

Geological heritage sites: a procedure and protocol for documentation and assessment

Dr Susan White

GSA Geological Heritage Standing Committee
123 Manningham St, Parkville VIC
susanwhite@netspace.net.au

Dr Melinda Mitchell

GSA (Victoria) Geological Heritage Subcommittee
PO Box 104, Black Rock VIC 3193
Mel.Mitchell@dse.vic.gov.au

SUMMARY

The Geological Society of Australia Geological Heritage Standing Committee promotes the understanding and conservation of the geological heritage of Australia through identifying and documenting features or sites. This paper outlines the methodology, protocols and procedures for assigning or reviewing geological significance developed by the GSA (Victoria) Geological Heritage subcommittee.

Key words: geological heritage, sites of significance, conservation

INTRODUCTION

The GSA has developed a methodology and protocol for assigning or reviewing geological significance (White et al., 2003). This methodology has been accepted as reliable and repeatable by organizations such as the former Australian Heritage Commission (now Australian Heritage Council).

This paper outlines the methodology, protocols and procedures used by GSA (Victoria) Heritage subcommittee and examples of geologically significant sites are cited.

METHODOLOGY

For a geological site or feature to be considered significant, it must possess at least one of eight characteristics and be representative or outstanding. The level of geological significance is classified at local, regional, state, national or international level by documentation, assessment and comparison. A significance rating assigned to a feature or site is periodically reassessed in the light of new information and/or site condition. Documentation is managed by a customised database.

Site information is reviewed from personal experience, fieldwork, literature review and consultation with other geologists with specific knowledge and expertise. The GSA (Vic) Heritage subcommittee has members with a wide range of geological experience and expertise. Significance rating is achieved by consensus after considerable discussion on the merits of the site. This is particularly the case for sites of International and National significance where an extensive understanding of comparable sites outside Victoria is desirable.

Geological sites or features should possess at least one of the following attributes to be considered significant:

- A type section of a geological unit;
- A fossil locality;
- Exposures of a range of features characteristic of a rock unit, or exposures of features which are unusual in a rock unit;
- An unusual occurrence of a particular feature or mineral;
- An illustration of tectonic and/or volcanic processes;
- Features which enable palaeoclimatic reconstruction;
- Demonstration of the effects of weathering, erosion and/or deposition on landform evolution. These geomorphic process may be active or relict; or
- A representative example of a landform type.

The criteria for significance is related to whether a site can be regarded as important with regards to it being representative or outstanding. A choice often has to be made between the most outstanding or unusual example and an excellent representative example from a group of very similar ones.

The representative approach (Joyce & King, 1980; Davey & White, 1986; Rosengren, 1994; Rosengren & White, 1997; Mitchell et al., 2000) has been found to be the most appropriate for assessing significance, but outstanding examples must also be considered. Criteria used in such assessment include:

- How representative is the feature?
- How adequately is each type of feature represented over a particular scale (i.e. regionally, statewide, nationwide)?
- How far would you travel with an interstate or international visitor with an interest in that type of site?
- How does it compare with other similar sites - regionally, in the state, in Australia, Internationally?
- Which feature is the most appropriate to represent a particular type?
- How many representatives are justified?
- Is the feature under threat?
- How common or rare is the feature?
- Is it a particularly good example?
- Is it a type section or type example (for landform)?

Other aspects of the site such as present and past land use, land status or land management, diversity of features present, access, and vulnerability to damage are also considered. Features or areas are also described according to size, physical and/or geological type and age.

Geological significance is classified as local, regional, state, national or international level by documentation, assessment and comparison. The significance rating assigned to a site is periodically reassessed in light of new information and/or site condition.

The criteria for classification are:

- **International Significance:** These sites are landforms, structures, rock formations or fossils which are rare in the world, and/or by the nature of their scale, state of preservation or display, are comparable with examples known internationally. They may be global type examples and are widely known as reference sites by the international geological community. A site could be included in an international register of sites of scientific significance and would rate listing on the Register of the National Estate by the Australian Heritage Commission (now Council). Forty-five features of international significance have been recognised, documented and assessed in Victoria. Tower Hill is an example of an internationally significant site due to the well-preserved evidence of phreatic volcanic processes.
- **National Significance:** Sites that are rare in Australia or are important nationally by virtue of their scale or state of preservation are assigned national significance. Typically used as reference sites by the Australian geological community, they should be included in a national register of sites of scientific significance and would be considered for listing on the Register of the National Estate by the Australian Heritage Commission (now Council). Seventy sites of national significance have been identified in Victoria. An example is spectacular granitic landscape of Mount Buffalo.
- **State Significance:** These sites are important in defining the geology and geomorphology of Victoria and may be reference sites or type examples and would be considered for listing on the Register of the National Estate by the Australian Heritage Council. There are over 200 sites of state significance identified and documented in Victoria. An example is the Plio-Pleistocene Newer Volcanics eruption point Mount Kororoit, Diggers Rest.
- **Regional Significance:** These sites include landforms or geological features representative of regions of about 60km radius. An example is the Tertiary rocks exposed at Royal Park railway cuttings in Melbourne.
- **Local Significance:** These are features representative of smaller areas in a region, eg. the Ovens Valley. Such sites are usually related to an area of a local municipality or an area with a radius of 20 km. A typical example is the Stony Creek Road cuttings at Halls Gap where there is a good exposure that shows the relationship of igneous rocks to the main body of the Silurian-Devonian Grampians Group sediments.
- **Unknown Significance:** Sites are assigned this rating if there is insufficient data to allow a complete assessment to be made. Typically these sites are either under investigation or subject to continual change eg. active quarry faces.

CONCLUSIONS

GSA (Victoria) Heritage Subcommittee uses this methodology in conjunction with a customised database to be a manageable process for cataloguing and searching records. It enables work to be steadily built over time with multiple operators and provides an effective method for comparison of site information across the state. Additionally, inquiries and research may be undertaken at various scales in a timely and thorough manner by using the database as a search tool.

ACKNOWLEDGMENTS

All the members of the GSA (Victoria) Heritage Subcommittee and other geologists who have generously donated their time and expertise to improving the management of sites across the state.

REFERENCES

- Davey A.G. and White S., 1984. Victorian Caves and Karst: Strategies for Management and Cataloguing. A report to the Caves Classification Committee, Department of Conservation, Forests and Lands, Victoria, 315 pp.
- Joyce E.B. and King R.L., 1980. Geological Features of the National Estate in Victoria. An inventory compiled for the Australian Heritage Commission, Victorian Division, Geological Society of Australia Incorporated (208 pp).
- King R.L., 1988. Geological Features of Significance and their Conservation IN Douglas J.G. and Ferguson J.A. (eds) Geology of Victoria, Geological Society of Australia Special Publication 5, Melbourne, pp. 599-601.
- Mitchell M. M., Cochrane R. M. & King R. L., 2000. Sites of geological significance in the MELBOURNE 1:250 000 mapsheet area. Geological Survey of Victoria Technical Record 2000/1 (184 pp).
- Mitchell M.M., 2002. Sites of geological significance in the Catchment and Land Protection Board Management area. Unpublished report for Melbourne Water Corporation.
- Rosengren N., 1994. Eruption points of the Newer Volcanic Province of Victoria—an inventory and evaluation of scientific significance.
- Rosengren N. & White S., 1997. Sites of Geological and Geomorphological Significance in part of North Eastern Victoria A report prepared for the Geological Society of Australia Inc (Victorian Division).
- White S., King R.L., Joyce, E.B., Mitchell, M.M., Cochrane R.M., Rosengren N.J. & Grimes K.G., 2003. Chapter 27 Conservation and heritage: registering sites of significance IN Birch, W.D (ed) Geology of Victoria (3rd Edition) Geological Society of Australia Special Publication 23.