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**GEOLOGICAL SURVEY OF CANADA  
OPEN FILE 5339**

**GIS dataset of geology, Ware (94F), British Columbia**

**K.M. Fallas and A.V. Okulitch**

**2015**

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## **ABSTRACT**

The geological database is derived from previous regional mapping of the Ware (NTS 94F) 1:250 000 scale map area, compiled as part of the Geological Survey of Canada's Central Foreland NATMAP project. Geological features represented by attributed points, lines, and polygons have been compiled into a GIS dataset suitable for stand-alone use, or integration with other data sets. Provided geological features extend traditional geological map information with greater detail and enhancements such as measured section locations and fossil localities. The Ware map area extends across the fold and thrust belt of the northern Rocky Mountains. The geology of the area is characterised by predominantly sedimentary strata, of Middle or Late Proterozoic to Paleogene age, exposed in northeast-verging thrust sheets, folds, and normal fault-bounded grabens. Early Proterozoic orthogneiss and Paleogene granite and dacite dykes occur along the western edge of the map-area. Upper Triassic and unconformably overlying Cretaceous strata of the Foothills Belt occur in the northeastern most corner of the map-area where they are overthrust by a panel containing Proterozoic strata of the Muskwa Assemblage unconformably overlain by Cambrian through Middle Devonian miogeoclinal rocks. The Muskwa Assemblage is intruded by 779 Ma gabbro dykes. To the southwest, major anticlines and several thrust faults expose Proterozoic to Silurian strata. The Paleozoic carbonate platform succession undergoes a gradual facies change southwest into fine clastics and basinal carbonates. Loss of thick carbonate panels results in a change in structural style from thrust fault-dominated to fold-dominated. In the central part of the area, sets of closely spaced folds and thrust faults deform Cambrian through Triassic units with older units predominating to the southwest until metasedimentary rocks of the Neoproterozoic Misinchinka Group are encountered in the last thrust sheet beside the Rocky Mountain Trench graben. This graben contains the Cretaceous and Tertiary Sifton Formation, which also lies unconformably on Proterozoic to Ordovician strata to the southwest. In the southwest corner of the map-area are folded and faulted exposures of the Neoproterozoic Ingenika Group overlain unconformably by the Lower Cambrian Atan Group and Cambro-Ordovician Kechika Formation. Minor Late Triassic gabbro and Paleogene dacite dykes intrude the succession.

## **NOTES**

This GIS compilation of the Ware map area is derived from a map compilation published as a print-ready map by Okulitch et al. in 2002. That compilation incorporated data and interpretations from three previous sources: Gabrielse (1977), Taylor (1979) and MacIntyre (1996), which were products of field mapping by numerous geologists conducted between 1964 and 1981. Details of the compilation issues addressed by Okulitch et al. (2002) are provided in the marginal notes of that map publication.

Measured stratigraphic sections and biostratigraphic information from fossil localities have been compiled and added to bedrock map features in the GIS data files. Original sources for stratigraphic and biostratigraphic data are cited in the data files, and full references are provided in this document. These sources include published journal papers and government reports, unpublished theses, and unpublished paleontological reports produced by the Geological Survey

of Canada. Biostratigraphic ages of fossil collections reported in the GIS files use the geological timescale terms provided by the reporting paleontologist. As a result, some terms may be consistent with older versions of the timescale. For example the subdivision of the Cambrian into Early, Middle and Late as used in older fossil reports, has been changed to Terreneuvian, Series 2 (~Early), Series 3 (~Middle), and Furongian (~Late) on recent versions of the timescale.

The addition of measured section and biostratigraphic data to this GIS compilation revealed some difficulties with each of the previous map compilations mentioned above. Although some modifications have been made to reconcile the Okulitch et al. (2002) compilation with the stratigraphic and biostratigraphic data, in some cases a satisfactory solution was not apparent without seeking new field observations. As a result some discrepancies between the bedrock map features and stratigraphic or biostratigraphic observations remain, and may serve as a useful starting point for future work.

The attempt to reconcile stratigraphic and biostratigraphic observations with the Okulitch et al. (2002) compilation required careful examination of stratigraphic relationships, particularly in areas with closely spaced folds and faults, such as the central portion of the map area previously mapped by MacIntyre (1996). As noted by Okulitch et al. (2002), interpretations of fault motions varied between previous compilations, and the steepness of fault surfaces makes it difficult in some cases to differentiate between normal and reverse or steepened thrust faults. The steep dips on some of these structures are illustrated in cross-sections shown in MacIntyre (1996). Inconsistent sense of stratigraphic offset (e.g. west-side-up or west-side-down) along the trace of some faults further complicates the assessment of fault motion. For these reasons some faults previously assigned as either normal or thrust faults are assigned as generic faults in this compilation to highlight the ambiguity of the structural history.

## **DATA DESCRIPTION**

### **Data Types:**

Vector GIS features (points, lines, polygons) with descriptive attributes representing the bedrock geology accompanied by stratigraphic and biostratigraphic data.

### **Location Information and Spatial Domain:**

NTS map area 94F, Ware, British Columbia.

Bounding Coordinates in geographic coordinates (decimal degrees):

North Bounding Latitude: 58.00

South Bounding Latitude: 57.00

East Bounding Longitude: -124.00

West Bounding Longitude: -126.00

### **Projection:**

Universal Transverse Mercator (UTM), Zone 10, NAD83

**Spatial Data File Types:**

Data from ArcGIS 9.3.1 are provided in the following file types:

.zip - compressed Extensible Markup Language (XML) files

.shp - ESRI® Shape file format

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Compilation by H. Gabrielse, 1977 (west half), G.C. Taylor, 1979 (east half), D.G. MacIntyre, 1994-1995 (central and south-central), and A.V. Okulitch, 2001. Additional revisions made by K.M. Fallas based on examination of measured section and biostratigraphic observations in 2006, 2014.

Digital data preparation and data editing by Karen Fallas with assistance from: Megan Crockett, Steven Hinds, Larry MacDonald, Rachel Noble, David Nunez, Mark Ponto, Heather Schneider, and Carol Wagner.

Scientific peer review by L.S. Lane.

Any revisions or additional geological information from the user would be welcomed by the Geological Survey of Canada.

**REFERENCES**

Cecile, M.P. and Norford, B.S., 1979. Basin to platform transition, Lower Paleozoic strata of Ware and Trutch map areas, northeastern British Columbia; in Current Research, Part A, Geological Survey of Canada, Paper 79-1A, p.219-226.

Fritz, W.H., 1979a. Cambrian stratigraphy in the northern Rocky Mountains, British Columbia; In Current Research, Part B, Geological Survey of Canada, Paper 79-1B, p.99-109.

Fritz, W.H., 1980. Two Cambrian Stratigraphic Sections near Gataga River, northern Rocky Mountains, British Columbia; in Current Research, Part C, Geological Survey of Canada, Paper 80-1C, p.113-119.

Gabrielse, H., 1975. Geology of Fort Grahame E1/2 map-area, British Columbia; Geological Survey of Canada, Paper 75-33.

Gabrielse, H. (compiler), 1977. Geology of the Toodoggone River (94E) and Ware west-half (94F) map-areas; Geological Survey of Canada, Open File 483.

Halleran, W.H. and Owsiacki, G., 1992. Ware mineral occurrence data NTS 094F; BC Ministry of Energy and Mines, MINFILE digital data, 31 occurrences, posted Nov 2004, URL [www.em.gov.bc.ca/Mining/Geolsurv/Minfile/mapareas/94fcov.htm](http://www.em.gov.bc.ca/Mining/Geolsurv/Minfile/mapareas/94fcov.htm) [December 2004]

Heather, K.B., 1982. Ordovician geology and related bedded barite occurrences of the Driftpile Creek-Akie River region of northwestern British Columbia; unpublished B.Sc. thesis, Department of Geological Sciences, University of British Columbia, Vancouver, B.C., 155 p.

Hunt, P.A. and Roddick, J.C., 1988. A compilation of K-Ar ages, report 18; Geological Survey of Canada, Paper 88-2, p. 127-153.

Irwin, S.E.B., 1990. Late Devonian conodont biostratigraphy of the Earn Group with age constraints for stratiform mineral deposits, Selwyn and Kechika basins, northern British Columbia and Yukon; unpublished M.Sc. thesis, University of British Columbia, Vancouver, B.C., 311 p.

Lowey, J.F., 1984. A lithogeochemical study of the Akie Ba-Pb-Zn mineral district, northeastern British Columbia; unpublished M.Sc. thesis, University of Calgary, Calgary, AB, 175 p.

MacIntyre, D.G. (compiler), 1996. Geology of the Aike River area, northeast British Columbia, NTS 94F; Ministry of Employment and Investment, Energy and Minerals Division, Geological Survey Branch, Geoscience Map 1996-1, scale 1:100 000.

MacIntyre, D.G., 1998. Geology, geochemistry and mineral deposits of the Akie River area, northeast British Columbia; British Columbia Ministry of Energy and Mines, Geological Survey Branch, Bulletin 103, 91p.

MacIntyre, D.G., Legun, A., Bellefontaine, K. and Massey, N., 1995. Mineral potential project, digital geological compilation, NE B.C.; Ministry of Energy, Mines and Petroleum Resources, Mineral Resources Division, Geological Survey Branch, Open File 1995-6.

McClay, K.R., Insley, M.W., Way, N.A. and Anderton, R., 1988. Tectonics and mineralization of the Kechika Trough, Gataga area, northeastern British Columbia. *In* Current Research, Part E, Geological Survey of Canada, Paper 88-1E, p. 1 -12.

Norford, B.S., 1990. Ordovician and Silurian stratigraphy, paleogeography and depositional history in the Peace River Arch area, Alberta and British Columbia; Bulletin of Canadian Petroleum Geology, vol. 38A, p.45-54.

Norford, B.S., in press. Ordovician and Silurian of northeastern British Columbia, stratigraphic sections and synthesis of biostratigraphy; *In*: Proterozoic to Devonian Stratigraphy of the Central Foreland NATMAP Project (L.S. Lane and R.B. MacNaughton, eds.); Geological Survey of Canada Bulletin 603.

Okulitch, A.V., Gabrielse, H., MacIntyre, D.G., and Taylor, G.C., 2002. Geology, Ware, British Columbia (94F); Geological Survey of Canada, Open File 4276, scale 1:250 000.

Pohler, S.M.L. and Orchard, M.J., 1990. Ordovician conodont biostratigraphy, western Canadian Cordillera; Geological Survey of Canada, Paper 90-15, 22p.

Pyle, L.J., 2000. Stratigraphy, conodont taxonomy and biostratigraphy of Upper Cambrian to Lower Silurian platform to basin facies, northern British Columbia; unpublished PhD thesis, University of Victoria, Victoria, British Columbia, 390 p.

Pyle, L.J. and Barnes, C.R., 2000. Upper Cambrian to Lower Silurian stratigraphic framework of platform-to-basin facies, northeastern British Columbia. Bulletin of Canadian Petroleum Geology, v. 48, no. 2, p. 123 - 149.

Pyle, L.J. and Barnes, C.R., 2001. Ordovician-Silurian stratigraphic framework, Macdonald Platform to Ospika Embayment transect, northeastern British Columbia; *Bulletin of Canadian Petroleum Geology*, vol. 49, p.513-535.

Pyle, L.J. and Barnes, C.R., 2003. Conodonts from a platform-to-basin transect, Lower Ordovician to Lower Silurian, northeastern British Columbia, Canada; *Journal of Paleontology*, v. 77, no. 1, p. 146-171.

Pyle, L.J., Orchard, M.J., Barnes, C.R. and Landry, M.L., 2003. Conodont biostratigraphy of the Lower to Middle Devonian Deserfers Formation (new), Road River Group, northeastern British Columbia; *Canadian Journal of Earth Sciences*, vol. 40, p.99-113.

Taylor, G.C. (compiler), 1979. Geology of the Trutch (94G) and Ware east-half (94F) map-areas; Geological Survey of Canada, Open File 606.

Wanless, R.K., Stevens, R.D., Lachance, G.R., and Delabio, R.N., 1974. Age determinations and geological studies, K-Ar isotopic ages, report 12; Geological Survey of Canada, Paper 74-2, 78 p.

Wanless, R.K., Stevens, R.D., Lachance, G.R., and Delabio, R.N., 1978. Age determinations and geological studies, K-Ar isotopic ages, report 13; Geological Survey of Canada, Paper 77-2.

Wanless, R.K., Stevens, R.D., Lachance, G.R., and Delabio, R.N., 1980. Age determinations and geological studies, K-Ar isotopic ages, report 14; Geological Survey of Canada, Paper 79-2, 67 p.

### **Paleontological Reports**

Bamber, E.W., 1976. Report on 2 fossil collections from Ware W1/2 map-area, British Columbia, NTS 94F/13; Geological Survey of Canada, Paleontological Report, C3-EWB-1976, 1p.

Bamber, E.W., 1987. Report on 5 collections of fossils from the Rabbit River, Kechika, and Ware map areas, north-central British Columbia, NTS 94F,L,M; Geological Survey of Canada, Paleontological Report, C7-EWB-1987, 3 p.

Fritz, W.H., 1969. Report on Lower and Middle Cambrian fossils from the Northern Rocky Mountains, British Columbia, NTS 94F; Geological Survey of Canada, Paleontological Report, C-18-1969-WHF, 2 p.

Fritz, W.H., 1971. Report on Lower and Middle Cambrian fossils from the Mount Lloyd George section (57°59 1/2'N; 125°02 1/2-04 1/2'W) measured just north of Mt. Lloyd George, Ware sheet (94F) B.C., NTS 94F; Geological Survey of Canada, Paleontological Report, C-24-1971-WHF, 3 p.

Fritz, W.H., 1972. Report on Lower and Upper Cambrian fossils from the Pesika Creek section, B.C. (lat. 57°00 1/4'; long. 124°39 1/2'), NTS 94F; Geological Survey of Canada, Paleontological Report, C1-1972-WHF, 3 p.

Fritz, W.H., 1976. Report on fossils submitted by H. Gabrielse in 1975, The fossils are from the Ware W1/2 map area, B.C., NTS 94F; Geological Survey of Canada, Paleontological Report, C-1-1976-WHF, 1 p.

Fritz, W.H., 1978. Report on Upper Cambrian fossils from near the headwaters of Prophet River, Ware sheet (NTS 94F), northeastern British Columbia, collected by B.S. Norford, 1978 (N 57°36', W124°12'); Geological Survey of Canada, Paleontological Report, C15-1978-WHF, 1 p.

Fritz, W.H., 1979b. Report on 6 collections of Upper Cambrian and Lower Ordovician fossils from near Mt. Sheffield (N57°45'; W124°33 2/4-3/4') on the headwaters of the Muskwa River, Northern Rocky Mountains, B.C., NTS 94F; Geological Survey of Canada, Paleontological Report, C-1-1979-WHF, 1 p.

Fritz, W.H., 1979c. Report on 5 lots of Middle and Upper Cambrian fossils from near Mount Smythe, northern Rocky Mountains, B.C., NTS 94F; Geological Survey of Canada, Paleontological Report, C5-1979-WHF, 1 p.

Fritz, W.H., 1979d. Report on 2 Middle Cambrian fossil collections from Spectre Peak, 32 kilometres north of Ware, northern Rocky Mountains, NE B.C., NTS 94F; Geological Survey of Canada, Paleontological Report, C9-1979-WHF, 1 p.

Fritz, W.H., 1979e. Report on 8 collections of Cambrian fossils from near the headwaters of South Gataga River, NW corner of the Ware map area, north-central B.C. (NTS 94F). Collected by W.H. Fritz for H. Gabrielse, 1979; Geological Survey of Canada, Paleontological Report, C10-1979-WHF, 1 p.

Hopkins, W.S., 1972. Palynology report on 17 samples from the Sustut Group, northwestern British Columbia, submitted by D.H. Eisbacher, 1972 (NTS 104H, 94F); Geological Survey of Canada, Paleontological Report, KT-07-WSH-1972, 2 p.

Hopkins, W.S., 1981. Palynology report on three field samples from southwestern British Columbia, collected by D. Long, 1980 (NTS 92O, 94F); Geological Survey of Canada, Paleontological Report, T-04-WSH-1981, 1 p.

Jackson, D.E., 1974. Report on five collections of fossils from British Columbia, collected by Dr. H. Gabrielse, 1973 (NTS 94C, 94F); Geological Survey of Canada, Paleontological Report, S-D2 Misc. DEJ 1974, 1 p.

Jackson, D.E., 1980. Report on seventeen collections of graptolites from the Grey Peak section, Ware map-area, British Columbia, collected by Drs. M.P. Cecile and B.S. Norford, 1978 (NTS 94F); Geological Survey of Canada, Paleontological Report, Misc. 2-DEJ-1980, 5 p.

Jaeger, H., 1987. Report on three lots of fossils from the Ware and Mesilinka River map-areas, northeastern British Columbia, collected by Drs. B.S. Norford and H. Gabrielse, 1973 and 1978 (NTS 94C, 94F); Geological Survey of Canada, Paleontological Report, Misc. 1-HJ-1987, 1 p.

McLaren, D.J., 1965. Report on Devonian fossils from the Trutch map-area, British Columbia, submitted by G.C. Taylor (NTS 94F, 94G); Geological Survey of Canada, Paleontological Report, D4-65-McL-N, 5 p.

Nassichuk, W.W., 1995a. A single collection of ammonoids from the Gunsteel Formation, Earn Group, Gataga area, northeastern B.C., submitted by Suzanne Paradis, GSC Vancouver; Geological Survey of Canada, Paleontological Report, 1-WWN-1995, 2 p.



Nassichuk, W.W., 1995b. Two collections of Upper Devonian ammonoids from Gunsteel and Besa River formations respectively in the Ware west half (Ware 94F, W half) map area, northeastern British Columbia. Collected by W. Roberts (Cyprus Anvil) and submitted by H. Gabrielse in 1978 and indentified for S. Paradis of GSC Vancouver; Geological Survey of Canada, Paleontological Report, 2-WWN-1995, 2 p.

Norford, B.S., 1965a. Report on eight lots of fossils collected by Dr. G.C. Taylor from northern British Columbia, Operation Liard, 1964; Geological Survey of Canada, Paleontological Report, O-S 2 BSN 1965, 2 p.

Norford, B.S., 1965b. Report on twenty-six lots of fossils collected by Dr. G.C. Taylor from northern British Columbia, Operation Liard, 1964; Geological Survey of Canada, Paleontological Report, O-S 3-BSN-1965, 5 p.

Norford, B.S., 1965c. Report on twenty-seven lots of fossils collected by Mr. R.T. Bell for Dr. G.C. Taylor from northern British Columbia, Operation Liard, 1964, mostly from the Kechika Group; Geological Survey of Canada, Paleontological Report, O 4-BSN-1965, 5 p.

Norford, B.S., 1971. Report on eighty lots of fossils from the Fort Grahame, Toodoggone and Ware map-areas, northern British Columbia, collected by Dr. H. Gabrielse, 1970 and 1971 (NTS 94C, 94E, 94F); Geological Survey of Canada, Paleontological Report, C-D 5-BSN-1971, 13 p.

Norford, B.S., 1974. Report on seven collections of fossils from the Ware map-area, British Columbia, collected by Dr. H. Gabrielse, 1973 (NTS 94F); Geological Survey of Canada, Paleontological Report, OD 3-BSN-1974, 1 p.

Norford, B.S., 1975. Report on one collection of fossils from the Ware map-area, British Columbia, collected by Dr. H. Gabrielse, 1975 (NTS 94F); Geological Survey of Canada, Paleontological Report, S-14-BSN-1975, 1 p.

Norford, B.S., 1978a. Report on twenty-seven collections from the Ware and Trutch map-areas, northern British Columbia, collected by Mr. C. Jefferson for Dr. G.C. Taylor, 1978 (NTS 94F,G); Geological Survey of Canada, Paleontological Report, O-D 5-BSN-1978, 4 p.

Norford, B.S., 1978b. Report on one lot of fossils from the Ware map-area, northern British Columbia, collected by Wayne Roberts, Cyprus Anvil Mining Corporation, 1978 (NTS 94F W1/2); Geological Survey of Canada, Paleontological Report, S-7-BSN-1978, 1 p.

Norford, B.S., 1980a. Report for Dr. H. Gabrielse on nineteen collections of fossils from the Cry Lake, McDame and Ware map-areas, northern British Columbia, collected by B.S. Norford, 1979 (NTS 94F, 104I, 104P); Geological Survey of Canada, Paleontological Report, C-S 2-1980-BSN, 5 p.

Norford, B.S., 1980b. Report on thirty-one lots of fossils from the Ware map-area, British Columbia, collected by Dr. D.G. MacIntyre, Energy, Mines and Petroleum Resources, British Columbia, 1979 (NTS 94F); Geological Survey of Canada, Paleontological Report, O-M 8-1980-BSN, 4 p.

Norford, B.S., 1981. Report on fifty-four lots of fossils from the Ware and Tuchodi Lakes map-areas, British Columbia, collected by Dr. D.G. MacIntyre, Ministry of Energy, Mines and Petroleum Resources, British Columbia, 1980 (NTS 94F, 94K); Geological Survey of Canada, Paleontological Report, C-D 5-1981-BSN, 10 p.

Norford, B.S., 1982. Report on one lot of fossils from the Ware map-area, British Columbia, collected by Dr. G.C. Taylor, 1978 (NTS 94F); Geological Survey of Canada, Paleontological Report, O-7-BSN-1982, 1 p.

Norford, B.S., 1987. Report on fifteen lots of fossils from the Kechika, Toodoggone River, Tuchodi Lakes and Ware map-areas, northern British Columbia, collected by Mr. Ken McClay, British Columbia Geological Survey, 1986 (NTS 94 E,F,K,L); Geological Survey of Canada, Paleontological Report, C-D 7-BSN-1987, 4 p.

Norford, B.S., 1989. Report on one lot of fossils from the Cirque Deposit, Ware map-area, northern British Columbia, submitted by Mr. Jim Paxton and Mr. Lee Pigage, Curragh Resources Ltd., 1989 (NTS 94F); Geological Survey of Canada, Paleontological Report, O5-1989-BSN, 2 p.

Norford, B.S., 1995. Report on five collections of Ordovician and Silurian fossils from the Ware map-area, British Columbia, collected by Dr. Joanne Nelson, British Columbia Geological Survey, 1995 (NTS 94F/7); Geological Survey of Canada, Paleontological Report, O-S 9-BSN-1995, 4 p.

Norford, B.S., 1996. Report on one collection of fossils from the Ware (west half) map-area, east-central British Columbia, collected by Dr. H. Gabrielse in 1980 and submitted for study in 1996 (NTS 94F); Geological Survey of Canada, Paleontological Report, S 2-BSN-1996, 3 p.

Norris, A.W., 1965. Report on Devonian fossils from the Trutch map-area, British Columbia, submitted by G.C. Taylor, 1964; Geological Survey of Canada, Paleontological Report, D8-65-N, 1 p.

Norris, A.W., 1972. Report on Devonian fossils from the Fort Ware (W1/2) map-area, British Columbia (NTS 94F), collected in 1971, and submitted by H. Gabrielse; Geological Survey of Canada, Paleontological Report, D2-1972-AWN, 3 p.

Norris, A.W., 1978. Report on one lot of Devonian fossils from the Ware map-area (NTS 94F), northeastern British Columbia, submitted by G.C. Taylor, 1978; Geological Survey of Canada, Paleontological Report, 11-AWN-1978, 1 p.

Nowlan, G.S., 1983. Report on seventeen samples from northern British Columbia, submitted for conodont analysis by Dr. M. Cecile (I.S.P.G.), NTS 94F, 94G; Geological Survey of Canada, Paleontological Report, 01-GSN-1983, 6 p.

Nowlan, G.S., 1994. Report on ten samples from Lower Paleozoic strata from the Prophet River section in central British Columbia (1) and the Angling River, Nelson River and Port Nelson sections in northern Manitoba, collected and submitted for conodont analysis by Dr. B.S. Norford (Institute of Sedimentary and Petroleum Geology), NTS 54C/12, 94F/09; Geological Survey of Canada, Paleontological Report, 008-GSN-1994, 9 p.

Nowlan, G.S., 1995. Report on three samples from Ordovician strata from three sections: Grey Peak Section, east central British Columbia, east central Hart River, Yukon Territory, and Two Island Bay, southern Ellesmere Island, submitted for conodont analysis by Dr. B.S. Norford (Geological Survey of Canada) and collected by Drs. Morrow and de Freitas, NTS 49F/02, 94F/14 and 116H/02; Geological Survey of Canada, Paleontological Report, 10-GSN-1995, 4 p.

Nowlan, G.S., 2002. Report on four samples from Cambrian and Lower Ordovician strata of the

Kechika Group, northern British Columbia, collected by Larry Lane (GSC-Calgary) and submitted for conodont analysis, NTS 94F/09, 94G/05; Geological Survey of Canada, Paleontological Report, 01-GSN-2002, 5 p.

Orchard, M.J., 1980. Report on 8 samples from the Ware map area (94F) submitted by H. Gabrielse for conodont analysis; Geological Survey of Canada, Paleontological Report, MJO-80 57-64, 3 p.

Orchard, M.J., 1992. Report on conodonts and other microfossils, Telegraph Creek (104G), Spatsizi (104H), Cry Lake (104I), Dease Lake (104J), McDame (104P), Toadogone (94E), and Ware (94F) map areas; Geological Survey of Canada, Paleontological Report, OF-1992-4, 10 p.

Orchard, M.J., 1994. Report on conodonts and other microfossils. Cry Lake (104I) and Nahanni (105I). 15 samples (7 productive) collected by B.S. Norford, University of Alberta, 1980; Geological Survey of Canada, Paleontological Report MJO-1994-33, 5 p.

Orchard, M.J., 1995. Report on conodonts and other microfossils. Toadogone River (94E), Ware (94F), Tuchodi Lakes (94K), & Kechika River (94L), 51 samples (46 productive) collected by K. McClay, 1985-1986 (excludes Upper Devonian collections); Geological Survey of Canada, Paleontological Report MJO-1995-29, 21 p.

Orchard, M.J., 1997. Report on conodonts and other microfossils. Ware (94F) & Kechika River (94L), 10 samples (3 productive) collected by H. Gabrielse, 1976; Geological Survey of Canada, Paleontological Report MJO-1997-5, 4 p.

Rigby, J.K., 1989. Letter to Brian Norford, ISPG, GSC Calgary, from J. Keith Rigby, Brigham Young University, Provo, Utah regarding Glenogle Formation collections, British Columbia; Geological Survey of Canada, Paleontological Report, Misc. 1-1989-JKR, 2 p.

Tipnis, R.S., 1978a. Preliminary report on 1 conodont sample from NE British Columbia, collected by B. Norford and M. Cecile, 1978; Geological Survey of Canada, Paleontological Report, RST-7-1978, 1 p.

Tipnis, R.S., 1978b. Report on 47 samples from the Lower Paleozoic conodont collections of the Halfway and Trutch map areas of northeastern British Columbia, submitted by Drs. B.S. Norford and M.P. Cecile; Geological Survey of Canada, Paleontological Report, 8-RST-1978, 18 p.

Tipnis, R.S., 1979a. Report on 23 samples from the Ordovician conodont collections of the Halfway and Trutch map-areas of northeastern British Columbia, submitted by Dr. M.P. Cecile (94B, G); Geological Survey of Canada, Paleontological Report, 10-RST-1979, 4 p.

Tipnis, R.S., 1979b. Report on 20 samples of Ordovician conodont collections from northeastern British Columbia, submitted by Dr. G.C. Taylor; Geological Survey of Canada, Paleontological Report, 11-RST-1979, 5 p.

Tipnis, R.S., 1979c. Report on 20 samples of Lower Paleozoic conodont collections from northeastern British Columbia, Halfway and Trutch map-areas, submitted by Dr. M.P. Cecile (NTS 94F); Geological Survey of Canada, Paleontological Report, 13-RST-1979, 6 p.

Tipnis, R.S., 1979d. Report on 57 samples of Ordovician conodont collections from North East British Columbia, submitted by Dr. B.S. Norford; Geological Survey of Canada, Paleontological Report, 15-

RST-1979, 12 p.

Tozer, E.T., 1971. Report on Triassic fossils from Ware area, British Columbia, submitted by H. Gabrielse, 1971 (NTS 94F); Geological Survey of Canada, Paleontological Report, Tr-5-1971-ETT, 1 p.

Tozer, E.T., 1974. Report on fossils from Ware area, B.C., submitted by H. Gabrielse, 1974 (NTS 94F); Geological Survey of Canada, Paleontological Report, Tr-14-1974-ETT, 1 p.

Tozer, E.T., 1980. Report on fossils submitted by the B.C. Ministry of Mines, from Ware area (NTS 94F), (Akie River Project); Geological Survey of Canada, Paleontological Report Tr 4 1980 ETT, 1 p.

Uyeno, T.T., 1972. Report on 2 lots of conodont samples from Mt. Holben, Ware map area, B.C., submitted by B.S. Norford for H. Gabrielse (NTS 94F); Geological Survey of Canada, Paleontological Report, MP8-TTU-72, 1 p.

Uyeno, T.T., 1978. Report on one lot of conodont samples from the Dunedin Formation from northern British Columbia, submitted by G.C. Taylor and collected by D.W. Morrow (NTS 94F); Geological Survey of Canada, Paleontological Report, 8-TTU-1978, 1 p.

Uyeno, T.T., 1979. Report on 10 lots of conodont samples from north- central British Columbia, submitted by M.P. Cecile (NTS 94F); Geological Survey of Canada, Paleontological Report, 9-TTU-1979, 3 p.

Uyeno, T.T., 1980. Report on 14 lots of conodont samples from northeastern British Columbia, submitted by G.C. Taylor (NTS 94F, G); Geological Survey of Canada, Paleontological Report, 5-TTU-1980, 4 p.

Uyeno, T.T., 1983. Report on 31 lots of conodont samples from north-central British Columbia and southwestern District of Mackenzie (NTS 94F, 95F,G,K,L, and 105I,P), submitted by Dr. D.W. Morrow; Geological Survey of Canada, Paleontological Report, 5-TTU-1983, 7 p.

Uyeno, T.T., 1984. Report on seven lots of conodont samples from northern British Columbia (NTS 94F, G), southeastern Yukon (NTS 95D), and northeastern Yukon (NTS 116P), submitted by B.S. Norford; Geological Survey of Canada, Paleontological Report, 10-TTU-1984, 2 p.