Standards for Predictive Ecosystem Mapping (PEM) Digital Data Capture in British Columbia,

Version 1.0 (2000)

Errata No. 1.0

March 2004

Introduction:

As many of you are aware the provincial government, specifically the Resource Information Branch, MSRM, is no longer responsible for the quality assurance of project deliverables associated with Predictive Ecosystem Mapping (PEM). Provincial responsibilities with respect to project deliverables are to determine if, upon delivery, the final project data is in compliance with the provincial standards and can be loaded into the provincial data warehouse. Under this new QA process, the Quality Assurance of PEM deliverables is to be completed by third party QA contractors. It is now the responsibility of the client to ensure all data is in compliance with the current RISC standard(s). It is also now the responsibility of the client to deliver all final PEM products to the province, including the relevant QA, as well as Accuracy Assessment (AA) documentation.

To facilitate this process, section 5.0 of the Standards for Predictive Ecosystem Mapping (PEM) – Digital Data Capture, Version 1.0 (2000) has been amended. These amendments should replace any earlier versions of Section 5. The information included in this document provides revised naming conventions for all digital PEM project deliverables and a new location for delivery of final PEM products. All future PEM project deliverables must adhere to the standards for data submission provided in this document.

Summary:

The following is a summary of the main changes in Section 5.0 – Deliverables, of the PEM technical standard:

1. A project identification number <BAPID> must be requested from the province at the onset of the project. When requesting the BAPID you will be required to supply basic information about the project. The BAPID should be used in naming all files and in all correspondence.
2. File format and naming requirements have changed slightly.
3. All project deliverables must be delivered to the province's ftp site.
4. The province can no longer accept files in hardcopy or on CD's excepted as noted in 5.
5. Air photos and plot cards should be delivered to MSRM.
6. There is a new requirement for interim deliverables. These include localized Biogeoclimatic linework and the approval of new map units.
7. There is now a referencing option available for projects occurring in areas where provincially approved localized BGC linework is already in existence.
8. QC, QA and AA reports will be submitted as part of the final deliverables.
9. Graphics and other inserts should not be linked to the report or expanded legend file as separate documents.

Any questions or comments can be directed to the PEM data custodian at: eco_mail@Victoria1.gov.bc.ca. Recommendations for changes to this standard and/or other related standards should be directed to the same location.

5 Deliverables

5.1 Location

The province can no longer accept data in any other submission format including hardcopy or data submitted on CDs, excepted as noted below for air photos and plot cards. The final submission of seamless data and all associated files must be made in one data transfer, not in individual sections.

PEM digital data is to be delivered to the Ministry of Sustainable Resource Management (MSRM) ftp site at **ftp://ftp.env.gov.bc.ca/pub/incoming/pem** . Anonymous login will be used by the contractor to access the ftp site. PEM deliverables must be zipped into one file named as follows:

<div align="center">

pem_<BAPID>.zip

</div>

The Business Area Project IDentification number <BAPID> must be requested from the MSRM at the onset of the project When submitting a request for BAPID the following information should be included in the body of the email:

- Business Area: (i.e. PEM, TEM, WHR, etc)
- Project Name:
- FIA Contract no.:
- MSRM Region:
- Scale of Mapping:
- Location: (i.e. mapsheets, landscape units, etc):
- Client:
- Mapping Consultant:
- Start date:
- If wildlife habitat assessment will be included (please apply for WHR BAPID according to the WHR data submission standards.)

BAPID requests should be sent to: eco_mail@Victoria1.gov.bc.ca.

The province should also be notified at this address whenever data is posted to the ftp site. "Request for BAPID" or "<BAPID> final deliverables" for example, pem_4145_final deliverables, should be included in the subject line of the email.

Original or copies of plot cards and typed air photos must be delivered to:

Resource Information Branch, Ministry of Sustainable Resource Management

Mailing Address:	Courier Address:
PO Box 9358 Stn Prov Govt,	4th Fl., 395 Waterfront Crescent,
Victoria, BC V8W 9R7	Victoria, BC V8T 5K7

5.2 Format required for project deliverables

To ensure all PEM deliverables are submitted correctly, users must adhere to the requirements outlined in all other sections of the *Standard for Predictive Ecosystem Mapping (PEM) Digital Data Capture in British Columbia,* (RIC, 2000) (the PEM Technical Standard).

Sections 5.3 to 5.49 explain the formats and naming conventions required for all mandatory and optional PEM deliverables that are submitted to the province upon project completion. File names must be in lower case and not contain any spaces. Word documents must be converted into PDF format and Excel documents must be converted into CSV format. All spatial coverages/layers should be ARC/INFO single digit precision export files. The completed project spatial data file must include the entire project boundary, all features along with the required spatial attributes identified in Section 3 of the *Standard for Digital Terrestrial Ecosystem Mapping (TEM) Data Capture in British Columbia,* (RIC, 2000).

Users should always refer to the project contract, referenced materials, the PEM Technical Standard and any other necessary documentation, to guarantee all required deliverables are submitted.

5.3 Interim Deliverables

In order to accommodate a more mechanized method of data delivery and project sign off, the following products should be provided to the province prior to submission of the final products. These files will allow improved updating of the mapcodes list and the production of project-specific validation routines which will be required to verify completed PEM projects.

5.3.1 Biogeoclimatic (BGC) and Ecosection Linework

In some areas of the province reconnaissance or field level reliability large scale BGC mapping is already available through the Ministry of Forests. In such instances, the PEM Inventory Standard and PEM DDC require the practitioner to simply reference the source of the BGC mapping (I.e. ABEC_BC or TBEC - the custodian approved versions). For more information on localized BGC mapping please see the following website: http://www.for.gov.bc.ca/hre/becweb/subsite-map/largescale-01.htm. In areas where relevant large scale BGC mapping is not available, all proposed BGC linework changes and new BGC units must be approved by the applicable Ministry of Forests regional ecologist prior to the production and submission of final ecosystem mapping. The approved BGC linework, along with the associated rules and methods, must be submitted in accordance with section 2.4.5 of the PEM DDC and section 5.4.2 below. Note, any significant changes to the Ecosection lines should be submitted to the Ministry of Sustainable Resource Management for approval prior to final mapping.

See section 4.4.1.2 of the PEM Inventory Standard and the information below in section 5.4.2, Localized BGC Files, for required formatting and section 2.4.5 Localized Biogeoclimatic Layer of the PEM technical standard for further details. Note, mapsheet and Ecosection information is no longer required as outlined in Section 2.4.5 of the *PEM Technical Standard.* The applicable data source(s) and version number(s) for each layer must be referenced.

5.3.2 New PEM entities (i.e. map codes)

All proposed new PEM entities, including the original supporting plot data, must be submitted to and approved by the regional ecologist for the study area prior to the submission of the final deliverables. Once approved, the list of new entities, including proposed entity name and definition, should be submitted to MSRM. The provincial list of site series and map codes will then be updated, to include these new PEM entities, allowing users to validate final submissions.

See section 2.4.2 – Knowledge base, of the PEM technical standard and section 4.7.3 - Knowledge base and algorithm requirements, for further information.

5.4 Final Project Deliverables

The following PEM project deliverables should follow the naming conventions outlined below. All files should be prefixed with the business area (i.e. pem) and include the project number <BAPID>followed by the thematic content.

5.4.1 Input Data Sources

Input Data Quality Assessment File – A non-spatial RTF file that documents the methods and procedures for collecting, evaluating and compiling all input data, including input data quality evaluations (as outlined in section 4.4 of the *Standards for Predictive Ecosystem Mapping, Version 1.0*).

The file name should be: pem_<BAPID>_<thematic content> - pem_4145_idq.rtf

PEM Input metadata (mandatory) - A non-spatial RTF file of thematic input data containing the information outlined in Table 2-2 of the *PEM Technical Standard*s.

The file name should be: pem_<BAPID>_<thematic content> - pem_4145_inp.rtf

PEM Input Polygon Database (mandatory) - A non-spatial CSV file of thematic input data containing the information outlined in Table 2-3 of the *PEM Technical Standard*s.

The file name should be: pem_<BAPID><thematic content> - pem_4145_inp.csv

PEM Non-Standard Inventory metadata (optional) - A non-spatial RTF file containing input for new inventories in support of a PEM project outlined in Table 2-6 of the *PEM Technical Standard*s.

The file name should be: pem_<BAPID>_<thematic content> - pem_4145_non.rtf

PEM Non-Standard Inventory Database (optional) - A non-spatial CSV file containing input for new inventories in support of a PEM project outlined in Table 2-7 of the *PEM Technical Standard*s.

The file name should be: pem_<BAPID><thematic content> - pem_4145_non.csv

5.4.2 Localized BGC Files

Note the following amendments:

- In some areas of the province reconnaissance or field level reliability large scale BGC mapping is already available through the Ministry of Forests. In projects where this is the case, the PEM Inventory Standard and PEM DDC require the practitioner to reference the source of the BGC mapping. For more information please see the following website: http://www.for.gov.bc.ca/hre/becweb/subsite-map/largescale-01.htm. In areas where reconnaissance or field level reliability large scale BGC mapping is not available section 4.4.1.2 of the PEM inventory Standard and section 2.4.5 and 5.4.2 (below) of the PEM DDC are required for localized BGC mapping.
- Mapsheet and Ecosection information is no longer required as outlined in Section 2.4.5 of the *PEM Technical Standard.* The applicable data source(s) and version number(s) for each layer must be referenced.

Localized Biogeoclimatic RTF file (mandatory) - A non-spatial RTF file containing all rule sets used in compiling the layer for the attributes outlined in Section 2.4.5 of the *PEM Technical Standard* along with the rules in Table 2-3 in the *Standard for Digital Terrestrial Ecosystem Mapping (TEM) Data Capture in British Columbia,* (RIC, 2000). The BGC information is to be approved by the Ministry of Forests Regional Ecologist prior to submission of the final deliverables.

The file name should be: pem_<BAPID><thematic content> - pem_4145_bgc.rtf

Localized Biogeoclimatic Database (mandatory) - A non-spatial CSV file containing the localized biogeoclimatic polygon information outlined in Section 2.4.5 of the *PEM Technical Standard* and Table 2-3 in the *Standard for Digital Terrestrial Ecosystem Mapping (TEM) Data Capture in British Columbia,* (RIC, 2000). This information is to be submitted prior to the final deliverables as it must be approved before producing the final deliverables.

The file name should be: pem_<BAPID><thematic content> - pem_4145_bgc.csv

Localized Biogeoclimatic Coverage (mandatory) - A spatial coverage containing the localized biogeoclimatic polygon information outlined in Section 2.4.5 of the *PEM Technical Standard* and Table 2-3 in the *Standard for Digital Terrestrial Ecosystem Mapping (TEM) Data Capture in British Columbia,* (RIC, 2000). This information is to be submitted prior to the final deliverables as it must be approved before producing the final deliverables.

The file name should be: pem_<BAPID><thematic content> - pem_4145_bgc.e00

5.4.3 Knowledge Base Files

PEM Knowledge base RTF file - (mandatory) - A non-spatial RTF file of the PEM knowledge base containing the relationship between the input attributes and the output mapping entities outlined in Table 2-4 of the *PEM Technical Standard*s. The element that applies the knowledge base to the assembled input inventories must also be referenced within this document. Definitions of all map entities and knowledge base validation procedures and validation results

must be included within this file.
Any associated tables and databases should be submitted in the original file type to maintain field formatting.

The file name should be: pem_<BAPID><thematic content><file number> - pem_4145_kb01.rtf

If more then one knowledge base files are delivered they should be named sequentially, i.e.:

pem_4145_kb02.rtf and pem_4145_kb03.rtf

5.4.4 Structural Stage Files

NOTE: The structural stage database is *not required* if the structural stage is assigned directly to each ecosystem component in the polygon data base.

PEM Structural Stage RTF file (mandatory) - A non-spatial RTF file containing the PEM structural stage knowledge base information outlined in Section 2.4.4 of the *PEM Technical Standard* along with the rules in Table 2-3 in the *Standard for Digital Terrestrial Ecosystem Mapping (TEM) Data Capture in British Columbia,* (RIC, 2000). This file may be included within the knowledge base.rtf.

The file name should be: pem_<BAPID><thematic content> - pem_4145_sts.rtf

Structural Stage Database (See note above) - A non-spatial CSV file containing the PEM structural stage polygon information outlined in Section 2.4.3 of the *PEM Technical Standard* and Section 3 in the *Standard for Digital Terrestrial Ecosystem Mapping (TEM) Data Capture in British Columbia,* (RIC, 2000).

The file name should be: pem_<BAPID><thematic content> - pem_4145_sts.csv

Structural Stage Coverage - A spatial coverage containing the PEM structural stage polygon information outlined in Section 2.43 of the *PEM Technical Standard* and Section 3 in the *Standard for Digital Terrestrial Ecosystem Mapping (TEM) Data Capture in British Columbia,* (RIC, 2000).

The file name should be: pem_<BAPID><thematic content> - pem_4145_sts.e00

5.4.5 User Defined Files

PEM User Defined RTF (optional): Often other attributes or codes are approved for certain projects in certain areas, however they are not yet provincially approved. In these circumstances, it is necessary for the contractor to submit all approved project specific attributes or codes.

The file name should be: pem_<BAPID><thematic content> - pem_4145_usr.rtf

User Defined database (optional): A non-spatial CSV file defining the user-defined attributes outlined in Table 2-4 of the *Standard for Digital Terrestrial Ecosystem Mapping (TEM) Data Capture in British Columbia,* (RIC, 2000) and Table 2-8 of the *PEM Technical Standard*.

The file name should be: pem_<BAPID><thematic content> - pem_4145_usr.csv

5.4.6 PEM Polygon Output Files

Project Metadata (mandatory) - A non-spatial CSV file of PEM project data containing the information outlined in Table 2-5 of the *PEM Technical Standard*.

The file name should be: pem_<BAPID><thematic content> - pem_4145_mta.csv

Polygon Attributes Database (mandatory) - A non-spatial CSV file of PEM polygon data containing the information outlined Table 2-3 in the *Standard for Digital Terrestrial Ecosystem Mapping (TEM) Data Capture in British Columbia,* (RIC, 2000).

The file name should be: pem_<BAPID><thematic content> - pem_4145_ecp.csv

Polygon Coverage (ECP) (Mandatory) - A spatial coverage containing the PEM polygon information, outlined in Table 2-3 and Section 3 in the *Standard for Digital Terrestrial Ecosystem Mapping (TEM) Data Capture in British Columbia,* (RIC, 2000).

The file name should be: pem_<BAPID><thematic content> - pem_4145_ecp.e00

5.4.7 PEM Field Sample Output files (ECI)

Sample Points Database (optional) - The non-spatial file(s) containing the sample points (plot locations) information outlined in Section 3 in the *Standard for Digital Terrestrial Ecosystem Mapping (TEM) Data Capture in British Columbia, (*RIC, 2000). This data is submitted from the VENUS system, which includes field data from both Full plots and GIFs. As well, visual checks may be submitted through the Graviti form included in VENUS or in a CSV spreadsheet.

The file name should be: pem_<BAPID><thematic content> - pem_4145_eci.mdb

                                 pem_<BAPID><thematic content> - pem_4145_eci.csv

PEM Sample Points Coverage (optional) - A spatial coverage containing the sample points (plot locations) information outlined in Section 3 in the *Standard for Digital Terrestrial Ecosystem Mapping (TEM) Data Capture in British Columbia,* (RIC, 2000).

The file name should be: < pem_<BAPID><thematic content> - pem_4145_eci.e00

5.4.8 Final Project Report

PEM Project File (mandatory) – The final report in RTF format must include the PEM Output accuracy assessment as outlined in Table 2-9 of the *PEM Technical Standard*.

The file name should be: pem_<BAPID><thematic content> - pem_4145_pro.rtf

5.4.9 Quality Assurance (QA) and Accuracy Assessment (AA) Reporting

Reports must be submitted as Portable Document Files (.pdf) indicating that all steps in the mapping and the final data have under gone complete quality assurance review. QA/AA review may be performed by a qualified third party or may be managed by having the mapping contractor sign the reports assuring the quality of the deliverables. Consult the most current version of the PEM QA guidelines for further explanation of the QA review procedures. Consult the "Protocol for Accuracy Assessment of Ecosystem Maps" for further explanation of the AA review procedures.

The file(s) name should be:

pem_<BAPID>_<thematic content> - i.e. pem_4145_qa01.pdf   for any QA documentation; and

pem_<BAPID>_<thematic content> - i.e. pem_4145_aa01.pdf   for any AA documentation.

If more then one QA/AA report is delivered each should be named sequentially, i.e.: pem_4145_qa02.pdf and pem_4145_qa03.pdf.

The practitioner must retain a copy of their work after the project has been signed off for the period of time indicated by their professional association legislation or for any period of time indicated in relevant legal documentation.

5.5 Data Acceptance/Project Sign-off

All final deliverables must conform to the standards discussed in this document and must pass all map verification rules.

If any PEM product does not meet to the required standard, an error report will be generated by the Ministry of Sustainable Resource Management and the delivered package (I.e. all submitted files) will be returned to the client. The client must have any identified problems rectified and resubmit the deliverables to the Ministry. Projects will not be accepted until the Ministry has received all final project deliverables, including any applicable quality assurance and/or accuracy assessment reports.