# Standard for Digital Terrain Data Capture in British Columbia

## Terrain Technical Standard and Database Manual

**JUNE, 1998**

**VERSION 1**

**PREPARED BY:**

**Terrain Data Working Committee**
**Surficial Geology Task Group**
**Earth Science Task Force**

**For:**

**Resources Inventory Committee (RIC)**

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# TERRAIN DATABASE MANUAL, STATUS

| | |
|---|---|
| GIS Specifications: | Section 4 contains updated information on the 'Digital data specifications for terrain mapping in GIS', in both ARC/INFO and IGDS. For further information, contact the Terrain Data Custodian, see Appendix 1. |
| Labeler Routine: | At this time the labeling algorithm is not going to be undertaken due to maintenance concerns. As well, many Geographic Information System (GIS) firms have developed their own labeling algorithms. Users are encouraged to 'phone around' and inquire on purchasing or leasing labeling software. Recorded at the rear of Section 6, are examples of terrain polygon symbols suitable for (GIS) plotting. |
| Data Capture:<br>(data entry screen) | Terrain polygon data entry screen has now been developed, this application works with this run-time MS-Access version 2.<br>**The URL is http://www.env.gov.bc.ca/rib/wis/terrain/inventory/capture.htm**<br>Note: Use of this particular application is not always mandatory, people can develop their own (more efficient) data entry screens as long as the rules in this manual are followed.<br>For further information contact the Terrain Data Custodian, see Appendix 1. |
| Internet Web Server: | To maintain contact with the Terrain Data Custodian, see Appendix 1 and inquire as to the posting of a manual announcement page, and the proposed FAQ page. |

# PREFACE

The Terrain Database manual is a functional part of British Columbia's approach to terrain, slope stability and bioterrain* mapping. It is intended to be used in conjunction with the following documents.

- *Terrain Classification System For British Columbia. Version 2.0.* 1997. D. E. Howes and E. Kenk. Victoria
- *Guidelines and Standards for Terrain Mapping in British Columbia* . RIC, January, 1996.
- *Mapping and Assessing Terrain Stability Guidebook.* (1995) and newer editions in process.
- **Standard for Terrestrial Ecosystem Mapping (TEM) in British Columbia* (1995) – (1998 in process) bioterrain mapping is a part of (TEM) mapping procedures and will be a part of the (TEM) data warehouse.

This manual sets out the procedures and rules for the digital capture, storage and delivery of terrain data (symboled polygon data) for GIS (Geographic Information Systems) and Database systems. The goal is to capture, store and distribute data in an organized manner throughout the province and commensurate with the objectives of the Resources Inventory Committee (RIC).

The Terrain Database Working Committee compiled this manual under the auspices of the Surficial Geology Task Group of RIC. The Database Committee consists of geoscientists and computer mapping experts from the consulting community and government agencies, meeting since October 1995.

As a part of the data manual, new terms and codes were added to the current *Terrain Classification System for British Columbia,* Howes and Kenk, Version 2.0. Howes and Kenk, Version 2.0 records all changes and additions made to date. This manual contains most of the terms required for completing the Terrain Data Form. The additional data such as slope and erosion classes comes from Forest Practices Code Terrain Guidebooks and (RIC) Terrain documents. This data is used for interpretations such as slope stability and potential erosion used to meet the requirements or terrain mapping. This manual follows all Terrain and RIC related documents, particularly the mapping and classification manuals.

The funding was provided by Corporate Resource Inventory Initiatives (CRII), Forest Renewal British Columbia (FRBC) and Resource Inventory Committee (RIC).

The compilation of this Terrain Database Manual draws heavily upon E. Kenk et al 1987, *Computer Assisted Planning Assessment and Map Production* (CAPAMP), volume 1 (1987). The CAPAMP manual documented the data entry and validation procedures for a thematic-mapping GIS, covering soil, agriculture capability, surficial geology and the all purpose entity. More modern GIS and database systems have replaced the CAPAMP system, and this *Terrain Database Manual* supersedes the CAPAMP document.

Users should be aware of the Digital Data Specification Standard, Resources Inventory Committee, Digital Data Working Group. Version 1, 1997.

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Committee Members working on the data manual since October 1995:

J.M. Ryder P.Geo.
J.M. Ryder & Assoc., Terrain Analysis Inc.
Vancouver, B.C.
jmrata@intergate.bc.ca

David Caverly
Gordian Management Group Inc.
Victoria, B.C.
dcaverly@IBM.com

Alastair Handley, GIS Analyst
Timberline Forest Industry Consultants
Victoria, B.C.
alh@tfic.bc.ca

Peter Bobrowsky P.Geo.
Environmental Geology Section
Ministry of Employment and Investment
Victoria, B.C.
peter.bobrowsky@gems7.gov.bc.ca

Bruce Mackenzie
Senior Technical Analyst
Information Systems Branch
Ministry of Environment Lands and Parks
Victoria, B.C.
bmackenz@ssbpost.env.gov.bc.ca

Evert Kenk R.P.F.
Land Data BC
Geomatics Branch
Ministry of Environment Lands and Parks
Victoria, B.C.
ekenk@mail.gdbc.gov.bc.ca

Larry Lacelle R.P.F.
Wildlife Inventory Section
Resource Inventory Branch
Ministry of Environment Lands and Parks
Penticton, B.C.
llacelle@fwhdept.env.gov.bc.ca

Doug VanDine P.Geo P.Eng
Vandine Geological Engineering
Victoria, B.C.

Darren McKellar
Wildlife Inventory Section
Resource Inventory Branch
Ministry of Environment Lands and Parks
Victoria, B.C.
dmckella@fwhdept.env.gov.bc.ca

Robert Maxwell P.Ag.
Habitat Inventory Section
Wildlife Inventory Section
Ministry of Environment Lands and Parks
Victoria, B.C.
bmaxwell@fwhdept.env.gov.bc.ca

Terry Gunning
Wildlife Inventory Section
Resource Inventory Branch
Ministry of Environment Lands and Parks
Victoria, B.C.
tgunning@fwhdept.env.gov.bc.ca

Ward Kilby P.Geo
Mineral Potential
Geological Survey Branch
Ministry of Energy and Mines
Victoria, B.C.
ward.kilby@gems6.gov.bc.ca

Erika Stovold
Wildlife Inventory Section
Resource Inventory Branch
Ministry of Environment Lands and Parks
Victoria, B.C.

Ian Webster
Mineral Potential
Geological Survey Branch
Ministry of Energy and Mines
Victoria BC
ian.webster@gems1.gov.bc.ca

# 1. Introduction

## *1.1 Purpose and directives*

The purpose of this document is to give concise, detailed information on compiling digital data for terrain mapping. This manual was written to facilitate terrain digital data storage and delivery. It includes data standards for terrain, terrain stability, and terrain-ecosystem mapping, to ensure terrain resource data entry for storage and access occurs in an systematic manner throughout the province. It is intended that, these data, including maps, polygon data, metadata, and legends, are suitable for digital data exchange among business, government, the research community, and the general public.

The aim of the terrain database is to provide mappers, contractees, government custodians, and other users with consistent criteria for terrain data management. Forest Renewal BC is funding a project to centrally store digital terrain data, to facilitate its automated distribution by computer. We anticipate that government-funded mapping projects will comply with the recommended use of RIC sanctioned documents. These will provide mappers, correlators and data managers, whether in the Districts, Regions or in Provincial custodian offices, with consistent terms of reference. The Terrain Database Working Committee will aim to keep this manual up to date through annual reviews of concerns and procedures to address future implementation requirements. It is recognized there will be some start-up problems and concerns with the standards.

Provincial terrain correlators will be available for consistent help and direction. As well, regional geomorphologists and GIS managers should also provide guidance and direction on the use of all Terrain related documents. A list of the current government geomorphologists and data managers (GIS) is provided at the end of this document.

For more detailed information on the rationale and the intentions of the use of GIS (Geographic Information Systems), see the Introduction of section 4.

---

**Note**: We strongly advise seeking guidance from the original terrain mapper in the preparation of interpretive products and/or manipulation of the terrain maps and databases. The database omits some aspects of terrain (for example, various subtypes of materials), so that applying generic algorithms may result in misleading information.

---

**Note**: This manual is designed to be comprehensive and prepared and is constructed to cover most terrain data collected in BC. As such, the manual does not cover which terrain attributes should be collected for a particular mapping project - that is the subject of a ‘contract requirement’ and the mapping methodology. The contract should specify which terrain attributes are required.

---

### *1.2 Scope and status of the manual*

This manual has been through a developmental stage for last two years. This manual does not cover all aspects of digital terrain data capture associated with mapping, such as on-site engineering reports or data logging of deep sections.

This manual, to date, includes:

1. Data entry procedures for basic terrain polygon data capture classification, as applied to terrain and terrain stability mapping;
2. Basic standards for GIS (ARC/INFO and IGDS) data storage;
3. Symbology for feature codes (on-site symbols) - Features codes and definitions for ARC/INFO symbology have been developed. Some feature codes can be acquired from the web URL http://www.env.gov.bc.ca:8000/feature_code/owa/fcode.formquery

This manual does not include:

1. Any procedures with regard to the terrain warehousing strategy.
2. Standards and procedures for map legends; see web site information at the Ministry of Energy Mines, Geological Survey Branch or Ministry of Environment, Resources Inventory Branch.
3. The logical data model for the storage of digital terrain mapping data can be acquired from the **Terrain Data Custodian, see Appendix 1.**

This manual supersedes portions of RIC's *Guidelines and Standards for Terrain Mapping in British Columbia* (1995), Appendix F, 'Digital Database'. For further information on the use of certain data entities, contact the **Terrain Data Custodian, see Appendix 1** at the British Columbia Geological Survey Branch, Victoria, tel. (250) 952-0422.

### *1.3 How to use the procedures for polygon data entry*

**Note 1:** The following procedures assume a basic familiarity with terrain mapping concepts:

**Note 2:** Terrain polygon data entry screen has now been developed (DC), this application works with run-time MS-Access version 2.

The URL is http://www.env.gov.bc.ca/rib/wis/terrain/inventory/capture.htm

1. Review the Terrain Polygon Data Form in section 3, which illustrates the attributes listing. These are core attributes[1] for terrain data capture and provincial storage. You can enter non-core terrain data in the project-specific section of the form, but it will be stored and managed only in flat files. Section 3 also contains a sample data form with a set of terrain symbols and codes, which serve as examples for data entry procedures.

2. Review section 2.2, 'Field Definitions for the Terrain Data Form'. This table gives field names, allowable field lengths, and character types for each attribute. Strict adherence to the codes is necessary as validation routines will later be run against the databases. Faulty coding will require time-consuming corrections. To assist mapping contractors with capturing polygon attributes, the terrain data capture application is now available. The application will be at our web site (see page ii) in a self extracting zipped format for download efficiency. Once installed, contractors are able to capture all polygon attributes with business rules enforced and validation performed. Attributes can be exported in a database format for loading into whichever proprietary GIS the contractor uses.

3. Review section 2.3, 'Codes, names and definitions'. These tables define most of the terrain terms, including new terms added to the terrain classification system. They are the complete list of current terrain mapping codes.

4. Section 4, 'Digital Data Specification for Terrain Mapping in GIS',. This section of the document specifies format and content standards for storing terrain surficial geology data in ARC/INFO IGDS format.

5. If you are unfamiliar with the terrain mapping system, refer to the manuals listed in 'References'. For a summary refer to the web site http://www.env.gov.bc.ca/ Also, contact the **Terrain Data Custodian, (Appendix 1)** for the address of their web site (currently under development).

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**Note**: Any field data form or database program may be used for field data capture, data entry or short-term storage, but the data *must* follow the defined standards and *must* be submitted in one of the standard forms: as an as a comma separated values (CSV) file. Table 2-1 presents the standards that accompany the fields and names of the data form.

Optionally, a contractor may use only certain attributes in the database for their particular project, but the coding in the database must still adhere to all standards provided in the database procedures in order to ensure consistency of data. The field length, the field description, and the comments on special characters or formats are provided where applicable.

**Note: core attributes[1]:** are those specified as a minimum data set required for a particular mapping methodology; those attributes are, or will be, discussed in each (RIC) mapping methodology. Core attributes are ones which the (RIC) committees will undertake to manage, storage and distribute as corporate data. Each mapping contract should also stipulate which are the core items to be collected for that project, and which are additional attributes.

With reference to the 'Terrain Data Form', each type of terrain project (for example general terrain, slope stability, or mineral potential) will have its own 'somewhat' unique set of terrain attributes. Therefore, not all attributes, on this form, will necessarily be used for any one project.

---

### *1.3.1 Project Metadata (project records)*

There are two types of project metadata. One is a record of field mapping information in the header of the Terrain Data Form. The other is a listing of GIS specifications related to spatial digital files recorded in section 5 (see also page iii). The final requirements for metadata are still under development. All data sets submitted to any government repository at the end of a project or contract must include metadata.

### *1.3.2 Unique polygon identification*

Each polygon must have a unique identifier. Preferably, this identifier should combine the project identifier (id) and polygon number. Alternatively, it can also include a combination of mapsheet number and polygon number. To fill out mapsheet number follow guidelines in 'Describing Ecosystems in the Field', as in Table 1-1.

---

**Note:** Do not use the MoF 20 chain mapsheet delineation.

---

***Table 1-1 - Map Number Recording Convention***

| **MAP SERIES** | | **MAPSHEET #** |
|---|---|---|
| **NTS series or BCGS series - 1:125 000 or 1:100 000 scale** | | |
| 92F/NW | 1:250 | 1 0 3 F \| N W _ \| _ |
| | | |
| **NTS series or BCGS series - 1:50 000 scale and larger** | | |
| NTS series- 92F/4E | 1:50 | _ 9 2 F \| _ 4 E \| _ |
| BCGS series - 1:20 000 scale 92F.057 | 1:20 | _ 9 2 F \| 0 5 7 \| _ |
| BCGS series - 1:10 000 scale 92F.057.2 | 1:10 | _ 9 2 F \| 0 5 7 \| 2 |

# 2. Completing the Terrain Data Form

## *2.1 Conventions*

This section of the document defines the conventions used in Table 2-1 and provides a detailed field description. An example of a 'data form' in Excel format is in Section 3, for terrain data capture application, see page ii for http site address.

The following description of allowable codes and fields relate to data entry procedures when used on a variety of terrain polygon databases. They apply to all terrain, slope stability and terrain data or a part of terrestrial ecosystem mapping and to some project specific codes.

### *2.1.1 Field Length*

The maximum number of characters which may be entered for a given item. There are two general modes, shown by the following examples.

**4** A 4-character field, no implied data type.

**6,2** 6-character field, numeric data implied, with three characters preceding the decimal point and two characters following (the decimal point counts as a character).The number 1 2 3 . 1 2 has a field length of 6,2.

### *2.1.2 Type*

A reference to one of the following three categories of data.

**n** *Numeric characters*. These are the ten digits 0–9, plus decimal points and leading blanks, for example, 1 0 and 0 1 0 are equivalent. (The entry 1 is not allowed). After the decimal use zeroes, not blanks. Decimals must be entered to the required precision. (For example if the standards specify data in tenths of units, enter 10 cm as 1 0 . 0).

**a** *Alphabetic characters*. These are the twenty-six letters of the alphabet plus the blank character.

**an** *Alphanumeric characters*. These include all numeric and alphabetic characters.

**c** *All possible characters*. These include numeric, alphabetic characters and special characters, such as / ' ; - =

### *2.1.3 Format*

A reference to one of the following two categories of data storage.

**x** *Fixed* - the position of each character of the data element is directly connotative. All numeric entries for example are fixed. Fixed format data can be readily used in sorting or analytic procedures. Specific edit procedures can usually be established for fixed format data.

**e** *Free* - the position of each character of the data element is *not* connotative. All 'comments' and 'notes' entries are free. Free-format data may appear in a report or description of a site but usually is not easily used in sorting or analytic procedures. Specific edit procedures usually *cannot* be established for free format data. (Exception: for Terrestrial Ecosystem projects, a certain number of the leading characters of a free format entry may be considered as fixed if special arrangements are made with the systems analyst in the Wildlife Inventory Section of the Resource Inventory Branch. Thus, with certain modifications, mineral potential or soil compaction ratings for example may be entered as fixed format data in fields that would be designated a 'comments' or 'notes' item).

### *2.1.4 Justification*

A reference to one of the following two forms of data entry.

**l** *Left justified.* The data is entered in the left-hand most part of the field. If for example the field length is 6 and the letters to be entered are ACK, then left justification would appear as follows: A C K . Normally, alphabetic characters are left justified.

**r** *Right justified.* The data is entered in the right-hand most part of the field. Right justification would appear as follows: 1 1 5. Normally, numeric characters are right justified.
Fields which require a decimal are always right justified for the decimal part of the number. In this case the decimal part of the number must always be completed; thus, a slope of five percent would be entered as 5.0 .
Alphanumeric characters are right justified. See Table 2-1.

### *2.1.5 Case*

A reference to one of the following two forms of character.

u *Uppercase.* The data must appear in uppercase characters. Uppercase characters would appear as follows: CWH

l *Lowercase.* The data must appear in lowercase characters. Lowercase characters would appear as follows: dx

### *2.1.6 Field Description*

The Field Description includes the 4 specification parts: type, format, justification, and case (where type is character) as shown by the example: c-x-l-l indicates -character data- of a -fixed format-, -left justified- and -lowercase- note, lowercase will always be in the fourth position. Numeric fixed entries with decimals are right justified and filled with zeroes on the right, as discussed above; a case code is not given for them in the tables which follow.

## *2.2 Field Definitions*

In Table 2-1, items 1 through 14 refer to the Terrain Polygon Metadata fields (project data) and items 15 through 105 refer to the descriptions of Terrain Polygon Data fields (terrain classifications). Refer to the form layout in section 3. Except for the mapsheet number, these attributes must be consistent throughout a terrain mapping project, and need only be provided once for the entire project. The project number and/or name should be entered on every form in order to keep the project data forms or records together. Where the terrain polygons are being mapped on a mapsheet basis, the mapsheet number should be filled in. If the polygons are being mapped *and* numbered on a mapsheet/project basis, the mapsheet number *must* be filled in, and every polygon on the data form must fall on the specified mapsheet.

The last column shows the name of the corresponding attribute in the comma-separated values (CSV) file for the CSV Terrain Data (Format) Deliverable.

Some fields require the mapper to choose from a specific set of values. The description column for each of these fields indicate the code table to use. Lists of valid codes for each field are given in section 2.3, ‘Codes, names and definitions’.

- Table 2-2 provides instructions on recording text in the header of the terrain dataform (for example, legend types and sources).
- Table 2-3 provides codes and terms for identifying the terrain survey intensity level.
- Table 2-4 through Table 2-30 provide terms and codes related to standardized terrain classification.

***Table 2-1 - Description of Terrain Mapping Project Data***

| Item # | Terrain Data Form Field Name | Coding Instructions | Field Length | Field Descrip | CSV Attribute Name |
|---|---|---|---|---|---|
| **Note:** The first 14 items refer to the metadata in the header of the Terrain Polygon Data Form. | | | | | |
| 1 | Project Name | The common name of the project, usually a well known local place or feature. See Table 2-2. | 40 | c-e-l | Proj_Name |
| 2 | Geographic Location | The geographic area of the mapping project. See Table 2-2. | 40 | an-e-l | Geog_Loc |
| 3 | Consultant/ Department | The government department or private sector company that is responsible for the current terrain mapping project. See Table 2-2. | 40 | c-e-l | Org_Name |
| 4 | Mapper Name | The geologist or geomorphologist who is doing the mapping. Where there is more than one mapper working on a project, the name of the project leader. See Table 2-2. | 30 | c-e-l | Mapper |
| 5 | Legend Type(s) | The type of legend associated with the map; refer to the *Terrain Mapping Methodology* (RIC) for legend format and specifications. Indicate one of the following with an 'x': General, Short, Terrain stability, Other/Custom. See Legend Type Code Table, Table 2-2. | 3 | c-x | Leg_Type |
| 6 | Legend Source | The origin of a customized legend. See Table 2-2. | 50 | c-e-l | Leg_Src |
| 7 | Map Scale | The scale on which the original terrain polygons were captured. See Table 2-2. | 8 | n-e-r | Scale |
| 8 | Terrain Survey Intensity Level | The extent to which the terrain mapping for the current project has been checked on the ground. See Table 2-3. | 1 | a-x-u | Tsil |
| 9 | Date Surveyed | The date on which the terrain mapping for the project was completed. Format: *dd-mmm-yy.* See Table 2-2. | 9 | c-x-r | Surv_Date |
| 10 | Date Recorded | The date on which of the project and polygon mapping was completed and entered into a Database. Format: dd-mmm-yy. | 9 | c-x-r | Rec_Date |
| 11 | Recorder Name | The person who originally entered the terrain map data electronically. | 30 | c-e-l | Rec_Name |
| 12 | Slope Units | The type of units, if slope classes were done for this database, percent or degrees denoting slope steepness. The same units must be used for all slope steepness values in a given project. Indicate one of the following with a (P) Percent, (D) Degrees or (N) Null. See Table 2-2 and See Table 2-17. | 1 | c-x-l | Slp_Unit |
| 13 | Stability. Classification Type | The classification system used to classify slope stability for the current project. Indicate only one of the following with an (R) Recon, (D) Detailed, or (E) Es. See Tables 2-18 - 2-20. | 1 | c-x-l | Stbcls_Tp |
| 14 | Comments | This field may be used to record any pertinent information regarding the project. At all times attempt to use referenced classifications which are well defined and understood in the science, or provide thorough definitions for the user. This project specific data will be stored in flat file format, unless keyword or standard designations are required, then contact the data custodian. The data custodian will keep records of new or additional classifications, which are commonly used for project specific applications. | 300 | c-e-l | Comments |

| Item # | Terrain Data Form Field Name | Coding Instructions | Field Length | Field Descrip | CSV Attribute Name |
|---|---|---|---|---|---|
| **Note:** Items 15 through 105 refer to the attributes on the Terrain Polygon Data Form. | | | | | |
| 15 | Polygon Number | An identifier each polygon being mapped. Polygons may be numbered within projects or within projects and mapsheets, depending on the preference of the lead mapper. | 8 | n-e-r | Poly_Nbr |
| 16 | Project Identification | A unique identifier for each project being delivered within a single contract. If only one project is being delivered, no project identifier is required. This variable allows any mapping metadata (TSIL for example) to be specified for the project as a whole. See section 4 and Table 2-2. | 5 | an-x-l | Proj_ID |
| 17 | Mapsheet Number | Where the project mapping falls entirely within a single mapsheet, the number of the mapsheet. See Table 1-1. | 9 | an-x-l | Mapsh_ Nbr |
| 18 | Decile of Terrain Component 1 | Describes the proportion of the polygon covered by Component 1, in deciles.<br>Note: The deciles of Components 1–3 must total 10 (i.e., 5–3–2 or 6–4, if the first two deciles total 10 then the third decile is not filled out). Decile 1 must be greater or equal to decile 2, which must be greater or equal to decile 3. No decile = 100% (1st component only). See Table 2-14. | 2 | n-x-r | Tdec_1 |
| 19 | Partial Cover Flag of Component 1 | A single slash '/' indicates that the overlying material in the terrain component only partially covers the underlying material. It means a moderately extensive but discontinous cover of surface material. Eolian veneer is an example.<br>*Note this is a new term added to the Terrain Classification Manual, Howes and Kenk, Version 2.0* | 1 | c-x-l | Prtflg_1 |
| 20 | Surficial Material Texture of Component 1 | The standard terrain texture at the surface. The size, shape and sorting of particles in clastic sediments (or the proportion and degree of decomposition of plant fibre in organic sediments) in the first stratum of the terrain component 1 in the current terrain polygon.<br>Indicated by 1–3 lowercase letters. The dominant (1), secondary (2), and tertiary (3) standard textures found in a stratigraphic unit are entered as 3, 2, 1 (see *the Terrain Classification Manual, Howes and Kenk, Version 2.0*). If only one or two textures are given, the remaining spaces are left blank. See Table 2-5. | 3 | c-x-r-l | Ttex_1 |
| 21 | Surficial Material of Component 1 | The formative geomorphological process of the first stratum of surficial material of component 1 of the current terrain polygon. See Table 2-6. | 2 | c-x-l-u | Surfm_1 |
| 22 | Surficial Material Qualifier of Component 1 | A code used to specify whether the formative geomorphological process of the first stratum of surficial deposit of component 1 is currently 'active' ('A') or 'inactive' ('I'). The assumed status is not recorded.<br>Note: 'G' is now coded directly with the genetic material (see previous item). See Table 2-7. | 1 | c-x-l-u | Surfm_Q1 |
| 23 | Surficial Material Subtype of Component 1 | A project-specific code for the subtype of the surficial material in the first stratum of the component of the current terrain polygon. A surficial material subtype is distinguished by characteristics that cannot be adequately represented by standard terrain classes. See Table 2-29. | 1 | n-x-r | Surfm_St1 |

| Item # | Terrain Data Form Field Name | Coding Instructions | Field Length | Field Descrip | CSV Attribute Name |
|---|---|---|---|---|---|
| 24 | Surface Expression of Component 1 | A series of 1–3 lowercase letter codes used in combination to describe the three-dimensional shape of the upper surface and the thickness of the first stratum in the component of the current terrain polygon. The first code is the most dominant surface expression. See Table 2-8. | 3 | c-x-l-l | Surf_E1 |
| 25 | Bedrock Type of Component 1 | The type of bedrock in the terrain component. (This is only applicable where surficial material is of origin type 'R'). See Table 2-4.<br>*These bedrock classes are new to the Terrain Classification System.* The intent of using the bedrock code is to provide auxiliary information, as to help qualify texture and/or terrain stability information. It is not intended to provide bedrock stratigraphy. | 2 | c-x-l-l | Bedrock_1 |
| 26 | Subsurficial Material Texture of Component 1 | The standard terrain texture at the first subsurface stratum. The size, shape and sorting of particles in clastic sediments (or the proportion and degree of decomposition of plant fibre in organic sediments) in the first stratum of the terrain component 1 in the current terrain polygon.<br>Indicated by 1–3 lowercase letters. The dominant (1), secondary (2), and tertiary (3) standard textures found in a stratigraphic unit are entered as 3, 2, 1 (see *the Terrain Classification Manual, Howes and Kenk, Version 2.0*). If only one or two textures are given, the remaining spaces are left blank. See Table 2-5. | 3 | c-x-r-l | Sttex_1 |
| 27 | Subsurficial Material of Component 1 | A code representing the formative geomorphological process of the first subsurface stratum of surficial material of the first component of the current terrain polygon.<br>Note: There is now provision for the coding of two subsurface materials, for each component in this database. It is expected however that the bulk of the (RIC) mapping will only use two strata. For the mapping of deep stratigraphy the user will have to modify and/or create a custom database. See Table 2-6. | 2 | c-x-l-u | Ssurfm_1 |
| 28 | Subsurficial Material Qualifier of Component 1 | A code used to specify whether the formative geomorphological process of the subsurficial stratum of surficial deposit of component 1 is currently 'active' ('A') or 'inactive' ('I'). The assumed status is not recorded.<br>Note: 'G' is now coded directly with the genetic material (see previous item). See Table 2-7. | 1 | c-x-l-u | Ssurfm_Q1 |
| 29 | Subsurficial Material Subtype of Component 1 | A project-specific code that indicates a subclass of the genetic material in the second stratum of component 1 of the current terrain polygon. A surficial material subclass is distinguished by characteristics that cannot be adequately represented by the standard surface material origin classes. See Table 2-29. | 1 | n-x-l | Ssurfm_ St1 |
| 30 | Subsurface Expression of Component 1 | A series of 1–3 lowercase letter codes used in combination to describe the three-dimensional shape of the upper surface and the thickness of the second stratum in component 1 of the current terrain polygon. The first code is the most dominant surface expression. See Table 2-8. | 3 | c-x-l-l | Ssurf_E1 |

| Item # | Terrain Data Form Field Name | Coding Instructions | Field Length | Field Descrip | CSV Attribute Name |
|---|---|---|---|---|---|
| 31 | Sub-Subsurficial Material Texture of Component 1 | The standard terrain texture at the Sub-subsurface. The size, shape and sorting of particles in clastic sediments (or the proportion and degree of decomposition of plant fibre in organic sediments) in the third stratum of the terrain component 1 in the current terrain polygon.<br>Indicated by 1–3 lowercase letters. The dominant (1), secondary (2), and tertiary (3) standard textures found in a stratigraphic unit are entered as 3, 2, 1 (see *the Terrain Classification Manual, Howes and Kenk, Version 2.0*). If only one or two textures are given, the remaining spaces are left blank. See Table 2-5. | 3 | c-x-r-l | Tttex_1 |
| 32 | Sub-Subsurficial Material of Component 1 | The formative geomorphological process of the Sub-substratum of surficial material of component 1 of the current terrain polygon. See Table 2-6. | 2 | c-x-l-u | Tsurfm_1 |
| 33 | Sub-Subsurficial Material Qualifier of Component 1 | A code used to specify whether the formative geomorphological process of the first stratum of surficial deposit of component 1 is currently 'active' ('A') or 'inactive' ('I'). The assumed status is not recorded.<br>Note: 'G' is now coded directly with the genetic material (see previous item). See Table 2-7. | 1 | c-x-l-u | Tsurfm_ Q1 |
| 34 | Sub-Subsurficial Material Subtype of Component 1 | A project-specific code for the subtype of the surficial material in the Sub-substratum of the component of the current terrain polygon. A surficial material subtype is distinguished by characteristics that cannot be adequately represented by standard terrain classes. See Table 2-29. | 1 | n-x-r | Tsurfm_ St1 |
| 35 | Sub-Subsurface Expression of Component 1 | A series of 1–3 lowercase letter codes used in combination to describe the three-dimensional shape of the upper surface and the thickness of the Sub-substratum in the component of the current terrain polygon. The first code is the most dominant surface expression. See Table 2-8. | 3 | c-x-l-l | Tsurf_E1 |
| 36 | Relation of Component 1 and 2 | A general indicator of the relative areal proportions of the first and second components within the current terrain polygon. (Note - These proportional indicators are frequently used in place of percentiles. Bioterrain mapping however usually specifies the use of percentiles). See Table 2-14. | 2 | c-x-l | Comrel1_2 |
| 37 | Decile of Terrain Component 2 | Describes the proportion of the polygon covered by Component 2, in deciles.<br>Note: The deciles of Components 1–3 must total 10 (i.e., 5–3–2 or 6–4, if the first two decile total 10 then the third decile is not filled out). Decile 1 must be greater or equal to decile 2, which must be greater or equal to decile 3. The dominant component of surficial material(s) in a terrain polygon; designated by a decile, (8 means 80%; no entry means 100%) See Table 2-14. | 2 | n-x-r | Tdec_2 |
| 38 | Partial Cover Flag of Component 2 | A single slash '/' indicates that the overlying material in the terrain component only partially covers the underlying material. Eolian veneer is an example.<br>*Note this is a new term added to the Terrain Classification Manual, Howes and Kenk, Version 2.0.* | 1 | c-x-l | Prtflg_2 |

| Item # | Terrain Data Form Field Name | Coding Instructions | Field Length | Field Descrip | CSV Attribute Name |
|---|---|---|---|---|---|
| 39 | Surficial Material Texture of Component 2 | The standard terrain texture at the surface. The size, shape and sorting of particles in clastic sediments (or the proportion and degree of decomposition of plant fibre in organic sediments) in the first stratum of the terrain component 2 in the current terrain polygon.<br>Indicated by 1–3 lowercase letters. The dominant (1), secondary (2), and tertiary (3) standard textures found in a stratigraphic unit are entered as 3, 2, 1 (see *the Terrain Classification Manual, Howes and Kenk, Version 2.0*). If only one or two textures are given, the remaining spaces are left blank. See Table 2-5. | 3 | c-x-r-l | Ttex_2 |
| 40 | Surficial Material of Component 2 | The formative geomorphological process of the first stratum of surficial material of component 2 of the current terrain polygon. See Table 2-6. | 2 | c-x-l-u | Surfm_2 |
| 41 | Surficial Material Qualifier of Component 2 | A code used to specify whether the formative geomorphological process of the first stratum of surficial deposit of component 2 is currently ‘active’ (‘A’) or ‘inactive’ (‘I’). The assumed status is not recorded.<br>Note: ‘G’ is now coded directly with the genetic material (see previous item). See Table 2-7. | 1 | c-x-l-u | Surfm_Q2 |
| 42 | Surficial Material Subtype of Component 2 | A project-specific code for the subtype of the surficial material in the first stratum of component 2 of the current terrain polygon. A surficial material subtype is distinguished by characteristics that cannot be adequately represented by standard terrain classes. See Table 2-29. | 1 | n-x-r | Surfm_St2 |
| 43 | Surface Expression of Component 2 | A series of 1–3 lowercase letter codes used in combination to describe the three-dimensional shape of the upper surface and the thickness of the first stratum in the component of the current terrain polygon. The first code is the most dominant surface expression. See Table 2-8. | 3 | c-x-l-l | Surf_E2 |
| 44 | Bedrock Type of Component 2 | The type of bedrock in the terrain component. (This is only applicable where surficial material is of origin type ‘R’). See Table 2-4.<br>*These bedrock classes are new to the Terrain Classification System.* The intent of using the bedrock code is to provide auxiliary information, as to help qualify texture and/or terrain stability information. It is not intended to provide bedrock stratigraphy. | 2 | c-x-l-l | Bedrock_2 |
| 45 | Subsurficial Material Texture of Component 2 | The standard terrain texture at the first subsurface stratum. The size, shape and sorting of particles in clastic sediments (or the proportion and degree of decomposition of plant fibre in organic sediments) in the first stratum of terrain component 2 in the current terrain polygon.<br>Indicated by 1–3 lowercase letters. The dominant (1), secondary (2), and tertiary (3) standard textures found in a stratigraphic unit are entered as 3, 2, 1 (see *the Terrain Classification Manual, Howes and Kenk, Version 2.0*). If only one or two textures are given, the remaining spaces are left blank. See Table 2-5. | 3 | c-x-r-l | Sttex_2 |

| Item # | Terrain Data Form Field Name | Coding Instructions | Field Length | Field Descrip | CSV Attribute Name |
|---|---|---|---|---|---|
| 46 | Subsurficial Material of Component 2 | A code representing the formative geomorphological process of the first subsurface stratum of surficial material of component 2 of the current terrain polygon.<br>Note: There is only provision for the coding of one subsurface material, for each component in this database. For the mapping of stratigraphy the user will have to modify and/or create a custom database. See Table 2-6. | 2 | c-x-l-u | Ssurfm_2 |
| 47 | Subsurficial Material Qualifier of Component 2 | A code used to specify whether the formative geomorphological process of the subsurficial stratum of surficial deposit of component 2 is currently 'active' ('A') or 'inactive' ('I'). The assumed status is not recorded.<br>Note: 'G' is now coded directly with the genetic material (see previous item). See Table 2-7. | 1 | c-x-l-u | Ssurfm_Q2 |
| 48 | Subsurficial Material Subtype of Component 2 | A project-specific code that indicates a subclass of the genetic material in the second stratum of component 2 of the current terrain polygon. A surficial material subclass is distinguished by characteristics that cannot be adequately represented by the standard surface material origin classes. See Table 2-29. | 1 | n-x-r | Ssurfm_ St2 |
| 49 | Subsurface Expression of Component 2 | A series of 1–3 lowercase letter codes used in combination to describe the three-dimensional shape of the upper surface and the thickness of the second stratum in component 2 of the current terrain polygon. The first code is the most dominant surface expression. See Table 2-8. | 3 | c-x-l-l | Ssurf_E2 |
| 50 | Sub-Subsurficial Material Texture of Component 2 | The standard terrain texture at the Sub-subsurface. The size, shape and sorting of particles in clastic sediments (or the proportion and degree of decomposition of plant fibre in organic sediments) in the third stratum of the terrain component 2 in the current terrain polygon.<br>Indicated by 1–3 lowercase letters. The dominant (1), secondary (2), and tertiary (3) standard textures found in a stratigraphic unit are entered as 3, 2, 1 (see *the Terrain Classification Manual, Howes and Kenk, Version 2.0*). If only one or two textures are given, the remaining spaces are left blank. See Table 2-5. | 3 | c-x-r-l | Tttex_2 |
| 51 | Sub-Subsurficial Material of Component 2 | The formative geomorphological process of the Sub-substratum of surficial material of component 2 of the current terrain polygon. See Table 2-6. | 2 | c-x-l-u | Tsurfm_2 |
| 52 | Sub-Subsurficial Material Qualifier of Component 2 | A code used to specify whether the formative geomorphological process of the first stratum of surficial deposit of component 2 is currently 'active' ('A') or 'inactive' ('I'). The assumed status is not recorded.<br>Note: 'G' is now coded directly with the genetic material (see previous item). See Table 2-7. | 1 | c-x-l-u | Tsurfm_ Q2 |
| 53 | Sub-Subsurficial Material Subtype of Component 2 | A project-specific code for the subtype of the surficial material in the Sub-substratum of the component of the current terrain polygon. A surficial material subtype is distinguished by characteristics that cannot be adequately represented by standard terrain classes. See Table 2-29. | 1 | n-x-r | Tsurfm_ St2 |

| Item # | Terrain Data Form Field Name | Coding Instructions | Field Length | Field Descrip | CSV Attribute Name |
|---|---|---|---|---|---|
| 54 | Sub-Subsurface Expression of Component 2 | A series of 1–3 lowercase letter codes used in combination to describe the three-dimensional shape of the upper surface and the thickness of the Sub-substratum in the component of the current terrain polygon. The first code is the most dominant surface expression. See Table 2-8. | 3 | c-x-l-l | Tsurf_E2 |
| 55 | Relation of Component 2 and 3 | A general indicator of the relative areal proportions of the second and third components of the current terrain polygon. See Table 2-14. | 2 | c-x-l | Comrel2_3 |
| 56 | Decile of Terrain Component 3 | Describes the proportion of the polygon covered by Component 3, in deciles.<br>Note: The deciles of Components 1–3 must total 10 (i.e., 5–3–2 or 6–4, if the first two deciles total 10 then the third decile is not filled out). Decile 1 must be greater or equal to decile 2, which must be greater or equal to decile 3. The dominant component of surficial material(s) in a terrain polygon; designated by a decile, (8 means 80%; no entry means 100%) | 2 | n-x-r | Tdec_3 |
| 57 | Partial Cover Flag of Component 3 | A single slash '/' indicates that the overlying material in the terrain component only partially covers the underlying material. Eolian veneer is an example.<br>*Note this is a new term added to the Terrain Classification Manual, Howes and Kenk, Version 2.0.* | 1 | c-x-l | Prtflg_3 |
| 58 | Surficial Material Texture of Component 3 | The standard terrain texture at the surface. The size, shape and sorting of particles in clastic sediments (or the proportion and degree of decomposition of plant fibre in organic sediments) in the first stratum of the terrain component 3 in the current terrain polygon.<br>Indicated by 1–3 lowercase letters. The dominant (1), secondary (2), and tertiary (3) standard textures found in a stratigraphic unit are entered as 3, 2, 1 (see *the Terrain Classification Manual, Howes and Kenk, Version 2.0*). If only one or two textures are given, the remaining spaces are left blank. See Table 2-5. | 3 | c-x-r-l | Ttex_3 |
| 59 | Surficial Material of Component 3 | The formative geomorphological process of the first stratum of surficial material of component 3 of the current terrain polygon. See Table 2-6. | 2 | c-x-l-u | Surfm_3 |
| 60 | Surficial Material Qualifier of Component 3 | A code used to specify whether the formative geomorphological process of the first stratum of surficial deposit of component 3 is currently 'active' ('A') or 'inactive' ('I'). The assumed status is not recorded.<br>Note: 'G' is now coded directly with the genetic material (see previous item). See Table 2-7. | 1 | c-x-l-u | Surfm_Q3 |
| 61 | Surficial Material Subtype of Component 3 | A project-specific code for the subtype of the surficial material in the first stratum of component 3 of the current terrain polygon. A surficial material subtype is distinguished by characteristics that cannot be adequately represented by standard terrain classes. See Table 2-29. | 1 | n-x-r | Surfm_St3 |

| Item # | Terrain Data Form Field Name | Coding Instructions | Field Length | Field Descrip | CSV Attribute Name |
|---|---|---|---|---|---|
| 62 | Surface Expression of Component 3 | A series of 1–3 lowercase letter codes used in combination to describe the three-dimensional shape of the upper surface and the thickness of the first stratum in the component of the current terrain polygon. The first code is the most dominant surface expression. See Table 2-8. | 3 | c-x-l-l | Surf_E3 |
| 63 | Bedrock Type of Component 3 | The type of bedrock in the terrain component. (This is only applicable where surficial material is of origin type 'R'). See Table 2-4.<br>*These bedrock classes are new to the Terrain Classification System.* The intent of using the bedrock code is to provide auxiliary information, as to help qualify texture and/or terrain stability information. It is not intended to provide bedrock stratigraphy. | 2 | c-x-l-l | Bedrock_3 |
| 64 | Subsurficial Material Texture of Component 3 | The standard terrain texture at the first subsurface stratum. The size, shape and sorting of particles in clastic sediments (or the proportion and degree of decomposition of plant fibre in organic sediments) in the first stratum of terrain component 3 in the current terrain polygon.<br>Indicated by 1–3 lowercase letters. The dominant (1), secondary (2), and tertiary (3) standard textures found in a stratigraphic unit are entered as 3, 2, 1 (see *the Terrain Classification Manual, Howes and Kenk, Version 2.0*). If only one or two textures are given, the remaining spaces are left blank. See Table 2-5. | 3 | c-x-r-l | Sttex_3 |
| 65 | Subsurficial Material of Component 3 | A code representing the formative geomorphological process of the first subsurface stratum of surficial material of component 3 of the current terrain polygon.<br>Note: There is only provision for the coding of one subsurface material, for each component in this database. For the mapping of stratigraphy the user will have to modify and/or create a custom database. See Table 2-6. | 2 | c-x-l-u | Ssurfm_3 |
| 66 | Subsurficial Material Qualifier of Component 3 | A code used to specify whether the formative geomorphological process of the subsurficial stratum of surficial deposit of component 3 is currently 'active' ('A') or 'inactive' ('I'). The assumed status is not recorded.<br>Note: 'G' is now coded directly with the genetic material (see previous item). See Table 2-7. | 1 | c-x-l-u | Ssurfm_Q3 |
| 67 | Subsurficial Material Subtype of Component 3 | A project-specific code that indicates a subclass of the genetic material in the second stratum of component 3 of the current terrain polygon. A surficial material subclass is distinguished by characteristics that cannot be adequately represented by the standard surface material origin classes. See Table 2-29. | 1 | n-x-r | Ssurfm_ St3 |
| 68 | Subsurface Expression of Component 3 | A series of 1–3 lowercase letter codes used in combination to describe the three-dimensional shape of the upper surface and the thickness of the second stratum in component 3 of the current terrain polygon. The first code is the most dominant surface expression. See Table 2-8. | 3 | c-x-l-l | Ssurf_E3 |

| Item # | Terrain Data Form Field Name | Coding Instructions | Field Length | Field Descrip | CSV Attribute Name |
|---|---|---|---|---|---|
| 69 | Sub-Subsurficial Material Texture of Component 3 | The standard terrain texture at the Sub-subsurface. The size, shape and sorting of particles in clastic sediments (or the proportion and degree of decomposition of plant fibre in organic sediments) in the third stratum of the terrain component 1 in the current terrain polygon.<br>Indicated by 1–3 lowercase letters. The dominant (1), secondary (2), and tertiary (3) standard textures found in a stratigraphic unit are entered as 3, 2, 1 (see *the Terrain Classification Manual, Howes and Kenk, Version 2.0*). If only one or two textures are given, the remaining spaces are left blank. See Table 2-5. | 3 | c-x-r-l | Tttex_3 |
| 70 | Sub-Subsurficial Material of Component 3 | The formative geomorphological process of the Sub-substratum of surficial material of component 3 of the current terrain polygon. See Table 2-6. | 2 | c-x-l-u | Tsurfm_3 |
| 71 | Sub-Subsurficial Material Qualifier of Component 3 | A code used to specify whether the formative geomorphological process of the first stratum of surficial deposit of component 3 is currently 'active' ('A') or 'inactive' ('I'). The assumed status is not recorded.<br>Note: 'G' is now coded directly with the genetic material (see previous item). See Table 2-7. | 1 | c-x-l-u | Tsurfm_ Q3 |
| 72 | Sub-Subsurficial Material Subtype of Component 3 | A project-specific code for the subtype of the surficial material in the Sub-substratum of the component of the current terrain polygon. A surficial material subtype is distinguished by characteristics that cannot be adequately represented by standard terrain classes. See Table 2-29. | 1 | n-x-r | Tsurfm_ St3 |
| 73 | Sub-Subsurface Expression of Component 3 | A series of 1–3 lowercase letter codes used in combination to describe the three-dimensional shape of the upper surface and the thickness of the Sub-substratum in the component of the current terrain polygon. The first code is the most dominant surface expression. See Table 2-8. | 3 | c-x-l-l | Tsurf_E3 |
| 74 | Polygon Number | A repeat of the polygon number on the first page of the form. Repeated on the second page to facilitate correct data entry, only if this type of spreadsheet/database is used. | 5 | n-e-r | Poly_Nbr |
| 75 | 1st Geomorphological Process Class | An uppercase letter representing the sole or most significant geomorphological process to affect terrain within the current polygon.<br>*A new process has been added to the Terrain Classification Manual,* Howes and Kenk, *Version 2.0; 'L' indicating active seepage*. See Table 2-9. | 1 | c-x-l-u | Geop_1 |
| 76 | 1st Process Qualifier | A code used to specify whether the first geomorphologic process of the polygon is currently 'active ('A'), or 'inactive' ('I'). See Table 2-7. | 1 | c-x-l-u | Geop_Q1 |
| 77 | 1st Process Subtype | A project-specific numeric code used to further specify the first geomorphological process within the current terrain polygon. Project specific subtypes of the standard geomorphological processes may be established to distinguish characteristics that cannot be adequately represented by the standard process classes alone. These subtypes should be described in the terrain legend. See Table 2-30. | 1 | n-x-r | Geop_St1 |

| Item # | Terrain Data Form Field Name | Coding Instructions | Field Length | Field Descrip | CSV Attribute Name |
|---|---|---|---|---|---|
| 78 | 1st Process Subclass | 1–3 standard lower case letters attached to the first geomorphological process within the current terrain polygon. Subclass modifiers are used to further describe the process. They are usually mapped at a more detailed level. *New subclass modifiers have been added to the classification.* See Tables 2-10 - 2-13. | 3 | c-x-l-l | Geop_ Scm1 |
| 79 | 2nd Geomorphological Process Class | An uppercase letter representing the second most significant geomorphological process to affect terrain within the current polygon. See Table 2-9. | 1 | c-x-l-u | Geop_2 |
| 80 | 2nd Process Qualifier | A code used to specify whether the second geomorphologic process of the polygon is currently ‘active (‘A’), or ‘inactive’ (‘I’). See Table 2-7. | 1 | c-x-l-u | Geop_Q2 |
| 81 | 2nd Process Subtype | A project-specific numeric code used to further specify the second geomorphological process within the current terrain polygon. Project specific subtypes of the standard geomorphological processes may be established to distinguish characteristics that cannot be adequately represented by the standard process classes alone. These subtypes should be described in the terrain legend. See Table 2-30. | 1 | n-x-r | Geop_St2 |
| 82 | 2nd Process Subclass | 1–3 standard lower case letters attached to the second geomorphological process within the current terrain polygon. Subclass modifiers are used to further describe the process. They are usually mapped at a more detailed level. *New subclass modifiers have been added to the Terrain Classification Manual, Howes and Kenk, Version 2.0.* See Tables 2-10 - 2-13 | 3 | c-x-l-l | Geop_ Scm2 |
| 83 | 3rd Geomorphological Process Class | An uppercase letter representing the third most significant geomorphological process to affect terrain within the current polygon. See Table 2-9. | 1 | c-x-l-u | Geop_3 |
| 84 | 3rd Process Qualifier | A code used to specify whether the third geomorphologic process of the polygon is currently ‘active (‘A’), or ‘inactive’ (‘I’). See Table 2-7. | 1 | c-x-l-u | Geop_Q3 |
| 85 | 3rd Process Subtype | A project-specific numeric code used to further specify the third geomorphological process within the current terrain polygon. Project specific subtypes of the standard geomorphological processes may be established to distinguish characteristics that cannot be adequately represented by the standard process classes alone. These subtypes should be described in the terrain legend. See Table 2-30. | 1 | n-x-r | Geop_St3 |
| 86 | 3rd Process Subclass | 1–3 standard lower case letters attached to the third geomorphological process within the current terrain polygon. Subclass modifiers are used to further describe the process. They are usually mapped at a more detailed level. *New subclass modifiers have been added to the Terrain Classification Manual, Howes and Kenk, Version 2.0.* See Tables 2-10 - 2-13. | 3 | c-x-l-l | Geop_ Scm3 |

| Item # | Terrain Data Form Field Name | Coding Instructions | Field Length | Field Descrip | CSV Attribute Name |
|---|---|---|---|---|---|
| 87 | 1st Soil Drainage Class of Polygon | A lowercase letter that represents the soil drainage class for all or most of the current terrain polygon. Soil drainage refers to the rapidity and extent of water removal from the soil in relation to additions; this refers to the annual moisture status of the soil, not just the permeability. Codes include r, w, m, i, p, v. (see Luttmerding et al., 1990, p.43). See Table 2-15. | 1 | c-x-l-l | Drain_1 |
| 88 | Soil Drainage Separator of Polygon | Symbols used where a terrain polygon includes two areas of relatively uniform drainage, indicating the proportion of the polygon occupied by each class. The codes include a comma ‘,’ ; a dash, ‘-’; (single slash ‘/’; double slash ‘//’ :*These are not commonly used*) . See Table 2-16. | 2 | c-x-l | Drain_Sep |
| 89 | 2nd Soil Drainage Class of Polygon | A lowercase letter that represents the drainage class for less than half of the current terrain polygon. Soil drainage refers to the rapidity and extent of water removal from the soil in relation to additions (see Luttmerding et al., 1990, p.43). See Table 2-15. | 1 | c-x-l-l | Drain_2 |
| 90 | Slope: Lower Limit of Dominant Slope Range | The lower limit of the range of slopes within a terrain polygon, or, where a polygon includes distinctly gentler and steeper slopes (e.g., stepped topography), the lower limit of the slope range associated with most of the polygon. The lower limit could be 12%; data must be entered either in degrees or as a percentage, not both. See Table 2-17. | 3 | n-x-r | Slpll_1 |
| 91 | Slope: Upper Limit of Dominant Slope Range | The upper limit of the range of slopes within a terrain polygon, or where a polygon includes distinctly gentler and steeper slopes (i.e. stepped topography), the upper limit of the slope range associated with most of the polygon. The upper limit could be 27%; data must be entered either in degrees or as a percentage, not both. See Table 2-17. | 3 | n-x-r | Slpul_1 |
| 92 | Slope Relation | The relative proportion of the two terrain slopes which make up the terrain polygon. The codes are comma ‘,’ indicating two distinct slope portions, and a dash ‘-’ indicating one sloped portion grading to another. | 1 | c-x-l | Slp_Rel |
| 93 | Slope: Lower Limit of Subdominant Slope Range | The lower limit of the range of slopes within a terrain polygon, or, where a polygon includes distinctly gentler and steeper slopes (e.g., stepped topography), the lower limit of the subdominant slope range associated with the polygon. The lower limit could be 2%; data must be entered either in degrees or as a percentage, not both. See Table 2-17. | 3 | n-x-r | Slpll_2 |
| 94 | Slope: Upper Limit of Subdominant Slope Range | The upper limit of the range of slopes within a terrain polygon, or where a polygon includes distinctly gentler and steeper slopes (i.e. stepped topography), the upper limit of the subdominant slope range associated with the polygon. The upper limit could be 10%; data must be entered either in degrees or as a percentage, both. See Table 2-17. | 3 | n-x-r | Slpul_2 |

| Item # | Terrain Data Form Field Name | Coding Instructions | Field Length | Field Descrip | CSV Attribute Name |
|---|---|---|---|---|---|
| 95 | Slope Stability Class | A code representing a class of slope stability. The code must be only one of the standard codes defined, either E1or E2, Recon, or Detailed slope stability classification systems. All polygons mapped within a project must be consistently classified using the same slope stability classification system. See Tables 2-18 - 2-20. | 2 | an-x-l-u | Slpstb_Cls |
| 96 | Slope Stability Qualifier For Roads | A flag indicating class IV terrain where road construction is likely to cause landslides, but harvesting (without roads) is not likely to cause landslides (see Forest Practices Code, 1995, p.9). See Table 2-21. | 1 | a-x-l-u | Rdstb_Flg |
| 97 | Surface Erosion Potential Class | A class which indicates the likelihood of soil erosion on bare or disturbed soil after logging or road construction (e.g. from ditches or cutbanks). Surface erosion refers to the removal of soil, particle by particle, by surface runoff. It results in sheet erosion and the development of rills and gullies. See Table 2-22. | 2 | a-x-l-u | Sfcero_Pot |
| 98 | Landslide Induced Stream Sedimentation Class | A rating class indicating the likelihood of landslide-induced stream sedimentation. See Table 2-23. | 1 | n-x-r | Lssed_Cls |
| 99 | Surface Erosion Sedimentation Class | A rating class indicating the likelihood of stream sedimentation due to surface erosion. This rating is assigned by the terrain mapper on the basis of air photo interpretation with occasional field confirmation. See Table 2-24. | 2 | a-x-l-l | Sesed_Cls |
| 100 | Bouldery or Blocky Substrate of Polygon | A flag ‘b’ indicating that the ground within the current polygon is covered by sufficiently large clasts to adversely affect soil development and forest growth. This area will present severe problems for restocking after logging due to absence of topsoil. This flag was the result of discussion with forest companies. (1995, with J.M. Ryder and Geologists). See Table 2-25. | 1 | a-x-l-l | Bbsub_Flg |
| 101 | Mean Aspect of Polygon | The general direction in which the current polygon is facing, measured to the nearest degree of azimuth. See Table 2-25. | 3 | n-x-r | Mean_Asp |
| 102 | Ea Avalanche Hazard Flag | A flag indicating that timber removal from the current polygon may result in increased avalanche hazard to sites downslope. This designation is from the BC Forest Service Environmentally Sensitive Mapping Codes in the Historical Forest Cover Mapping System. See Table 2-26. | 1 | a-x-l-l | Avlhaz_ Flg |
| 103 | Polygons of Relatively Low Reliability | A flag indicating that for reasons such as cloud cover on an air photo the current polygon has been mapped with significantly less reliability than adjacent polygons. See Table 2-27. | 1 | a-x-l-u | Lowrel_ Flg |
| 104 | Field Check of Polygon | A class which describes the level of field checking done on the current polygon (detailed/reconn/visual). See Table 2-28. | 1 | a-x-l-l | Fldchktp |

| Item # | Terrain Data Form Field Name | Coding Instructions | Field Length | Field Descrip | CSV Attribute Name |
|---|---|---|---|---|---|
| 105 | Comments | This field may be used to record any pertinent information regarding the polygon. At all times attempt to use referenced classifications which are well defined and understood in the science, or provide thorough definitions for the user. This project specific data will be stored in flat file format, unless keyword or standard designations are required, then contact the data custodian. The data custodian will keep records of new or additional classifications, which are commonly used for project specific applications. | 300 | c-e-l | Comments |

## *2.3 Codes, names and definitions*

***Table 2-2 - Metadata for Header on Data Form***

| Field | Data Examples | Explanatory Notes |
|---|---|---|
| Project Name | South Chilcotin (1996) | Includes the portions of the 1996 project. |
| Project Number | 96124 | A project record number for FRBC projects (if established) |
| Geographic Location | On Chilkko River, near Hannceville | |
| Consultant/ Department | J.C. Smith; Terrain Analysis Ltd. | |
| Mapper Name | R.B. Jones P.Geo (Party Chief) | |
| Legend Type | | *General:* Standard legend, consisting of definitions or short descriptions for all classes of texture, surficial material, surface expression, and geomorphological processes, as in Howes and Kenk, Version 2.0).<br>*Short:* Legend consists of definitions for only those attributes that appear on the map(s). It should also include the reference and credit sections as outlined in *Guidelines and Standards for Terrain Mapping in BC*, (draft, 1996), with regard to marginal information for terrain maps.<br>*Terrain Stability:* A legend describing slope stability classes. See *Mapping and Assessing Terrain Stability Guidebook* (Forest Practices Code, 1995).<br>*Custom/Other:* Terrain legends that include *project-specific* definitions/descriptions, including definitions for all sub-types mapped, and terrain legends developed for interpretative maps – for example, drift exploration potential, potential erosion, and terrain hazards. The credits and references should follow *Guidelines and Standards for Terrain Mapping in BC,* (draft, 1996).<br>NOTE: for future legend descriptions and formats, see web site information at the Ministry of Employment and Investment, Geological Survey Branch or Ministry of Environment, Resources Inventory Branch. |
| Legend Source | | Used if the mapper has designed a 'generic' or custom legend for one project, and wants to use it for a subsequent project. E.g., J.M. Ryder, East Kootenay, Biophysical Project. 1975. |
| Map Scale | 1:20000 recorded as 20000 | This is the map scale at which the original data was captured, not the scale of the air photo. This should be the same scale as that submitted to the repository. |
| Mapsheet Number | 92F091 | Refer to Table 1 |
| Date Surveyed | dd-mmm-yy | (10-Apr-97) |

The terrain terms in the following tables are mainly from the *Terrain Classification System for British Columbia,* Howes and Kenk, (Version 2, 1997) unless referenced otherwise.

***Table 2-3 - Terrain Survey Intensity Levels***

| **Terrain Survey Intensity Levels** | **Scale** | **% of Polygons Field Checked** | **Field Checks per 100 ha** | **Method of Field Checking** | **Typical Objectives** |
|---|---|---|---|---|---|
| A | > 1:20 000 | 75 - 100 | > 1.5 | foot traverses | slope stability in sensitive areas: residential land planning; hazard zonation |
| B | 1:10 000 to 1:50 000 | 50 - 75 | 1.0 to 3 | foot and vehicle traverses | slope stability assessment |
| C | 1:20 000 to 1:100 000 | 25 - 50 | 0.5 to >1.0 | foot, vehicle, some flying | inventory mapping; biophysical mapping |
| D | 1;20 000 to 1:250 000 | 0 - 25 | 0 to 0.1 | vehicle and flying | regional planning; preliminary mapping |
| E | any scale | 0 | none | no field work (airphoto interp. only) | general reconnaissance |
| RIC, *Guidelines and Standards for Terrain Mapping in British Columbia* (draft, 1996). | | | | | |

***Table 2-4 - Bedrock Classification Codes*** [1]

**Sedimentary Rocks**

| | General | Code | Specific | Code |
|---|---|---|---|---|
| Clastic, Calcareous | Fine Grained: | **kf** | Calcareous Siltstone<br>Calcareous Mudstone<br>Calcareous Shale | **kz**<br>**kd**<br>**kh** |
| | Medium Grained: | **km** | Calcareous Greywacke<br>Calcareous Arkose<br>Calcareous Sandstone | **kg**<br>**ka**<br>**ks** |
| | Coarse Grained: | **kc** | Calcareous Conglomerate<br>Calcareous Breccia | **kn**<br>**kb** |
| Clastic, Non-Calcareous | Fine Grained: | **uf** | Siltstone<br>Mudstone<br>Shale | **zl**<br>**md**<br>**sh** |
| | Medium Grained: | **um** | Sandstone<br>Greywacke<br>Arkose | **ss**<br>**gk**<br>**ak** |
| | Coarse Grained : | **uc** | Conglomerate<br>Breccia | **cg**<br>**bx** |
| Precipitates, Crystalline | Calcareous : | **pk** | Travertine<br>Limestone<br>Dolomite | **tv**<br>**ls**<br>**do** |
| | Non-Calcareous: | **pu** | Gypsum<br>Limonite<br>Barite | **gy**<br>**li**<br>**ba** |
| Organic | Calcareous :<br>Carbonaceous: | **ok**<br>**oc** | Marl<br>Lignite<br>Coal | **ma**<br>**lg**<br>**co** |

[1] These codes are new to the terrain classification system; they are based on *Describing Ecosystems in the Field* (1990), Table 2.14.

Note: these terms are recorded on the terrain maps as ‘umR’ or ‘coR’.

*The bedrock code applies only once per component, either to an ’R’ occurring in the surface material or to an ‘R’ in the subsurface and sub-subsurface material.*

**Table 2-4 - cont.**[1]
**Igneous Rocks**

| | | | | |
|---|---|---|---|---|
| Intrusive | Acid (Felsic): | **ia** | Syenite | **sy** |
| | | | Granite | **gr** |
| | | | Quartz Monzonite | **qm** |
| | | | Granodiorite | **gd** |
| | Intermediate: | **ii** | Quartz Diorite | **qd** |
| | | | Diorite | **di** |
| | BASIC (Mafic): | **ib** | Quartz Gabbro | **qg** |
| | | | Gabbro | **gb** |
| | | | Pyroxenite | **py** |
| | | | Dunite | **du** |
| Extrusive | Acid (Felsic): | **ea** | Trachyte | **tr** |
| | | | Rhyolite | **rh** |
| | | | Dacite | **da** |
| | Intermediate: | **ei** | Andesite | **an** |
| | BASIC (Mafic): | **eb** | Quartz Basalt | **qb** |
| | | | Basalt | **bs** |
| | Recent Lava Flow | **la** | | |
| | Pyroclastic: | **ep** | Tuff | **tu** |
| | | | Volcanic Breccia | **vb** |
| | | | Agglomerate | **ag** |

[1] These codes are new to the terrain classification system; they are based on *Describing Ecosystems in the Field* (1990), Table 2.14.

Note: these terms are recorded on the terrain maps as ‘umR’ or ‘coR’.

*The bedrock code applies only once per component, either to an ‘R’ occurring in the surface material or to an ‘R’ in the subsurface and sub-subsurface material.*

**Table 2-4 - cont.[1]**
**Metamorphic Rocks**

| | | | | |
|---|---|---|---|---|
| Foliated | Fine Grained: | **ff** | Slate<br>Phyllite | **sl**<br>**ph** |
| | Medium to Coarse Grained: | **fm** | Schist<br>Gneiss<br>Granite Gneiss<br>Diorite Gneiss | **sc**<br>**gn**<br>**gg**<br>**dg** |
| | Coarse Grained: | **fc** | Migmatite | **mi** |
| Non-Foliated | Fine Grained: | **nf** | Argillite<br>Serpentinite | **ar**<br>**sp** |
| | Medium to Coarse Grained: | **nm** | Quartzite<br>Hornfels<br>Granulite | **qt**<br>**hf**<br>**gl** |
| | Coarse Grained: | **nc** | Amphibolite<br>Hornblendite | **am**<br>**hb** |
| | Calcareous: | **nk** | Marble<br>Dolomite Marble<br>Serpentine Marble | **mb**<br>**dm**<br>**sm** |

[1] These codes are new to the terrain classification system; they are based on *Describing Ecosystems in the Field* (1990), Table 2.14.

Note: these terms are recorded on the terrain maps as ‘umR’ or ‘coR’.

*The bedrock code applies only once per component, either to an ‘R’ occurring in the surface material or to an ‘R’ in the subsurface and sub-subsurface material.*

***Table 2-5 - Terrain Texture Codes***

| Code | Name | Size(mm) | Other Characteristics |
|---|---|---|---|
| **a** | blocks | >256 | angular particles |
| **b** | boulders | >256 | rounded and subrounded particles |
| **k** | cobble | 64-256 | rounded and subrounded particles |
| **p** | pebbles | 2-64 | rounded and subrounded particles |
| **s** | sand | 0.062-2.000 | - |
| **[1]z** | silt | 0.002-0.062 | - |
| **c** | clay | <0.002 | - |
| **d** | mixed fragments | >2 | mix of rounded and angular particles |
| **g** | gravel | >2 | mix of boulders, cobbles and pebbles |
| **x** | angular fragments | >2 | mix of rubble and fragments blocks |
| **r** | rubble | 2-256 | angular particles |
| **m** | mud | <0.062 | mix of clay and silt and minor fraction of sand |
| **y** | shells | - | shells or shell fragments |
| **e** | fibric | - | well-preserved fibre; (40%) identified after rubbing |
| **u** | mesic | - | intermediate composition between fibric and humic |
| **h** | humic | - | decomposed organic material; < (10%) fibres identified after rubbing |

[1]New codes, 1997

***Table 2-6 - Surficial Material Codes***

| Code | Name | (Assumed Status of Formative Process) | Description |
|---|---|---|---|
| **A** | anthropogenic | (A) | Man-made or man-modified material |
| **C** | colluvium | (A) | Products of mass wastage |
| **D** | weathered bedrock | (A) | In situ, decomposed bedrock |
| **E** | eolian | (I) | Materials deposited by wind action |
| **F** | fluvial | (I) | River deposits |
| **FG** | glaciofluvial | (I) | Ice contact fluvial materials |
| **I** | ice | (A) | Permanent snow, glaciers and icefields |
| **L** | lacustrine | (I) | Lake sediments; includes wave deposits |
| **LG** | glaciolacustrine | (I) | Ice contact lacustrine material |
| **M** | morainal | (I) | Material deposited directly by glaciers |
| **O** | organic | (A) | Accumulation/decay of vegetative matter |
| **R** | bedrock | (–) | Outcrops/rocks covered by less then 10 cm of unconsolidated or organic materials. |
| **U** | undifferentiated | (–) | Layered sequence; three materials or more |
| **V** | volcanic | (I) | Unconsolidated pyroclastic sediments |
| **W** | marine | (I) | Marine sediments; includes wave deposits |
| **WG** | glaciomarine | (I) | Ice contact marine sediments |

***Miscellaneous Code***

| | | | |
|---|---|---|---|
| **N** | not mapped | (-) | Lakes, towns, entities within the map area which are commonly not mapped |

***Table 2-7 - Surficial Material and Geomorphological Process Qualifier Codes***

| Code | Name | Description |
|---|---|---|
| **A** | active | Used to qualify surficial material and geomorphological processes |
| **I** | inactive | with regard to their assumed status of activity |
| See Howes and Kenk, Version 2.0 | | |

***Table 2-8 - Surface Expression Codes***

| Code | Name | Description |
|---|---|---|
| **a** | moderate slope | [1]Unidirectional surface; $>16^0$ to $\leq 26^0$ |
| **b** | blanket | A mantle of unconsolidated materials; >1m thick |
| **c** | cone(s) | A cone or sector of a cone; $>15^0$ |
| **d** | depression(s) | A lower area surrounded by a higher surrounded terrain |
| **f** | fan(s) | A sector of a cone ; up to $15^0$ |
| **h** | hummock(s) | Hillocks and hollows, irregular in plan; $>15^0$ |
| **j** | gentle slope | [1]unidirectional surface; $4^0$ and $15^0$ |
| **k** | moderately steep slope | [1]Unidirectional surface; 27 and $35^0$ |
| **m** | rolling | Elongate hillocks; $3^0$ to $15^0$; parallel forms in plan |
| **p** | plain | Level of very gently sloping; 0 to $3^0$ |
| **r** | ridge(s) | Elongate hillocks; generally $>15^0$; parallel forms in plan |
| **s** | steep slope | Steep slopes; $>35^0$ |
| **t** | terrace(s) | Step-like topography |
| **u** | undulating | Hillocks and hollows; $<15^0$; irregular in plan |
| **v** | veneer | Mantle of unconsolidated materials; 10 cm to 1m thick |
| **[2]w** | mantle of variable thickness | A layer or discontinuous layer of surficial materials of variable thickness that fills or partially fills depressions in an irregular substrate. The thickness ranges from zero to about three meters. |
| **[2]x** | thin veneer | A very thin veneer, where there is a dominance of surficial materials about 2 to 20 centimeters thick |

[1] The slope ranges apply to the slopes or forms, of the surface expression, created during the time of deposition or by any subsequent modification. The terms, a,k,j for example can not be used on terrain maps as a surrogate for slope classes, related to the lay-of-the-land. See Howes & Kenk, Version 2, 1997.

[2]New codes, 1997

***Table 2-9 - Geomorphological Process Codes***

| Code | Name | (Assumed Process Status) | Description |
|---|---|---|---|
| **A** | snow avalanches | (A) | Terrain modified by snow avalanches |
| **B** | braiding channel | (A) | Diverging/converging channels; unvegetated bars |
| **C** | cryoturbation | (A) | Materials modified by frost heaving and churning |
| **D** | deflation | (A) | Removal of sand and silt by wind action |
| **E** | meltwater channels | (I) | Channel formation by meltwater |
| **F** | slow mass movement | (A) | Slow downslope movement of masses of cohesive or non-cohesive material |
| **H** | kettle | (I) | Depressions in surficial material due to the melting of buried or partially buried glacier ice |
| **I** | irregularly sinuous channel | (A) | A single, clearly defined main channel displaying irregular turns and bends |
| **J** | anastamosing channel | (A) | A channel zone were channels diverge and converge around many vegetated islands |
| **K** | karst | (A) | Processes associated with the solution of carbonates |
| [1] **L** | abundant surface seepage | (A) | Zones of abundant seepage often found along the base of slope positions |
| **M** | meandering channel | (A) | Channels characterized by a regular pattern of bends with uniform amplitude and wave length |
| **N** | nivation | (A) | Erosion beneath and along the margin of snow patches |
| **P** | piping | (A) | Subterranean erosion by flowing water |
| **R** | rapid mass movement | (A) | Rapid downslope movement of dry, moist or saturated debris |
| **S** | solifluction | (A) | Slow downslope movement of saturated overburden across a frozen or otherwise impermeable substrate |
| **U** | inundation | (A) | Seasonally under water due to high watertable |
| **V** | gully erosion | (A) | Parallel/subparallel ravines due to running water |
| **W** | washing | (A) | Modification by wave action |
| **X** | permafrost | (A) | Processes controlled by the presence of permafrost |
| **Z** | periglacial processes | (A) | Solifluction, cryoturbation and nivation processes occurring within a single unit |

[1]New codes, 1997

***Table 2-10 - Geomorphological Process Subclass Codes***

**Mass Movement Process Subclass Codes**

| Code | Name | Description |
|---|---|---|
| **c** | soil creep | slow movement of soil |
| **g** | rock creep | slow movement of angular debris under periglacial conditions (e.g. rock glaciers) |
| **k** | tension cracks | open fissures, commonly near crest of slope |
| **p**<br>**j** | lateral spread<br>–in bedrock<br>–in surficial material | lateral extension of a fractured mass of bedrock or surficial material; movement is predominantly horizontal |
| **e** | earthflow | slow viscous flow of material containing a high proportion of silt and clay |
| **m**<br>**u** | slump<br>–in bedrock<br>–in surficial material | sliding of internally cohesive masses of bedrock or surficial material along a slip plane that is concave upward or planar |
| **x** | slump–earthflow | combined slump (upper part) and earthflow (lower part) |
| **f** | debris fall | descent of a mass of surficial material by falling, bouncing and rolling |
| **b** | rockfall | descent of masses of bedrock by falling, bouncing and rolling |
| **s** | debris slide | sliding of disintegrating mass of surficial material |
| **r** | rockslide | descent of large masses of disintegrating bedrock by sliding |
| **d** | debris flow | rapid flow of saturated debris |
| **t**[1] | debris torrent | rapid flow of a mixture of water, earth and vegetation debris down a steep, well-defined stream channel |
| [1] “ | initiation zone | includes sites or zones of instability, *head scarps* of debris slides and other kinds of mass movement, and *sources* of rockfall and debris flows |

[1]New codes, 1997

***Table 2-11 - Avalanche Process Subclass Codes***[1]

| Code | Subclass Name | Definitions |
|---|---|---|
| **f** | avalanche tracks<br>-major | in zones of coniferous forest: broad avalanche track(s) occupied by predominantly shrubby, deciduous vegetation, conifers largely absent |
| **m** | -minor | similar to above, but generally narrower than the height of adjacent trees |
| **w** | -mixed | polygon includes both major and minor avalanche tracks |
| **o** | -old | tracks are clearly visible on air photos, but are less well defined than active tracks because they are partly or completely occupied by young conifers |
| [1]New codes, 1997 | | |

***Table 2-12 - Fluvial Process Subclass Codes***[1]

| Code | Subclass Name | Definitions |
|---|---|---|
| **u** | progressive bank erosion | persistent bank erosion, indicated by the presence of undercut banks, overhanging and fallen trees and much timber in the channel; old air photos and historical information can be used as evidence |
| **a** | abrupt channel diversion; aversion | present channel has recently shifted abruptly to a previously vegetated area; former channel can be identified on air photos or on ground |
| **b** | backchannels (undivided) | small channels on a floodplain which may or may not be connected to the main channel |
| **p** | permanent river-fed (backchannels) | joined to the main channel at the upstream end, allowing flowing or standing water all year |
| **e** | ephemeral river-fed (backchannels) | joined to the main channel at the upstream end, but dry during late summer |
| **s** | spring-fed (backchannels) | water is maintained during the late summer by the emergence of floodplain groundwater |
| **t** | permanent, tributary-fed (backchannels) | either flowing or standing water from tributaries is present in the backchannel all year |
| **r** | ephemeral, tributary-fed (backchannels) | normally fed by tributaries, but dry during late summer |
| [1]New codes, 1997 | | |

***Table 2-13 - Permafrost Process Subclass Codes***[1]

| Code | Subclass Name | Definitions |
|---|---|---|
| p | palsas peat plateaus | flat-topped or rounded mounds and ridges of peat or peaty earth formed by differential frost-heaving; contain perennial ice lenses and a core of permafrost |
| t | thermokarst:<br>subsidence | ground surface depressions which are created by the thawing of ice-rich permafrost and associated soil subsidence |
| e | thermokarst: thermal erosion by water | gullies and depressions created by melting of ice-rich permafrost due to heat loss transfer from flowing water or lakes |
| f | thaw flow slides | slope failures caused by the thawing of permafrost on slopes |
| w | ice-wedge polygons | intersecting narrow cracks that contain ice-wedges comprise polygonal patterns on ground underlain by permafrost |
| r | patterned ground | collective term for the regular surface features, like stone polygons, frost boils, and stone stripes, that are characteristic of ground that is subject to intensive frost (freeze thaw) action; subclass can also be applied to other periglacial processes |
| [1]New codes, 1997 | | |

***Table 2-14 - Component Relation Delimiters Codes***

| Code | Definition |
|---|---|
| **.** | components on either side of the symbol are approximately equal, in proportion (Note: The = sign can appear on the plotted map as a '**.**' |
| ***/*** | the component in front of the symbol is more extensive than the one that follows |
| ***//*** | the component in front of the symbol is considerably more extensive than the component that follows |
| **0 to 9** | The amount of each component is rated with a number(decile), i.e. 6Mbv 4Cbv |

***Table 2-15 - Soil Drainage Codes***

| Code | Definition |
|---|---|
| **x** | very rapidly drained |
| **r** | rapidly drained |
| **w** | well drained |
| **m** | moderately well drained |
| **i** | imperfectly drained |
| **p** | poorly drained |
| **v** | very poorly drained |
| Describing Ecosystems in the Field, (1990) | |

***Table 2-16 - Drainage Separator Codes***

| Code | Definition |
|---|---|
| **’** | ‘w**,** i’ indicates that no intermediate classes between well and imperfectly drained are present |
| **-** | ‘w-i’ indicates that all intermediate classes between well and imperfectly drained are present. |
| ***/*** | ‘r/p’ rapid drainage is dominant, poor drainage is sub-dominant |
| ***//*** | ‘r//p’ rapid drainage is significantly dominant, poor drainage is minor |

***Table 2-17 - Slope Steepness***

| Code | Term | Definition |
|---|---|---|
| (a number) | Slope: lower limit of the dominant slope. | The lower limit of the slope within a terrain polygon, or, where a polygon includes distinctly gentler and steeper slopes; record the **lower limit** of the slope associated with **most of the polygon**; all of this data must be entered either in degrees or percent, not both. |
| (a number) | Slope: upper limit of the dominant slope. | The upper limit of the slope within a terrain polygon, or where a polygon includes distinctly gentler and steeper slopes; record the **upper limit** of the slope associated with **most of the polygon**; all of this data must be entered either in degrees or as a percentage, not both. |
| (a number) | Slope: lower limit of the subdominant slope. | If a polygon includes distinctly gentler and steeper slopes; record the **lower limit** of the slope associated with the **subdominant portion of the polygon**; all of this data must be entered either in degrees or as a percentage, not both. |
| (a number) | Slope: upper limit of the subdominant slope. | If a polygon includes distinctly gentler and steeper slopes record the **upper limi**t of the slope range associated with the **subdominant portion of the polygon**; all of this data must be entered either in degrees or as a percentage, not both. |

***Table 2-18 - Terrain Stability Classes [1] Slope Stability Classes for Detailed Mapping[2]***

| Code | Class Name | Definition |
|---|---|---|
| **1** | I | A slope in which no significant stability problems exist. |
| **2** | II | A slope in which there is a very low likelihood of landslides following timber harvesting or road construction. However minor slumping is expected along road cuts especially for on or two years following construction. |
| **3** | III | A slope on which stability problems can develop. Timber harvesting should not significantly reduce terrain stability; there is a low likelihood of landslide initiation following timber harvesting. Minor slumping is expected along road cuts, especially for one or two years following construction; there is a low likelihood of landslide initiation following road-building. |
| **4** | IV | A terrain polygon expected to contain areas with a moderate likelihood of landslide initiation following timber harvesting or road construction. Wet season construction will significantly increase the potential for road related landslides. A field inspection of these areas is to be made by a qualified terrain specialist prior to any development, to assess the stability of the affected area. |
| **5** | V | A terrain polygon expected to contain areas with a high likelihood of landslide initiation following timber harvesting or road construction. Wet season construction will significantly increase the potential for road related landslides. A field inspection of these areas is to be made by a qualified terrain specialist prior to any development, to assess the stability of the affected area. |

[1]Forest Practices Code of British Columbia 1995. *Mapping and Assessing Terrain Stability Guidebook* B.C. Ministry of Forests and BC Environment pg. 10. With reference to the printed terrain maps, the symbol which conventionally appears on the map is a Roman Numeral, for example, 'IV'.

[2]Refer to latest Forest Service stability 'guidebook', in progress (1998) for updated definitions.

***Table 2-19* - Classes for Reconnaissance Terrain Stability Mapping[1] [2]***

| Code | Class Name | Definition |
|---|---|---|
| **S** | Stable | There is negligible to low likelihood of landslide initiation following timber harvesting or roadbuilding. |
| **P** | Potentially Unstable | Expected to contain areas with a moderate likelihood of landslide initiation following timber harvesting or road building. |
| **U** | Unstable | Natural landslide scars are present.<br>Expected to contain areas with a high likelihood of landslide initiation following timber harvesting or road building. |
| [1]Forest Practices Code of British Columbia 1995. *Mapping and Assessing Terrain Stability Guidebook* B.C. Ministry of Forests and BC Environment pg. 4<br>[2]Refer to latest Forest Service stability 'guidebook', in progress (1998) for updated definitions. | | |

***Table 2-20* - Slope Stability Qualifier for Roads[1]***

| Code | Class Name | Definition |
|---|---|---|
| **R** | Qualifier for roads | This symbol is used to modify terrain stability class IV in terrain that responds differently to logging and road building. It indicates a low likelihood of landslides after timber harvesting, but a moderate likelihood of slides as a result of road construction. (The mapper must provide a suitable description in the map legend). E.g. $\mathbf{IV_R}$ |
| [1]Forest Practices Code of British Columbia 1995. *Mapping and Assessing Terrain Stability Guidebook.* B.C. Ministry of Forests and BC Environment pg. 9 | | |

***Table 2-21* - Surface Erosion Potential Class Codes[1] [2]***

| Code | Class Name | Definition |
|---|---|---|
| **VL** | Very low | |
| **L** | Low | |
| **M** | Moderate | |
| **H** | High | |
| **VH** | Very high | |
| [1]Forest Practices Code of British Columbia 1995. *Mapping and Assessing Terrain Stability Guidebook.* B.C. Ministry of Forests and BC Environment pg. 14<br>[2]Refer to latest Forest Service stability 'guidebook', in progress (1998) for updated definitions. | | |

***** 'Due to regional variations in climate, geology, soil and other factors, few specific criteria apply universally across all regions of the province. The mapper must develop criteria for stability classes specific to the map area', (Forest Practices Code 1995). This includes definitions of slope classes.

***Table 2-22* - Landslide Induced Stream Sediment Class Codes[1 2]***

| Code | Hillside without gullies | Hillside with gullies |
|---|---|---|
| **1** | | |
| **2** | | |
| **3** | | |

[1]Forest Practices Code of British Columbia 1995. *Mapping and Assessing Terrain Stability Guidebook* B.C. Ministry of Forests and BC Environment pg. 12-13.

[2]Refer to latest Forest Service stability 'guidebook', in progress (1998) for updated definitions.

***Table 2-23* - Class Codes for Potential Sediment Delivery From Surface Erosion Sources[1 2]***

| Code | Class Name | Definition |
|---|---|---|
| **vl** | Very Low Potential | |
| **l** | Low Potential | |
| **m** | Moderate Potential | |
| **h** | High Potential | |
| **vh** | Very High Potential | |

[1]Forest Practices Code of British Columbia 1995. *Mapping and Assessing Terrain Stability Guidebook.* B.C. Ministry of Forests and BC Environment pg. 15.

[2]Refer to latest Forest Service stability 'guidebook', in progress (1998) for updated definitions.

***Table 2-24 - Bouldery or Blocky Substrate***

| Code | Class Name | Definition |
|---|---|---|
| **b** | Bouldery Substrate | Within a terrain polygon the ground is covered with boulders or blocks that are sufficiently numerous to seriously restrict forest regeneration or replanting. |

J.M. Ryder. 1995. Personal Communication. Based on meetings with geologists mapping forest land.

* 'Due to regional variations in climate, geology, soil and other factors, few specific criteria apply universally across all regions of the province. The mapper must develop criteria for stability classes specific to the map area', (Forest Practices Code 1995). This includes definitions of slope classes.

***Table 2-25 - Mean Aspect***

Record the aspect, in degrees, which best represents the aspect of terrain polygon.

| Code | Class Name | Definition |
|---|---|---|
| **E.g. 123°** | Mean Aspect | The mean aspect in degrees |

***Table 2-26 -'Ea' (Forest Service) Snow Avalanche Hazard Flag***

**Note:** This system is used only at the specific request of a forestry inventory official.

| Code | Class Name | Definition |
|---|---|---|
| **a** | E.S.A Snow Avalanche | Snow avalanches are likely to adversely affect timber values, or to damage roads or other structures, or pose a hazard to humans. |
| Ministry of Forests 1992. Forest *Classification/Sampling and Environmentally Sensitive Areas*. Ea - Snow Avalanche. Forest Inventory. Victoria. B.C. | | |

***Table 2-27 - Polygons of Relatively Low Reliability Flag***

| Code | Class Name | Definition |
|---|---|---|
| **L** | LowRely | This applies, for example to areas on air photos which have cloud cover, snow cover or are in heavy shadow. |
| J.M. Ryder. 1995. Personal Communication. Based on meetings with geomorphologists mapping forest land. | | |

***Table 2-28 - Field Check Class***

| Code | Class Name | Definition |
|---|---|---|
| **d** | detailed | A complete description of the terrain features, including material, topography, hydrology, and processes if evident, is done on a site(s) in the polygon. Usually involves use of a data form. |
| **r** | recon | A reconnaissance level description of the terrain features, necessary to confirm mapping, done during traverse of a polygon. Usually involves short free-format notes in a notebook. |
| **v** | visual | Site viewed from a distance during foot or air traverses; applies only to terrain types that can be reliably mapped by visual inspection; optional: briefly note on air photo or map. |
| Guidelines and Standards for Terrain Mapping In British Columbia. (RIC) 1996. | | |

***Table 2-29 - Surficial Material Subtype***

| Code | Description |
|---|---|
| **(a number)** | A number following the genetic material (M1). This notation can be used to indicate a particular type of material in a study area. For example, a compact clayey calcareous till. |

***Table 2-30 - Geomorphological Process Subtype***

| Code | Description |
|---|---|
| **(a number)** | A number following a geologic process. For example, this notation can be used to indicate a particular type of gullying. For example, deep gullies subject to failures in fine sandy glaciolacustrine materials: **-V1** |

# 3. Terrain Data Form (Example and Blank Forms)

# TERRAIN DATA FORM

| | | | |
|---|---|---|---|
| (1)PROJECT NAME: | (4)MAPPER NAME: | (7)MAP SCALE: | (10)DATE RECORDED: | (13)STABILITY CLASS TYP.:Recon. Detailed Es |
| (2)GEOGRAPHIC LOCATION: | (5)LEGEND TYPE(S): Gen. Short TerStb. Other | (8)TSIL: | (11)RECORDER NAME: | |
| (3)CONSULTANT/DEPT: | (6)LEGEND SOURCE: | (9)DATE SURVEYED: | (12)**SLOPE UNITS: (%) (Degrees) | **NOTE- Style of recording must be consistent. |
| (14)PROJECT SPECIFIC COMMENTS: | | | | |

| | | | | TERRAIN COMPONENT 1 | | | | | | | | | | | | | | | | | | | | TERRAIN COMPONENT 2 | | | | | | | | | | | | | | | | | | |

# Terrain Data Form

| TERRAIN COMPONENT 3 | | |

# TERRAIN DATA FORM

| | | | | |
|---|---|---|---|---|
| (1)PROJECT NAME: | (4)MAPPER NAME: | (7)MAP SCALE: | (10)DATE RECORDED | (13)STABILITY CLASS TYP.:Recon. Detailed Es |
| (2)GEOGRAPHIC LOCATION: | (5)LEGEND TYPE(S): Gen. Short TerStb. Other | (8)TSIL: | (11)RECORDER NAME: | |
| (3)CONSULTANT/DEPT: | (6)LEGEND SOURCE: | (9)DATE SURVEYED : | (12)**SLOPE UNITS: (%) (Degrees) | **NOTE- Style of recording must be consistent. |

| | | | TERRAIN COMPONENT 1 | | | | | | | | | | | | | | | | | | TERRAIN COMPONENT 2 | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 |
| Polygon number | project identification | mapsheet number | decile | partial cover flag | surficial material texture | surficial (genetic) material | surficial qualifier | surficial subtype | surficial expression | bedrock type | subsurficial material texture | subsurficial (genetic) material | subsurficial qualifier | subsurficial subtype | subsurficial expression | Sub-Subsurficial Material Texture | Sub-Subsurficial Material | Sub-Subsurficial Material Qualifier | Sub-Subsurficial Material Subtype | Sub-Subsurficial Expression | relation | decile | partial cover flag | surficial material texture | surficial (genetic) material | surficial qualifier | surficial subtype | surficial expression | bedrock type | subsurficial material texture | subsurficial (genetic) material | subsurficial qualifier | subsurficial subtype | subsurficial expression | Sub-Subsurficial Material Texture | Sub-Subsurficial Material | Sub-Subsurficial Material Qualifier | Sub-Subsurficial Material Subtype | Sub-Subsurficial Expression |

# Terrain Data Form

| TERRAIN COMPONENT 3 | | | | | | | | | | | | | | | | | | | | GEOMORPHOLOGICAL PROCESSES | | | | | | | | | | | | | | DRAINAGE | | | | | | | | | | | | | | | | | | |

# 4. Digital Data Specification For terrain Mapping In GIS

### *4.1 Logical Data Description*

A Geographic Information System stores two types of data in a database; **Spatial** data and descriptive, or **attribute** data. Spatial data, describes the location and shape of features being mapped. The attribute data describes the spatial features being mapped. These two types of data are linked by a common field or fields within the GIS. The linkage between the spatial and attribute data is critical to the integrity if the data stored within the GIS.

Spatial data can be collected, and stored in GIS's in a variety of ways. The most basic methods are to store map features as points, lines, or polygons. All terrain data being collected in British Columbia at this time is stored as points, lines, or polygons.

| | |
|---|---|
| POINTS | Represent features that are to small to be mapped as lines or polygons. These may be sample sites, well or sink holes. |
| ARCS | Represent linear features that are two small to be mapped as polygons. Such as rivers, creeks, roads, and pipelines. |
| POLYGONS | Represent features that can be mapped as areas. Examples of area features are lakes, large rivers, and terrain polygons. |

Features captured during a terrain mapping project can be divided into four broad categories.

1. Terrain polygons. These are unique areas that have been derived on the basis of their terrain attributes. Such as surface and subsurface texture, expression, and genetic material. The attributes that describe these polygons are stored in a number of tables in a relational database. The spatial and aspatial data is linked through a unique identification code which is assigned to each and every terrain polygon. This code is stored in the field "ter_tag" in the polygon attribute table. The database which contains the spatial data is fully described in section 5 of this manual. Section 2 describes the attribute data in detail and discusses tools that can be used to aid in the collection of this data.
2. On site symbols as described in "The Guidelines and Standards for Terrain Mapping" that can be collected as points or lines in the GIS but are too small to be collected as polygons. Examples of these features are dunes, eskers, and sinkholes.
3. On site symbols as described in "The Guidelines and Standards for Terrain Mapping" that can be collected as polygons in the GIS. Examples of these features may include gravel pits, sink holes or a cutface.

4. Sample/Observation Sites. The locations of all field samples taken during data collection are represented in this coverage. Field samples may be collected as points or line features only. Examples include bore holes, pits, air observation, and trenches.

Each feature which may be captured is identified by a unique feature code, if the data is captured in ARC/INFO, or a unique combination of level and colour in an IGDS design file. A Provincial Feature Code database is currently being maintained at the BC Environment Web Site. As new types of geographic objects or "features" are defined in support of an inventory they should be described in the Provincial Feature Code database.

### *4.2 Physical Data Description*

The four ARC/INFO coverages will have the following feature attributes tables defined as described below.

**Terrain Polygon Coverage Feature Attribute Tables**.

Coverages containing terrain polygons must have a **POLYGON ATTRIBUTE TABLE (PAT)** and an **ARC ATTRIBUTE TABLE (AAT).** The PAT contains the link between the terrain polygons and their associated attributes, while the AAT contains Arc Attributes. Table 4-1 specifies the required format of the **PAT,** Table 4-2 shows the specifics of the **AAT.**

***Table 4-1 - Polygon Attribute Table for Terrain Polygons***

| COLUMN | ITEM NAME | WIDTH | OUTPUT | TYPE | N.DEC | ALTERNATE NAME | INDEXED |
|---|---|---|---|---|---|---|---|
| 1 | AREA | 4 | 1 6 | F | 0 | - | |
| 5 | PERIMETER | 4 | 12 | F | 3 | - | |
| 8 | TER_*PROJECT#* | 4 | 5 | B | - | - | |
| 12 | TER_*PROJECT*-ID | 4 | 5 | B | - | - | |
| 16 | TER_TAG* | 18 | 18 | C | - | - | |
| *Redefined Items.* | | | | | | | |
| 16 | PROJ_ID | 5 | 5 | C | | | |
| 21 | MAPSH_NBR | 8 | 8 | C | | | |
| 29 | POLY_NBR | 5 | 5 | I | | | |

***TER_TAG is the name of the item that maintains the link between terrain polygons and their attributes. It consists of the project identifier, mapsheet number, and a user assigned polygon number.**

***Table 4-2 - ARC Attribute Table for Terrain Polygons.***

| COLUMN | ITEM NAME | WIDTH | OUTPUT | TYPE | N.DEC | ALTERNATE NAME | INDEXED |
|---|---|---|---|---|---|---|---|
| 1 | FNODE# | 4 | 5 | B | - | - | |
| 5 | TNODE# | 4 | 5 | B | - | - | |
| 9 | LPOLY# | 4 | 5 | B | - | - | |
| 13 | RPOLY# | 4 | 5 | B | - | - | |
| 17 | LENGTH | 4 | 12 | F | 3 | - | |
| 21 | TER_*PROJECT*# | 4 | 5 | B | - | - | |
| 25 | TER_*PROJECT*-ID | 4 | 5 | B | - | - | |
| 29 | FCODE | 10 | 10 | C | - | - | indexed |
| 39 | SRC_CODE | 10 | 10 | C | - | - | |

**Point and Line On Site Symbols Coverage Feature Attribute Tables.**

Coverages containing point and line on site symbols must have a **POINT ATTRIBUTE TABLE (PAT)** and an **ARC ATTRIBUTE TABLE (AAT).** Both the PAT and AAT contain the fields, FCODE and SRC_FCODE for storing feature code values, as well as the field COMMENT. Table 4-3 specifies the required format of the **PAT,** Table 4-4 shows the specifics of the **AAT.**

***Table 4-3 - Point Attribute Table for point on site symbols.***

| COLUMN | ITEM NAME | WIDTH | OUTPUT | TYPE | N.DEC | ALTERNATE NAME | INDEXED |
|---|---|---|---|---|---|---|---|
| 1 | AREA | 4 | 1 6 | F | 0 | - | |
| 5 | PERIMETER | 4 | 12 | F | 3 | - | |
| 9 | TEF_*PROJECT*# | 4 | 5 | B | - | - | |
| 13 | TEF_*PROJECT*-ID | 4 | 5 | B | - | - | |
| 17 | FCODE | 10 | 10 | C | - | - | indexed |
| 27 | SRC_FCODE | 10 | 10 | C | - | - | |
| 37 | COMMENT | 30 | 30 | C | - | - | |

***Table 4-4 - ARC Attribute Table for Linear on site symbols.***

| COLUMN | ITEM NAME | WIDTH | OUTPUT | TYPE | N.DEC | ALTERNATE NAME | INDEXED |
|---|---|---|---|---|---|---|---|
| 1 | FNODE# | 4 | 5 | B | - | - | |
| 5 | TNODE# | 4 | 5 | B | - | - | |
| 9 | LPOLY# | 4 | 5 | B | - | - | |
| 13 | RPOLY# | 4 | 5 | B | - | - | |
| 17 | LENGTH | 4 | 12 | F | 3 | - | |
| 21 | TEF_*PROJECT*# | 4 | 5 | B | - | - | |
| 25 | TEF_*PROJECT*-ID | 4 | 5 | B | - | - | |
| 29 | FCODE | 10 | 10 | C | - | - | indexed |
| 39 | SRC_CODE | 10 | 10 | C | - | - | |
| 49 | COMMENT | 30 | 30 | C | - | - | |

**Area Based ( Polygonal) On site Symbol Coverage Attribute Tables.**

Coverages containing area-based on site symbols must have a **POLYGON ATTRIBUTE TABLE (PAT)** and an **ARC ATTRIBUTE TABLE (AAT).** Both the PAT and AAT contain the fields FCODE and SRC_FCODE for storing feature code values. Table 4-5 specifies the required format of the **PAT,** Table 4-6 shows the specifics of the **AAT.**

***Table 4-5 - Point Attribute Table for point on site symbols.***

| COLUMN | ITEM NAME | WIDTH | OUTPUT | TYPE | N.DEC | ALTERNATE NAME | INDEXED |
|---|---|---|---|---|---|---|---|
| 1 | AREA | 4 | 16 | F | 0 | - | |
| 5 | PERIMETER | 4 | 12 | F | 3 | - | |
| 9 | TEA_*PROJECT*# | 4 | 5 | B | - | - | |
| 13 | TEA_*PROJECT*-ID | 4 | 5 | B | - | - | |
| 17 | FCODE | 10 | 10 | C | - | - | indexed |
| 27 | SRC_FCODE | 10 | 10 | C | - | - | |
| 37 | COMMENT | 30 | 30 | C | - | - | |

***Table 4-6 - ARC Attribute Table for Linear On site Symbols.***

| COLUMN | ITEM NAME | WIDTH | OUTPUT | TYPE | N.DEC | ALTERNATE NAME | INDEXED |
|---|---|---|---|---|---|---|---|
| 1 | FNODE# | 4 | 5 | B | - | - | |
| 5 | TNODE# | 4 | 5 | B | - | - | |
| 9 | LPOLY# | 4 | 5 | B | - | - | |
| 13 | RPOLY# | 4 | 5 | B | - | - | |
| 17 | LENGTH | 4 | 12 | F | 3 | - | |
| 21 | TEA_*PROJECT*# | 4 | 5 | B | - | - | |
| 25 | TEA_*PROJECT*-ID | 4 | 5 | B | - | - | |
| 29 | FCODE | 10 | 10 | C | - | - | indexed |
| 39 | SRC_CODE | 10 | 10 | C | - | - | |
| 49 | COMMENT | 30 | 30 | C | - | - | |

**Sample Site Coverage Feature Attribute Tables.**

The coverage containing point and line sample sites must have a **POINT ATTRIBUTE TABLE (PAT)** and an **ARC ATTRIBUTE TABLE (AAT).** Both the PAT and AAT contain the fields, FCODE and SRC_FCODE for storing feature code values, as well as the field COMMENT. Table 4-7 specifies the required format of the **PAT,** Table 4-8 shows the specifics of the **AAT.**

***Table 4-7 - Point Attribute Table for Point Sample Sites.***

| COLUMN | ITEM NAME | WIDTH | OUTPUT | TYPE | N.DEC | ALTERNATE NAME | INDEXED |
|---|---|---|---|---|---|---|---|
| 1 | AREA | 4 | 16 | F | 0 | - | |
| 5 | PERIMETER | 4 | 12 | F | 3 | - | |
| 9 | TES_*PROJECT*# | 4 | 5 | B | - | - | |
| 13 | TES_*PROJECT*-ID | 4 | 5 | B | - | - | |
| 17 | FCODE | 10 | 10 | C | - | - | indexed |
| 27 | SRC_FCODE | 10 | 10 | C | - | - | |
| 37 | COMMENT | 30 | 30 | C | - | - | |

***Table 4-8 - ARC Attribute Table for Linear Sample Sites.***

| COLUMN | ITEM NAME | WIDTH | OUTPUT | TYPE | N.DEC | ALTERNATE NAME | INDEXED |
|---|---|---|---|---|---|---|---|
| 1 | FNODE# | 4 | 5 | B | - | - | |
| 5 | TNODE# | 4 | 5 | B | - | - | |
| 9 | LPOLY# | 4 | 5 | B | - | - | |
| 13 | RPOLY# | 4 | 5 | B | - | - | |
| 17 | LENGTH | 4 | 12 | F | 3 | - | |
| 21 | TES_*PROJECT*# | 4 | 5 | B | - | - | |
| 25 | TES_*PROJECT*-ID | 4 | 5 | B | - | - | |
| 29 | FCODE | 10 | 10 | C | - | - | indexed |
| 39 | SRC_CODE | 10 | 10 | C | - | - | |
| 49 | COMMENT | 30 | 30 | C | - | - | |

### *4.2.1 ARC/INFO Feature Classification*

The internal attribute tables for point, line, and area features may contain the fields FCODE, SRC_FCODE, and COMMENT. COMMENT is a 30 character text field which stores unstructured information on features, such as the height of a waterfall, or the water temperature of a mineral spring. The contents of this field should be self-evident, since it has no specified domain. For example, the height of a waterfall should be stored as 'height 20 metres', not as '20'.

The fields FCODE and SRC_CODE are 10 character text fields which store the ***FEATURE CODE*** used to classify the spatial data being mapped. All points, lines, and polygons in all terrain coverages must be assigned a feature code, in conformance with *National Standards for the Exchange of Digital Topographic Data* (1984). Each feature code consists of two uppercase letters and eight digits. ARC/INFO stores them as a 10-character point or line attribute named 'FCODE'. Tables 4-9 to 4-14 list the features that may be captured in a terrain mapping project, and their associated feature codes. Note the following specialised rules for feature codes:

1. Terrain polygon boundaries are assigned feature codes that indicate the relative accuracy of the polygon boundary. The boundaries may be definite, indefinite or assumed. For information see (*Guidelines and Standards for Terrain Mapping in BC,* (1996), page 20).

2. Wherever a polygon boundary is a feature from another coverage (for example, a lake shore line from a TRIM data set), the feature code of the original feature code must be maintained in a separate field called 'SRC_FCODE'.

### *4.2.2 IGDS Feature Classification*

Features are classified using a unique combination of level, colour, and type in the IGDS design file. Tables 4-9 to 4-14 list the features that may be captured in a terrain mapping project, and their associated IGDS level, colour, and type values.

### *4.2.3 Terrain Features and Feature Classification Codes.*

All of the on site symbols, and sample site features that maybe captured during a terrain mapping project can be described with a finite set of predefined attributes which are presented here in detail. The following six tables; ***Terrain Classification Codes*** table 4-9***, Linear On Site Symbol Classification Codes*** table 4-10***, Point On Site Symbol Classification Codes*** table 4-11***, Polygonal On Site Classification Codes*** table 4-12***, Linear Sample Site Classification Codes*** table 4-13 ***and, Point Sample Site Classification Codes*** table 4-14***,*** list the features, and their associated feature codes and IGDS specifications which may be captured when terrain mapping. These feature codes or IGDS specifications must be used to identify terrain features being mapped.

Where the 'Source' column reads 'CCSM', the definition of the feature has been taken from the Canadian Council on Surveying and Mapping (see their *Second Draft Report of National Standards for the Exchange of Digital Topographic Data,* volume II (July 1984)). These codes and definitions were used wherever possible to maintain consistency with other mapping sources. Where the 'Source' column reads 'Terrain', the definition for the feature has been taken from the table following page 131 of *Guidelines and Standards for Terrain Mapping in British Columbia* (1996). New codes were generated for these features where there was no close equivalent in the above document. Digital tables of these feature codes, their definitions, and ARC/INFO symbology are available on the MELP World Wide Web site at *http://www.env.gov.bc.ca/*

***Table 4-9 - Terrain Polygon Classification Codes.***

| ARC/INFO FCODE | SOURCE | FEATURE | ATTRIBUTE | DESCRIPTION | REMARKS | IGDS LEVEL | IGDS COLOUR | IGDS TYPE |
|---|---|---|---|---|---|---|---|---|
| WI84555000 | Terrain | Terrain polygon boundary | | | | 10 | 146 | 4 |
| WI84555120 | Terrain | Terrain polygon boundary | Approximate | | | 10 | 147 | 4 |
| WI84555130 | Terrain | Terrain polygon boundary | Assumed | | | 10 | 148 | 4 |
| WI84555110 | Terrain | Terrain polygon boundary | Defined | | | 10 | 149 | 4 |
| | Terrain | Terrain polygon label | | | | 10 | 150 | 7 |

***Table 4-10 - Linear On Site Symbol Classification Codes.***

| FCODE | SOURCE | FEATURE | ATTRIBUTE | DESCRIPTION | REMARKS | IGDS LEVEL | IGDS COLOUR | IGDS TYPE | SYMBOL |
|---|---|---|---|---|---|---|---|---|---|
| AD01000000 | CCSM | Archaeological Area | | | | 14 | 1 | 4 | |
| HB01005000 | Terrain | Arete | | A narrow, jagged, serrate mountain crest, or a narrow, rocky, sharp-edged ridge or spur, commonly present above the snowline in rugged mountains sculptured by glaciers, and resulting from the continued backward growth of the walls of adjoining cirques. | | 14 | 2 | 4 | |
| HB02105000 | Terrain | Block Field | | A level or gently sloping area covered with blocks derived from underlying bedrock or drift by weathering and/or frost heave, and having undergone no significant down slope movement; characteristic of periglacial regions. | | 14 | 3 | 4 | |
| HB02485000 | Terrain | Boulder Field | | A flat or gently sloping area covered with a continuous veneer of large angular and subangular blocks of rock, derived from well-jointed underlying bedrock by intensive frost action and usually occurring in situ on high, flat topped mountains. | | 14 | 4 | 4 | |
| GA03950000 | CCSM | Canal | | | | See TRIM IDGS specifications | | | |
| HB04600000 | CCSM | Cave | | A naturally-formed, subterranean open area or chamber, or series of chambers. The implication of size is that it is large enough for a human being to enter. Partial synonym: cavern. | (symbol) | 14 | 6 | 4 | |
| HB05450000 | CCSM | Cinder Cone | | A steep-sided conical hill formed by the accumulation of cinders and other pyroclastic deposits around a volcanic vent; normally of basaltic or andestic composition. | | 14 | 7 | 4 | |

| FCODE | SOURCE | FEATURE | ATTRIBUTE | DESCRIPTION | REMARKS | IGDS LEVEL | IGDS COLOUR | IGDS TYPE | SYMBOL |
|---|---|---|---|---|---|---|---|---|---|
| HB05475000 | Terrain | Cirque | | A rounded recess in a mountain formed by glacial erosion, with steep head and side walls, and a relatively gently-sloping floor that is commonly a basin with a small lake and terminated down valley by a convex break of slope. | | 14 | 8 | 4 | |
| HB05785000 | Terrain | Coastal Aggradation | | The building up of the coast by deposition, as in the development of a beach. | Geomorph-ological process | 14 | 9 | 4 | |
| HB07585000 | Terrain | Crag | | A streamlined hill consisting of a knob of resistant bedrock. | | 14 | 10 | 4 | |
| FE07885000 | Terrain | Cross-Section | | A two-dimensional representation through the subsurface. | Sampling layer | 14 | 11 | 4 | |
| DD08300000 | CCSM | Cut | Railway | | | See TRIM IGDS specifications | | | |
| DD08350000 | CCSM | Cut | Roadway | An excavation made to allow the level or nearly level passage of a road or track through a hill. See also 'fill'. | | See TRIM IGDS specifications | | | |
| GA08450000 | CCSM | Dam | section. Top | A barrier to prevent the flow of water, or to raise and control the level of water by forming a reservoir. | | See TRIM IGDS specifications | | | |
| GA08800000 | CCSM | Ditch | | A trench dug in the earth, as for drainage or irrigation. | | See TRIM IGDS specifications | | | |
| HB09050000 | CCSM | Drumlin | | A streamlined hill or ridge of till or other drift, with a long axis that parallels the direction of former ice flow; generally the upstream end is widest and highest, and the drumlin tapers in the downflow direction. | | 14 | 16 | 4 | |
| GB09150000 | CCSM | Dugout | | Any shallow artificial pond or other water filled excavation. | | 14 | 17 | 4 | |

| FCODE | SOURCE | FEATURE | ATTRIBUTE | DESCRIPTION | REMARKS | IGDS LEVEL | IGDS COLOUR | IGDS TYPE | SYMBOL |
|---|---|---|---|---|---|---|---|---|---|
| HB09250000 | CCSM | Dune | | A low ridge, hummock, or mound of loose sandy material transported and deposited by wind. | | 14 | 18 | 4 | |
| HB09250001 | CCSM | Dune | Inactive | A stabilized, low ridge, hummock, or mound of loose sandy material transported and deposited by wind. | | 14 | 19 | 4 | |
| DD09900000 | CCSM | Embankment Fill | Railway | | | See TRIM IGDS specifications | | | |
| DD09950000 | CCSM | Embankment Fill | Roadway | | | See TRIM IGDS specifications | | | |
| HB10150000 | CCSM | Escarpment | | A steep slope that is usually of great lateral extent compared to its height, such as the risers of river terraces and steep faces associated with stratified rocks. | | 14 | 22 | 4 | |
| HB10150310 | Terrain | Escarpment | Bedrock definite | A clear and obvious line of bedrock cliffs or bluffs produced by faulting or by erosion. | | 14 | 23 | 4 | |
| HB10150319 | Terrain | Escarpment | Bedrock indefinite | An unclear line of bedrock cliffs or bluffs produced by faulting or by erosion. | | 14 | 24 | 4 | |
| HB10150320 | Terrain | Escarpment | Overburden definite | A clear and obvious relatively steep and straight, cliff-like face or slope composed of unconsolidated sediment. | | 14 | 25 | 4 | |
| HB10150329 | Terrain | Escarpment | Overburden indefinite | An unclear relatively steep and straight, cliff-like face or slope composed of unconsolidated sediment. | | 14 | 26 | 4 | |
| HB10200000 | CCSM | Esker | | A sinuous ridge of sand and gravel resulting from deposition by meltwater in a tunnel beneath or within a glacier or ice sheet. The ridges generally trend at right angles to a glacier margin. | | 14 | 27 | 4 | |

| FCODE | SOURCE | FEATURE | ATTRIBUTE | DESCRIPTION | REMARKS | IGDS LEVEL | IGDS COLOUR | IGDS TYPE | SYMBOL |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| HB10200310 | CCSM | Esker | flow known | A sinuous ridge of sand and gravel resulting from deposition by meltwater in a tunnel beneath or within a glacier or ice sheet. The ridges generally trend at right angles to a glacier margin. Flow direction during deposition is known. | | 14 | 28 | 4 | |
| HB10200319 | CCSM | Esker | flow unknown | A sinuous ridge of sand and gravel resulting from deposition by meltwater in a tunnel beneath or within a glacier or ice sheet. The ridges generally trend at right angles to a glacier margin but the direction of flow during deposition is unknown. | | 14 | 29 | 4 | |
| GA10450000 | CCSM | Falls | | A waterfall which in most cases starts with a series of rapids, then goes over a vertical or near vertical drop and ends with a cataract over the debris at the bottom of the drop. Many topographic maps give the height of the vertical drop if over a specific height. | (line) | See TRIM IGDS specifications | | | |
| HB10495110 | Terrain | Fan | Alluvial | A fan-shaped deposit of fluvial sand and gravel, usually located at the mouth of a tributary valley; a type of floodplain. | | 14 | 31 | 4 | |
| HB10495120 | Terrain | Fan | Colluvial | A fan-shaped mass of sediments deposited by colluvial processes, most commonly debris flows. | | 14 | 32 | 4 | |
| HB10495130 | Terrain | Fan | Talus Cone | A small, cone-shaped or apron-like landform at the base of a cliff, consisting of poorly sorted talus that has accumulated episodically. | | 14 | 33 | 4 | |
| GD11400000 | CCSM | Flow Arrow | | An arrow placed on a map to show the direction of flow. | | See TRIM IGDS specifications | | | |
| HB11775000 | Terrain | Fossil | | An area in which remains, traces, or imprints of a plant or animal has been preserved by natural processes. | | 14 | 35 | 4 | |

| FCODE | SOURCE | FEATURE | ATTRIBUTE | DESCRIPTION | REMARKS | IGDS LEVEL | IGDS COLOUR | IGDS TYPE | SYMBOL |
|---|---|---|---|---|---|---|---|---|---|
| HB11775110 | Terrain | Fossil | Marine | An area in which remains, traces, or imprints of a plant or animal has been preserved by natural processes in a marine environment. | | 14 | 36 | 4 | |
| HB11775120 | Terrain | Fossil | Terrestrial | An area in which remains, traces, or imprints of a plant or animal has been preserved by natural processes in a terrestrial environment. | | 14 | 37 | 4 | |
| HB12225000 | Terrain | Geologic Contact | | A plane or irregular surface between two types or ages of rock or sediment. | | 14 | 38 | 4 | |
| HB12225120 | Terrain | Geologic Contact | Approximate | An approximate plane or irregular surface between two types or ages of rock or sediment. | | 14 | 39 | 4 | |
| HB12225110 | Terrain | Geologic Contact | Defined | A clear or obvious plane or irregular surface between two types or ages of rock or sediment. | | 14 | 40 | 4 | |
| HB12225130 | Terrain | Geologic Contact | Inferred | An inferred plane or irregular surface between two types or ages of rock or sediment. | | 14 | 41 | 4 | |
| GD12300000 | CCSM | Glacier | | A body of ice formed by the compaction and recrystallization of snow, that has definite lateral limits, and with motion in a definite direction. | | See TRIM IGDS specifications | | | |
| HB14315000 | Terrain | Ice Contact Delta | | An accumulation of stream-transported sediments deposited in a body of water, on or in contact with glacial ice. The landform is flat or very gently sloping, and triangular or fan-shaped in plan. | | 14 | 43 | 4 | |
| HB15065000 | Terrain | Kame | | Irregular or conical hillocks composed chiefly of sand and gravel; formed by deposition of meltwater-transported sediments in contact with (against, within, or upon) stagnant glacier ice; a type of glaciofluvial deposit. | | 14 | 44 | 4 | |
| HB15125000 | Terrain | Kettle Hole | | A closed depression or hollow in glacial drift which has resulted from the melting of a buried or partly buried mass of glacier ice; common in glaciofluvial deposits. | | 14 | 45 | 4 | |

| FCODE | SOURCE | FEATURE | ATTRIBUTE | DESCRIPTION | REMARKS | IGDS LEVEL | IGDS COLOUR | IGDS TYPE | SYMBOL |
|---|---|---|---|---|---|---|---|---|---|
| GB15250000 | CCSM | Lagoon | | A small narrow stretch of sea water separated or partly separated from the ocean by a low, narrow, elongate strip of land. | | 14 | 46 | 4 | |
| GB15300000 | CCSM | Lake | Definite | A large, inland body of salt or fresh water, entirely surrounded by land. Larger than a pond. | | See TRIM IGDS specifications | | |  |
| GB15300120 | CCSM | Lake | Dry | A lake bed from which all water has drained or evaporated. | | See TRIM IGDS specifications | | |  |
| GB15300140 | CCSM | Lake | Intermittent | | | See TRIM IGDS specifications | | | |
| HB15850000 | CCSM | Lava Bed | | A landform area covered with lava. | | 14 | 50 | 4 | |
| HB16415110 | Terrain | Linear Feature | Direction Known | A feature arranged in a line or lines. | | 14 | 51 | 4 | |
| HB16415119 | Terrain | Linear Feature | Direction Unknown | A feature arranged in a line or lines. | | 14 | 52 | 4 | |
| GC17100000 | CCSM | Marsh | | A water-saturated, poorly drained area, intermittently, or permanently water covered, having aquatic and grass like vegetation, essentially without trees and without peat like accumulation. See also Bog, Fen. | area outline | See TRIM IGDS specifications | | | |
| HB17275110 | Terrain | Meltwater Channel | Definite | A channel or valley formed or followed by a glacial meltwater stream. | | 14 | 54 | 4 | |
| HB17275119 | Terrain | Meltwater Channel | Indefinite | A channel or valley formed or followed by a glacial meltwater stream. | | 14 | 55 | 4 | |

| FCODE | SOURCE | FEATURE | ATTRIBUTE | DESCRIPTION | REMARKS | IGDS LEVEL | IGDS COLOUR | IGDS TYPE | SYMBOL |
|---|---|---|---|---|---|---|---|---|---|
| HB17275120 | Terrain | Meltwater Channel | Lateral, Definite | A channel or valley formed or followed by a glacial meltwater stream. | | 14 | 56 | 4 | |
| HB17275129 | Terrain | Meltwater Channel | Lateral, Indefinite | A channel or valley formed or followed by a glacial meltwater stream. | | 14 | 57 | 4 | |
| HB17275130 | Terrain | Meltwater Channel | Left Bank | A channel or valley formed or followed by a glacial meltwater stream. | | 14 | 58 | 4 | |
| HB17275140 | Terrain | Meltwater Channel | Right Bank | A channel or valley formed or followed by a glacial meltwater stream. | | 14 | 59 | 4 | |
| HB17275150 | Terrain | Meltwater Channel | Subglacial, Definite | A channel or valley formed or followed by a glacial meltwater stream. | | 14 | 60 | 4 | |
| HB17275159 | Terrain | Meltwater Channel | Subglacial, Indefinite | A channel or valley formed or followed by a glacial meltwater stream. | | 14 | 61 | 4 | |
| HB17275001 | TFIC - W.Kilby | Meltwater Channel Minor | Direction of flow unknown | A channel or valley formed or followed by a glacial meltwater stream. | | 14 | 62 | 4 | |
| HB17275000 | TFIC - W.Kilby | Meltwater Channel | | A channel or valley formed or followed by a glacial meltwater stream. | | 14 | 63 | 4 | |
| AG17600000 | CCSM | Mine | Open Pit | A pit or excavation from which ores, coal, etc. are taken by digging. A open pit mine is generally larger and deeper than a quarry. | | 14 | 64 | 4 | |
| AG17700000 | CCSM | Mine | Strip | | | 14 | 65 | 4 | |
| AB17500000 | CCSM | Mine | Underground | | | 14 | 66 | 4 | |

| FCODE | SOURCE | FEATURE | ATTRIBUTE | DESCRIPTION | REMARKS | IGDS LEVEL | IGDS COLOUR | IGDS TYPE | SYMBOL |
|---|---|---|---|---|---|---|---|---|---|
| AB17500001 | CCSM | Mine | Abandoned Underground | | | 14 | 67 | 4 | |
| CG17800000 | CCSM | Mine Entrance | Adit | A near horizontal passage from the surface into a mine. | | 14 | 68 | 4 | |
| CG17800001 | CCSM | Mine Entrance | Adit Abandoned | | | 14 | 69 | 4 | |
| CG17900000 | CCSM | Mine Shaft | | A vertical or inclined excavation through which a mine is worked. | | 14 | 70 | 4 | |
| CG17900001 | CCSM | Mine Shaft | Abandoned | | | 14 | 71 | 4 | |
| HB18700000 | CCSM | Moraine | | A landform that consists of till or, less commonly of other drift; it exhibits a variety of shapes, ranging from plains to mounds and ridges, that are initial constructional forms independent of underlying bedrock or older materials. | | 14 | 72 | 4 | |
| HB18700110 | CCSM | Moraine | Lateral | A ridge built along the side of a valley glacier. | | 14 | 73 | 4 | |
| HB18700119 | CCSM | Moraine | Lateral Indefinite | An indefinite ridge built along the side of a valley glacier. | | 14 | 74 | 4 | |
| HB18700120 | CCSM | Moraine | Medial | A morainal ridge in the middle of a glacier, parallel to the direction of glacier flow, and formed the by the union of lateral moraines of two coalescing glaciers. | | 14 | 75 | 4 | |
| HB18700129 | CCSM | Moraine | Medial Indefinite | An indefinite morainal ridge in the middle of a glacier, parallel to the direction of glacier flow, and formed the by the union of lateral moraines of two coalescing glaciers. | | 14 | 76 | 4 | |

| FCODE | SOURCE | FEATURE | ATTRIBUTE | DESCRIPTION | REMARKS | IGDS LEVEL | IGDS COLOUR | IGDS TYPE | SYMBOL |
|---|---|---|---|---|---|---|---|---|---|
| HB18700130 | CCSM | Moraine | Terminal | The end moraine that marks the furthest point reached by an advancing glacier. | | 14 | 77 | 4 | |
| HB18700139 | CCSM | Moraine | Terminal Indefinite | The indefinite end moraine that marks the furthest point reached by an advancing glacier. | | 14 | 78 | 4 | |
| HB19265110 | Terrain | Occurrence / Concentration | Gravel | | | 14 | 79 | 4 | |
| HB19265120 | Terrain | Occurrence / Concentration | Peat | A concentration of semi-carbonized plant remains. | | 14 | 80 | 4 | |
| HB19265130 | Terrain | Occurrence / Concentration | Sand | A concentration of sand particles between 0.062-2 mm. | | 14 | 81 | 4 | |
| GD21065000 | Terrain | Permafrost | | Ground in which temperature has remained below 0 degrees Celsius continuously for at least 2 years, regardless of type of material or water content; a thermal condition. | | 14 | 82 | 4 | |
| HB21515000 | Terrain | Piping | | Subsurface erosion of particulate materials by flowing water, resulting in the formation of underground caves and conduits and the development of collapse-depressions at the land surface. | | 14 | 83 | 4 | |
| AG21550000 | CCSM | Pit | | An excavation where sand or gravel has been removed for use in construction. It is not used in Canada as a synonym for coal mine. A borrow pit is the excavation left when earth or sand have been removed. | | 14 | 84 | 4 | |
| AG21550001 | CCSM | Pit | Abandoned | | | 14 | 85 | 4 | |

| FCODE | SOURCE | FEATURE | ATTRIBUTE | DESCRIPTION | REMARKS | IGDS LEVEL | IGDS COLOUR | IGDS TYPE | SYMBOL |
|---|---|---|---|---|---|---|---|---|---|
| AG21550110 | CCSM | Pit | Gravel | An open pit where gravel is mined. | | 14 | 86 | 4 | |
| AG21550120 | CCSM | Pit | Sand | An open pit where sand is mined. | | 14 | 87 | 4 | |
| AG21550130 | CCSM | Pit | Shale | | | 14 | 88 | 4 | |
| AG22450000 | CCSM | Quary | Dry | An open excavation for which building stone, slate etc. is obtained. | | 14 | 89 | 4 | |
| GB22500000 | CCSM | Quarry | Water Filled | | | 14 | 90 | 4 | |
| HB23050000 | CCSM | Raised Beach/Strand Lines | | An ancient beach occurring above the present shoreline and separated from the present beach as a result of terrain uplift or the lowering of the sea or lake level. | | 14 | 91 | 4 | |
| HB23050310 | Terrain | Raised Beach/Strand Line | Definite | An obvious abandoned shoreline. | | 14 | 92 | 4 | |
| HB23050319 | Terrain | Raised Beach/Strand Line | Indefinite | An indefinite abandoned shoreline. | | 14 | 93 | 4 | |
| GA23500000 | CCSM | Rapids | | A fast flowing section of a watercourse generally with exposed rocks or boulders. | line | See TRIM IGDS specifications | | | |
| GA24850000 | CCSM | River/Stream | Definite | A natural, freshwater surface body of running water that serves as a natural outlet for a drainage area or a basin of considerable extent. A stream is smaller than a river but larger than a brook or c | | See TRIM IGDS specifications | | | |

| FCODE | SOURCE | FEATURE | ATTRIBUTE | DESCRIPTION | REMARKS | IGDS LEVEL | IGDS COLOUR | IGDS TYPE | SYMBOL |
|---|---|---|---|---|---|---|---|---|---|
| GA24850110 | CCSM | River/Stream | Braided | | | See TRIM IGDS specifications | | | |
| GA24850120 | CCSM | River/Stream | Disappearing | A surface stream that disappears into an underground channel. | | See TRIM IGDS specifications | | | |
| GA24850130 | CCSM | River/Stream | Dry | The bed of a former river which has ceased to flow due to climatic change or the formation of a new river channel. | | See TRIM IGDS specifications | | | |
| GA24850310 | Terrain | River/Stream | Gully | A small valley or ravine, longer than wide, and typically from a few metres to a few tens of metres across. | | 14 | 99 | 4 | |
| GA24850150 | Terrain | River/Stream | Intermittent | | | See TRIM IGDS specifications | | | |
| GA90000110 | TRIM | River/Stream | Left Bank | | | See TRIM IGDS specifications | | | |
| GA24850131 | Terrain | River/Stream | Left Bank - Dry | The left side of a dry river or stream when facing down channel. | | 14 | 102 | 4 | |
| GA90000120 | TRIM | River/Stream | Right Bank | | | See TRIM IGDS specifications | | | |
| GA24850132 | Terrain | River/Stream | Right Bank - Dry | The right side of a dry river or stream when facing down channel. | | 14 | 104 | 4 | |
| HB25335000 | Terrain | Roche Moutonee | | A knob of rock with a whale-back form, the long axis of which is oriented parallel to former ice flow, and having a smooth, glacially-abraded stoss (up-flow) slope and a much steeper and rougher, glacially-plucked lee slope. | | 14 | 105 | 4 | |
| GD25375000 | Terrain | Rock Glacier | | A tongue shaped or lobate, ridged accumulation of angular rock fragments containing interstitial ice that moves slowly downslope; morphologically similar to a glacier. | | 14 | 106 | 4 | |
| HB25400000 | CCSM | Rock Outcrop | | A portion on the surface where one or more bedrock geological formations are exposed. | | 14 | 107 | 4 | |

| FCODE | SOURCE | FEATURE | ATTRIBUTE | DESCRIPTION | REMARKS | IGDS LEVEL | IGDS COLOUR | IGDS TYPE | SYMBOL |
|---|---|---|---|---|---|---|---|---|---|
| HB25745000 | Terrain | Sackung | Sagging Slope | Uphill-facing scarps on mountain sides that trend parallel to contours and developed as a result of gravitational movement. | | 14 | 108 | 4 | |
| HB27550000 | CCSM | Sinkhole | | A funnel shaped depression in the land surface that communicates with a subterranean passage developed by solution, common in limestone and karst regions. | symbol | 14 | 115 | 4 | |
| HB27900000 | CCSM | Slide | | A landform feature consisting of a descent of a mass of earth or rock. | area outline | 14 | 116 | 4 | |
| HB27900330 | Terrain | Slide | Debris | Downslope movement of a mixture of saturated debris, including soil, weathered rock, mud, boulders, and vegetative debris. | | 14 | 117 | 4 | |
| HB27900333 | Terrain | Slide | Debris - Flow | Rapid flow of a mixture of saturated debris, including soil, weathered rock, mud, boulders, and vegetative debris. | | 14 | 118 | 4 | |
| HB27900335 | Terrain | Slide | Debris Rotational | A landslide in which movement takes place along a well defined, curved shear surface. Material is a mixture of saturated debris, including soil weathered rock, mud, boulders, and vegetative debris. | | 14 | 119 | 4 | |
| HB27900338 | Terrain | Slide | Debris Translational | Downslope movement of a mixture of saturated debris, including soil, weathered rock, mud, boulders, and vegetative debris on a surface which is roughly parallel to the ground surface. | | 14 | 120 | 4 | |
| HB27900110 | CCSM | Slide | Mud | Downslope movement of mainly mud material. | | 14 | 121 | 4 | |
| HB27900120 | CCSM | Slide | Rock | Downslope movement of mainly rock material. | | 14 | 122 | 4 | |
| HB27900322 | Terrain | Slide | Rock Fall | The relatively free falling or precipitous movement of a detached fragment of bedrock from a cliff or other very steep slope. | | 14 | 123 | 4 | |

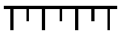
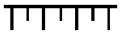
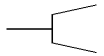
| FCODE | SOURCE | FEATURE | ATTRIBUTE | DESCRIPTION | REMARKS | IGDS LEVEL | IGDS COLOUR | IGDS TYPE | SYMBOL |
|---|---|---|---|---|---|---|---|---|---|
| HB27900323 | Terrain | Slide | Rock Flow | Rapid flow of material dominated by rock. | | 14 | 124 | 4 | |
| HB27900325 | Terrain | Slide | Rock Rotational | A landslide in which movement takes place along a well defined, curved shear surface. Material is dominated by rock. | | 14 | 125 | 4 | |
| HB27900327 | Terrain | Slide | Rock Topple | Fractured rock failure, usually from a near vertical rock face. | | 14 | 126 | 4 | |
| HB27900328 | Terrain | Slide | Rock Translational | Downslope movement of material dominated by rock on a surface which is roughly parallel to the ground surface. | | 14 | 127 | 4 | |
| HB27900340 | Terrain | Slide | Soil | Downslope movement of material dominated by soil. | | 14 | 128 | 4 | |
| HB27900343 | Terrain | Slide | Soil Flow | Rapid flow of material dominated by soil. | | 14 | 129 | 4 | |
| HB27900345 | Terrain | Slide | Soil Rotational | A landslide in which movement takes place along a well defined, curved shear surface. Material is dominated by soil. | | 14 | 130 | 4 | |
| HB27900348 | Terrain | Slide | Soil Translational | Downslope movement of material dominated by soil on a surface which is roughly parallel to the ground surface. | | 14 | 131 | 4 | |
| HB27955000 | Terrain | Slide Headwall/Scarp | | A steep slope at the head of a landslide. | | 14 | 132 | 4 | |
| HB27955119 | Terrain | Slide Headwall/Scarp | Indefinite | An unclear steep slope at the head of a landslide. | | 14 | 133 | 4 | |

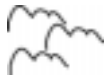
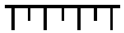
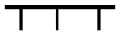
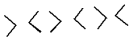
| FCODE | SOURCE | FEATURE | ATTRIBUTE | DESCRIPTION | REMARKS | IGDS LEVEL | IGDS COLOUR | IGDS TYPE | SYMBOL |
|---|---|---|---|---|---|---|---|---|---|
| HB28335000 | Terrain | Snow Avalanche | | A mass of snow and/or ice, sometimes accompanied by rock and vegetative debris, moving rapidly down slope. | | 14 | 134 | 4 | |
| HB28515000 | Terrain | Soil Erosion | | The loosening and removal of materials by wind, moving water and glacier ice. | | 14 | 135 | 4 | |
| HB28515110 | Terrain | Soil Erosion | Badland | Rough, and steeply gullied topography in arid or semiarid areas, characterised by dry, loose soil. Infrequent, heavy showers cause unchecked erosion of the vegetation-free landscape. | | 14 | 136 | 4 | |
| HB28515120 | Terrain | Soil Erosion | Rill | One of the first and smallest channels formed by runoff. | | 14 | 137 | 4 | |
| HB28515130 | Terrain | Soil Erosion | Sheet | Overland flow or downslope movement of water taking the form of a thin, continuous film over relatively large area that is not concentrated into channels. | | 14 | 138 | 4 | |
| GF28750000 | CCSM | Spring | | A place where water flows or springs naturally from rock or soil. | symbol | 14 | 139 | 4 | |
| HB29785000 | Terrain | Striae | | Fine cut lines (scratches) on the surface of bedrock or clasts formed by glacial abrasion; oriented parallel to former ice-flow direction. | | 14 | 140 | 4 | |
| HB29785110 | Terrain | Striae | Movement Known | Fine cut lines (scratches) on the surface of bedrock or clasts formed by glacial abrasion; oriented parallel to a known former ice-flow direction. | | 14 | 141 | 4 | |
| HB29785119 | Terrain | Striae | Movement Unknown | Fine cut lines (scratches) on the surface of bedrock or clasts formed by glacial abrasion; oriented parallel to an unknown former ice-flow direction. | | 14 | 142 | 4 | |

| FCODE | SOURCE | FEATURE | ATTRIBUTE | DESCRIPTION | REMARKS | IGDS LEVEL | IGDS COLOUR | IGDS TYPE | SYMBOL |
|---|---|---|---|---|---|---|---|---|---|
| GA30025000 | Terrain | Surface Water Disappearance | | The location where surface water disappears. | | 14 | 143 | 4 | |
| AP30300000 | CCSM | Mine | Tailing Pile | Refuse material separated as residue in the mining and milling of ore, and deposited in the vicinity of the mine. | | 14 | 144 | 4 | |
| HB30715000 | Terrain | Tension Crack | | Open fissures in bedrock or surficial materials resulting from tensile stress; typically located at or near the crest of a steep slope, and indicative of potential slope failure. | | 14 | 145 | 4 | |
| GD31025000 | Terrain | Tors | | A small castellated hill of bedrock with open joint planes rising abruptly from a relatively smooth hilltop or slope; commonly surrounded by fallen blocks. | | 14 | 150 | 4 | |
| HB32850000 | CCSM | Volcano | | | | 14 | 151 | 4 | |
| HB32850001 | CCSM | Volcano | Inactive | A vent in the surface of the earth through which magma and associated gases and ash had previously erupted but which is now inactive. | | 14 | 152 | 4 | |
| GE33200110 | CCSM | Water Mark | High | The mark left on a shore by the water when at its highest level. | | 14 | 153 | 4 | |
| GE33200120 | CCSM | Water Mark | Low | | | 14 | 154 | 4 | |
| GF33400000 | CCSM | Well | Water | | symbol | 14 | 155 | 4 | |
| GE33200110 | CCSM | Water Mark | Inactive | The mark left on a shore by the water when at its highest level. | | 14 | 153 | 4 | |

***Table 4-11 - Point On Site Symbol Classification Codes.***

| ARC/INFO FCODE | SOURCE | FEATURE | ATTRIBUTE | DESCRIPTION | REMARKS | IGDS LEVEL | IGDS COLOR | IGDS TYPE | SYMBOL |
|---|---|---|---|---|---|---|---|---|---|
| AD01000000 | CCSM | Archaeological Area | | | | 13 | 1 | 7 | |
| HB01005000 | Terrain | Arete | | A narrow, jagged, serrate mountain crest, or a narrow, rocky, sharp-edged ridge or spur, commonly present above the snowline in rugged mountains sculptured by glaciers, and resulting from the continued backward growth of the walls of adjoining cirques. | | 13 | 2 | 7 | |
| HB02105000 | Terrain | Block Field | | A level or gently sloping area covered with blocks derived from underlying bedrock or drift by weathering and/or frost heave, and having undergone no significant downslope movement; characteristic of periglacial regions. | | 13 | 3 | 7 | |
| HB02485000 | Terrain | Boulder Field | | A flat or gently sloping area covered with a continuous veneer of large angular and subangular blocks of rock, derived from well-jointed underlying bedrock by intensive frost action and usually occurring in situ on high, flat topped mountains. | | 13 | 4 | 7 | |
| GA03950000 | CCSM | Canal | | | | See TRIM IGDS specifications | | | |
| HB04600000 | CCSM | Cave | | A naturally-formed, subterranean open area or chamber, or series of chambers. The implication of size is that it is large enough for a human being to enter. Partial synonym: cavern. | (symbol) | 13 | 6 | 7 | |
| HB05450000 | CCSM | Cinder Cone | | A steep-sided conical hill formed by the accumulation of cinders and other pyroclastic deposits around a volcanic vent; normally of basaltic or andestic composition. | | 13 | 7 | 7 | |

| ARC/INFO FCODE | SOURCE | FEATURE | ATTRIBUTE | DESCRIPTION | REMARKS | IGDS LEVEL | IGDS COLOR | IGDS TYPE | SYMBOL |
|---|---|---|---|---|---|---|---|---|---|
| HB05475000 | Terrain | Cirque | | A rounded recess in a mountain formed by glacial erosion, with steep head and side walls, and a relatively gently-sloping floor that is commonly a basin with a small lake and terminated down valley by a convex break of slope. | | 13 | 8 | 7 | |
| HB07585000 | Terrain | Crag | | A streamlined hill consisting of a knob of resistant bedrock. | | 13 | 9 | 7 | |
| FE07885000 | Terrain | Cross-Section | | A two-dimensional representation through the subsurface. | Sampling layer | 13 | 10 | 7 | |
| DD08300000 | CCSM | Cut Earthwork | Railway | | | See TRIM IGDS specifications | | |  |
| DD08350000 | CCSM | Cut Earthwork | Road | An excavation made to allow the level or nearly level passage of a road or track through a hill. See also 'fill'. | | See TRIM IGDS specifications | | |  |
| GA08450000 | CCSM | Dam | section. Top | A barrier to prevent the flow of water, or to raise and control the level of water by forming a reservoir. | | See TRIM IGDS specifications | | |  |
| GA08800000 | CCSM | Ditch | | A trench dug in the earth, as for drainage or irrigation. | | See TRIM IGDS specifications | | | |
| HB09050000 | CCSM | Drumlin | | A streamlined hill or ridge of till or other drift, with a long axis that parallels the direction of former ice flow; generally the upstream end is widest and highest, and the drumlin tapers in the downflow direction. | | 13 | 15 | 7 | |
| GB09150000 | CCSM | Dugout | | Any shallow artificial pond or other water filled excavation. | | 13 | 16 | 7 | |
| HB09250000 | CCSM | Dune | | A low ridge, hummock, or mound of loose sandy material transported and deposited by wind. | | 13 | 17 | 7 | |

| ARC/INFO FCODE | SOURCE | FEATURE | ATTRIBUTE | DESCRIPTION | REMARKS | IGDS LEVEL | IGDS COLOR | IGDS TYPE | SYMBOL |
|---|---|---|---|---|---|---|---|---|---|
| HB09250001 | CCSM | Dune | Inactive | A stabilized, low ridge, hummock, or mound of loose sandy material transported and deposited by wind. | | 13 | 18 | 7 |  |
| DD09900000 | CCSM | Embankment Fill | Railway | | | See TRIM IGDS specifications | | |  |
| DD09950000 | CCSM | Fill Embankment | Road | | | See TRIM IGDS specifications | | | |
| HB10150000 | CCSM | Escarpment | | A steep slope that is usually of great lateral extent compared to its height, such as the risers of river terraces and steep faces associated with stratified rocks. | | 13 | 21 | 7 | |
| HB10150310 | Terrain | Escarpment | Bedrock - definite | A clear and obvious line of bedrock cliffs or bluffs produced by faulting or by erosion. | | 13 | 22 | 7 | |
| HB10150319 | Terrain | Escarpment | Bedrock - indefinite | An unclear line of bedrock cliffs or bluffs produced by faulting or by erosion. | | 13 | 23 | 7 | |
| HB10150320 | Terrain | Escarpment | Overburden - definite | A clear and obvious relatively steep and straight, cliff-like face or slope composed of unconsolidated sediment. | | 13 | 24 | 7 |  |
| HB10150329 | Terrain | Escarpment | Overburden - indefinite | An unclear relatively steep and straight, cliff-like face or slope composed of unconsolidated sediment. | | 13 | 25 | 7 | |
| HB10200000 | CCSM | Esker | | A sinuous ridge of sand and gravel resulting from deposition by meltwater in a tunnel beneath or within a glacier or ice sheet. The ridges generally trend at right angles to a glacier margin. | | 13 | 26 | 7 |  |

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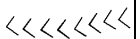
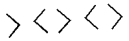
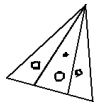
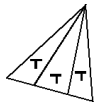
|---|---|---|---|---|---|---|---|---|---|
| HB10200310 | CCSM | Esker | flow known | A sinuous ridge of sand and gravel resulting from deposition by meltwater in a tunnel beneath or within a glacier or ice sheet. The ridges generally trend at right angles to a glacier margin. Flow direction during deposition is known. | | 13 | 27 | 7 |  |
| HB10200319 | CCSM | Esker | flow unknown | A sinuous ridge of sand and gravel resulting from deposition by meltwater in a tunnel beneath or within a glacier or ice sheet. The ridges generally trend at right angles to a glacier margin but the direction of flow during deposition is unknown. | | 13 | 28 | 7 |  |
| GA10450000 | CCSM | Falls | | A waterfall which in most cases starts with a series of rapids, then goes over a vertical or near vertical drop and ends with a cataract over the debris at the bottom of the drop. Many topographic maps give the height of the vertical drop if over a specific height. | (line) | See TRIM IGDS specifications | | | |
| HB10495110 | Terrain | Fan | Alluvial | A fan-shaped deposit of fluvial sand and gravel, usually located at the mouth of a tributary valley; a type of floodplain. | | 13 | 30 | 7 |  |
| HB10495120 | Terrain | Fan | Colluvial | A fan-shaped mass of sediments deposited by colluvial processes, most commonly debris flows. | | 13 | 31 | 7 | |
| HB10495130 | Terrain | Fan | Talus Cone | A small, cone-shaped or apron-like landform at the base of a cliff, consisting of poorly sorted talus that has accumulated episodically. | | 13 | 32 | 7 |  |
| GD11400000 | CCSM | Flow Arrow | | An arrow placed on a map to show the direction of flow. | | See TRIM IGDS specifications | | | |
| HB11775000 | Terrain | Fossil | | An area in which remains, traces, or imprints of a plant or animal has been preserved by natural processes. | | 13 | 34 | 7 | |
| HB11775110 | Terrain | Fossil | Marine | An area in which remains, traces, or imprints of a plant or animal has been preserved by natural processes in a marine environment. | | 13 | 35 | 7 | |

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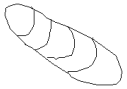
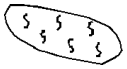
|---|---|---|---|---|---|---|---|---|---|
| HB11775120 | Terrain | Fossil | Terrestrial | An area in which remains, traces, or imprints of a plant or animal has been preserved by natural processes in a terrestrial environment. | | 13 | 36 | 7 | |
| GD12300000 | CCSM | Glacier | | A body of ice formed by the compaction and recrystallization of snow, that has definite lateral limits, and with motion in a definite direction. | | See TRIM IGDS specifications | | |  |
| HB14315000 | Terrain | Ice Contact Delta | | An accumulation of stream-transported sediments deposited in a body of water, on or in contact with glacial ice. The landform is flat or very gently sloping, and triangular or fan-shaped in plan. | | 13 | 38 | 7 | |
| HB15065000 | Terrain | Kame | | Irregular or conical hillocks composed chiefly of sand and gravel; formed by deposition of meltwater-transported sediments in contact with (against, within, or upon) stagnant glacier ice; a type of glaciofluvial deposit. | | 13 | 39 | 7 | |
| HB15125000 | Terrain | Kettle Hole | | A closed depression or hollow in glacial drift which has resulted from the melting of a buried or partly buried mass of glacier ice; common in glaciofluvial deposits. | | 13 | 40 | 7 | |
| GB15250000 | CCSM | Lagoon | | A small narrow stretch of sea water separated or partly separated from the ocean by a low, narrow, elongate strip of land. | | 13 | 41 | 7 |  |
| GB15300000 | CCSM | Lake | Definite | A large, inland body of salt or fresh water, entirely surrounded by land. Larger than a pond. | | See TRIM IGDS specifications | | | |
| GB15300120 | CCSM | Lake | Dry | A lake bed from which all water has drained or evaporated. | | See TRIM IGDS specifications | | | |
| GB15300140 | CCSM | Lake | Intermittent | | | See TRIM IGDS specifications | | | |
| HB15850000 | CCSM | Lava Bed | | A landform area covered with lava. | | 13 | 45 | 7 | |
| HB16415110 | Terrain | Linear Feature | Direction Known | A feature arranged in a line or lines. | | 13 | 46 | 7 | |

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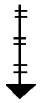
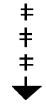
|---|---|---|---|---|---|---|---|---|---|
| HB16415119 | Terrain | Linear Feature | Direction Unknown | A feature arranged in a line or lines. | | 13 | 47 | 7 | |
| GC17100000 | CCSM | Marsh | | A water-saturated, poorly drained area, intermittently, or permanently water covered, having aquatic and grasslike vegetation, essentially without trees and without peat like accumulation. See also Bog, Fen. | area outline | See TRIM IGDS specifications | | | |
| HB17275110 | Terrain | Meltwater Channel | Definite | A channel or valley formed or followed by a glacial meltwater stream. | | 13 | 49 | 7 | |
| HB17275119 | Terrain | Meltwater Channel | Indefinite | A channel or valley formed or followed by a glacial meltwater stream. | | 13 | 50 | 7 | |
| HB17275120 | Terrain | Meltwater Channel | Lateral, Definite | A channel or valley formed or followed by a glacial meltwater stream. | | 13 | 51 | 7 | |
| HB17275129 | Terrain | Meltwater Channel | Lateral, Indefinite | A channel or valley formed or followed by a glacial meltwater stream. | | 13 | 52 | 7 | |
| HB17275130 | Terrain | Meltwater Channel | Left Bank | A channel or valley formed or followed by a glacial meltwater stream. | | 13 | 53 | 7 | |
| HB17275140 | Terrain | Meltwater Channel | Right Bank | A channel or valley formed or followed by a glacial meltwater stream. | | 13 | 54 | 7 | |
| HB17275150 | Terrain | Meltwater Channel | Subglacial, Definite | A channel or valley formed or followed by a glacial meltwater stream. | | 13 | 55 | 7 |  |
| HB17275159 | Terrain | Meltwater Channel | Subglacial, Indefinite | A channel or valley formed or followed by a glacial meltwater stream. | | 13 | 56 | 7 |  |

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|---|---|---|---|---|---|---|---|---|---|
| AG17600000 | CCSM | Mine | Open Pit | A pit or excavation from which ores, coal, etc. are taken by digging. A open pit mine is generally larger and deeper tan a quarry. | | 13 | 57 | 7 | |
| AG17700000 | CCSM | Mine | Strip | | | 13 | 58 | 7 | |
| AP30300000 | CCSM | Mine | Tailing Area | Refuse material separated as residue in the mining and milling of ore, and deposited in the vicinity of the mine. | | 13 | 128 | 7 | |
| AB17500000 | CCSM | Mine | Underground | | | 13 | 59 | 7 | |
| AB17500001 | CCSM | Mine | Underground Abandoned | | | 13 | 60 | 7 | |
| CG17800000 | CCSM | Mine Entrance | Adit | A near horizontal passage from the surface into a mine. | | 13 | 61 | 7 | |
| CG17800001 | CCSM | Mine Entrance | Adit Abandoned | | | 13 | 62 | 7 | |
| CG17900000 | CCSM | Mine Shaft | | A vertical or inclined excavation through which a mine is worked. | | 13 | 63 | 7 | |
| CG17900001 | CCSM | Mine Shaft | Abandoned | | | 13 | 64 | 7 | |
| HB18700000 | CCSM | Moraine | | A landform that consists of till or, less commonly of other drift; it exhibits a variety of shapes, ranging from plains to mounds and ridges, that are initial constructional forms independent of underlying bedrock or older materials. | | 13 | 65 | 7 | |
| HB18700110 | CCSM | Moraine | Lateral | A ridge built along the side of a valley glacier. | | 13 | 66 | 7 | |
| HB18700119 | CCSM | Moraine | Lateral Indefinite | An indefinite ridge built along the side of a valley glacier. | | 13 | 67 | 7 | |
| HB18700120 | CCSM | Moraine | Medial | A morainal ridge in the middle of a glacier, parallel to the direction of glacier flow, and formed the by the union of lateral moraines of two coalescing glaciers. | | 13 | 68 | 7 | |

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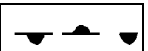
| HB18700129 | CCSM | Moraine | Medial Indefinite | An indefinite morainal ridge in the middle of a glacier, parallel to the direction of glacier flow, and formed the by the union of lateral moraines of two coalescing glaciers. | | 13 | 69 | 7 |  |
| HB18700130 | CCSM | Moraine | Terminal | The end moraine that marks the furthest point reached by an advancing glacier. | | 13 | 70 | 7 | |
| HB18700139 | CCSM | Moraine | Terminal Indefinite | The indefinite end moraine that marks the furthest point reached by an advancing glacier. | | 13 | 71 | 7 | |
| HB19265110 | Terrain | Occurrence / Concentration | Gravel | | | 13 | 72 | 7 | |
| HB19265120 | Terrain | Occurrence / Concentration | Peat | A concentration of semi-carbonized plant remains. | | 13 | 73 | 7 | |
| HB19265130 | Terrain | Occurrence / Concentration | Sand | A concentration of sand particles between 0.62-2 mm. | | 13 | 74 | 7 | |
| GD21065000 | Terrain | Permafrost | | Ground in which temperature has remained below 0 degrees Celsius continuously for at least 2 years, regardless of type of material or water content; a thermal condition. | | 13 | 75 | 7 | |
| HB21515000 | Terrain | Piping | | Subsurface erosion of particulate materials by flowing water, resulting in the formation of underground caves and conduits and the development of collapse-depressions at the land surface. | | 13 | 76 | 7 | |
| AG21550000 | CCSM | Pit | Gravel Sand | An excavation where sand or gravel has been removed for use in construction. It is not used in Canada as a synonym for coal mine. A borrow pit is the excavation left when earth or sand have been removed. | | 13 | 77 | 7 | |
| AG21550001 | CCSM | Pit | Abandoned | | | 13 | 78 | 7 | |
| AG21550110 | CCSM | Pit | Gravel | An open pit where gravel is mined. | | 13 | 79 | 7 | |

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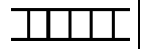
|---|---|---|---|---|---|---|---|---|---|
| AG21550120 | CCSM | Pit | Sand | An open pit where sand is mined. | | 13 | 80 | 7 | |
| AG21550130 | CCSM | Pit | Shale | | | 13 | 81 | 7 | |
| AG22450000 | CCSM | Quarry | Dry | An open excavation for which building stone, slate etc. is obtained. | | 13 | 82 | 7 | |
| GB22500000 | CCSM | Quarry | Water Filled | | | 13 | 83 | 7 | |
| HB23050000 | CCSM | Raised Beach/Strand Lines | | An ancient beach occurring above the present shoreline and separated from the present beach as a result of terrain uplift or the lowering of the sea or lake level. | | 13 | 84 | 7 | |
| HB23050310 | Terrain | Raised Beach/Strand Line | Definite | An obvious abandoned shoreline. | | 13 | 85 | 7 | |
| HB23050319 | Terrain | Raised Beach/Strand Line | Indefinite | An indefinite abandoned shoreline. | | 13 | 86 | 7 | |
| GA23500000 | CCSM | Rapids | | A fast flowing section of a watercourse generally with exposed rocks or boulders. | (line) | See TRIM IGDS specifications | | | |
| GA24850310 | Terrain | River/Stream | Gully | A small valley or ravine, longer than wide, and typically from a few metres to a few tens of metres across. | | 13 | 88 | 7 |  |
| HB25335000 | Terrain | Roche Moutonee | | A knob of rock with a whale-back form, the long axis of which is oriented parallel to former ice flow, and having a smooth, glacially-abraded stoss (up-flow) slope and a much steeper and rougher, glacially-plucked lee slope. | | 13 | 89 | 7 | |

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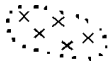
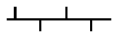
|---|---|---|---|---|---|---|---|---|---|
| GD25375000 | Terrain | Rock Glacier | | A tongue shaped or lobate, ridged accumulation of angular rock fragments containing interstitial ice that moves slowly downslope; morphologically similar to a glacier. | | 13 | 90 | 7 | |
| HB25400000 | CCSM | Rock Outcrop | | A portion on the surface where one or more bedrock geological formations are exposed. | | 13 | 91 | 7 |  |
| HB25745000 | Terrain | Sackung | Sagging Slope | Uphill-facing scarps on mountain sides that trend parallel to contours and developed as a result of gravitational movement. | | 13 | 92 | 7 |  |
| HB27550000 | CCSM | Sinkhole | | A funnel shaped depression in the land surface that communicates with a subterranean passage developed by solution, common in limestone and karst regions. | (symbol) | 13 | 99 | 7 | |
| HB27900000 | CCSM | Slide | | A landform feature consisting of a descent of a mass of earth or rock. | (area outline) | 13 | 100 | 7 | |
| HB27900330 | Terrain | Slide | Debris | Downslope movement of a mixture of saturated debris, including soil, weathered rock, mud, boulders, and vegetative debris. | | 13 | 101 | 7 | |
| HB27900333 | Terrain | Slide | Debris - Flow | Rapid flow of a mixture of saturated debris, including soil, weathered rock, mud, boulders, and vegetative debris. | | 13 | 102 | 7 | |
| HB27900335 | Terrain | Slide | Debris - Rotational | A landslide in which movement takes place along a well defined, curved shear surface. Material is a mixture of saturated debris, including soil, weathered rock, mud, boulders, and vegetative debris. | | 13 | 103 | 7 | |
| HB27900338 | Terrain | Slide | Debris - Translational | Downslope movement of a mixture of saturated debris, including soil, weathered rock, mud, boulders, and vegetative debris on a surface which is roughly parallel to the ground surface. | | 13 | 104 | 7 | |
| HB27900110 | CCSM | Slide | Mud | Downslope movement of mainly mud material. | | 13 | 105 | 7 | |

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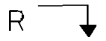
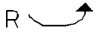
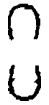
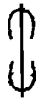
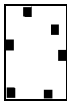
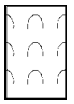
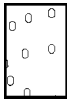
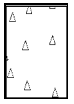
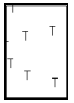
|---|---|---|---|---|---|---|---|---|---|
| HB27900120 | CCSM | Slide | Rock | Downslope movement of mainly rock material. | | 13 | 106 | 7 | |
| HB27900322 | Terrain | Slide | Rock - Fall | The relatively free falling or precipitous movement of a detached fragment of bedrock from a cliff or other very steep slope. | | 13 | 107 | 7 |   |
| HB27900323 | Terrain | Slide | Rock - Flow | Rapid flow of material dominated by rock. | | 13 | 108 | 7 | |
| HB27900325 | Terrain | Slide | Rock Rotational | A landslide in which movement takes place along a well defined, curved shear surface. Material is dominated by rock. | | 13 | 109 | 7 |   |
| HB27900327 | Terrain | Slide | Rock Topple | Fractured rock failure, usually from a near vertical rock face. | | 13 | 110 | 7 | |
| HB27900328 | Terrain | Slide | Rock Translational | Downslope movement of material dominated by rock on a surface which is roughly parallel to the ground surface. | | 13 | 111 | 7 | |
| HB27900340 | Terrain | Slide | Soil | Downslope movement of material dominated by soil. | | 13 | 112 | 7 | |
| HB27900343 | Terrain | Slide | Soil Flow | Rapid flow of material dominated by soil. | | 13 | 113 | 7 | |
| HB27900345 | Terrain | Slide | Soil Rotational | A landslide in which movement takes place along a well defined, curved shear surface. Material is dominated by soil. | | 13 | 114 | 7 | |
| HB27900348 | Terrain | Slide | Soil Translational | Downslope movement of material dominated by soil on a surface which is roughly parallel to the ground surface. | | 13 | 115 | 7 | |
| HB27955000 | Terrain | Slide Headwall/Scarp | | A steep slope at the head of a landslide. | | 13 | 116 | 7 | |
| HB27955119 | Terrain | Slide | Indefinite | An unclear steep slope at the head of a landslide. | | 13 | 117 | 7 | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Headwall/Scarp | | | | | | | |
| HB28335000 | Terrain | Snow Avalanche | | A mass of snow and/or ice, sometimes accompanied by rock and vegetative debris, moving rapidly down slope. | | 13 | 118 | 7 | |
| HB28515000 | Terrain | Soil Erosion | | The loosening and removal of materials by wind, moving water and glacier ice. | | 13 | 119 | 7 | |
| HB28515110 | Terrain | Soil Erosion | Badland | Rough, and steeply gullied topography in arid or semiarid areas, characterized by dry, loose soil. Infrequent, heavy showers cause unchecked erosion of the vegetation-free landscape. | | 13 | 120 | 7 | |
| HB28515120 | Terrain | Soil Erosion | Rill | One of the first and smallest channels formed by runoff. | | 13 | 121 | 7 | |
| HB28515130 | Terrain | Soil Erosion | Sheet | Overland flow or downslope movement of water taking the form of a thin, continuous film over relatively large area that is not concentrated into channels. | | 13 | 122 | 7 | |
| GF28750000 | CCSM | Spring | | A place where water flows or springs naturally from rock or soil. | (symbol) | 13 | 123 | 7 | |
| HB29785000 | Terrain | Striae | | Fine cut lines (scratches) on the surface of bedrock or clasts formed by glacial abrasion; oriented parallel to former ice-flow direction. | | 13 | 124 | 7 |  |
| HB29785110 | Terrain | Striae | Movement Known | Fine cut lines (scratches) on the surface of bedrock or clasts formed by glacial abrasion; oriented parallel to a known former ice-flow direction. | | 13 | 125 | 7 | |
| HB29785119 | Terrain | Striae | Movement Unknown | Fine cut lines (scratches) on the surface of bedrock or clasts formed by glacial abrasion; oriented parallel to an unknown former ice-flow direction. | | 13 | 126 | 7 |  |
| GA30025000 | Terrain | Surface Water Disappearance | | The location where surface water disappears. | | 13 | 127 | 7 | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| HB30715000 | Terrain | Tension Crack | | Open fissures in bedrock or surficial materials resulting from tensile stress; typically located at or near the crest of a steep slope, and indicative of potential slope failure. | | 13 | 129 | 7 | |
| GD31025000 | Terrain | Tors | | A small castellated hill of bedrock with open joint planes rising abruptly from a relatively smooth hilltop or slope; commonly surrounded by fallen blocks. | | 13 | 130 | 7 | |
| HB32850000 | CCSM | Volcano | | | | 13 | 131 | 7 | |
| HB32850001 | CCSM | Volcano | Inactive | A vent in the surface of the earth through which magma and associated gases and ash had previously erupted but which is now inactive. | | 13 | 132 | 7 | |
| GE33200110 | CCSM | Water Mark | High | The mark left on a shore by the water when at its highest level. | | 13 | 133 | 7 | |
| GE33200120 | CCSM | Water Mark | Low | | | 13 | 134 | 7 | |
| GF33400000 | CCSM | Well | Water | | symbol | 13 | 135 | 7 | |

***Table 4-12 - Polygonal On Site Classification Codes.***

| ARC/INFO FCODE | SOURCE | FEATURE | ATTRIBUTE | DESCRIPTION | REMARKS | IGDS LEVEL | IGDS COLOR | IGDS TYPE | SYMBOL |
|---|---|---|---|---|---|---|---|---|---|
| HB02105000 | Terrain | Block Field | | A level or gently sloping area covered with blocks derived from underlying bedrock or drift by weathering and/or frost heave, and having undergone no significant downslope movement; characteristic of periglacial regions. | | 15 | 1 | label = 7<br>arc = 4 |  |
| HB02485000 | Terrain | Boulder Field | | A flat or gently sloping area covered with a continuous veneer of large angular and subangular blocks of rock, derived from well-jointed underlying bedrock by intensive frost action and usually occurring in situ on high, flat topped mountains. | | 15 | 2 | label = 7<br>arc = 4 | |
| GB09150000 | CCSM | Dugout | | Any shallow artificial pond or other water filled excavation. | | 15 | 3 | label = 7<br>arc = 4 | |
| HB09250000 | CCSM | Dune | | A low ridge, hummock, or mound of loose sandy material transported and deposited by wind. | | 15 | 4 | label = 7<br>arc = 4 |  |
| HB09250001 | Terrain | Dune | Inactive | A stabilized, low ridge, hummock, or mound of loose sandy material transported and deposited by wind. | | 15 | 5 | label = 7<br>arc = 4 | |
| HB10495110 | Terrain | Fan | Alluvial | A fan-shaped deposit of fluvial sand and gravel, usually located at the mouth of a tributary valley; a type of floodplain. | | 15 | 6 | label = 7<br>arc = 4 |  |
| HB10495120 | Terrain | Fan | Colluvial | A fan-shaped mass of sediments deposited by colluvial processes, most commonly debris flows. | | 15 | 7 | label = 7<br>arc = 4 |  |
| HB10495130 | Terrain | Fan | Talus Cone | A small, cone-shaped or apron-like landform at the base of a cliff, consisting of poorly sorted talus that has accumulated episodically. | | 15 | 8 | label = 7<br>arc = 4 |  |

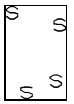
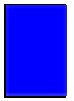
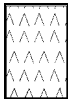
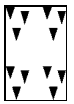
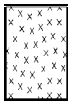
| ARC/INFO FCODE | SOURCE | FEATURE | ATTRIBUTE | DESCRIPTION | REMARKS | IGDS LEVEL | IGDS COLOR | IGDS TYPE | SYMBOL |
|---|---|---|---|---|---|---|---|---|---|
| GB15250000 | CCSM | Lagoon | | A small narrow stretch of sea water separated or partly separated from the ocean by a low, narrow, elongate strip of land. | | 15 | 9 | label = 7<br>arc = 4 |  |
| GB15300000 | CCSM | Lake | Definite | A large, inland body of salt or fresh water, entirely surrounded by land. Larger than a pond. | | See TRIM IGDS specifications | | |  |
| GB15300120 | CCSM | Lake | Dry | A lake bed from which all water has drained or evaporated. | | 15 | 11 | label = 7<br>arc = 4 | |
| GB15300140 | CCSM | Lake | Intermittent | | | See TRIM IGDS specifications | | | |
| HB15850000 | CCSM | Lava Bed | | A landform area covered with lava. | | 15 | 13 | label = 7<br>arc = 4 |  |
| GC17100000 | CCSM | Marsh | | A water-saturated, poorly drained area, intermittently, or permanently water covered, having aquatic and grasslike vegetation, essentially without trees and without peat like accumulation. See also Bog, Fen. | (area outline) | See TRIM IGDS specifications | | | |
| GD21065000 | Terrain | Permafrost | | Ground in which temperature has remained below 0 degrees Celsius continuously for at least 2 years, regardless of type of material or water content; a thermal condition. | | 15 | 15 | label = 7<br>arc = 4 |  |
| HB25400000 | CCSM | Rock Outcrop | | A portion on the surface where one or more bedrock geological formations are exposed. | | 15 | 16 | label = 7<br>arc = 4 |  |
| AP30300000 | CCSM | Mine | Tailing Area | Refuse material separated as residue in the mining and milling of ore, and deposited in the vicinity of the mine. | | See TRIM IGDS specifications | | | |

***Table 4-13 - Linear Sample Site Classification Codes***

| ARC/INFO FCODE | SOURCE | FEATURE | ATTRIBUTE | DESCRIPTION | REMARKS | IGDS LEVEL | IGDS COLOR | IGDS TYPE |
|---|---|---|---|---|---|---|---|---|
| FE25755000 | Terrain | Sample Site | | The site of a geologic observation. | Sampling layer | 14 | 109 | 4 |
| FE25755110 | Terrain | Sample Site | Age dating | The site of a sample for age dating. | Sampling layer | 14 | 110 | 4 |
| FE25755120 | Terrain | Sample Site | Air | The site of an observation made from the air. | Sampling layer | 14 | 111 | 4 |
| FE25755130 | Terrain | Sample Site | Bore Hole/Pit | The site of a borehole excavation. | Sampling layer | 14 | 112 | 4 |
| FE25755140 | Terrain | Sample Site | Ground | The site of an observation, sample or test made on the ground. | Sampling layer | 14 | 113 | 4 |
| FE25755150 | Terrain | Sample Site | Stratigraphic Section | Any sequence of rock or unconsolidated sediment units, either at or below the surface. | Sampling layer | 14 | 114 | 4 |

***Table 4-14 - Point Sample Site Classification Codes***

| ARC/INFO FCODE | SOURCE | FEATURE | ATTRIBUTE | DESCRIPTION | REMARKS | IGDS LEVEL | IGDS COLOR | IGDS TYPE |
|---|---|---|---|---|---|---|---|---|
| FE25755000 | Terrain | Sample Site | | The site of a geologic observation. | Sampling layer | 13 | 93 | 7 |
| FE25755110 | Terrain | Sample Site | Age dating | The site of a sample for age dating. | Sampling layer | 13 | 94 | 7 |
| FE25755120 | Terrain | Sample Site | Air | The site of an observation made from the air. | Sampling layer | 13 | 95 | 7 |
| FE25755130 | Terrain | Sample Site | Bore Hole/Pit | The site of a borehole excavation. | Sampling layer | 13 | 96 | 7 |
| FE25755140 | Terrain | Sample Site | Ground | The site of an observation, sample or test made on the ground. | Sampling layer | 13 | 97 | 7 |
| FE25755150 | Terrain | Sample Site | Stratigraphic Section | Any sequence of rock or unconsolidated sediment units, either at or below the surface. | Sampling layer | 13 | 98 | 7 |

### *4.2.4 Terrain Polygon Attributes*

Terrain polygon attributes can be captured using the attribute form described in section 2 of this manual or with the data capture utility that will be available from the Wildlife Branch of the Ministry of Environment Lands and Parks. This data is stored in a database which is described in detail in section 5. This aspatial data is linked to the spatial data by a key called “ter_tag”. Ter_tag is a unique identifier consisting of the project number, mapsheet number, and terrain polygon number.

In IGDS files this unique key must be stored in the textnode for the terrain polygons being mapped. In ARC/INFO “ter_tag” is a field on the polygon attribute table of the ter_<project_name> coverage.

The Terrain Attribute data must be delivered in a CSV flat file format. The contents, and format, of this file is discussed in detail in section 2.

## *4.3 Coordinate System*

The standard position of a point on the earth's surface is located by its coordinates. These coordinates can be expressed as spherical or planar coordinates. The first method specifies location in terms of a spheroid (real world coordinates) using latitude, longitude as units of measure. Latitude and longitude represent the x and y positioning of a geographic feature based on the horizontal datum, and must be stated in degrees or portions of degrees. Alternatively, data may be stored in planar coordinates, such as metres, by projecting the data to a flat two dimensional surface. Terrain data may be delivered in the coordinate systems outlined in tables 4-15 and 4-16.

***Table 4-15 - IGDS Coordinate Systems***

| IGDS parameters | Geographic | UTM | BC Albers |
|---|---|---|---|
| Unit of Resolution | impractical | cm | cm |
| Measurement Unit | | metre | metre |
| X,Y Offsets | | 0, 0 | 0, 0 |

***Table 4-16 - ARC/INFO Coordinate Systems***

| ARC/INFO parameters | Geographic | UTM | BC Albers |
|---|---|---|---|
| Unit of Resolution | decimal degrees, double precision | metres, single precision | metres, single precision |
| Measurement Unit | decimal degrees, double precision | metres | metres |
| X,Y Offsets | None | 0, 0 | 0, 0 |

### *4.3.1 Datum*

The NAD83 datum must be used for all data delivered to the terrain data custodian unless specified by the data custodian. **NAD83** - North American Datum 1983, earth-centred ellipsoid derived from Geodetic Reference System 1980 (GRS80)

**NAD27** - North American Datum 1927, based on the Clarke Spheroid of 1866.

### *4.3.2 Projection*

All data must be delivered in one of the following map projections.

Spherical - **Geographic** (Lat/Long)

Rectangular - **UTM, Albers(BC)**

**TM** - Universal Transverse Mercator is the ellipsoidal Transverse Mercator projection with specific parameters pre-defined. British Columbia spans UTM zones 7-11, each zone is 6 degrees of longitude in width, the central meridian being the longitude at the midpoint of the 6 degree span. Rectangular coordinates are metric with Easting values offset by 500,000 metres.

**Albers (British Columbia)** - This projection pre-defines specific parameters for use with the Albers Equal Area Conic projection. For British Columbia these parameters have been defined as:

| | |
|---|---|
| central meridian | 126° 0′ 0″ |
| 1st standard parallel | 50° 0′ 0″ |
| 2nd standard parallel | 58° 30′ 0″ |
| latitude of origin | 45° 0′ 0″ |

Rectangular coordinates are metric with Easting values offset by 1,000,000 metres.

### *4.3.3 NAD27 - NAD83 Conversion*

Data which has been upgraded to the new datum must provide the method of transformation. It is recommended that transformation of data captured for use at scales of 1:50 000 and larger use the National Transformation Grid Version 2.0. If the National Transformation Grid Version 1.1 has been used it must be noted in the specification.

NOTE: When compared to Version 1.1, Version 2.0 of the National Transformation Grid provides greater detail in urban areas and more accurate control in pockets of the northeast of the province. This will only be significant at scales of 1:20 000 and larger.

Reference:

**Standard for the Use of Map Projections in British Columbia for Resource, Cultural and Heritage Inventories**

Resources Inventory Committee, September, 1996

For further information on NAD27, NAD83 and the National Transformation Grid contact:

Geospatial Reference Section

GDBC,

Ministry of Environment, Lands and Parks,

Province of British Columbia

#### *4.3.4 Registration*

All mapping must be tied to the following baseline data:

Choices: Provincial Baseline Digital Atlas 1:20 000 (TRIM)

#### 4.3.5 *Base Positional Accuracy*

Provincial Baseline Digital Atlas 1:20 000 (TRIM) -

90% of all well defined planimetric features shall be coordinated to within 10 metres of their true position.

90% of all discrete spot elevations and DEM points shall be accurate to within 5 metres of their true elevation.

90% of all points interpolated from the TRIM (including contour data) shall be accurate to within 10 metres of their true elevation.

True position/elevation is defined as the coordinates which would be obtained from positioning with high order ground methods.

#### *4.3.6 Data Extents*

The geographic extent of terrain data being captured need not match any particular mapsheet boundary. Each coverage may cover as large, or small, an area as needed. Assembling large areas into continuous coverage's reduces the potential for edge-matching errors. These areas may be defined by specific areas of interest e.g. forest districts or watersheds if desired.

### *4.3.7 Data Format*

Terrain data will be accepted by the Terrain Data Custodian in the following formats.

ARC/INFO export (single precision, uncompressed)

IGDS

### *4.3.8 Coverage or Layer Naming Conventions*

Terrain features may be stored in as many as four ARC/INFO coverages or a single IGDS design file. Each ARC/INFO coverage contains a different category of terrain data, has a specific name, and requires/contains specific feature attributes as described in Table 4-17.

***Table 4-17 - Coverage and Layer Naming Conventions***

| Data Type | Coverage | IGDS Design file | Attributes Required |
|---|---|---|---|
| Terrain Polygons | ter_*project** | ter_*project*.dgn | Polygon and Arc |
| Point and line on site symbols | tef_*project* | ter_*project*.dgn | Arc and Point |
| Area based on site symbols | tea_*project* | ter_*project*.dgn | Polygon and Arc |
| Sample Sites | tes_*project* | ter_*project*.dgn | Arc and Point |

* *project* refers to the name of the mapping project. Coverage ter_kalam would contain terrain polygons for the project Kalam.

### *4.3.9 Minimum Feature Size*

This section defines thresholds for each type of feature captured. These thresholds define the point at which i) the geometry of the feature changes, or ii) the feature is not captured.

The minimum size of polygon, line and area features relates to the scale of data capture, which translate into ground coordinates in the coverages themselves. The generally accepted minimums are as follows:

1. **Terrain polygons** – at least 1 $cm^2$ at the data capture scale. (see *Guidelines and Standards for Terrain Mapping in BC* (1996), page 19).

2. **Line features** – at least 0.5 cm at the data capture scale. Features smaller than this must be ignored, or represented as point features.

3. Area features – at least 0.25 cm at the data capture scale. Features smaller than this must be ignored, or represented as point features.

#### *4.3.10 Data Capture Rules*

##### *4.3.10.1 Right-Hand Rule*

A line which bounds a polygonal feature must be captured such that the feature lies to the right of the line. Equivalently, the boundary of the feature must be oriented in a clockwise direction.

*Applicability:* This rule applies to discrete polygon spatial data types only.

##### *4.3.10.2 Downstream Rule*

Features having a defined discernible gradient must be digitized, or rotated so it points, in a downstream direction.

*Applicability:* This rule applies to linear or point spatial data types only.

*Example:* rivers, glaciers, moraines, slides

##### *4.3.10.3 Pseudo-node Rule*

Pseudo-nodes (nodes where only two arcs meet) should be avoided, except where necessary to meet the maximum element size constraints of a particular software product.

##### *4.3.10.4 Undershoot/Overshoot Rule*

Polygonal feature classes must not contain undershoots or overshoots (e.g. 1-nodes, or nodes that touch only one arc).

##### *4.3.10.5 Single Inside Point Rule*

A polygonal feature must contain only one label point, or text node, located **INSIDE** the polygon

*Applicability:* This rule applies to all polygonal data.

##### *4.3.10.6 Linear On Site Symbols.*

Linear on site symbols should not be broken for other feature groups. Eskers, for example, must be digitized across rivers, kettle holes, etc., and the arcs must not intersect.

### *4.3.11 Digitizing Accuracy*

When mapping terrain in an area which already has accurate digital topographic or base mapping at an appropriate scale (for example, Terrain Resource Inventory Mapping from Geographic Data BC), terrain features should be registered to features in the existing base maps unless the new data is more accurate than the base information. The accuracy of digitized data is related to the scale of the source data. All digitized features must be within 0.5 mm of the original map features when check plotted. Therefore data captured from a 1:20000 base map must be within 10m of its mapped position. If the scale of the source map was 1:50000 data must be within +/- 25 meters of its mapped position. Where the mapping is captured from new terrain surveys, accuracy levels will be specified in the contract.

# 5. Metadata

Two types of metadata must be collected while mapping terrain data:

1. A record of field mapping information in the header of the RIC Inventory Data Form. This is described in section 2.
2. A record information regarding the digital capture of the data. This information, known as data set metadata, is stored in a metadata table within each data set.

All metadata must be included with all data sets when submitted to the terrain data custodian.

### *5.1 Data Set Metadata*

The instructions in this document may be revised when the BC Government creates a standard for storing metadata, see page iii.

For each spatial data set, there must be an attribute database table named ’<dataset_name>.meta’, that contains data set metadata.

The table should have two items (columns):

1. **key** : character, 16 wide.
2. **value** : character, 100 wide.

There should be at least four records in the table, with key values of

’TITLE’ - Short name for this data.

’DESCRIPTION’ - What kind of data is it ?

’SOURCE’ - Where did this data come from ?

’ACCURACY’ - How well does this data represent the earth ?

Other possible key values are:

‘CUSTODIAN’ - What person or agency is responsible to update this data set ?

'WARNING' - Any warnings that users should see before they use this data.

'HISTORY' - What is the origin of the data ? What are the important stages/problems/etc. in its history ?

'RESOLUTION' - What is the minimum size of a unit or feature ?

'REGISTRY' - How is it referred to in the corporate metadata repository ? e.g. 'BC Environment Data Registry', followed by the Registry title of this data set.

'PRODUCTION_DATE' - When was it first created in this form? 'MODIFIED' - Date, agency or person, and how it was modified. For example: '07/95 (MELP ISB) Added FCODE symbology.'

'ORACLE_NOTES' - Does it link to Oracle data? How?

'FUTURE' - What changes/additions/etc. are planned for this data and by whom?

'DISTRIBUTION' - What limitations/copyrights are there on distributing it?

# 6. Quality Assurance Procedures

All digital data must be checked to ensure that:

1. All attributes in all fields are allowable values;
2. All classes and their representation are consistent with the data model, that is each geographic object (class or feature) is represented by the right Geometric Object (point, line, or polygon);
3. All mandatory fields are populated;
4. All digitizing rules have been adhered to;
5. The accuracy of the digital data is acceptable;
6. All linework must be topologically 'clean'. All polygon boundary lines must be broken where they intersect;
7. Dangling arcs must be removed on polygon and region layers;
8. Features and attributes must be edge matched along project or mapsheet boundaries.

Spatial data can be checked with a check plot. The check plot must consist of a symbolised map plotted at the same scale of the source data. It must show all of the features collected and these features must be drawn with the correct symbology. Check plots must be reviewed against the source document to ensure that all features were collected and coded properly.

Terrain attribute data must also be checked. Polygon attributes should be checked to ensure that polygons were given the correct terrain classification. This is best done with another check plot which contains labeled polygons. The attributes themselves must also be checked to ensure that all codes collected are valid. At this time a generic attribute validation program does not exist. The data capture program does however validate data as it is collected. All errors and omissions should be corrected before the data is sent to the terrain database custodian.

## *6.1 Check Plot Specification*

Check plots are usually created to help verify data, but are only one possible output of the digital terrain data specified above.

Over time, the data custodian is expected to develop and provide the following items:

Standard symbology.

Sample output .

ARC/INFO Arc macro language scripts to automate the plotting of:

Terrain map surround

Terrain polygon labels

Terrain map legend

Sample/observation site labels.

### *6.1.1 Content*

A standard terrain dataset should be plotted as two separate plots on mylar at the same scale:

1. Terrain polygons with labels derived from their attributes (1 coverage);
2. Point, line, and area features, with sample/observation sites (3 coverages).

Though check plots do not necessarily require legends, final map products do.

### *6.1.2 Extent*

Check plots should contain data from complete projects, watersheds or BCGS/NTS mapsheets.

### *6.1.3 Surround*

The surround for the terrain polygon plot should contain:

1. A section on the left or bottom for overflow labels (labels too large to fit into their polygons at the plot scale);
2. A terrain polygon legend, which can be derived from the polygons, their attributes, and attributes of their project. It can include a key containing a lookup table matching attribute codes to full names for all codes used in the polygon labels. Some legends may contain all ‘generic’ or ‘comprehensive’ codes for terrain mapping;
3. A section for project-specific notes compiled for polygons represented on the plot;
4. A title box;
5. An index map.

The end of this section contains some example templates for map sizes (with considerations for plotter dimensions, reproduction, cabinet storage), surround layout and information requirements.

For a sample surround and legend, see pages 53, 54 and 58 Guidelines and Standards for Terrain Mapping in BC (1996).

### *6.1.4 Symbology*

ARC/INFO symbols sets, and lookup tables, are available for terrain mapping. They can be downloaded from http://ftp.env.gov.bc.ca/dist/arcinfo/terrain. Symbology using true type fonts is being developed but as of June 25, 1997 is not yet available. Symbology is defined in 'plotter' units so that one set of symbology is usable for datasets of any scale, so long as the data density is appropriate.

### *6.1.5 Registration Grid*

A coordinate reference should be plotted for assistance with registration. This may consist of grid lines or ticks in longitude/latitude and/or UTM coordinates. It should extend over the entire map surface.

### *6.1.6 Annotation Text*

This mapping contains no annotation text.

### *6.1.7 Terrain Polygon Labels*

Depending on project specifications, terrain polygon labels may contain indicators of:

Terrain components 1, 2, and 3.

Drainage.

Slope.

Slope stability.

Geomorphological processes.

TERTAG field (see section 4, 'Attribute Tables').

The algorithm for generating these labels will not be undertaken do to maintainence concerns.

### *6.1.8 Terrain Polygon Symbols - Labeling Suggestions*

The label examples below include the 'standard look' of terrain labels commonly used on terrain maps. Refer to Howes and Kenk Version 2.0 for further label examples.

The labels have a standard format in terms of the order of elements; the texture symbols (sg) always precede the ' surficial material' (M) and the surface expression (bv) always follows the surficial material, for example **sgFGbv** ( in Arial font); **sgFGbv** (in Univers font).

**Simple terrain labels**

| Code | Description |
|---|---|
| **Mb** | morainal blanket |
| **Mb/Cv** | morainal blanket is the dominant material in the polygon and colluvial veneer is the subdominant material, they are separated by a single delimeter. |
| **6Mb 4Cv**<br>**m,w** | similar to b) but the components are apportioned by percentiles used in 'terrain mapping for ecosystems', this convention also classifies and labels soils drainage classifications. |

**Complex terrain labels**

| Code | Description |
|---|---|
| **sgFGb/gCk/sFAp - B** | the 'G' and 'A' qualifiers can now be recorded in a 'straight line' instead of a superscript. |
| **7arCv 3rsMv - C**<br>**Rk Rm** | the line between the symbols, indicating stratigraphy should be recorded, however if the underlying surficial material is located directly below the upper surficial material the reader should understand this convention - if explained in the legend and does not conflict with other symbols, see f) |
| **7arCv 3rsMv - C**<br>**Rk Rm** | |
| **doRm // Cxv** | a bedrock type (dolomite 'do' in this case) can be recorded before the 'R' bedrock symbol. |
| **Rs . Cv - VARd**<br>**5 w**<br>**V** | a terrain slope stability symbol set; terrain, slope class (5), drainage (w), and slope stability symbol (V) class 5. |

### *6.1.9 Fonts and Symbol Placement:*

The fonts for the labels should consider 'plain' letter types to allow for photo copy reductions without loosing part of the type and to allow for space between the letters and clarity with each letter type i.e. avoid 'i's which look like 'l's.

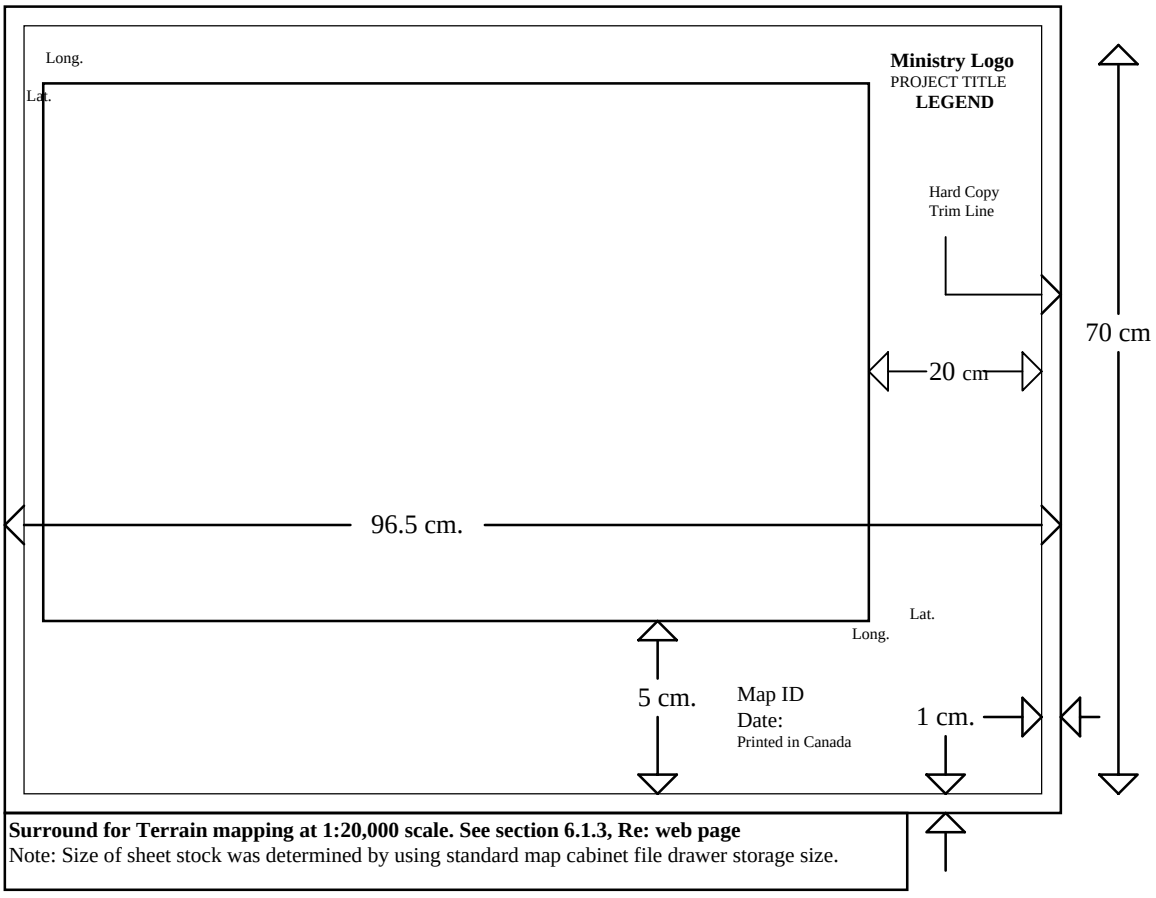
ARC/INFO has the following preferred fonts, 'Univers Medium' and 'Trimvirate'; other closely similar fonts such as Helvetica are suitable.

Symbol placement, the labels can be reduced in size and rotated to fit the polygon configurations. In tight situations lablels can be placed in a overflow galley, but must have a numeric identifier, polygon number, both in the polygon and with the label. But marginal overflows make the map reading more difficult.

### *6.1.10 Sample/Observation Site labels*

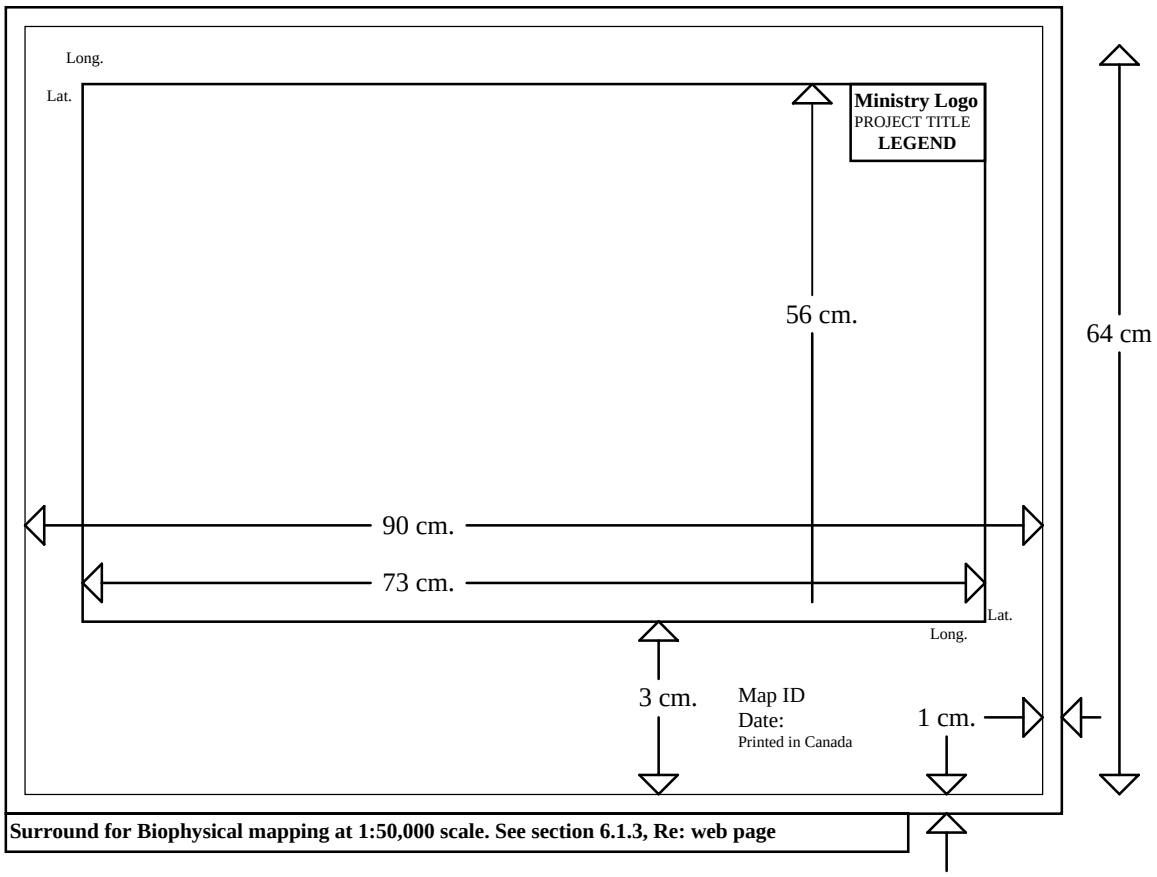
Sample/observation site labels should contain appropriate indicators from the sample/observation site attribute database.

***Figure 6-1- Example Map Surround 1:20,000***




**Surround for Terrain mapping at 1:20,000 scale. See section 6.1.3, Re: web page**
Note: Size of sheet stock was determined by using standard map cabinet file drawer storage size.

***Figure 6-2 - Example Map Surround 1:50,000***



# APPENDICES

***Appendix 1 - Contact List (1998)***

**Primary Contacts for Direction**

**Geological Survey Branch, Ministry of Employment and Investment**

Peter Bobrowsky
Quaternay Geologist
Head Surficial Geology Section
Geological Survey Branch
1810 Blanshard St.
Victoria BC, V8V 1X5

(250)952 0395
pbobrowsky@galaxy.gov.bc.ca

Ward Kilby
Geologist, Manager-Mineral Potential
'**Terrain Data Custodian**
Geological Survey Branch
5th Floor
Ministry of Employment and Investment
1810 Blanshard Street
Victoria BC, V8V 1X5

**(250)952 0422**
ward.kilby@gems6.gov.bc.ca

Ian Webster
Geologist
'**Assistant Terrain Data Custodian**
Geological Survey Branch
5th Floor
Ministry of Employment and Investment
1810 Blanshard Street
Victoria BC, V8V 1X5

**(250)952-0433**
Ian.Webster@gems1.gov.bc.ca

**Ministry of Environment, Lands and Parks, Terrain Advisors**

Tony Cheong
Senior Geomorphologist
Inventory and Data Systems, Fisheries Branch
Ministry of Environment, Lands and Parks
1-780 Blanshard St.
Victoria BC, V8V 1X4

(250)387 9597
tcheong@fwhdept.env.gov.bc.ca

Bruce Thomson
Geomorphologist
Planning and Assessment
Ministry of Environment, Lands and Parks
10334 152A St.
Surrey BC, V3R 7P8

(604)582 5200

Larry Lacelle
(Bioterrain Corelator)
Wildlife Inventory Section
Resource Inventory Branch
Ministry of Environment, Lands and Parks
201-3547 Skaha Rd..
Penticton BC, V2A 7K2

(250)490-8246
llacelle@fwhdept.env.gov.bc.ca.

Bob Maxwell
(Bioterrain)
Wildlife Inventory Section
Resource Inventory Branch
Ministry of Environment, Lands and Parks
2975 Jutland Road, Victoria, BC V8T 9M1

(250)387 9783
bmaxwell@fwhdept.env.gov.bc.ca

**Data and GIS Advisors**

Bruce Mackenzie,
Senior Technical Analyst
Information Services Branch
Ministry of Environment, Lands and Parks
2975 Jutland Road, Victoria, BC V8T 9M1

(250)387 9614
bmackenz@ssbpost.env.gov.bc.ca

Darren McKellar
Wildlife Inventory Section
Resource Inventory Branch
Ministry of Environment, Lands and Parks
2975 Jutland Road, Victoria, BC V8T 9M1

(250)356-5072
dmckellar@fwhdept.env.gov.bc.ca

Evert Kenk
Head, LandData BC
Geomatics Branch
Ministry of Environment Lands and Parks
1802 Douglas Street
Victoria BC, V8V 1X4

(250)387 9309
ekenk@galaxy.gov.bc.ca

**Ministry of Forests**

Jim Schwab
Regional Geomorphologist
BC Ministry of Forests
Prince Rupert Forest Region
Bag 5000 3726 Alfred St.
Smithers BC, V0J 2NO

(250)847 7435

Tim Giles
Research Geomorphologist
Kamloops Forest District
515 Columbia St.
Kamloops BC, V2C 2T7

(250)371 3708

Steve Chatwin
Geomorphologist
BC Ministry of Forests
31 Bastion, Victoria, BC V8W 3E7

(250)387-5887

Peter Jordan
Research Geomorphologist
BC Ministry of Forests
Nelson Forest Region
518 Lake St.
Nelson B.C., V1L 4C6

(250)354 6242
peter.jordan@gems4.gov.bc.ca

Tom Millard
Research Geomorphologist
BC Ministry of Forests
Vancouver Forest Region
2100 Labieux Rd.
Nanaimo BC, V9T 6E9

(250)751 7115

Terry Rollerson
Geomorphologist
Research Manager
BC Ministry of Forests
Vancouver Forest Region
2100 Labieux Rd.
Nanaimo BC, V9T 6E9

(250)751 7008

M. Sabur
Geomorphologist
BC Ministry of Forests
Cariboo Forest Region
540 Borland St.
Williams Lake BC, V2G 1R8

(250)398-4248

**Consultants, Advisors and Co-Authors on the Terrain Database Manual**

J.M. Ryder
Geomorphologist
J.M Ryder and Associates, Terrain Analysis Inc.
P.O. Box 45005
Suite 101 4336 Dunbar St.
Vancouver BC, V6S 2M8

(250)736 4211
jmryder@intergate.bc.ca

David Caverly
Information Management Consultant
Gordian Management Group Inc
2959 Earl Grey Street,
Victoria, BC, V9A 1W5

(250)389 2806
dcaverly@IBM.com

Alastair Handley
GIS Advisor
Timberline Forestry Industry Consultants
Suite 310 1207 Douglas St.,
Victoria BC V8W 2E7

(250)480 1101
alh@tfic.bc.ca

D.F (Doug) VanDine
Vandine Geological Engineering
267 Wildwood Avenue,
Victoria BC, V8S 3W2

(250)598 1028
vandine@islandnet.com

Terry Gunning
Spatial and Habitat Data Assistant
Wildlife Inventory Section
Resource Inventory Branch
Ministry of Environment, Lands and Parks
2975 Jutland Road, Victoria, BC V8T 9M1

(250)387-9773
tgunning@fwhdept.env.gov.bc.ca

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***Appendix 2 - Project specific Data capture***

Many terrain projects are lkely to have project specific attributes. These attributes are not within the standards for digital terrain capture and will not be systematically stored in the provincial data warehouse. However, consulting companies, regions and districts can store and manage this data for their specific applications. At this time the data warehouse will look into storing this data in flat file format only.

With respect to slope classes; the slope tables recorded below provide a format and guide as to how companies can enter their own specific slope classes. However, being that the relationship of slope classes to local and regional topographies can vary, mappers must therefore set their own class limits.

The provincial terrain database committee prefers that mappers record the actual numeric valus of slopes within polygons, this way the information is more definitive and suitable for intrepretations. This is the reason the slope class tables were removed from the database standards and placed in into the project specfic level.

| **Terrain Data Form Field Name** | **Coding Instructions** | **Field Length** | **Field Descrip** | **CSV Attribute Name** |
|---|---|---|---|---|
| Slope Class 1 | The dominant slope class of a polygon, by recording a class 1,2,3,4 or 5. From "Terrain Geology Mapping" (RIC Jan. 1996). See Table 6-1. | 1 | n-x-r | Slpc_1 |
| Slope Class Relation | A slope class separator used to show the relation between two slope classes. See Table 6-2. | 1 | c-x-r | Slpc_Rel |
| Slope Class 2 | The subdominant slope class of a polygon, by recording a class 1,2,3,4 or 5. From "Terrain Geology Mapping" (RIC Jan. 1996). See Table 6-1. | 1 | n-x-r | Slpc_2 |

***Table 6-1 - Slope Classes[1 2 3]***

| **Code** | **Class Name** | **Definition - Mapper to define their own class limits** |
|---|---|---|
| **1** | Slope Class 1 | E.g. only (0-5 percent; 0-3 degrees) |
| **2** | Slope Class 2 | E.g. only (*6-27 percent; 4-15 degrees*) |
| **3** | Slope Class 3 | E.g. only (*28-49 percent; 16-26 degrees*) |
| **4** | Slope Class 4 | E.g. only (*50-70 percent; 27-35 degrees*) |
| **5** | Slope Class 5 | E.g. only (*>70 percent; >35 degrees*) |

[1] **Slope class limits must be determined on a project specific basis.**

[2]The primary reference base is degrees as the conversion to %'s is not exact in this class table. For very detailed slope measurements and recordings in the 'terrain data base', as for detailed terrain stability work, it is best to refer to the contract specifications and the regional terrain authority.

[3]Mappers are encouraged to record a minimum and maximum slope. Ex. 35-50% for each polygon. Slope classes can then be prepared from those numbers.

***Table 6-2 - Slope Class Separators***

| Code | Class Name | Definition |
|---|---|---|
| , | slope class relation | A slope class separator used to show the relation between two slope classes.<br>A comma indicates two distinct slope classes exist in a polygon. |
| - | slope class relation | A slope class separator used to show the relation between two slope classes.<br>A dash indicates that all intermediate classes exist between the two slope classes recorded. |