



Department of Energy
 Yucca Mountain Site Characterization
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CIVILIAN RADIOACTIVE WASTE MANAGEMENT SYSTEM MANAGEMENT AND OPERATING CONTRACTOR (CRWMS M&O) REQUESTED TO DEVELOP A STRATIGRAPHIC COMPENDIUM FOR THE YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT (YMP) (SCP: N/A)

The Regulatory & Site Evaluation Division (RSED) requests that CRWMS M&O develop a compendium of stratigraphic definition, recognition, and correlation criteria for YMP. Enclosure 1 provides a detailed description of the types of information to be contained in the volume and justification for creation of the requested product. Enclosure 2 provides examples of some formal and informal stratigraphic units occurring in the Yucca Mountain vicinity.

The CRWMS M&O will coordinate all aspects of building the compendium, including synthesizing available data, obtaining participant input, producing the final product (8.5 by 11 inch format), and incorporating the material into the Reference Information Base (RIB).

Development of this product falls within the CRWMS M&O current work scope involving stratigraphic modelling. Please provide RSED a draft copy of the subject volume by October 1, 1993. A final version should be available for incorporation into the RIB by December 1, 1993.

Please direct any questions regarding this request to Mark C. Tynan at 794-7940.

J. Russell Dyer, Director
 Regulatory & Site Evaluation Division

RSED:MCT-4321

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Enclosures:

1. Development of Requirements for Compendium
2. Stratigraphic Unit Example

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NSM Mail Control

YMP-5 210 9309230011 930608
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**REGULATORY & SITE EVALUATION DIVISION
YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT**

**REQUIREMENTS FOR THE DEVELOPMENT OF A STRATIGRAPHIC
COMPENDIUM CONTAINING DEFINITION, RECOGNITION, AND
CORRELATION CRITERIA FOR SURFACE AND SUBSURFACE
VOLCANIC, SEDIMENTARY, THERMAL/MECHANICAL,
HYDROGEOLOGIC, AND GEOCHEMICAL
UNITS IN THE SITE AREA AND VICINITY**

The Yucca Mountain Site Characterization Project Office requires that a standard reference catalog be developed for all formal and informal sedimentary and volcanic Precambrian, Quaternary, Tertiary, Mesozoic, and Paleozoic units encountered within the site area. Types of units to be contained in the volume include lithostratigraphic, biostratigraphic, chronostratigraphic, "microstratigraphic," hydrogeologic, geochemical, and thermal/mechanical units.

Comprehensive bibliographic or reference information should be included for each unit contained therein. This volume will serve as a standard reference for all core logging and field mapping exercises.

For each formal or informal, surface or subsurface unit:

1. Establish or provide definition and description from existing literature; augment with additional criteria for definition of the unit, including upper and lower contacts.
2. Establish or identify from literature a type section.
3. Establish or identify from literature a reference section or reference sections (in outcrop, in well, in trench).
4. Provide coordinate locations (x, y, z where applicable) for well, outcrop, or trench. A map should be included showing the location(s) of each type or reference section; if in a borehole, include a borehole location map.
5. Provide criteria for recognition of the unit, including upper and lower contacts.
6. Provide description and illustrations for correlation of unit, and include (where possible) type section, reference section correlations within the site area, and related units in the Yucca Mountain vicinity. Discussions involving all related/correlative units outside the Yucca Mountain vicinity should be referenced to existing literature, but need not be described in detail within this volume. Lithostratigraphic and thermal/mechanical unit correlations should be indicated, as appropriate.
7. Provide description of physical location and condition of all "type and reference sections." If type or reference section is within a borehole, trench, pit, or outcrop that is no longer accessible, describe situation and designate new reference section. For type sections or reference sections outside the Yucca Mountain vicinity, establish a local reference section.
8. Provide description and references for all radiometric age dates, biostratigraphic controls, etc., for each unit.
9. Include color photographs of lithologic specimens, thin sections, and outcrops, as appropriate.

- 10. Provide borehole geophysical log(s) examples for units recognized in YMP boreholes.
- 11. Develop stratigraphic definition, recognition, and correlation criteria for units used by others outside the YMP umbrella of investigators. This should include the State of Nevada and/or other workers' nomenclature.

The volume shall contain a table of contents, list of tables, list of figures, introduction to the geology and stratigraphy of Yucca Mountain and vicinity, and index. The volume should be developed in three or more parts, or as deemed appropriate by authors, but should include:

- a. Quaternary units
- b. Tertiary units
- c. Pre-Tertiary units

These sections should be subdivided into subsections, or a clear indication should be provided in description regarding where the unit is recognized, as deemed appropriate:

- 1. Units recognized in both surface and subsurface.
- 2. Units recognized only in the subsurface in the Yucca Mountain vicinity.
- 3. Units recognized only in surface outcrops or trenches, etc.
- 4. Units recognized only from laboratory testing; these could be incorporated as a subset of 1, 2, or 3 above.

The volume should be constructed such that each unit is self-contained. Binding should be (in 8.5 by 11 inch format) with a "ring binder" so that new units can be easily added, existing descriptions can be modified or deleted as required. The volume should be updated throughout site characterization. It shall be made available to all field and laboratory workers assigned tasks of core or outcrop mapping, description or correlation. The product will serve as a reference for current and future activities and will represent a project document encompassing most significant aspects of stratigraphic and related geologic studies. It will serve as a basis for license application support for YMP activities and interpretations, providing concise and readily available criteria for systematic definition, recognition, and correlation of various types of units in the Yucca Mountain area.

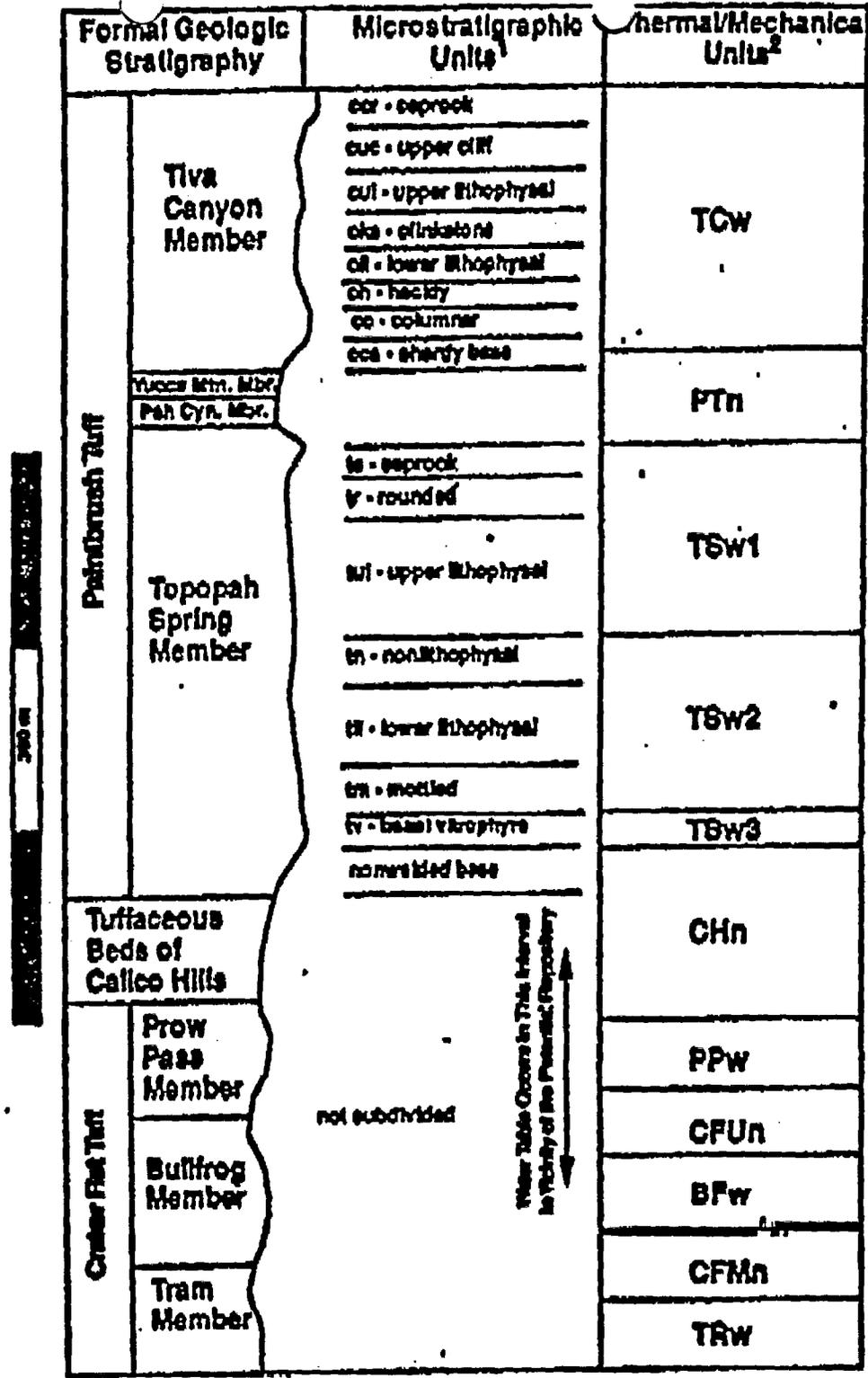


Figure 1.2 Comparative stratigraphic terminology in common usage at Yucca Mountain. ¹modified after Scott and Bonk (1984) for the immediate repository vicinity; ²from Ortiz and others, 1985. Thicknesses and "weathering profile" are highly schematic; character varies with location.