British Columbia Geological Survey
Open File 2018-3

Preliminary bedrock geology of the McBride River area

Parts of NTS Sheets 104H/14,15; 104I/02, 03, 06

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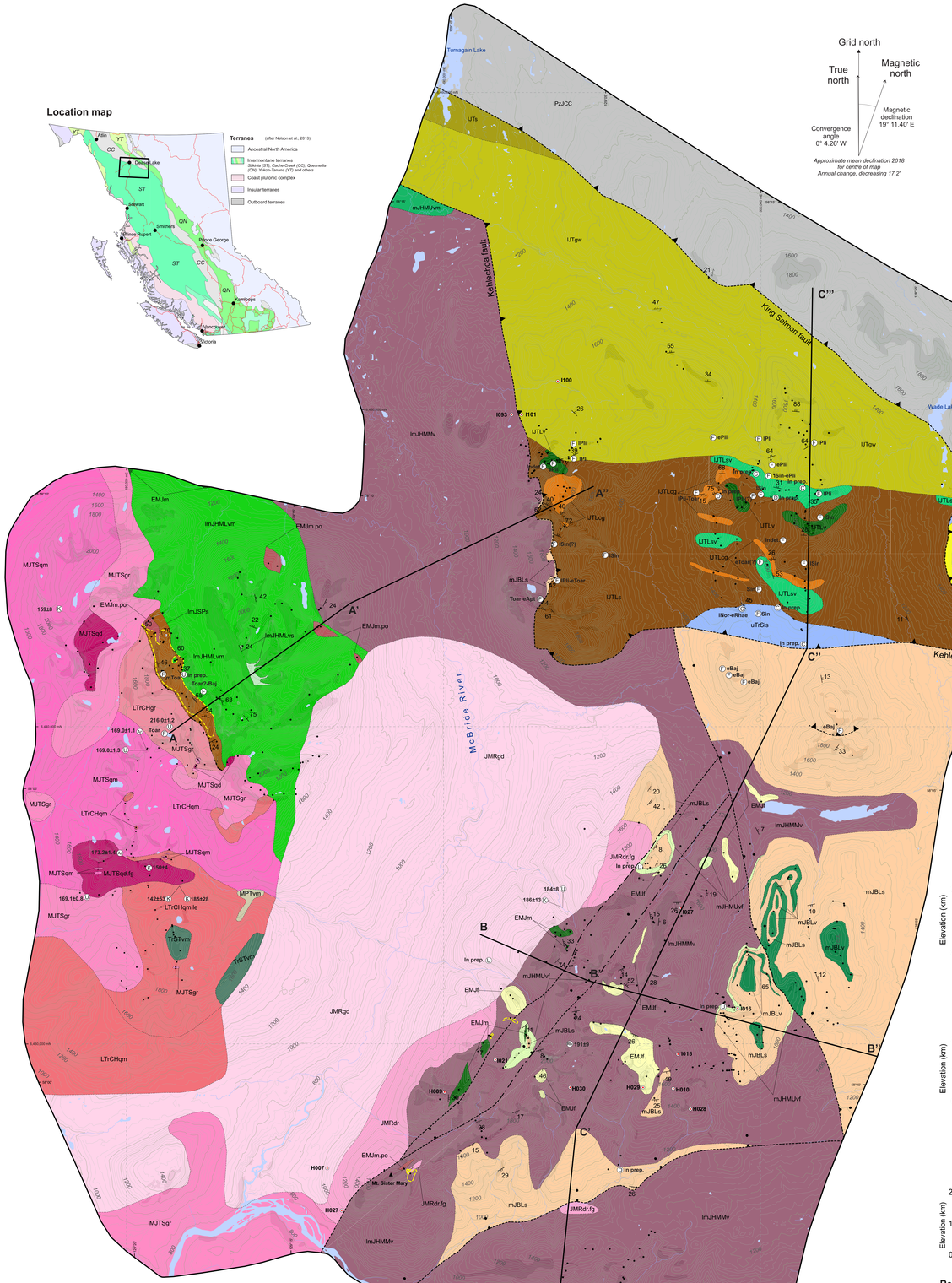
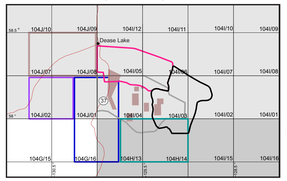


Previous mapping in the region



Geochronology data

Sample	Easting	Northing	Unit	Age (Ma)	Type	Mineral	Sample description	Source
AN-79-467	493616	6434342	JMRgd	166±8	U-Pb	Zrn	Hbl-Bt-bearing granodiorite	Anderson et al. (1982)[1]
AN-79-467	493616	6434342	JMRgd	184±8	U-Pb	Zrn	Hbl-Bt-bearing granodiorite (re-analysis of AN-79-467)	Anderson and Bevier (1992)[1]
AN-79-467	493616	6434342	JMRgd	186±13	K-Ar	Hbl	Hbl-Bt-bearing granodiorite	Stevens et al. (1982a)[1]
17BvS-6-36	491425	6433827	JMRgd	In prep.	U-Pb	Zrn	Hbl-Bt granodiorite	This study
11BVAJ1-232	479755	6454626	MUTsgr	168.1±0.8	U-Pb	Zrn	Hbl-bearing Bt monzogranite	van Straaten et al. (2012)
GAD 67-132-3	477914	6443782	MUTsgm	159±6	K-Ar	Hbl	Leucocratic Hbl-Bt-bearing Qtz monzonite or granodiorite	Wanless et al.(1972), Anderson (1983)[1]
11BVAJ5-276	480640	6439273	MUTsgm	169.0±1.1	Ar-Ar	Bt	Hbl-bearing Bt Qtz monzonite to monzogranite	van Straaten et al. (2012)
11BVAJ5-276	480640	6439273	MUTsgm	169.0±1.3	U-Pb	Zrn	Hbl-bearing Bt Qtz monzonite to monzogranite	van Straaten et al. (2012)
AN-79-719-1	480471	6435640	MUTSgd.fg	150±4	K-Ar	WR	Fine-grained quartz diorite	Stevens et al. (1982b)[1]
11BVAM2-332	479794	6436014	MUTSgd.fg	173.2±1.4	Ar-Ar	Hbl	Fine-grained Hbl-Bt Qtz diorite	van Straaten et al. (2012)
17BB-10-60	495568	6426021	mJBLsg	In prep.	U-Pb	Zrn (D)	Medium grained sandstone	This study
17BB-16-68	496183	6435981	mJHMUvf	In prep.	U-Pb	Zrn	Felsic tuff	This study
17BB-37-301	498815	6431164	mJHMUvf	In prep.	U-Pb	Zrn	Flow-banded Pt porphyry	This study
11BVAJ5-276	493980	6429991	mJHMUvf (MPTvm)	191±8	Rb-Sr	WR	Hornblende-plagioclase phyric volcanic rock, gray Aug/Pl	Erdman (1978)
17BvS-19-159	481756	6441786	lmJHMLvf	In prep.	U-Pb	Zrn	Felsic lapillistone to lapilli tuff	This study
17BvS-25-238	498661	6447266	UTLcg	In prep.	U-Pb	Zrn (D)	Polymictic conglomerate with limestone and volcanic clasts	This study
17BvS-25-242	500472	6447222	UTLsv	In prep.	U-Pb	Zrn (D)	Feldspathic arenite to volcaniclastic sandstone	This study
AN-79-719-1	481553	6434837	LTrCHgm.le	142±53	K-Ar	Hbl	Leucocratic Hbl granodiorite	Stevens et al. (1982b)[1]
AN-79-719-1	481553	6434837	LTrCHgm.le	185±28	K-Ar	Hbl	Leucocratic Hbl granodiorite	Stevens et al. (1982b)[1]
11BVAJ6-304	481362	6435661	LTrCHgr	216.2±1.2	U-Pb	Zrn	Hbl-bearing granodiorite to monzogranite	van Straaten et al. (2012)

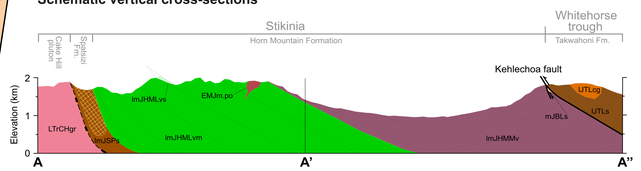
UTM NAD83 Zone 9N.
* Location digitized from 1:100,000 scale map (Gabrielse, 1998, Figure 14)

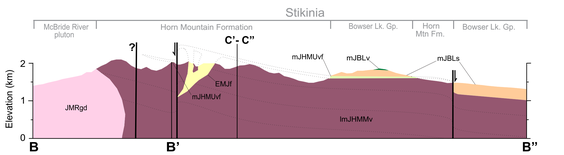
Fossil data

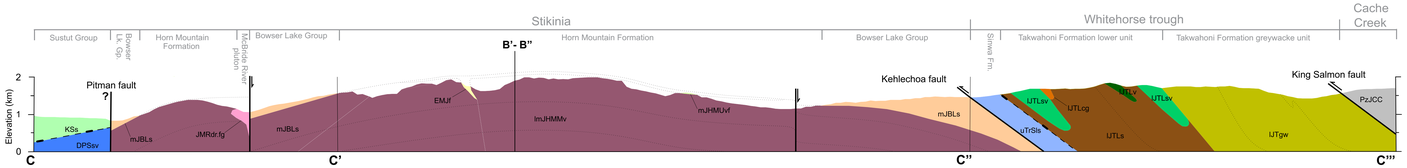
Sample	GSC number	Easting	Northing	Location accuracy*	Unit	Age	Fossil descriptions	Identified by	Source
n/a	95019	496997	6441523	moderate	mJBLs	early Bajocian	Poorly preserved inner whorls of ammonite (Sonninidae? indeterminate forms);	H. Frebold and H.W. Tipper	Gabrielse (1998)
n/a	95018	499468	6441403	moderate	mJBLs	early Bajocian	Fragment of ammonite (indet., possibly inner whorl of a sonninid);	H. Frebold and H.W. Tipper	Gabrielse (1998)
n/a	95024, 95023, 95020	498788	6441830	moderate	mJBLs	early Bajocian	Impressions and poorly preserved fragments of ammonite (sonninids, sp. indet.), bivalves (Myophorella sp., Trigonia, other indeterminate forms), indeterminate corals	H. Frebold and H.W. Tipper	Gabrielse (1998)
n/a	95016	502494	6439876	moderate	mJBLs	early Bajocian	Ammonites (Fragments and distorted specimens of Chondroceras spp. indet., fragments and poor impressions of Staphanoceras s.l.), various brachiopods, pelecypods, gastropods	H. Frebold	Gabrielse (1998)
n/a	95241	493048	6444024	low	mJBLs or UTLs	Toarcian to early Aalian	Belemnites (indet.)	J. A. Jeletzky	Gabrielse (1998)
n/a	95240	493583	6444607	moderate	mJBLs or UTLs	late Pliensbachian to early Toarcian	Belemnites (Nannobelus?), indeterminate pelecypods, indeterminate brachiopods	J. A. Jeletzky	Gabrielse (1998)
17BB-37-301	498815	6431164	mJHMUvf	In prep.	U-Pb	Zrn	Flow-banded Pt porphyry	This study
11BVAJ5-276	493980	6429991	mJHMUvf (MPTvm)	191±8	Rb-Sr	WR	Hornblende-plagioclase phyric volcanic rock, gray Aug/Pl	Erdman (1978)
17BvS-19-159	481756	6441786	lmJHMLvf	In prep.	U-Pb	Zrn	Felsic lapillistone to lapilli tuff	This study
17BvS-25-238	498661	6447266	UTLcg	In prep.	U-Pb	Zrn (D)	Polymictic conglomerate with limestone and volcanic clasts	This study
17BvS-25-242	500472	6447222	UTLsv	In prep.	U-Pb	Zrn (D)	Feldspathic arenite to volcaniclastic sandstone	This study
AN-79-719-1	481553	6434837	LTrCHgm.le	142±53	K-Ar	Hbl	Leucocratic Hbl granodiorite	Stevens et al. (1982b)[1]
AN-79-719-1	481553	6434837	LTrCHgm.le	185±28	K-Ar	Hbl	Leucocratic Hbl granodiorite	Stevens et al. (1982b)[1]
11BVAJ6-304	481362	6435661	LTrCHgr	216.2±1.2	U-Pb	Zrn	Hbl-bearing granodiorite to monzogranite	van Straaten et al. (2012)
17BB-29-192	V.003863	512188	6446347	high	uTrSls	In prep.	In prep.	M.L. Golding	Golding, pers. comm.
17BB-23-123	V.003861	501320	6447523	high	uTrSls	In prep.	In prep.	M.L. Golding	Golding, pers. comm.
17BB-23-125	V.003862	499851	6447971	high	uTrSls	In prep.	In prep.	M.L. Golding	Golding, pers. comm.
n/a	95092, 95095	499920	6445564	moderate	UTLs?	late Norian – early Rhaetian	Heterozoids (indet.), fragmentary pelecypods (indet.), ichthyoliths, conodonts (Mockina bidentata (Mosher 1968); Mockina englandi (Orchard 1991))	M. J. Orchard and M.L. Golding	Gabrielse (1998)[1], Golding et al. (2017)
17BvS-23-209	V.003859	501349	6442602	high	uTrSls	In prep.	In prep.	M.L. Golding	Golding, pers. comm.
17BvS-23-212	V.003860	500535	6443750	high	uTrSls	In prep.	In prep.	M.L. Golding	Golding, pers. comm.
17BB-28-192	V.003863	512188	6446347	high	uTrSls	In prep.	In prep.	M.L. Golding	Golding, pers. comm.
n/a	95019	496997	6441523	moderate	mJBLs	early Bajocian	Poorly preserved inner whorls of ammonite (Sonninidae? indeterminate forms);	H. Frebold and H.W. Tipper	Gabrielse (1998)
n/a	95018	499468	6441403	moderate	mJBLs	early Bajocian	Fragment of ammonite (indet., possibly inner whorl of a sonninid);	H. Frebold and H.W. Tipper	Gabrielse (1998)
n/a	95024, 95023, 95020	498788	6441830	moderate	mJBLs	early Bajocian	Impressions and poorly preserved fragments of ammonite (sonninids, sp. indet.), bivalves (Myophorella sp., Trigonia, other indeterminate forms), indeterminate corals	H. Frebold and H.W. Tipper	Gabrielse (1998)
n/a	95016	502494	6439876	moderate	mJBLs	early Bajocian	Ammonites (Fragments and distorted specimens of Chondroceras spp. indet., fragments and poor impressions of Staphanoceras s.l.), various brachiopods, pelecypods, gastropods	H. Frebold	Gabrielse (1998)
n/a	95241	493048	6444024	low	mJBLs or UTLs	Toarcian to early Aalian	Belemnites (indet.)	J. A. Jeletzky	Gabrielse (1998)
n/a	95240	493583	6444607	moderate	mJBLs or UTLs	late Pliensbachian to early Toarcian	Belemnites (Nannobelus?), indeterminate pelecypods, indeterminate brachiopods	J. A. Jeletzky	Gabrielse (1998)
n/a	95025, 95026	481195	6439799	moderate	lmJSPs	Toarcian	Ammonite (probably Hildaites sp. ind., other gen. et sp. indet.)	H. Frebold and G. Jakobs	Gabrielse (1998)
n/a	95093	481139	6441653	moderate	lmJSPs	middle Toarcian	Ammonites (Pseudolioceras verbosum?, Zugodactylites? sp. ind., Harpoceras?, sp. ind., Phymatoceras? sp. ind.)	H. Frebold and G. Jakobs	Gabrielse (1998)
n/a	95251	482474	6441083	moderate	lmJSPs	Toarcian? - Bajocian	Belemnite (Belemnopsis sp. indet.)	n/a	Gabrielse (1998)
n/a	95098	499935	6449577	moderate	UTgw	late Pliensbachian	Ammonite (Arieticeras cf. A.domarense (Meneghini))	H. Frebold	Gabrielse (1998)
n/a	95021	501627	6448946	moderate	UTgw	late Pliensbachian	Fragments of ammonites (Amaltheus sp., Margaritatus Group, Protogrammoceras spp. indet.), bivalves (Weyla, Trigonoidis, others), corals	H. Frebold and H.W. Tipper	Gabrielse (1998)
n/a	94994, 95991, 94986	501834	6447339	moderate	UTgw	late Pliensbachian	Ammonites (Amaltheus spp., Amaltheus cf. algovianum (Oppel), Amaltheus spp., Arieticeras spp., Lytoceraceae aff. accutum (Fucini), bivalves (Inoceramus, Weyla?)	H. Frebold and H.W. Tipper	Gabrielse (1998)
n/a	95258, 95257, 95268	494106	6448453	moderate	UTgw	late Pliensbachian	Ammonites (Protogrammoceras?, or Fuciniceras? sp. indet., poor impressions of whorl fragments, Prodactylioceras aff. P. talricum (Meneghini), Prodactylioceras aff. P. meneghini (Fucini)	H. Frebold and H.W. Tipper	Gabrielse (1998)
n/a	94995	494096	6448922	moderate	UTgw	early Pliensbachian	Ammonites (Arieticeras spp. indet. impressions of small specimens, Protogrammoceras spp., dactylioceratid impression of inner whorl, Amaltheus sp.)	H. Frebold and H.W. Tipper	Gabrielse (1998)
17BB-25-149	V.003872	500357	6448252	high	UTgw	early Pliensbachian	Ammonites (Tropidoceras)	T.P. Poulton	Poulton (2017)
n/a	95092, 95299	498464	6449118	moderate	UTgw	early Pliensbachian	Ammonites (Coeloceras? sp., Phylloceras spp., dactylioceratid?, Gemmellaroceras sp., polymorphid spp., inner whorls of Tropidoceras cf. erythraeum?, Miltoceras? Sp.)	H. Frebold and H.W. Tipper	Gabrielse (1998)
17BB-25-148	V.003871	500244	6447909	high	UTgw	late Sinemurian to early Pliensbachian	Ammonites (sedoceratoasian genera Eodoceras, Eleutoceras, Metadecoceras, and perhaps Crucilobiceras)	T.P. Poulton	Poulton (2017)
n/a	C-95096, 95091, 95101	499962	6445195	low	UTL	early Toarcian(?)	Fragments of ammonites and poorly preserved fragments of ammonites (harpoceratid, Amoceras?, other gen. et sp. indet.)	H. Frebold and G. Jakobs	Gabrielse (1998)
n/a	95261 - 95266	497969	6447378	moderate	UTLs	late Pliensbachian to Toarcian	Ammonites (Dactylioceratidae; gen. et sp. indet. impressions of small fragments of Protogrammoceras? sp. indet., Harpoceras sp. ind., Hildaites sp. ind., other gen. et sp. indet.)	H. Frebold; H.W. Tipper, G. Jakobs	Gabrielse (1998)
n/a	95269	499759	6447274	moderate	UTLs	late Pliensbachian(?)	Very poorly preserved small ammonites (Protogrammoceras sp. indet., impression of a distorted fragment of Arietoceras? sp. indet. showing twist with shallow sulci)	H. Frebold and H.W. Tipper	Gabrielse (1998)
n/a	94991	493457	6448255	moderate	UTL?	early Pliensbachian	Poorly preserved ammonite (Zubaricoras sp. indet.)	H. Frebold and H.W. Tipper	Gabrielse (1998)
n/a	95015	500005	6447324	moderate	UTLs	late Sinemurian	Ammonites (Paltechioceras cf. rothpletzi (Boye), coarsely ribbed Paltechioceras sp., Plesechioceras? sp. Phylloceras sp.), many genera and species of bivalves	H.W. Tipper	Gabrielse (1998)
n/a	95094	501877	6446556	moderate	UTLs	late Sinemurian	Ammonites (Paltechioceras sp., Phylloceras sp.), numerous and varied bivalves	H.W. Tipper	Gabrielse (1998)
n/a	94993, 95996	501319	6445156	moderate	UTLs	late Sinemurian	Ammonites (Paltechioceras cf. harbledownensis (Crickmay), faint impression of Crucilobiceras sp. indet. showing two rows of spines, Juraphyllites n. sp.?), wide variety of bivalves	H. Frebold and H.W. Tipper	Gabrielse (1998)
n/a	95099	495094	6445413	low	UTLs	late Sinemurian	Ammonites (Gleviceras sp., and aptychi)	H.W. Tipper	Gabrielse (1998)
n/a	94990	493492	6445755	moderate	UTLs	late Sinemurian?	Poorly preserved ammonite fragments (Astrocerras?)	H. Frebold and H.W. Tipper	Gabrielse (1998)
n/a	95256	499937	6444329	moderate	UTLs	Sinemurian	Fragments of a small ammonite (probably Amoceras)	H. Frebold	Gabrielse (1998)
n/a	95092, 95095	499920	6445564	moderate	UTLs?	Sinemurian	Ammonites (Epophioceras aff. E. carinatum Spath, Gleviceras sp., Amioceras sp., Astierceras cf. A. varians Fucini)	H. Frebold and H.W. Tipper	Gabrielse (1998)
n/a	95051, 95057	500570	6445754	moderate	UTLs	Indet.	n/a	n/a	Gabrielse (1998)
n/a	95107	493137	6448199	low	UTL?	Indet.	Bivalves, indet.	E.T. Tozer	Gabrielse (1998)
17BB-22-123	V.003861	501320	6447523	high	Limestone, block in UTLgw	In prep.	In prep.	M.L. Golding	Golding, pers. comm.
17BB-23-125	V.003862	499851	6447971	high	Limestone, clasts in UTLs	In prep.	In prep.	M.L. Golding	Golding, pers. comm.
n/a	C-117416	499412	6443715	moderate	uTrSls	late Norian – early Rhaetian	Heterozoids (indet.), fragmentary pelecypods (indet.), ichthyoliths, conodonts (Mockina bidentata (Mosher 1968); Mockina englandi (Orchard 1991))	M. J. Orchard and M.L. Golding	Gabrielse (1998)[1], Golding et al. (2017)
17BvS-23-209	V.003859	501349	6442602	high	uTrSls	In prep.	In prep.	M.L. Golding	Golding, pers. comm.
17BvS-23-212	V.003860	500535	6443750	high	uTrSls	In prep.	In prep.	M.L. Golding	Golding, pers. comm.
17BB-28-192	V.003863	512188	6446347	high	uTrSls	In prep.	In prep.	M.L. Golding	Golding, pers. comm.

UTM NAD83 Zone 9N.
* Location accuracy: High - GPS measurements (this study); Moderate - digitization of fossil locations from 1:100,000 scale map (Gabrielse, 1998, Figure 14); Low - converted from latitude-longitude (Gabrielse, 1998, appendix 2)

Schematic vertical cross-sections







Symbols

- Field station: 2011; 2015; 2017
- Minfile (104)
- Sample site: fossil, conodont
- Geochronology sample site: U-Pb zircon, U-Pb detrital zircon, Ar-Ar, K-Ar, Rb-Sr
- Bedding: tops unknown; tops known, right-way-up; tops known, overturned
- Foliation
- Contact: defined, approximate, inferred from aeromagnetic data, inferred
- Unconformity: defined, approximate, inferred
- Fault: defined, approximate, inferred from aeromagnetic data, inferred
- Normal fault: defined, approximate, inferred from aeromagnetic data, inferred (dot on hanging wall)
- Thrust fault: defined, approximate, inferred from aeromagnetic data, inferred (tooth on hanging wall)
- Altered or gossanous rocks
- Outcrop (darker shade)

Legend

(for detailed unit descriptions the reader is referred to van Straaten and Bichlmaier, 2018)

Stratified rocks

Overlap assemblages

Miocene-Pleistocene, Tuya Formation

- MPTvm — Olivine basalt

Cretaceous, Sustut Group

- KSs — Undivided sedimentary rocks

unconformity

Stikinia

Middle Jurassic, Bowser Lake Group

- mJBLs — Sandstone, conglomerate and shale

- mJBLv — Mafic volcanic rocks

Lower to Middle Jurassic, upper Hazelton Group

Middle Jurassic, Horn Mountain Formation

- uJHMLvm — Upper mafic volcanic rocks
- mJHMUvf — Upper felsic volcanic rocks

Lower to Middle Jurassic, Horn Mountain Formation

- mJHMMv — Middle maroon volcanic rocks
- lmJHMLvm — Lower mafic volcanic rocks
- lmJHMLvs — Lower volcaniclastic sandstone

Lower to Middle Jurassic, Spatsizi Formation

- lmJSPs — Argillite, siltstone and sandstone

unconformity

Triassic, Stuhini Group

- TrSTvm — Mafic volcanic rocks

Devonian-Permian, Stikine assemblage

- DPSsv — Phyllitic greenstone and phyllite

Tectonic contact

Whitehorse trough

Lower Jurassic, Laberge Group

Lower Jurassic, Takwahoni Formation

- UTLs — Siltstone with lesser feldspathic arenite
- UTLgw — Feldspathic wacke, feldspathic arenite and lesser siltstone

Lower unit

- UTLsv — Volcaniclastic sandstone facies
- UTLv — Mafic volcanic facies
- UTLs — Argillite and siltstone facies
- UTLcg — Conglomerate facies

unconformity

Upper Triassic, Sinwa Formation

- uTrSls — Limestone

Tectonic contact

Cache Creek

Paleozoic to Jurassic

- PzJCC — Undivided

Lower Jurassic, Inklin Formation

- UJs — Feldspathic wacke, siltstone and phyllite

Upper Triassic, Sinwa Formation

- uTrSls — Limestone

Intrusive rocks

Jurassic, McBride River pluton

- JMRgd — Hornblende-biotite granodiorite
- JMRdr — Hornblende-clinopyroxene(?) diorite to quartz diorite
- JMRdr.fg — Mafic-rich microdiorite

Middle Jurassic, Three Sisters pluton

- MJTSgr — Biotite monzogranite
- MJTSqm — Biotite quartz monzonite
- MJTSqd — Hornblende-rich quartz diorite
- MJTSqd.fg — Fine-grained hornblende-biotite quartz diorite

Early to Middle Jurassic, Horn Mountain intrusions

- EMJf — Felsic intrusive
- EMJm.po — Platy plagioclase porphyry
- EMJm — Mafic intrusive

Late Triassic, Cake Hill pluton

- LTrCHgr — Hornblende granodiorite to monzogranite
- LTrCHgm — Hornblende quartz monzodiorite
- LTrCHgm.le — Leucocratic hornblende quartz monzodiorite

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