CLD event

For radioactive cloud SIGMET bulletins, only a circle shape is to be used for element 5 “location”. A radius of up to 15 nautical miles from the source may be applied; and a vertical extent from surface “SFC” to the upper limit of the flight information region (FIR) or control area (CTA) is to be applied (i.e. FL600). Only stationary “STNR” is to be used for the element 7 “movement or expected movement”.

For an event where limited information is available to the forecaster (i.e. first issuance of a RDOACT CLD SIGMET), the change in intensity (element 8) may be set as “INTST UNKNOWN”:

Example (1):

```
WSCN04 CWA0 161220  
CZYZ SIGMET R1 VALID 161220/161620 CWUL-  
CZYZ TORONTO FIR RDOACT CLD OBS AT 1205Z WI 15NM OF N4350 W07905  
SFC/FL600 STNR INTST UNKNOWN=
```

Example (2):

```
WSCN24 CWA0 161220  
CZYZ SIGMET R1 VALID 161220/161620 CWUL-  
CZYZ TORONTO FIR RDOACT CLD OBS AT 1205Z WI 15NM OF /N4350 W07905/25  
E CYYZ SFC/FL600 STNR INTST UNKNOWN  
RMK GFACN33=
```

### 5.8.4 Format of the meteorological part of a WV SIGMET

The meteorological part of a WV SIGMET consists of the following eight elements (this table has been divided into three parts due to horizontal space constraints):

**Table 18:** Meteorological elements of a WV SIGMET

| <b>Element 1</b><br>Location<br>indicator of the<br>FIR | <b>Element 2</b><br>Name of the<br>FIR | <b>Element 3</b><br>Phenomenon<br>and Volcano Name |             | <b>Element 3</b><br>Volcano<br>Position |
|---------------------------------------------------------|----------------------------------------|----------------------------------------------------|-------------|-----------------------------------------|
| <CCCC>                                                  | <name> FIR                             | VA ERUPTION                                        | [MT <name>] | [PSN <Nnnnn Wnnnn>]                     |

| <b>Element 4</b><br>Volcanic ash cloud | <b>Element 5</b><br>Extent of the<br>cloud<br>Vertical | <b>Element 5</b><br>Extent of the<br>cloud<br>Horizontal | <b>Element 6<sup>1</sup></b><br>Movement or expected<br>movement |
|----------------------------------------|--------------------------------------------------------|----------------------------------------------------------|------------------------------------------------------------------|
| VA CLD OBS [AT <GGggZ>]<br>VA CLD FCST | FL<nnn/nnn><br>SFC/FL<nnn><br>TOP FL<nnn>              | Geographical<br>location of the<br>phenomenon            | [MOV <direction, speed>KT]                                       |

| <b>Element 7<sup>1</sup></b><br>Volcanic ash cloud forecast at the end of the<br>period of validity |                                              | <b>Element 8</b><br>Remark |
|-----------------------------------------------------------------------------------------------------|----------------------------------------------|----------------------------|
| [FCST AT <GGggZ>]                                                                                   | [Geographical location of<br>the phenomenon] | RMK                        |

**Note (1):** Elements 6 and 7 **shall not** be used in conjunction in the same bulletin.

#### 5.8.4.1 Location indicator and name of the FIR (element 1 and 2)

Refer to 5.8.3.1.

#### 5.8.4.2 Information on the volcano eruption (element 3)

VA ERUPTION [MT <name>] [PSN <Nnnnn Wnnnn>]

- The name of the volcano is preceded by the words VA ERUPTION MT.
- The position of the volcano is given by the abbreviation PSN followed by the latitude and longitude in degrees and minutes (Nnnnn Wnnnn).
- If the FIR is affected by a VA cloud with limited information about the eruption which generated the cloud, then parts of element 3 may be set as “unknown” (refer to 5.8.4.9 for details).

Example: VA ERUPTION MT GARIBALDI PSN N4951 W12300

**5.8.4.3 Volcanic ash cloud (element 4)****VA CLD OBS** [**AT <GGggZ>**] or **VA CLD FCST**

Time of observation of the **VA CLD**. The time of observation is taken from the source of the observation (satellite image, special air-report, report from ground volcano logical station, etc.). If the VA cloud is not yet observed over the FIR but the volcanic ash advisory received from the responsible VAAC indicates that the cloud will be affecting the FIR after a certain time within the next 12 hours, a SIGMET **shall** be issued, and the abbreviation **VA CLD FCST** **shall** be used.

Example (1): **VA CLD OBS AT 0110Z**Example (2): **VA CLD FCST****5.8.4.4 Extent of the cloud (element 5)**

Vertical: Refer to 5.8.3.5.

Horizontal: Refer to 5.8.3.4.

**5.8.4.5 Movement or expected movement (element 6)**

Refer to 5.8.3.6.

Square brackets indicate that element 6 is optional. It can only be used if element 7 is not used. Given that parts of a VA cloud often have differing motion (speed and direction) this element is normally omitted. Movement of the VA cloud is inferred by the forecast position at the end of the period of validity (element 7).

If, at the end of the period of validity, the VA cloud is expected to have left entirely Canada's area of responsibility, then element 6 is used while element 7 is omitted.

**5.8.4.6 Volcanic ash cloud forecast at the end of the period of validity (element 7)****[FCST AT <GGggZ>]**

The "**GGggZ**" group should indicate the end of the validity period given in the first line of the SIGMET message. Geographical location of the phenomenon is given as per section 5.8.3.4.

Square brackets indicate that element 7 is optional. It can only be used if element 6 is not used. Specifically, if at the end of the period of validity the VA cloud is expected to have left Canada's area of responsibility entirely, then element 7 is omitted and element 6 is used.

**5.8.4.7 Remark (element 8)**

Refer to 5.8.3.8

#### 5.8.4.8 Example of a WV SIGMET

Example:

WVCN01 CWA0 111200

CZVR SIGMET U1 VALID 111200/111800 CWEG-

CZVR VANCOUVER FIR VA ERUPTION MT KASATOCHI PSN N5210 W17530

VA CLD OBS AT 1200Z FL270/400 WI 60NM WID LINE BTN N5415 W13502 -

N5045 W13255 FCST AT 1800Z WI 60NM WID LINE BTN N5415 W13411 - N5156

W13213 - N4956 W13100=

#### 5.8.4.9 Special case: VA event with limited information

In the case of a VA cloud event and that limited information is available to the forecaster (i.e. first issuance of a VA SIGMET), the following elements may be set as “UNKNOWN”:

- Eruption unknown (element 3): VA ERUPTION MT UNKNOWN PSN UNKNOWN
- Extent of the cloud unknown (element 5): FL UNKNOWN WI UNKNOWN
- Movement unknown (element 6): MOV UNKNOWN

Example:

Eruption of Mount Garibaldi observed on satellite pictures, no AIREP and no volcanic ash advisory from Montréal VAAC.

WVCN01 CWA0 161220

CZVR SIGMET U1 VALID 161220/161820 CWEG-

CZVR VANCOUVER FIR VA ERUPTION MT GARIBALDI PSN N4951 W12300

VA CLD OBS AT 1205Z FL UNKNOWN WI 60NM OF N4951 W12300

MOV UNKNOWN=

### 5.8.5 Format of the meteorological part of a WC SIGMET

The meteorological part of a WC SIGMET consists of the following 12 elements (this table has been divided into three parts due to horizontal space constraints):

**Table 19:** Meteorological elements of a WC SIGMET

| Element 1<br>Location indicator of the FIR | Element 2<br>Name of the FIR | Element 3<br>Phenomenon Name and position of centre |                       | Element 4<br>Associated CBs | Element 5<br>Observed or forecast |
|--------------------------------------------|------------------------------|-----------------------------------------------------|-----------------------|-----------------------------|-----------------------------------|
| <CCCC>                                     | <name><br>FIR                | TC <name>                                           | PSN <Nnnnn<br>Wnnnnn> | CB                          | OBS [AT<br><GGggZ>] or<br>FCST    |

| Element 6<br>Location of CBs                                                                           | Element 7<br>Level of CBs | Element 8 <sup>1</sup><br>Movement or expected movement | Element 9<br>Change in intensity |
|--------------------------------------------------------------------------------------------------------|---------------------------|---------------------------------------------------------|----------------------------------|
| WI <nnn>NM OF TC<br>CENTRE or WI Nnnnn<br>Wnnnnn – Nnnnn<br>Wnnnnn – Nnnnn<br>Wnnnnn – Nnnnn<br>Wnnnnn | TOP FL<nnn>               | [MOV <direction speed>KT<br>or<br>STNR]                 | INTSF or WKN or<br>NC            |

| Element 10 <sup>1</sup><br>Forecast of TC centre at the end of the period of validity |                                 | Element 11 <sup>1 and 2</sup><br>Forecast position of CBs at the end of the period of validity              | Element 12<br>Remark |
|---------------------------------------------------------------------------------------|---------------------------------|-------------------------------------------------------------------------------------------------------------|----------------------|
| [FCST AT <GGggZ>]                                                                     | [TC CENTRE PSN<br>Nnnnn Wnnnnn] | [CB WI <nnn>NM OF TC<br>CENTRE or CB WI Nnnnn<br>Wnnnnn – Nnnnn Wnnnnn –<br>Nnnnn Wnnnnn – Nnnnn<br>Wnnnnn] | RMK                  |

**Note (1):** Element 8 **shall not** be used in conjunction with elements 10 and 11 in the same bulletin.

**Note (2):** The shape (i.e. circle or polygon) of the forecast CB position **shall** be the same as the one used in element 6.

#### 5.8.5.1 Location indicator and name of the FIR (element 1 and 2)

Refer to 5.8.3.1.

### 5.8.5.2 Phenomenon name and position of centre (element 3)

TC <name> PSN <Nnnnn Wnnnn>

The name of the tropical cyclone consists of the abbreviation **TC** followed by the international name of the tropical cyclone given by the Tropical Cyclone Advisory Centre (TCAC).

The position consists of the abbreviation **PSN** followed by the coordinates of one point corresponding to the TC centre. Refer to section 5.8.3.4 regarding rules pertaining to coordinate points.

Example (1): International SIGMET

TC GLORIA PSN N4714 W05424

Example (2): National SIGMET

TC GLORIA PSN /N4714 W05424/75 W CYYT

### 5.8.5.3 Associated CBs (element 4)

The TC name and centre position **shall** be followed by the abbreviation CB.

### 5.8.5.4 The phenomenon is either observed or forecast (element 5)

OBS [AT <GGggz>] or FCST

Refer to 5.8.3.3. Normally, time is taken from the forecaster's observations or from a TC advisory received from a Tropical Cyclone Advisory Centre (TCAC) such as the Canadian Hurricane Centre (CHC). If the TC is not yet observed in the FIR but the tropical cyclone advisory or TC forecast indicate that it is going to affect the FIR within the next 12 hours, a SIGMET may be issued where the abbreviation **FCST** **shall** be used.

### 5.8.5.5 Location of CBs (element 6)

The location of CBs is depicted as:

- A circle around the TC centre defined as the radial distance in nautical miles  
WI <nnn>NM OF TC CENTRE
- A closed polygon area using coordinate points where the last coordinate point is a repeat of the first one. The number of coordinates should be kept to a minimum and should not normally exceed seven. The TC centre position **shall** be within the boundaries of the polygon area, unless the TC centre position is located just outside of Canada's AOR.

WI Nnnnn Wnnnnn – Nnnnn Wnnnnn – Nnnnn Wnnnnn – Nnnnn Wnnnnn

Refer to 5.8.3.4 for more details about the use of polygon area.

Example (1): Circle area - International or National SIGMET

WI 45NM OF TC CENTRE

Example (2): Polygon area – International SIGMET

WI N4502 W07345 – N4907 W07331 – N5345 W06943 – N5256 W06758 N4848  
W07149 – N4508 W07206 – N4502 W07345

Example (3): Polygon area – National SIGMET

WI /N4502 W07345/25 SW CYUL – /N4907 W07331/60 SE CYMT – /N5345  
W06943/150 E CYAH – /N5256 W06758/45 W CYWK – /N4848 W07149/25 NE CYRJ  
– /N4508 W07206/25 SW CYSC – /N4502 W07345/25 SW CYUL

#### **5.8.5.6 Level of CB cloud formation (element 7)**

TOP FL<nnn>

Example: TOP FL450

#### **5.8.5.7 Movement or expected movement (element 8)**

Refer to 5.8.3.6.

For TC SIGMETs, “forecast of TC centre at the end of the period of validity” (element 10) and “forecast position of CB” (element 11) are not to be used in conjunction with the “movement or expected movement” (element 8). If, at the end of the period of validity, the area described in the SIGMET is expected to have left Canada’s area of responsibility entirely, then element 10 and 11 are omitted and element 8 is included.

Example:

WCNT01 CWA0 161223  
CZQX SIGMET U2 VALID 161220/161820 CWUL-  
CZQX GANDER OCEANIC FIR TC OLIVIA PSN N4730 W03300 CB OBS AT 1200Z  
WI 120NM OF TC CENTRE TOP FL360 MOV NE 25KT WKN=

#### **5.8.5.8 Change in intensity (element 9)**

Refer to 5.8.3.7.

**5.8.5.9 Forecast of TC centre at the end of the period of validity (element 10)**

[FCST AT <GGggZ> TC CENTRE PSN <Nnnnn Wnnnnn>]

The GGggZ group should indicate the end of the validity period given in the first line of the SIGMET message. The geographical location of the TC centre, always preceded by the abbreviations “TC CENTRE PSN”, is as per 5.8.3.4.

For TC SIGMETs, “forecast of TC centre at the end of the period of validity” (element 10) and “forecast position of CB” (element 11) are not to be used in conjunction with the “movement or expected movement” (element 8). If, at the end of the period of validity, the area described in the SIGMET is expected to still be within Canada’s area of responsibility, then element 10 and 11 are included and element 8 is omitted. Refer to 5.8.5.12 for examples.

**5.8.5.10 Forecast position of CBs at the end of the period of validity (element 11)**

[CB WI <nnn>NM OF TC CENTRE] or [CB WI Nnnnn Wnnnnn – Nnnnn Wnnnnn – Nnnnn Wnnnnn – Nnnnn Wnnnnn]

Element 11 **shall** be used in conjunction with element 10. However, element 10 can be used on its own in the event that the extent of the CB circle around the TC centre has not changed at the end of the period of validity; then repeating the area described in element 6 is not recommended. Refer to 5.8.5.5.

**5.8.5.11 Remark (element 12)**

Refer to 5.8.3.8.

**5.8.5.12 Example of a WC SIGMET**

Example (1): Tropical cyclone Bertha with centre inside Gander Oceanic FIR at N45°45’ W041°30’. The area of CB around the TC centre is diminishing over time.

WCNT01 CWA0 161220

CZQX SIGMET W3 VALID 161220/161820 CWUL-

CZQX GANDER OCEANIC FIR TC BERTHA PSN N4545 W04130 CB OBS AT 1200Z  
WI 150NM OF TC CENTRE TOP FL380 WKN FCST AT 1820Z TC CENTRE PSN  
N5230 W03430 CB WI 120NM OF TC CENTRE=

Example (2): Tropical cyclone Alberto with centre outside of Gander Oceanic FIR and polygon of CB affecting FIR

WCNT01 CWA0 161422

CZQX SIGMET V3 VALID 161420/162020 CWUL-

CZQX GANDER OCEANIC FIR TC ALBERTO PSN N4417 W04707 CB OBS WI  
N4700 W04800 – N4354 W04817 – N4352 W04614 – N4630 W04530 – N4700  
W04800 TOP FL390 WKN FCST AT 2020Z TC CENTRE PSN N4410 W04254 CB WI  
N4700 W04330 – N4325 W04411 – N4316 W 04210 - N4600 W04100 – N4700  
W04330=

### 5.8.6 Correcting a SIGMET

In the event of a SIGMET message transmitted with an error, a correction is sent by updating the SIGMET according to 5.8.7.

### 5.8.7 Updating a SIGMET

An updated SIGMET, when issued, automatically replaces the previous SIGMET in the same series (i.e. the previous SIGMET with the same letter):

- A WS SIGMET must be updated every four hours (from date/time group in the WMO heading. (Refer to 5.8.1).
- A WV and a WC SIGMET must be updated every six hours (from date/time group in the WMO heading). (Refer to 5.8.1)
- However, a forecaster should update a SIGMET at any time if necessary or if the SIGMET becomes unrepresentative.

For rules regarding the alphanumeric sequence, refer to 5.8.2.1.

Example (1): For an ongoing phenomena:

WSCN05 CWA0 161220

CZUL SIGMET M3 VALID 161220/161620 CWUL-

Updated four hours later (i.e. before 1620Z) as:

WSCN05 CWA0 161605

CZUL SIGMET M4 VALID 161605/162005 CWUL-

Example (2): For an expected phenomenon (expected time of occurrence 0315Z):

WSCN01 CWA0 040115

CZVR SIGMET U1 VALID 040315/040715 CWEG-

Updated at 0245Z as event occurred earlier (30 minutes) than expected:

WSCN01 CWA0 040245

CZVR SIGMET U2 VALID 040245/040645 CWEG-

Example (3): For an expected VA event (expected time of occurrence 1800Z):

WVCN02 CWA0 280920

CZEG SIGMET J1 VALID 281800/290000 CWEG-

Updated six hours later (i.e. before 1520Z) as:

WVCN02 CWA0 281510

CZEG SIGMET J2 VALID 281800/290000 CWEG-

Updated voluntarily by the forecaster at the start of the occurrence as:

WVCN02 CWA0 281800

CZEG SIGMET J3 VALID 281800/290000 CWEG-

### 5.8.8 Cancelling a SIGMET

If, during the validity period of a SIGMET, the phenomenon for which the SIGMET had been issued is no longer occurring or no longer expected to occur, this SIGMET **shall** be cancelled by the issuing MWO. The cancellation is done by issuing the same type of SIGMET.

#### 5.8.8.1 WMO header

Same data type designator. Refer to 5.8.1.

#### 5.8.8.2 First line—CCCC SIGMET [n]nn VALID YYGGgg/YYGGgg CCCC-

**Table 20:** CCCC SIGMET [n]nn VALID YYGGgg/YYGGgg CCCC-

| Symbol        | Interpretation                                                                                                                                        |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| CCCC          | ICAO location indicator of the ATS unit serving the FIR to which the SIGMET refers                                                                    |
| SIGMET        | Message identifier                                                                                                                                    |
| [n]nn         | Daily alphanumeric sequence (refer to 5.8.2.1)                                                                                                        |
| VALID         | Period of validity indicator                                                                                                                          |
| YYGGgg/YYGGgg | Validity period of SIGMET given by date/time group of the beginning and date/time group of the end of the period                                      |
| CCCC-         | ICAO location indicator of the MWO originating the message, and a hyphen “-” (without a space); separating the preamble from text (refer to 5.8.2.3). |

#### 5.8.8.2.1 Daily alphanumeric sequence

Number incremented by one. Refer to 5.8.2.1 for details.

### 5.8.8.2.2 Validity period of SIGMET

In the case of a SIGMET for an ongoing phenomenon:

- the date/time group indicating the start of the SIGMET period will be rounded back to five minutes from the filing time (date/time group in the WMO heading) while the date/time group indicating the end of the SIGMET period does not change from the SIGMET it cancels.
- if the validity period has expired, the date/time group indicating the start and end of the SIGMET period will all be the same, and those will be rounded back to five minutes from the filing time.

In the case of a SIGMET for an expected phenomenon (forecast event):

- the validity period remains unchanged.

### 5.8.8.3 Second line

The second line of a cancelled SIGMET consists of the following seven elements (this table has been divided into two parts due to horizontal space constraints):

**Table 21:** Meteorological elements of a cancelled SIGMET (any type)

| Element 1<br>Location indicator of<br>the FIR | Element 2<br>Name of the<br>FIR | Element 3<br>Cancellation | Element 4<br>SIGMET message being<br>cancelled |
|-----------------------------------------------|---------------------------------|---------------------------|------------------------------------------------|
| <CCCC>                                        | <name> FIR                      | CNL                       | SIGMET [n]nn                                   |

| Element 5<br>Validity period of SIGMET message being<br>cancelled | Element 6<br>VA movement | Element 7<br>Remark |
|-------------------------------------------------------------------|--------------------------|---------------------|
| <YYGGgg/YYGGgg>                                                   | [VA MOV TO <CCCC> FIR]   | RMK                 |

#### 5.8.8.3.1 Location indicator and name of the FIR (element 1 and 2)

Refer to 5.8.3.1.

#### 5.8.8.3.2 Cancellation (element 3)

Indicated by the abbreviation **CNL**.

#### 5.8.8.3.3 SIGMET message being cancelled (element 4)

The abbreviation SIGMET followed by the alphanumeric sequence of the message being cancelled.

#### **5.8.8.3.4 Validity period of SIGMET message being cancelled (element 5)**

A reference to the valid period for which the SIGMET is being cancelled.

#### **5.8.8.3.5 VA movement (element 6)**

Indication of VA moving into another FIR (optional). Coordination with neighbouring meteorological watch offices (MWO) is required if VA is moving into a FIR outside Canada's area of responsibility.

#### **5.8.8.3.6 Remark (element 7)**

Refer to 5.8.3.8.

Example (1): For an ongoing phenomena:

WSCN05 CWA0 161220  
CZUL SIGMET M3 VALID 161220/161620 CWUL-  
CZUL MONTREAL FIR <<meteorological part>>

Cancelled as:

WSCN05 CWA0 161430  
CZUL SIGMET M4 VALID 161430/161620 CWUL-  
CZUL MONTREAL FIR CNL SIGMET M3 161220/161620=

Example (2): For an ongoing phenomena:

WSCN05 CWA0 161220  
CZUL SIGMET M3 VALID 161220/161620 CWUL-  
CZUL MONTREAL FIR <<meteorological part>>

Cancelled late as the validity period had expired:

WSCN05 CWA0 161630  
CZUL SIGMET M4 VALID 161630/161630 CWUL-  
CZUL MONTREAL FIR CNL SIGMET M3 161220/161620=

Example (3): For an expected phenomenon (expected time of occurrence 1500Z):

WSCN05 CWA0 161220  
CZUL SIGMET M1 VALID 161500/161900 CWUL-  
CZUL MONTREAL FIR <<meteorological part>>

Cancelled before the expected time of commencement of the phenomenon as:

WSCN05 CWA0 161430  
CZUL SIGMET M2 VALID 161500/161900 CWUL-  
CZUL MONTREAL FIR CNL SIGMET M1 161500/161900=

### 5.8.9 Test SIGMET

There may be occasions when test SIGMET messages are transmitted by the MWO. The test SIGMET messages will be identifiable by the letter “T” in the alphanumeric sequence (refer to 5.8.2.1). Additionally, the word “TEST” will be added at the beginning of the message.

Examples of a test message:

#### International (ICAO)

WSCN03 CWA0 162225

CZWG SIGMET T1 VALID 162225/170225 CWEG-

CZWG WINNIPEG FIR TEST SQL TSGR OBS WI 40NM WID LINE BTN N4929

W09449 - N5104 W09348 - N5209 W09120 TOP FL340 MOV E 15KT NC=

#### National

WSCN23 CWA0 162225

CZWG SIGMET T1 VALID 162225/170225 CWEG-

CZWG WINNIPEG FIR TEST SQL TSGR OBS WI 40NM WID LINE BTN /N4929

W09449/25 SW CYQK - /N5104 W09348/CYRL - /N5209 W09120/60 NW CYPL TOP  
FL340 MOV E 15KT NC

RMK GFACN33=

Examples of a cancellation of a test message:

#### International (ICAO)

WSCN03 CWA0 162300

CZWG SIGMET T2 VALID 162300/170225 CWEG-

CZWG WINNIPEG FIR TEST CNL SIGMET T1 162225/170225=

#### National

WSCN23 CWA0 162300

CZWG SIGMET T2 VALID 162300/170225 CWEG-

CZWG WINNIPEG FIR TEST CNL SIGMET T1 162225/170225

RMK GFACN33=

### 5.8.10 Relationship to GFA and Sig Wx prognostic charts

A SIGMET will be issued to advise pilots on the occurrence or expected occurrence of specified weather phenomena, regardless of the fact that the phenomena may or may not be included in the Graphic Area Forecast (GFA). Once issued, a SIGMET message automatically amends the current GFA. Because a SIGMET may be covering a greater vertical extent than the GFA, it may also amend the Sig Wx prognostic charts.

### 5.8.11 Relationship to AIRMET

A SIGMET is always issued for specified weather phenomena whereas an AIRMET is issued for specified weather phenomena only if they are not included in the GFA.

In a situation where a phenomenon described in a SIGMET decreases in intensity to now meet the AIRMET criteria (e.g. **SEV TURB** becomes **MOD TURB**), the SIGMET **shall** then be cancelled. An AIRMET **shall** be issued, if and only if the phenomenon was not forecast in the current GFA. If the phenomenon was forecast in the currently valid GFA, the issuance of an AIRMET is not required.

Conversely, a phenomenon that had resulted in the issuance of an AIRMET may increase in intensity to the SIGMET criteria. In this situation, the AIRMET **shall** be cancelled while a SIGMET **shall** be issued.

## Chapter 6 AIRMET

### 6.1 Definition

AIRMET: Information message issued by a meteorological watch office (MWO) to advise pilots of the occurrence or expected occurrence of specified weather phenomena which may affect the safety of aircraft operations and were not already included in a Graphic Area Forecast (GFA), and the development of those phenomena in time and space.

### 6.2 Domain

The message **shall** describe specified weather phenomena up to and including 24,000 feet (FL240) for the Canadian flight information regions (FIR) and a portion the Gander Oceanic flight information region. Refer to E.1 of Appendix E for the map of the Canadian AIRMET information domain. As with a GFA, the top of a weather phenomenon above FL240 is stated, provided that the base of such phenomenon is below FL240.

### 6.3 Projection

As per *WMO No. 49 - Technical Regulations, Volume II, Meteorological Service for International Air Navigation*, section [C.3.3] 3.2.2, the depiction of the location of the phenomenon **shall** use the polar stereographic projection true at 60 degrees latitude north with lines between coordinate points as orthodromes (great circles).

### 6.4 Language

An AIRMET message is prepared in abbreviated English language using approved MSC abbreviations as published in the *Manual of Word Abbreviations* (MANAB). Abbreviations to be used in AIRMET messages are given in E.2 of Appendix E.

## 6.5 Units

The only units explicitly stated are:

- nautical miles (**NM**) for a distance associated to the abbreviation “**WI**” (within)
- knots (**KT**) for speed
- Zulu (**Z**) for time in UTC, with midnight being indicated by the numerals zero and zero “**00**”
- statute miles (**SM**) for visibility
- feet (**FT**) for the height (above ground level) of the base and top of **BKN** or **OVC** cloud
- heights are otherwise stated in flight levels corresponding to hundreds of feet and preceded by the abbreviation “**FL**”.

## 6.6 Types of AIRMET

ICAO Annex 3 provides one AIRMET format which encompasses all of the specified weather phenomena. An AIRMET can be identified through the data type designator included in the WMO abbreviated heading of an AIRMET message as explained in section 6.7.

## 6.7 Structure of the AIRMET message

An AIRMET message consists of:

- WMO heading - an AIRMET is preceded by an appropriate WMO heading
- First line - containing location indicators of the relevant ATS unit serving the FIR and MWO, alphanumeric identification and period of validity.
- Meteorological part - containing meteorological information concerning the phenomenon for which the AIRMET is issued.
- Equal sign “=” - indicates the end of the message.

## 6.8 Format of AIRMET

**Note:** In the following text, square brackets [ ] are used to indicate an optional or conditional element, and angled brackets < > for symbolic representation of a variable element, which in the real AIRMET accepts concrete alphanumeric values.

### 6.8.1 WMO header

The *WMO No. 386 - Manual on the Global Telecommunication System* recommends the use of the following abbreviated headings for bulletins containing meteorological information.

**Table 22:** T<sub>1</sub>T<sub>2</sub>A<sub>1</sub>A<sub>2</sub>ii CCCC YYGGgg [CCx]

| Symbol                        | Interpretation                                                                                                       |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------|
| T <sub>1</sub>                | Data type designator (refer to 6.8.1.1)                                                                              |
| T <sub>2</sub>                | Data type designator (refer to 6.8.1.1)                                                                              |
| A <sub>1</sub> A <sub>2</sub> | Geographical designator (where message applies not the issuing country) (refer to 6.8.1.2)                           |
| ii                            | Bulletin number (refer to 6.8.1.3)                                                                                   |
| CCCC                          | International four-letter location indicator of the centre originating or compiling the bulletins (refer to 6.8.1.4) |
| YYGGgg                        | International date-time group                                                                                        |
| CCx                           | Correction identifier (refer to 6.8.1.5)                                                                             |

#### 6.8.1.1 Data type designator

T<sub>1</sub>: W for Warnings (refer to *WMO-No. 386, table A, A.II 5/2*)

T<sub>2</sub>: A for AIRMET (refer to *WMO-No. 386, table B1, A.II-5/6*)

#### 6.8.1.2 Geographical designator

The geographic designator indicates where the meteorological information applies to, not the issuing country.

A<sub>1</sub>A<sub>2</sub>: CN for Canada (all FIRs but CZQX Oceanic) (refer to *WMO-No. 386, table C1, A.II-5/9*)

A<sub>1</sub>A<sub>2</sub>: NT for North Atlantic area (CZQX Oceanic) (refer to *WMO-No. 386, table C, A.II-5/12*)

#### 6.8.1.3 Bulletin number

ii: number with two digits

- 01–19 for global distribution
- 20–39 for inter-regional distribution (as per WMO regions)

**6.8.1.4 International four-letter location indicator of the centre originating or compiling the bulletins**

**CCCC:** As standardized practice, all AIRMET messages issued by Canada will be under CWA0 which refers to the Canadian Centre for Meteorological and Environmental Prediction/Network Operations (CCMEP/NETOPS) as the centre compiling the bulletins.

**6.8.1.5 Correction identifier**

**CCx:** Since there are no provisions in ICAO documentation for correcting an AIRMET, the correction identifier will not be used. Refer to 6.8.4 for details.

**6.8.1.6 Bulletin scheme**

AIRMET messages will be issued in a set of two bulletins. The first one is aimed at international distribution while the second one will contain additional information for national purposes. Refer to E.3 of Appendix E for the full bulletin scheme, as shown in this excerpt:

| <b>FIR</b> | <b>FIR name</b> | <b>Type</b> | <b>International (ICAO)</b> | <b>National</b> |
|------------|-----------------|-------------|-----------------------------|-----------------|
| CZYZ       | TORONTO         | AIRMET      | WACN04 CWA0                 | WACN24 CWA0     |

## 6.8.2 First line—**CCCC AIRMET [n]nn VALID YYGGgg/YYGGgg CCCC-**

**Table 23:** CCCC AIRMET [n]nn VALID YYGGgg/YYGGgg CCCC-

| Symbol        | Interpretation                                                                                                                                       |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| CCCC          | ICAO location indicator of the ATS unit serving the FIR to which the AIRMET refers                                                                   |
| AIRMET        | Message identifier                                                                                                                                   |
| [n]nn         | Daily alphanumeric sequence (refer to 6.8.2.1)                                                                                                       |
| VALID         | Period of validity indicator                                                                                                                         |
| YYGGgg/YYGGgg | Validity period of AIRMET given by date/time group of the beginning and date/time group of the end of the period (refer to 6.8.2.2)                  |
| CCCC-         | ICAO location indicator of the MWO originating the message and a hyphen “-” (without a space); separating the preamble from text (refer to 6.8.2.3). |

### 6.8.2.1 Daily alphanumeric sequence

- 1) An AIRMET message **shall** be identified by a letter:
  - letter attribution rules and the lettering scheme are defined in section E.4 Appendix E.
- 2) An AIRMET message letter **shall** be numerically sequenced as follows:
  - numbering of an AIRMET message letter begins at one;
  - the number is incremented by one when updating the message, including cancellation;
  - the sequence number **shall** correspond with the number of AIRMET messages issued for an event within a FIR since 0000Z on the day concerned; and
  - the numbering is thus reset at 0000Z (messages are not updated at 0000Z for the sole purpose of resetting the number).

Example: **CZVR AIRMET U1 VALID 040315/040715 CWEG-**

### 6.8.2.2 Validity period and lead time of AIRMET

**Table 24:** Validity period and lead time of AIRMET

| Symbol | Lead time – up to (hours) | Validity period (hours) |
|--------|---------------------------|-------------------------|
| WA     | 4                         | 4                       |

- 1) The period of validity of an AIRMET is four hours.
- 2) In the case of an AIRMET for an ongoing phenomenon:
  - the date/time group indicating the start of the AIRMET period will be rounded back to five minutes from the filing time (date/time group in the WMO heading).
- 3) In the case of an AIRMET for an expected phenomenon (forecast event):
  - the beginning of the validity period will be the time of the expected commencement (occurrence) of the phenomenon.
  - For an AIRMET, the lead time (the time of issuance of the AIRMET) can be up to four hours before the start of the validity period (i.e. expected time of occurrence of the phenomenon).
  - An AIRMET for an expected phenomenon is issued only for the first appearance of an event in Canadian airspace (e.g. moving in from the U.S. or onset inside a Canadian FIR). A phenomenon moving from one Canadian FIR to another is treated as an ongoing phenomenon. No forecast event AIRMET message would be issued for the FIR in which the event is moving.

Example (1): For an ongoing phenomenon:

WACN05 CWA0 161220

CZUL AIRMET M1 VALID 161220/161620 CWUL-

Example (2): For an expected phenomenon (expected time of occurrence 0315Z):

WACN01 CWA0 040115

CZVR AIRMET U1 VALID 040315/040715 CWEG-

### 6.8.2.3 Meteorological Watch Office (MWO)

CWUL for Canadian Meteorological Aviation Center - East (CMAC-E) in Montréal.

CWEG for Canadian Meteorological Aviation Center - West (CMAC-W) in Edmonton.

### 6.8.3 Format of the meteorological part of an AIRMET

The meteorological part of an AIRMET consists of the following nine elements (this table has been divided into two parts due to horizontal space constraints).

**Table 25:** Meteorological elements of an AIRMET

| Element 1<br>Location indicator<br>of the FIR | Element 2<br>Name of the<br>FIR | Element 3<br>Description of<br>the<br>phenomenon | Element 4<br>Observed or<br>forecast | Element 5<br>Location                         |
|-----------------------------------------------|---------------------------------|--------------------------------------------------|--------------------------------------|-----------------------------------------------|
| <CCCC>                                        | <name> FIR                      | <Phenomenon>                                     | OBS [AT <GGggZ>]<br>FCST             | Geographical<br>location of the<br>phenomenon |

| Element 6<br>Level                              | Element 7<br>Movement or expected<br>movement | Element 8<br>Change in intensity | Element 9<br>Remark |
|-------------------------------------------------|-----------------------------------------------|----------------------------------|---------------------|
| [FL<nnn/nnn>]<br>[SFC/FL<nnn>]<br>[TOP FL<nnn>] | MOV <direction, speed>KT<br>STNR              | INTSF or WKN or NC               | RMK                 |

#### 6.8.3.1 Location indicator and name of the FIR (element 1 and 2)

Example (1): **CZUL MONTREAL FIR**

Example (2): **CZVR VANCOUVER FIR**

#### 6.8.3.2 Description of the phenomenon (element 3)

The description of the phenomenon consists of a qualifier and a phenomenon abbreviation. AIRMETs are issued for the following phenomena:

- 1) **SFC WSPD** - widespread mean surface wind speed above 30 kts
- 2) Surface visibility and/or cloud less than **3SM** and/or **BKN** or **OVC** below **1000FT** AGL over a widespread area
  - Visibilities are indicated in statute miles. Visibilities expressed with a whole mile and a fraction will include a space: e.g. 1 1/4SM
  - Heights for cloud bases and tops are indicated in FT above ground level for consistency with the GFA. In the AIRMET bulletin, FT is mentioned whereas AGL is implied.

- 3) Thunderstorm (**TS**) and/or Towering cumulus (**TCU**)
  - **TCU** if **ISOL**, **OCNL**, **FRQ**; or
  - **TS** if **ISOL**, **OCNL**, with hail as necessary; or
  - Both **TS** and **TCU** if both are present and the spatial amount of the **TCU** exceeds that of the **TS**, with the cumulative spatial amount not exceeding 100%. Otherwise only the **TS** is reported.
- 4) Turbulence (**TURB**) only **MOD**
- 5) Icing (**ICE**) only **MOD**
- 6) Mountain waves (**MTW**) only **MOD**

The appropriate abbreviations and combinations thereof, and their meaning are given in E.5 of Appendix E.

### 6.8.3.3 The phenomenon is either observed or forecast (element 4)

**OBS** [**AT** <**GGggZ**>] or **FCST**

The abbreviation **OBS** is used when:

- there has been a recent<sup>1</sup> direct observation of the phenomenon (e.g. METAR, PIREP); or
- there has been a recent<sup>1</sup> indirect observation of the phenomenon (i.e. remote sensing imagery) or the observation of a meteorological element (e.g. strong wind, freezing precipitation), which leads the forecaster to believe that the phenomenon is occurring.

**OBS** is optionally followed by the time group in the form of **AT GGggZ**, where **GGgg** is the time of the observation in hours and minutes UTC. If the exact time of the observation is not known, the time is not included. No additional information will be given, e.g. aircraft type reporting the phenomenon.

**Note (1):** recent means normally within a two hour period preceding the issuance time of the AIRMET and in no circumstance more than three hours preceding the issuance time of the AIRMET.

The use of **FCST** occurs if either:

- the phenomenon is not directly or indirectly observed but there is strong meteorological evidence (i.e. numerical guidance) to suggest that the phenomenon is occurring; or
- the phenomenon is expected. In other words, there is meteorological evidence (i.e. numerical guidance) to suggest that the phenomenon will be occurring within the prescribed lead time (refer to 6.8.2.2).

When **FCST** is used, it is assumed that the time of the occurrence or commencement of the phenomenon coincides with the beginning of the period of validity in the first line of the AIRMET.

Example (1): **OBS AT 0140Z**

Example (2): **FCST**

#### 6.8.3.4 Location of the phenomenon (element 5)

The location of the phenomenon is depicted as an area using coordinate points:

- The description always begins with the abbreviation “**WI**” (within).
- The area can be described as a circle, a line or a polygon.
- Distances are in nautical miles (NM), direction to one of the eight points of compass (octants<sup>1</sup>).

**Note (1):** Refer to E.6 of Appendix E for details.

**Table 26:** Maximum coordinate points by AIRMET shape

| Description          | Recommended maximum number of coordinate points |
|----------------------|-------------------------------------------------|
| Circle <sup>1</sup>  | 1                                               |
| Line <sup>2</sup>    | 4                                               |
| Polygon <sup>3</sup> | 7                                               |

**Note (1):** A radial distance is used to define the size of the circle.

**Note (2):** The line is defined by the entire width of an area centered on a line between two or more points.

**Note (3):** Polygons shall be closed. The last coordinate point is a repeat of the first one.

**Coordinate points:**

- The international (ICAO) AIRMET message describes a coordinate point using a latitude and longitude only (resolution defined in E.6 of Appendix E)
- The national AIRMET message describes a coordinate point using a latitude and longitude. Additionally, an equivalent description with respect to an aviation reference site<sup>3</sup> is given corresponding to an approximation of the coordinate point in latitude and longitude.

There are two exceptions to this rule:

- 1) Any coordinate point located within Gander Oceanic FIR will be described in latitude and longitude only. These points will be limited to the resolution as defined in E.6 of Appendix E.
- 2) Any coordinate point north of N7200 will be described with respect to an aviation reference site only if within a 90 nautical mile radius of that site. Otherwise the coordinate point will be represented in latitude and longitude only. This is due to the sparse number of aviation reference sites over northern Canada.

**Table 27:** Format for coordinate points

| Bulletin             | Symbolic form                                                                            | Examples                    |
|----------------------|------------------------------------------------------------------------------------------|-----------------------------|
| International (ICAO) | Nnnnn Wnnnnn                                                                             | N4502 W07345                |
| National             | /Nnnnn Wnnnnn/[Distance <sup>1</sup> Direction <sup>2</sup> ]<br>Identifier <sup>3</sup> | /N4502 W07345/25 SW<br>CYUL |

**Note (1):** Distance is in nautical miles (NM) with units not explicitly stated.

**Note (2):** Direction to the eight point compass (octants). See E.6 of Appendix E for details

**Note (3):** Refer to E.7 of Appendix E for the list of available aviation reference sites.

**Table 28:** Examples of coordinate points

| Description | International (ICAO)                                                                                                  | National                                                                                                                                                                                                    |
|-------------|-----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Circle      | WI 45NM OF N4643 W07345                                                                                               | WI 45NM OF /N4643 W07345/75 N CYUL                                                                                                                                                                          |
| Line        | WI 50NM WID LINE BTN N4459<br>W07304 - N4855 W07253 -<br>N5256 W06904                                                 | WI 50NM WID LINE BTN /N4459<br>W07304/45 SE CYUL - /N4855 W07253/30<br>NW CYRJ - /N5256 W06904/75 W CYWK                                                                                                    |
| Polygon     | WI N4502 W07345 - N4907<br>W07331 - N5345 W06943 -<br>N5256 W06758 - N4848<br>W07149 - N4508 W07206 -<br>N4502 W07345 | WI /N4502 W07345/25 SW CYUL - /N4907<br>W07331/60 SE CYMT - /N5345<br>W06943/150 E CYAH - /N5256 W06758/45<br>W CYWK - /N4848 W07149/25 NE CYRJ -<br>/N4508 W07206/25 SW CYSC - /N4502<br>W07345/25 SW CYUL |

**6.8.3.5 Flight level and extent (element 6)**

[FL<nnn/nnn>]

[SFC/FL<nnn>]

[TOP FL<nnn>]

The location and extent of the phenomenon in the vertical is given by one or more of the above abbreviations, as follows:

- A layer FL<nnn/nnn> where the lower level is reported first; this is used particularly in turbulence and icing AIRMETs
- A layer with reference to one FL using SFC/FL<nnn>
- The level of the tops of the TS and/or TCU clouds using the abbreviation TOP

Example (1): MOD TURB...FL220/270

Example (2): MOD ICE...SFC/FL030

Example (3): ISOL TS...TOP FL340

Square brackets “[ ]” indicate that element 6 is optional. Specifically, element 6 is not required for the three following phenomena:

- 1) SFC WSPD - widespread mean surface wind speed above 30 kts.
- 2) Surface visibility and/or cloud - visibility less than 3SM and/or BKN or OVC cloud below 1000FT AGL over a widespread area.
- 3) The level or extent of the phenomenon is either not required (i.e. phenomenon at the surface) or the information is contained within element 3 (i.e. low cloud description).

**6.8.3.6 Movement or expected movement (element 7)**

MOV <direction, speed>KT or STNR

Direction of movement is given with reference to one of the 16 points of compass (radials)<sup>1</sup>. Speed is given in knots (KT). The abbreviation STNR is used if no significant movement is expected.

Example (1): MOV SSE 15KT

**Note (1):** Refer to E.6 of Appendix E for details

### 6.8.3.7 Change in intensity (element 8)

The expected evolution of the phenomenon's intensity is indicated by one of the following abbreviations:

- **INTSF** - intensifying
- **WKN** - weakening
- **NC** - no change

### 6.8.3.8 Remark (element 9)

The remark (**RMK**) is found only in the national AIRMET message. It begins on a new line. The purpose is to allow additional information of national interest to be conveyed in an AIRMET message. Items listed in the remark line will be separated by a forward slash “/”:

- the GFA region(s) the AIRMET message applies to (refer to Figure 6),
- cross-referencing AIRMET messages when a phenomenon straddles one or several FIR boundaries (refer to Figure 6).
- for a phenomenon that has moved out of a FIR, the cancelled AIRMET message will refer to the continuing AIRMET message in neighbouring FIR(s) within Canada's AOR (refer to Figure 7).
- Additionally, for a phenomenon that has moved out of an FIR, the continuing AIRMET message in neighbouring FIR(s) within Canada's AOR will refer to the cancellation AIRMET message.

**Symbolic form:** **RMK** [**GFACN**<nn>] / [**CCCC** <name> **FIR AIRMET**[n]nn]<sup>1</sup>

**Note (1):** Refer to 6.8.3.1 and 6.8.2.1 for the description.

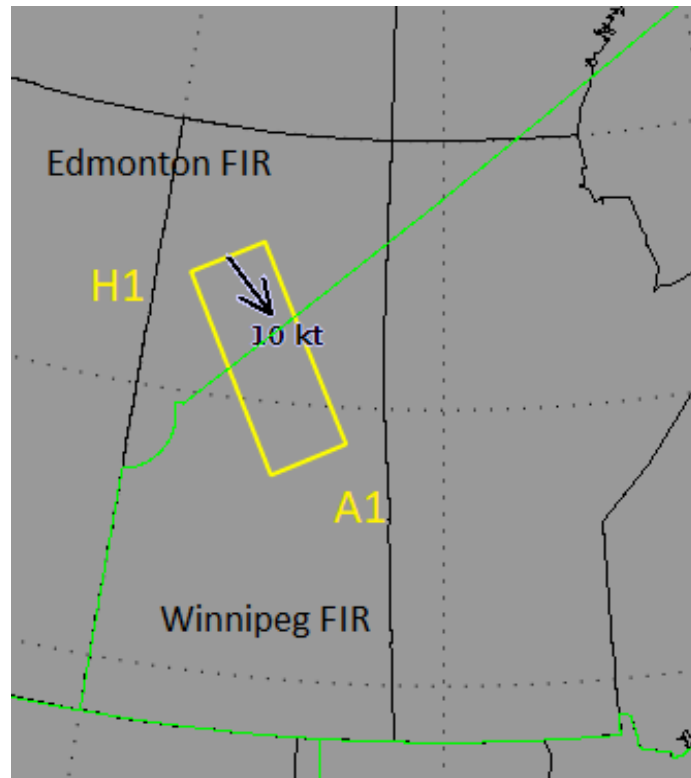


**Figure 6:** AIRMET phenomenon covering two FIR

The above phenomenon requires two AIRMET messages, one per FIR. The meteorological part will be identical in both messages (1) and (2).

Message (1):

WACN22 CWA0 161220  
 CZEG AIRMET H1 VALID 161220/161620 CWEG-  
 CZEG EDMONTON FIR «meteorological part»  
 RMK GFACN32/CZWG WINNIPEG FIR AIRMET A1=

Message (2):

WACN23 CWA0 161220  
 CZWG AIRMET A1 VALID 161220/161620 CWEG-  
 CZWG WINNIPEG FIR «meteorological part»  
 RMK GFACN32/CZEG EDMONTON FIR AIRMET H1=

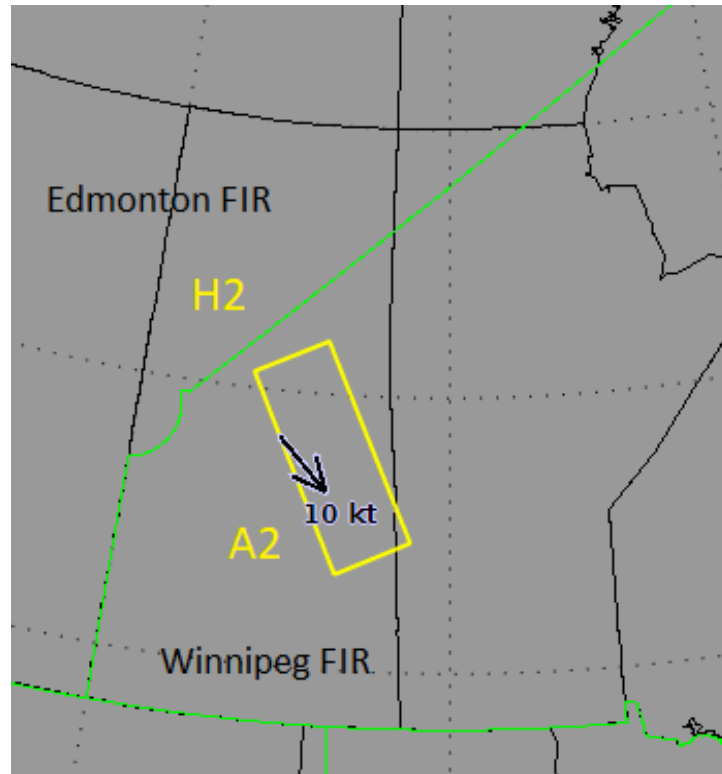


**Figure 7:** AIRMET phenomenon covering only one FIR

The above phenomenon is a continuation of Figure 6. In other words, the area has moved southeastward with time. AIRMET A2 is an update of A1 while AIRMET H2 is a cancellation of H1 since the phenomenon no longer affects the Edmonton FIR.

Message (1):

WACN22 CWA0 161530  
 CZEG AIRMET H2 VALID 161530/161620 CWEG-  
 CZEG EDMONTON FIR CNL AIRMET B1 161220/161620  
 RMK **GFACN32/CZWG WINNIPEG FIR AIRMET A2=**

Message (2):

WACN23 CWA0 161530  
 CZWG AIRMET A2 VALID 161530/161930 CWEG-  
 CZWG WINNIPEG FIR «meteorological part»  
 RMK **GFACN32/CZEG EDMONTON FIR AIRMET H2=**

#### 6.8.4 Correcting an AIRMET

In the event of an AIRMET message transmitted with an error, a correction is issued by updating the AIRMET according to 6.8.5.

### 6.8.5 Updating of AIRMET

An updated AIRMET, when issued, automatically replaces the previous AIRMET in the same series (i.e. the previous AIRMET with the same letter):

- An AIRMET must be updated every four hours (from date/time group in the WMO heading, refer to 6.8.1); however,
- a forecaster should update an AIRMET at any time if necessary or if the AIRMET becomes unrepresentative.

For rules regarding the alphanumeric sequence, refer to 6.8.2.1.

Example (1): For an ongoing phenomena:

WACN05 CWA0 161220

CZUL AIRMET M3 VALID 161220/161620 CWUL-

Updated four hours later (i.e. before 1620Z) as:

WACN05 CWA0 161605

CZUL AIRMET M4 VALID 161605/162005 CWUL-

Example (2): For an expected phenomenon (expected time of occurrence 0315Z):

WACN01 CWA0 040115

CZVR AIRMET U1 VALID 040315/040715 CWEG-

Updated at 0245Z as event occurred earlier (30 minutes) than expected:

WACN01 CWA0 040245Z

CZVR AIRMET U2 VALID 040245/040645 CWEG-

### 6.8.6 Cancelling an AIRMET

Cancelling an AIRMET is required when:

- during the validity period of an AIRMET, the phenomenon for which the AIRMET had been issued is no longer occurring or no longer expected to occur (forecast AIRMET);
- during the validity period of an AIRMET, the phenomenon for which the AIRMET had been issued strengthens, such that a SIGMET is now required. Refer to 6.8.9 for details; and/or
- during the validity period of an AIRMET, the new issue of the Graphical Area Forecasts (GFA) has been transmitted and now includes the phenomenon. Refer to 6.8.8 for details.

An AIRMET does not cancel itself automatically at the end of its validity period.

#### 6.8.6.1 WMO header

Other than for the date/time group, the WMO header remains the same. Refer to 6.8.1.

**6.8.6.2 First line—CCCC AIRMET [n]nn VALID YYGGgg/YYGGgg CCCC-****Table 29: CCCC AIRMET [n]nn VALID YYGGgg/YYGGgg CCCC-**

| Symbol        | Interpretation                                                                                                                                   |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| CCCC          | ICAO location indicator of the ATS unit serving the FIR to which the AIRMET refers                                                               |
| AIRMET        | Message identifier                                                                                                                               |
| [n]nn         | Daily alphanumeric sequence (refer to 6.8.2.1)                                                                                                   |
| VALID         | Period of validity indicator                                                                                                                     |
| YYGGgg/YYGGgg | Validity period of AIRMET given by date/time group of the beginning and date/time group of the end of the period                                 |
| CCCC-         | ICAO location indicator of the MWO originating the message and hyphen “-” without a space; separating the preamble from text (refer to 6.8.2.3). |

**6.8.6.2.1 Daily alphanumeric sequence**

Number incremented by one. Refer to 6.8.2.1 for details.

**6.8.6.2.2 Validity period of AIRMET**

When an AIRMET is for an ongoing phenomenon.

- The date/time group indicating the start of the AIRMET period will be rounded back to five minutes from the filing time (date/time group in the WMO heading) while the date/time group indicating the end of the AIRMET period does not change from previous AIRMET issued, it remains the same as the AIRMET it cancels.
- If the validity period has expired, the date/time group indicating the start and end of the AIRMET period will all be the same, and those will be rounded back to five minutes from the filing time

When an AIRMET is for an expected phenomenon.

- The validity period remains unchanged.

**6.8.6.3 Second line**

The second line of a cancelled AIRMET consists of six elements.

**Table 30:** Meteorological elements of a cancelled AIRMET

| <b>Element 1</b><br>Location indicator of the FIR | <b>Element 2</b><br>Name of the FIR | <b>Element 3</b><br>Cancellation | <b>Element 4</b><br>AIRMET message being cancelled | <b>Element 5</b><br>Validity period of AIRMET message being cancelled | <b>Element 6</b><br>Remark |
|---------------------------------------------------|-------------------------------------|----------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|----------------------------|
| <CCCC>                                            | <name> FIR                          | CNL                              | AIRMET [n]nn                                       | <YYGGgg/YYGGgg>                                                       | RMK                        |

**6.8.6.3.1 Location indicator and name of the FIR (element 1 and 2)**

Refer to 6.8.3.1.

**6.8.6.3.2 Cancellation (element 3)**

Indicated by the abbreviation **CNL**.

**6.8.6.3.3 AIRMET message being cancelled (element 4)**

The abbreviation **AIRMET** followed by the alphanumeric sequence of the message being cancelled.

**6.8.6.3.4 Validity period of AIRMET message being cancelled (element 5)**

A reference to the valid period for the AIRMET being cancelled.

**6.8.6.3.5 Remark (element 6)**

Refer to 6.8.3.8.

Example (1): For an ongoing phenomenon:

WACN05 CWA0 161220

CZUL AIRMET M3 VALID 161220/161620 CWUL-

CZUL MONTREAL FIR <<meteorological part>>

Cancelled as:

WACN05 CWA0 161430

CZUL AIRMET M4 VALID 161430/161620 CWUL-

CZUL MONTREAL FIR CNL AIRMET M3 161220/161620=

Example (2): For an ongoing phenomenon:

WACN05 CWA0 161220

CZUL AIRMET M3 VALID 161220/161620 CWUL-

CZUL MONTREAL FIR <<meteorological part>>

Cancelled late as the validity period had expired:

WACN05 CWA0 161630

CZUL AIRMET M4 VALID 161630/161630 CWUL-

CZUL MONTREAL FIR CNL AIRMET M3 161220/161620=

Example (3): For an expected phenomenon (expected time of occurrence 1500Z):

WACN05 CWA0 161220

CZUL AIRMET M1 VALID 161500/161900 CWUL-

CZUL MONTREAL FIR <<meteorological part>>

Cancelled before the expected time of commencement of the phenomenon as:

WACN05 CWA0 161430

CZUL AIRMET M2 VALID 161500/161900 CWUL-

CZUL MONTREAL FIR CNL AIRMET M1 161500/161900=

### 6.8.7 Test AIRMET

There may be occasions when test AIRMET messages are transmitted by the meteorological watch office (MWO). The test AIRMET messages will be identifiable by the letter **T** in the alphanumeric sequence (refer to 6.8.2.1). Additionally, the word “**TEST**” will be added at the beginning of the message.

Example (1):

#### International (ICAO)

WACN03 CWA0 162225

CZWG AIRMET **T1** VALID 162225/170225 CWEG-

CZWG WINNIPEG FIR **TEST** ISOL TS OBS WI 40NM WID LINE BTN N4929 W09449  
- N5104 W09348 - N5209 W09120 TOP FL340 MOV E 15KT NC=

#### National

WACN23 CWA0 162225

CZWG AIRMET **T1** VALID 162225/170225 CWEG-

CZWG WINNIPEG FIR **TEST** ISOL TS OBS WI 40NM WID LINE BTN /N4929  
W09449/25 SW CYQK - /N5104 W09348/CYRL - /N5209 W09120/60 NW CYPL TOP  
FL340 MOV E 15KT NC  
RMK GFACN33=

Example (2):

**International (ICAO)**

WACN03 CWA0 162300

CZWG AIRMET **T2** VALID 162300/170225 CWEG-

CZWG WINNIPEG FIR **TEST** CNL AIRMET **T1** 162225/170225=

**National**

WACN23 CWA0 162300

CZWG AIRMET **T2** VALID 162300/170225 CWEG-

CZWG WINNIPEG FIR **TEST** CNL AIRMET **T1** 162225/170225

RMK GFACN33=

### 6.8.8 Relationship to GFA

An AIRMET is issued to advise pilots of the occurrence or expected occurrence of specified weather phenomena which may affect the safety of aircraft operations and were not already included in the Graphic Area Forecast (GFA). Once issued, an AIRMET message automatically amends the current GFA. If the phenomenon is included in the GFA, then there is no requirement to issue an AIRMET.

### 6.8.9 Relationship to SIGMET

A SIGMET is always issued for its specified weather phenomena. On the other hand, an AIRMET is issued for its specified weather phenomena if not included in the Graphic Area Forecast (GFA).

In a situation where a phenomenon described in a SIGMET decreases in intensity to now meet the AIRMET criteria (e.g. **SEV TURB** becomes **MOD TURB**), the SIGMET **shall** then be cancelled. An AIRMET **shall** be issued, if and only if the phenomenon was not forecast in the current GFA. If the phenomenon was forecast in the currently valid GFA, the issuance of an AIRMET is not required.

Conversely, a phenomenon that had resulted in the issuance of an AIRMET may increase in intensity to the SIGMET criteria. In this situation, the AIRMET **shall** be cancelled while a SIGMET **shall** be issued.

## **Chapter 7 Significant weather prognostic charts**

### **7.1 Definition**

Forecasts in chart or pictorial form depict, with greater clarity than verbal, the most probable forecast conditions over large areas. Forecast of significant enroute weather phenomena prepared as SIG WX charts are primarily designed to meet requirements for preflight planning.

### **7.2 Issuing centres**

#### **7.2.1 Canadian Meteorological Aviation Centres (CMAC)**

The CMACs routinely issue a Graphic Area Forecast (GFA) in chart form as described in Chapter 4. Additionally, the CMACs routinely issue forecasts of significant weather (SIG WX) in chart form for the Canadian airspace and for the North Atlantic. These are detailed in 7.3.

### **7.3 CMAC prognostic charts**

#### **7.3.1 Canadian significant weather prognostic chart (CAN SIG WX)**

##### **7.3.1.1 Description**

The chart is a depiction of forecast significant weather at mid-levels (700 hPa to 400 hPa or [FL100](#) to [FL240](#)).

##### **7.3.1.2 Issue and valid times**

The charts are issued four times a day at approximately 0210, 0815, 1425 and 1940 UTC, and are valid at 12, 18, 00 and 06 UTC respectively. In other words, a chart is issued roughly 10 hours before its valid time.

##### **7.3.1.3 Domain**

The Canadian significant weather prognostic chart covers the seven GFA domains. Refer to 4.4 for details.

##### **7.3.1.4 Units**

Speeds are expressed in knots (KT) and heights in hundreds of feet. Mean sea level pressure is in hectopascals (hPa), and time is expressed in coordinated universal time (UTC).

### 7.3.1.5 Map projection and background

As per the *Technical Regulations* (WMO-No. 49), Volume II, Meteorological Service for International Air Navigation, Section [C.3.3] 3.2.2, the map **shall** use the polar stereographic projection true at 60 degrees latitude north.

For clarity, the map background contains at least the following features:

- provincial, federal and territorial boundaries
- oceans, coastlines and major lakes

### 7.3.1.6 Content

The significant weather charts depict forecast surface positions of pressure centres and fronts, forecast areas of significant cloud, turbulence and icing, as well as forecast freezing levels. When applicable, information on tropical cyclones, volcanoes/volcanic ash and radioactive releases are also indicated.

#### 1) Areas of clouds

Areas of clouds are indicated by scalloped lines. Cloud type, amount and thickness are indicated by **NCC hh/hh**, where:

- **N** indicates the cloud cover as **BKN** or **OVC**;
- **CC** indicates the type of cloud or may be replaced by **LYR** in cases of multiple vertical layers; and
- **hh/hh** indicates the heights, in hundreds of feet ASL, of the top and of the base of the cloud. **XX** indicates a base below the 700 hPa level.

#### 2) Turbulence

Turbulence is indicated by a symbol (see below) shown within a given area. A forecast of turbulence implies a greater than 50% chance of encountering turbulence somewhere within the area to which the symbol applies.

Symbol indicating moderate turbulence:



Symbol indicating severe turbulence:



- **hh/hh** gives the heights of the top and of the base of the turbulent layer, in hundreds of feet ASL. **XX** indicates a base below the 700 hPa level.

**Note:** A forecast of CB, thunderstorms, TCU, or ACC automatically implies moderate or severe turbulence; in this case, no turbulence symbol is used.

3) Icing

Icing is indicated by a symbol (see below) appearing within a given area.

Symbol indicating moderate icing:



Symbol indicating severe icing:



- **hh/hh** gives the heights of the top and of the base of the icing layer, in hundreds of feet ASL. **XX** indicates a base below the 700 hPa level.

**Note:** A forecast of CB, thunderstorms, TCU, or ACC automatically implies moderate or severe icing; in this case, no icing symbol is used.

4) Freezing levels

The freezing levels are depicted by dashed lines drawn at intervals of 5,000 feet and labeled in hundreds of feet ASL.

5) Surface fronts

Surface fronts are depicted in the standard fashion. Refer to C.2 of Appendix C for examples.

6) Pressure centres

Low and high pressure centres are marked "L" or "H", as applicable, and values of the central pressure are labeled in hPa.

7) Tropical cyclones

Tropical cyclones are indicated using the appropriate symbol along with official name:

Symbol indicating a tropical storm:



Symbol indicating a hurricane:



**Note:** The forecast mean direction and speed of motion (in knots) of surface pressure centres, fronts and troughs are added if the speed is greater than five knots. The direction and speed are six-hour means centred at the valid time of the chart.

## **7.3.2 North Atlantic significant weather prognostic chart (NAT SIG WX)**

### **7.3.2.1 Description**

The chart is a depiction of forecast significant weather at low and mid-levels (SFC to 400 hPa or SFC to [FL240](#)).

### **7.3.2.2 Issue and valid times**

These charts are valid at 00 UTC and 12 UTC and are transmitted at approximately 1315 UTC and 0115 UTC respectively.

### **7.3.2.3 Domain**

The North Atlantic significant weather prognostic chart covers the north-eastern section of North America, the North Atlantic Ocean between latitude 30 and 70 degrees, including Greenland, and a section of Western Europe.

### **7.3.2.4 Units**

Refer to 7.3.1.4.

### **7.3.2.5 Map projection and background**

Refer to 7.3.1.5.

### **7.3.2.6 Content**

Refer to 7.3.1.6.

## 7.4 Examples of forecasts in chart form

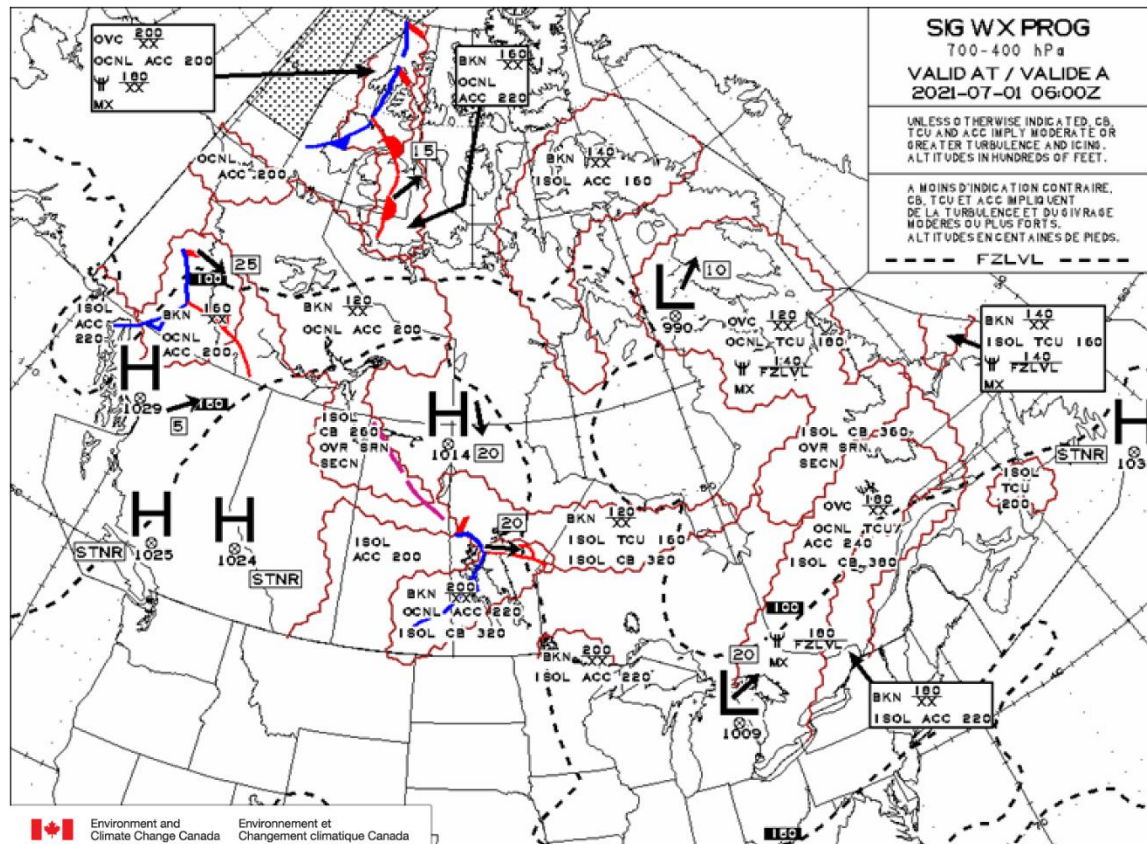


**Figure 8:** Canadian significant weather prognostic chart (CAN SIG WX)

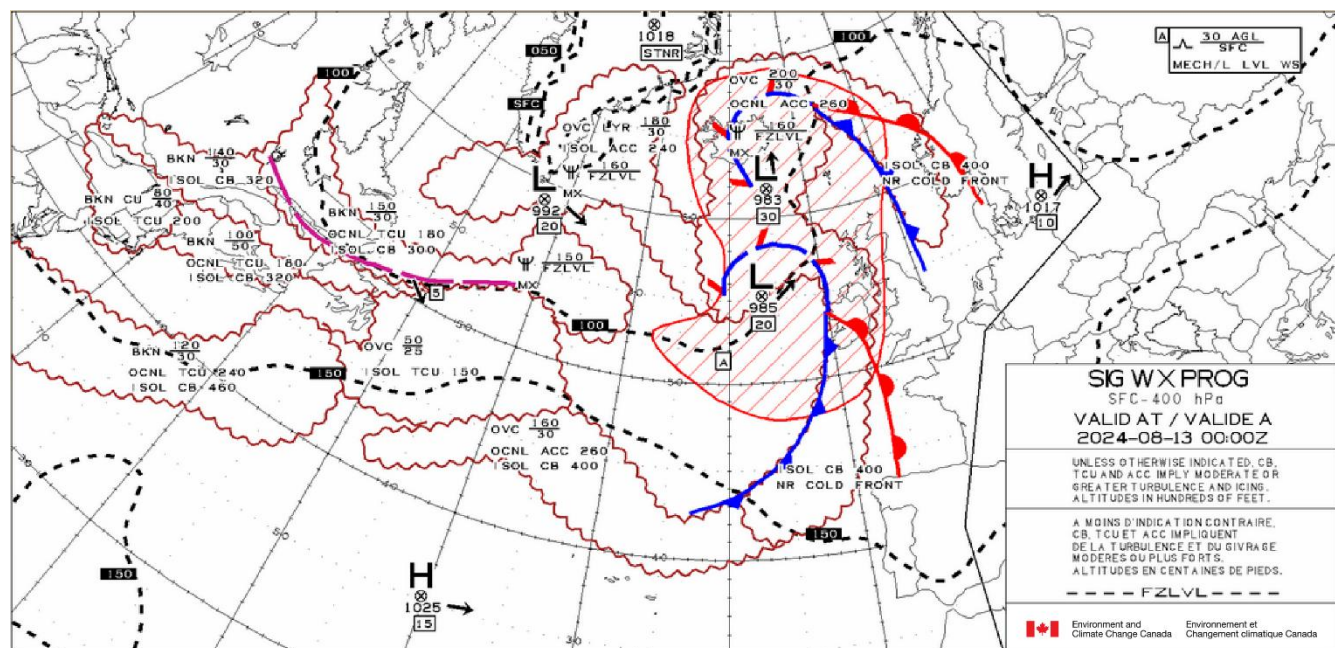


**Figure 9:** North Atlantic significant weather prognostic chart (NAT SIG WX)

## Chapter 8 Definitions

The following terms are defined in accordance with their use in this manual. These definitions may not be appropriate for general use.

**Abbreviated English:** Abbreviated English language using approved Meteorological Service of Canada (MSC) abbreviations as published in *Manual of Word Abbreviations* (MANAB).

**Aerodrome advisory:** A forecast, in TAF code, issued for aerodromes which do not fully meet Environment and Climate Change Canada's (ECCC) weather observing standards.

**Aerodrome forecast (TAF):** A forecast, in TAF code, for a designated aerodrome usually issued on a routine basis. It consists of a concise statement of the expected meteorological conditions at the aerodrome for a specified period.

**Aerodrome:** Any area of land, water (including the frozen surface thereof) or other supporting surface used, designed, prepared, equipped or set apart for use, either in whole or in part, for the arrival, departure, movement or servicing of aircraft. This includes any buildings, installations and equipment situated thereon or associated therewith.

**Aeronautical Meteorological Forecaster (AMF):** An aeronautical meteorological forecaster is a meteorologist who meets, at a minimum, the definition and top-level competency standards as defined in the *Manual on the Implementation of Education and Training Standards in Meteorology and Hydrology*, Volume I, Meteorology (WMO-No. 1083), as they pertain to aeronautical meteorology, who is continuously and actively responsible for the content of any aviation weather forecast service. Additional AMF competencies may be required that are in keeping with Canadian regulations.

**Air traffic control (ATC):** Service provided by ground-based controllers who direct aircraft on the ground and through controlled airspace. The primary purpose of ATC systems worldwide is to separate aircraft to prevent collisions, to organize and expedite the flow of traffic, and to provide information and other support for pilots when able.

**Air traffic service (ATS):** A service which regulates and assists aircraft in real-time to ensure their safe operations.

**AIRMET:** Information message issued by a meteorological watch office (MWO) to advise pilots of the occurrence or expected occurrence of specified weather phenomena which may affect the safety of aircraft operations, which were not already included in the Graphic Area Forecasts (GFA), and the development of those phenomena in time and space.

**Altitude above ground level (AGL):** The altitude expressed in feet measured above ground level.

**Alternate aerodrome (ALTERNATE):** An aerodrome to which an aircraft may proceed when it becomes either impossible or inadvisable to proceed to or land at the aerodrome of intended landing.

**Altitude above Sea Level (ASL):** The altitude expressed in feet measured above sea level.

**Altitude:** The vertical distance of a level, a point or an object considered as a point, measured from mean sea level.

**Area of Responsibility (AOR):** The geographical area over which Canada has the responsibility for providing aviation weather forecast services to civil aviation. This area is composed of all seven Canadian domestic Flight Information Regions (FIRs) as well as the Gander Oceanic FIR/CTA as per international agreement.

**Automated Weather Observation System (AWOS):** A set of meteorological sensors and associated systems designed to electronically collect and disseminate meteorological data.

**Aerodrome routine meteorological report (METAR):** An aviation report that describes the actual weather conditions at a specified location and at a specified time as observed from the ground. METAR is the name of the international meteorological code for an aviation routine weather report. METAR observations are normally taken and disseminated on the hour.

**Aviation special weather report (SPECI):** A SPECI, the name of the code for an aviation selected special weather report, will be reported when weather changes of significance to aviation are observed.

**Aviation weather service:** The provision of weather information intended primarily for the safe, regular and efficient conduct of aviation operations.

**Canadian Aviation Regulations (CAR):** The rules, enacted under the *Aeronautics Act*, that govern civil aviation in Canada. Replacing the Air Regulations and the Air Navigation Orders, the CARs and their associated standards came into force on October 10, 1996, after a comprehensive consultation process between Transport Canada and the aviation community. This cooperative and partnership approach to rule-making continues within the Canadian Aviation Regulation Advisory Council (CARAC), which discusses proposed amendments to the CARs and their associated standards.

**Canadian Meteorological Aviation Centre (CMAC):** A meteorological centre dedicated to production of aviation weather forecasts and the monitoring of meteorological conditions which may affect flight operations in Canada. As such a CMAC fulfills the role of a meteorological watch office (MWO).

**Canadian Centre for Meteorological and Environmental Prediction (CCMEP):** The component of the MSC responsible for the assimilation of weather data for objective and subjective analyses and forecasts and for generating numerical weather prediction products as guidance to support forecast production centres.

**Ceiling:** The lesser of the height above ground or water of the base of the lowest layer of cloud where the summation amount exceeds half the sky (more than four eighths (4/8)) or the vertical visibility in a surface-based layer which completely obscures the sky.

**Control area (CTA):** A controlled airspace extending upwards vertically from a specified height above the surface of the earth.

**Department of National Defence (DND):** Federal government department with the authority and responsibility to provide and arrange the provision of meteorological services to support the safe, efficient conduct of military aviation operations and training.

**Domestic aviation:** All aviation operations taking place solely within Canada. It specifically excludes trans-border (Canada-United States) and all other international air transport operations.

**Environment and Climate Change Canada (ECCC):** Canadian federal government department responsible for providing meteorological information to Canadians to ensure their safety and promote informed decision making related to the environment.

**Flight Information Region (FIR):** An airspace of defined dimensions extending upwards from the surface of the earth within which Flight Information Service (FIS) and alerting service are provided.

**Flight Level (FL):** A standard nominal altitude of an aircraft, in hundreds of feet. This altitude is calculated from the international standard pressure datum of 1013.25 hPa (29.92 inHg), the average sea-level pressure, and therefore is not necessarily the same as the aircraft's true altitude either above mean sea level or above ground level.

**Forecast:** A statement of expected meteorological conditions for a specified time or period, and for a specified area or portion of airspace.

**Graphic Area Forecast (GFA):** A forecast in chart form describing the most probable meteorological conditions expected to occur between the surface and 24,000 feet over a given area at a specified time.

**Height:** The vertical distance of a level, a point or an object considered as a point, measured from a specified datum, e.g. above ground.

**International Civil Aviation Organization (ICAO):** A specialized agency of the United Nations, the objective of which is to develop the principles and techniques of international air navigation and to foster planning and development of international civil air transport.

**MANAB:** Manual of word abbreviations authorized for use in transmissions over Environment and Climate Change Canada's Telecommunication Networks.

**MANOBS:** Manual of surface weather observation standards which prescribes the standard procedures of the Meteorological Service of Canada for observing, recording and reporting weather conditions.

**Meteorological Service of Canada (MSC):** The component of Environment and Climate Change Canada (ECCC) that leads, serves as the national focus, provides science, policy and service support to ECCC. MSC also provides ice services, including research, systematic observations and forecasts directly to clients. MSC coordinates nationally the standards for the delivery of the aviation weather program as required by Transport Canada and NAV CANADA. Furthermore, MSC prepares and delivers aviation and other forecast products required by the Department of National Defence (DND).

**Meteorological Watch Office (MWO):** An office that maintains a continuous watch over meteorological conditions affecting flight operations within its specified area of responsibility. An MWO is responsible for the provision of SIGMET and AIRMET information as well as pertinent information on volcanic activity and radioactive release to the Air Navigation Services provider.

**NAV CANADA (NC):** A private sector non-share capital corporation, financed through publicly-traded debt, which owns and operates Canada's civil air navigation system. NAV CANADA has the responsibility for the provision of aviation weather services in Canadian airspace and any airspace in respect of which Canada has the responsibility for the provision of air traffic control services. NAV CANADA also specifies the location and frequency of aviation weather observations and forecasts, and is responsible for the dissemination of this information for aviation purposes.

**Part-period:** A portion or a segment of the period of validity of a forecast.

**Period of coverage:** The span of time which a TAF program covers daily.

**Period of validity:** The span of time which a forecast encompasses. Also called "valid period," it is part of the aerodrome forecast. It must, however, be kept in mind that a forecast is only valid until another forecast (regular, amended or cancelled) is issued for the same area of responsibility or the same aerodrome.

**Pilot report (PIREP):** A report by a pilot pertaining to weather conditions encountered in flight.

**Plain English:** As used in this manual, the expression "Plain English" is intended to mean non-abbreviated English language in a telegraphic type format intended to convey meteorological information to the aviation community as effectively and as efficiently as possible.

**Prognostic chart:** A forecast of one or several specified meteorological element for a specified time or period and a specified surface or portion of airspace, depicted graphically on a chart.

**RCAP (Restricted Canada Air Pilot):** Approach plates for non-standard approaches or company specific approaches.

**RNAV (Area navigation):** A method of navigation which permits aircraft operation on any desired flight path within the coverage of ground- or space-based NAVAIDs or within the limits of the capability of self-contained aids, or a combination of these.

**SIGMET:** An information message issued by a meteorological watch office (MWO) to advise pilots of the occurrence or expected occurrence of specified weather phenomena, which may affect the safety of aircraft operations, and the development of those phenomena in time and space.

**Transport Canada (TC):** The federal authority responsible for the regulation of civil aviation.

**Valid period:** Alternate term for "Period of validity."

**Weather station:** An establishment primarily responsible for the observing and reporting of weather conditions. The station may be operated by a human observer, a fully automated system or a combination of both. Complete or partial sets of meteorological parameters may be observed.

**World Area Forecast System (WAFS):** A worldwide satellite broadcast system by which World Area Forecast Centres (WAFC) provide meteorological information for aviation purposes. These broadcasts are supervised by the International Civil Aviation Organization (ICAO) in order to fulfill requirements of the ICAO Annex 3 covering meteorological information which is necessary for flights.

**World Meteorological Organization (WMO):** A specialized agency of the United Nations (UN). It is the UN system's authoritative voice on the state and behavior of the Earth's atmosphere, its interaction with the oceans, the climate it produces and the resulting distribution of water resource.

## Appendices

### Appendix A Aerodrome Forecast (TAF)—Supplement to Chapter 2

**Notes:** This table lists all Canadian aerodromes with a TAF or advisory program issued by Environment and Climate Change Canada, as well as their applicable bulletin number, IFR Approach and Alternate Limits. Additional information, such as the coordinates and elevations, has been provided for completeness. For information beyond the bulletin and limit values listed in the following table, pilots are advised to refer to the latest Canadian Flight Supplement (CFS) and Canadian Air Pilot (CAP).

| ID   | Aerodrome's Name                 | Province | Coordinates Latitude<br>(degrees-minutes-seconds) | Coordinates Longitude<br>(degrees-minutes-seconds) | Elevation (feet) | Elevation (metres) | FIR  | FTCN bulletin | GFA region | Issuing Centre | IFR Approach CIG | IFR Approach VIS | Alternate CIG | Alternate VIS | Notes      |
|------|----------------------------------|----------|---------------------------------------------------|----------------------------------------------------|------------------|--------------------|------|---------------|------------|----------------|------------------|------------------|---------------|---------------|------------|
| CYXX | Abbotsford                       | BC       | N49 01 31                                         | W122 21 36                                         | 194              | 59.1               | CZVR | 31            | 31         | CMAC-W         | 300              | 1                | 600           | 2             | 1 ILS RVR  |
| CYLT | Alert                            | NU       | N82 31 04                                         | W062 16 50                                         | 100              | 30.5               | CZEG | 39            | 37         | DWS            | 300              | 1                | 800           | 2             |            |
| CYAB | Arctic Bay                       | NU       | N73 00 23                                         | W085 02 50                                         | 72               | 21.9               | CZEG | 33            | 37         | CMAC-W         | 500              | 1 ½              | 1200          | 3             | RNAV only  |
| CYEK | Arviat                           | NU       | N61 05 38                                         | W094 04 18                                         | 34               | 10.4               | CZEG | 22            | 36         | CMAC-W         | 300              | 1                | 800           | 2             | NPA (RNAV) |
| CYAT | Attawapiskat                     | ON       | N52 55 39                                         | W082 25 55                                         | 30               | 9.1                | CZYZ | 24            | 33         | CMAC-E         | 500              | 1 ½              | 800           | 2 ½           | RNAV only  |
| CYBG | Bagotville                       | QC       | N48 19 50                                         | W070 59 47                                         | 522              | 159.1              | CZUL | 39            | 33         | DWS            | 200              | ½                | 600           | 2             |            |
| CYBC | Baie-Comeau                      | QC       | N49 07 57                                         | W068 12 16                                         | 71               | 21.6               | CZUL | 36            | 34         | CMAC-E         | 200              | ½                | 600           | 2             | 1 ILS RVR  |
| CYBK | Baker Lake                       | NU       | N64 17 56                                         | W096 04 40                                         | 61               | 18.6               | CZEG | 22            | 36         | CMAC-W         | 500              | 1 ½              | 800           | 2 ½           | NPA (RNAV) |
| CZBF | Bathurst                         | NB       | N47 37 47                                         | W065 44 20                                         | 193              | 58.8               | CZQM | 37            | 34         | CMAC-E         | 300              | 1                | 800           | 2             | RNAV only  |
| CBBC | Bella Bella<br>(Campbell Island) | BC       | N52 11 06                                         | W128 09 24                                         | 141              | 43.0               | CZVR | 31            | 31         | CMAC-W         | 500              | 1 ½              | 800           | 2 ½           | NPA (RNAV) |

| ID   | Aerodrome's Name                 | Province | Coordinates Latitude<br>(degrees-minutes-seconds) | Coordinates Longitude<br>(degrees-minutes-seconds) | Elevation (feet) | Elevation (metres) | FIR  | FTCN bulletin | GFA region | Issuing Centre | IFR Approach CIG | IFR Approach VIS | Alternate CIG | Alternate VIS | Notes                    |
|------|----------------------------------|----------|---------------------------------------------------|----------------------------------------------------|------------------|--------------------|------|---------------|------------|----------------|------------------|------------------|---------------|---------------|--------------------------|
| CYTL | Big Trout Lake                   | ON       | N53 49 04                                         | W089 53 49                                         | 730              | 222.5              | CZWG | 24            | 33         | CMAC-E         | 300              | 1                | 800           | 2 ¼           | NPA (RNAV)               |
| CYBN | Borden (Heli)                    | ON       | N44 16 18                                         | W079 54 45                                         | 729              | 222.2              | CZYZ | 39            | 33         | DWS            | 500              | ½                | 800           | 2             | A                        |
| CYBR | Brandon Muni                     | MB       | N49 54 36                                         | W099 57 07                                         | 1343             | 409.3              | CZWG | 34            | 32         | CMAC-W         | 200              | ½                | 600           | 2             | 1 ILS                    |
| CYVT | Buffalo Narrows                  | SK       | N55 50 31                                         | W108 25 03                                         | 1423             | 433.7              | CZEG | 32            | 32         | CMAC-W         | 500              | 1 ½              | 800           | 2 ½           | RNAV only                |
| CYDB | Burwash                          | YT       | N61 22 14                                         | W139 02 24                                         | 2642             | 805.3              | CZEG | 23            | 35         | CMAC-W         | 500              | 1 ½              | 800           | 2 ½           | RNAV only                |
| CYYC | Calgary Intl                     | AB       | N51 07 21                                         | W114 00 48                                         | 3606             | 1099.1             | CZEG | 32            | 32         | CMAC-W         | 0                | ⅛                | 400           | 1             | 6 ILS<br>6 RVR<br>CATIII |
| CYBW | Calgary/Springbank               | AB       | N51 06 19                                         | W114 22 17                                         | 3940             | 1200.9             | CZEG | 32            | 32         | CMAC-W         | 300              | 1                | 600           | 2             | 1 ILS RVR                |
| CYCB | Cambridge Bay                    | NU       | N69 06 29                                         | W105 08 14                                         | 102              | 31.1               | CZEG | 23            | 35         | CMAC-W         | 300              | 1                | 800           | 2             | NPA (RNAV)               |
| CYBL | Campbell River                   | BC       | N49 57 02                                         | W125 16 15                                         | 357              | 108.8              | CZVR | 31            | 31         | CMAC-W         | 300              | 1                | 600           | 2             | 1 ILS RVR                |
| CYCA | Cartwright                       | NL       | N53 40 58                                         | W057 02 31                                         | 40               | 12.2               | CZQX | 38            | 34         | CMAC-W         | 600              | 2                | 900           | 3             | NPA (RNAV)               |
| CYCG | Castlegar/West Kootenay Regional | BC       | N49 17 47                                         | W117 37 57                                         | 1626             | 495.6              | CZVR | 31            | 31         | CMAC-W         | 2800             | 3                | 3100          | 3             | RNAV only                |
| CYLD | Chapleau                         | ON       | N47 49 13                                         | W083 20 49                                         | 1470             | 448.1              | CZYZ | 25            | 33         | CMAC-E         | 500              | 1 ½              | 800           | 2 ½           | RNAV only                |
| CYYG | Charlottetown                    | PE       | N46 17 21                                         | W063 07 09                                         | 160              | 48.8               | CZQM | 37            | 34         | CMAC-E         | 200              | ½                | 600           | 2             | 1 ILS RVR                |
| CYMT | Chibougamau/Chapais              | QC       | N49 46 19                                         | W074 31 41                                         | 1270             | 387.1              | CZUL | 26            | 33         | CMAC-E         | 300              | 1                | 800           | 2 ½           | NPA (RNAV)               |
| CZUM | Churchill Falls                  | NL       | N53 33 43                                         | W064 06 23                                         | 1442             | 439.5              | CZQX | 38            | 34         | CMAC-E         | 300              | 1                | 800           | 2 ½           | RNAV only                |
| CYYQ | Churchill                        | MB       | N58 44 21                                         | W094 03 59                                         | 96               | 29.3               | CZWG | 34            | 32         | CMAC-W         | 200              | ½                | 600           | 2             | 1 ILS RVR                |

| ID   | Aerodrome's Name                           | Province | Coordinates Latitude<br>(degrees-minutes-seconds) | Coordinates Longitude<br>(degrees-minutes-seconds) | Elevation<br>(feet) | Elevation<br>(metres) | FIR  | FTCN bulletin | GFA region | Issuing Centre | IFR Approach<br>CIG | IFR Approach<br>VIS | Alternate<br>CIG | Alternate<br>VIS | Notes          |
|------|--------------------------------------------|----------|---------------------------------------------------|----------------------------------------------------|---------------------|-----------------------|------|---------------|------------|----------------|---------------------|---------------------|------------------|------------------|----------------|
| CYCY | Clyde River                                | NU       | N70 29 09                                         | W068 31 01                                         | 87                  | 26.5                  | CZEG | 33            | 36         | CMAC-W         | 300                 | 1                   | 800              | 2                | NPA<br>(RNAV)  |
| CYOD | Cold Lake/Group<br>Captain R.W.<br>McNair  | AB       | N54 24 18                                         | W110 16 46                                         | 1775                | 541.0                 | CZEG | 39            | 32         | DWS            | 200                 | ½                   | 600              | 2                | 1 ILS RVR      |
| CYQQ | Comox                                      | BC       | N49 42 39                                         | W124 53 12                                         | 84                  | 25.6                  | CZVR | 39            | 31         | DWS            | 200                 | ½                   | 600              | 2                | 2 ILS<br>2 RVR |
| CYZS | Coral Harbour                              | NU       | N64 11 36                                         | W083 21 34                                         | 204                 | 62.2                  | CZEG | 22            | 36         | CMAC-W         | 300                 | 1                   | 800              | 2                | NPA<br>(RNAV)  |
| CYXC | Cranbrook/Canadian<br>Rockies Intl         | BC       | N49 36 44                                         | W115 46 55                                         | 3084                | 940.0                 | CZVR | 31            | 31         | CMAC-W         | 200                 | ½                   | 600              | 2                | 1 ILS          |
| CYDN | Dauphin (Lt. Col<br>W.G. Barker VC<br>Apt) | MB       | N51 06 03                                         | W100 03 09                                         | 999                 | 304.5                 | CZWG | 34            | 32         | CMAC-W         | 300                 | 1                   | 800              | 2 ¼              | RNAV only      |
| CYDA | Dawson City                                | YT       | N64 02 32                                         | W139 07 49                                         | 1215                | 370.3                 | CZEG | 23            | 35         | CMAC-W         | 1500                | 3                   | 1800             | 3                | NPA<br>(RNAV)  |
| CYDQ | Dawson Creek                               | BC       | N55 44 32                                         | W120 10 59                                         | 2147                | 654.4                 | CZEG | 22            | 31         | CMAC-W         | 300                 | 1                   | 900              | 3                | RNAV only      |
| CYDL | Dease Lake                                 | BC       | N58 25 20                                         | W130 01 56                                         | 2634                | 802.8                 | CZEG | 22            | 31         | CMAC-W         | 800                 | 2 ½                 | 2100             | 3                | RCAP only      |
| CYDF | Deer Lake                                  | NL       | N49 12 40                                         | W057 23 29                                         | 72                  | 21.9                  | CZQX | 38            | 34         | CMAC-E         | 200                 | ½                   | 600              | 2                | 1 ILS          |
| CYWJ | Déline                                     | NT       | N65 12 40                                         | W123 26 11                                         | 703                 | 214.3                 | CZEG | 23            | 35         | CMAC-W         | 500                 | 1 ½                 | 800              | 2 ½              | RNAV only      |
| CYHD | Dryden Regional                            | ON       | N49 49 54                                         | W092 44 39                                         | 1354                | 412.7                 | CZWG | 24            | 33         | CMAC-E         | 300                 | 1                   | 600              | 2                | 1 ILS RVR      |
| CYXR | Earlton<br>(Timiscaming<br>Regional)       | ON       | N47 41 42                                         | W079 50 56                                         | 800                 | 243.8                 | CZYZ | 25            | 33         | CMAC-E         | 300                 | 1                   | 800              | 2 ½              | RNAV only      |

| ID   | Aerodrome's Name      | Province | Coordinates Latitude<br>(degrees-minutes-seconds) | Coordinates Longitude<br>(degrees-minutes-seconds) | Elevation (feet) | Elevation (metres) | FIR  | FTCN bulletin | GFA region | Issuing Centre | IFR Approach CIG | IFR Approach VIS | Alternate CIG | Alternate VIS | Notes          |
|------|-----------------------|----------|---------------------------------------------------|----------------------------------------------------|------------------|--------------------|------|---------------|------------|----------------|------------------|------------------|---------------|---------------|----------------|
| CYEG | Edmonton Intl         | AB       | N53 18 35                                         | W113 34 47                                         | 2373             | 723.3              | CZEG | 32            | 32         | CMAC-W         | 200              | ½                | 400           | 1             | 3 ILS<br>3 RVR |
| CYED | Edmonton/Namao (Heli) | AB       | N53 40 09                                         | W113 28 32                                         | 2257             | 687.9              | CZEG | 39            | 32         | DWS            | 600              | 2                | 900           | 3             | A              |
| CZVL | Edmonton/Villeneuve   | AB       | N53 40 06                                         | W113 51 08                                         | 2256             | 687.6              | CZEG | 32            | 32         | CMAC-W         | 200              | ½                | 600           | 2             | 1 ILS RVR      |
| CYEN | Estevan Regional      | SK       | N49 12 37                                         | W102 57 57                                         | 1905             | 580.6              | CZWG | 34            | 35         | CMAC-W         | 300              | 1                | 800           | 2             | RNAV only      |
| CYEU | Eureka                | NU       | N79 59 40                                         | W085 48 43                                         | 269              | 82.0               | CZEG | 33            | 37         | CMAC-W         | 500              | 1 ½              | 800           | 2 ½           | NPA (RNAV)     |
| CZFA | Faro                  | YT       | N62 12 25                                         | W133 22 24                                         | 2350             | 716.3              | CZEG | 23            | 35         | CMAC-W         | 500              | 1 ½              | 800           | 2 ½           | RNAV only      |
| CYPY | Fort Chipewyan        | AB       | N58 46 02                                         | W111 07 02                                         | 781              | 238.0              | CZEG | 22            | 32         | CMAC-W         | 300              | 1                | 800           | 2 ¼           | RNAV only      |
| CYGH | Fort Good Hope        | NT       | N66 14 26                                         | W128 38 45                                         | 267              | 81.4               | CZEG | 23            | 35         | CMAC-W         | 300              | 1                | 800           | 2             | RNAV only      |
| CYMM | Fort McMurray         | AB       | N56 39 12                                         | W111 13 24                                         | 1211             | 369.1              | CZEG | 32            | 32         | CMAC-W         | 200              | ½                | 600           | 2             | 1 ILS          |
| CZFM | Fort McPherson        | NT       | N67 24 25                                         | W134 51 35                                         | 115              | 35.1               | CZEG | 23            | 35         | CMAC-W         | 500              | 1 ½              | 800           | 2 ½           | RNAV only      |
| CYYE | Fort Nelson           | BC       | N58 50 11                                         | W122 35 49                                         | 1253             | 381.9              | CZEG | 22            | 31         | CMAC-W         | 200              | ½                | 600           | 2             | 1 ILS          |
| CYER | Fort Severn           | ON       | N56 01 08                                         | W087 40 34                                         | 52               | 15.8               | CZWG | 24            | 33         | CMAC-E         | 500              | 1 ½              | 800           | 2 ½           | NPA (RNAV)     |
| CYFS | Fort Simpson          | NT       | N61 45 37                                         | W121 14 11                                         | 556              | 169.5              | CZEG | 33            | 35         | CMAC-W         | 300              | 1                | 800           | 2             | NPA (RNAV)     |
| CYSM | Fort Smith            | NT       | N60 01 13                                         | W111 57 43                                         | 671              | 204.6              | CZEG | 22            | 35         | CMAC-W         | 300              | 1                | 800           | 2             | NPA (RNAV)     |
| CYXJ | Fort St. John         | BC       | N56 14 17                                         | W120 44 25                                         | 2280             | 694.9              | CZEG | 22            | 34         | CMAC-W         | 200              | ½                | 600           | 2             | 1 ILS RVR      |
| CYFC | Fredericton Intl      | NB       | N45 52 08                                         | W066 32 14                                         | 67               | 20.4               | CZQM | 37            | 34         | CMAC-E         | 200              | ½                | 600           | 2             | 1 ILS RVR      |

| ID   | Aerodrome's Name                | Province | Coordinates Latitude<br>(degrees-minutes-seconds) | Coordinates Longitude<br>(degrees-minutes-seconds) | Elevation (feet) | Elevation (metres) | FIR  | FTCN bulletin | GFA region | Issuing Centre | IFR Approach CIG | IFR Approach VIS | Alternate CIG | Alternate VIS | Notes              |
|------|---------------------------------|----------|---------------------------------------------------|----------------------------------------------------|------------------|--------------------|------|---------------|------------|----------------|------------------|------------------|---------------|---------------|--------------------|
| CYCX | Gagetown (Heli)                 | NB       | N45 50 00                                         | W066 26 00                                         | 166              | 50.6               | CZQM | 39            | 34         | DWS            | 500              | ½                | -             | -             | A                  |
| CYRA | Gamèti/Rae Lakes                | NT       | N64 06 58                                         | W117 18 35                                         | 723              | 220.4              | CZEG | 23            | 35         | CMAC-W         | 500              | 1 ½              | 800           | 2 ½           | RNAV only          |
| CYQX | Gander Intl                     | NL       | N48 56 13                                         | W054 34 05                                         | 496              | 151.2              | CZQX | 38            | 34         | CMAC-E         | 200              | ½                | 400           | 1             | 2 ILS 2 RVR        |
| CYGP | Gaspé (Michel Pouliot)          | QC       | N48 46 31                                         | W064 28 47                                         | 112              | 34.1               | CZUL | 36            | 34         | CMAC-E         | 300              | 1                | 800           | 2 ¼           | NPA (RNAV)         |
| CYGQ | Geraldton (Greenstone Regional) | ON       | N49 46 43                                         | W086 56 19                                         | 1143             | 348.4              | CZWG | 24            | 33         | CMAC-E         | 300              | 1                | 800           | 2 ¼           | NPA (RNAV)         |
| CYGX | Gillam                          | MB       | N56 21 28                                         | W094 42 39                                         | 476              | 145.1              | CZWG | 24            | 32         | CMAC-W         | 300              | 1                | 800           | 2 ¼           | NPA (RNAV)         |
| CYHK | Gjoa Haven                      | NU       | N68 38 08                                         | W095 51 01                                         | 154              | 46.9               | CZEG | 33            | 36         | CMAC-W         | 500              | 1 ½              | 800           | 2 ½           | RNAV only          |
| CYYR | Goose Bay                       | NL       | N53 19 09                                         | W060 25 33                                         | 160              | 48.8               | CZQX | 39            | 34         | DWS            | 200              | ½                | 600           | 2             | 1 ILS RVR          |
| CYZE | Gore Bay-Manitoulin             | ON       | N45 52 54                                         | W082 34 02                                         | 613              | 186.8              | CZYZ | 25            | 33         | CMAC-E         | 300              | 1                | 800           | 2 ¼           | RNAV only          |
| CYQU | Grande Prairie                  | AB       | N55 10 47                                         | W118 53 06                                         | 2195             | 669.0              | CZEG | 32            | 32         | CMAC-W         | 200              | ½                | 600           | 2             | 1 ILS              |
| CYZX | Greenwood                       | NS       | N44 59 04                                         | W064 55 01                                         | 92               | 28.0               | CZQM | 39            | 34         | DWS            | 200              | ½                | 600           | 2             | 1 ILS RVR          |
| CYAW | Halifax/Shearwater (Heli)       | NS       | N44 38 14                                         | W063 30 08                                         | 144              | 43.9               | CZQM | 39            | 34         | DWS            | 200              | ½                | 600           | 2             | A                  |
| CYHZ | Halifax/Stanfield Intl          | NS       | N44 52 52                                         | W063 30 31                                         | 477              | 145.4              | CZQM | 37            | 34         | CMAC-E         | 100              | ¼                | 400           | 1             | 2 ILS 2 RVR CAT II |
| CYHM | Hamilton                        | ON       | N43 10 25                                         | W079 56 06                                         | 780              | 237.7              | CZYZ | 35            | 33         | CMAC-E         | 100              | ¼                | 600           | 2             | 1 ILS RVR CAT II   |

| ID   | Aerodrome's Name                | Province | Coordinates Latitude<br>(degrees-minutes-seconds) | Coordinates Longitude<br>(degrees-minutes-seconds) | Elevation (feet) | Elevation (metres) | FIR  | FTCN bulletin | GFA region | Issuing Centre | IFR Approach CIG | IFR Approach VIS | Alternate CIG | Alternate VIS | Notes      |
|------|---------------------------------|----------|---------------------------------------------------|----------------------------------------------------|------------------|--------------------|------|---------------|------------|----------------|------------------|------------------|---------------|---------------|------------|
| CYGV | Havre St-Pierre                 | QC       | N50 16 55                                         | W063 36 41                                         | 124              | 37.8               | CZUL | 36            | 34         | CMAC-E         | 300              | 1                | 800           | 2             | RNAV only  |
| CYHY | Hay River/Merlyn Carter Airport | NT       | N60 50 23                                         | W115 46 58                                         | 541              | 164.9              | CZEG | 22            | 35         | CMAC-W         | 300              | 1                | 600           | 2             | 1 ILS      |
| CYOJ | High Level                      | AB       | N58 37 17                                         | W117 09 53                                         | 1105             | 336.8              | CZEG | 22            | 32         | CMAC-W         | 300              | 1                | 800           | 2 ¼           | NPA (RNAV) |
| CYGT | Igloolik                        | NU       | N69 21 53                                         | W081 48 59                                         | 173              | 52.7               | CZEG | 33            | 36         | CMAC-W         | 500              | 1 ½              | 800           | 2 ½           | RNAV only  |
| CYGR | Îles-de-la-Madeleine            | QC       | N47 25 30                                         | W061 46 41                                         | 35               | 10.7               | CZQM | 37            | 34         | CMAC-E         | 300              | 1                | 800           | 2 ¼           | NPA (RNAV) |
| CYPH | Inukjuak                        | QC       | N58 28 19                                         | W078 04 37                                         | 83               | 25.3               | CZUL | 26            | 33         | CMAC-E         | 300              | 1                | 800           | 2             | RNAV only  |
| CYEV | Inuvik (Mike Zubko)             | NT       | N68 18 14                                         | W133 28 59                                         | 222              | 67.7               | CZEG | 23            | 35         | CMAC-W         | 200              | ½                | 600           | 2             | 1 ILS RVR  |
| CYFB | Iqaluit                         | NU       | N63 45 23                                         | W068 33 21                                         | 110              | 33.5               | CZUL | 36            | 36         | CMAC-W         | 200              | ¾                | 600           | 2             | 1 ILS RVR  |
| CYIV | Island Lake                     | MB       | N53 51 26                                         | W094 39 13                                         | 773              | 235.6              | CZWG | 24            | 32         | CMAC-W         | 300              | 1                | 800           | 2 ¼           | NPA (RNAV) |
| CYIK | Ivujivik                        | QC       | N62 25 02                                         | W077 55 31                                         | 126              | 38.4               | CZUL | 26            | 36         | CMAC-E         | 300              | 1                | 800           | 2 ¼           | NPA (RNAV) |
| CYKA | Kamloops                        | BC       | N50 42 09                                         | W120 26 55                                         | 1133             | 345.3              | CZVR | 31            | 31         | CMAC-W         | 2000             | 3                | 2300          | 3             | NPA (RNAV) |
| CYKG | Kangiqsujuaq (Wakeham Bay)      | QC       | N61 35 19                                         | W071 55 46                                         | 517              | 157.6              | CZUL | 26            | 36         | CMAC-W         | 300              | 1                | 900           | 3             | RNAV only  |
| CYAS | Kangirsuk                       | QC       | N60 01 38                                         | W069 59 57                                         | 406              | 123.7              | CZUL | 26            | 36         | CMAC-W         | 300              | 1                | 800           | 2             | NPA (RNAV) |
| CYYU | Kapuskasing                     | ON       | N49 24 42                                         | W082 28 07                                         | 743              | 226.5              | CZYZ | 25            | 33         | CMAC-E         | 300              | 1                | 800           | 2             | RNAV only  |

| ID   | Aerodrome's Name        | Province | Coordinates Latitude<br>(degrees-minutes-seconds) | Coordinates Longitude<br>(degrees-minutes-seconds) | Elevation (feet) | Elevation (metres) | FIR  | FTCN bulletin | GFA region | Issuing Centre | IFR Approach CIG | IFR Approach VIS | Alternate CIG | Alternate VIS | Notes      |
|------|-------------------------|----------|---------------------------------------------------|----------------------------------------------------|------------------|--------------------|------|---------------|------------|----------------|------------------|------------------|---------------|---------------|------------|
| CYLW | Kelowna                 | BC       | N49 57 26                                         | W119 22 40                                         | 1421             | 433.1              | CZVR | 31            | 32         | CMAC-W         | 500              | 1 ½              | 800           | 2 ½           | NPA (RNAV) |
| CYQK | Kenora                  | ON       | N49 47 18                                         | W094 21 47                                         | 1686             | 513.9              | CZWG | 34            | 33         | CMAC-E         | 300              | 1                | 800           | 2             | RNAV only  |
| CYKJ | Key Lake                | SK       | N57 15 23                                         | W105 37 03                                         | 1344             | 409.7              | CZEG | 32            | 32         | CMAC-W         | 300              | 1                | 800           | 2 ½           | RNAV only  |
| CYGK | Kingston                | ON       | N44 13 33                                         | W076 35 48                                         | 303              | 92.4               | CYZY | 35            | 33         | CMAC-E         | 300              | 1                | 600           | 2             | 1 ILS      |
| CYTE | Kinngait                | NU       | N64 13 49                                         | W076 31 30                                         | 158              | 48.1               | CZEG | 33            | 36         | CMAC-W         | 300              | 1                | 900           | 3             | NPA (RNAV) |
| CYKF | Kitchener/Waterloo      | ON       | N43 27 39                                         | W080 22 43                                         | 1055             | 321.6              | CYZY | 35            | 33         | CMAC-E         | 200              | ½                | 600           | 2             | 1 ILS      |
| CYBB | Kugaaruk                | NU       | N68 32 09                                         | W089 48 19                                         | 51               | 15.5               | CZEG | 33            | 36         | CMAC-W         | 500              | 1 ¾              | 900           | 3             | RNAV only  |
| CYCO | Kugluktuk               | NU       | N67 49 00                                         | W115 08 38                                         | 74               | 22.6               | CZEG | 23            | 35         | CMAC-W         | 500              | 1 ½              | 800           | 2 ½           | NPA (RNAV) |
| CYVP | Kuujuuaq                | QC       | N58 05 42                                         | W068 25 20                                         | 131              | 39.9               | CZUL | 26            | 33         | CMAC-E         | 200              | ½                | 600           | 2             | 1 ILS RVR  |
| CYGW | Kuujuuarapik            | QC       | N55 16 55                                         | W077 45 55                                         | 34               | 10.4               | CZUL | 26            | 33         | CMAC-E         | 300              | 1                | 800           | 2 ½           | NPA (RNAV) |
| CYGL | La Grande Rivière       | QC       | N53 37 31                                         | W077 42 15                                         | 639              | 194.8              | CZUL | 36            | 33         | CMAC-E         | 300              | 1                | 800           | 2 ¼           | NPA (RNAV) |
| CYAH | La Grande-4             | QC       | N53 45 17                                         | W073 40 31                                         | 1005             | 306.3              | CZUL | 26            | 33         | CMAC-E         | 300              | 1                | 800           | 2 ½           | RNAV only  |
| CYVC | La Ronge (Barber Field) | SK       | N55 09 05                                         | W105 15 43                                         | 1242             | 378.6              | CZWG | 24            | 32         | CMAC-W         | 300              | 1                | 800           | 2             | NPA (RNAV) |
| CYQL | Lethbridge County       | AB       | N49 37 49                                         | W112 47 59                                         | 3048             | 929.0              | CZEG | 32            | 32         | CMAC-W         | 200              | ½                | 600           | 2             | 1 ILS      |
| CYLL | Lloydminster            | AB       | N53 18 33                                         | W110 04 21                                         | 2194             | 668.7              | CZEG | 32            | 32         | CMAC-W         | 300              | 1                | 800           | 2             | NPA (RNAV) |
| CYXU | London                  | ON       | N43 01 59                                         | W081 09 04                                         | 912              | 278.0              | CYZY | 35            | 33         | CMAC-E         | 300              | 1                | 600           | 2             | 1 ILS RVR  |

| ID   | Aerodrome's Name                     | Province | Coordinates Latitude<br>(degrees-minutes-seconds) | Coordinates Longitude<br>(degrees-minutes-seconds) | Elevation (feet) | Elevation (metres) | FIR  | FTCN bulletin | GFA region | Issuing Centre | IFR Approach CIG | IFR Approach VIS | Alternate CIG | Alternate VIS | Notes                    |
|------|--------------------------------------|----------|---------------------------------------------------|----------------------------------------------------|------------------|--------------------|------|---------------|------------|----------------|------------------|------------------|---------------|---------------|--------------------------|
| CYBX | Lourdes-de-Blanc-Sablon              | QC       | N51 26 37                                         | W057 11 07                                         | 121              | 36.9               | CZUL | 36            | 34         | CMAC-E         | 300              | 1                | 800           | 2 ½           | NPA (RNAV)               |
| CYLK | Lutselk'e                            | NT       | N62 25 06                                         | W110 40 56                                         | 586              | 178.6              | CZEG | 22            | 35         | CMAC-W         | 500              | 1 ¾              | 900           | 3             | RNAV only                |
| CYYL | Lynn Lake                            | MB       | N56 51 50                                         | W101 04 34                                         | 1170             | 356.6              | CZWG | 24            | 32         | CMAC-W         | 300              | 1                | 800           | 2             | NPA (RNAV)               |
| CYZY | MacKenzie                            | BC       | N55 17 58                                         | W123 08 00                                         | 2264             | 690.1              | CZVR | 21            | 31         | CMAC-W         | 500              | 1 ½              | 800           | 2 ½           | RNAV only                |
| CYSP | Marathon                             | ON       | N48 45 19                                         | W086 20 40                                         | 1035             | 315.5              | CZYZ | 25            | 33         | CMAC-E         | 500              | 1 ½              | 800           | 2 ½           | RNAV only                |
| CYMH | Mary's Harbour                       | NL       | N52 18 10                                         | W055 50 52                                         | 35               | 10.7               | CZQX | 38            | 34         | CMAC-E         | 600              | 2                | 900           | 3             | NPA (RNAV)               |
| CZMT | Masset                               | BC       | N54 01 38                                         | W132 07 30                                         | 19               | 5.8                | CZVR | 21            | 31         | CMAC-W         | 500              | 1 ¾              | 800           | 3             | RNAV only                |
| CYMA | Mayo                                 | YT       | N63 36 59                                         | W135 52 06                                         | 1653             | 503.8              | CZEG | 23            | 35         | CMAC-W         | 500              | 1 ½              | 800           | 3             | NPA (RNAV)               |
| CYXH | Medicine Hat                         | AB       | N50 01 08                                         | W110 43 15                                         | 2352             | 716.9              | CZEG | 32            | 32         | CMAC-W         | 300              | 1                | 800           | 2             | RNAV only                |
| CYQM | Moncton/Greater Moncton Intl         | NB       | N46 06 44                                         | W064 40 43                                         | 232              | 70.7               | CZQM | 37            | 34         | CMAC-E         | 200              | ½                | 400           | 1             | 2 ILS<br>2 RVR           |
| CYYY | Mont-Joli                            | QC       | N48 36 32                                         | W068 12 29                                         | 172              | 52.4               | CZUL | 36            | 34         | CMAC-E         | 300              | 1                | 800           | 2             | NPA (RNAV)               |
| CYMX | Montréal Intl (Mirabel)              | QC       | N45 40 50                                         | W074 02 19                                         | 270              | 82.3               | CZUL | 36            | 33         | CMAC-E         | 100              | ¼                | 600           | 2             | 1 ILS<br>2 RVR<br>CAT II |
| CYUL | Montréal/Pierre Elliott Trudeau Intl | QC       | N45 28 14                                         | W073 44 27                                         | 118              | 36.0               | CZUL | 36            | 33         | CMAC-E         | 100              | ¼                | 400           | 1             | 4 ILS<br>4 RVR<br>CAT II |

| ID   | Aerodrome's Name                                           | Province | Coordinates Latitude<br>(degrees-minutes-seconds) | Coordinates Longitude<br>(degrees-minutes-seconds) | Elevation<br>(feet) | Elevation<br>(metres) | FIR  | FTCN bulletin | GFA region | Issuing Centre | IFR Approach<br>CIG | IFR Approach<br>VIS | Alternate<br>CIG | Alternate<br>VIS | Notes          |
|------|------------------------------------------------------------|----------|---------------------------------------------------|----------------------------------------------------|---------------------|-----------------------|------|---------------|------------|----------------|---------------------|---------------------|------------------|------------------|----------------|
| CYHU | Montréal/MET<br>(Aéroport<br>Métropolitain de<br>Montréal) | QC       | N45 31 03                                         | W073 25 01                                         | 90                  | 27.4                  | CZUL | 36            | 33         | CMAC-E         | 200                 | ½                   | 600              | 2                | 1 ILS RVR      |
| CYMJ | Moose Jaw/R Vice<br>Marshal C.M.<br>McEwen                 | SK       | N50 19 49                                         | W105 33 33                                         | 1892                | 576.7                 | CZWG | 39            | 32         | DWS            | 200                 | ½                   | 400              | 1                | 2 ILS<br>1 RVR |
| CYMO | Moosonee                                                   | ON       | N51 17 28                                         | W080 36 28                                         | 30                  | 9.1                   | CZYZ | 25            | 33         | CMAC-E         | 300                 | 1                   | 800              | 2                | NPA<br>(RNAV)  |
| CYQA | Muskoka                                                    | ON       | N44 58 29                                         | W079 18 12                                         | 922                 | 281.0                 | CZYZ | 25            | 33         | CMAC-E         | 500                 | 1 ½                 | 800              | 2 ½              | RNAV only      |
| CZMD | Muskrat Dam                                                | ON       | N53 26 29                                         | W091 45 46                                         | 911                 | 277.7                 | CZWG | 24            | 33         | CMAC-E         | 500                 | 1 ½                 | 800              | 2 ½              | RNAV only      |
| CYDP | Nain                                                       | NL       | N56 33 02                                         | W061 40 56                                         | 22                  | 6.7                   | CZQX | 38            | 34         | CMAC-E         | 1100                | 3                   | 1400             | 3                | NPA<br>(RNAV)  |
| CYCD | Nanaimo                                                    | BC       | N49 03 16                                         | W123 52 12                                         | 92                  | 28.0                  | CZVR | 31            | 31         | CMAC-W         | 300                 | 1                   | 600              | 2                | 1 ILS          |
| CYNA | Natashquan                                                 | QC       | N50 11 24                                         | W061 47 20                                         | 39                  | 11.9                  | CZUL | 36            | 34         | CMAC-E         | 300                 | 1                   | 800              | 2                | NPA<br>(RNAV)  |
| CYUT | Naujaat                                                    | NU       | N66 31 14                                         | W086 13 29                                         | 75                  | 22.9                  | CZEG | 33            | 36         | CMAC-W         | 300                 | 1                   | 800              | 2                | RNAV only      |
| CYVQ | Norman Wells                                               | NT       | N65 16 53                                         | W126 47 55                                         | 238                 | 72.5                  | CZEG | 23            | 35         | CMAC-W         | 300                 | 1                   | 800              | 2                | NPA<br>(RNAV)  |
| CYQW | North Battleford<br>(Cameron<br>McIntosh)                  | SK       | N52 46 09                                         | W108 14 37                                         | 1799                | 548.3                 | CZWG | 34            | 32         | CMAC-W         | 300                 | 1                   | 800              | 2 ½              | RNAV only      |
| CYYB | North Bay                                                  | ON       | N46 21 50                                         | W079 25 27                                         | 1215                | 370.3                 | CZYZ | 25            | 33         | CMAC-E         | 200                 | ½                   | 600              | 2                | 1 ILS RVR      |
| CYNE | Norway House                                               | MB       | N53 57 30                                         | W097 50 39                                         | 734                 | 223.7                 | CZWG | 24            | 32         | CMAC-W         | 500                 | 1 ½                 | 800              | 2 ½              | RNAV only      |

| ID   | Aerodrome's Name                    | Province | Coordinates Latitude<br>(degrees-minutes-seconds) | Coordinates Longitude<br>(degrees-minutes-seconds) | Elevation<br>(feet) | Elevation<br>(metres) | FIR  | FTCN bulletin | GFA region | Issuing Centre | IFR Approach<br>CIG | IFR Approach<br>VIS | Alternate<br>CIG | Alternate<br>VIS | Notes          |
|------|-------------------------------------|----------|---------------------------------------------------|----------------------------------------------------|---------------------|-----------------------|------|---------------|------------|----------------|---------------------|---------------------|------------------|------------------|----------------|
| CYOC | Old Crow                            | YT       | N67 34 12                                         | W139 50 24                                         | 814                 | 248.1                 | CZEG | 23            | 35         | CMAC-W         | 500                 | 1 ¾                 | 900              | 3                | NPA<br>(RNAV)  |
| CYND | Ottawa/Gatineau                     | QC       | N45 31 18                                         | W075 33 49                                         | 211                 | 64.3                  | CZUL | 26            | 33         | CMAC-E         | 300                 | 1                   | 800              | 2 ½              | RNAV only      |
| CYOW | Ottawa/MacDonald-Cartier Intl       | ON       | N45 19 21                                         | W075 40 09                                         | 374                 | 114.0                 | CZUL | 36            | 33         | CMAC-E         | 100                 | 3/8                 | 400              | 1                | 2 ILS<br>2 RVR |
| CYXP | Pangnirtung                         | NU       | N66 08 42                                         | W065 42 49                                         | 79                  | 24.1                  | CZEG | 33            | 36         | CMAC-W         | 2100                | 3                   | 2400             | 3                | NPA<br>(RNAV)  |
| CYPC | Paulatuk (Nora Aliqatchialuk Ruben) | NT       | N69 21 38                                         | W124 04 33                                         | 15                  | 4.6                   | CZEG | 23            | 35         | CMAC-W         | 300                 | 1                   | 800              | 2                | NPA<br>(RNAV)  |
| CYPE | Peace River                         | AB       | N56 13 37                                         | W117 26 50                                         | 1872                | 570.6                 | CZEG | 32            | 32         | CMAC-W         | 300                 | 1                   | 800              | 2                | NPA<br>(RNAV)  |
| CYYF | Penticton                           | BC       | N49 27 45                                         | W119 36 08                                         | 1130                | 344.4                 | CZVR | 31            | 31         | CMAC-W         | 2100                | 3                   | 2400             | 3                | RNAV only      |
| CYWA | Petawawa                            | ON       | N45 57 08                                         | W077 19 09                                         | 427                 | 130.1                 | CZYZ | 39            | 33         | DWS            | 700                 | 2                   | 1000             | 3                |                |
| CYPQ | Peterborough                        | ON       | N44 13 48                                         | W078 21 48                                         | 628                 | 191.4                 | CZYZ | 35            | 33         | CMAC-E         | 500                 | 1 ½                 | 800              | 2 ½              | NPA<br>(RNAV)  |
| CYPL | Pickle Lake                         | ON       | N51 26 47                                         | W090 12 51                                         | 1267                | 386.2                 | CZWG | 24            | 33         | CMAC-E         | 300                 | 1                   | 800              | 2                | NPA<br>(RNAV)  |
| CYIO | Pond Inlet                          | NU       | N72 41 22                                         | W077 58 08                                         | 202                 | 61.6                  | CZEG | 33            | 36         | CMAC-W         | 500                 | 1 ½                 | 800              | 2 ½              | NPA<br>(RNAV)  |
| CYZT | Port Hardy                          | BC       | N50 40 50                                         | W127 22 00                                         | 71                  | 21.6                  | CZVR | 31            | 31         | CMAC-W         | 300                 | 1                   | 600              | 2                | 1 ILS          |
| CYPG | Portage La Prairie/Southport        | MB       | N49 54 11                                         | W098 16 26                                         | 885                 | 269.7                 | CZWG | 39            | 32         | DWS            | 200                 | ½                   | 600              | 2                | 1 ILS          |

| ID   | Aerodrome's Name           | Province | Coordinates Latitude<br>(degrees-minutes-seconds) | Coordinates Longitude<br>(degrees-minutes-seconds) | Elevation (feet) | Elevation (metres) | FIR  | FTCN bulletin | GFA region | Issuing Centre | IFR Approach CIG | IFR Approach VIS | Alternate CIG | Alternate VIS | Notes      |
|------|----------------------------|----------|---------------------------------------------------|----------------------------------------------------|------------------|--------------------|------|---------------|------------|----------------|------------------|------------------|---------------|---------------|------------|
| CYPA | Prince Albert (Glassfield) | SK       | N53 12 52                                         | W105 40 23                                         | 1405             | 428.2              | CZWG | 24            | 32         | CMAC-W         | 200              | ½                | 600           | 2             | 1 ILS RVR  |
| CYXS | Prince George              | BC       | N53 53 03                                         | W122 40 39                                         | 2266             | 690.7              | CZVR | 21            | 31         | CMAC-W         | 200              | ½                | 600           | 2             | 1 ILS RVR  |
| CYPR | Prince Rupert              | BC       | N54 17 09                                         | W130 26 41                                         | 116              | 35.4               | CZVR | 21            | 31         | CMAC-W         | 200              | ½                | 600           | 2             | 1 ILS      |
| CYPX | Puvirnituk                 | QC       | N60 03 08                                         | W077 17 15                                         | 83               | 25.3               | CZUL | 26            | 36         | CMAC-E         | 300              | 1                | 800           | 2 ¼           | NPA (RNAV) |
| CYVM | Qikiqtarjuaq               | NU       | N67 32 48                                         | W064 01 54                                         | 18               | 5.5                | CZEG | 33            | 36         | CMAC-W         | 1700             | 3                | 2000          | 3             | NPA (RNAV) |
| CYHA | Quaqtaq                    | QC       | N61 02 47                                         | W069 37 04                                         | 103              | 31.4               | CZUL | 26            | 36         | CMAC-E         | 300              | 1                | 800           | 2             | RNAV only  |
| CYQB | Québec/Jean Lesage Intl    | QC       | N46 47 28                                         | W071 23 36                                         | 244              | 74.4               | CZUL | 36            | 33         | CMAC-E         | 200              | ½                | 600           | 2             | 1 ILS RVR  |
| CYQZ | Quesnel                    | BC       | N53 01 34                                         | W122 30 37                                         | 1788             | 545.0              | CZVR | 21            | 31         | CMAC-W         | 500              | 1 ½              | 900           | 3             | RNAV only  |
| CYRT | Rankin Inlet               | NU       | N62 48 38                                         | W092 06 53                                         | 106              | 32.3               | CZEG | 22            | 36         | CMAC-W         | 300              | 1                | 800           | 2             | NPA (RNAV) |
| CYQF | Red Deer Regional          | AB       | N52 10 56                                         | W113 53 40                                         | 2968             | 904.6              | CZEG | 32            | 32         | CMAC-W         | 300              | 1                | 800           | 2 ¼           | NPA (RNAV) |
| CYRL | Red lake                   | ON       | N51 04 02                                         | W093 47 35                                         | 1266             | 385.9              | CZWG | 34            | 33         | CMAC-E         | 300              | 1                | 800           | 2 ½           | NPA (RNAV) |
| CYQR | Regina Intl                | SK       | N50 25 56                                         | W104 39 58                                         | 1895             | 577.6              | CZWG | 34            | 32         | CMAC-W         | 200              | ½                | 600           | 2             | 1 ILS RVR  |
| CYRB | Resolute Bay               | NU       | N74 43 01                                         | W094 58 10                                         | 222              | 67.7               | CZEG | 33            | 37         | CMAC-W         | 200              | ½                | 600           | 2             | 1 ILS RVR  |
| CYRJ | Roberval                   | QC       | N48 31 12                                         | W072 15 56                                         | 586              | 178.6              | CZUL | 36            | 33         | CMAC-E         | 300              | 1                | 800           | 2 ½           | NPA (RNAV) |

| ID   | Aerodrome's Name                                 | Province | Coordinates Latitude<br>(degrees-minutes-seconds) | Coordinates Longitude<br>(degrees-minutes-seconds) | Elevation (feet) | Elevation (metres) | FIR  | FTCN bulletin | GFA region | Issuing Centre | IFR Approach CIG | IFR Approach VIS | Alternate CIG | Alternate VIS | Notes          |
|------|--------------------------------------------------|----------|---------------------------------------------------|----------------------------------------------------|------------------|--------------------|------|---------------|------------|----------------|------------------|------------------|---------------|---------------|----------------|
| CYUY | Rouyn-Noranda                                    | QC       | N48 12 22                                         | W078 50 08                                         | 988              | 301.1              | CZUL | 26            | 33         | CMAC-E         | 200              | ½                | 800           | 2             | NPA (RNAV)     |
| CWSA | Sable Island                                     | NS       | N43 55 46                                         | W059 57 35                                         | 4                | 1.2                | CZQM | 37            | 34         | CMAC-E         | 300              | 1                | 800           | 2             | RNAV only      |
| CYSY | Sachs Harbour<br>(David Nasogaluak JR. Saaryuaq) | NT       | N71 59 37                                         | W125 14 29                                         | 283              | 86.3               | CZEG | 23            | 35         | CMAC-W         | 300              | 1                | 800           | 2             | NPA (RNAV)     |
| CYSJ | Saint John                                       | NB       | N45 18 57                                         | W065 53 24                                         | 357              | 108.8              | CZQM | 37            | 34         | CMAC-E         | 200              | ½                | 600           | 2             | 1 ILS<br>2 RVR |
| CYZG | Salluit                                          | QC       | N62 10 46                                         | W075 40 02                                         | 745              | 227.1              | CZUL | 26            | 36         | CMAC-W         | 300              | 1                | 800           | 2 ½           | RNAV only      |
| CYZP | Sandspit                                         | BC       | N53 15 15                                         | W131 48 50                                         | 21               | 6.4                | CZVR | 21            | 31         | CMAC-W         | 300              | 1                | 600           | 2             | 1 ILS          |
| CZSJ | Sandy Lake                                       | ON       | N53 03 51                                         | W093 20 40                                         | 951              | 289.9              | CZWG | 24            | 33         | CMAC-E         | 500              | 1 ½              | 800           | 2 ½           | NPA (RNAV)     |
| CYUX | Sanirajak                                        | NU       | N68 46 33                                         | W081 14 33                                         | 30               | 9.1                | CZEG | 33            | 36         | CMAC-W         | 300              | 1                | 800           | 2             | NPA (RNAV)     |
| CYZR | Sarnia (Chris Hadfield)                          | ON       | N42 59 58                                         | W082 18 32                                         | 595              | 181.4              | CZYZ | 35            | 33         | CMAC-E         | 300              | 1                | 800           | 2             | RNAV only      |
| CYXE | Saskatoon/John G. Diefenbaker Intl               | SK       | N52 10 15                                         | W106 41 59                                         | 1654             | 504.1              | CZWG | 34            | 32         | CMAC-W         | 200              | ½                | 600           | 2             | 1 ILS RVR      |
| CYAM | Sault Ste. Marie                                 | ON       | N46 29 06                                         | W084 30 35                                         | 630              | 192.0              | CZYZ | 25            | 33         | CMAC-E         | 200              | ½                | 600           | 2             | 1 ILS RVR      |
| CYKL | Schefferville                                    | QC       | N54 48 19                                         | W066 48 19                                         | 1709             | 520.9              | CZUL | 26            | 34         | CMAC-E         | 300              | 1                | 800           | 2 ¼           | NPA (RNAV)     |
| CYZV | Sept-Îles                                        | QC       | N50 13 24                                         | W066 15 56                                         | 180              | 54.9               | CZUL | 36            | 34         | CMAC-E         | 200              | ½                | 600           | 2             | 1 ILS RVR      |
| CYSC | Sherbrooke                                       | QC       | N45 26 19                                         | W071 41 29                                         | 792              | 241.4              | CZUL | 36            | 33         | CMAC-E         | 300              | 1                | 800           | 2             | RNAV only      |

| ID   | Aerodrome's Name                | Province | Coordinates Latitude<br>(degrees-minutes-seconds) | Coordinates Longitude<br>(degrees-minutes-seconds) | Elevation (feet) | Elevation (metres) | FIR  | FTCN bulletin | GFA region | Issuing Centre | IFR Approach CIG | IFR Approach VIS | Alternate CIG | Alternate VIS | Notes                     |
|------|---------------------------------|----------|---------------------------------------------------|----------------------------------------------------|------------------|--------------------|------|---------------|------------|----------------|------------------|------------------|---------------|---------------|---------------------------|
| CYXL | Sioux Lookout                   | ON       | N50 06 50                                         | W091 54 19                                         | 1257             | 383.1              | CZWG | 34            | 33         | CMAC-E         | 300              | 1                | 800           | 2 ¼           | NPA (RNAV)                |
| CYZH | Slave Lake                      | AB       | N55 17 35                                         | W114 46 38                                         | 1912             | 582.8              | CZEG | 32            | 32         | CMAC-W         | 500              | 1 ½              | 800           | 2 ½           | RNAV only                 |
| CYYD | Smithers                        | BC       | N54 49 31                                         | W127 10 58                                         | 1716             | 523.0              | CZVR | 21            | 31         | CMAC-W         | 500              | 1 ½              | 800           | 2 ½           | RNAV only                 |
| CYAY | St. Anthony                     | NL       | N51 23 31                                         | W056 04 59                                         | 108              | 32.9               | CZQX | 38            | 34         | CMAC-E         | 400              | 1 ¼              | 800           | 2 ¼           | NPA (RNAV)                |
| CYSN | St Catharines/Niagara District) | ON       | N43 11 30                                         | W079 10 18                                         | 321              | 97.8               | CZYZ | 35            | 33         | CMAC-E         | 300              | 1                | 800           | 2             | RNAV only                 |
| CYYT | St. John's Intl                 | NL       | N47 37 07                                         | W052 45 09                                         | 461              | 140.5              | CZQX | 38            | 34         | CMAC-E         | 0                | ⅓                | 400           | 1             | 3 ILS<br>3 RVR<br>CAT III |
| CYJT | Stephenville                    | NL       | N48 32 29                                         | W058 33 00                                         | 81               | 24.7               | CZQX | 38            | 34         | CMAC-E         | 300              | 1                | 600           | 2             | 1 ILS RVR                 |
| CYSF | Stony Rapids                    | SK       | N59 15 01                                         | W105 50 29                                         | 819              | 249.6              | CZEG | 22            | 32         | CMAC-W         | 500              | 1 ½              | 800           | 2 ½           | NPA (RNAV)                |
| CYSB | Sudbury                         | ON       | N46 37 30                                         | W080 47 56                                         | 1143             | 348.4              | CZYZ | 25            | 33         | CMAC-E         | 200              | ½                | 600           | 2             | 1 ILS RVR                 |
| CYYN | Swift Current                   | SK       | N50 17 31                                         | W107 41 26                                         | 2680             | 816.9              | CZWG | 34            | 32         | CMAC-W         | 300              | 1                | 800           | 2             | RNAV only                 |
| CYQY | Sydney/J.A. Douglas McCurdy     | NS       | N46 09 41                                         | W060 02 53                                         | 203              | 61.87              | CZQM | 37            | 34         | CMAC-E         | 200              | ½                | 600           | 2             | 1 ILS RVR                 |
| CYYH | Taloyoak                        | NU       | N69 32 48                                         | W093 34 37                                         | 90               | 27.4               | CZEG | 33            | 36         | CMAC-W         | 500              | 1 ½              | 800           | 2 ½           | NPA (RNAV)                |
| CYTQ | Tasiujaq                        | QC       | N58 40 04                                         | W069 57 21                                         | 122              | 37.2               | CZUL | 26            | 33         | CMAC-E         | 300              | 1                | 800           | 2             | RNAV only                 |
| CYXT | Terrace                         | BC       | N54 28 07                                         | W128 34 42                                         | 713              | 217.3              | CZVR | 21            | 31         | CMAC-W         | 300              | 1                | 600           | 2             | 1 ILS                     |

| ID   | Aerodrome's Name                                   | Province | Coordinates Latitude<br>(degrees-minutes-seconds) | Coordinates Longitude<br>(degrees-minutes-seconds) | Elevation<br>(feet) | Elevation<br>(metres) | FIR  | FTCN bulletin | GFA region | Issuing Centre | IFR Approach<br>CIG | IFR Approach<br>VIS | Alternate<br>CIG | Alternate<br>VIS | Notes                 |
|------|----------------------------------------------------|----------|---------------------------------------------------|----------------------------------------------------|---------------------|-----------------------|------|---------------|------------|----------------|---------------------|---------------------|------------------|------------------|-----------------------|
| CYZW | Teslin                                             | YT       | N60 10 23                                         | W132 44 30                                         | 2313                | 705.0                 | CZEG | 33            | 35         | CMAC-W         | 500                 | 1 ½                 | 800              | 2 ½              | RNAV only             |
| CYQD | The Pas                                            | MB       | N53 58 17                                         | W101 05 28                                         | 888                 | 270.7                 | CZWG | 24            | 32         | CMAC-W         | 300                 | 1                   | 800              | 2                | RNAV only             |
| CYTH | Thompson                                           | MB       | N55 48 17                                         | W097 51 45                                         | 735                 | 224.0                 | CZWG | 24            | 32         | CMAC-W         | 200                 | ½                   | 600              | 2                | 1 ILS RVR             |
| CYQT | Thunder Bay                                        | ON       | N48 22 19                                         | W089 19 18                                         | 654                 | 199.3                 | CZWG | 34            | 33         | CMAC-E         | 200                 | ½                   | 600              | 2                | 1 ILS RVR             |
| CYTS | Timmins/Victor M. Power                            | ON       | N48 34 11                                         | W081 22 36                                         | 967                 | 294.7                 | CZYZ | 25            | 33         | CMAC-E         | 200                 | ½                   | 600              | 2                | 1 ILS RVR             |
| CYAZ | Tofino/Long Beach                                  | BC       | N49 04 56                                         | W125 46 21                                         | 80                  | 24.4                  | CZVR | 31            | 31         | CMAC-W         | 300                 | 1                   | 800              | 2 ½              | RNAV only             |
| CYOO | Toronto/Oshawa                                     | ON       | N43 55 22                                         | W078 53 47                                         | 460                 | 140.2                 | CZYZ | 35            | 33         | CMAC-E         | 300                 | 1                   | 800              | 2                | RNAV only             |
| CYTZ | Toronto/Billy Bishop<br>Toronto City Airport       | ON       | N43 37 39                                         | W079 23 46                                         | 252                 | 76.8                  | CZYZ | 35            | 33         | CMAC-E         | 300                 | 1                   | 600              | 2                | 1 ILS RVR             |
| CYYZ | Toronto/Lester B. Pearson Intl                     | ON       | N43 40 38                                         | W079 37 50                                         | 569                 | 173.4                 | CYZY | 35            | 33         | CMAC-E         | 0                   | ⅛                   | 400              | 1                | 10 ILS RVR<br>CAT III |
| CYTR | Trenton                                            | ON       | N44 07 08                                         | W077 31 41                                         | 283                 | 86.3                  | CZYZ | 39            | 33         | DWS            | 200                 | ½                   | 600              | 2                | 2 ILS<br>2 RVR        |
| CYRQ | Trois-Rivières                                     | QC       | N46 21 06                                         | W072 40 50                                         | 199                 | 60.7                  | CZUL | 26            | 33         | CMAC-E         | 200                 | ½                   | 800              | 2                | NPA<br>(RNAV)         |
| CYUB | Tuktoyaktuk/James Gruben                           | NT       | N69 26 00                                         | W133 01 35                                         | 14                  | 4.3                   | CZEG | 23            | 35         | CMAC-W         | 300                 | 1                   | 800              | 2                | RNAV only             |
| CYHI | Ulukhaktok/Holman                                  | NT       | N70 45 46                                         | W117 48 22                                         | 117                 | 35.7                  | CZEG | 23            | 35         | CMAC-W         | 500                 | 1 ½                 | 800              | 2 ½              | NPA<br>(RNAV)         |
| CYOY | Valcartier (W/C<br>J.H.L. (Joe)<br>Lecomte) (Heli) | QC       | N46 54 00                                         | W071 30 00                                         | 550                 | 167.6                 | CZUL | 39            | 33         | DWS            | -                   | -                   | -                | -                | A                     |

| ID   | Aerodrome's Name                      | Province | Coordinates Latitude<br>(degrees-minutes-seconds) | Coordinates Longitude<br>(degrees-minutes-seconds) | Elevation (feet) | Elevation (metres) | FIR  | FTCN bulletin | GFA region | Issuing Centre | IFR Approach CIG | IFR Approach VIS | Alternate CIG | Alternate VIS | Notes                      |
|------|---------------------------------------|----------|---------------------------------------------------|----------------------------------------------------|------------------|--------------------|------|---------------|------------|----------------|------------------|------------------|---------------|---------------|----------------------------|
| CYVO | Val-d'Or                              | QC       | N48 03 12                                         | W077 46 58                                         | 1107             | 337.4              | CZUL | 26            | 33         | CMAC-E         | 200              | ½                | 600           | 2             | 1 ILS RVR                  |
| CYVR | Vancouver Intl                        | BC       | N49 11 41                                         | W123 11 02                                         | 14               | 4.3                | CZVR | 31            | 31         | CMAC-W         | 0                | ⅛                | 400           | 1             | 5 ILS<br>4 RVR<br>CAT III  |
| CYWH | Victoria Harbour<br>(Water Aerodrome) | BC       | N48 25 22                                         | W123 23 15                                         | 0                | 0                  | CZVR | 31            | 31         | CMAC-W         | 500              | 1                | 800           | 2             | NPA<br>(RNAV)              |
| CYYJ | Victoria Intl                         | BC       | N48 38 50                                         | W123 25 33                                         | 64               | 19.5               | CZVR | 31            | 31         | CMAC-W         | 200              | ½                | 600           | 2             | NPA<br>(RNAV)<br>1 ILS RVR |
| CYWK | Wabush                                | NL       | N52 55 22                                         | W066 51 53                                         | 1808             | 551.1              | CZUL | 36            | 34         | CMAC-E         | 300              | 1                | 600           | 2             | 1 ILS                      |
| CYKQ | Waskaganish                           | QC       | N51 28 24                                         | W078 45 30                                         | 79               | 24.1               | CZUL | 26            | 33         | CMAC-E         | 300              | 1                | 800           | 2             | NPA<br>(RNAV)              |
| CYQH | Watson Lake                           | YT       | N60 06 59                                         | W128 49 21                                         | 2255             | 687.3              | CZEG | 33            | 35         | CMAC-W         | 300              | 1                | 600           | 2             | 1 ILS RVR                  |
| CYXZ | Wawa                                  | ON       | N47 58 01                                         | W084 47 11                                         | 944              | 287.7              | CZYZ | 25            | 33         | CMAC-E         | 500              | 1 ½              | 900           | 3             | RNAV only                  |
| CYWE | Wekweëti                              | NT       | N64 11 27                                         | W114 04 36                                         | 1208             | 368.2              | CZEG | 23            | 35         | CMAC-W         | 500              | 1 ½              | 800           | 2 ½           | RNAV only                  |
| CYZU | Whitecourt                            | AB       | N54 08 38                                         | W115 47 12                                         | 2567             | 782.4              | CZEG | 32            | 32         | CMAC-W         | 300              | 1                | 800           | 2             | NPA<br>(RNAV)              |
| CYXY | Whitehorse/Erik<br>Nielsen Intl.      | YT       | N60 42 34                                         | W135 04 02                                         | 2317             | 706.2              | CZEG | 33            | 35         | CMAC-W         | 200              | ½                | 600           | 2             | 1 ILS RVR                  |
| CYVV | Wiarton                               | ON       | N44 44 45                                         | W081 06 26                                         | 729              | 222.2              | CZYZ | 35            | 33         | CMAC-E         | 300              | 1                | 800           | 2             | NPA<br>(RNAV)              |
| CYWL | Williams Lake                         | BC       | N52 11 00                                         | W122 03 16                                         | 3083             | 939.7              | CZVR | 21            | 31         | CMAC-W         | 500              | 1 ½              | 800           | 2 ½           | NPA<br>(RNAV)              |
| CYQG | Windsor                               | ON       | N42 16 32                                         | W082 57 20                                         | 622              | 189.6              | CYZY | 35            | 33         | CMAC-E         | 200              | ½                | 600           | 2             | 1 ILS RVR                  |

| ID   | Aerodrome's Name                         | Province | Coordinates Latitude<br>(degrees-minutes-seconds) | Coordinates Longitude<br>(degrees-minutes-seconds) | Elevation<br>(feet) | Elevation<br>(metres) | FIR  | FTCN bulletin | GFA region | Issuing Centre | IFR Approach<br>CIG | IFR Approach<br>VIS | Alternate<br>CIG | Alternate<br>VIS | Notes                    |
|------|------------------------------------------|----------|---------------------------------------------------|----------------------------------------------------|---------------------|-----------------------|------|---------------|------------|----------------|---------------------|---------------------|------------------|------------------|--------------------------|
| CYWG | Winnipeg/James Armstrong Richardson Intl | MB       | N49 54 36                                         | W097 14 24                                         | 784                 | 239.0                 | CZWG | 34            | 32         | CMAC-W         | 100                 | ¼                   | 400              | 1                | 3 ILS<br>3 RVR<br>CAT II |
| CYQI | Yarmouth                                 | NS       | N43 49 37                                         | W066 05 17                                         | 141                 | 43.0                  | CZQM | 37            | 34         | CMAC-E         | 300                 | 1                   | 800              | 2                | RNAV only                |
| CYZF | Yellowknife                              | NT       | N62 27 46                                         | W114 26 25                                         | 675                 | 205.7                 | CZEG | 33            | 35         | CMAC-W         | 200                 | ½                   | 600              | 2                | 1 ILS RVR                |
| CYQV | Yorkton Muni                             | SK       | N51 15 53                                         | W102 27 41                                         | 1635                | 498.3                 | CZWG | 34            | 32         | CMAC-W         | 300                 | 1                   | 800              | 2                | RNAV only                |

**Legend:**

**A** = Landing limits at heliports are best IFR approach limits.

Gagetown CYCX, Borden CYBN, Namao CYED, Petawawa CYWA, and Valcartier CYOY are not IFR aerodromes.

**CAP** = Canada Air Pilot

**CAT (I, II or III)** = ILS Categories I, II or III

**CMAC-E** = Canadian Meteorological Aviation Centre – East

**CMAC-W** = Canadian Meteorological Aviation Centre – West

**DWS** = Defense Weather Services

**ILS** = Instrument Landing System;

**NPA** = Non Precision Approach

**RCAP** = Restricted Canada Air Pilot

**RNAV** = Area Navigation

**RVR** = Runway Visual Range

## Appendix B    Forecasts in digital form of the winds and the temperatures aloft— Supplement to Chapter 3

**Note:** This table lists the sites for which a forecast in digital form of the winds and the temperatures aloft is produced. Additional information, such as the coordinates and elevations, have been provided for completeness. Pilots are advised to refer to the latest Canadian Flight Supplement (CFS) for information about sites that are aerodromes as well.

| ID  | Site Name | Province or Country | Coordinates Latitude<br>(degrees-minutes-seconds) | Coordinates Longitude<br>(degrees-minutes-seconds) | Elevation (feet) | Elevation (metres) | FIR    | GFA Region |
|-----|-----------|---------------------|---------------------------------------------------|----------------------------------------------------|------------------|--------------------|--------|------------|
| VBI | N/A       | ON                  | N49 28 00                                         | W094 03 00                                         | 1184             | 361                | CZWG   | 33         |
| WCK | N/A       | NT                  | N74 00 00                                         | W135 00 00                                         | 0                | 0                  | CZEG   | 37         |
| WCM | N/A       | NT                  | N70 00 00                                         | W115 00 00                                         | 846              | 258                | CZEG   | 35         |
| WDG | N/A       | NT                  | N80 00 00                                         | W115 00 00                                         | 0                | 0                  | CZEG   | 37         |
| WFA | N/A       | GL                  | N62 00 00                                         | W056 00 00                                         | 0                | 0                  | CZQX-O | N/A        |
| WFB | N/A       | GL                  | N72 00 00                                         | W062 00 00                                         | 0                | 0                  | N/A    | N/A        |
| WFC | N/A       | GL                  | N66 00 00                                         | W054 00 00                                         | 0                | 0                  | N/A    | N/A        |
| WFK | N/A       | NU                  | N89 00 00                                         | W075 00 00                                         | 0                | 0                  | CZEG   | 37         |
| WJQ | N/A       | NT                  | N76 00 00                                         | W140 00 00                                         | 0                | 0                  | CZEG   | 37         |
| WKJ | N/A       | NT                  | N63 00 00                                         | W107 00 00                                         | 1250             | 381                | CZEG   | 35         |
| WKQ | N/A       | NU                  | N85 00 00                                         | W070 00 00                                         | 0                | 0                  | CZEG   | 37         |
| WKZ | N/A       | NU                  | N57 00 00                                         | W089 00 00                                         | 0                | 0                  | CZWG   | 32         |
| WLL | N/A       | NT                  | N82 00 00                                         | W140 00 00                                         | 0                | 0                  | CZEG   | 37         |
| WLR | N/A       | NU                  | N61 00 00                                         | W080 00 00                                         | 0                | 0                  | CZWG   | 36         |
| WOM | N/A       | NL                  | N58 00 00                                         | W060 00 00                                         | 0                | 0                  | CZQX   | 34         |
| WOP | N/A       | GL                  | N67 00 00                                         | W050 00 00                                         | 1030             | 314                | N/A    | N/A        |
| WOX | N/A       | NL                  | N59 00 00                                         | W050 00 00                                         | 0                | 0                  | CZQX-O | N/A        |

| ID  | Site Name | Province or Country | Coordinates Latitude<br>(degrees-minutes-seconds) | Coordinates Longitude<br>(degrees-minutes-seconds) | Elevation<br>(feet) | Elevation<br>(metres) | FIR    | GFA Region |
|-----|-----------|---------------------|---------------------------------------------------|----------------------------------------------------|---------------------|-----------------------|--------|------------|
| WPM | N/A       | NL                  | N47 00 00                                         | W049 00 00                                         | 0                   | 0                     | CZQX-O | 34         |
| WPV | N/A       | NU                  | N67 00 00                                         | W060 00 00                                         | 0                   | 0                     | CZEG   | 36         |
| WRS | N/A       | NT                  | N78 00 00                                         | W130 00 00                                         | 0                   | 0                     | CZEG   | 37         |
| WUA | N/A       | NU                  | N73 00 00                                         | W110 00 00                                         | 0                   | 0                     | CZEG   | 37         |
| WUB | N/A       | NU                  | N65 00 00                                         | W105 00 00                                         | 991                 | 302                   | CZEG   | 35         |
| WUC | N/A       | MB                  | N55 00 00                                         | W095 00 00                                         | 600                 | 183                   | CZWG   | 32         |
| WUD | N/A       | NU                  | N60 00 00                                         | W085 00 00                                         | 0                   | 0                     | CZWG   | 33         |
| WUE | N/A       | ON                  | N55 00 00                                         | W085 00 00                                         | 98                  | 30                    | CZWG   | 33         |
| WUF | N/A       | QB                  | N51 00 00                                         | W075 00 00                                         | 1201                | 366                   | CZUL   | 33         |
| WUG | N/A       | QB                  | N57 00 00                                         | W073 00 00                                         | 499                 | 152                   | CZUL   | 33         |
| WUI | N/A       | MB                  | N52 00 00                                         | W101 00 00                                         | 299                 | 91                    | CZWG   | 32         |
| WUJ | N/A       | MB                  | N53 00 00                                         | W097 36 00                                         | 712                 | 217                   | CZWG   | 32         |
| WZJ | N/A       | NU                  | N81 06 00                                         | W070 18 00                                         | 4268                | 1301                  | CZEG   | 37         |
| XAA | N/A       | NT                  | N85 00 00                                         | W140 00 00                                         | 0                   | 0                     | CZEG   | 37         |
| XAB | N/A       | NT                  | N85 00 00                                         | W120 00 00                                         | 0                   | 0                     | CZEG   | 37         |
| XAD | N/A       | NU                  | N85 00 00                                         | W090 00 00                                         | 0                   | 0                     | CZEG   | 37         |
| XAE | N/A       | GL                  | N85 00 00                                         | W060 00 00                                         | 0                   | 0                     | CZEG   | 37         |
| XBA | N/A       | NT                  | N80 00 00                                         | W140 00 00                                         | 0                   | 0                     | CZEG   | 37         |
| XBB | N/A       | NT                  | N80 00 00                                         | W120 00 00                                         | 0                   | 0                     | CZEG   | 37         |
| XBM | N/A       | NU                  | N80 00 00                                         | W100 00 00                                         | 3                   | 1                     | CZEG   | 37         |
| XBS | N/A       | GL                  | N80 00 00                                         | W060 00 00                                         | 1024                | 312                   | N/A    | N/A        |
| XBT | N/A       | NU                  | N84 00 00                                         | W100 00 00                                         | 0                   | 0                     | CZEG   | 37         |
| XCB | N/A       | NT                  | N77 30 00                                         | W130 00 00                                         | 0                   | 0                     | CZEG   | 37         |

| ID  | Site Name | Province or Country | Coordinates Latitude<br>(degrees-minutes-seconds) | Coordinates Longitude<br>(degrees-minutes-seconds) | Elevation<br>(feet) | Elevation<br>(metres) | FIR  | GFA Region |
|-----|-----------|---------------------|---------------------------------------------------|----------------------------------------------------|---------------------|-----------------------|------|------------|
| XCC | N/A       | NU                  | N77 30 00                                         | W110 00 00                                         | 0                   | 0                     | CZEG | 37         |
| XCE | N/A       | NU                  | N77 30 00                                         | W090 00 00                                         | 66                  | 20                    | CZEG | 37         |
| XCF | N/A       | GL                  | N77 30 00                                         | W075 00 00                                         | 0                   | 0                     | N/A  | N/A        |
| XCN | N/A       | GL                  | N76 30 00                                         | W068 50 00                                         | 528                 | 161                   | N/A  | N/A        |
| XDA | N/A       | NT                  | N75 00 00                                         | W140 00 00                                         | 0                   | 0                     | CZEG | 37         |
| XDB | N/A       | NT                  | N75 00 00                                         | W130 00 00                                         | 0                   | 0                     | CZEG | 37         |
| XDC | N/A       | NT                  | N75 00 00                                         | W120 00 00                                         | 0                   | 0                     | CZEG | 37         |
| XDD | N/A       | NU                  | N75 00 00                                         | W110 00 00                                         | 469                 | 143                   | CZEG | 37         |
| XDF | N/A       | GL                  | N75 00 00                                         | W070 00 00                                         | 0                   | 0                     | N/A  | N/A        |
| XDH | N/A       | NU                  | N74 30 00                                         | W082 30 00                                         | 0                   | 0                     | CZEG | 37         |
| XDJ | N/A       | NT                  | N89 00 00                                         | W140 00 00                                         | 0                   | 0                     | CZEG | 37         |
| XEE | N/A       | NT                  | N70 00 00                                         | W140 00 00                                         | 0                   | 0                     | CZEG | 35         |
| XEJ | N/A       | NT                  | N70 00 00                                         | W130 00 00                                         | 3                   | 1                     | CZEG | 35         |
| XEH | N/A       | NT                  | N70 00 00                                         | W120 00 00                                         | 0                   | 0                     | CZEG | 35         |
| XEJ | N/A       | NU                  | N70 00 00                                         | W090 00 00                                         | 0                   | 0                     | CZEG | 36         |
| XEK | N/A       | GL                  | N70 00 00                                         | W060 00 00                                         | 0                   | 0                     | N/A  | N/A        |
| XUH | N/A       | QC                  | N48 00 00                                         | W075 00 00                                         | 1001                | 305                   | CZUL | 33         |
| YEI | N/A       | NU                  | N61 08 00                                         | W100 55 00                                         | 1158                | 353                   | CZEG | 35         |
| YFN | N/A       | SK                  | N57 22 00                                         | W107 08 00                                         | 1588                | 484                   | CZWG | 32         |
| YIX | N/A       | NT                  | N66 06 00                                         | W117 56 00                                         | 512                 | 156                   | CZEG | 35         |
| YVN | N/A       | NU                  | N66 36 00                                         | W061 34 00                                         | 2369                | 722                   | CZEG | 36         |
| YLT | Alert     | NU                  | N82 31 04                                         | W062 16 50                                         | 100                 | 30.5                  | CZEG | 37         |
| YTF | Alma      | QC                  | N48 30 31                                         | W071 38 29                                         | 449                 | 136.9                 | CZUL | 33         |

| ID  | Site Name                           | Province or Country | Coordinates Latitude<br>(degrees-minutes-seconds) | Coordinates Longitude<br>(degrees-minutes-seconds) | Elevation (feet) | Elevation (metres) | FIR  | GFA Region |
|-----|-------------------------------------|---------------------|---------------------------------------------------|----------------------------------------------------|------------------|--------------------|------|------------|
| YAB | Arctic Bay                          | NU                  | N73 00 23                                         | W085 02 50                                         | 72               | 21.9               | CZEG | 37         |
| YYW | Armstrong                           | ON                  | N50 17 25                                         | W088 54 35                                         | 1058             | 322.5              | CZWG | 33         |
| YBK | Baker Lake                          | NU                  | N64 17 56                                         | W096 04 40                                         | 61               | 18.6               | CZEG | 36         |
| YTL | Big Trout Lake                      | ON                  | N53 49 04                                         | W089 53 49                                         | 730              | 222.5              | CZWG | 33         |
| YBR | Brandon Muni                        | MB                  | N49 54 36                                         | W099 57 07                                         | 1343             | 409.3              | CZWG | 32         |
| YDB | Burwash                             | YT                  | N61 22 14                                         | W139 02 24                                         | 2642             | 805.3              | CZEG | 35         |
| YYC | Calgary Intl                        | AB                  | N51 06 50                                         | W114 01 13                                         | 3557             | 1084.2             | CZEG | 32         |
| YCB | Cambridge Bay                       | NU                  | N69 06 29                                         | W105 08 14                                         | 102              | 31.1               | CZEG | 35         |
| YTE | Kinngait                            | NU                  | N64 13 49                                         | W076 31 30                                         | 158              | 48.1               | CZEG | 36         |
| YMT | Chibougamau/Chapais                 | QC                  | N49 46 19                                         | W074 31 41                                         | 1270             | 387.1              | CZUL | 33         |
| YYQ | Churchill                           | MB                  | N58 44 21                                         | W094 03 59                                         | 96               | 29.3               | CZWG | 32         |
| YOD | Cold Lake/Group Captain R.W. McNair | AB                  | N54 24 18                                         | W110 16 46                                         | 1775             | 541.0              | CZEG | 32         |
| YZS | Coral Harbour                       | NU                  | N64 11 36                                         | W083 21 34                                         | 204              | 62.2               | CZEG | 36         |
| YXC | Cranbrook/Canadian Rockies Intl     | BC                  | N49 36 44                                         | W115 46 55                                         | 3084             | 940.0              | CZVR | 31         |
| YDL | Dease Lake                          | BC                  | N58 25 20                                         | W130 01 56                                         | 2634             | 802.8              | CZEG | 31         |
| YUW | Dewar Lakes                         | NU                  | N68 39 00                                         | W071 10 00                                         | 1729             | 527.0              | CZEG | 36         |
| YEG | Edmonton Intl                       | AB                  | N53 18 35                                         | W113 34 47                                         | 2373             | 723.3              | CZEG | 32         |
| YEA | Empress                             | AB                  | N50 56 00                                         | W110 00 47                                         | 2211             | 673.9              | CZEG | 32         |
| YEU | Eureka                              | NU                  | N79 59 40                                         | W085 48 43                                         | 269              | 82.0               | CZEG | 37         |
| YMM | Fort McMurray                       | AB                  | N56 39 12                                         | W111 13 24                                         | 1211             | 369.1              | CZEG | 32         |
| YYE | Fort Nelson                         | BC                  | N58 50 11                                         | W122 35 49                                         | 1253             | 381.9              | CZEG | 31         |
| YFS | Fort Simpson                        | NT                  | N61 45 37                                         | W121 14 11                                         | 556              | 169.5              | CZEG | 35         |
| YSM | Fort Smith                          | NT                  | N60 01 13                                         | W111 57 43                                         | 671              | 204.6              | CZEG | 35         |

| ID  | Site Name               | Province or Country | Coordinates Latitude<br>(degrees-minutes-seconds) | Coordinates Longitude<br>(degrees-minutes-seconds) | Elevation<br>(feet) | Elevation<br>(metres) | FIR  | GFA Region |
|-----|-------------------------|---------------------|---------------------------------------------------|----------------------------------------------------|---------------------|-----------------------|------|------------|
| YXJ | Fort St. John           | BC                  | N56 14 17                                         | W120 44 25                                         | 2280                | 694.9                 | CZEG | 34         |
| YFC | Fredericton Intl        | NB                  | N45 52 08                                         | W066 32 14                                         | 67                  | 20.4                  | CZQM | 34         |
| YQX | Gander Intl             | NL                  | N48 56 13                                         | W054 34 05                                         | 496                 | 151.2                 | CZQX | 34         |
| YGP | Gaspé (Michel Pouliot)  | QC                  | N48 46 31                                         | W064 28 47                                         | 112                 | 34.1                  | CZUL | 34         |
| YYR | Goose Bay               | NL                  | N53 19 09                                         | W060 25 33                                         | 160                 | 48.8                  | CZQX | 34         |
| YHZ | Halifax/Stanfield Intl  | NS                  | N44 52 52                                         | W063 30 31                                         | 477                 | 145.4                 | CZQM | 34         |
| YUX | Sanirajak               | NU                  | N68 46 33                                         | W081 14 33                                         | 30                  | 9.1                   | CZEG | 36         |
| YOJ | High Level              | AB                  | N58 37 17                                         | W117 09 53                                         | 1105                | 336.8                 | CZEG | 32         |
| YHO | Hopedale                | NL                  | N55 26 56                                         | W060 13 41                                         | 46                  | 14.0                  | CZQX | 34         |
| YGR | Îles-de-la-Madeleine    | QC                  | N47 25 30                                         | W061 46 41                                         | 35                  | 10.7                  | CZQM | 34         |
| YPH | Inukjuak                | QC                  | N58 28 19                                         | W078 04 37                                         | 83                  | 25.3                  | CZUL | 33         |
| YEV | Inuvik (Mike Zubko)     | NT                  | N68 18 14                                         | W133 28 59                                         | 222                 | 67.7                  | CZEG | 35         |
| YFB | Iqaluit                 | NU                  | N63 45 23                                         | W068 33 21                                         | 110                 | 33.5                  | CZUL | 36         |
| YIC | Isachsen                | NU                  | N78 47 00                                         | W103 33 00                                         | 190                 | 58                    | CZEG | 37         |
| YJA | Jasper                  | AB                  | N52 59 48                                         | W118 03 34                                         | 3350                | 1021.1                | CZEG | 32         |
| YKA | Kamloops                | BC                  | N50 42 09                                         | W120 26 55                                         | 1133                | 345.3                 | CZVR | 31         |
| YYU | Kapuskasing             | ON                  | N49 24 42                                         | W082 28 07                                         | 743                 | 226.5                 | CZYZ | 33         |
| YCO | Kugluktuk               | NU                  | N67 49 00                                         | W115 08 38                                         | 74                  | 22.6                  | CZEG | 35         |
| YVP | Kuuujuaq                | QC                  | N58 05 46                                         | W068 25 37                                         | 129                 | 39.3                  | CZUL | 33         |
| YGW | Kuujuarapik             | QC                  | N55 16 55                                         | W077 45 55                                         | 34                  | 10.4                  | CZUL | 34         |
| YEO | Lac Eon                 | QC                  | N51 52 00                                         | W063 17 00                                         | 1932                | 588.9                 | CZUL | 33         |
| YAH | La Grande-4             | QC                  | N53 45 17                                         | W073 40 31                                         | 1005                | 306.3                 | CZUL | 33         |
| YVC | La Ronge (Barber Field) | SK                  | N55 09 05                                         | W105 15 43                                         | 1242                | 378.6                 | CZWG | 32         |

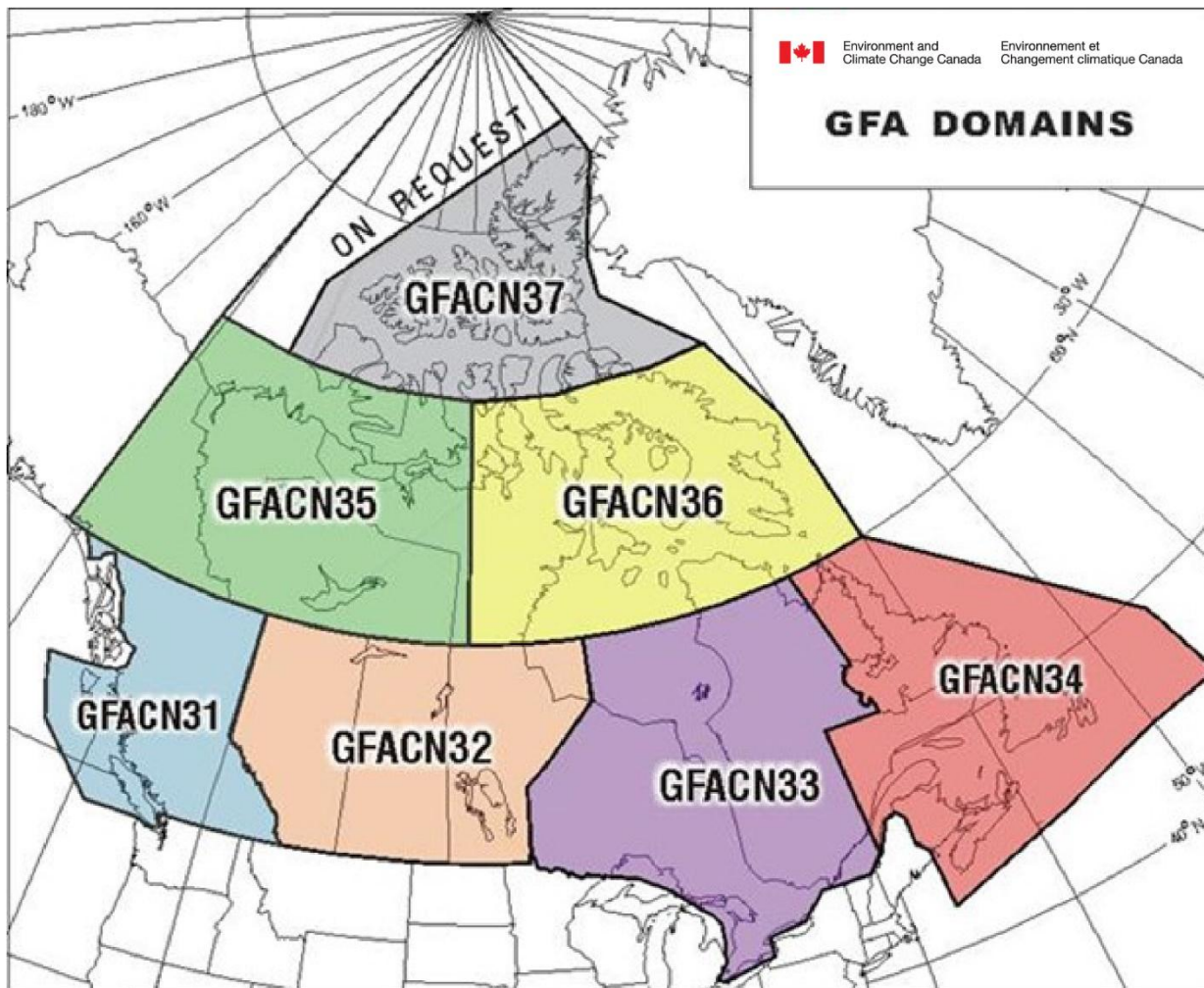
| ID  | Site Name                            | Province or Country | Coordinates Latitude<br>(degrees-minutes-seconds) | Coordinates Longitude<br>(degrees-minutes-seconds) | Elevation (feet) | Elevation (metres) | FIR  | GFA Region |
|-----|--------------------------------------|---------------------|---------------------------------------------------|----------------------------------------------------|------------------|--------------------|------|------------|
| YQL | Lethbridge County                    | AB                  | N49 37 49                                         | W112 47 59                                         | 3048             | 929.0              | CZEG | 32         |
| YYL | Lynn Lake                            | MB                  | N56 51 50                                         | W101 04 34                                         | 1170             | 356.6              | CZWG | 32         |
| YMV | Manicouagan                          | QC                  | N50 40 00                                         | W068 50 00                                         | 1309             | 399                | CZUL | 34         |
| YMW | Maniwaki                             | QC                  | N46 16 22                                         | W075 59 26                                         | 658              | 200.6              | CZUL | 33         |
| YNM | Matagami                             | QC                  | N49 45 42                                         | W077 48 10                                         | 918              | 279.8              | CZUL | 33         |
| YMA | Mayo                                 | YT                  | N63 36 59                                         | W135 52 06                                         | 1653             | 503.8              | CZEG | 35         |
| YQM | Moncton/Greater Moncton Intl         | NB                  | N46 06 44                                         | W064 40 43                                         | 232              | 70.7               | CZQM | 34         |
| YYY | Mont-Joli                            | QC                  | N48 36 32                                         | W068 12 27                                         | 172              | 52.4               | CZUL | 34         |
| YUL | Montréal/Pierre Elliott Trudeau Intl | QC                  | N45 28 14                                         | W073 44 27                                         | 118              | 36.0               | CZUL | 33         |
| YMO | Moosonee                             | ON                  | N51 17 28                                         | W080 36 28                                         | 30               | 9.1                | CZYZ | 33         |
| YMD | Mould Bay                            | NT                  | N76 14 00                                         | W119 20 00                                         | 7                | 2                  | CWEG | 37         |
| YNA | Natashquan                           | QC                  | N50 11 24                                         | W061 47 20                                         | 39               | 11.9               | CZUL | 34         |
| YNI | Nitchecon                            | QC                  | N53 17 00                                         | W070 54 00                                         | 1604             | 489                | CZUL | 34         |
| YVQ | Norman Wells                         | NT                  | N65 16 53                                         | W126 47 55                                         | 238              | 72.5               | CZEG | 35         |
| YYB | North Bay                            | ON                  | N46 21 50                                         | W079 25 27                                         | 1215             | 370.3              | CZYZ | 33         |
| YOC | Old Crow                             | YT                  | N67 34 12                                         | W139 50 24                                         | 814              | 248.1              | CZEG | 35         |
| YOW | Ottawa/MacDonald-Cartier Intl        | ON                  | N45 19 21                                         | W075 40 09                                         | 374              | 114.0              | CZUL | 33         |
| YYF | Penticton                            | BC                  | N49 27 45                                         | W119 36 08                                         | 1130             | 344.4              | CZVR | 31         |
| YZT | Port Hardy                           | BC                  | N50 40 50                                         | W127 22 00                                         | 71               | 21.6               | CZVR | 31         |
| YXS | Prince George                        | BC                  | N53 53 03                                         | W122 40 39                                         | 2266             | 690.7              | CZVR | 31         |
| YPU | Puntzi Mountain                      | BC                  | N52 06 46                                         | W124 08 41                                         | 2985             | 909.8              | CZVR | 31         |
| YHA | Quaqtaq                              | QC                  | N61 02 47                                         | W069 37 04                                         | 103              | 31.4               | CZUL | 36         |
| YQB | Québec/Jean Lesage Intl              | QC                  | N46 47 28                                         | W071 23 36                                         | 244              | 74.4               | CZUL | 33         |

| ID  | Site Name                                     | Province or Country | Coordinates Latitude<br>(degrees-minutes-seconds) | Coordinates Longitude<br>(degrees-minutes-seconds) | Elevation (feet) | Elevation (metres) | FIR  | GFA Region |
|-----|-----------------------------------------------|---------------------|---------------------------------------------------|----------------------------------------------------|------------------|--------------------|------|------------|
| YRT | Rankin Inlet                                  | NU                  | N62 48 38                                         | W092 06 53                                         | 106              | 32.3               | CZEG | 36         |
| YRL | Red Lake                                      | ON                  | N51 04 02                                         | W093 47 35                                         | 1266             | 385.9              | CZWG | 33         |
| YQR | Regina Intl                                   | SK                  | N50 25 56                                         | W104 39 58                                         | 1895             | 577.6              | CZWG | 32         |
| YRB | Resolute Bay                                  | NU                  | N74 43 01                                         | W094 58 10                                         | 222              | 67.7               | CZEG | 37         |
| YRI | Rivière-du-Loup                               | QC                  | N47 45 52                                         | W069 35 04                                         | 426              | 129.8              | CWUL | 34         |
| YSA | Sable Island                                  | NS                  | N43 55 46                                         | W059 57 35                                         | 4                | 1.2                | CZQM | 34         |
| YSY | Sachs Harbour (David Nasogaluak JR. Saaryuaq) | NT                  | N71 59 38                                         | W125 14 33                                         | 282              | 86.0               | CZEG | 35         |
| YSV | Saglek                                        | NL                  | N58 28 00                                         | W062 39 00                                         | 1693             | 516                | CZQX | 34         |
| YZG | Salluit                                       | QC                  | N62 10 46                                         | W075 40 02                                         | 743              | 226.5              | CZUL | 36         |
| YZP | Sandspit                                      | BC                  | N53 15 15                                         | W131 48 50                                         | 21               | 6.4                | CZVR | 31         |
| YXE | Saskatoon/John G. Diefenbaker Intl            | SK                  | N52 10 15                                         | W106 41 59                                         | 1654             | 504.1              | CZWG | 32         |
| YAM | Sault Ste. Marie                              | ON                  | N46 29 06                                         | W084 30 35                                         | 630              | 192.0              | CZYZ | 33         |
| YKL | Schefferville                                 | QC                  | N54 48 19                                         | W066 48 19                                         | 1709             | 520.9              | CZUL | 34         |
| YZV | Sept-Îles                                     | QC                  | N50 13 24                                         | W066 15 56                                         | 180              | 54.9               | CZUL | 34         |
| YSC | Sherbrooke                                    | QC                  | N45 26 19                                         | W071 41 29                                         | 792              | 241.4              | CZUL | 33         |
| YZH | Slave Lake                                    | AB                  | N55 17 35                                         | W114 46 38                                         | 1912             | 582.8              | CZEG | 32         |
| YYD | Smithers                                      | BC                  | N54 49 31                                         | W127 10 58                                         | 1716             | 523.0              | CZVR | 31         |
| YAY | St. Anthony                                   | NL                  | N51 23 31                                         | W056 04 59                                         | 108              | 32.9               | CZQX | 34         |
| YIF | St-Augustin                                   | QC                  | N51 12 35                                         | W058 39 27                                         | 19               | 5.8                | CZUL | 34         |
| YYT | St. John's Intl                               | NL                  | N47 37 07                                         | W052 45 09                                         | 461              | 140.5              | CZQX | 34         |
| FVP | St-Pierre                                     | FR                  | N46 45 47                                         | W056 10 27                                         | 28               | 8.5                | CZQX | 34         |
| YJT | Stephenville                                  | NL                  | N48 32 29                                         | W058 33 00                                         | 81               | 24.7               | CZQX | 34         |

| ID  | Site Name                                 | Province or Country | Coordinates Latitude<br>(degrees-minutes-seconds) | Coordinates Longitude<br>(degrees-minutes-seconds) | Elevation (feet) | Elevation (metres) | FIR  | GFA Region |
|-----|-------------------------------------------|---------------------|---------------------------------------------------|----------------------------------------------------|------------------|--------------------|------|------------|
| YQY | Sydney/J.A. Douglas McCurdy               | NS                  | N46 09 41                                         | W060 02 53                                         | 203              | 61.87              | CZQM | 34         |
| YYH | Taloyoak                                  | NU                  | N69 32 48                                         | W093 34 37                                         | 90               | 27.4               | CZEG | 36         |
| YQD | The Pas                                   | MB                  | N53 58 17                                         | W101 05 28                                         | 888              | 270.7              | CZWG | 32         |
| YQT | Thunder Bay                               | ON                  | N48 22 19                                         | W089 19 18                                         | 654              | 199.3              | CZWG | 33         |
| YYZ | Toronto/Lester B. Pearson Intl            | ON                  | N43 40 38                                         | W079 37 50                                         | 569              | 173.4              | CYZY | 33         |
| YVO | Val-d'Or                                  | QC                  | N48 03 12                                         | W077 46 58                                         | 1107             | 337.4              | CZUL | 33         |
| YVR | Vancouver Intl.                           | BC                  | N49 11 41                                         | W123 11 02                                         | 14               | 4.3                | CZVR | 31         |
| YWK | Wabush                                    | NL                  | N52 55 22                                         | W066 51 53                                         | 1808             | 551.1              | CZUL | 34         |
| YQH | Watson Lake                               | YT                  | N60 06 59                                         | W128 49 21                                         | 2255             | 687.3              | CZEG | 35         |
| YNC | Wemindji                                  | QC                  | N53 00 38                                         | W78 49 52                                          | 66               | 20.1               | CZUL | 33         |
| YXY | Whitehorse/Erik Nielsen Intl.             | YT                  | N60 42 34                                         | W135 04 02                                         | 2317             | 706.2              | CZEG | 35         |
| YVV | Warton                                    | ON                  | N44 44 45                                         | W081 06 26                                         | 729              | 222.2              | CZYZ | 33         |
| YQG | Windsor                                   | ON                  | N42 16 32                                         | W082 57 20                                         | 622              | 189.6              | CYZY | 33         |
| YWG | Winnipeg/James Armstrong Richardson Intl. | MB                  | N49 54 36                                         | W097 14 24                                         | 784              | 239.0              | CZWG | 32         |
| YQI | Yarmouth                                  | NS                  | N43 49 37                                         | W066 05 17                                         | 141              | 43.0               | CZQM | 34         |
| YZF | Yellowknife                               | NT                  | N62 27 46                                         | W114 26 25                                         | 675              | 205.7              | CZEG | 35         |

## Appendix C Graphic Area Forecast (GFA)—Supplement to Chapter 4

### C.1 GFA domain names



#### Legend:

**GFACN31:** Pacific region

**GFACN32:** Prairie region

**GFACN33:** Ontario Quebec region

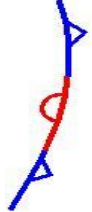
**GFACN34:** Atlantic region

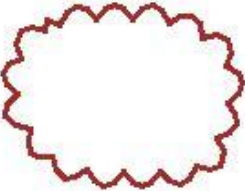
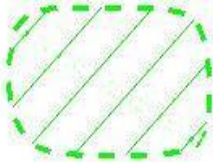
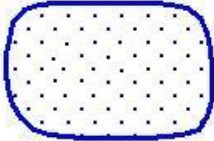
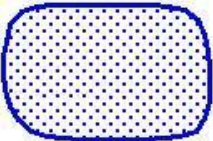
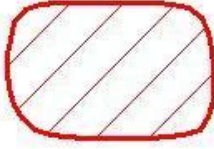
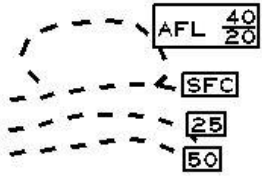
**GFACN35:** Yukon-Northwest territories region

**GFACN36:** Nunavut region

**GFACN37:** Arctic region

## C.2 Examples of GFA content

| Synoptic features                                                                                               |                                                                                                                     |                                                                                                                  |                                                                                                             |
|-----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| low / tropical depression<br>  | high<br>                           | warm front<br>                | cold front<br>           |
| stationary front<br>           | trough<br>                         | trough<br>                    | upper warm front<br>     |
| upper cold front<br>          | upper stationary front<br>        | upper trough<br>             | speed and direction<br> |
| tropical cyclone (storm)<br> | tropical cyclone (hurricane)<br> | tropical cyclone (post)<br> |                                                                                                             |

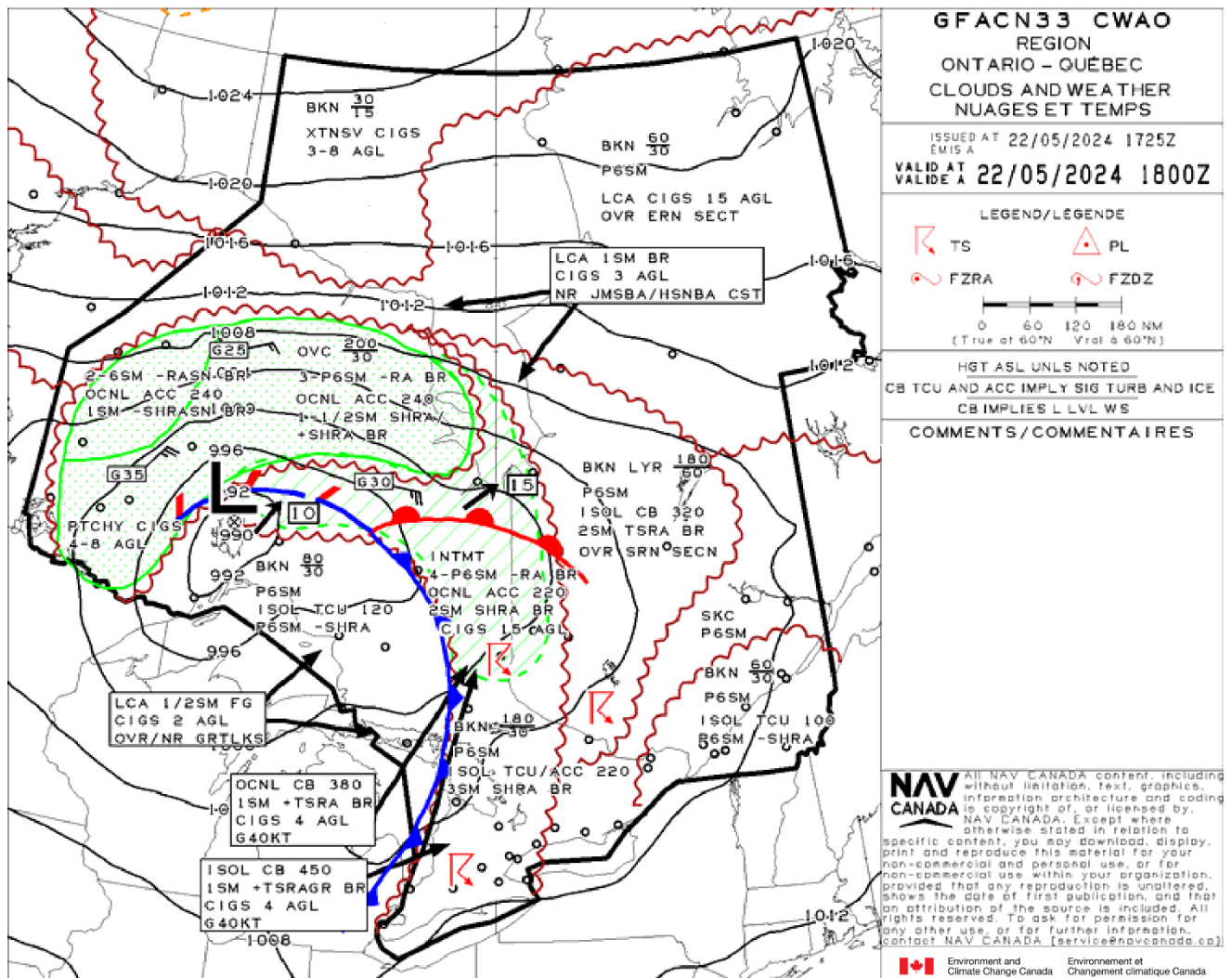
| Cloud and restriction to visibility                                                                       |                                                                                                                                   | Surface wind and low level jet                                                                                                                                                                                                 |                                                                                                                                                                                                                              |
|-----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| organized cloud area<br> | area of obstruction to vision<br>                | Surface wind<br>                                                                                                                             | low level jet<br>                                                                                                                         |
| Continuous precipitation                                                                                  |                                                                                                                                   | Intermittent precipitation or shower                                                                                                                                                                                           |                                                                                                                                                                                                                              |
| rain, drizzle, snow<br>  | freezing rain, freezing drizzle, ice pellets<br> | rain, drizzle, snow<br>                                                                                                                      | freezing rain, freezing drizzle, ice pellets<br>                                                                                          |
| Icing                                                                                                     |                                                                                                                                   | Turbulence                                                                                                                                                                                                                     |                                                                                                                                                                                                                              |
| moderate<br>           | severe<br>                                     | moderate: lower level<br><br>moderate: higher level<br> | severe: lower level<br><br>severe: higher level<br> |
| Freezing level                                                                                            |                                                                                                                                   | Volcano                                                                                                                                                                                                                        | Radioactive release                                                                                                                                                                                                          |
|                        |                                                                                                                                   |                                                                                                                                            |                                                                                                                                         |

### C.3 Guidelines for GFA correction

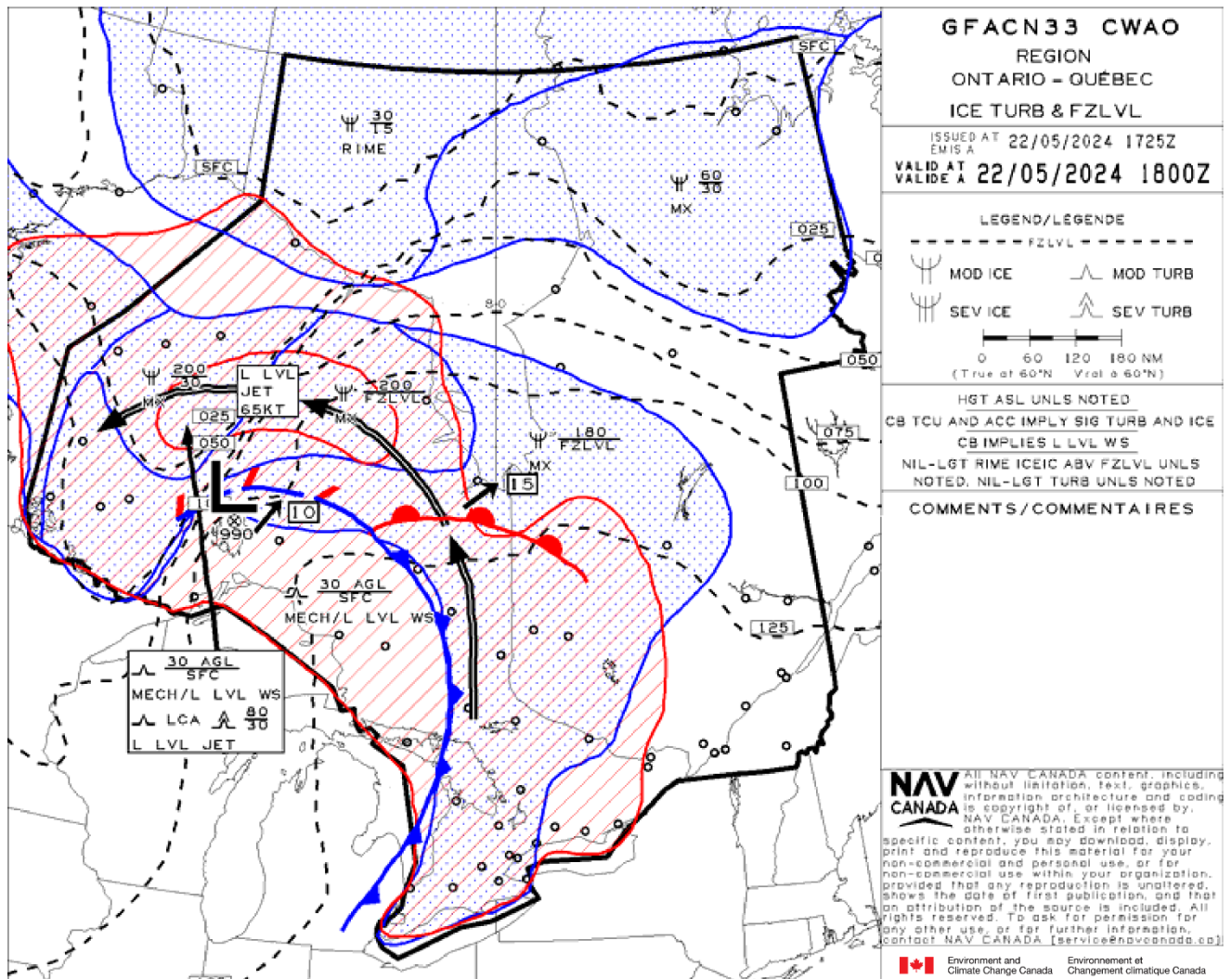
| GFA correction                                                                                                                                                                                             | Detailed guidelines                                                                                                                                                                                                                                                                                                                             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Any unforecast weather phenomena not requiring an AIRMET (i.e. below AIRMET criteria threshold) or any other unforecast weather phenomena that, according to the forecaster, should be depicted in the GFA | Widespread area of BKN or OVC cloud with height of the base between 1000 and 5000 feet AGL<br>Widespread area affected by the reduction of visibility between 3 and 6SM, including the weather phenomenon causing the reduction in visibility<br>Widespread mean surface wind speed between 20 KT and 30 KT, or peak wind gust of 30 KT or more |
| Forecast phenomena (in the GFA chart) that fail to occur                                                                                                                                                   | Removal of forecast weather phenomena in the GFA chart that are no longer occurring or no longer expected to occur                                                                                                                                                                                                                              |
| A significant error was made in a GFA chart                                                                                                                                                                | A significant error is one which, if uncorrected, would result in an erroneous interpretation of the GFA and create a potential hazard to aviation                                                                                                                                                                                              |

## C.4 Examples of GFA

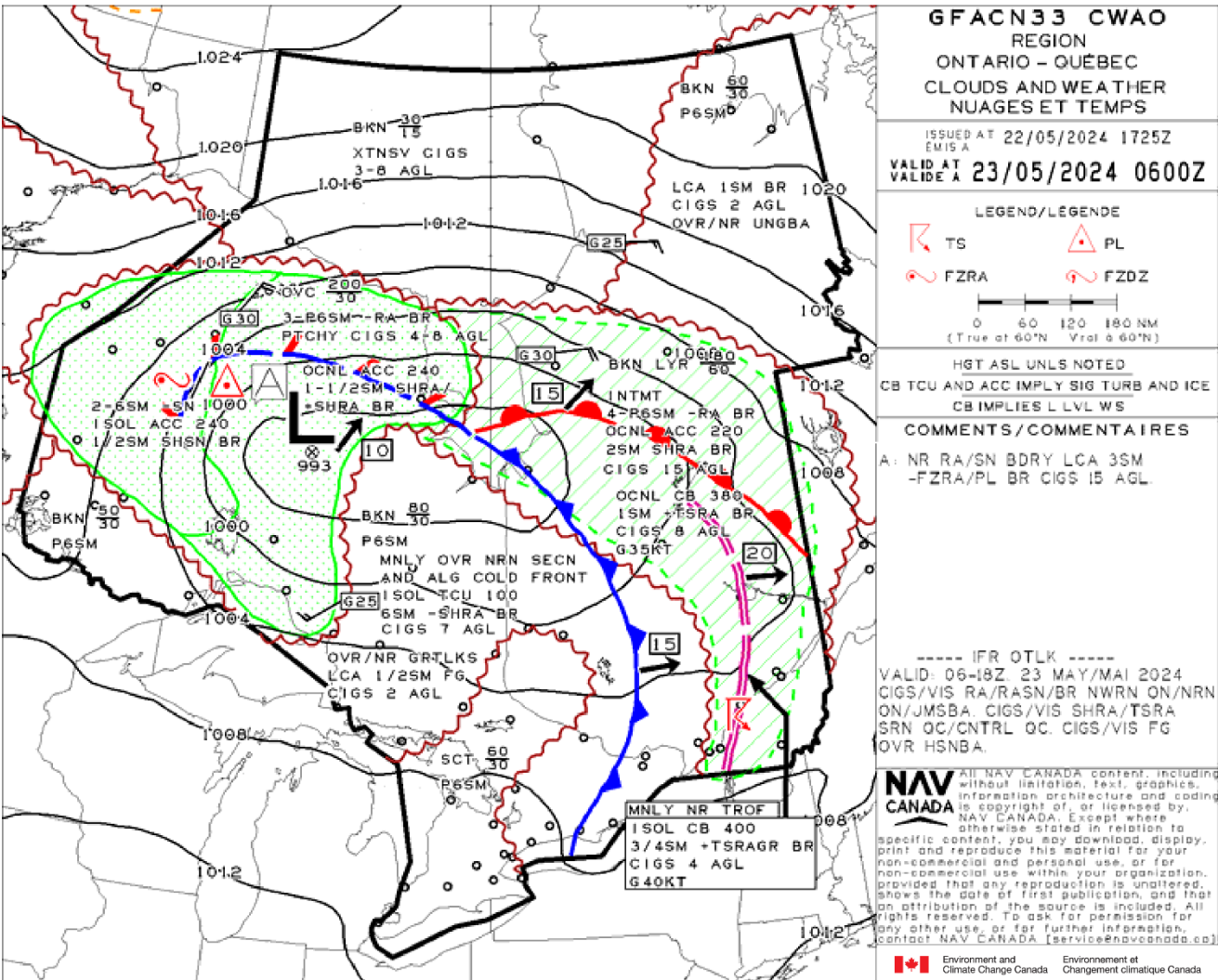
Example (1): GFACN33 T<sub>0</sub>+0 hr clouds and weather panel



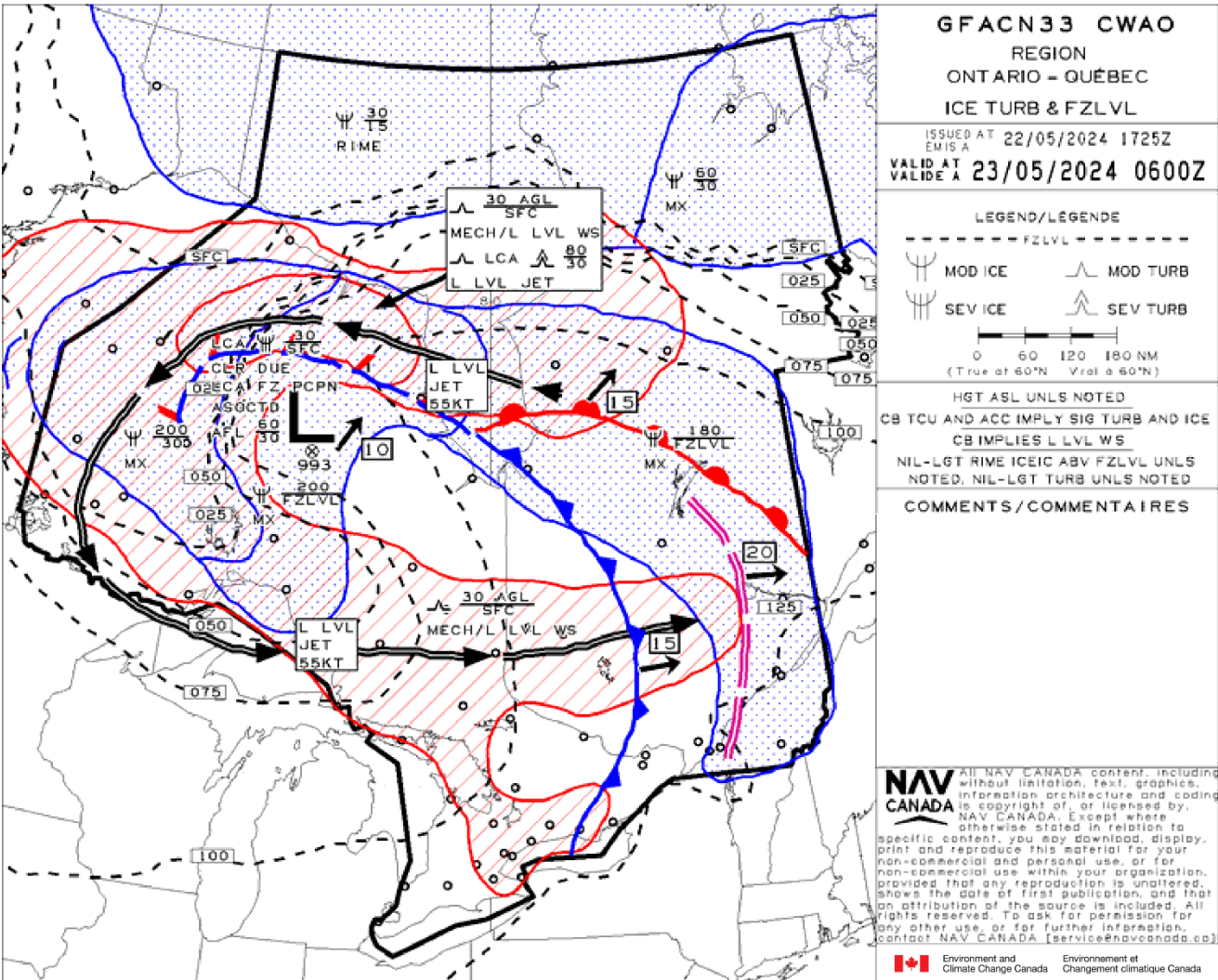
Example (2): GFACN33 T<sub>0</sub>+0 hr icing and turbulence panel



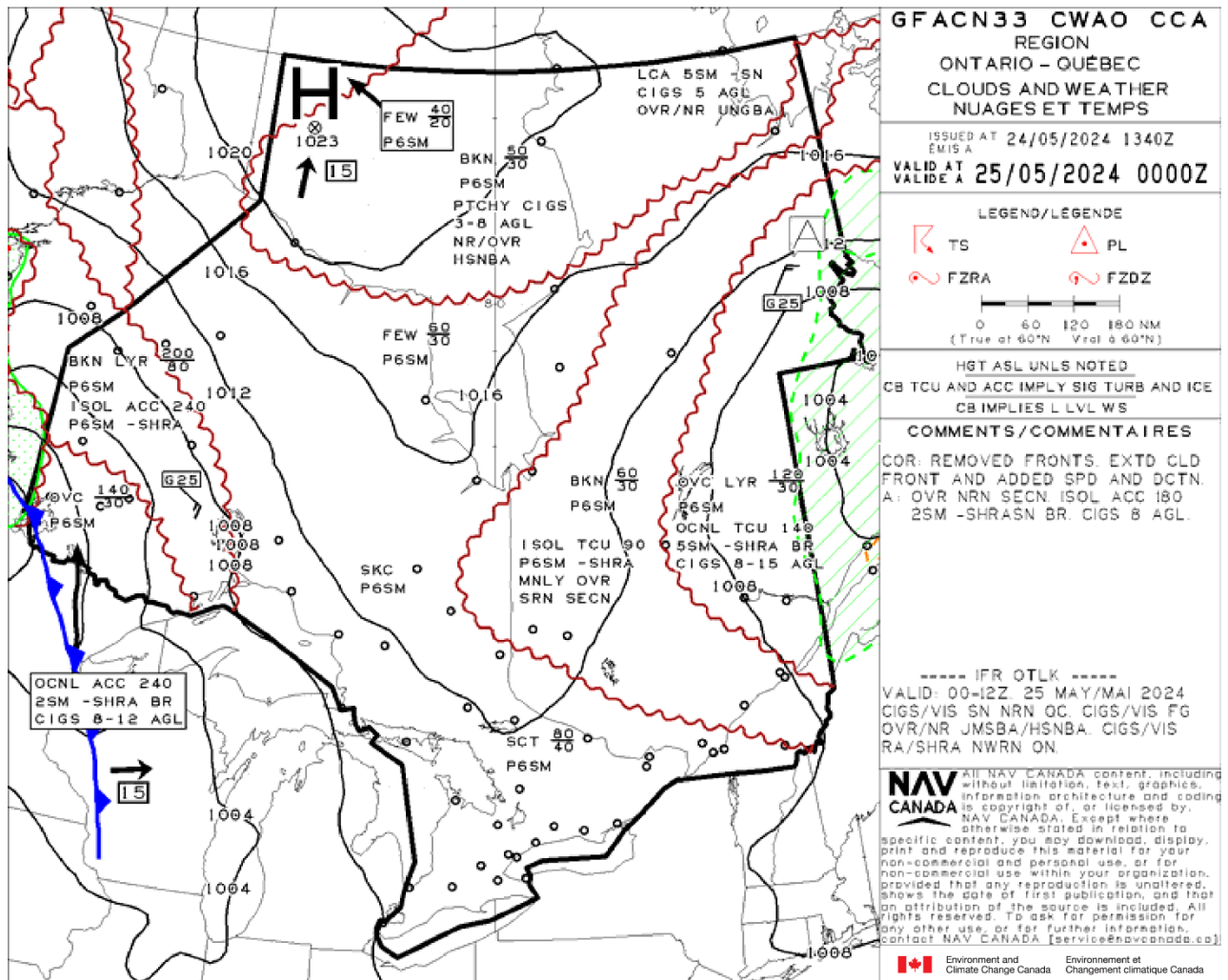
Example (3): GFACN33 T0+12 hr clouds and weather panel



Example (4): GFACN33 T<sub>0</sub>+12 hr icing and turbulence panel

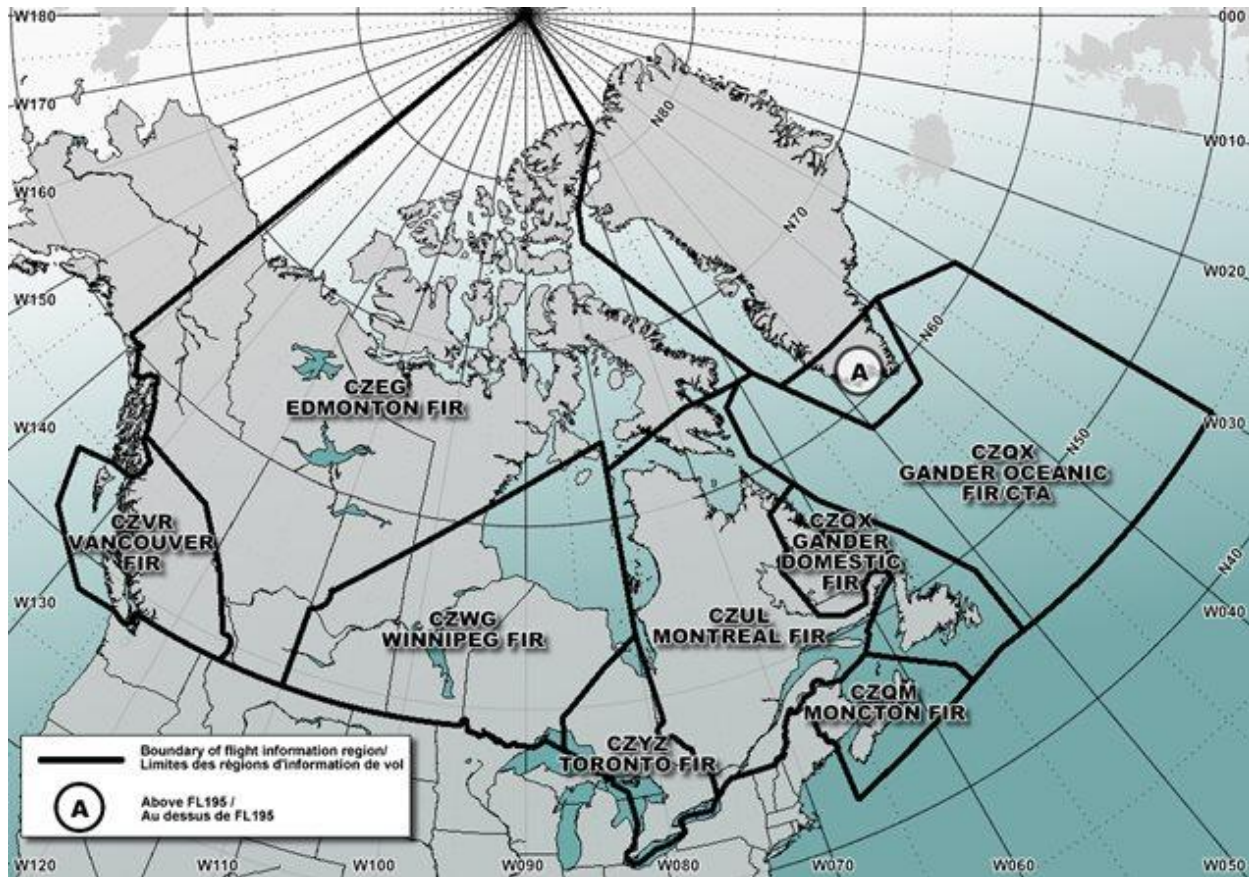


Example (5): Corrected GFACN33 T<sub>0</sub>+12 hr clouds and weather panel



## Appendix D SIGMET information—Supplement to Chapter 5

### D.1 Canadian SIGMET information domain



The summation of all flight information regions represents Canada's area of responsibility (domain) for the provision of SIGMET information.

## D.2 Abbreviations and decode used in SIGMET

| Code     | Description                |
|----------|----------------------------|
| APRX     | Approximate, Approximately |
| AT       | At (followed by time)      |
| CB       | Cumulonimbus               |
| CLD      | Cloud(s)                   |
| CNL      | Cancel, Cancelling         |
| DS       | Dust storm                 |
| E        | East, Eastern longitude    |
| ENE      | East-Northeast             |
| ESE      | East-Southeast             |
| +FC      | Tornado(es)/Waterspout(s)  |
| FCST     | Forecast(s)                |
| FIR      | Flight Information Region  |
| FL       | Flight Level               |
| FRQ      | Frequent                   |
| FZRA     | Freezing Rain              |
| GFA      | Graphic Area Forecast      |
| GR       | Hail                       |
| HVY      | Heavy                      |
| ICE      | Icing                      |
| INTSF    | Intensifying               |
| INTST    | Intensity                  |
| KT       | Knots                      |
| L LVL WS | Low level wind shear       |
| MOV      | Move, Moving, Movement     |
| MT       | Mountain(s)                |
| MTW      | Mountain waves             |
| N        | North, Northern latitude   |
| NC       | No change                  |
| NE       | Northeast                  |

| <b>Code</b> | <b>Description</b>        |
|-------------|---------------------------|
| NM          | Nautical mile(s)          |
| NNE         | North-Northeast           |
| NNW         | North-Northwest           |
| NW          | Northwest                 |
| OBS         | Observed                  |
| POSS        | Possible, Possibly        |
| PSN         | Position                  |
| RDOACT      | Radioactive               |
| RMK         | Remark(s)                 |
| S           | South, Southern latitude  |
| SE          | Southeast                 |
| SEV         | Severe                    |
| SFC         | Surface                   |
| SIGMET      | Refer to 5.1 of chapter 5 |
| SQL         | Squall line               |
| SS          | Sandstorm                 |
| SSE         | South-Southeast           |
| SSW         | South-Southwest           |
| STNR        | Stationary                |
| SW          | Southwest                 |
| TC          | Tropical cyclone          |
| TS          | Thunderstorm(s)           |
| TURB        | Turbulence                |
| VA          | Volcanic ash              |
| W           | West, Western longitude   |
| WKN         | Weakening                 |
| WNW         | West-Northwest            |
| WSW         | West-Southwest            |
| WI          | Within                    |
| WID         | Wide                      |

| Code | Description                           |
|------|---------------------------------------|
| Z    | Zulu (UTC) Universal Time Coordinated |

### D.3 SIGMET Bulletin scheme

| FIR indicator | FIR name        | Type                                 | International (ICAO)                   | National                               |
|---------------|-----------------|--------------------------------------|----------------------------------------|----------------------------------------|
| CZVR          | Vancouver       | SIGMET<br>SIGMET (TC)<br>SIGMET (VA) | WSCN01 CWA<br>WCCN01 CWA<br>WVCN01 CWA | WSCN21 CWA<br>WCCN21 CWA<br>WVCN21 CWA |
| CZEG          | Edmonton        | SIGMET<br>SIGMET (TC)<br>SIGMET (VA) | WSCN02 CWA<br>WCCN02 CWA<br>WVCN02 CWA | WSCN22 CWA<br>WCCN22 CWA<br>WVCN22 CWA |
| CZWG          | Winnipeg        | SIGMET<br>SIGMET (TC)<br>SIGMET (VA) | WSCN03 CWA<br>WCCN03 CWA<br>WVCN03 CWA | WSCN23 CWA<br>WCCN23 CWA<br>WVCN23 CWA |
| CZYZ          | Toronto         | SIGMET<br>SIGMET (TC)<br>SIGMET (VA) | WSCN04 CWA<br>WCCN04 CWA<br>WVCN04 CWA | WSCN24 CWA<br>WCCN24 CWA<br>WVCN24 CWA |
| CZUL          | Montréal        | SIGMET<br>SIGMET (TC)<br>SIGMET (VA) | WSCN05 CWA<br>WCCN05 CWA<br>WVCN05 CWA | WSCN25 CWA<br>WCCN25 CWA<br>WVCN25 CWA |
| CZQM          | Moncton         | SIGMET<br>SIGMET (TC)<br>SIGMET (VA) | WSCN06 CWA<br>WCCN06 CWA<br>WVCN06 CWA | WSCN26 CWA<br>WCCN26 CWA<br>WVCN26 CWA |
| CZQX          | Gander Domestic | SIGMET<br>SIGMET (TC)<br>SIGMET (VA) | WSCN07 CWA<br>WCCN07 CWA<br>WVCN07 CWA | WSCN27 CWA<br>WCCN27 CWA<br>WVCN27 CWA |
| CZQX          | Gander Oceanic  | SIGMET<br>SIGMET (TC)<br>SIGMET (VA) | WSNT01 CWA<br>WCNT01 CWA<br>WVNT01 CWA | WSNT21 CWA<br>WCNT21 CWA<br>WVNT21 CWA |

## D.4 Alphanumeric sequence

Rules for the use of letters:

- 25 letters of the alphabet will be shared by all 8 FIRs; T is exclusively used for test messages - refer to 5.8.9.
- A letter can be used if not currently in service in any FIR and if it was retired for a minimum of 24 hours (regardless of the date). Otherwise, the next letter is used. Letter Z wraps back to letter A if necessary.
- If all letters are unavailable according to the above rules, then the letter that has had the longest retirement is used.
- The letter attributed to a SIGMET message will not change during its lifespan (updates and cancellation).
- WS, WV and WC messages share the same alphabet. If letter A is used in a WS, then a subsequent WV would have to use letter B.
- WS, WV and WC messages do not share the alphabet with WA (AIRMET). Letter A may be used simultaneously in both a WS and a WA.

## D.5 Meteorological phenomena to be included in SIGMET

|                             |                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Thunderstorm</b>         | frequent<br>frequent, with hail<br>frequent, with hail and possible tornado/waterspout<br>frequent, with hail and tornado/waterspout<br>squall line<br>squall line, with hail<br>squall line, with hail and possible tornado/waterspout<br>squall line, with hail and tornado/waterspout | FRQ <sup>2</sup> TS<br>FRQ <sup>2</sup> TSGR <sup>4</sup><br>FRQ <sup>2</sup> TSGR <sup>4</sup> POSS +FC <sup>5</sup><br>FRQ <sup>2</sup> TSGR <sup>4</sup> +FC <sup>5</sup><br>SQL <sup>3</sup> TS<br>SQL <sup>3</sup> TSGR <sup>4</sup><br>SQL <sup>3</sup> TSGR <sup>4</sup> POSS +FC <sup>5</sup><br>SQL <sup>3</sup> TSGR <sup>4</sup> +FC <sup>5</sup> |
| <b>Turbulence</b>           | severe turbulence                                                                                                                                                                                                                                                                        | SEV TURB <sup>6</sup>                                                                                                                                                                                                                                                                                                                                        |
| <b>Icing</b>                | severe icing<br>severe icing due to freezing rain                                                                                                                                                                                                                                        | SEV ICE <sup>7</sup><br>SEV ICE (FZRA) <sup>7</sup>                                                                                                                                                                                                                                                                                                          |
| <b>Mountain wave</b>        | severe mountain wave                                                                                                                                                                                                                                                                     | SEV MTW                                                                                                                                                                                                                                                                                                                                                      |
| <b>Low-level wind shear</b> | low-level wind shear                                                                                                                                                                                                                                                                     | L LVL WS                                                                                                                                                                                                                                                                                                                                                     |
| <b>Dust storm</b>           | heavy dust storm                                                                                                                                                                                                                                                                         | HVY DS                                                                                                                                                                                                                                                                                                                                                       |
| <b>Sand storm</b>           | heavy sand storm                                                                                                                                                                                                                                                                         | HVY SS                                                                                                                                                                                                                                                                                                                                                       |
| <b>Radioactive cloud</b>    | Radioactive cloud                                                                                                                                                                                                                                                                        | RDOACT CLD                                                                                                                                                                                                                                                                                                                                                   |
| <b>Volcanic ash</b>         | volcanic ash                                                                                                                                                                                                                                                                             | VA                                                                                                                                                                                                                                                                                                                                                           |
| <b>Tropical cyclone</b>     | tropical cyclone with 10-minute mean surface wind speed of 63 km/h (34 KT) or more                                                                                                                                                                                                       | TC                                                                                                                                                                                                                                                                                                                                                           |

**Note (1):** Only one of the weather phenomena listed **shall** be selected and included in each SIGMET.

**Note (2):** Frequent (**FRQ**) indicates an area of thunderstorms within which there is little or no separation between adjacent thunderstorms with a maximum spatial coverage greater than 50% of the area affected, or forecast to be affected, by the phenomenon (at a fixed time or during the period of validity).

**Note (3):** Squall line (**SQL**) indicates thunderstorms along a line with little or no space between individual clouds.

**Note (4):** Hail (**GR**) should be used as a further description of the thunderstorm, as necessary.

**Note (5):** Tornado and/or waterspout (**+FC**) should be used as a further description of the thunderstorm, as necessary.

**Note (6):** Severe (**SEV**) turbulence (**TURB**) refers only to:

- low-level turbulence associated with strong surface winds
- rotor streaming
- high-level turbulence whether in cloud or not in cloud (CAT)

Turbulence **shall** not be used in connection with convective clouds.

**Note (7):** Severe (**SEV**) icing (**ICE**) **shall** refer to icing in other than convective clouds. Freezing rain (**FZRA**) **shall** refer to severe icing conditions caused by freezing rain.

## **D.6 Resolution**

### **Distance**

Every 5 NM from 10 to 30 NM (5, 10, 15, 20, 25, 30)

Every 15 NM from 30 to 90 NM (30, 45, 60, 75, 90)

Every 30 NM above 90 NM (90, 120, 150, 180, 210, etc.)

### **Direction 8 point compass (octants\*)**

Octants (degrees true):

N: directions greater than 337.5 degrees to 22.5 degrees

NE: directions greater than 22.5 degrees to 67.5 degrees

E: directions greater than 67.5 degrees to 112.5 degrees

SE: directions greater than 112.5 degrees to 157.5 degrees

S: directions greater than 157.5 degrees to 202.5 degrees

SW: directions greater than 202.5 degrees to 247.5 degrees

W: directions greater than 247.5 degrees to 292.5 degrees

NW: directions greater than 292.5 degrees to 337.5 degrees

### **Latitude and longitude (all FIRs except Gander Oceanic)**

Degrees and minutes (1 minute)

### **Latitude and longitude (Gander Oceanic FIR)**

Degrees and minutes (15 minutes)<sup>1</sup>

### **Level (FL)**

Every FL001 (corresponding to 100 feet) – up to FL015

Every FL005 – FL015 to FL030

Every FL010 – above FL030

### **Movement (direction/speed) 16 point compass (radials\*)/ 5 KT increments**

Radials (degrees true):

|      |               |
|------|---------------|
| N:   | 360 degrees   |
| NNE: | 22.5 degrees  |
| NE:  | 45 degrees    |
| ENE: | 67.5 degrees  |
| E:   | 90 degrees    |
| ESE: | 112.5 degrees |
| SE:  | 135 degrees   |
| SSE: | 157.5 degrees |
| S:   | 180 degrees   |
| SSW: | 202.5 degrees |
| SW:  | 225 degrees   |
| WSW: | 247.5 degrees |
| W:   | 270 degrees   |
| WNW: | 292.5 degrees |
| NW:  | 315 degrees   |
| NNW: | 337.5 degrees |

**Note (1):** U.S. National Weather Service (NWS) uses a 15 minute resolution over oceanic areas such as New York Oceanic FIR. This harmonizes the practice with our southern neighbouring FIR. UK Met Service, over Shanwick Oceanic FIR, may use up to the minute but in reality, rarely go beyond 30 minutes resolution. An exception is made for the location of a TC centre which will be stated to 1 minute resolution in order to match TCAC guidance (refer to 5.8.5).

## D.7 Aviation reference sites used in National SIGMET

| <b>Id</b> | <b>Name</b>                      | <b>Province</b> | <b>FIR</b> | <b>GFA</b> | <b>Coordinates<br/>Latitude<br/>(degrees – minutes – seconds)</b> | <b>Coordinates<br/>Longitude<br/>(degrees – minutes – seconds)</b> |
|-----------|----------------------------------|-----------------|------------|------------|-------------------------------------------------------------------|--------------------------------------------------------------------|
| CYXX      | Abbotsford                       | BC              | CZVR       | 31         | N49 01 31                                                         | W122 21 36                                                         |
| CYXC      | Cranbrook/Canadian Rockies Intl  | BC              | CZVR       | 31         | N49 36 44                                                         | W115 46 55                                                         |
| CYKA      | Kamloops                         | BC              | CZVR       | 31         | N50 42 09                                                         | W120 26 55                                                         |
| CYLW      | Kelowna                          | BC              | CZVR       | 31         | N49 57 26                                                         | W119 22 41                                                         |
| CYYF      | Penticton                        | BC              | CZVR       | 31         | N49 27 45                                                         | W119 36 08                                                         |
| CYZT      | Port Hardy                       | BC              | CZVR       | 31         | N50 40 50                                                         | W127 22 00                                                         |
| CYXS      | Prince George                    | BC              | CZVR       | 31         | N53 53 03                                                         | W122 40 39                                                         |
| CYPR      | Prince Rupert                    | BC              | CZVR       | 31         | N54 17 09                                                         | W130 26 41                                                         |
| CYZP      | Sandspit                         | BC              | CZVR       | 31         | N53 15 15                                                         | W131 48 50                                                         |
| CYXT      | Terrace                          | BC              | CZVR       | 31         | N54 28 07                                                         | W128 34 42                                                         |
| CYVR      | Vancouver Intl                   | BC              | CZVR       | 31         | N49 11 41                                                         | W123 11 02                                                         |
| CYYJ      | Victoria Intl                    | BC              | CZVR       | 31         | N48 38 50                                                         | W123 25 33                                                         |
| CYWL      | Williams Lake                    | BC              | CZVR       | 31         | N52 11 00                                                         | W122 03 16                                                         |
| CBBC      | Bella Bella (Campbell Island)    | BC              | CZVR       | 31         | N52 11 06                                                         | W128 09 24                                                         |
| CYBL      | Campbell River                   | BC              | CZVR       | 31         | N49 57 07                                                         | W125 16 23                                                         |
| CYCG      | Castlegar/West Kootenay Regional | BC              | CZVR       | 31         | N49 17 46                                                         | W117 37 57                                                         |

| <b>Id</b> | <b>Name</b>                     | <b>Province</b> | <b>FIR</b> | <b>GFA</b> | <b>Coordinates<br/>Latitude<br/>(degrees – minutes – seconds)</b> | <b>Coordinates<br/>Longitude<br/>(degrees – minutes – seconds)</b> |
|-----------|---------------------------------|-----------------|------------|------------|-------------------------------------------------------------------|--------------------------------------------------------------------|
| CYZY      | MacKenzie                       | BC              | CZVR       | 31         | N55 17 58                                                         | W123 08 00                                                         |
| CZMT      | Masset                          | BC              | CZVR       | 31         | N54 01 38                                                         | W132 07 30                                                         |
| CYCD      | Nanaimo                         | BC              | CZVR       | 31         | N49 03 16                                                         | W123 52 12                                                         |
| CYQZ      | Quesnel                         | BC              | CZVR       | 31         | N53 01 34                                                         | W122 30 37                                                         |
| CYYD      | Smithers                        | BC              | CZVR       | 31         | N54 49 31                                                         | W127 10 58                                                         |
| CYAZ      | Tofino/Long Beach               | BC              | CZVR       | 31         | N49 04 55                                                         | W125 46 21                                                         |
| CYQQ      | Comox                           | BC              | CZVR       | 31         | N49 42 39                                                         | W124 53 12                                                         |
| CZST      | Stewart                         | BC              | CZVR       | 31         | N55 56 00                                                         | W129 59 00                                                         |
| CAV4      | McBride/Charlie Leake Field     | BC              | CZVR       | 31         | N53 18 54                                                         | W120 10 14                                                         |
| CYCP      | Blue River                      | BC              | CZVR       | 31         | N52 07 29                                                         | W119 17 34                                                         |
| CYRV      | Revelstoke                      | BC              | CZVR       | 31         | N50 57 44                                                         | W118 11 04                                                         |
| CYPZ      | Burns Lake                      | BC              | CZVR       | 31         | N54 22 35                                                         | W125 57 05                                                         |
| CYPS      | Pemberton                       | BC              | CZVR       | 31         | N50 18 09                                                         | W122 44 16                                                         |
| CBT3      | Tsetzi Lake (Pan Phillips)      | BC              | CZVR       | 31         | N52 58 19                                                         | W125 01 36                                                         |
| CAG3      | Chilko Lake (Tsylos Park Lodge) | BC              | CZVR       | 31         | N51 37 34                                                         | W124 08 31                                                         |
| CYYE      | Fort Nelson                     | BC              | CZEG       | 31         | N58 50 11                                                         | W122 35 49                                                         |
| CYXJ      | Fort St. John                   | BC              | CZEG       | 31         | N56 14 18                                                         | W120 44 25                                                         |

| <b>Id</b> | <b>Name</b>                     | <b>Province</b> | <b>FIR</b> | <b>GFA</b> | <b>Coordinates<br/>Latitude<br/>(degrees – minutes – seconds)</b> | <b>Coordinates<br/>Longitude<br/>(degrees – minutes – seconds)</b> |
|-----------|---------------------------------|-----------------|------------|------------|-------------------------------------------------------------------|--------------------------------------------------------------------|
| CYYC      | YYC Calgary Intl                | AB              | CZEG       | 32         | N51 07 21                                                         | W114 00 48                                                         |
| CYEG      | Edmonton Intl                   | AB              | CZEG       | 32         | N53 18 36                                                         | W113 34 46                                                         |
| CYMM      | Fort McMurray                   | AB              | CZEG       | 32         | N56 39 12                                                         | W111 13 24                                                         |
| CYQU      | Grande Prairie                  | AB              | CZEG       | 32         | N55 10 55                                                         | W118 53 14                                                         |
| CYOJ      | High Level                      | AB              | CZEG       | 32         | N58 37 18                                                         | W117 09 53                                                         |
| CYQL      | Lethbridge County               | AB              | CZEG       | 32         | N49 37 49                                                         | W112 47 59                                                         |
| CYLL      | Lloydminster                    | AB              | CZEG       | 32         | N53 18 38                                                         | W110 04 27                                                         |
| CYXH      | Medicine Hat                    | AB              | CZEG       | 32         | N50 01 08                                                         | W110 43 14                                                         |
| CYPE      | Peace River                     | AB              | CZEG       | 32         | N56 13 38                                                         | W117 26 54                                                         |
| CYQF      | Red Deer Regional               | AB              | CZEG       | 32         | N52 11 06                                                         | W113 53 40                                                         |
| CYDB      | Burwash                         | YT              | CZEG       | 35         | N61 22 14                                                         | W139 02 24                                                         |
| CYCB      | Cambridge Bay                   | NU              | CZEG       | 35         | N69 06 29                                                         | W105 08 14                                                         |
| CYFS      | Fort Simpson                    | NT              | CZEG       | 35         | N61 45 37                                                         | W121 14 12                                                         |
| CYSM      | Fort Smith                      | NT              | CZEG       | 35         | N60 01 13                                                         | W111 57 43                                                         |
| CGS2      | Goose Lake                      | NU              | CZEG       | 35         | N65 33 07                                                         | W106 26 09                                                         |
| CYHY      | Hay River/Merlyn Carter Airport | NT              | CZEG       | 35         | N60 50 23                                                         | W115 46 58                                                         |
| CHB3      | Hope Bay                        | NU              | CZEG       | 35         | N68 09 40                                                         | W106 36 56                                                         |

| <b>Id</b> | <b>Name</b>                  | <b>Province</b> | <b>FIR</b> | <b>GFA</b> | <b>Coordinates<br/>Latitude<br/>(degrees – minutes – seconds)</b> | <b>Coordinates<br/>Longitude<br/>(degrees – minutes – seconds)</b> |
|-----------|------------------------------|-----------------|------------|------------|-------------------------------------------------------------------|--------------------------------------------------------------------|
| CYEV      | Inuvik (Mike Zubko)          | NT              | CZEG       | 35         | N68 18 14                                                         | W133 28 59                                                         |
| CYCO      | Kugluktuk                    | NU              | CZEG       | 35         | N67 49 00                                                         | W115 08 38                                                         |
| CYMA      | Mayo                         | YT              | CZEG       | 35         | N63 37 00                                                         | W135 52 08                                                         |
| CYVQ      | Norman Wells                 | NT              | CZEG       | 35         | N65 16 53                                                         | W126 47 55                                                         |
| CYQH      | Watson Lake                  | YT              | CZEG       | 35         | N60 06 59                                                         | W128 49 21                                                         |
| CYXY      | Whitehorse/Erik Nielsen Intl | YT              | CZEG       | 35         | N60 42 34                                                         | W135 04 02                                                         |
| CYZF      | Yellowknife                  | NT              | CZEG       | 35         | N62 27 47                                                         | W114 26 25                                                         |
| CYEK      | Arviat                       | NU              | CZEG       | 36         | N61 05 38                                                         | W094 04 18                                                         |
| CYBK      | Baker Lake                   | NU              | CZEG       | 36         | N64 17 56                                                         | W096 04 40                                                         |
| CYTE      | Kinngait                     | NU              | CZEG       | 36         | N64 13 49                                                         | W076 31 30                                                         |
| CYCY      | Clyde River                  | NU              | CZEG       | 36         | N70 29 09                                                         | W068 31 01                                                         |
| CYZS      | Coral Harbour                | NU              | CZEG       | 36         | N64 11 36                                                         | W083 21 34                                                         |
| CYUX      | Sanirajak                    | NU              | CZEG       | 36         | N68 46 33                                                         | W081 14 33                                                         |
| CHC5      | Hayes Camp                   | NU              | CZEG       | 36         | N66 39 06                                                         | W091 32 39                                                         |
| CYIO      | Pond Inlet                   | NU              | CZEG       | 36         | N72 41 22                                                         | W077 58 08                                                         |
| CYVM      | Qikiqtarjuaq                 | NU              | CZEG       | 36         | N67 32 48                                                         | W064 01 54                                                         |
| CYRT      | Rankin Inlet                 | NU              | CZEG       | 36         | N62 48 38                                                         | W092 06 53                                                         |

| <b>Id</b> | <b>Name</b>      | <b>Province</b> | <b>FIR</b> | <b>GFA</b> | <b>Coordinates<br/>Latitude<br/>(degrees – minutes – seconds)</b> | <b>Coordinates<br/>Longitude<br/>(degrees – minutes – seconds)</b> |
|-----------|------------------|-----------------|------------|------------|-------------------------------------------------------------------|--------------------------------------------------------------------|
| CYYH      | Taloyoak         | NU              | CZEG       | 36         | N69 32 48                                                         | W093 34 37                                                         |
| CYHK      | Gjoa Haven       | NU              | CZEG       | 36         | N68 38 08                                                         | W095 51 01                                                         |
| CYRB      | Resolute Bay     | NU              | CZEG       | 37         | N74 43 01                                                         | W094 58 10                                                         |
| CYDQ      | Dawson Creek     | BC              | CZEG       | 31         | N55 44 32                                                         | W120 10 59                                                         |
| CYDL      | Dease Lake       | BC              | CZEG       | 31         | N58 25 20                                                         | W130 01 53                                                         |
| CYVT      | Buffalo Narrows  | SK              | CZEG       | 32         | N55 50 31                                                         | W108 25 03                                                         |
| CYPY      | Fort Chipewyan   | AB              | CZEG       | 32         | N58 46 03                                                         | W111 07 03                                                         |
| CYZH      | Slave Lake       | AB              | CZEG       | 32         | N55 17 35                                                         | W114 46 38                                                         |
| CYSF      | Stony Rapids     | SK              | CZEG       | 32         | N59 15 01                                                         | W105 50 29                                                         |
| CYZU      | Whitecourt       | AB              | CZEG       | 32         | N54 08 38                                                         | W115 47 12                                                         |
| CYDA      | Dawson City      | YT              | CZEG       | 35         | N64 02 32                                                         | W139 07 48                                                         |
| CYWJ      | Déline           | NT              | CZEG       | 35         | N65 12 40                                                         | W123 26 11                                                         |
| CZFA      | Faro             | YT              | CZEG       | 35         | N62 12 25                                                         | W133 22 24                                                         |
| CYGH      | Fort Good Hope   | NT              | CZEG       | 35         | N66 14 26                                                         | W128 38 51                                                         |
| CZFM      | Fort McPherson   | NT              | CZEG       | 35         | N67 24 25                                                         | W134 51 35                                                         |
| CYRA      | Gamèti/Rae Lakes | NT              | CZEG       | 35         | N64 06 58                                                         | W117 18 35                                                         |
| CYLK      | Lutselk'e        | NT              | CZEG       | 35         | N62 25 06                                                         | W110 40 56                                                         |

| <b>Id</b> | <b>Name</b>                                   | <b>Province</b> | <b>FIR</b> | <b>GFA</b> | <b>Coordinates<br/>Latitude<br/>(degrees – minutes – seconds)</b> | <b>Coordinates<br/>Longitude<br/>(degrees – minutes – seconds)</b> |
|-----------|-----------------------------------------------|-----------------|------------|------------|-------------------------------------------------------------------|--------------------------------------------------------------------|
| CYOA      | Ekati                                         | NT              | CZEG       | 35         | N64 41 56                                                         | W110 36 53                                                         |
| CYOC      | Old Crow                                      | YT              | CZEG       | 35         | N67 34 12                                                         | W139 50 24                                                         |
| CYPC      | Paulatuk (Nora Aliqatchialuk Ruben)           | NT              | CZEG       | 35         | N69 21 38                                                         | W124 04 33                                                         |
| CYSY      | Sachs Harbour (David Nasogaluak JR. Saaryuaq) | NT              | CZEG       | 35         | N71 59 37                                                         | W125 14 29                                                         |
| CYZW      | Teslin                                        | YT              | CZEG       | 35         | N60 10 23                                                         | W132 44 30                                                         |
| CYUB      | Tuktoyaktuk/James Gruben                      | NT              | CZEG       | 35         | N69 26 00                                                         | W133 01 35                                                         |
| CYHI      | Ulukhaktok/Holman                             | NT              | CZEG       | 35         | N70 45 46                                                         | W117 48 22                                                         |
| CYGT      | Iglolik                                       | NU              | CZEG       | 36         | N69 21 53                                                         | W081 48 59                                                         |
| CYBB      | Kugaaruk                                      | NU              | CZEG       | 36         | N68 32 09                                                         | W089 48 19                                                         |
| CYXP      | Pangnirtung                                   | NU              | CZEG       | 36         | N66 08 42                                                         | W065 42 49                                                         |
| CYUT      | Naujaat                                       | NU              | CZEG       | 36         | N66 31 14                                                         | W086 13 29                                                         |
| CYEU      | Eureka                                        | NU              | CZEG       | 37         | N79 59 40                                                         | W085 48 43                                                         |
| CYAB      | Arctic Bay                                    | NU              | CZEG       | 37         | N73 00 23                                                         | W085 02 50                                                         |
| CYLT      | Alert                                         | NU              | CZEG       | 37         | N82 31 04                                                         | W062 16 50                                                         |
| CYOD      | Cold Lake/Group Captain R.W. McNair           | AB              | CZEG       | 32         | N54 24 18                                                         | W110 16 46                                                         |
| CYCS      | Chesterfield Inlet                            | NU              | CZEG       | 36         | N63 20 50                                                         | W090 43 52                                                         |
| CMR2      | Mary River                                    | NU              | CZEG       | 36         | N71 19 25                                                         | W079 21 14                                                         |

| <b>Id</b> | <b>Name</b>                | <b>Province</b> | <b>FIR</b> | <b>GFA</b> | <b>Coordinates<br/>Latitude<br/>(degrees – minutes – seconds)</b> | <b>Coordinates<br/>Longitude<br/>(degrees – minutes – seconds)</b> |
|-----------|----------------------------|-----------------|------------|------------|-------------------------------------------------------------------|--------------------------------------------------------------------|
| CYGZ      | Grise Fiord                | NU              | CZEG       | 37         | N76 25 33                                                         | W082 54 29                                                         |
| CJQ6      | Tanquary Fiord             | NU              | CZEG       | 37         | N81 24 34                                                         | W076 52 54                                                         |
| CYVL      | Colville Lake/Tommy Kochon | NT              | CZEG       | 35         | N67 01 16                                                         | W126 07 43                                                         |
| CFF4      | Great Bear Lake            | NT              | CZEG       | 35         | N66 42 11                                                         | W119 43 02                                                         |
| CYXQ      | Beaver Creek               | YT              | CZEG       | 35         | N62 24 37                                                         | W140 52 08                                                         |
| CMN4      | Minto                      | YT              | CZEG       | 35         | N62 36 17                                                         | W137 13 19                                                         |
| CFC4      | MacMillan Pass             | YT              | CZEG       | 35         | N63 10 34                                                         | W130 12 13                                                         |
| CYWY      | Wrigley                    | NT              | CZEG       | 35         | N63 12 35                                                         | W123 26 12                                                         |
| CYWE      | Wekweètì                   | NT              | CZEG       | 35         | N64 11 27                                                         | W114 04 36                                                         |
| CBX5      | Tungsten (Cantung)         | NT              | CZEG       | 35         | N61 57 24                                                         | W128 12 09                                                         |
| CBH4      | Prairie Creek              | NT              | CZEG       | 35         | N61 33 53                                                         | W124 48 54                                                         |
| CFT3      | Finlayson Lake             | YT              | CZEG       | 35         | N61 41 29                                                         | W130 46 26                                                         |
| CYJP      | Fort Providence            | NT              | CZEG       | 35         | N61 19 09                                                         | W117 36 22                                                         |
| CYFR      | Fort Resolution            | NT              | CZEG       | 35         | N61 10 51                                                         | W113 41 23                                                         |
| CYJF      | Fort Liard                 | NT              | CZEG       | 31         | N60 14 08                                                         | W123 28 12                                                         |
| CYSQ      | Atlin                      | BC              | CZEG       | 31         | N59 34 35                                                         | W133 40 17                                                         |
| CBA9      | Ospika                     | BC              | CZEG       | 31         | N56 16 15                                                         | W124 03 50                                                         |

| <b>Id</b> | <b>Name</b>                                | <b>Province</b> | <b>FIR</b> | <b>GFA</b> | <b>Coordinates<br/>Latitude<br/>(degrees – minutes – seconds)</b> | <b>Coordinates<br/>Longitude<br/>(degrees – minutes – seconds)</b> |
|-----------|--------------------------------------------|-----------------|------------|------------|-------------------------------------------------------------------|--------------------------------------------------------------------|
| CBQ7      | Kemess Creek                               | BC              | CZEG       | 31         | N56 58 28                                                         | W126 44 27                                                         |
| CBX7      | Tumbler Ridge                              | BC              | CZEG       | 31         | N55 01 38                                                         | W120 55 52                                                         |
| CGC2      | Galore Creek (Heli)                        | BC              | CZEG       | 31         | N57 07 24                                                         | W131 27 09                                                         |
| CYJA      | Jasper                                     | AB              | CZEG       | 32         | N52 59 48                                                         | W118 03 34                                                         |
| CYBA      | Banff                                      | AB              | CZEG       | 32         | N51 12 00                                                         | W115 32 00                                                         |
| CYLB      | Lac La Biche                               | AB              | CZEG       | 32         | N54 46 13                                                         | W112 01 54                                                         |
| CYOP      | Rainbow Lake                               | AB              | CZEG       | 32         | N58 29 28                                                         | W119 24 24                                                         |
| CFU4      | Garden River                               | AB              | CZEG       | 32         | N58 42 50                                                         | W113 52 34                                                         |
| CYBE      | Uranium City                               | SK              | CZEG       | 32         | N59 33 41                                                         | W108 28 53                                                         |
| CZWL      | Wollaston Lake                             | SK              | CZEG       | 32         | N58 06 25                                                         | W103 10 21                                                         |
| CYKJ      | Key Lake                                   | SK              | CZEG       | 32         | N57 15 23                                                         | W105 37 03                                                         |
| CFS6      | Loon River                                 | AB              | CZEG       | 32         | N57 08 31                                                         | W115 04 31                                                         |
| CFS4      | Ogilvie                                    | YT              | CZEG       | 35         | N65 40 28                                                         | W138 06 56                                                         |
| CEL4      | Hanna                                      | AB              | CZEG       | 32         | N51 37 53                                                         | W111 54 15                                                         |
| CYBR      | Brandon Muni                               | MB              | CZWG       | 32         | N49 54 36                                                         | W099 57 08                                                         |
| CYYQ      | Churchill                                  | MB              | CZWG       | 32         | N58 44 21                                                         | W094 03 59                                                         |
| CYDN      | Dauphin (Lt.Col WG. (Billy) Barker VC Apt) | MB              | CZWG       | 32         | N51 06 05                                                         | W100 03 12                                                         |

| <b>Id</b> | <b>Name</b>                              | <b>Province</b> | <b>FIR</b> | <b>GFA</b> | <b>Coordinates<br/>Latitude<br/>(degrees – minutes – seconds)</b> | <b>Coordinates<br/>Longitude<br/>(degrees – minutes – seconds)</b> |
|-----------|------------------------------------------|-----------------|------------|------------|-------------------------------------------------------------------|--------------------------------------------------------------------|
| CYGX      | Gillam                                   | MB              | CZWG       | 32         | N56 21 28                                                         | W094 42 39                                                         |
| CYIV      | Island Lake                              | MB              | CZWG       | 32         | N53 51 26                                                         | W094 39 13                                                         |
| CYVC      | La Ronge (Barber Field)                  | SK              | CZWG       | 32         | N55 09 05                                                         | W105 16 01                                                         |
| CYYL      | Lynn Lake                                | MB              | CZWG       | 32         | N56 51 52                                                         | W101 04 34                                                         |
| CYQW      | North Battleford (Cameron McIntosh)      | SK              | CZWG       | 32         | N52 46 09                                                         | W108 14 40                                                         |
| CYNE      | Norway House                             | MB              | CZWG       | 32         | N53 57 30                                                         | W097 50 39                                                         |
| CYPA      | Prince Albert (Glassfield)               | SK              | CZWG       | 32         | N53 12 52                                                         | W105 40 23                                                         |
| CYQR      | Regina Intl                              | SK              | CZWG       | 32         | N50 25 56                                                         | W104 39 58                                                         |
| CYXE      | Saskatoon/John G. Diefenbaker Intl       | SK              | CZWG       | 32         | N52 10 15                                                         | W106 42 00                                                         |
| CYQD      | The Pas                                  | MB              | CZWG       | 32         | N53 58 17                                                         | W101 05 28                                                         |
| CYTH      | Thompson                                 | MB              | CZWG       | 32         | N55 48 17                                                         | W097 51 45                                                         |
| CYWG      | Winnipeg/James Armstrong Richardson Intl | MB              | CZWG       | 32         | N49 54 36                                                         | W097 14 24                                                         |
| CYTL      | Big Trout Lake                           | ON              | CZWG       | 33         | N53 49 04                                                         | W089 53 49                                                         |
| CYQK      | Kenora                                   | ON              | CZWG       | 33         | N49 47 18                                                         | W094 21 47                                                         |
| CYHD      | Dryden Regional                          | ON              | CZWG       | 33         | N49 49 53                                                         | W092 44 37                                                         |
| CYXL      | Sioux Lookout                            | ON              | CZWG       | 33         | N50 06 51                                                         | W091 54 20                                                         |
| CYQT      | Thunder Bay                              | ON              | CZWG       | 33         | N48 22 19                                                         | W089 19 18                                                         |

| <b>Id</b> | <b>Name</b>                          | <b>Province</b> | <b>FIR</b> | <b>GFA</b> | <b>Coordinates<br/>Latitude<br/>(degrees – minutes – seconds)</b> | <b>Coordinates<br/>Longitude<br/>(degrees – minutes – seconds)</b> |
|-----------|--------------------------------------|-----------------|------------|------------|-------------------------------------------------------------------|--------------------------------------------------------------------|
| CYGQ      | Geraldton (Greenstone Regional)      | ON              | CZWG       | 33         | N49 46 43                                                         | W086 56 19                                                         |
| CYYN      | Swift Current                        | SK              | CZWG       | 32         | N50 17 33                                                         | W107 41 27                                                         |
| CYQV      | Yorkton Muni                         | SK              | CZWG       | 32         | N51 15 53                                                         | W102 27 41                                                         |
| CYPL      | Pickle Lake                          | ON              | CZWG       | 33         | N51 26 47                                                         | W090 12 48                                                         |
| CYRL      | Red lake                             | ON              | CZWG       | 33         | N51 04 02                                                         | W093 47 35                                                         |
| CYMJ      | Moose Jaw/R Vice Marshal C.M. McEwen | SK              | CZWG       | 32         | N50 19 49                                                         | W105 33 33                                                         |
| CYPG      | Portage La Prairie/Southport         | MB              | CZWG       | 32         | N49 54 11                                                         | W098 16 26                                                         |
| CYBQ      | Tadoule Lake                         | MB              | CZWG       | 32         | N58 42 22                                                         | W098 30 44                                                         |
| CKA9      | Southend/Hans Ulricksen field        | SK              | CZWG       | 32         | N56 20 11                                                         | W103 17 37                                                         |
| CZTM      | Shamattawa                           | MB              | CZWG       | 32         | N55 51 47                                                         | W092 04 53                                                         |
| CYBV      | Berens River                         | MB              | CZWG       | 32         | N52 21 32                                                         | W097 01 05                                                         |
| CYHB      | Hudson Bay                           | SK              | CZWG       | 32         | N52 49 06                                                         | W102 18 40                                                         |
| CYFO      | Flin Flon                            | MB              | CZWG       | 32         | N54 40 41                                                         | W101 40 55                                                         |
| CYYO      | Wynyard                              | SK              | CZWG       | 32         | N51 48 36                                                         | W104 10 12                                                         |
| CYEN      | Estevan Regional                     | SK              | CZWG       | 32         | N49 12 37                                                         | W102 57 57                                                         |
| CYKY      | Kindersley Regional                  | SK              | CZWG       | 32         | N51 30 55                                                         | W109 10 50                                                         |
| CYLH      | Lansdowne House                      | ON              | CZWG       | 33         | N52 11 44                                                         | W087 56 03                                                         |

| <b>Id</b> | <b>Name</b>                    | <b>Province</b> | <b>FIR</b> | <b>GFA</b> | <b>Coordinates<br/>Latitude<br/>(degrees – minutes – seconds)</b> | <b>Coordinates<br/>Longitude<br/>(degrees – minutes – seconds)</b> |
|-----------|--------------------------------|-----------------|------------|------------|-------------------------------------------------------------------|--------------------------------------------------------------------|
| CZSJ      | Sandy Lake                     | ON              | CZWG       | 33         | N53 03 51                                                         | W93 20 40                                                          |
| CYKP      | Ogoki Post                     | ON              | CZWG       | 33         | N51 39 31                                                         | W085 54 04                                                         |
| CYYW      | Armstrong                      | ON              | CZWG       | 33         | N50 17 38                                                         | W088 54 36                                                         |
| CYIB      | Atikokan Muni                  | ON              | CZWG       | 33         | N48 46 27                                                         | W091 38 20                                                         |
| CJV8      | Grand Rapids                   | MB              | CZWG       | 32         | N53 10 21                                                         | W099 19 23                                                         |
| CZSN      | South Indian Lake              | MB              | CZWG       | 32         | N56 47 34                                                         | W098 54 26                                                         |
| CYER      | Fort Severn                    | ON              | CZWG       | 33         | N56 01 08                                                         | W087 40 34                                                         |
| CYPO      | Peawanuck                      | ON              | CZWG       | 33         | N54 59 17                                                         | W085 26 36                                                         |
| CYAT      | Attawapiskat                   | ON              | CZWG       | 33         | N52 55 39                                                         | W082 25 55                                                         |
| CYLJ      | Meadow Lake                    | SK              | CZWG       | 32         | N54 07 31                                                         | W108 31 22                                                         |
| CYYU      | Kapuskasing                    | ON              | CZYZ       | 33         | N49 24 42                                                         | W082 28 10                                                         |
| CYTS      | Timmins/Victor M. Power        | ON              | CZYZ       | 33         | N48 34 14                                                         | W081 22 36                                                         |
| CYAM      | Sault Ste. Marie               | ON              | CZYZ       | 33         | N46 29 06                                                         | W084 30 34                                                         |
| CYSB      | Sudbury                        | ON              | CZYZ       | 33         | N46 37 32                                                         | W080 47 52                                                         |
| CYYB      | North Bay                      | ON              | CZYZ       | 33         | N46 21 50                                                         | W079 25 27                                                         |
| CYYZ      | Toronto/Lester B. Pearson Intl | ON              | CYZY       | 33         | N43 40 36                                                         | W079 37 50                                                         |
| CYHM      | Hamilton                       | ON              | CZYZ       | 33         | N43 10 25                                                         | W079 56 06                                                         |

| <b>Id</b> | <b>Name</b>                    | <b>Province</b> | <b>FIR</b> | <b>GFA</b> | <b>Coordinates<br/>Latitude<br/>(degrees – minutes – seconds)</b> | <b>Coordinates<br/>Longitude<br/>(degrees – minutes – seconds)</b> |
|-----------|--------------------------------|-----------------|------------|------------|-------------------------------------------------------------------|--------------------------------------------------------------------|
| CYQG      | Windsor                        | ON              | CYZY       | 33         | N42 16 34                                                         | W082 57 19                                                         |
| CYGK      | Kingston                       | ON              | CYZY       | 33         | N44 13 35                                                         | W076 35 48                                                         |
| CYKF      | Kitchener/Waterloo             | ON              | CYZY       | 33         | N43 27 39                                                         | W080 22 43                                                         |
| CYXU      | London                         | ON              | CYZY       | 33         | N43 01 59                                                         | W081 09 04                                                         |
| CYLD      | Chapleau                       | ON              | CZYZ       | 33         | N47 49 13                                                         | W083 20 49                                                         |
| CYXR      | Earlton (Timiskaming Regional) | ON              | CZYZ       | 33         | N47 41 42                                                         | W079 50 56                                                         |
| CYZE      | Gore Bay-Manitoulin            | ON              | CZYZ       | 33         | N45 53 03                                                         | W082 34 06                                                         |
| CYSP      | Marathon                       | ON              | CZYZ       | 33         | N48 45 26                                                         | W086 20 45                                                         |
| CYMO      | Moosonee                       | ON              | CZYZ       | 33         | N51 17 31                                                         | W080 36 30                                                         |
| CYQA      | Muskoka                        | ON              | CZYZ       | 33         | N44 58 30                                                         | W079 18 14                                                         |
| CYPQ      | Peterborough                   | ON              | CZYZ       | 33         | N44 13 50                                                         | W078 21 48                                                         |
| CYSN      | St Catharines/Niagara District | ON              | CZYZ       | 33         | N43 11 30                                                         | W079 10 16                                                         |
| CYZR      | Sarnia (Chris Hadfield)        | ON              | CZYZ       | 33         | N42 59 59                                                         | W082 18 34                                                         |
| CYXZ      | Wawa                           | ON              | CZYZ       | 33         | N47 58 01                                                         | W084 47 11                                                         |
| CYVV      | Warton                         | ON              | CZYZ       | 33         | N44 44 39                                                         | W081 06 31                                                         |
| CYWA      | Petawawa                       | ON              | CZYZ       | 33         | N45 57 00                                                         | W077 19 03                                                         |
| CYTR      | Trenton                        | ON              | CZYZ       | 33         | N44 07 08                                                         | W077 31 41                                                         |

| <b>Id</b> | <b>Name</b>                          | <b>Province</b> | <b>FIR</b> | <b>GFA</b> | <b>Coordinates<br/>Latitude<br/>(degrees – minutes – seconds)</b> | <b>Coordinates<br/>Longitude<br/>(degrees – minutes – seconds)</b> |
|-----------|--------------------------------------|-----------------|------------|------------|-------------------------------------------------------------------|--------------------------------------------------------------------|
| CYHF      | Hearst (René Fontaine) Muni          | ON              | CZYZ       | 33         | N49 42 50                                                         | W083 41 13                                                         |
| CYGD      | Goderich                             | ON              | CZYZ       | 33         | N43 46 04                                                         | W081 42 39                                                         |
| CYVP      | Kuujuuaq                             | QC              | CZUL       | 33         | N58 05 42                                                         | W068 25 20                                                         |
| CYPH      | Inukjuak                             | QC              | CZUL       | 33         | N58 28 19                                                         | W078 04 37                                                         |
| CYGW      | Kuujuarapik                          | QC              | CZUL       | 33         | N55 16 55                                                         | W077 45 55                                                         |
| CYGL      | La Grande Rivière                    | QC              | CZUL       | 33         | N53 37 31                                                         | W077 42 15                                                         |
| CYUY      | Rouyn-Noranda                        | QC              | CZUL       | 33         | N48 12 22                                                         | W078 50 08                                                         |
| CYVO      | Val-d'Or                             | QC              | CZUL       | 33         | N48 03 12                                                         | W077 46 58                                                         |
| CYRJ      | Roberval                             | QC              | CZUL       | 33         | N48 31 12                                                         | W072 15 57                                                         |
| CYQB      | Québec/Jean Lesage Intl              | QC              | CZUL       | 33         | N46 47 28                                                         | W071 23 36                                                         |
| CYOW      | Ottawa/MacDonald-Cartier Intl        | ON              | CZUL       | 33         | N45 19 21                                                         | W075 40 02                                                         |
| CYUL      | Montréal/Pierre Elliott Trudeau Intl | QC              | CZUL       | 33         | N45 28 14                                                         | W073 44 27                                                         |
| CYSC      | Sherbrooke                           | QC              | CZUL       | 33         | N45 26 19                                                         | W071 41 29                                                         |
| CYKL      | Schefferville                        | QC              | CZUL       | 34         | N54 48 19                                                         | W066 48 19                                                         |
| CYWK      | Wabush                               | NL              | CZUL       | 34         | N52 55 22                                                         | W066 51 53                                                         |
| CYBX      | Lourdes-de-Blanc-Sablon              | QC              | CZUL       | 34         | N51 26 31                                                         | W057 11 10                                                         |
| CYZV      | Sept-Îles                            | QC              | CZUL       | 34         | N50 13 24                                                         | W066 15 56                                                         |

| <b>Id</b> | <b>Name</b>            | <b>Province</b> | <b>FIR</b> | <b>GFA</b> | <b>Coordinates<br/>Latitude<br/>(degrees – minutes – seconds)</b> | <b>Coordinates<br/>Longitude<br/>(degrees – minutes – seconds)</b> |
|-----------|------------------------|-----------------|------------|------------|-------------------------------------------------------------------|--------------------------------------------------------------------|
| CYGV      | Havre St-Pierre        | QC              | CZUL       | 34         | N50 16 55                                                         | W063 36 40                                                         |
| CYNA      | Natashquan             | QC              | CZUL       | 34         | N50 11 24                                                         | W061 47 20                                                         |
| CYBC      | Baie-Comeau            | QC              | CZUL       | 34         | N49 07 57                                                         | W068 12 16                                                         |
| CYYY      | Mont-Joli              | QC              | CZUL       | 34         | N48 36 32                                                         | W068 12 29                                                         |
| CYGP      | Gaspé (Michel-Pouliot) | QC              | CZUL       | 34         | N48 46 30                                                         | W064 28 54                                                         |
| CYFB      | Iqaluit                | NU              | CZUL       | 36         | N63 45 24                                                         | W068 33 22                                                         |
| CYMT      | Chibougamau/Chapais    | QC              | CZUL       | 33         | N49 46 19                                                         | W074 31 41                                                         |
| CYAH      | La Grande-4            | QC              | CZUL       | 33         | N53 45 17                                                         | W073 40 31                                                         |
| CYTQ      | Tasiujaq               | QC              | CZUL       | 33         | N58 40 04                                                         | W069 57 21                                                         |
| CYKQ      | Waskaganish            | QC              | CZUL       | 33         | N51 28 24                                                         | W078 45 30                                                         |
| CYIK      | Ivujivik               | QC              | CZUL       | 36         | N62 25 02                                                         | W077 55 31                                                         |
| CYPX      | Puvirnituk             | QC              | CZUL       | 36         | N60 03 08                                                         | W077 17 15                                                         |
| CYHA      | Quaqtaq                | QC              | CZUL       | 36         | N61 02 47                                                         | W069 37 04                                                         |
| CYBG      | Bagotville             | QC              | CZUL       | 33         | N48 19 50                                                         | W070 59 47                                                         |
| CYRQ      | Trois-Rivières         | QC              | CZUL       | 33         | N46 21 06                                                         | W072 40 50                                                         |
| CYMW      | Maniwaki               | QC              | CZUL       | 33         | N46 16 22                                                         | W075 59 26                                                         |
| CYKO      | Akulivik               | QC              | CZUL       | 36         | N60 49 07                                                         | W078 08 55                                                         |

| <b>Id</b> | <b>Name</b>                      | <b>Province</b> | <b>FIR</b> | <b>GFA</b> | <b>Coordinates<br/>Latitude<br/>(degrees – minutes – seconds)</b> | <b>Coordinates<br/>Longitude<br/>(degrees – minutes – seconds)</b> |
|-----------|----------------------------------|-----------------|------------|------------|-------------------------------------------------------------------|--------------------------------------------------------------------|
| CYAS      | Kangirsuk                        | QC              | CZUL       | 36         | N60 01 38                                                         | W069 59 57                                                         |
| CYZG      | Salluit                          | QC              | CZUL       | 36         | N62 10 46                                                         | W075 40 02                                                         |
| CYKG      | Kangiqsujuaq (Wakeham Bay)       | QC              | CZUL       | 36         | N61 35 19                                                         | W071 55 46                                                         |
| CYLC      | Kimmirut                         | NU              | CZUL       | 36         | N62 50 53                                                         | W069 52 38                                                         |
| CYNM      | Matagami                         | QC              | CZUL       | 33         | N49 45 42                                                         | W077 48 10                                                         |
| CYPP      | Parent                           | QC              | CZUL       | 33         | N47 55 55                                                         | W074 36 29                                                         |
| CYSK      | Sanikiluaq                       | NU              | CZUL       | 33         | N56 32 13                                                         | W079 15 00                                                         |
| CYMU      | Umiuq                            | QC              | CZUL       | 33         | N56 32 10                                                         | W076 31 06                                                         |
| CTU2      | Fontanges                        | QC              | CZUL       | 33         | N54 33 14                                                         | W071 10 24                                                         |
| CYHH      | Nemiscau                         | QC              | CZUL       | 33         | N51 41 28                                                         | W076 08 08                                                         |
| CRB4      | Rivière Bonnard                  | QC              | CZUL       | 33         | N50 42 16                                                         | W071 09 45                                                         |
| CYLU      | Kangiqsualujjuaq (Georges River) | QC              | CZUL       | 34         | N58 42 41                                                         | W065 59 34                                                         |
| CSF3      | Poste Montagnais (Mile 134)      | QC              | CZUL       | 34         | N51 53 19                                                         | W065 42 54                                                         |
| CYHR      | Chevery                          | QC              | CZUL       | 34         | N50 28 08                                                         | W059 38 12                                                         |
| CYYG      | Charlottetown                    | PE              | CZQM       | 34         | N46 17 21                                                         | W063 06 55                                                         |
| CYQY      | Sydney/J.A. Douglas McCurdy      | NS              | CZQM       | 34         | N46 09 41                                                         | W060 02 53                                                         |
| CYQM      | Moncton/Greater Moncton Intl     | NB              | CZQM       | 34         | N46 06 58                                                         | W064 40 43                                                         |

| <b>Id</b> | <b>Name</b>            | <b>Province</b> | <b>FIR</b> | <b>GFA</b> | <b>Coordinates<br/>Latitude<br/>(degrees – minutes – seconds)</b> | <b>Coordinates<br/>Longitude<br/>(degrees – minutes – seconds)</b> |
|-----------|------------------------|-----------------|------------|------------|-------------------------------------------------------------------|--------------------------------------------------------------------|
| CYSJ      | Saint John             | NB              | CZQM       | 34         | N45 18 57                                                         | W065 53 24                                                         |
| CYFC      | Fredericton Intl       | NB              | CZQM       | 34         | N45 52 08                                                         | W066 32 14                                                         |
| CYHZ      | Halifax/Stanfield Intl | NS              | CZQM       | 34         | N44 52 47                                                         | W063 30 37                                                         |
| CYQI      | Yarmouth               | NS              | CZQM       | 34         | N43 49 38                                                         | W066 05 18                                                         |
| CYZX      | Greenwood              | NS              | CZQM       | 34         | N44 59 04                                                         | W064 55 01                                                         |
| CZBF      | Bathurst               | NB              | CZQM       | 34         | N47 37 46                                                         | W065 44 25                                                         |
| CYGR      | Îles-de-la-Madeleine   | QC              | CZQM       | 34         | N47 25 30                                                         | W061 46 41                                                         |
| CSB2      | Sable Island           | NS              | CZQM       | 34         | N43 55 46                                                         | W059 57 35                                                         |
| CYPD      | Port Hawkesbury        | NS              | CZQM       | 34         | N45 39 23                                                         | W061 22 06                                                         |
| CYSL      | St-Leonard             | NB              | CZQM       | 34         | N47 09 26                                                         | W067 50 11                                                         |
| CZUM      | Churchill Falls        | NL              | CZQX       | 34         | N53 33 45                                                         | W064 06 21                                                         |
| CYCA      | Cartwright             | NL              | CZQX       | 34         | N53 40 57                                                         | W057 02 31                                                         |
| CYDF      | Deer Lake              | NL              | CZQX       | 34         | N49 12 33                                                         | W057 23 40                                                         |
| CYQX      | Gander Intl            | NL              | CZQX       | 34         | N48 56 13                                                         | W054 34 05                                                         |
| CYJT      | Stephenville           | NL              | CZQX       | 34         | N48 32 40                                                         | W058 33 00                                                         |
| CYYT      | St. John's Intl        | NL              | CZQX       | 34         | N47 37 07                                                         | W052 45 09                                                         |
| CYMH      | Mary's Harbour         | NL              | CZQX       | 34         | N52 18 10                                                         | W055 50 52                                                         |

| <b>Id</b> | <b>Name</b>                 | <b>Province</b> | <b>FIR</b> | <b>GFA</b> | <b>Coordinates<br/>Latitude</b><br>(degrees – minutes – seconds) | <b>Coordinates<br/>Longitude</b><br>(degrees – minutes – seconds) |
|-----------|-----------------------------|-----------------|------------|------------|------------------------------------------------------------------|-------------------------------------------------------------------|
| CYDP      | Nain                        | NL              | CZQX       | 34         | N56 33 02                                                        | W061 40 56                                                        |
| CYAY      | St. Anthony                 | NL              | CZQX       | 34         | N51 23 31                                                        | W056 04 59                                                        |
| CYYR      | Goose Bay                   | NL              | CZQX       | 34         | N53 19 09                                                        | W060 25 33                                                        |
| LFVP      | St-Pierre France            | FR              | CZQX       | 34         | N46 45 47                                                        | W056 10 27                                                        |
| CDA5      | St. Andrews (Codroy Valley) | NL              | CZQX       | 34         | N47 46 32                                                        | W059 18 45                                                        |
| CYFT      | Makkovik                    | NL              | CZQX       | 34         | N55 04 38                                                        | W059 11 16                                                        |

## D.8 Examples of SIGMET messages

Example (1): A line of thunderstorms is observed over northwestern Ontario late in the day. This is the fourth SIGMET message issued for this event.

### International (ICAO)

WSCN03 CWA0 162225  
CZWG SIGMET **A4** VALID 162225/170225 CWEG-  
CZWG WINNIPEG FIR SQL TS OBS WI 40NM WID LINE BTN N4929 W09449 –  
N5104 W09348 – N5209 W09120 TOP FL340 MOV E 15KT NC=

### National

WSCN23 CWA0 162225  
CZWG SIGMET **A4** VALID 162225/170225 CWEG-  
CZWG WINNIPEG FIR SQL TS OBS WI 40NM WID LINE BTN /N4929 W09449/25  
SW CYQK – /N5104 W09348/CYRL – /N5209 W09120/60 NW CYPL TOP FL340  
MOV E 15KT NC  
RMK GFACN33=

This SIGMET is updated after 00Z on the 17<sup>th</sup> such that there is a reset of the SIGMET number while the letter remains the same.

### International (ICAO)

WSCN03 CWA0 170205  
CZWG SIGMET **A1** VALID 170205/170605 CWEG-  
CZWG WINNIPEG FIR SQL TS OBS WI 40NM WID LINE BTN N4915 W09332 –  
N5103 W09212 – N5144 W08943 TOP FL310 MOV E 15KT WKN=

### National

WSCN23 CWA0 170205  
CZWG SIGMET **A1** VALID 170205/170605 CWEG-  
CZWG WINNIPEG FIR SQL TS OBS WI 40NM WID LINE BTN /N4915 W09332/45  
SE CYQK – /N5103 W09212/60 E CYRL – /N5144 W08943/25 NE CYPL TOP FL310  
MOV E 15KT WKN  
RMK GFACN33=

Example (2): Severe mountain waves (lee waves) along the eastern side of the Rockies. The line falls entirely within the Edmonton FIR but covers two GFA regions. The remark line in the National SIGMET message will mention the affected GFACNs.

**International (ICAO)**

WSCN02 CWA0 161220

CZEG SIGMET L1 VALID 161220/161620 CWEG-

CZEG EDMONTON FIR SEV MTW FCST WI 60NM WID LINE BTN N5614 W12155 –  
N5105 W11440 FL070/140 STNR INTSF=

**National**

WSCN22 CWA0 161220

CZEG SIGMET L1 VALID 161220/161620 CWEG-

CZEG EDMONTON FIR SEV MTW FCST WI 60NM WID LINE BTN /N5614  
W12155/45 W CYXJ – /N5105 W11440/25 W CYYC FL070/140 STNR INTSF  
RMK **GFACN31/GFACN32=**

Example (3): Following an AIREP for severe turbulence encounter over the Northern Atlantic, the following SIGMET messages are issued. This event spans over Gander Domestic and Gander Oceanic FIRs as well as GFACN34.

**International (ICAO)**

**CZQX**

WSCN07 CWA0 161220

CZQX SIGMET **E1** VALID 161220/161620 CWUL-

CZQX GANDER DOMESTIC FIR SEV TURB OBS AT 1155Z WI 90NM WID LINE  
BTN N5319 W06025 – N5615 W05245 – N5930 W04715 FL280/350 MOV NE 20KT  
NC=

**CZQX (Oceanic)**

WSNT01 CWA0 161220

CZQX SIGMET **U1** VALID 161220/161620 CWUL-

CZQX GANDER OCEANIC FIR/CTA SEV TURB OBS AT 1155Z WI 90NM WID LINE  
BTN N5319 W06025 - N5615 W05245 N5930 W04715 FL280/350 MOV NE 20KT  
NC=

## **National**

### **CZQX**

WSCN27 CWAQ 161220

CZQX SIGMET **E1** VALID 161220/161620 CWUL-

CZQX GANDER DOMESTIC FIR SEV TURB OBS AT 1155Z WI 90NM WID LINE

BTN /N5319 W06025/CYYR – /N5615 W05245/ – /N5930 W04715/ FL280/350 MOV  
NE 20KT NC

RMK GFACN34/**CZQX GANDER OCEANIC FIR/CTA SIGMET U1=**

### **CZQX (Oceanic)**

WSNT21 CWAQ 162225

CZQX SIGMET **U1** VALID 161220/161620 CWUL-

CZQX GANDER OCEANIC FIR/CTA SEV TURB OBS AT 1155Z WI 90NM WID LINE

BTN /N5319 W06025/CYYR – /N5615 W05245/ – /N5930 W04715/ FL280/350 MOV  
NE 20KT NC

RMK GFACN34/**CZQX GANDER DOMESTIC FIR SIGMET E1**

Since this event spans over two FIRs, the remark line cross-references the SIGMET messages. Note that only the first coordinate point relates to an aviation reference site. The other two coordinate points being into Gander Oceanic FIR, they are defined only in latitudes and longitudes as per section 5.8.3.4.

Example (4): The centre of hurricane Maria is about to move across the Avalon Peninsula. The tropical cyclone SIGMET (WCCN) is updated and only covers the Gander Domestic FIR and GFACN34 since the CB activity is confined with a radius of 150NM from the centre of the hurricane. The radius of CB is not expected to change between the initial and forecast time.

#### **International (ICAO)**

WCCN07 CWA0 161802

CZQX SIGMET G3 VALID 1601800/170000 CWUL-

CZQX GANDER DOMESTIC FIR TC MARIA PSN N4720 W05430 CB OBS AT 1800Z  
WI 150NM OF TC CENTRE TOP FL360 WKN FCST AT 0000Z TC CENTRE PSN  
N5110 W05030=

#### **National**

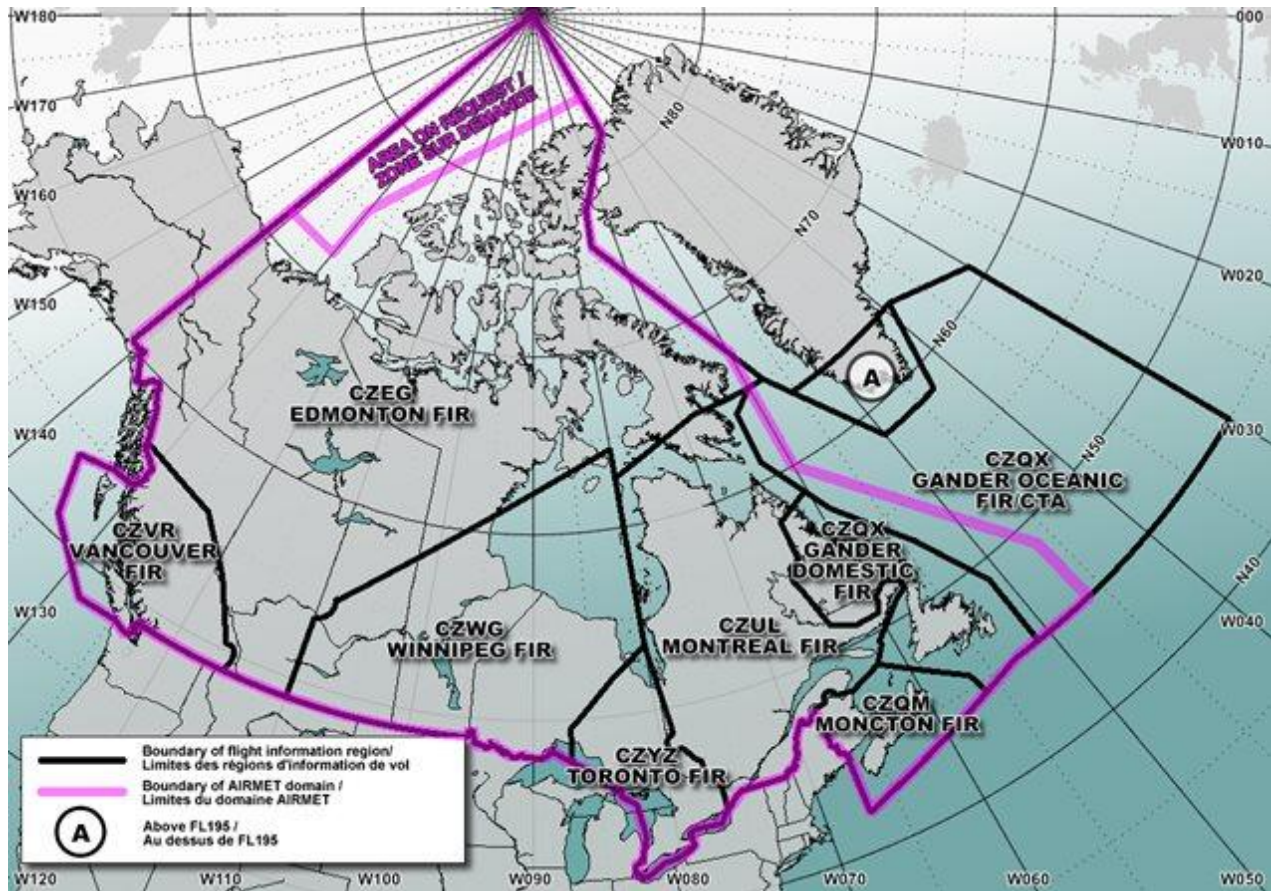
WCCN27 CWA0 161802

CZQX SIGMET G3 VALID 161800/170000 CWUL-

CZQX GANDER DOMESTIC FIR TC MARIA PSN /N4720 W05430/75 SW CYYT CB  
OBS AT 1800Z WI 150NM OF TC CENTRE TOP FL360 WKN FCST AT 0000Z TC  
CENTRE PSN /N5110 W05030/180 NE CYYT  
RMK GFACN34=

## Appendix E AIRMET information—Supplement to Chapter 6

### E.1 Canadian AIRMET information domain



The pink boundary contours Canada's area of responsibility for the provision of AIRMET information and corresponds to the summation of all GFA domains. Refer to C.1 of Appendix C.

## E.2 Abbreviations and decode used in AIRMET

| Code   | Description                                  |
|--------|----------------------------------------------|
| AIRMET | See section 6.1                              |
| AT     | <i>At (followed by time)</i>                 |
| BKN    | Broken                                       |
| BL     | Blowing                                      |
| BR     | Mist                                         |
| BTN    | Between                                      |
| CLD    | Cloud                                        |
| CNL    | Cancel/Cancelled                             |
| DS     | Dust storm                                   |
| DU     | Dust                                         |
| DZ     | Drizzle                                      |
| E      | East or Eastern longitude                    |
| ENE    | East-north-east                              |
| ESE    | East-south-east                              |
| FC     | Funnel cloud                                 |
| FCST   | Forecast(s)                                  |
| FG     | Fog                                          |
| FIR    | Flight information region                    |
| FL     | Flight level                                 |
| FRQ    | Frequent                                     |
| FU     | Smoke                                        |
| FZ     | Freezing (when associated with RA, DZ or FG) |
| GFA    | Graphic area forecast                        |
| GR     | Hail                                         |
| GS     | Snow pellets                                 |
| HZ     | Haze                                         |
| IC     | Ice crystal                                  |
| ICE    | Icing                                        |
| INTSF  | Intensifying                                 |
| ISOL   | Isolated                                     |
| KT     | Knots                                        |
| MOD    | Moderate                                     |
| MOV    | Move                                         |

| <b>Code</b> | <b>Description</b>                |
|-------------|-----------------------------------|
| MT          | Mountain(s)                       |
| MTW         | Mountain waves                    |
| N           | North <i>or</i> Northern latitude |
| NC          | No change                         |
| NE          | North-east                        |
| NM          | Nautical miles                    |
| NNE         | North-north-east                  |
| NNW         | North-north-west                  |
| NW          | North-west                        |
| OBS         | Observed                          |
| OCNL        | Occasional                        |
| OVC         | Overcast                          |
| PL          | Ice pellets                       |
| PO          | Dust/sand whirls                  |
| STNR        | Stationary                        |
| RA          | Rain                              |
| RMK         | Remark(s)                         |
| S           | South <i>or</i> Southern latitude |
| SA          | Sand                              |
| SE          | South-east                        |
| SFC         | Surface                           |
| SG          | Snow grain                        |
| SH          | Shower                            |
| SN          | Snow                              |
| SQ          | Squall                            |
| SS          | Sand storm                        |
| SSE         | South-south-east                  |
| SSW         | South-south-west                  |
| SW          | South-west                        |
| TCU         | Towering cumulus                  |
| TS          | Thunderstorm                      |
| TURB        | Turbulence                        |
| VA          | Volcanic ash                      |
| VIS         | Visibility                        |

| <b>Code</b> | <b>Description</b>               |
|-------------|----------------------------------|
| W           | West <i>or</i> Western longitude |
| WKN         | Weakening                        |
| WSPD        | Wind speed                       |
| WNW         | West-north-west                  |
| WSW         | West-south-west                  |
| WI          | Within                           |
| WID         | Wide                             |
| Z           | Coordinated universal time       |

### E.3 AIRMET Bulletin scheme

| FIR indicator | FIR name        | Type   | International (ICAO) | National    |
|---------------|-----------------|--------|----------------------|-------------|
| CZVR          | Vancouver       | AIRMET | WACN01 CWA0          | WACN21 CWA0 |
| CZEG          | Edmonton        | AIRMET | WACN02 CWA0          | WACN22 CWA0 |
| CZWG          | Winnipeg        | AIRMET | WACN03 CWA0          | WACN23 CWA0 |
| CZYZ          | Toronto         | AIRMET | WACN04 CWA0          | WACN24 CWA0 |
| CZUL          | Montréal        | AIRMET | WACN05 CWA0          | WACN25 CWA0 |
| CZQM          | Moncton         | AIRMET | WACN06 CWA0          | WACN26 CWA0 |
| CZQX          | Gander domestic | AIRMET | WACN07 CWA0          | WACN27 CWA0 |
| CZQX          | Gander oceanic  | AIRMET | WANT01 CWA0          | WANT21 CWA0 |

## E.4 Alphanumeric sequence

Rules for the use of letters:

- 25 letters of the alphabet will be shared by all 8 FIRs; T is exclusively used for test messages - refer to 6.8.7.
- A letter can be used if not currently in service in any FIR and if it was retired for a minimum of 24 hours (regardless of the date). Otherwise, the next letter is used. Letter Z wraps back to letter A if necessary.
- If all letters are unavailable according to the above rules, then the letter that has had the longest retirement is used.
- The letter attributed to an AIRMET message will not change during its lifespan (updates and cancellation).
- WA (AIRMET) messages do not share the alphabet with WS, WV and WC (SIGMET) messages. Letter A may be used simultaneously in both a WA and a WS.

## E.5 Meteorological phenomena to be included in AIRMET

|                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Surface wind speed                    | Widespread <sup>1</sup> mean surface wind speed above 30 KT                                                                                                                                                                                                                                                                                                                                                                                                                   | SFC WIND (+ wind speed or wind speed range and units)                                                                                                                                                                                                                                                                                                                                |
| Surface visibility and/or Cloud       | widespread <sup>1</sup> areas affected by reductions of visibility to less than three statute miles (5 000 m), including the weather phenomena causing the reduction of visibility and / or                                                                                                                                                                                                                                                                                   | SFC VIS (+ visibility or visibility range)<br>(+ weather phenomena or combinations of)<br>and / or                                                                                                                                                                                                                                                                                   |
|                                       | widespread <sup>1</sup> areas of broken or overcast cloud with height of base less than 1,000 ft (300 m) above ground level                                                                                                                                                                                                                                                                                                                                                   | BKN CLD <sup>2</sup> (+ height or height range of the base, top and units)<br>OVC CLD <sup>2</sup> (+ height or height range of the base, top and units)                                                                                                                                                                                                                             |
| Thunderstorms and/or Towering cumulus | isolated thunderstorms<br>occasional thunderstorms<br>isolated thunderstorms with hail<br>occasional thunderstorms with hail<br>isolated towering cumulus<br>occasional towering cumulus<br>frequent towering cumulus<br>occasional towering cumulus and isolated thunderstorms<br>frequent towering cumulus and isolated thunderstorms<br>occasional towering cumulus and isolated thunderstorms with hail<br>frequent towering cumulus and isolated thunderstorms with hail | ISOL TS <sup>3</sup><br>OCNL TS <sup>4</sup><br>ISOL TSGR <sup>3,6</sup><br>OCNL TSGR <sup>4,6</sup><br>ISOL TCU <sup>3</sup><br>OCNL TCU <sup>4</sup><br>FRQ TCU <sup>5</sup><br>OCNL TCU <sup>4</sup> – ISOL TS <sup>3</sup><br>FRQ TCU <sup>5</sup> – ISOL TS <sup>3</sup><br>OCNL TCU <sup>4</sup> – ISOL TSGR <sup>3,6</sup><br>FRQ TCU <sup>5</sup> – ISOL TSGR <sup>3,6</sup> |
| Turbulence                            | moderate turbulence (except for turbulence in convective clouds)                                                                                                                                                                                                                                                                                                                                                                                                              | MOD TURB <sup>5</sup>                                                                                                                                                                                                                                                                                                                                                                |
| Icing                                 | moderate icing (except for icing in convective clouds)                                                                                                                                                                                                                                                                                                                                                                                                                        | MOD ICE <sup>6</sup>                                                                                                                                                                                                                                                                                                                                                                 |
| Mountain wave                         | moderate mountain wave                                                                                                                                                                                                                                                                                                                                                                                                                                                        | MOD MTW                                                                                                                                                                                                                                                                                                                                                                              |

**Note (1):** Widespread indicates that 50% or greater of the area is affected.

**Note (2):** Heights for cloud bases and tops are all indicated in FT above ground level for consistency with GFA. In the final bulletin, FT is indicated whereas AGL is implied.

**Note (3):** Isolated (**ISOL**) if it consists of individual features which affect, or are forecast to affect, an area with a maximum spatial coverage of 25% or less of the area concerned (at a fixed time or during the period of validity).

**Note (4):** Occasional (**OCNL**) if it consists of well separated features which affect, or are forecast to affect, an area with a maximum spatial coverage greater than 25% and up to 50% of the area concerned (at a fixed time or during the period of validity).

**Note (5):** Frequent (**FRQ**) indicates an area of towering cumulus (TCU) within which there is little or no separation between adjacent clouds with a maximum spatial coverage greater than 50% of the area affected, or forecast to be affected, by the phenomenon (at a fixed time or during the period of validity).

**Note (6):** Hail (**GR**) should be used as a further description of the thunderstorm as necessary.

**Note (7):** Moderate (**MOD**) turbulence (**TURB**) refers only to low-level turbulence associated with surface winds, rotor streaming and (**CAT**) turbulence, whether in cloud or not, near to jet streams. Turbulence **shall** not be used in connection with convective clouds.

**Note (8):** Moderate (**MOD**) icing (**ICE**) **shall** refer to icing in other than in convective clouds.

## **E.6 Resolution**

### **Distance**

Every 5 NM from 10 to 30 NM (5, 10, 15, 20, 25, 30)

Every 15 NM from 30 to 90 NM (30, 45, 60, 75, 90)

Every 30 NM above 90 NM (90, 120, 150, 180, 210, etc.)

### **Direction 8 point compass (octants\*)**

\*Octants (degrees true):

N: directions greater than 337.5 degrees to 22.5 degrees

NE: directions greater than 22.5 degrees to 67.5 degrees

E: directions greater than 67.5 degrees to 112.5 degrees

SE: directions greater than 112.5 degrees to 157.5 degrees

S: directions greater than 157.5 degrees to 202.5 degrees

SW: directions greater than 202.5 degrees to 247.5 degrees

W: directions greater than 247.5 degrees to 292.5 degrees

NW: directions greater than 292.5 degrees to 337.5 degrees

### **Latitude and longitude (all FIRs except Gander Oceanic)**

Degrees and minutes (1 minute)

### **Latitude and longitude (Gander Oceanic FIR)**

Degrees and minutes (15 minutes)<sup>1</sup>

### **Level (FL)**

Every FL001 (corresponding to 100 feet) - up to FL015

Every FL005 – FL015 to FL030

Every FL010 – above FL030

### **Cloud height (FT)**

Every 100 feet – up to 1,500 feet

Every 500 feet – 1500 to 3,000 feet

Every 1,000 feet – above 3,000 feet

### **Visibility (SM)**

Every  $\frac{1}{8}$  statute mile – 0 to  $\frac{3}{4}$  statute mile

Every  $\frac{1}{4}$  statute mile –  $\frac{3}{4}$  to 3 statute mile

**Movement (direction/speed) 16 point compass (radials\*)/ 5 KT increments**

\*Radials (degrees true):

|      |               |
|------|---------------|
| N:   | 360 degrees   |
| NNE: | 22.5 degrees  |
| NE:  | 45 degrees    |
| ENE: | 67.5 degrees  |
| E:   | 90 degrees    |
| ESE: | 112.5 degrees |
| SE:  | 135 degrees   |
| SSE: | 157.5 degrees |
| S:   | 180 degrees   |
| SSW: | 202.5 degrees |
| SW:  | 225 degrees   |
| WSW: | 247.5 degrees |
| W:   | 270 degrees   |
| WNW: | 292.5 degrees |
| NW:  | 315 degrees   |
| NNW: | 337.5 degrees |

**Note (1):** U.S. National Weather Service (NWS) uses a 15 minute resolution over oceanic areas such as New York Oceanic FIR. This harmonizes the practice with our southern neighbouring FIR.

## **E.7 Aviation reference sites used in National AIRMET**

Refer to table D.7 of Appendix D.

## E.8 Examples of AIRMET messages

Example (1): At 1305Z a PIREP from a Beechcraft 1900 (B190) indicated moderate turbulence. This event not being forecast in the GFACN32 leads the forecaster to issue the following AIRMET messages.

### International (ICAO)

WACN02 CWA0 251315

CZEG AIRMET H1 VALID 251315/251715 CWEG-

CZEG EDMONTON FIR MOD TURB OBS AT 1305Z WI 90NM WID LINE BTN  
N6228 W11427 - N6441 W10840 - N6453 W09605 FL190/340 MOV NE 10KT NC=

### National

WACN22 CWA0 251315

CZEG AIRMET H1 VALID 251315/251715 CWEG-

CZEG EDMONTON FIR MOD TURB OBS AT 1305Z WI 90NM WID LINE BTN  
/N6228 W11427/CYZF - /N6441 W10840/45 W CYOA - /N6453 W09605/30 W CYBK  
FL190/340 MOV NE 10KT NC  
RMK GFACN32=

Example (2): Freezing drizzle (FZDZ) was observed at 0700Z at Churchill, Manitoba (CYYQ). Icing not being forecast in the GFACN32 leads the forecaster to issue the following AIRMET messages.

### International (ICAO)

WACN03 CWA0 250725

CZWG AIRMET A1 VALID 250725/251125 CWEG-

CZWG WINNIPEG FIR MOD ICE OBS AT 0700Z WI 90NM WID LINE BTN  
N5955 W09403 - N5845 W09404 - N5646 W08903 SFC/FL020 STNR NC=

### National

WACN23 CWA0 250725

CZWG AIRMET A1 VALID 250725/251125 CWEG-

CZWG WINNIPEG FIR MOD ICE OBS AT 0700Z WI 90NM WID LINE BTN  
/N5955 W09403/75 S CYEK - /N5845 W09404/CYYQ - /N5646 W08903/60 NW  
CYER SFC/FL020 STNR NC  
RMK GFACN32=

Example (3): Unforecast convective activity (CB) in GFACN31 area required the issuance of the following AIRMET messages.

**International (ICAO)**

WACN01 CWA0 301925

CZVR AIRMET U1 VALID 301925/302325 CWEG-

CZVR VANCOUVER FIR ISOL TS OBS WI N5138 W12321 - N4903 W11759 - N4900 W11546 - N5000 W11546 - N5123 W11811 - N5138 W12321 TOP FL240 STNR WKN=

**National**

WACN21 CWA0 301925

CZVR AIRMET U1 VALID 301925/302325 CWEG-

CZVR VANCOUVER FIR ISOL TS OBS WI /N5138 W12321/45 SE CYPV - /N4903 W11759/20 SW CYCG - /N4900 W11546/30 S CYXC - /N5000 W11546/25 N CYXC - /N5123 W11811/25 N CYRV - /N5138 W12321/45 SE CYPV TOP FL240 STNR WKN RMK GFACN31=

Example (4): Satellite pictures and surface observations indicate an area of stratus and fog along the Quebec Lower North Shore. This is not well represented in GFACN34 and requires the issuance of AIRMET messages.

**International (ICAO)**

WACN05 CWA0 301925

CZUL AIRMET J1 VALID 301925/302325 CWEG-

CZUL MONTREAL FIR SFC VIS 1/4-1 1/4SM FG/BR - OVC CLD 100-500/1200FT OBS WI N5013 W06536 - N5011 W06046 - N4906 W06148 - N4932 W06444 - N5013 W06536 STNR NC=

**National**

WACN25 CWA0 301925

CZUL AIRMET J1 VALID 301925/302325 CWEG-

CZUL MONTREAL FIR SFC VIS 1/4-1 1/4SM FG/BR - OVC CLD 100-500/1200FT OBS WI /N5013 W06536/25 E CYZV -/N5011 W06046/45 E CYNA -/N4906 W06148/60 SE CYNA - /N4932 W06444/25 SW CYPN - /N5013 W06536/25 E CYZV STNR NC RMK GFACN34=