

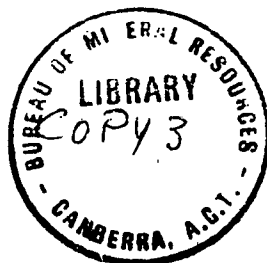
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COMMONWEALTH OF AUSTRALIA.

DEPARTMENT OF NATIONAL DEVELOPMENT.
BUREAU OF MINERAL RESOURCES
GEOLOGY AND GEOPHYSICS.

RECORDS:

1963/149



SUMMARY OF ACTIVITIES FOR 1963
MISCELLANEOUS INVESTIGATIONS, MAP COMPILATION AND MAP EDITING

by

D.E. Gardner

The information contained in this report has been obtained by the Department of National Development, as part of the policy of the Commonwealth Government, to assist in the exploration and development of mineral resources. It may not be published in any form or used in a company prospectus without the permission in writing of the Director, Bureau of Mineral Resources, Geology and Geophysics.

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MISCELLANEOUS INVESTIGATIONS, MAP COMPILATION AND MAP EDITING.

(To November, 1963)

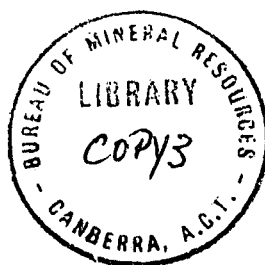
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RECORDS 1963/149

CONTENTS

	<u>Page</u>
GENERAL	1
STAFF	1
ENGINEERING GEOLOGY	1
GENERAL	1
CONSTRUCTION PROJECTS	2
AUSTRALIAN CAPITAL TERRITORY	2
Foundation Investigations (Buildings)	2
National Library Site	2
Secretariat Building Site	2
Bureau of Mineral Resources Building Site	2
Other Building Sites	2
Investigation of Depth of Foundation and	
Excavating Character of Earth and Rock	2
Oakey Hill Reservoir Site	2
Belconnen Water Main (9 miles)	2
Woden District; Proposed Residential and	
Development Areas	2
Dam Sites	2
Canberra Lake Dam	2
Bendora Dam	3
NORTHERN TERRITORY	3
TERRITORY OF PAPUA AND NEW GUINEA	3
Port Moresby Hydro-Electric Scheme	3
Upper Ramu Hydro-Electric Scheme	
Pondo-Towonokoko Hydro-Electric Scheme,	
New Britain	3
Toriu River Hydro-Electric Scheme, New	
Britain	3
MATERIALS	3
AUSTRALIAN CAPITAL TERRITORY	3
Sand (and Gravel)	3
Heavy Clayware	4
Aggregate for Concrete and Roadmaking	4
Building Stone	4



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CONTENTS (ii)

	<u>Page</u>
NORTHERN TERRITORY	4
Heavy Clayware	4
Materials for Cement Manufacture	4
MAPPING; AUSTRALIAN CAPITAL TERRITORY	4
Soil and Outcrop Mapping	5
Detailed Mapping	5
MISCELLANEOUS - AUSTRALIAN CAPITAL TERRITORY	5
Field Work	5
Office Work	5
UNDERGROUND WATER AND DRAINAGE, AUSTRALIAN CAPITAL TERRITORY	5
Water Resources	5
Investigations	6
Drainage	6
MAP COMPILATION	6
MAP EDITING	6
STRATIGRAPHIC INDEXING	6
RECORDS	6

SUMMARY OF ACTIVITIES FOR 1963

MISCELLANEOUS INVESTIGATIONS, MAP COMPILATION AND MAP EDITING.

(To November, 1963)

GENERAL

The field work of the section covers engineering geology in the Commonwealth Territories, underground water and drainage in the A.C.T., and the field mapping associated with both activities. Office work includes the compilation of special maps, editing of standard series geological maps for publication, preparation of stratigraphical indexes for publication, and the maintenance of a register of stratigraphic names. Records of engineering and groundwater investigations in the Northern Territory are finally edited and prepared for reproduction by the section.

STAFF

E.K. Carter, Supervising Geologist	- Overseas for some months during the year.
D.E. Gardner, Senior Geologist	- Engineering geology A.C.T.
G.M. Burton, Senior Geologist	- Underground water and drainage, A.C.T.; map editing.
Miss B.K. Graham, Geologist Grade 3	- Compilation of map of Australia and Oceania.
E.G. Wilson, Geologist Grade 2	- A.C.T. drainage and minor engineering projects; map editing.
J.K. Hill, Geologist Grade 2	- Engineering geology, A.C.T. and T.P.N.G.
E.J. Best, Geologist Grade 1	- Engineering geology, A.C.T. and T.P.N.G. (New Britain)
D.F. Maggs, Geologist Grade 1	- Engineering geology, A.C.T. and Northern Territory.
Miss C. Mitchell, Geologist Grade 1	- Stratigraphic lexicons and indexing.

ENGINEERING GEOLOGY

GENERAL

Much of the work is being done in collaboration with other Government organizations, including the Department of Works and the National Capital Development Commission in the A.C.T., the Commonwealth Department of Works in Port Moresby and in Darwin, and also, in reference to the work in the Northern Territory and the Territory of Papua and New Guinea, the Commonwealth Department of Works, Melbourne. In Darwin and Port Moresby the Resident Geologists assist with some phases of the work. Nearly all investigations entail geophysical surveys, which are carried out by the Geophysical Branch of the Bureau. The planning of investigations in each locality is done in collaboration with the appropriate organizations: a fair amount of time needs to be spent, mainly in the Canberra office, in coordinating activities and in keeping the participating organization informed of progress and of interpretation of results.

The work undertaken in engineering geology is classified here under the headings Construction Projects, Materials, Mapping, and Miscellaneous.

CONSTRUCTION PROJECTS

AUSTRALIAN CAPITAL TERRITORY

Foundation Investigations (Buildings).

National Library Site. The investigation entailed a geological and geophysical survey of site, drilling program, logging of drill core, interpretation of results, and recommendations to consulting engineers.

The site is intersected by two flatly dipping faults; adjacent to these, the bedrock is completely decomposed; it was necessary to ascertain the positions of the faults and the zones of decomposed bedrock.

Secretariat Building Site Geological appraisal of results of drilling by consulting engineers, recommended re-drilling with better equipment, interpretation of results, report for guidance of consulting engineers, geological services while foundation work in progress.

The site is near a major fault. Bedrock is deeply weathered and decomposed; cavernous limestone, forming a sub-artesian aquifer that discharges a large volume of water, occurs at the initial design foundation level.

Bureau of Mineral Resources Building Site. Critical interpretation of contractor's foundation investigation; Department of Works advised of possible foundation weakness.

Possible differential settlement in old alluvium near the south-east corner of the site.

Other Building Sites. Several inspections were made of other building sites and foundations, including the new hospital, and a hostel site in Northbourne Avenue.

Investigation of Depth of Foundation and Excavating Character of Earth and Rock.

Oakey Hill Reservoir Site. Mapping, recommended method of drilling, evaluation of results.

Auger drilling established depth of material that can be stripped by heavy earth-moving plant; jackhammer drilling showed that weathered bedrock to foundation level can be excavated by light blasting.

Belconnen Water Main (9 miles). Recommended testing by light seismic equipment, succeeded by check excavating.

Woden District, Proposed Residential and Development Areas. See under Mapping.

Dam Sites

Canberra Lake Dam. Mapping of foundation excavations; planning and supervising investigation of fault at dam site, and siting of drill holes for anchor cables. Compilation of completion report.

The work at the dam site entailed careful logging and interpretation of drill core, and the drawing of numerous sections

to obtain an accurate three-dimensional picture of the bedrock conditions beneath the site.

Bendora Dam. A start was made on compiling the completion report on the Bendora Dam. Plans and sections have been completed correlating geology and grout-take; draft sections and plans have been completed, incorporating the detailed geology exposed as the site was excavated.

NORTHERN TERRITORY

Darwin River Water Storage Projects. The field work has included geological mapping, recommendations for geophysical work, evaluation of results, planning drilling program, logging core and supervising drilling, and prospecting for materials for an earth dam.

TERRITORY OF PAPUA AND NEW GUINEA

Port Moresby Hydro-Electric Scheme. Geological mapping was in progress at the start of 1963. A design investigation report was compiled, and is being included in tender documents for construction of an underground hydro-electric power station with a weir, pressure shaft and access shaft, and tailrace tunnel.

Upper Ramu Hydro-Electric Scheme. Geological mapping, geophysical surveys, recommended drilling program, logging of drill core, interpretation of results, interim reports.

The scheme envisages a weir or dam, low pressure tunnel (7000 feet) and surface penstock and power house or pressure shaft and underground power station.

Pordo-Towonokoko Hydro-Electric Scheme, New Britain. Work in 1963 included evaluation of the results of geological and geophysical surveys completed in 1962, and compilation of a preliminary report. The preliminary report makes it clear that geological conditions are unfavourable. However, a drilling program has been suggested to obtain further information, if required.

Any hydro-electric project in the area would be costly because of unsuitable bedrock, and there is a risk of major landslides.

Toriu River Hydro-Electric Scheme, New Britain. Compilation of report on preliminary geological investigation.

A hydro-electric scheme on the Toriu River is a possible alternative to the Pordo-Towonokoko Scheme. Geology and access are more favourable, but the stream flow is inferior.

MATERIALS

AUSTRALIAN CAPITAL TERRITORY

Sand (and Gravel). In response to requests from Department of Works and Department of Interior, intermittent investigations, including the supervision of augering, were carried out in the Molonglo River valley at Kowen, Oaks Estate, Pialligo, Fyshwick, Canberra and Coppins Crossing, along Jerrabomberra Creek, and in the Murrumbidgee Valley near Pine Island.

Some projects were intended to ascertain whether marketable sand and gravel could be excavated from the sites of possible silt-traps above the Canberra Lake; others were undertaken in the search for sources of fine sand, which is in short supply in the Canberra area.

Heavy Clayware. Investigation of clay and shale deposits in the Gungahlin district includes the assessment of the results of geophysical surveys carried out at the end of 1962, planning and supervision of sampling, and arranging the testing of samples.

Deposits were inspected at the requests of Commonwealth Brickworks, Canberra and of private brickmaking interests; advice was given on testing and sampling. Localities visited include the Gungahlin District, Queanbeyan area, and the area between Bungendore and Hoskinstown.

A start was made on the compilation of a record of heavy clayware investigations carried out in the Canberra area over a period of several years.

Aggregate for Concrete and Roadmaking. Inspections were made of prospective pits and quarry sites, and advice given on testing. Localities include the Woden District (three localities), Gungahlin District (Greenwood granite), Cooma Road near Donald Trig, and Stromlo district near Cotter Road.

Building Stone. Three localities were inspected. Information was compiled on durability and testing; a standard laboratory procedure was devised for testing sandstones; several samples, submitted jointly by the Department of Works, the National Capital Development Commission and commercial suppliers of dimension stone, were sent to the Bureau Laboratory, Acton, for testing by the methods specified.

Works Department and the National Capital Development Commission have not succeeded in finding any organization that is equipped to carry out satisfactory standard tests on the properties and durability of building stones.

NORTHERN TERRITORY

Heavy Clayware. Liaison maintained with Darwin resident geologists on testing deposits in the Darwin area.

Materials for Cement Manufacture. In conjunction with the resident geologists, Darwin, a program was drawn up for laboratory testing, including beneficiation, of samples obtained in the Darwin area during 1962. Results were appraised at each stage of the laboratory work, and guided by the geological background, recommendations were made regarding the direction of further testing. Some of the work was referred, for comment, to the Mining Engineering Section.

MAPPING : AUSTRALIAN CAPITAL TERRITORY

(Excluding mapping done in investigations of construction projects and in the search for materials).

Mapping comprised soil and outcrop mapping in proposed residential and development areas, Woden District and detailed mapping of extensive trenches subsequently excavated in two of the areas.

It had been hoped that some progress would be made in the field work needed for an engineering geology map of the A.C.T. but other commitments kept the geologists fully occupied

Soil and Outcrop Mapping. The suburbs of Hughes, Curtin, No.2 area, No.8 area, West Deakin Government Offices area and Woden District Centre, aggregating 3 square miles, were mapped on a scale of 1 inch: 100 feet. All these areas were test-augered.

Detailed Mapping. Several thousand feet of trenches that had been excavated for hydraulic services in the suburbs of Curtin and Hughes were mapped on a scale of 1 inch : 40 feet.

The excavation for the Mint Building was mapped in detail.

MISCELLANEOUS - AUSTRALIAN CAPITAL TERRITORY

Miscellaneous activities are classified here under the headings of Field Work and Office Work.

Field Work

Site inspections were made and information was provided on the thickness and stability of soil at some localities along the edge of the future Canberra lake.

Information was made available to contractors to the National Capital Development Commission, on the thickness of soil and collevium in portions of the Piallago District.

Augering of a proposed garbage disposal area, Weetangera District, was logged and supervised.

A geophysical party carrying out a gravity survey of the Lake George area was assisted.

Office Work.

A Record on Mining and Prospecting in the A.C.T. and environs was revised, with additions, and issued.

Information on bauxite in the Northern Territory was given to Government Departments, leaseholders and overseas aluminium interests.

Technical data was compiled on diamond drilling techniques and equipment, water-pressure testing of diamond drill holes and on prospecting for and testing of materials for earth and rock dams.

Miscellaneous enquiries on coal and other subjects were answered.

UNDERGROUND WATER AND DRAINAGE, AUSTRALIAN CAPITAL TERRITORY (including adjacent areas within the Canberra 4-Mile Sheet)

Water Resources

Seven bore sites were selected at Hall, Federal Highway Quarry, Murrumbateman, Collector and Orroral Valley.

Advice was given on possible water supplies in Queanbeyan, Murrumbateman, Hall, Coolac and Rabaul (New Britain).

Routine measurements of water level and quality of surface and underground water were continued. Much new equipment was prepared for this work.

Investigations

Seven bore holes were drilled to investigate the effect of the filling of Lake Burley Griffin on the surrounding piezometric surface; a report is being prepared.

Drainage

Underground water drainage in the Woden development area was investigated. Auger holes were sunk and logged, and a report issued.

Drainage in the Stornaway Road area, Queanbeyan, was investigated.

Preliminary investigations of drainage in the Belconnen development area were made.

MAP COMPILATION

Much progress has been made in the preparation of the map of Australia and Oceania. Final compilations of the four sheets covering the Australian mainland and Papua-New Guinea have been submitted to the States for comment, and the New Guinea compilation to commercial and governmental authorities in Holland. Fair drawing of the four sheets is now in progress.

The first compilation of Sheet 8, including Fiji, New Caledonia, New Hebrides and the Solomon Islands is under way. Material for Sheets 2, 3, 4 and 5 has been promised by the U.S. geological Survey.

MAP EDITING

Editing of the final (colour) edition of fifteen 1:250,000 geological map sheets and of the preliminary (black and white) edition of twenty 1:250,000 sheets was completed.

Standards and working methods were established, and assistance given to the drafting office in preparing colour designs, and specifications for printing.

STRATIGRAPHIC INDEXING

Current literature was searched, as received, for new stratigraphic names, and revision lists for Lexicons and the Central Register of stratigraphic names were issued monthly to the seven Stratigraphic Nomenclature subcommittees.

Proposed stratigraphic names were checked and their authors were advised whether the names were available. This has assisted in the prevention of further confusion in Australian nomenclature.

The manuscript of the Victorian Lexicon of stratigraphy was completed; after the incorporation of suggestions from the Victorian Geological Survey, the revised version was submitted to the International Stratigraphic Commission for publication.

RECORDS

The Engineering Geology Group works almost entirely on projects that are initiated by outside organizations, mainly the National Capital Development Commission and the Department of Works in the A.C.T., the Department of Works Headquarters,

Melbourne, and the branches of the Department of Works in the Territories; the formulation of a time-table for the work is largely beyond the control of the Bureau of Mineral Resources. A rapid acceleration in the rate of committal of large-scale engineering projects in the A.C.T. and the other Commonwealth Territories has resulted in a continuing demand for geological services; because of this a geologist in the Group has to be assigned to a new project, often before the Record on the earlier project has been started. In addition to the Records listed below, at least seven others are being prepared as opportunities arise.

The following Records written in the Section were issued:-

- 1963/41: Geological reconnaissance of the Tuma River hydro-electric scheme, Western Highlands, T.P.N.G., December, 1962. by E.K. Carter.
- 1963/57: Investigation of heavy clayware resources, Darwin area, Northern Territory, by D.E. Gardner and P. Rix.
- 1963/68: Googong dam site, Queanbeyan River, N.S.W. Report of Investigations May 1961 - August 1962 by G.M. Burton.
- 1963/76: Geological investigation, Port Moresby No.2 underground hydro-electric power generation scheme, Laloki River, T.P.N.G., by E.K. Carter and G. Brouxhon.
- 1963/89: Upper Ramu hydro-electric project, New Guinea. Permeability tests in diamond drill holes, by J.K.Hill.
- 1963/107: Soil and scree deposits at Woden, A.C.T., and their relationship to underground drainage, by E.G. Wilson