

GEOPROCESS FILE SUMMARY REPORT

OGILVIE RIVER MAP AREA N.T.S. 116F (E1/2) and 116G

INTRODUCTION

The GEOPROCESS FILE is a compilation of information and knowledge on geological processes and terrain hazards, including mass movement processes, permafrost, flooding risks, faults, seismic activity and recent volcanism, etc. Please refer to the GEOPROCESS FILE Introduction and User's Guide for more in-depth information on how the maps were developed, which other GEOPROCESS FILE maps are available, how to utilize this inventory and how to interpret the legend. Special interest should be taken in the detailed description of the terrain hazard map units. Appendices in the User's Guide include summary papers on the geological framework, permafrost distribution, and Quaternary geology in Yukon and a list of comprehensive GEOPROCESS FILE references.

This report includes a brief discussion of the scope and limitations of the GEOPROCESS FILE compilation maps and summaries followed by summaries of the bedrock geology, surficial geology and terrain hazards for this N.T.S. map area, and a list of references.

Geological Processes and Terrain Hazard Compilation Maps

The GEOPROCESS FILE map units were drafted on the 1:250,000 topographic base maps through interpretation from bedrock geology maps, surficial geology maps and in some cases terrain hazard maps at various scales. The compilation maps have a confidence level reflecting the original source material. All materials used to produce the maps are listed in the references attached to each map. A file containing the documentation used to construct these maps is available at the Indian and Northern Affairs library in Whitehorse, Yukon. Areas for which no surficial geology or terrain hazard information is published were left blank. Summary reports on surficial geology and terrain hazards for these map sheets were written by extrapolating the data from adjacent map sheets or smaller scale maps. Information from small scale (e.g. 1:1,000,000) maps was used for the summary reports, but not redrafted onto the 1:250,000 GEOPROCESS FILE maps.

The GEOPROCESS FILE compilation maps are intended as a first cut planning tool; the legend on the maps describes the general aspects of terrain hazards (also see below) and associated geological processes. **These maps should never replace individual site investigations for planning of site specific features, such as buildings, roads, pits, etc.**

Bedrock Geology Summaries

Each 1:250,000 N.T.S. map area is described according to morphogeological belts and terranes defined by Gabrielse *et al.* (1991) and Wheeler *et al.* (1991). Bedrock geology (including structure) and mineral occurrences are briefly described and taken largely from the referenced, most recent 1:250,000 geological map with additional contributions from Wheeler and McFeely (1991), and Yukon MINFILE (1993). A summary paper ("A Geological Framework for Yukon") in Appendix A of the Introduction and User's Guide provides a framework and context for each of the bedrock summaries.

The level of knowledge and understanding of Yukon geology is constantly evolving with more detailed

mapping and development of geological models. Names, ages and terrane affinities of rock units on the most recent 1:250,000 geological maps may, in some cases, now be considered incorrect. Thus information contained within some of the bedrock geology summaries may be out of date. Although much of the information reflects the knowledge at the time that the source map was published, additional information has been inserted whenever possible to assist the user in merging the information with current geological maps, concepts and understanding. The age ranges for similar packages of rocks may also vary between map areas since the actual rocks, or at least the constraints on their age, may vary between map areas.

BEDROCK GEOLOGY

The Ogilvie River map area is in the Foreland Belt and is generally mountainous except for extensive upland pediments at the head of the Ogilvie River. The physiography is a typical reflection of Rocky Mountain style bedrock geology.

The Ogilvie River map area is mainly underlain by carbonate rocks of the Mackenzie Platform as well as younger, non-marine clastic strata. Folds and thrust faults are common throughout the area and particularly large faults are responsible for bringing the oldest (deepest) rock units to the surface.

The oldest rocks in the map area belong to the pre-570 million year old Wernecke Supergroup. They are composed of Quartet Group slaty argillite and quartzite; Gillespie Lake Group siliceous dolomite, siltstone and quartzite; and Tindir Group shale, limestone and dolomite. This package is unconformably overlain by 530-390 million year old unnamed limestone and dolomite and Road River Group black shale and limestone; Michell Formation black shale, limestone and dolomite; and Ogilvie Formation limestone; which is unconformably overlain by 375-255 million year old Canol Formation black shale, McCann Hill chert, Nation River Formation mudstone and conglomerate; Ford Lake shale, chert and limestone; Hart River Formation limestone, dolomite and chert; Ettrain Formation limestone, sandstone and conglomerate; Jungle Creek Formation conglomerate, sandstone, mudstone, limestone and shale; and Tahkandit Formation limestone and chert. These rocks are unconformably overlain by 240-130 million year old black calcareous shale and limestone, and Kingak Formation shale and siltstone.

The aforementioned packages of rocks are generally marine in origin. They are unconformably overlain by dominantly non-marine clastic strata that includes; 130-50 million year old sandstone, Mount Goodenough Formation shale, siltstone and sandstone; Biederman black argillite, siltstone and sandstone; Rat River Formation sandstone and shale; Kathul greywacke, conglomerate, sandstone and argillite; Eagle Plain Formation siltstone, sandstone, shale and conglomerate; and Monster Formation arkosic sandstone, mudstone and conglomerate which are all predominant in the northwestern and northeastern parts of the map area.

The bedrock structure in the area is dominated by typical fold and thrust belt geometry complicated by a right angle bend where the east-trending Mackenzie Fold Belt intersects with the an unnamed north-trending fold belt.

Mineral deposits and occurrences

The Ogilvie map area hosts approximately 15 mineral occurrences, most of which are zinc-lead occurrences in limestone and shales, sedex showings, barite veins and copper-zinc veins. There is at least one known coal occurrence. The rocks in the central and northeastern parts of the map area have been explored for oil and gas with seismic surveys and three exploration wells.

References

Ogilvie Map Area N.T.S. 116F (E1/2) and 116G

To be thorough, check the references for adjacent N.T.S. map sheets and the General Reference List (See Introduction and User's Guide).

Most of the following references should be available for viewing in the DIAND library on the third floor of the Elijah Smith building in Whitehorse.

- Brown, R.J.E., 1967, Permafrost in Canada. Geological Survey of Canada, Map 1246A, (scale 1:7,603,200).
- Dixon, J., 1992, A review of Cretaceous and Tertiary stratigraphy in the northern Yukon and adjacent Northwest Territories. Geological Survey of Canada, Paper 92-9, 79p.
NTS 106E, 106F, 106K, 106L, 116F/G, 116H, 116I, 116J/K, 116N/O, 116P, 117
- Gabrielse, H. and Yorath, C.J. (eds.), 1991, Geology of the Cordilleran Orogen in Canada. Geological Survey of Canada, Geology of Canada, No. 4, 844 p.
- Geological Survey of Canada, xxxx, Regional stream sediment and water geochemical reconnaissance data, NTS 116B, parts of 116C, 116F, 116G. Geological Survey of Canada, Open File 2365.
- Heginbottom, J.A. and Radburn, L.K. (comp.), 1992, Permafrost and ground ice conditions of northwestern Canada. Geological Survey of Canada, Map 1691A, scale 1:1,000,000.
- Hughes, O.L., 1969, Surficial geology of northern Yukon Territory and northwestern District of Mackenzie, Northwest Territories. Geological Survey of Canada. Paper 69-36, 11 p.
- Indian and Northern Affairs, 1995, Yukon MinFile 116G/F (E1/2) - Ogilvie River. Exploration and Geological Services Division, Yukon, Indian and Northern Affairs Canada.
- Jingfors, K. and McKenna, K., 1991, Initial environmental evaluation: Terrain, vegetation, wildlife and resource use for Dempster Highway Multi-Department mobile radio system and microwave project (prepared for Northwestel, Whitehorse)
NTS 116B/C, 116F/G, 116H
DIAND library
- Norris, D.K., 1982, Geology of Ogilvie River, Yukon Territory. Geological Survey of Canada, Map 1526A, scale 1:250,000
- Norris, D.K., 1984a, Geology of the northern Yukon and northwestern District of MacKenzie. Geological Survey of Canada, Map 1581A, scale 1:500,000.
NTS 116SE, 116NE, 106SW, 106NW, 117SE, 107SW
- Norris, D.K., 1984b, Composite legend to accompany maps 1514A to 1529A, and structure section diagram 1530A (Operation Porcupine project area).
NTS 117, 116/NE, 116/NW, 116F, 116G, 116H, 106/NW, 106E, 106F

- Norris, A.W., 1985, Stratigraphy of Devonian outcrop belts in northern Yukon Territory and northwestern District of Mackenzie (operation porcupine area). Geological Survey of Canada, Memoir 410, 81 p. (includes maps).
NTS 116F/G, 116H, 106E, 106F
- Pugh, D.C., 1983, Pre-Mesozoic geology in the subsurface of Peel River map area, Yukon Territory and District of MacKenzie. Geological Survey of Canada, Memoir 401, 61 p.(includes maps)
- Ricketts, B.D., 1988, The Monster Formation: A coastal fan system of late Cretaceous age, Yukon Territory. Geological Survey of Canada, Paper 86-14.
- Thomas, R.D. and Rampton, V.D., 1982a, Surficial geology and geomorphology, Engineer Creek, Yukon Territory. Geological Survey of Canada, "B-series maps", Map 1982-8, scale 1:100,000.
- Thomas, R.D. and Rampton, V.D., 1982b, Surficial geology and geomorphology, Lower Ogilvie River, Yukon Territory. Geological Survey of Canada, "B-series maps", Map 1982-9, scale 1:100,000.
- Wheeler, J.O., Brookfield, A.J., Gabrielse, H., Monger, J.W.H., Tipper, H.W. and Woodsworth, G.J., 1991, Terrane map of the Canadian Cordillera. Geological Survey of Canada, Map 1713.
- Wheeler, J.O. and McFeely P., 1991, Tectonic Assemblage map of the Canadian Cordillera and adjacent parts of the United States of America. Geological Survey of Canada, Map 1712A.