THE GEOLOGY AND GENESIS OF IRON OXIDE-COPPER-GOLD MINERALISATION ASSOCIATED WITH WERNECKE BRECCIA, YUKON, CANADA

VOLUME II

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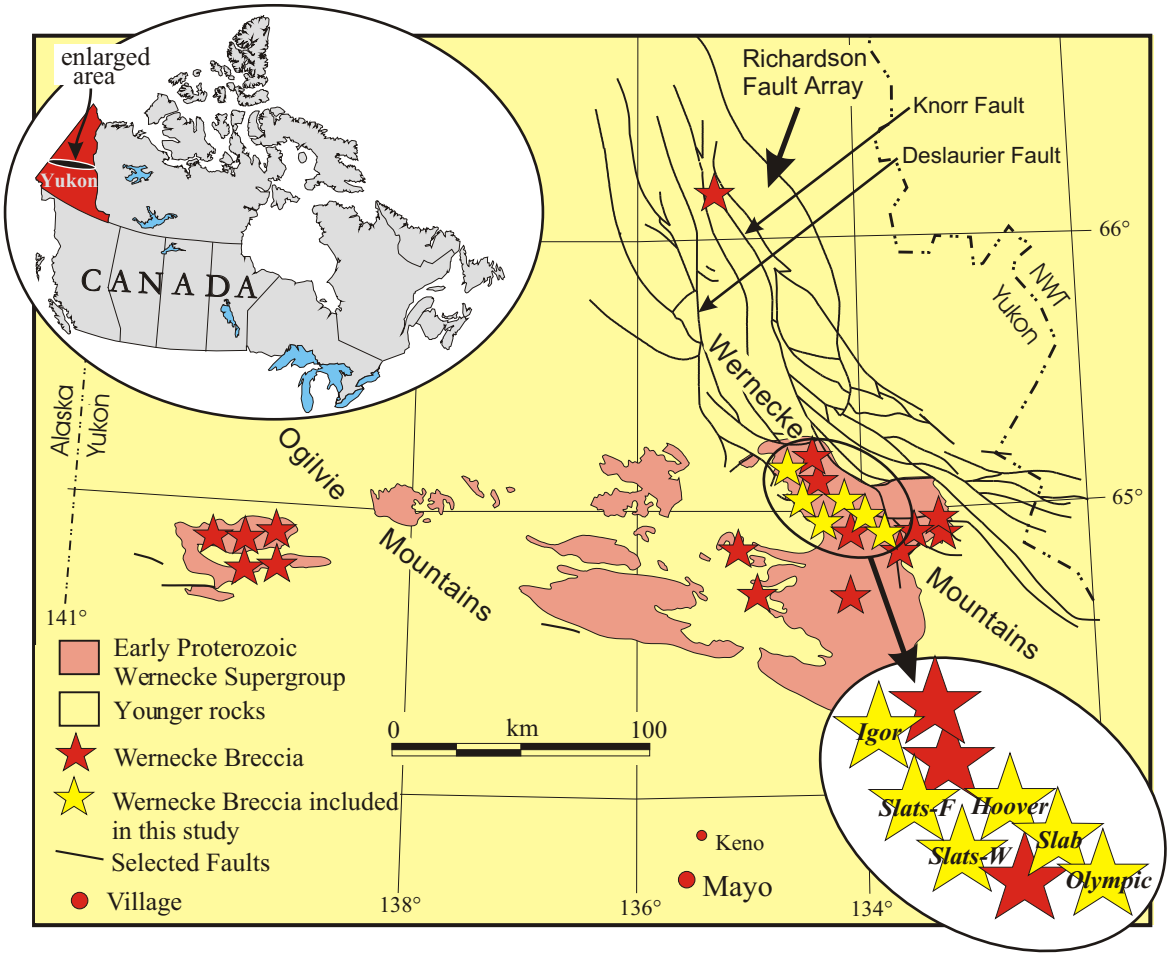
SECTION A - FIGURES

Regional-scale Proterozoic iron oxide-copper-gold-mineralised breccia systems: examples from the Wernecke Mountains, Yukon, Canada

Figure 1:

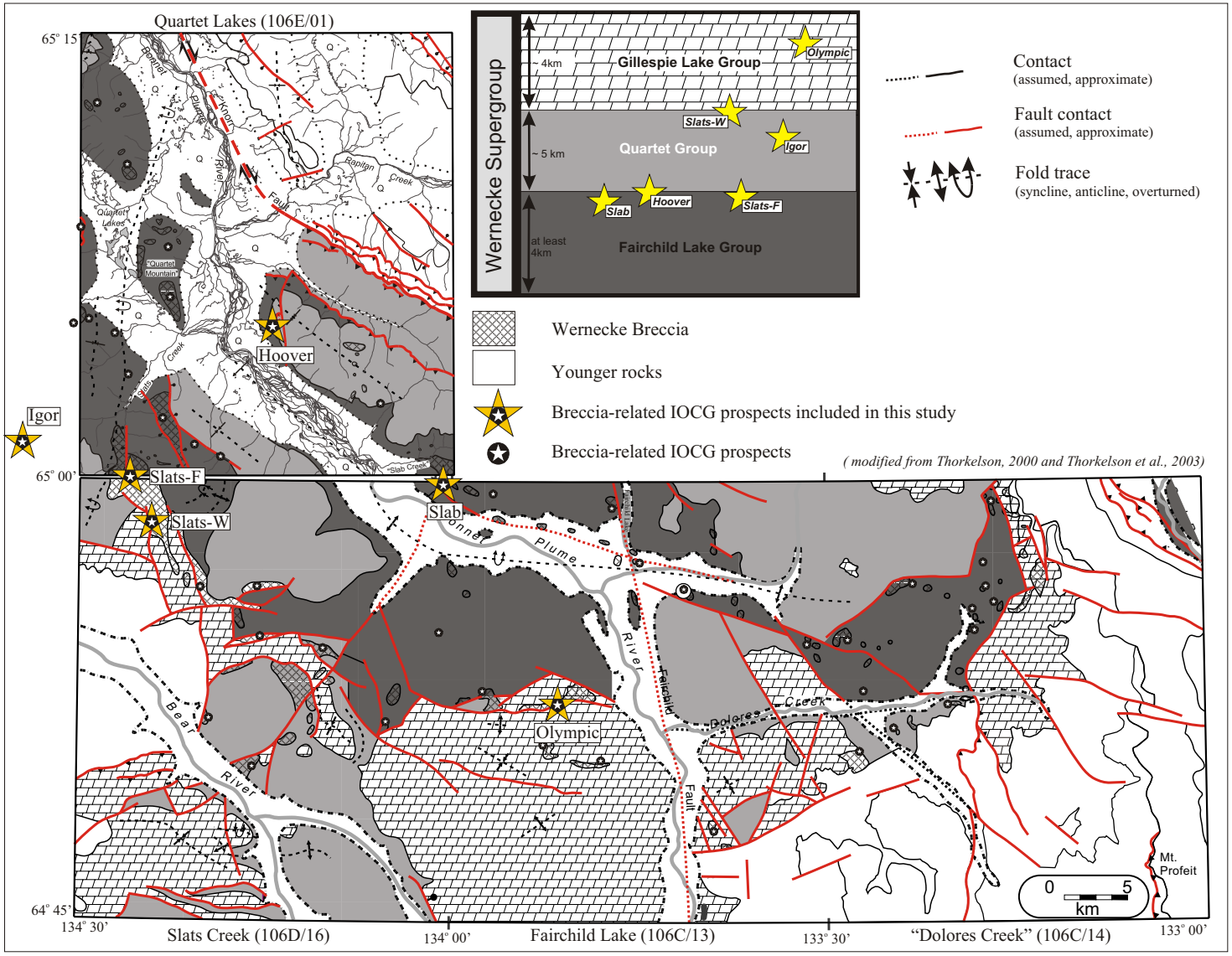
Location of study area, distribution of WSG and Wernecke Breccia plus location of breccia-associated IOCG prospects included in this study (modified from Thorkelson, 2000).



Section A: Figure 1

Figure 2:

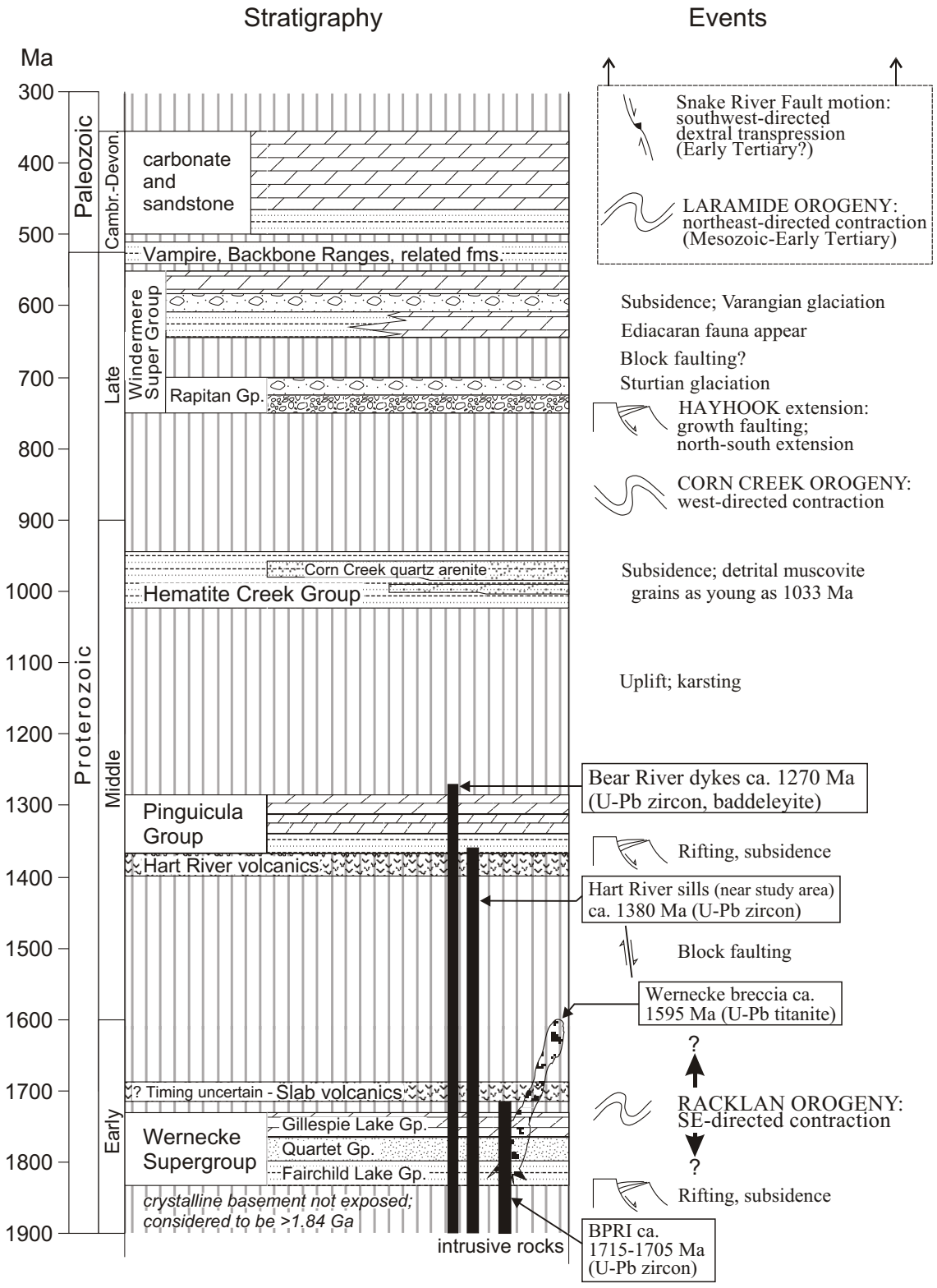
Simplified geology map of the study area (for details see Thorkelson, 2000 and Thorkelson *et al.*, 2002). Legend shows approximate stratigraphic position of IOCG prospects included in this study.



Section A: Figure 2

Figure 3:

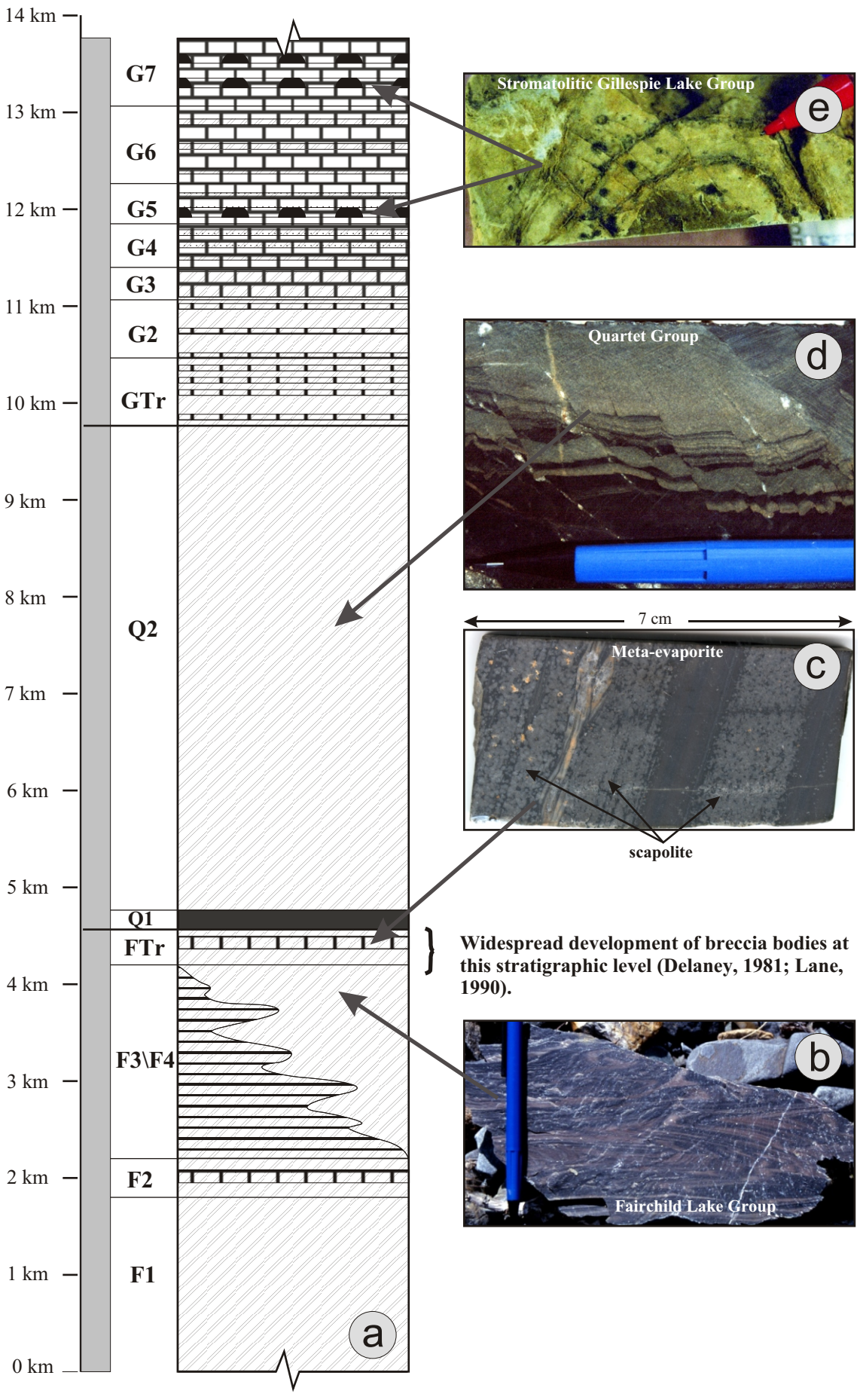
Time stratigraphic column of the study area showing major depositional, intrusive and deformational events (modified from Thorkelson, 2000).



Section A: Figure 3

Figure 4:

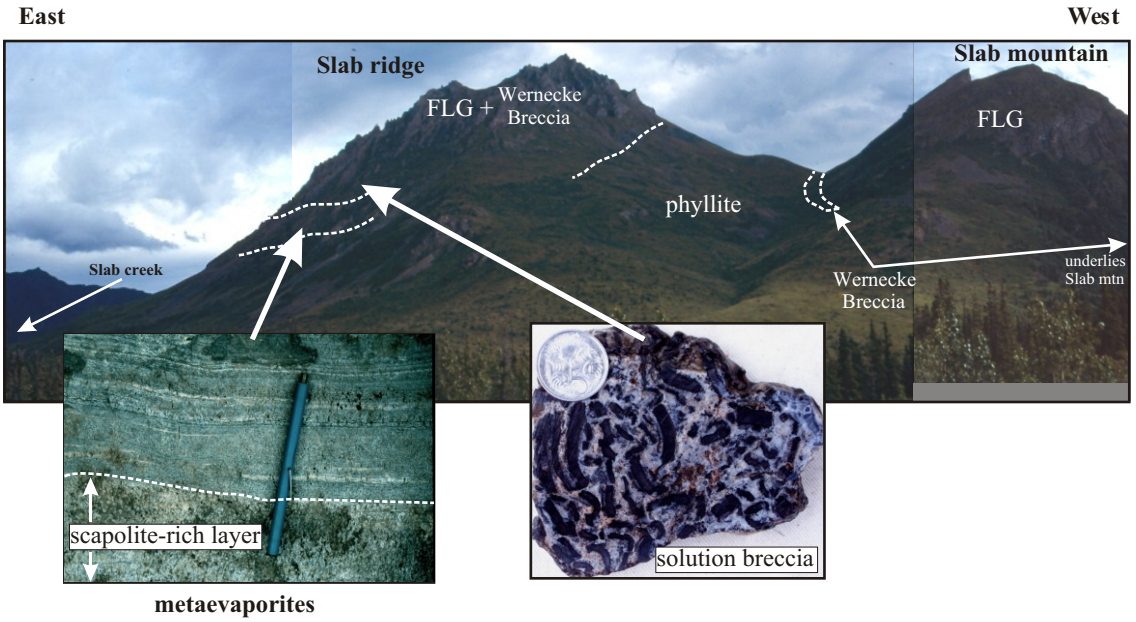
WSG a) stratigraphic column, see text and Table 1 for unit descriptions (information from Delaney, 1981), b) typical FLG, c) probable meta-evaporite in F-Tr, d) typical Quartet Group and e) GLG stromatolitic dolostone.



Section A: Figure 4

Figure 5:

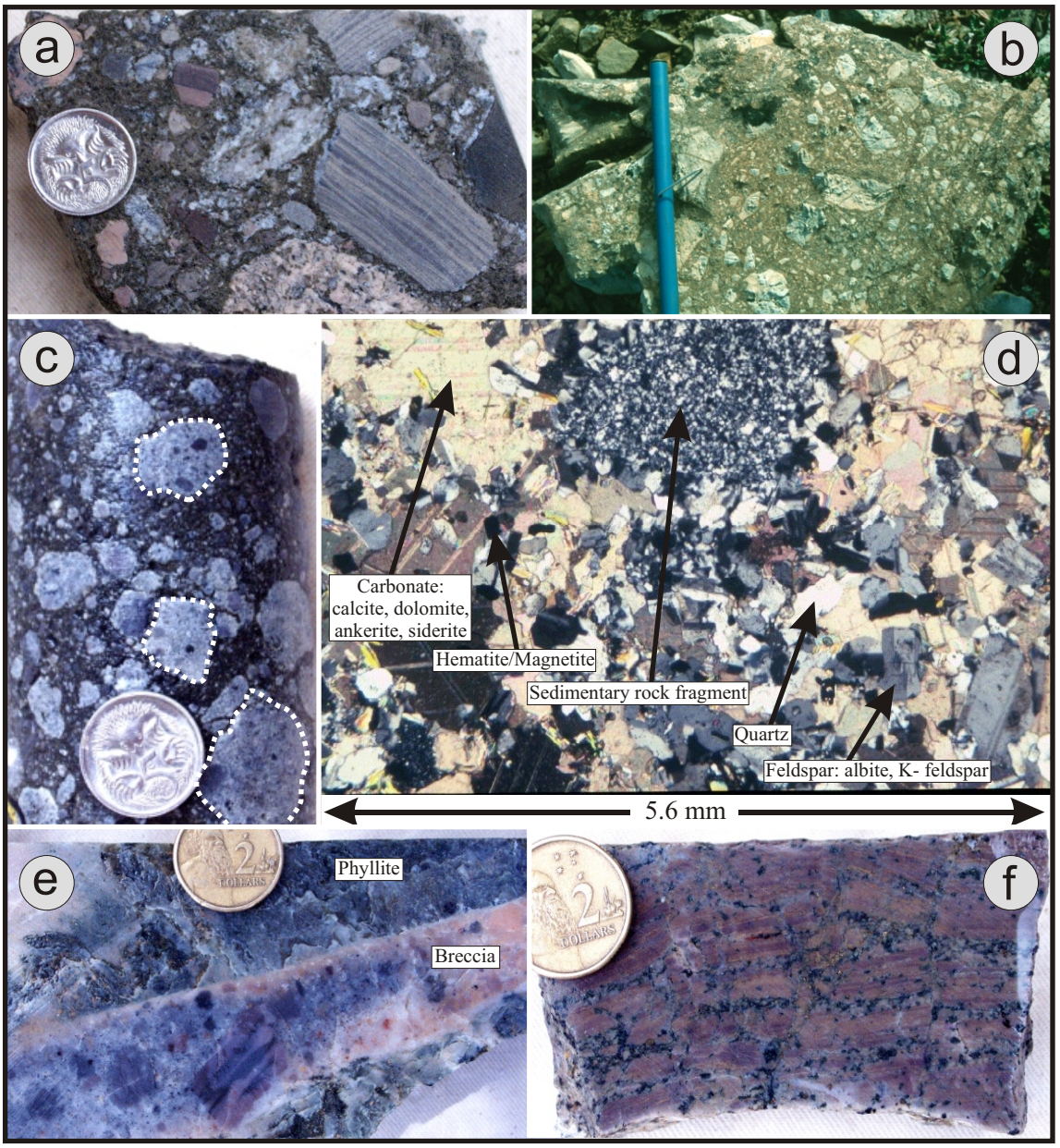
View of Slab mountain and Slab ridge (looking south) showing location of metaevaporites. Insets: detail of metaevaporites in outcrop showing one thick (labelled) and several narrow (light coloured) scapolite-rich layers and detail of solution breccia that overlies metaevaporites.



Section A: Figure 5

Figure 6:

Examples of Wernecke Breccia: a) clast supported breccia, Slab area, b) matrix supported breccia, Olympic area, c) breccia with abundant clasts of earlier breccia, Slab area, d) photomicrograph of Wernecke Breccia matrix (crossed polars) made up dominantly of sedimentary rock fragments, carbonate, feldspar, lesser quartz and minor hematite and magnetite, e) sharp contact between breccia and phyllitic metasiltstone, Hoover area, f) crackle brecciated metasiltstone from a gradational breccia contact, Hoover area.



Section A: Figure 6

Figure 7:

Slab mountain area showing location of 'Slab mountain', 'Slab ridge', 'Slab creek', Bonnet Plume River, fold axial trace in the river valley, Wernecke Breccia, high strain zone, breccia that contains deformed clasts of phyllite and large clast of Slab volcanics with some of the flows outlined.

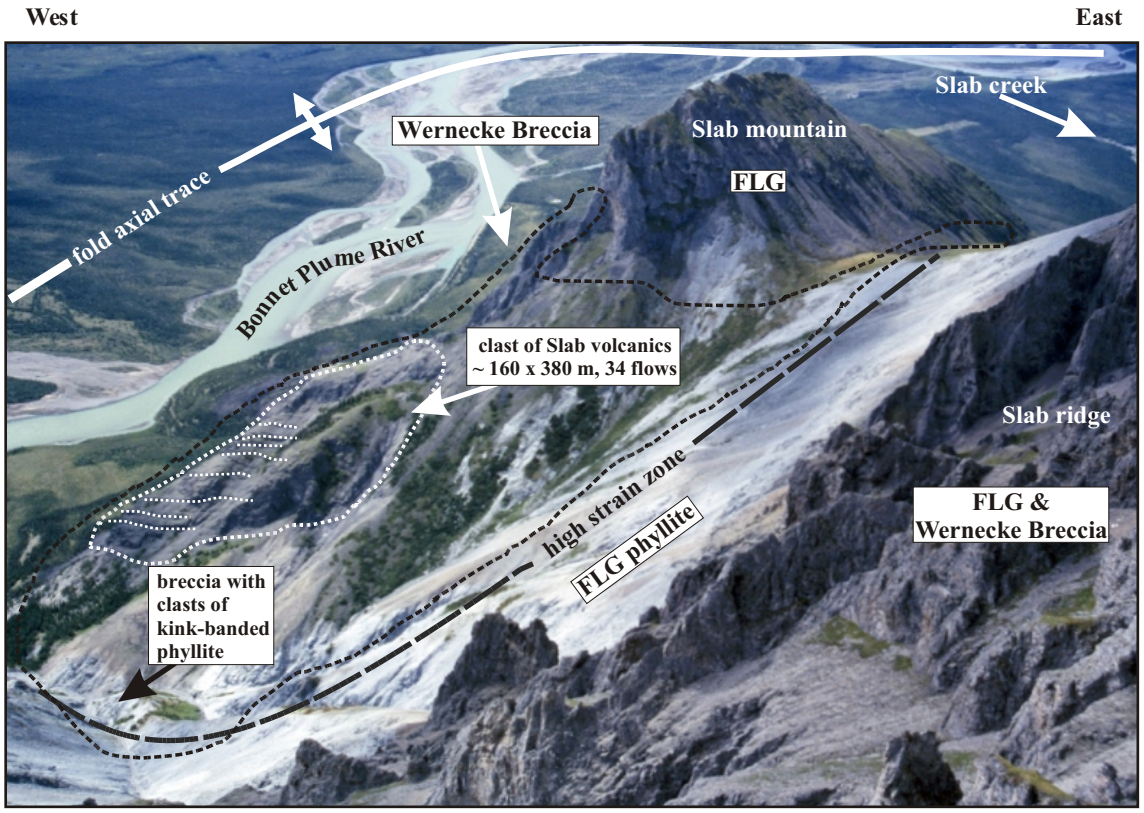

West
East
Slab creek
Wernecke Breccia
Slab mountain
FLG
fold axial trace
Bonnet Plume River
clast of Slab volcanics
~ 160 x 380 m, 34 flows
Slab ridge
high strain zone
FLG &
Wernecke Breccia
FLG phyllite
breccia with
clasts of
kink-banded
phyllite

Figure 8:

Hoover area showing location of FLG, Quartet Group, marker carbonate horizon and upper and lower breccias. (Photo taken by DJ Thorkelson).

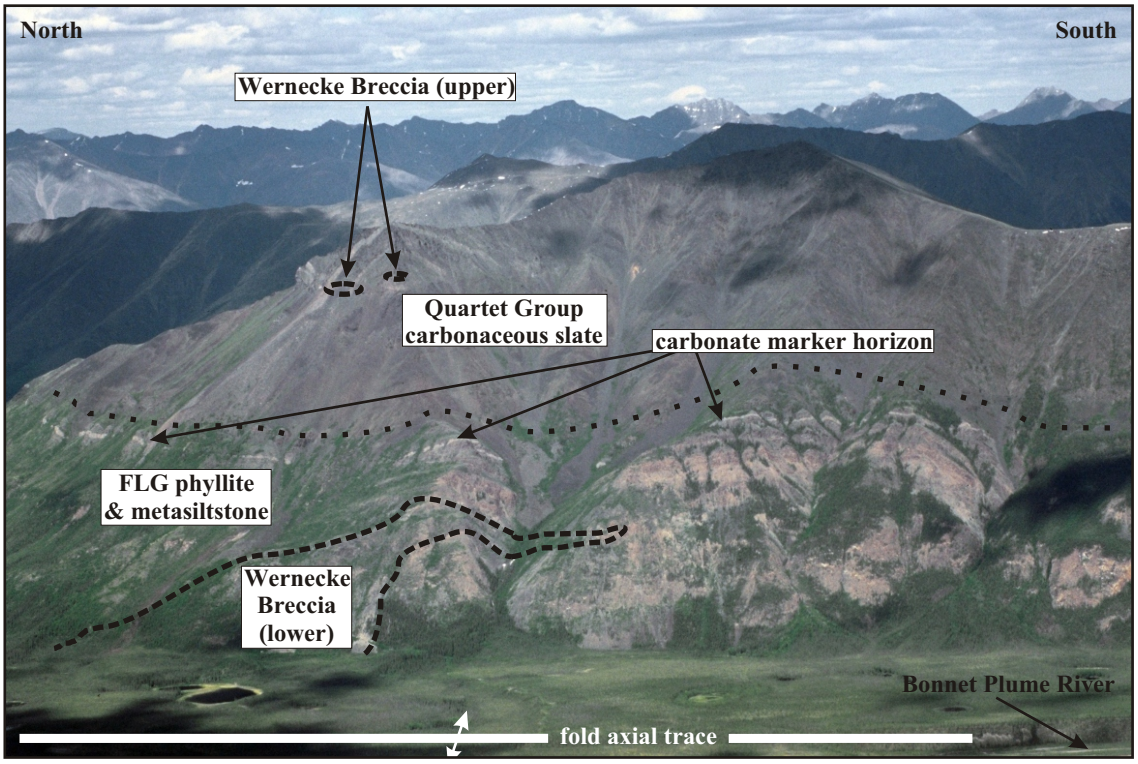
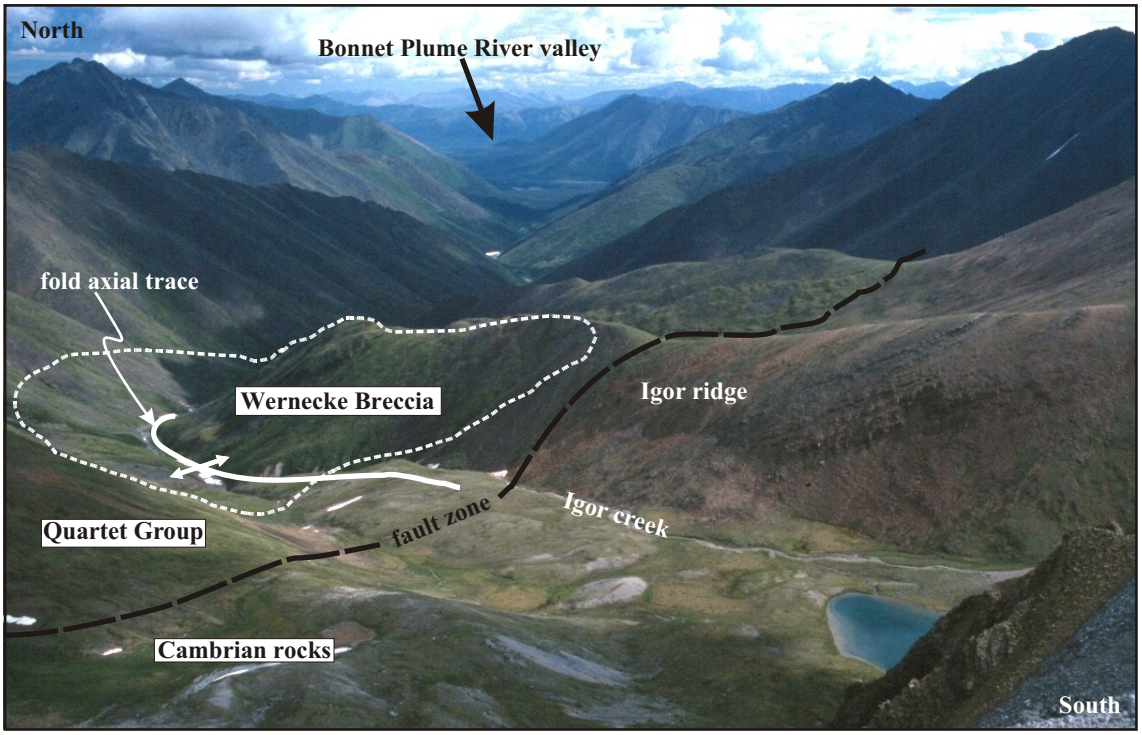

North
South
Wernecke Breccia (upper)
Quartet Group
carbonaceous slate
carbonate marker horizon
FLG phyllite
& metasiltstone
Wernecke
Breccia
(lower)
Bonnet Plume River
fold axial trace

Figure 9:

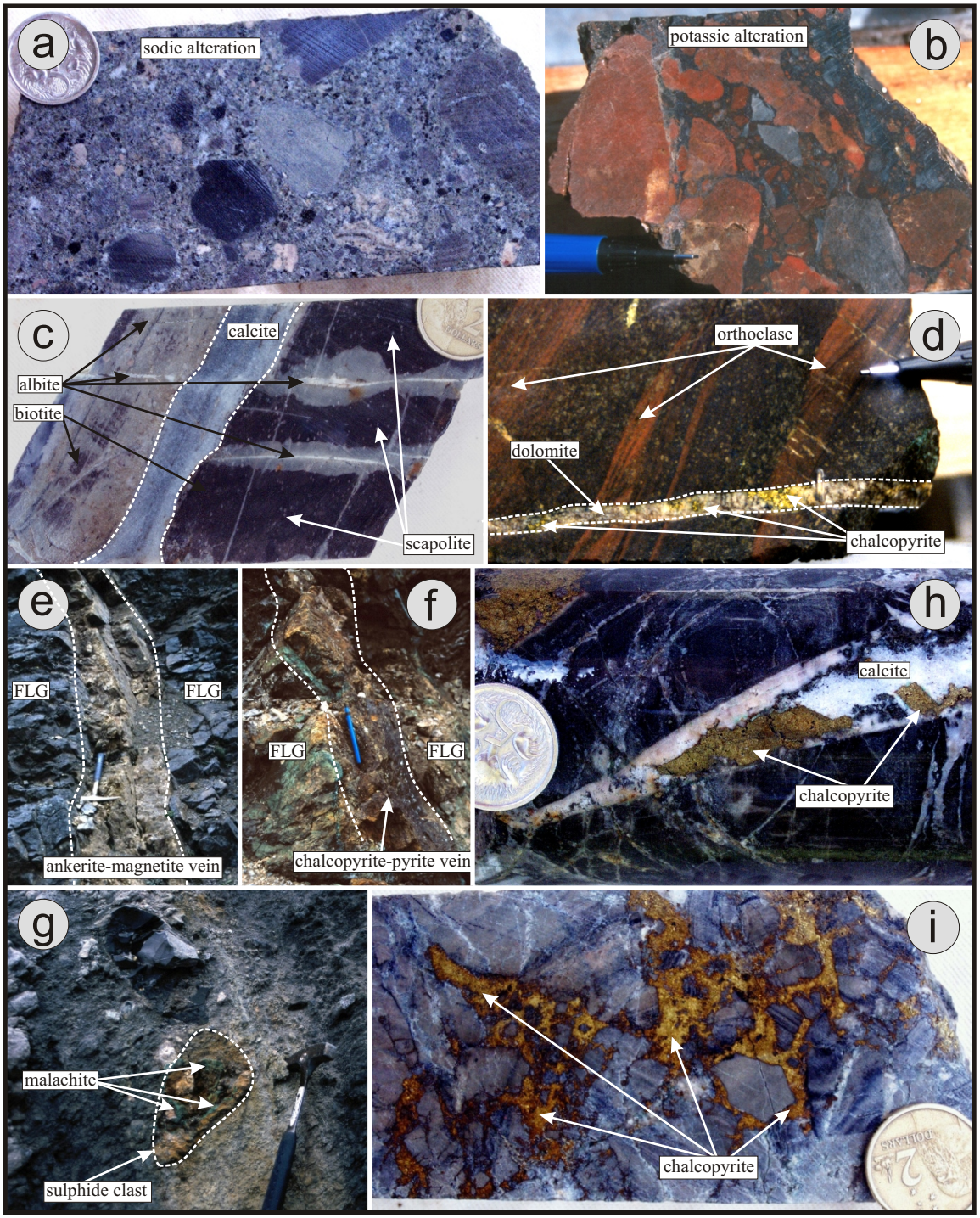
Igor area showing location of 'Igor ridge', fold axial trace in 'Igor creek', Wer necke Breccia, Quartet Group and Cambrian strata.



Section A: Figure 9

Figure 10:

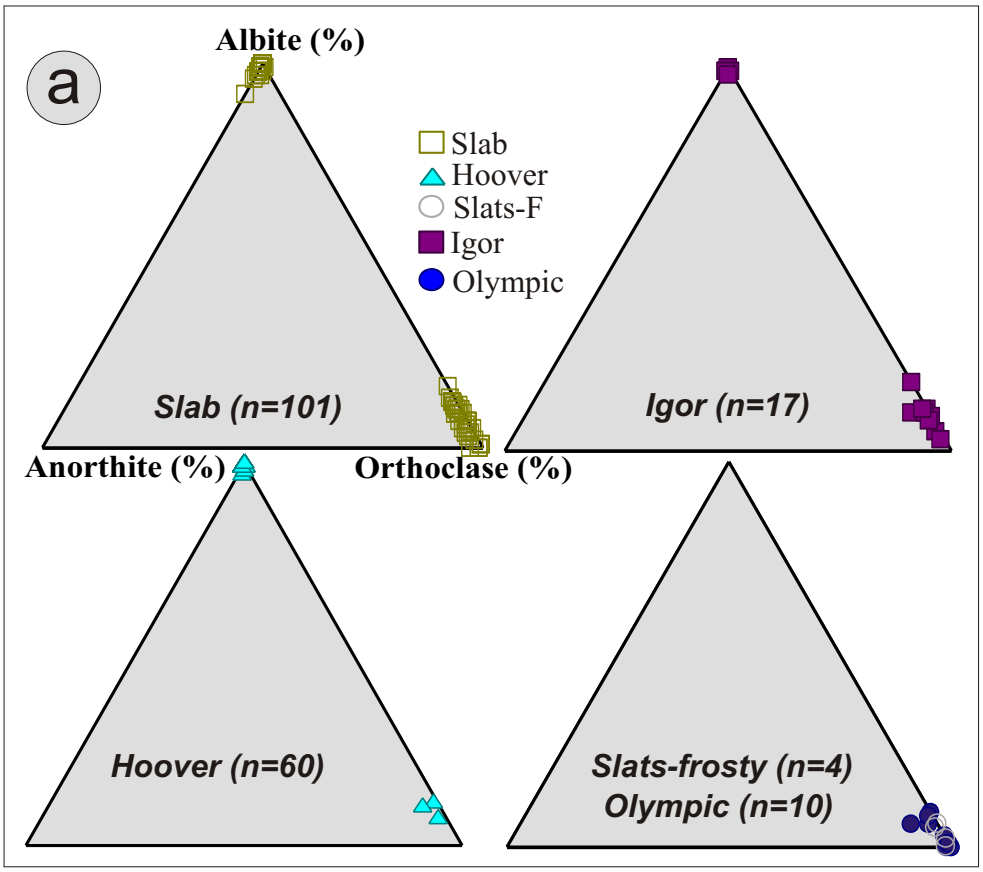
Examples of alteration and mineralization: a) grey sodic-altered breccia, b) red potassic-altered breccia, c) biotite-scapolite alteration in FLG metasiltstone cut by albite veins, cross-cut by calcite vein, d) potassic-altered Quartet Group metasiltstone cut by dolomite-chalcopyrite vein, e) ankerite-magnetite vein cutting FLG, Slab prospect, f) massive chalcopyrite-pyrite vein cutting FLG, Slab prospect, g) clast of massive sulphide in breccia, Slab prospect, h) calcite-chalcopyrite vein cutting FLG, Slab prospect and i) chalcopyrite forming matrix to breccia, Hoover prospect.



Section A: Figure 10

Figure 11:

Composition of a) feldspar and b) carbonate in Wernecke samples, based on microprobe data. Analyses were obtained with the James Cook University electron microprobe in wavelength dispersive mode, at an accelerating voltage of 15 kV and a current of 20 nA.


a
Albite (%)
Slab
Hoover
Slats-F
Igor
Olympic
Slab (n=101)
Igor (n=17)
Anorthite (%)
Orthoclase (%)
Hoover (n=60)
Slats-frosty (n=4)
Olympic (n=10)

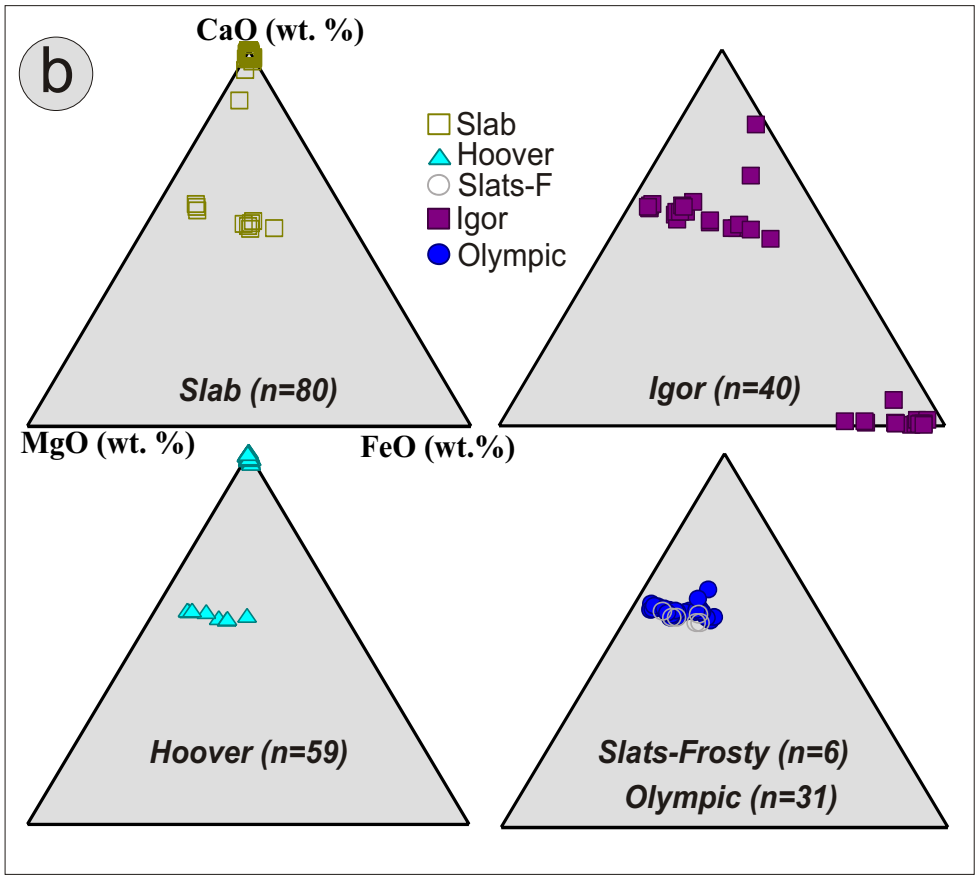
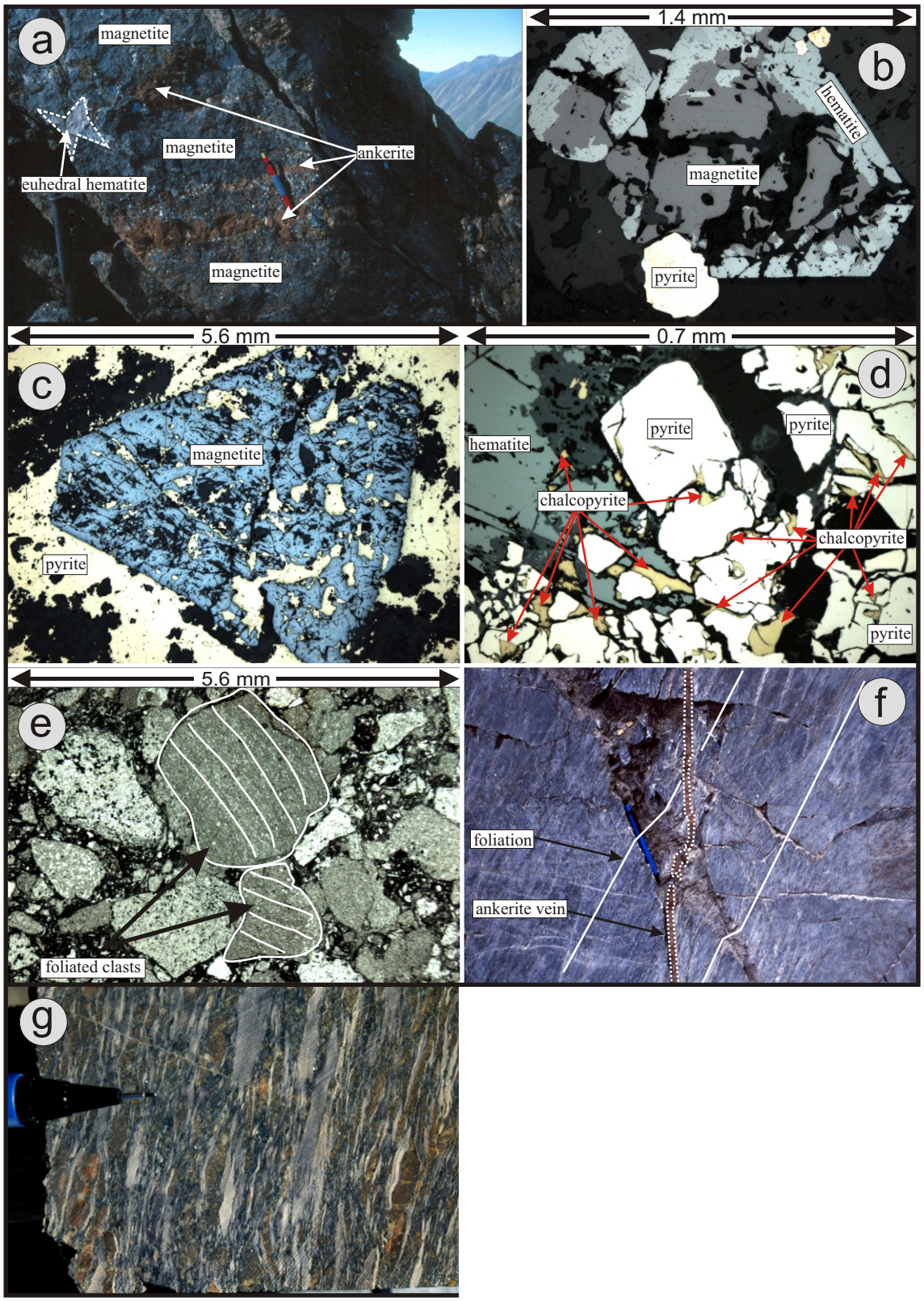

b
CaO (wt. %)
Slab
Hoover
Slats-F
Igor
Olympic
Slab (n=80)
Igor (n=40)
MgO (wt. %)
FeO (wt.%)
Hoover (n=59)
Slats-Frosty (n=6)
Olympic (n=31)

Figure 12:

Examples of mineralization and deformation: a) massive magnetite-coarsely crystalline hematite-ankerite-quartz vein, Slats-Frosty area, b) euhedral magnetite replaced by hematite (rl), Igor prospect, c) euhedral magnetite overgrown by pyrite (rl), Igor prospect, d) hematite overgrown by pyrite with chalcopyrite filling fractures (rl), Olympic prospect, e) clasts of foliated metasiltstone in Wernecke Breccia, f) foliated FLG cut by ankerite vein, both have been kinked during Racklan deformation and g) flattened clasts in foliated breccia. rl = reflected light.



Section A: Figure 12

Figure 13:

Simplified paragenesis for prospects in the Wernecke Mountains : a) Slab, b) Hoover, c) Slats-Frosty, d) Slats-Wallbanger, e) Igor and f) Olympic prospects. NB: paragenetic stages apply only to a specific area, e.g. Slab stage 3 ≠ Hoover stage 3 ≠ Igor stage 3.

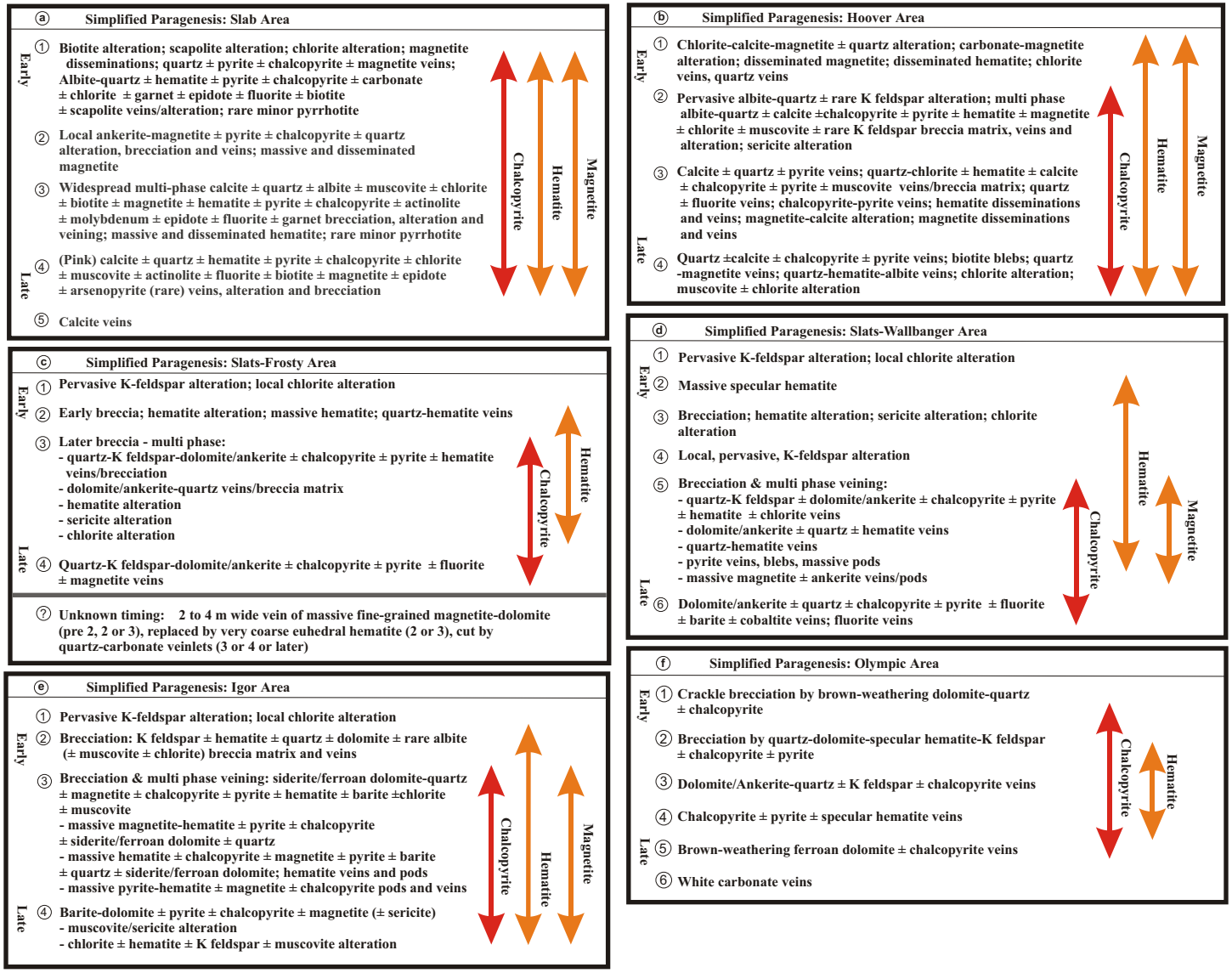
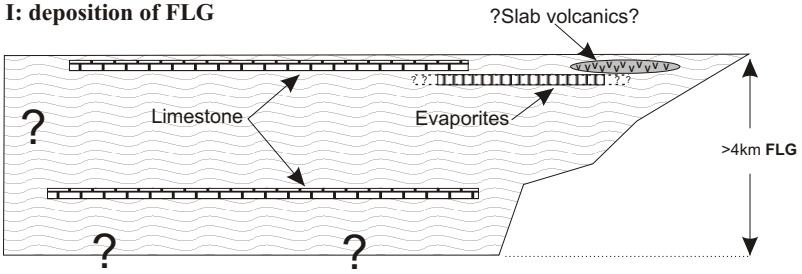

ⓐ Simplified Paragenesis: Slab Area
Early
① Biotite alteration; scapolite alteration; chlorite alteration; magnetite disseminations; quartz ± pyrite ± chalcopyrite ± magnetite veins; Albite-quartz ± hematite ± pyrite ± chalcopyrite ± carbonate ± chlorite ± garnet ± epidote ± fluorite ± biotite ± scapolite veins/alteration; rare minor pyrrhotite
② Local ankerite-magnetite ± pyrite ± chalcopyrite ± quartz alteration, brecciation and veins; massive and disseminated magnetite
③ Widespread multi-phase calcite ± quartz ± albite ± muscovite ± chlorite ± biotite ± magnetite ± hematite ± pyrite ± chalcopyrite ± actinolite ± molybdenum ± epidote ± fluorite ± garnet brecciation, alteration and veining; massive and disseminated hematite; rare minor pyrrhotite
Late
④ (Pink) calcite ± quartz ± hematite ± pyrite ± chalcopyrite ± chlorite ± muscovite ± actinolite ± fluorite ± biotite ± magnetite ± epidote ± arsenopyrite (rare) veins, alteration and brecciation
⑤ Calcite veins
Chalcopyrite
Hematite
Magnetite
ⓑ Simplified Paragenesis: Hoover Area
Early
① Chlorite-calcite-magnetite ± quartz alteration; carbonate-magnetite alteration; disseminated magnetite; disseminated hematite; chlorite veins, quartz veins
② Pervasive albite-quartz ± rare K feldspar alteration; multi phase albite-quartz ± calcite ±chalcopyrite ± pyrite ± hematite ± magnetite ± chlorite ± muscovite ± rare K feldspar breccia matrix, veins and alteration; sericite alteration
③ Calcite ± quartz ± pyrite veins; quartz-chlorite ± hematite ± calcite ± chalcopyrite ± pyrite ± muscovite veins/breccia matrix; quartz ± fluorite veins; chalcopyrite-pyrite veins; hematite disseminations and veins; magnetite-calcite alteration; magnetite disseminations and veins
Late
④ Quartz ±calcite ± chalcopyrite ± pyrite veins; biotite blebs; quartz -magnetite veins; quartz-hematite-albite veins; chlorite alteration; muscovite ± chlorite alteration
Chalcopyrite
Hematite
Magnetite
ⓒ Simplified Paragenesis: Slats-Frosty Area
Early
① Pervasive K-feldspar alteration; local chlorite alteration
② Early breccia; hematite alteration; massive hematite; quartz-hematite veins
③ Later breccia - multi phase:
- quartz-K feldspar-dolomite/ankerite ± chalcopyrite ± pyrite ± hematite veins/brecciation
- dolomite/ankerite-quartz veins/breccia matrix
- hematite alteration
- sericite alteration
- chlorite alteration
Late
④ Quartz-K feldspar-dolomite/ankerite ± chalcopyrite ± pyrite ± fluorite ± magnetite veins
Chalcopyrite
Hematite
? Unknown timing: 2 to 4 m wide vein of massive fine-grained magnetite-dolomite (pre 2, 2 or 3), replaced by very coarse euhedral hematite (2 or 3), cut by quartz-carbonate veinlets (3 or 4 or later)
ⓓ Simplified Paragenesis: Slats-Wallbanger Area
Early
① Pervasive K-feldspar alteration; local chlorite alteration
② Massive specular hematite
③ Brecciation; hematite alteration; sericite alteration; chlorite alteration
④ Local, pervasive, K-feldspar alteration
⑤ Brecciation & multi phase veining:
- quartz-K feldspar ± dolomite/ankerite ± chalcopyrite ± pyrite ± hematite ± chlorite veins
- dolomite/ankerite ± quartz ± hematite veins
- quartz-hematite veins
- pyrite veins, blebs, massive pods
- massive magnetite ± ankerite veins/pods
Late
⑥ Dolomite/ankerite ± quartz ± chalcopyrite ± pyrite ± fluorite ± barite ± cobaltite veins; fluorite veins
Chalcopyrite
Hematite
Magnetite
ⓔ Simplified Paragenesis: Igor Area
① Pervasive K-feldspar alteration; local chlorite alteration
Early
② Brecciation: K feldspar ± hematite ± quartz ± dolomite ± rare albite (± muscovite ± chlorite) breccia matrix and veins
③ Brecciation & multi phase veining: siderite/ferroan dolomite-quartz ± magnetite ± chalcopyrite ± pyrite ± hematite ± barite ±chlorite ± muscovite
- massive magnetite-hematite ± pyrite ± chalcopyrite ± siderite/ferroan dolomite ± quartz
- massive hematite ± chalcopyrite ± magnetite ± pyrite ± barite ± quartz ± siderite/ferroan dolomite; hematite veins and pods
- massive pyrite-hematite ± magnetite ± chalcopyrite pods and veins
Late
④ Barite-dolomite ± pyrite ± chalcopyrite ± magnetite (± sericite)
- muscovite/sericite alteration
- chlorite ± hematite ± K feldspar ± muscovite alteration
Chalcopyrite
Hematite
Magnetite
ⓕ Simplified Paragenesis: Olympic Area
Early
① Crackle brecciation by brown-weathering dolomite-quartz ± chalcopyrite
② Brecciation by quartz-dolomite-specular hematite-K feldspar ± chalcopyrite ± pyrite
③ Dolomite/Ankerite-quartz ± K feldspar ± chalcopyrite veins
④ Chalcopyrite ± pyrite ± specular hematite veins
Late
⑤ Brown-weathering ferroan dolomite ± chalcopyrite veins
⑥ White carbonate veins
Chalcopyrite
Hematite

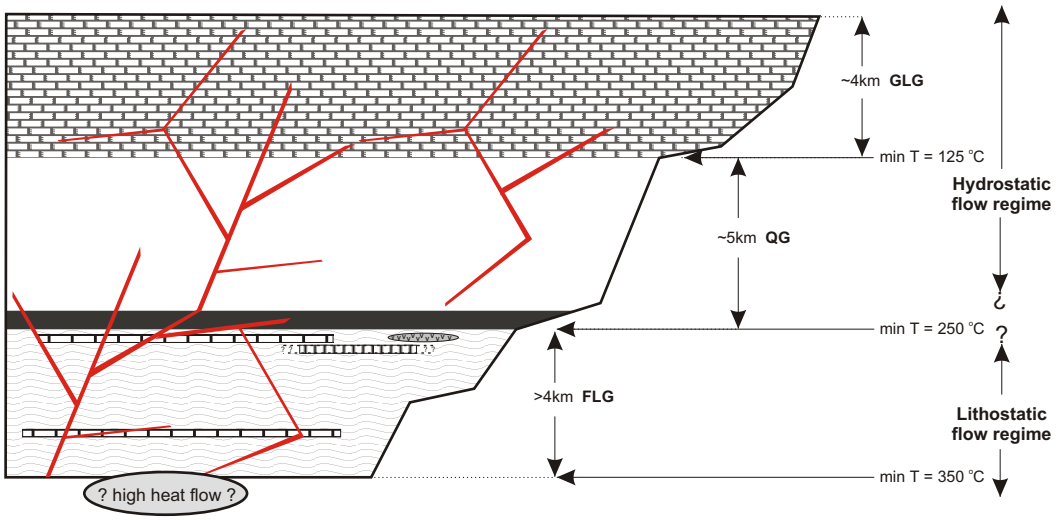
Figure 14:

Cartoon depicting evolution of Wernecke Basin and structural controls on location of Wernecke Breccia. Stage I: deposition of FLG. Stage II: deposition of Quartet Group and GLG. Stage III: emplacement of Wernecke Breccia into pre-existing weak zones in deformed and metamorphosed WSG. Breccia bodies are widespread at the top of FLG in metaevaporite-bearing stratigraphy. See text for detailed description of stages.

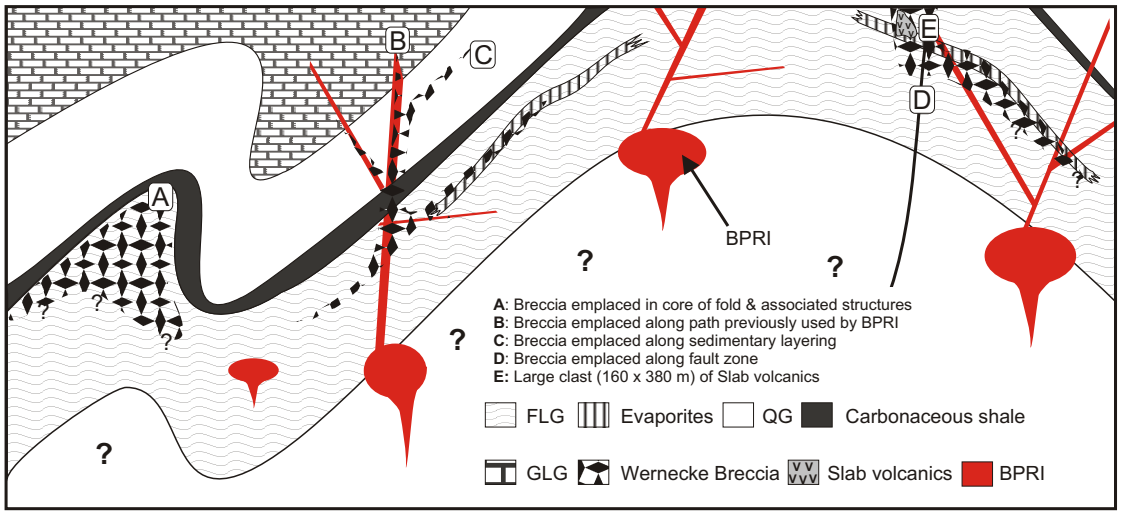
I: deposition of FLG



II: subsidence and thermal deepening of the basin; deposition of QG and GLG, followed by intrusion (pre- or syn-Racklan Orogenesis) of BPRI



III: Racklan orogenesis - greenschist facies metamorphism (~ 450 °C, 3-6 kbars), deformation and syn- to post-deformation breccia emplacement



SECTION A - TABLES

Regional-scale Proterozoic iron oxide-copper-gold-mineralised breccia systems: examples from the Wernecke Mountains, Yukon, Canada

Table 1: Description of formations within WSG. Information from Delaney (1981).

Formation	Thickness (m)	Description	Sedimentary Structures
G-7	400 to 700	Thin to thick beds of orange-, buff-, and grey-weathering dolostone (patches of limestone); locally stromatolitic, locally carbonaceous. Lenses and nodules of grey chert.	Wavy and lenticular beds, parallel to crinkly laminations, oolites, pisolites, stromatolites, molar-tooth structure
G-6	500 to 800	Thin to thick beds of buff-, grey-, and maroon-weathering dolostone (locally carbonaceous), limestone, mudstone and siltstone.	Lenticular and wavy beds, parallel and cross laminations, load structures, microstylolites
G-5	~ 500	Thin to medium beds of buff-, grey, to locally maroon- or orange-weathering dolostone (locally carbonaceous) and claystone, minor siltstone and mudstone. Local thin to thick interbeds of stromatolitic dolostone conglomerate (granule- to pebble-sized clasts) and mounds, up to 3m high, of brecciated stromatolitic dolostone (pebble- to cobble-sized clasts). Pods and lenses of dark grey chert.	Wavy and flaser beds, parallel and cross laminations, ripple marks, slump structures, stromatolites
G-4	~ 450	Thin beds of brown-, buff-, grey-, locally orange- or maroon-, recessive-weathering dolostone, mudstone and siltstone interlayered with up to 20% thin beds and lenses of grey chert.	Parallel to wavy laminations
G-3	At least 50	Medium to thick beds of buff-weathering silty dolostone.	Parallel laminations, tent structures
G-2	400 to 600	Brown-, grey- and orange-weathering mudstone and lesser siltstone and silty dolostone. Minor lenses of black chert.	Laminations, lenticular beds, load structures
G-Tr	25 to 700	Grey-weathering siltstone, fine-grained sandstone and mudstone interlayered with thin beds of orange- to brown-weathering silty dolostone and dolomitic siltstone.	Parallel- and cross-laminations, wavy, lenticular and flaser-bedding, graded bedding, ripple marks, load structures, flame structures, shrinkage cracks, slump folds
Q-2	≤ 5000	Thin-, medium- to thick-bedded grey-weathering siltstone, mudstone, fine-grained sandstone and claystone.	Parallel- and cross-laminations, wavy, lenticular and flaser-bedding, graded bedding, ripple marks, load structures, flame structures, shrinkage cracks, slump folds
Q-1	~ 200	Dark grey-weathering, thin-bedded, locally pyritic, carbonaceous claystone, clayey siltstone and carbonaceous mudstone.	None – sediments have generally been metamorphosed to slate
F-Tr	≤ 365	Grey-, brown- to white-weathering slate, mudstone, siltstone, dolomitic mudstone, silty dolostone and limestone. 7-14 m-thick limestone marker.	Cross-beds, molar tooth structures
F-4	> 500	Thin to thick beds of grey-weathering siltstone, fine-grained sandstone and mudstone.	Parallel- to cross-laminations to wavy beds, ripple marks, cross-beds
F-3	~ 2000	Thin to medium beds of grey-weathering siltstone, mudstone and fine-grained sandstone, minor intercalated thin beds of silty limestone.	Parallel laminations to lenticular beds, ripple marks, load structures, flutes
F-2	~ 400	Thin-bedded grey to buff-weathering siltstone, mudstone, fine-grained sandstone and silty to sandy limestone.	Wavy to planar to lenticular beds/laminations, cross-beds, load structures
F-1	> 1800	Thin to medium beds of grey-weathering siltstone, mudstone and fine-grained sandstone, minor limestone.	Laminated to lenticular beds, asymmetrical cross-beds, ripple marks, load structures

Table 2: Representative results of scapolite and biotite microprobe analyses. % meionite = 100 (Ca+Mg+Fe+Mn+Ti) / (Na+K+Ca+Mg+Fe+Mn+Ti); marialite = 100 - meionite (after Deer *et al*., 1992). Analyses were obtained with the James Cook University JEOL electron microprobe in wavelength dispersive mode, at an accelerating voltage of 15 kV and a current of 20 nA, ZAF corrections were used. [1] average of 70 analyses, [2] average of 10 analyses.

Oxide (weight %)	Scapolite Min - Max	Scapolite [1] Average	Biotite Min - Max	Biotite[2] Average
SiO_2	54.61-57.73	56.08	37.27-40.64	38.92
TiO_2	0.00-0.04	0.01	1.33-2.57	2.00
Al_2O_3	21.12-22.54	21.78	14.79-13.23	14.00
FeO	0.00-0.09	0.04	12.97-15.53	14.28
MnO	0.00-0.04	0.01	0.04-0.43	0.19
MgO	0.00-0.01	0.00	12.76-14.59	13.75
CaO	5.34-7.13	6.34	0.00-0.37	0.17
Na_2O	7.94-10.24	9.68	0.00-0.61	0.08
K_2O	0.44-1.21	0.55	9.96-10.63	10.27
Cl	2.90-3.55	3.29	0.46-0.72	0.59
Total	96.09-98.97	97.77	91.21-97.49	94.25
% meionite $Ca_4[Al_6Si_6O_{24}]CO_3$	22.12-30.44	25.98		
% marialite $Na_4[Al_3Si_9O_{24}]Cl$	69.56-77.88	74.02		

Table 3 (next page): Main characteristics of IOCG prospects included in this study, see text for details. In mineralization column: V = vein, D = disseminated, B = forms breccia matrix. [1]Yukon MINFILE (2003) database number. Information from: [2](Thorkelson *et al.*, 2003), [3](Yukon MINFILE, 2003), [4](Stammers, 1995), [5](Eaton & Archer, 1981) and [6](Caulfield, 1994).

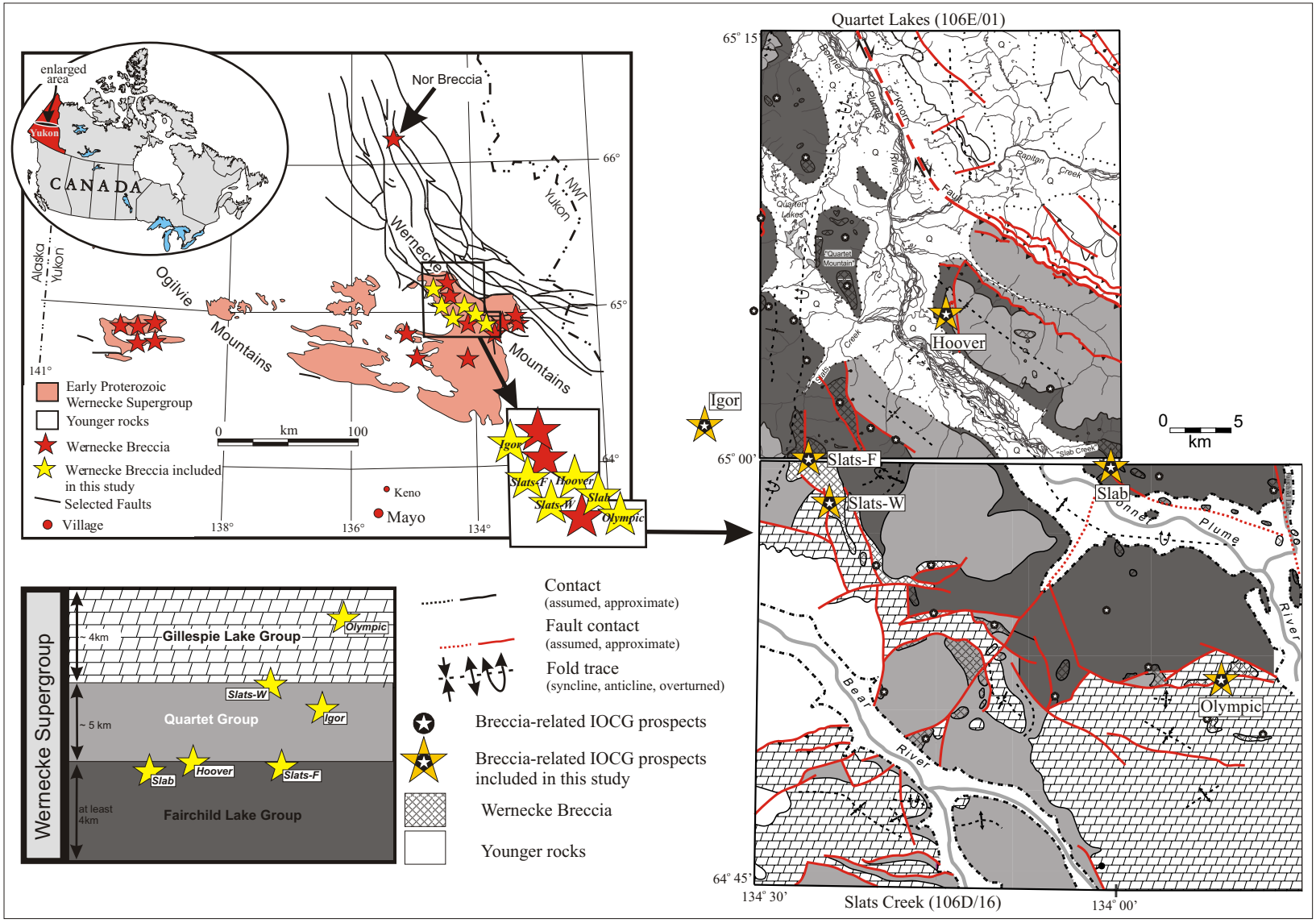
Prospect	Resource/best intersection	Metals	Mineralization (dominant)	Alteration (dominant)	Stratigraphic setting	Structural setting
Slab (106D 070)[1]	20 million tons of 0.35% Cu & 0.17 gpt Au[2]	Fe, Cu, Au ± Mo, Co, U	Magnetite^{VD}, hematite^{VDB} chalcopyrite^{VDB}, pyrite^{VDB} ± brannerite^{VD}, molybdenite^{D}, cobaltite^{D}	Pervasive albite-scapolite ± orthoclase; calcite veins	Upper FLG interlayered fine-grained calcareous metasedimentary rocks & minor carbonate; halite-facies metaevaporites	Folds, high strain zone(s), permeable strata
Hoover (106E 002)[1]	0.32 gpt Au & 0.42% Cu over 73m[2]; 3.6% Cu over 3.1m[2,3]	Fe, Cu, Au ± U, Co	Magnetite^{VD}, hematite^{VDB}, pyrite^{VDB}, chalcopyrite^{VDB} ± brannerite^{VD}	Pervasive albite ± scapolite; calcite ± dolomite veins	Transition from FLG fine-grained calcareous metasedimentary rocks to Quartet Group carbonaceous shale/slate	Folds, high strain zone
Slats-F (106D 075)[1]	1380 ppb Au & 9650 ppm Cu from a grab sample[2]	Fe, Cu, Au ± Co	Magnetite^{VD}, hematite^{VDB}, minor chalcopyrite^{VD}, pyrite^{VD}	Pervasive orthoclase; dolomite-ankerite veins	?FLG fine-grained calcareous metasedimentary rocks	Fold, high strain zone, fractures, pathways previously used by BPRI, permeable strata
Slats-W (106D 075)[1]	450 ppb Au, 1115 ppm Cu & 5800 ppm Co over 1m[4]	Fe, Cu ± Co, U, Au	Magnetite^{VD}, pyrite^{VDB}, hematite^{VDB}, chalcopyrite^{VD} ± cobaltite^{D}, brannerite^{VD}	Pervasive orthoclase; dolomite-ankerite veins	Interlayered shale and fine-grained calcareous metasedimentary rocks at the transition from Quartet Group to GLG	pathways previously used by BPRI, permeable strata
Igor (106E 009)[1]	4.74% Cu, 0.088% U_3O_8 & 325 ppm Co over 19.7m[5]; 6.14% Cu, 0.89% U_3O_8 & 358 ppm Co over 10.6m[5]	Fe, Cu, U ± Co, Au	Magnetite^{VDB}, hematite^{VDB}, pyrite (some is cobaltian)^{VDB}, chalcopyrite^{VDB}, barite^{VD} ± pitchblende^{VD}	Pervasive orthoclase-sericite ± albite; dolomite-ankerite-siderite veins; disseminated siderite; disseminated and vein barite	Quartet Group fine-grained calcareous metasedimentary rocks with well preserved sedimentary structures, e.g. ripple marks	Fold, high strain zone
Olympic (106C 095)[1]	1593 ppm Cu, 40 ppm Co & 23 ppb Au over 11m[6]; 0.8% Cu & 14 ppm Co over 1.7m[6]	Fe, Cu ± Co, Au	Hematite^{VDB}, pyrite^{VD}, chalcopyrite^{VD} ± cobaltite^{D}	Pervasive and vein dolomite-ankerite; locally pervasive orthoclase;	GLG dolostone (locally stromatolitic)	Folds, faults, pathways previously used by BPRI

SECTION B - FIGURES

Constraints on the age of Wernecke Breccia and associated iron oxide-copper-gold mineralisation: new Ar-Ar, U-Pb, Pb-Pb and Re-Os dates

Figure 1:

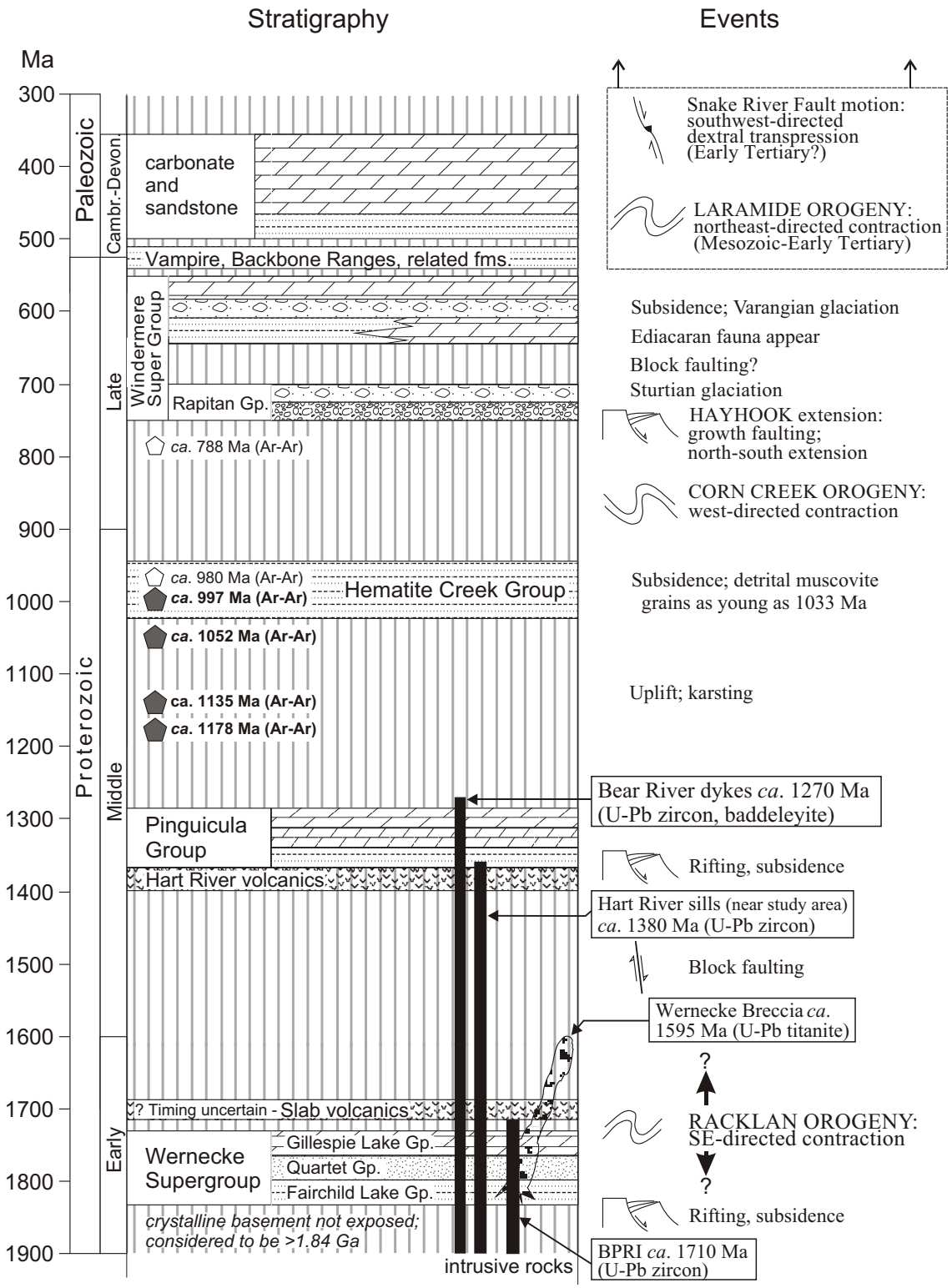
Location of study area, distribution of WSG and Wernecke Breccia (modified from Thorkelson, 2000) plus simplified geology map of the study area (for details see Thorkelson, 2000 and Thorkelson *et al.*, 2002). Legend shows approximate stratigraphic position of IOCG prospects included in this study.



Section B: Figure 1

Figure 2:

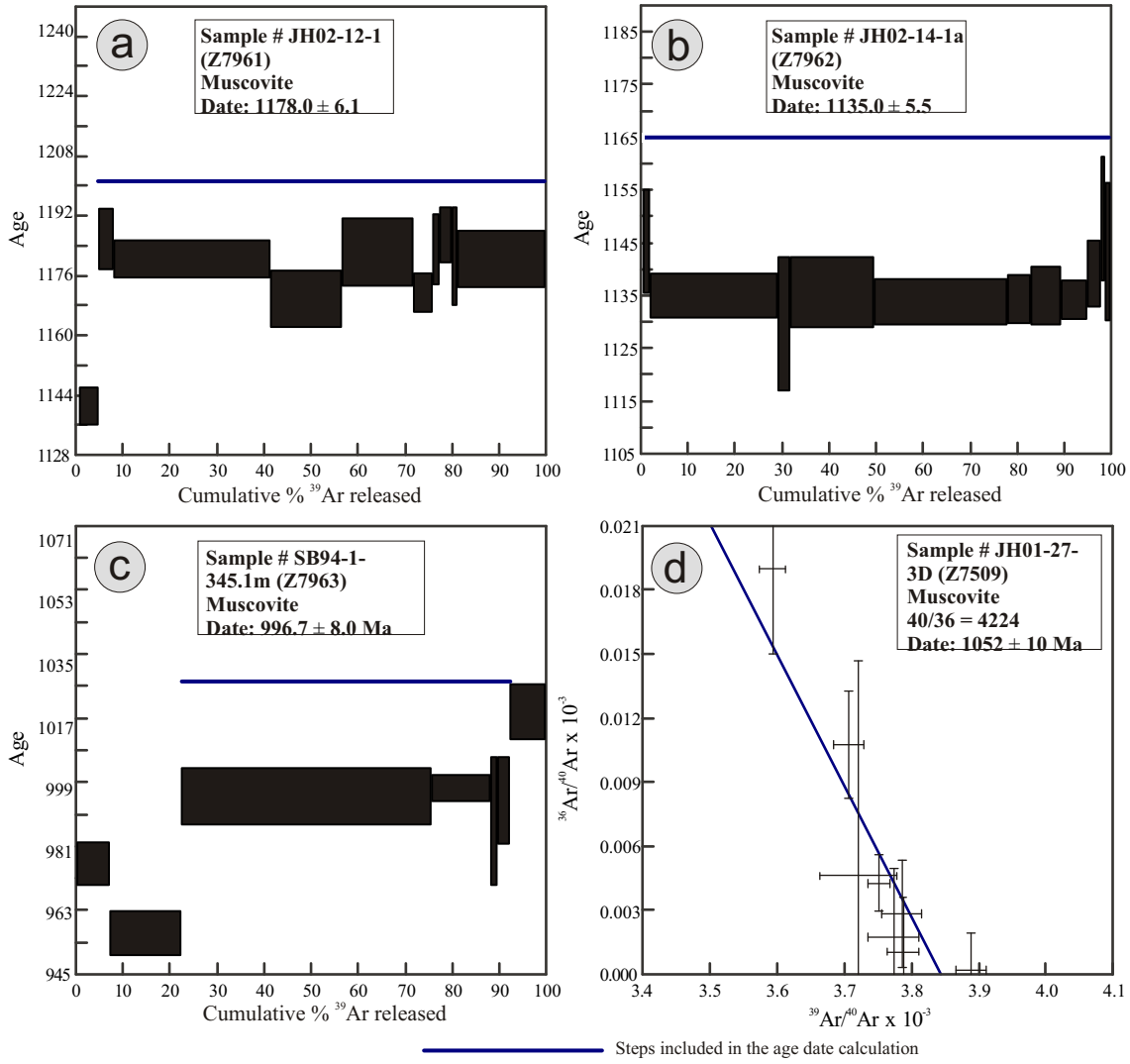
Time stratigraphic column of the Wernecke area showing major depositional, intrusive and deformational events (modified from Thorkelson, 2000). Ar-Ar dates in bold are from this study.



Section B: Figure 2

Figure 3:

Release spectra for ^{40}Ar-^{39}Ar ages for muscovite from four Wernecke Breccia-related samples.



Section B: Figure 3

Figure 4:

$^{207}Pb/^{235}U$ versus $^{206}Pb/^{238}U$ plot for three fractions of titanite from a Wernecke Breccia-related vein. Error for Pb/Pb age is quoted at the 2σ level.

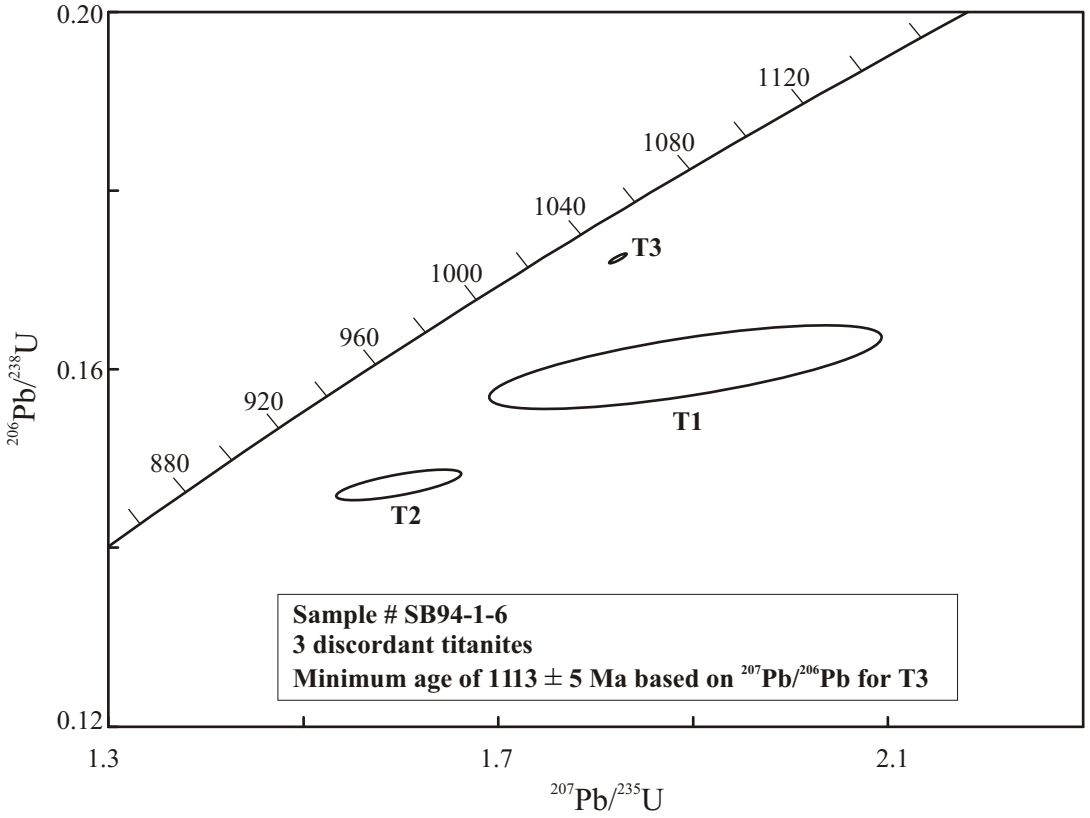
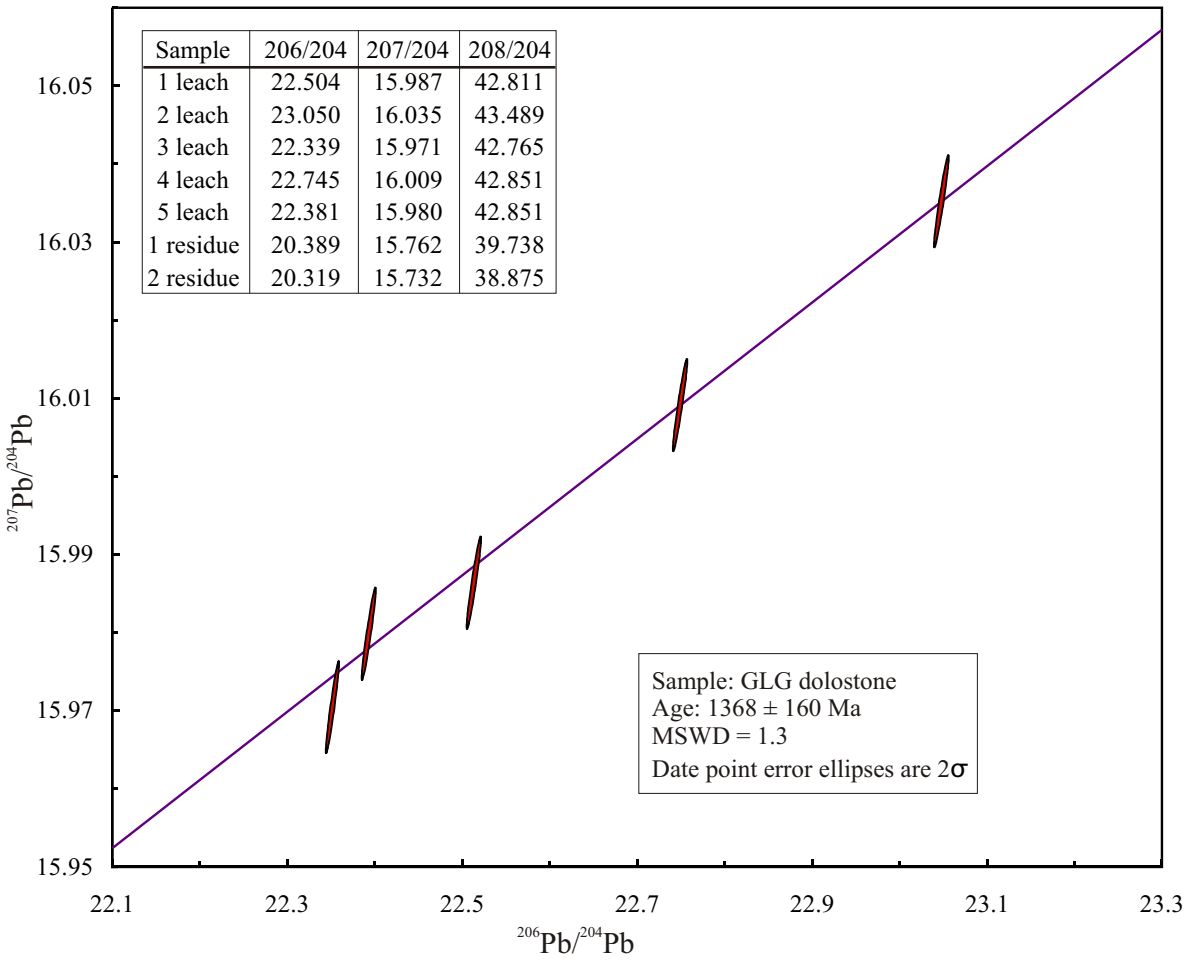

0.20
0.16
0.12
1.3
1.7
2.1
$^{206}Pb/^{238}U$
$^{207}Pb/^{235}U$
1120
1080
1040
1000
960
920
880
T3
T1
T2
Sample # SB94-1-6
3 discordant titanites
Minimum age of 1113 ± 5 Ma based on $^{207}Pb/^{206}Pb$ for T3

Figure 5:

$^{206}Pb/^{204}Pb$ versus $^{207}Pb/^{204}Pb$ plot for 5 analyses of a sample of GLG dolostone.


Sample | 206/204 | 207/204 | 208/204
1 leach | 22.504 | 15.987 | 42.811
2 leach | 23.050 | 16.035 | 43.489
3 leach | 22.339 | 15.971 | 42.765
4 leach | 22.745 | 16.009 | 42.851
5 leach | 22.381 | 15.980 | 42.851
1 residue | 20.389 | 15.762 | 39.738
2 residue | 20.319 | 15.732 | 38.875
16.05
16.03
16.01
15.99
15.97
15.95
207Pb/204Pb
22.1
22.3
22.5
22.7
22.9
23.1
23.3
206Pb/204Pb
Sample: GLG dolostone
Age: 1368 ± 160 Ma
MSWD = 1.3
Date point error ellipses are 2σ

SECTION B - TABLES

Constraints on the age of Wernecke Breccia and associated iron oxide-copper-gold mineralisation: new Ar-Ar, U-Pb, Pb-Pb and Re-Os dates

Table 1: Summary of published age dates for Wernecke Breccia-related samples, WSG and Slab volcanics.

Date (Ma)	Analysis	Description	Reference
Wernecke Breccia			
1500	K-Ar - biotite	Breccia complex cutting upper FLG on Quartet Mountain	Archer *et al.* (1977)
1153	U-Pb - pitchblende	Fractures associated with breccia in lower Quartet Group west of Quartet Lakes	Archer & Schmidt (1978)
1249	U-Pb - pitchblende	Fractures associated with breccia in lower Quartet Group west of Quartet Lakes	Archer & Schmidt (1978)
ca. 1200 to 400	U-Pb - pitchblende, brannerite	17 analyses of U minerals from breccia, veins & whole rock samples	Archer et al. (1986)
1270 ± 40	U-Pb - monazite	Nor breccia	Parrish & Bell (1987)
1594.8 ± 4.6	U-Pb - titanite	Matrix of breccia zone on east side of Slab mountain	Thorkelson (2000); Thorkelson et al. (2001a)
Wernecke Supergroup			
980 +/- 4	white mica	FLG schist	Thorkelson et al. (in review)
788 ± 8	white mica	FLG schist	Thorkelson et al. (in review)
Slab volcanics			
1382.8 ± 7.4	Rutile	Intermediate composition lava in a large clast of Slab volcanics within Wernecke Breccia	Thorkelson (2000)

Table 2: Summary of sample characteristics and new age dates obtained during this study.

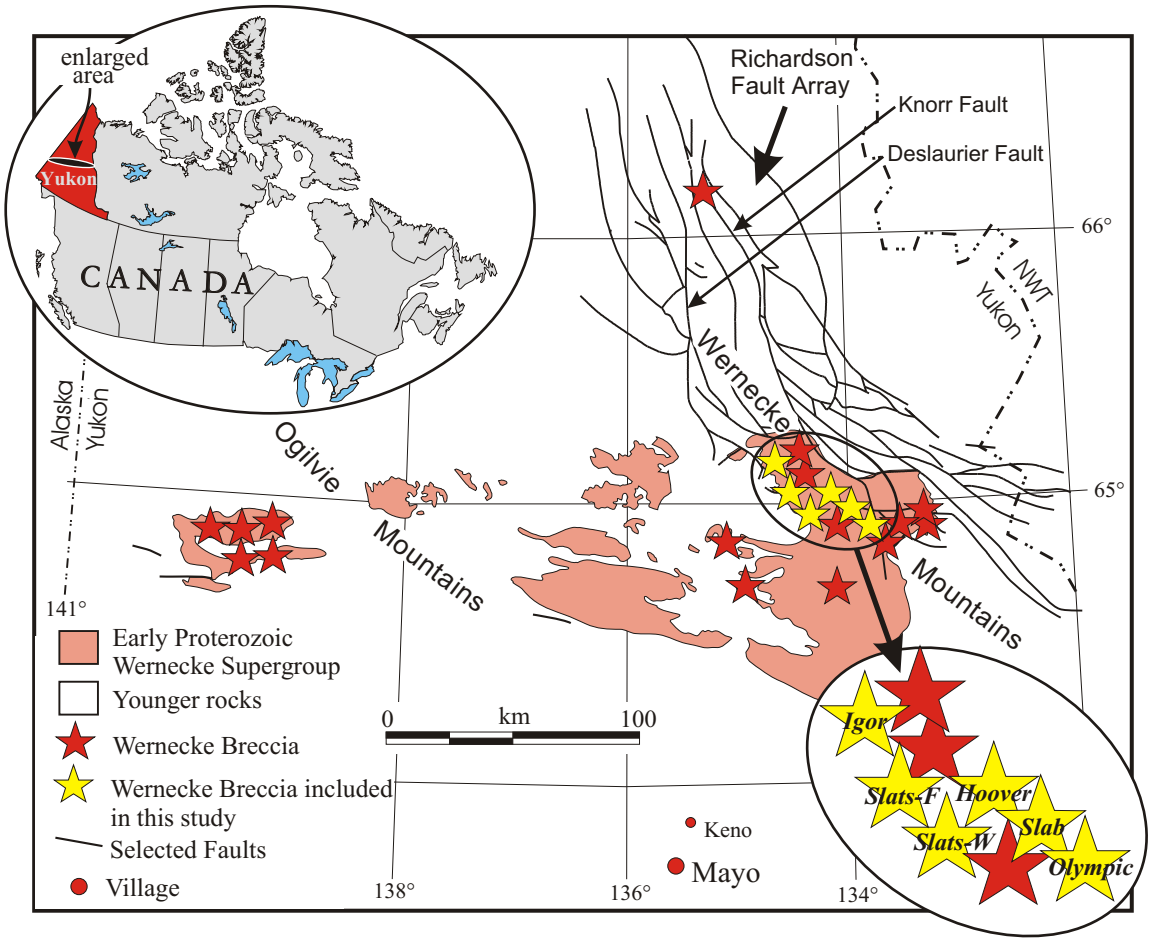
Sample #	JH02-12-1 (Z7961)	JH02-14-1a (Z7962)	SB94-1-345.1m (Z7963)	JH01-27-3D (Z7509)	SB94-1-6.9 m	JH02-21-1
Location	Igor NAD 83, Zone 8 E0517196, N7213545	Slab NAD 83, Zone 8 E0545492, N7209860	Slab NAD 27, Zone 8 E0545727, N7208459	Slab NAD 27, Zone 9 E0545639, N7208014	Slab NAD 27, Zone 8 E0545727, N7208459	Olympic NAD 83, Zone 8 E0555311, N7195674
Sample description	Breccia with abundant hydrothermal musc. in the matrix	Abundant muscovite in the selvage of a massive pyrite-chalcopyrite vein that cross-cuts FLG adjacent to breccia	Quartz-calcite-muscovite-albite-molybdenum-chlorite vein that cross-cuts FLG meta-siltstone	Quartz-calcite-muscovite-albite-molybdenite-chalcopyrite vein that cross-cuts Wernecke Breccia	Calcite-biotite-titanite vein that cuts FLG metasiltstone proximal to breccia	GLG stromatolitic dolostone
Reason for dating	To date breccia emplacement into middle WSG strata	To date breccia-associated mineralising event	To date late-stage carbonate alteration and constrain age of brecciation	To date late-stage carbonate alteration and constrain age of brecciation	To date late-stage carbonate alteration and constrain age of brecciation	To constrain age of WSG
Paragenetic stage	Breccia matrix	Main breccia-associated mineralization	Late stage vein	Late stage vein	Late stage vein	upper WSG
Phase	Muscovite	Muscovite	Muscovite, Molybdenite	Muscovite, Molybdenite	Titanite	Dolostone
Analysis	^{40}Ar-^{39}Ar	^{40}Ar-^{39}Ar	^{40}Ar-^{39}Ar, Re-Os	^{40}Ar-^{39}Ar, Re-Os	U-Pb	Pb-Pb
Age (Ma)	1178.0 ± 6.1	1135.0 ± 5.5	Ar-Ar: 996.7 ± 8.0 Re-Os: 1601 ± 6 Re-Os: 1609 ± 6	Ar-Ar: 1052 ± 10 Re-Os: 1648.1 ± 5.97	minimum of 1113 ± 5	1368 ± 160
Age spectra	Fig. 3b	Fig. 3c	Fig. 3d	Fig. 3a	Fig. 4	Fig. 5

SECTION C - FIGURES

Stable isotope (C,O,S,H) and fluid inclusion constraints on the origin of Wernecke Breccia and associated iron oxide-copper-gold mineralisation

Figure 1:

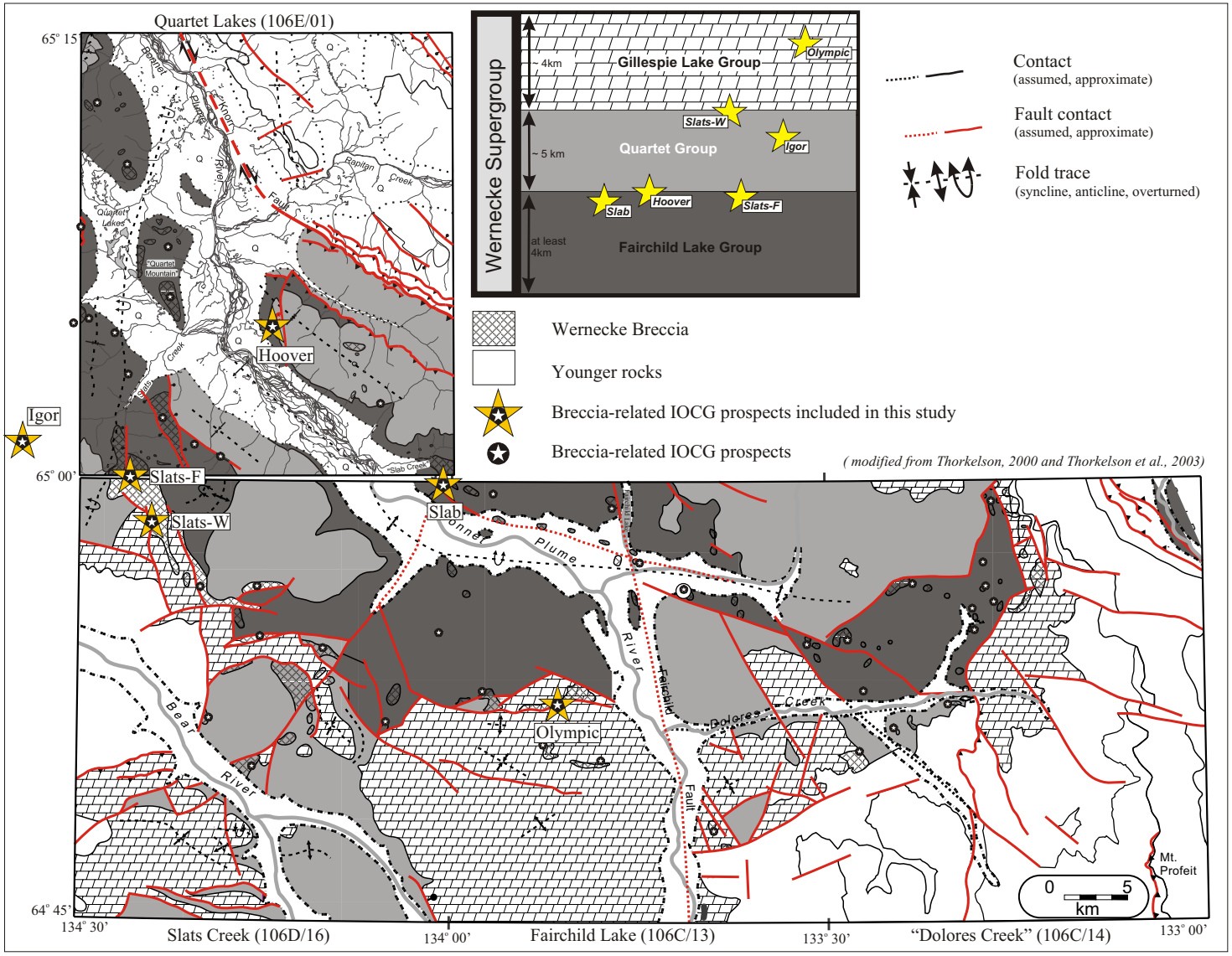
Location of study area, distribution of WSG and Wernecke Breccia plus location of breccia-associated IOCG prospects included in this study (modified from Thorkelson, 2000).



Section C: Figure 1

Figure 2:

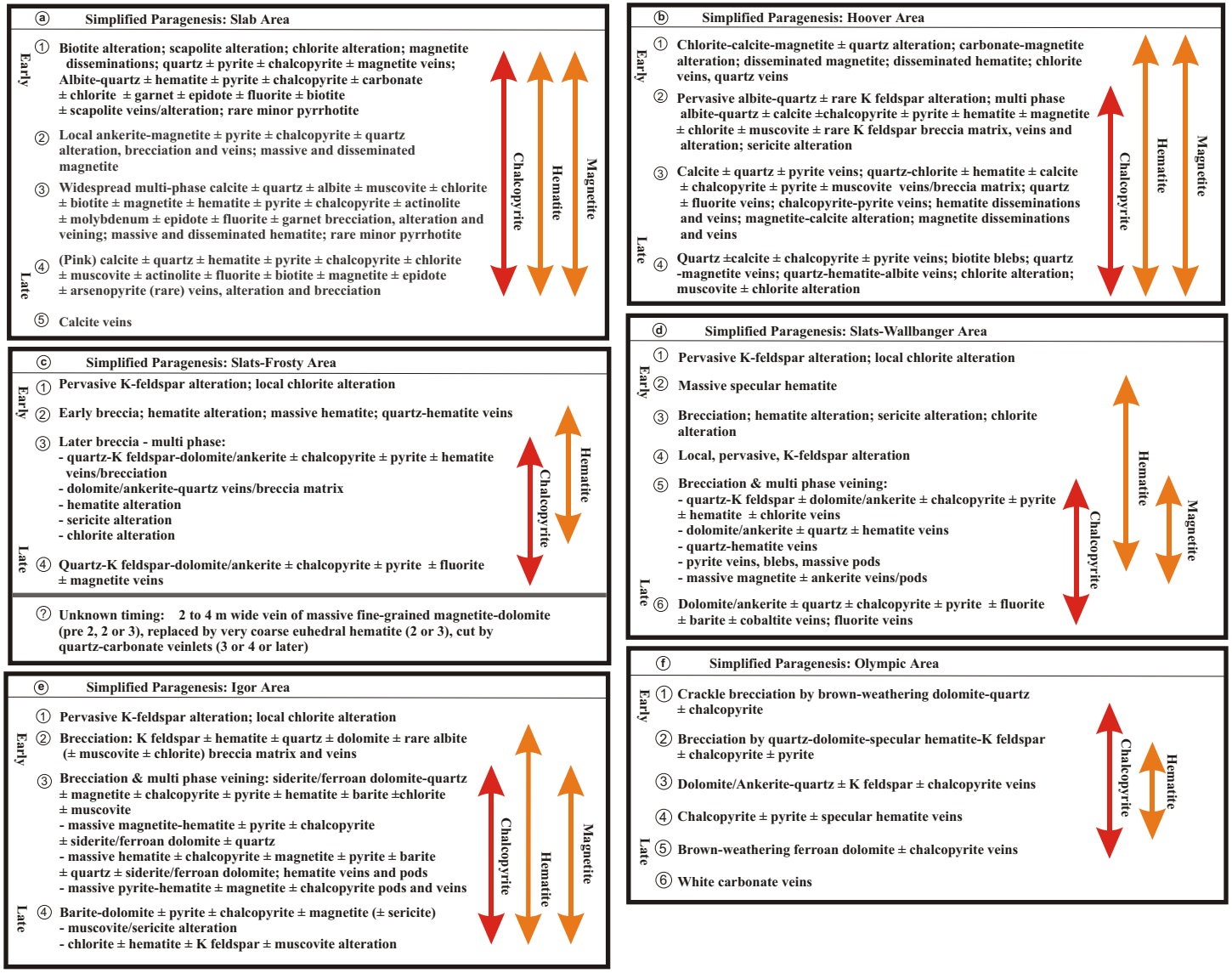
Simplified geology map of the study area (for details see Thorkelson, 2000 and Thorkelson *et al.*, 2002). Legend shows approximate stratigraphic position of IOCG prospects included in this study. Slats-F = Slats-Frosty, Slats-W = Slats Wallbanger.



Section C: Figure 2

Figure 3:

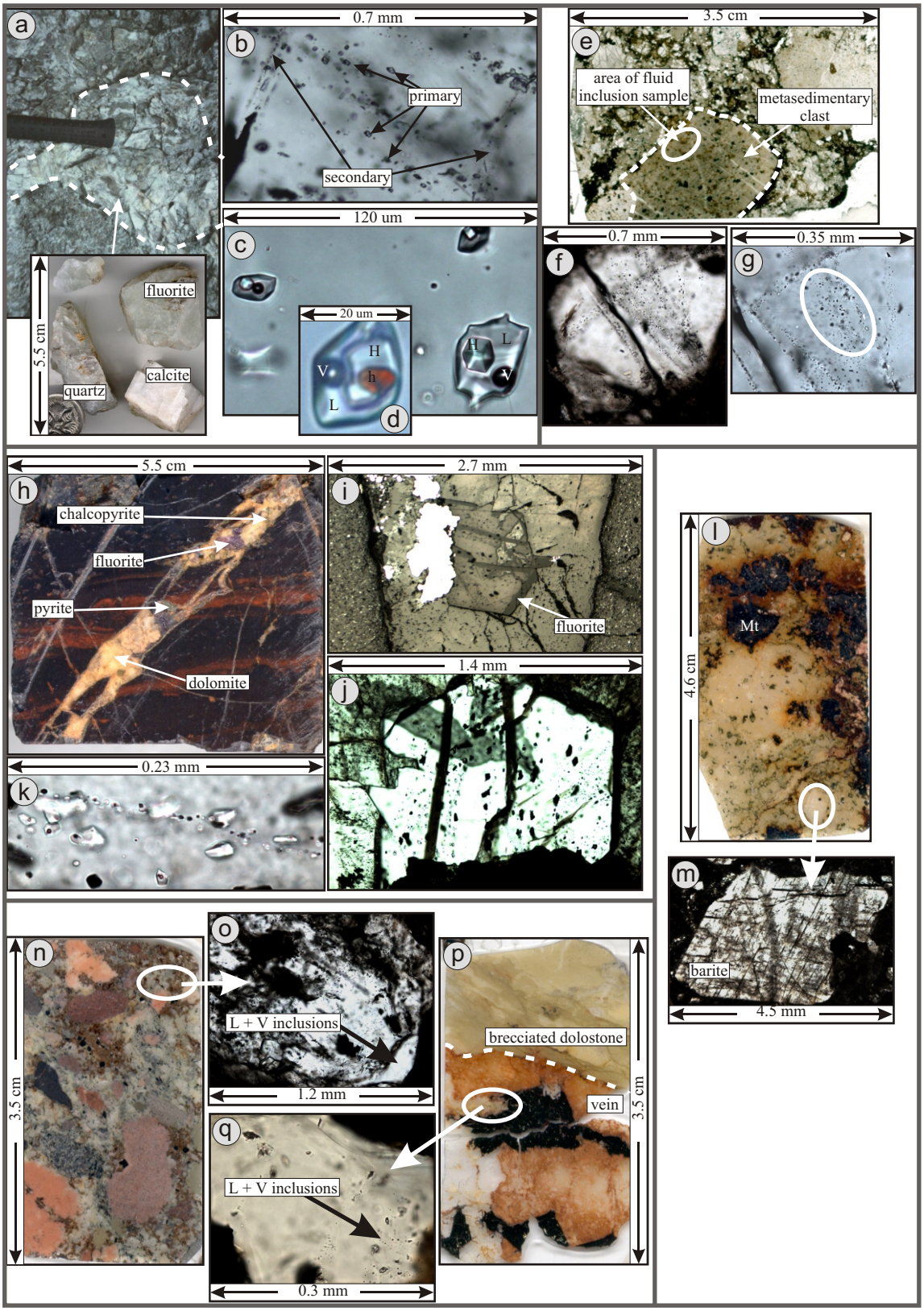
Simplified paragenesis for prospects in the Wernecke Mountains: a) Slab, b) Hoover, c) Slats-Frosty, d) Slats-Wallbanger, e) Igor and f) Olympic prospects. NB: paragenetic stages apply only to a specific area, e.g. Slab stage 3 ≠ Hoover stage 3 ≠ Igor stage 3.



Section C: Figure 3

Figure 4:

Photographs of fluid inclusion samples: Slab area - **a)** large crystals of quartz, calcite and fluorite locally make up the matrix of Wernecke Breccia, **b)** fluid inclusions in quartz crystal, **c)** fluid inclusions containing L + V + H and **d)** fluid inclusion containing L + V + H + h. L=liquid, V=vapour, H=halite, h=hematite; Hoover area – **e)** metasedimentary clast in Wernecke Breccia, **f)** trails of secondary fluid inclusions parallel to fractures within quartz in the clast; **g)** closer view of inclusions in f; Slats-Frosty area - **h)** ferroan dolomite-pyrite-fluorite vein cutting hematite-altered metasiltstone; the fluorite contains pseudosecondary fluid inclusions, **i)** fluorite in h), note fluid inclusion trails parallel to fractures that do not extend beyond the fluorite crystal, **j)** and **k)** liquid + vapour fluid inclusions in fluorite; Igor area – **l)** Wernecke Breccia sample with large barite and magnetite crystals, **m)** barite crystal in area shown in l); and Olympic area – **n**) Wernecke Breccia sample used for fluid inclusion analysis, **o**) quartz grain from breccia matrix with fluid inclusions in the outer rim, **p**) ferroan dolomite-quartz-chalcopyrite±pyrite vein and **q**) dolomite with primary fluid inclusions.



Section C: Figure 4

Figure 5:

Summary of fluid inclusion data for samples from the Wernecke Mountains area. Th = final homogenization temperature; NaCl eq. wt. % = equivalent weight % NaCl. See Table 1 caption for details of salinity calculations.

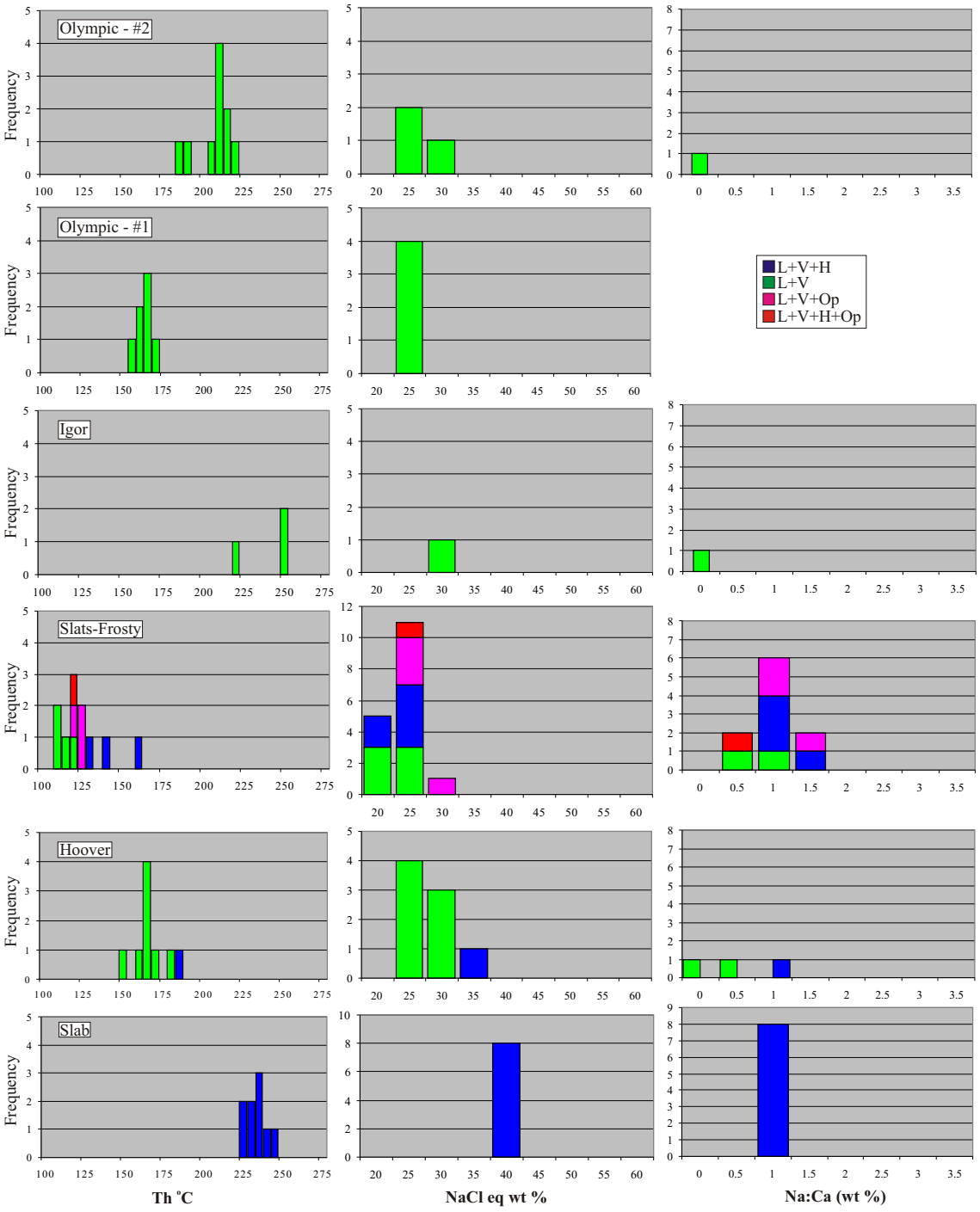

Olympic - #2
Olympic - #1
Igor
Slats-Frosty
Hoover
Slab
Frequency
L+V+H
L+V
L+V+Op
L+V+H+Op
Th °C
NaCl eq wt %
Na:Ca (wt %)

Figure 6:

Comparison of fluid composition for inclusions from the Slab, Hoover, Slats-Frosty, Igor and Olympic areas using the NaCl-$CaCl_2$-H_2O system.

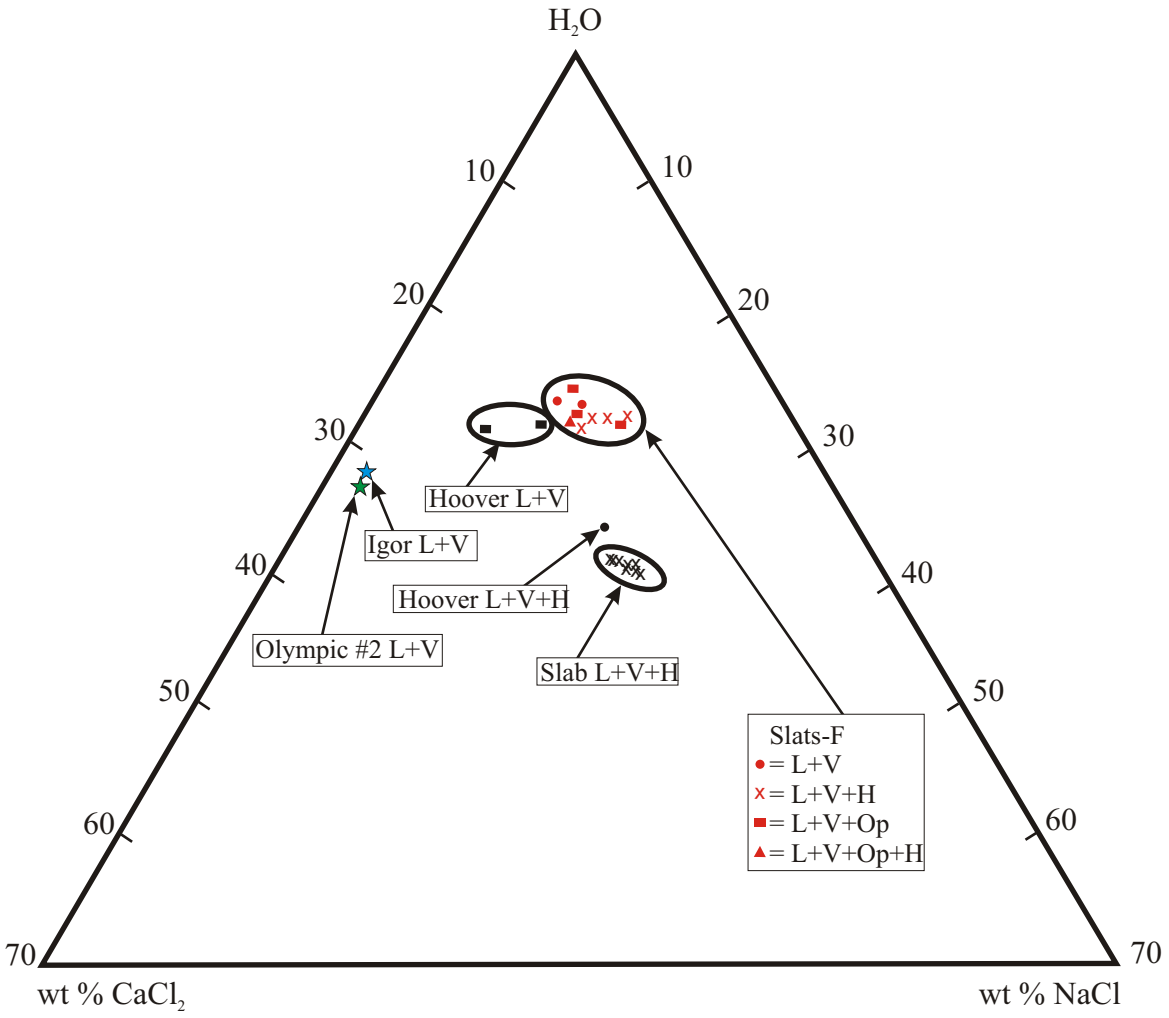
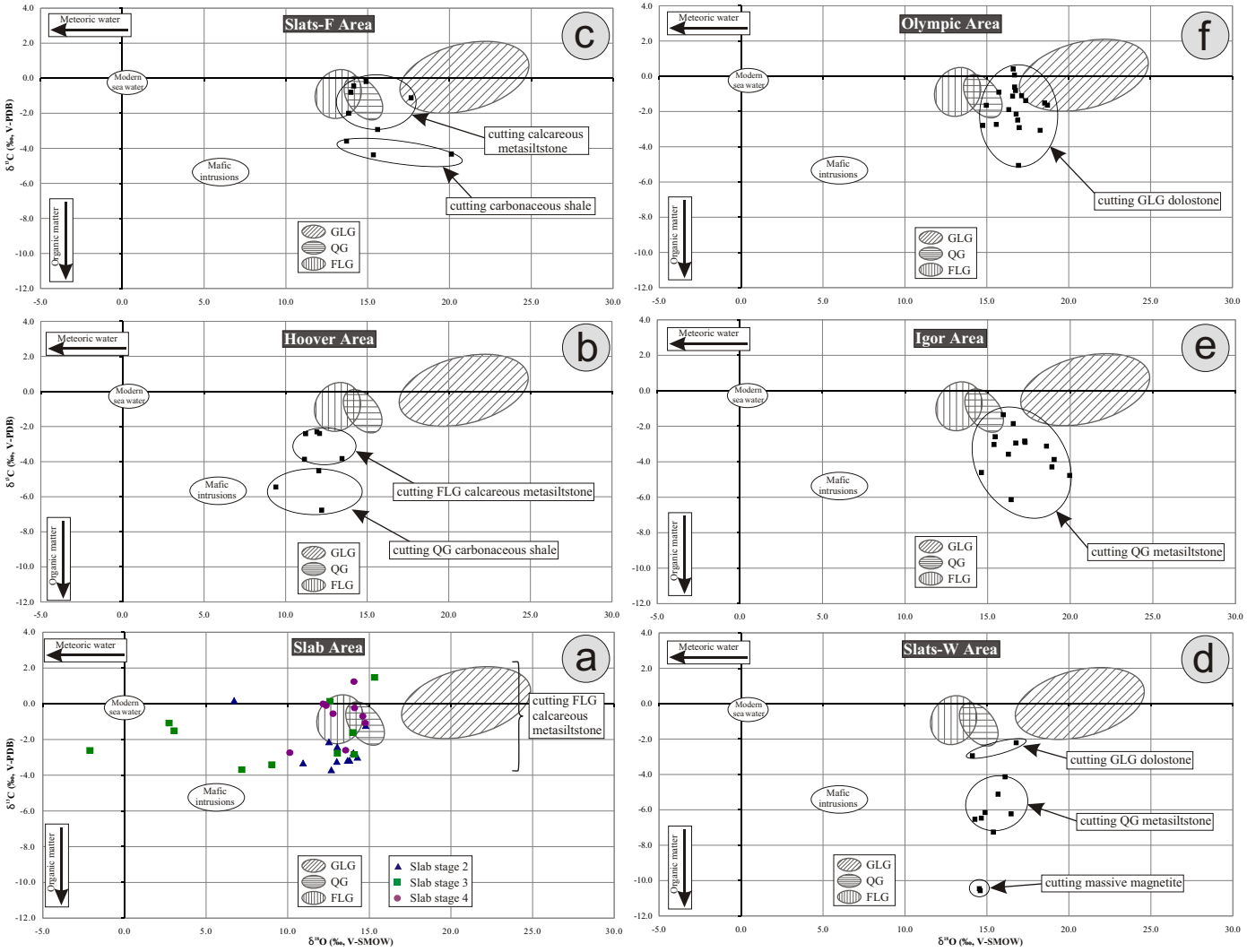

H2O
10
20
30
40
50
60
70
10
20
30
40
50
60
70
wt % CaCl2
wt % NaCl
Hoover L+V
Igor L+V
Hoover L+V+H
Olympic #2 L+V
Slab L+V+H
Slats-F
= L+V
= L+V+H
= L+V+Op
= L+V+Op+H

Figure 7:

$\delta^{18}O$ versus $\delta^{13}C$ results for samples of hydrothermal carbonate from the Slab, Hoover, Slats-Frosty, Slats-Wallbanger, Igor and Olympic areas. Also shown are results for samples of host WSG limestone/dolostone from FLG, Quartet Group and GLG.



Section C: Figure 7

Figure 8:

Overall $\delta^{18}O$ versus $\delta^{13}C$ results for carbonate samples from the Wernecke Mountains. Also shown are fields for common large earth reservoirs that are important in hydrothermal systems. Fields are from Taylor (1974), Sheppard (1977), Graham and Harman (1983), and Hoefs (1987) as compiled in Rollinson (1993). Mean values for Paleoproterozoic carbonates are from Shields and Veizer (2002). FLG = Fairchild Lake Group, Quartet Group = Quartet Group, GLG = Gillespie Lake Group.

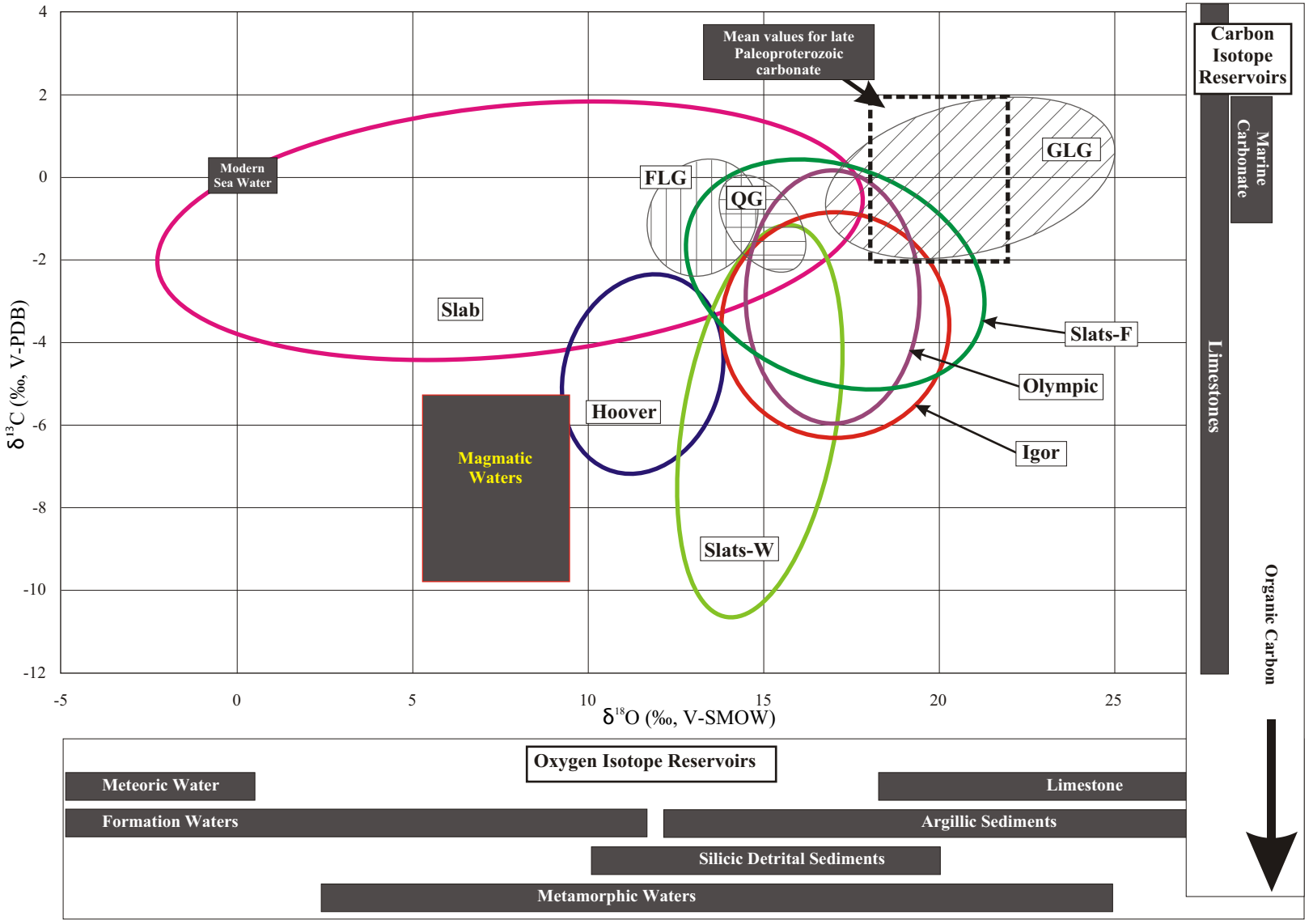
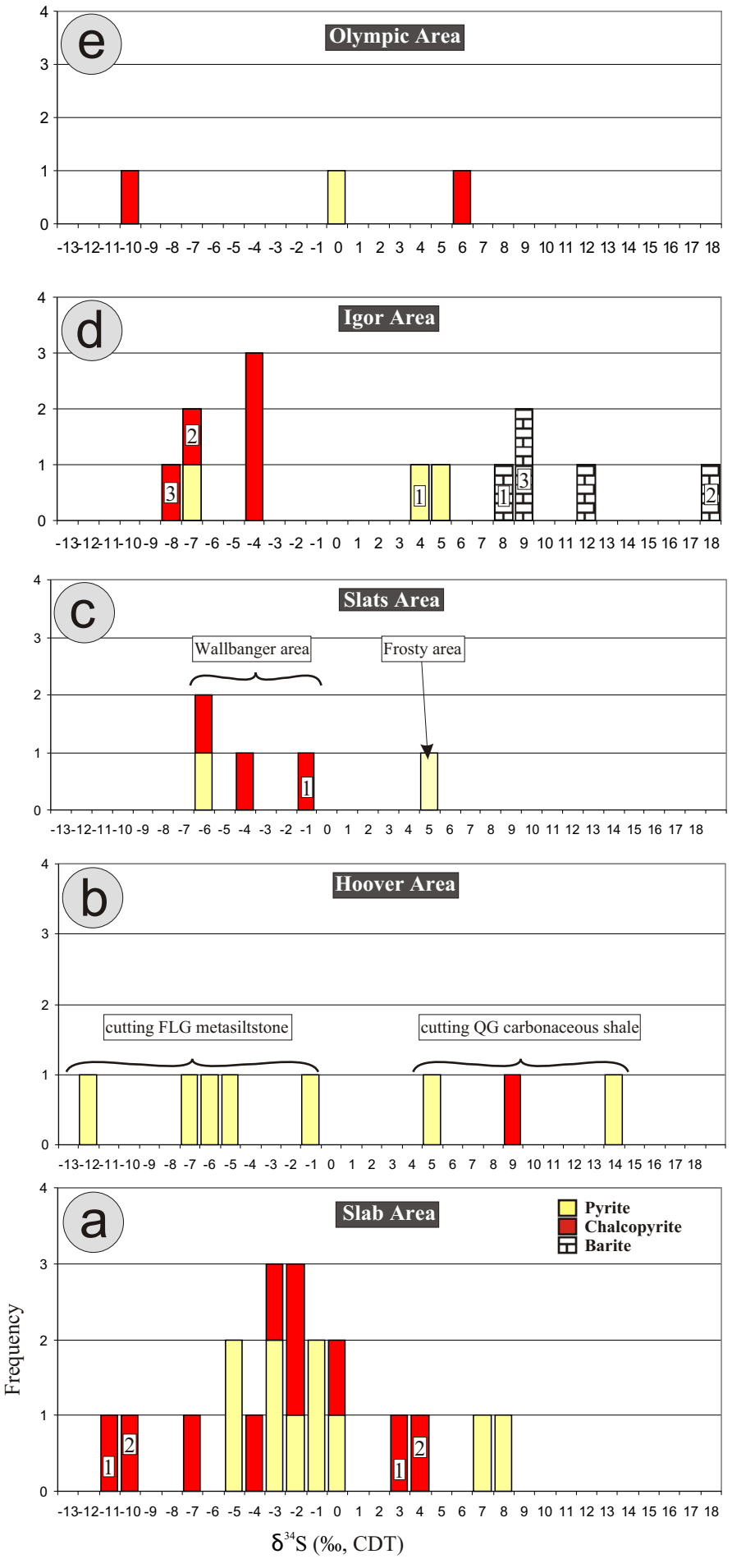

Mean values for late Paleoproterozoic carbonate
Modern Sea Water
FLG
QG
GLG
Slab
Slats-F
Olympic
Igor
Hoover
Magmatic Waters
Slats-W
Carbon Isotope Reservoirs
Marine Carbonate
Limestones
Organic Carbon
δ13C (‰, V-PDB)
δ18O (‰, V-SMOW)
4
2
0
-2
-4
-6
-8
-10
-12
-5
0
5
10
15
20
25
Oxygen Isotope Reservoirs
Meteoric Water
Formation Waters
Limestone
Argillic Sediments
Silicic Detrital Sediments
Metamorphic Waters

Figure 9:

$\delta^{34}S$ results for samples from the Slab, Hoover, Slats-Frosty, Slats-Wallbanger, Igor and Olympic areas. See text for discussion.



Section C: Figure 9

Figure 10:

Overall $\delta^{34}S$ results for samples from the Wernecke Mountains. Also shown are fields for common large earth reservoirs that are important in hydrothermal systems. Fields are from Chambers (1982), Kerridge *et al.* (1983) and Chaussidon *et al.* (1989) as compiled in Rollinson (1993).

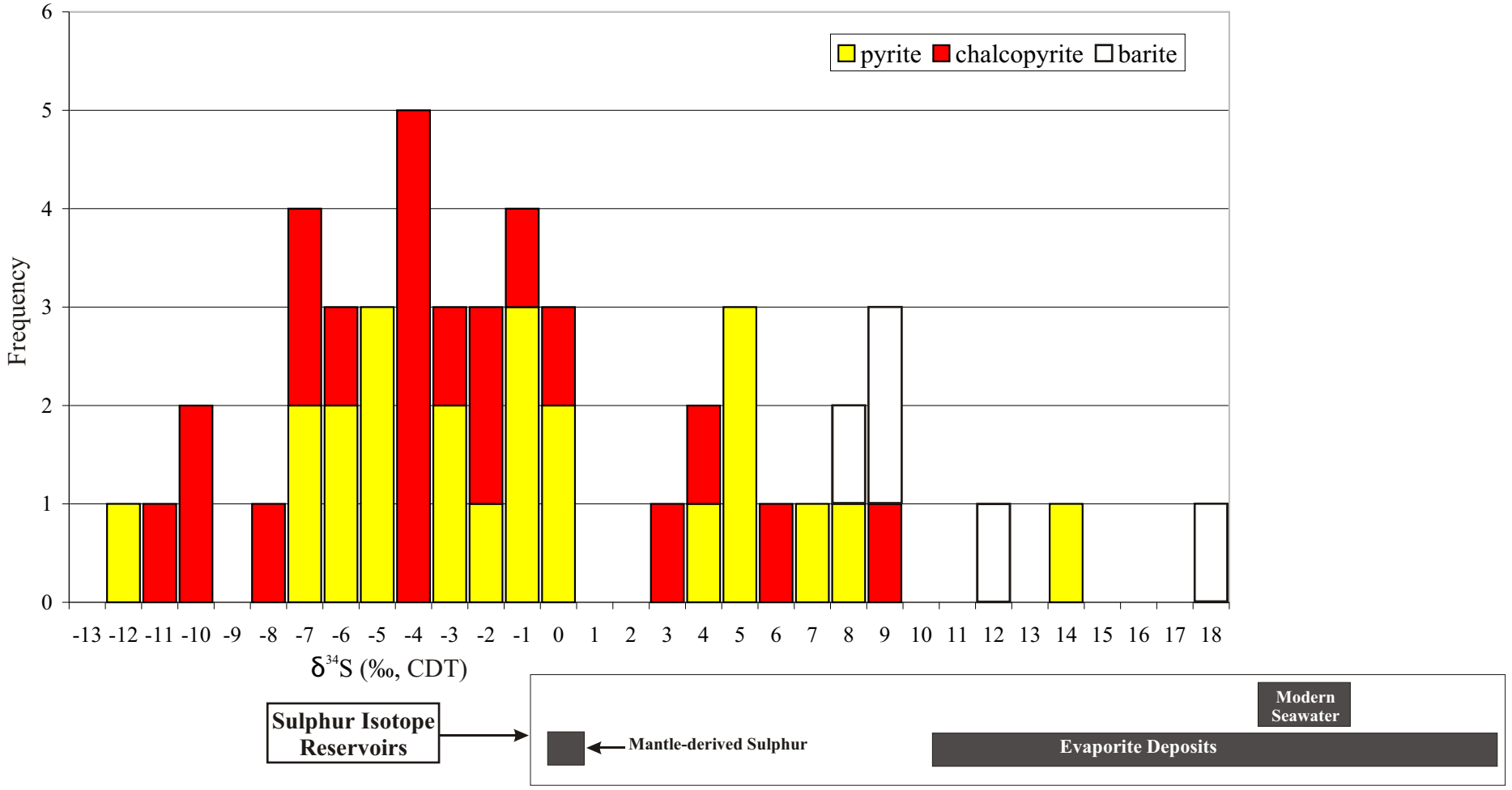
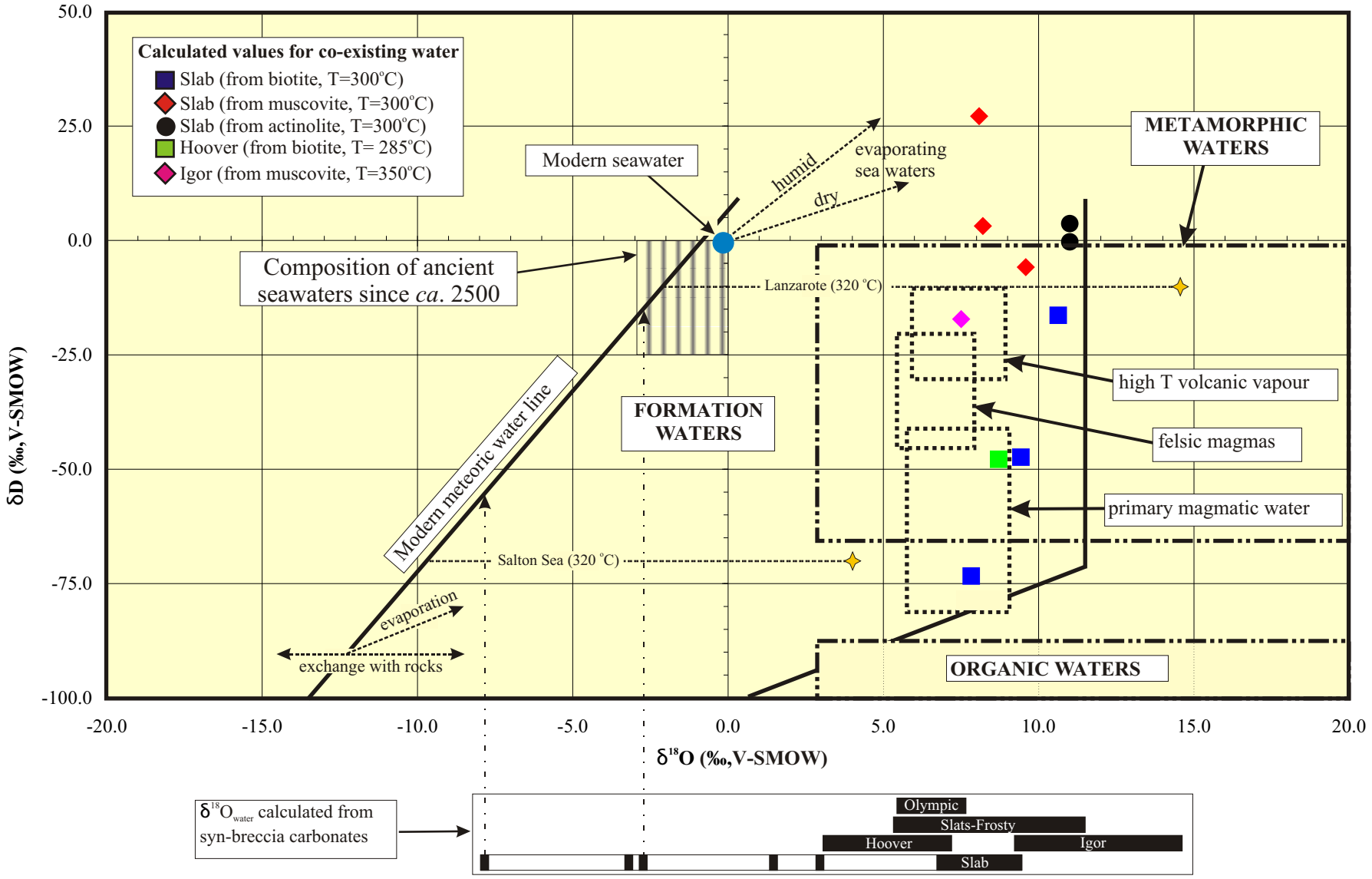

pyrite
chalcopyrite
barite
Frequency
0
1
2
3
4
5
6
-13 -12 -11 -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
δ34S (‰, CDT)
Sulphur Isotope Reservoirs
Mantle-derived Sulphur
Modern Seawater
Evaporite Deposits

Figure 11:

Plot of calculated $\delta^{18}O_{water}$ versus δD_{water} values for mineral separates of biotite, muscovite and actinolite from Wernecke samples. See Appendix VII for sample descriptions. $\delta^{18}O_{water}$ values for biotite and muscovite were calculated using the fractionation equations of Zheng (1993). δD_{water} values for biotite and muscovite were calculated using the fractionation equations of Suzuoki and Epstein (1976). $\delta^{18}O_{water}$ and δD_{water} values for actinolite were calculated using the fractionation equations of Zheng (1993) and Graham *et al.* (1984) respectively for tremolite. Magmatic water and formation waters fields are from Taylor (1974). Meteoric water line is from Epstein *et al.* (1965) and Epstein (1970). The metamorphic waters field is from values in Taylor (1974) and Sheppard (1981) as compiled by Rollinson (1993). The fields for felsic magma and high temperature volcanic vapour are from Taylor (1992) and Giggenbach (1992) as shown in Hedenquist *et al.* (1998). Composition of ancient seawater from Sheppard (1986). Isotopic trends are given for: 1) seawater undergoing evaporation (Knauth and Beeunas, 1986), 2) meteoric waters undergoing exchange with ^{18}O in minerals, 3) evaporation of meteoric water and 4) isotopic compositions of Salton Sea and Lanzarote geothermal waters compared to their local meteoric waters (Sheppard, 1986).

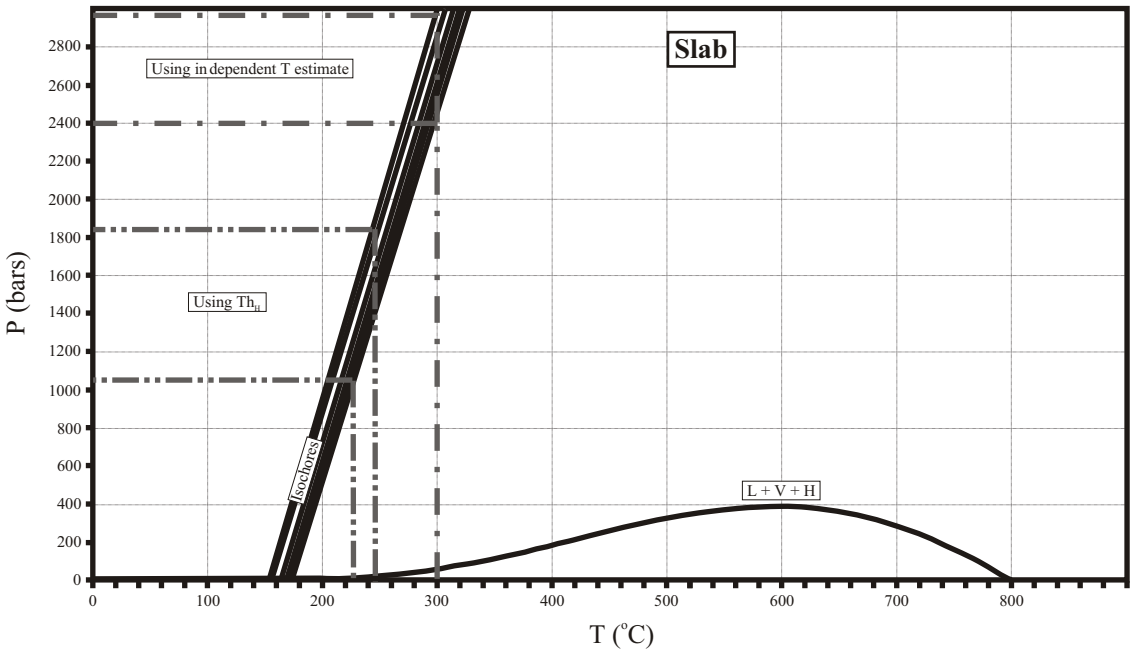
Black bars beneath the main figure are calculated $\delta^{18}O_{water}$ values for calcite, dolomite and siderite from the Slab, Hoover and Igor areas using the fractionation factors of Zheng (1999).



Section C: Figure 11

Figure 12:

Examples of isochores from the Slab and Igor prospects. Diagrams were constructed using the programme Flinc-Calc that is based on the equations of Zhang and Fratz (1987) and Brown (1998).


Slab
Using in dependent T estimate
Using Th_{H}
Isochores
L + V + H
P (bars)
T (°C)
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
0
100
200
300
400
500
600
700
800

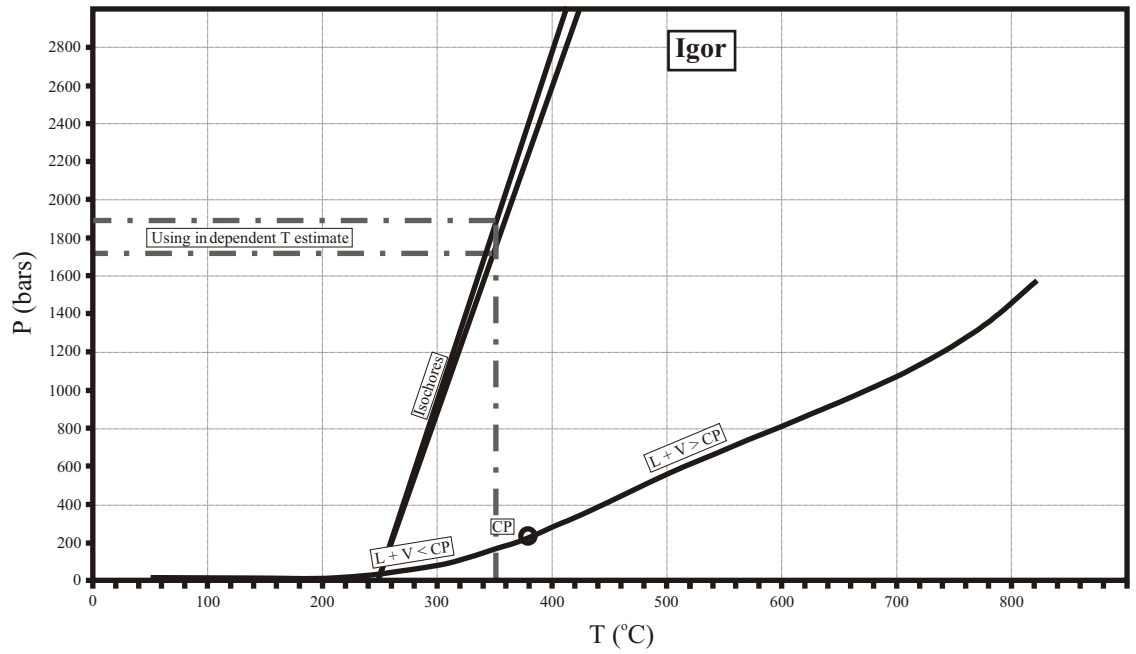
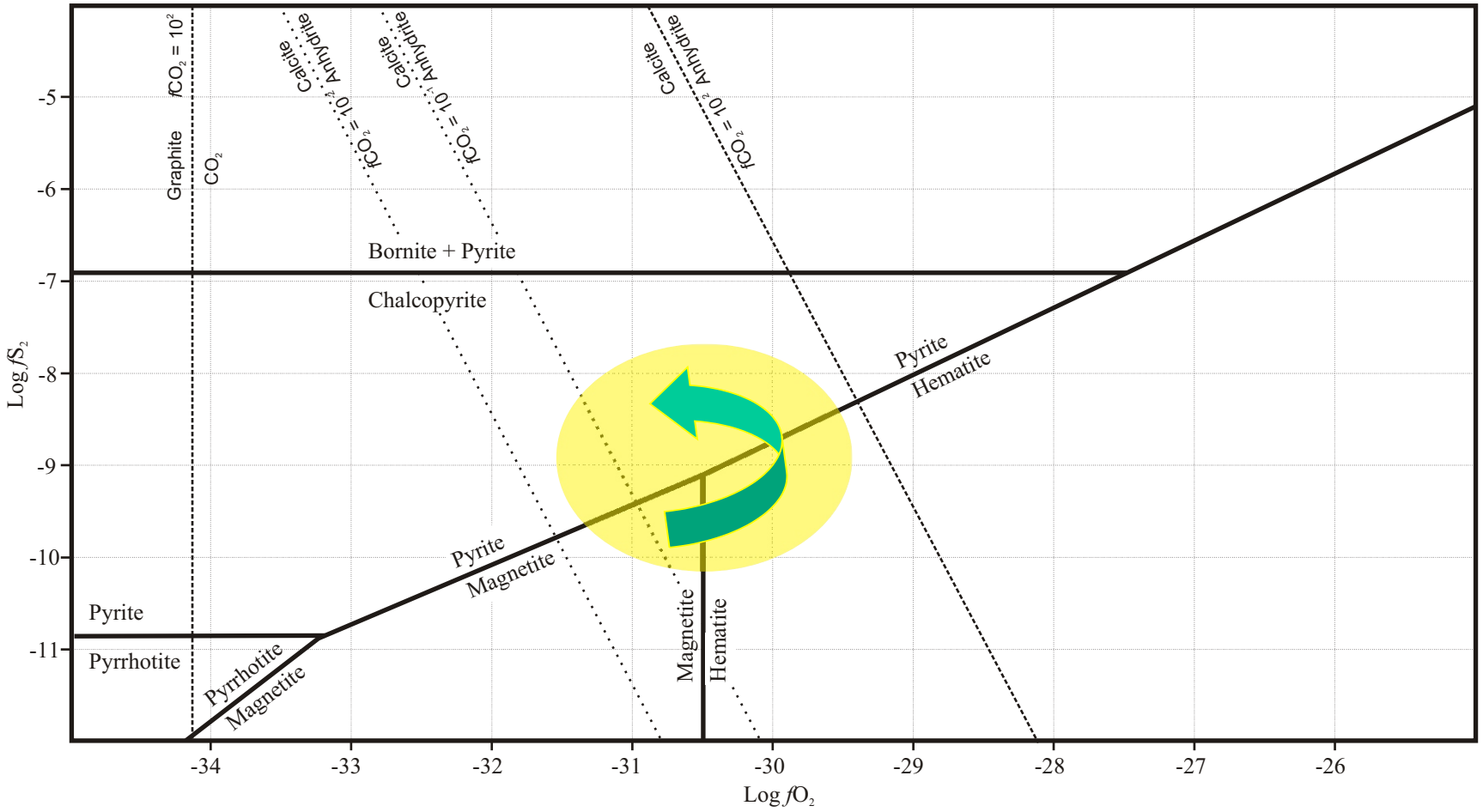

Igor
Using in dependent T estimate
Isochores
L + V > CP
CP
L + V < CP
P (bars)
T (°C)
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
0
100
200
300
400
500
600
700
800

Figure 13:

Log fO_2 – log fS_2 plot for Slab area fluids. The following equations were used to define the mineral stability fields; Log K values were calculated for temperature = 300 ^{o}C and pressure = 2500 bars.

Reaction used	**Equation**	**Log K**
Pyrite-Magnetite:	$3\ FeS_2 + 2\ O_{2(g)} = Fe_3O_4 + 3\ S_{2(g)}$	-4.6
Pyrite-Hematite:	$4\ FeS_2 + 3\ O_{2(g)} = 2\ Fe_2O_3 + 4\ S_{2\ (g)}$	33.88
Pyrrhotite-Magnetite:	$6\ FeS + 4\ O_{2(g)} = 2\ Fe_3O_4 + 3\ S_2$	55.34
Bornite-Chalcopyrite:	$Cu_5FeS_4 + 4\ FeS_2 = 5\ CuFeS_2 + S_2$	83.64
Graphite-CO2(g):	$C + O_{2(g)} = CO_{2(g)}$	-6.93
Calcite-gypsum:	$2\ CaCO_3 + S_{2(g)} + 3\ O_{2(g)} + 4\ H_2O = 2\ CaSO_4 + 2\ CO_{2(g)}$	36.13

Calculations were carried out using the programme “The Geochemists Workbench”® release 4.0.2. (Bethke, 2000). GWB uses information developed by numerous researchers, as compiled for example by Pitzer, 1991 and Johnson *et al.*, 1992.



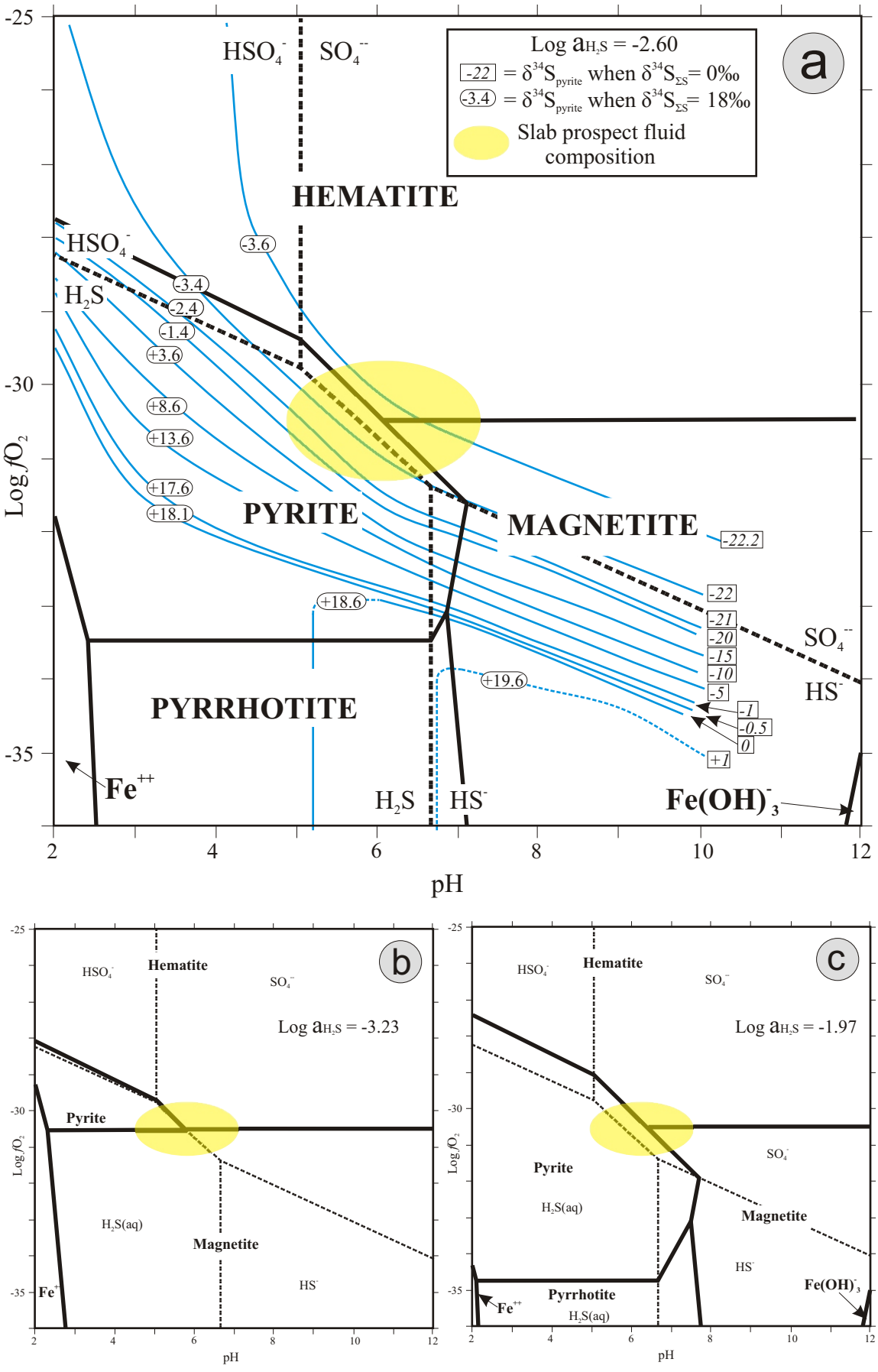
fS_2 - fO_2 mineral stability relationships at 300°C and 2.5 kb.

Figure 14:

Plots of pH versus log fO_2 for the Slab area. a) using a medium value for log aH_2S of -2.6, b) using a low value for log aH_2S of -3.23 and c) using a high value for log aH_2S of -1.97. The positions of δS^{34}_{i} contours are also shown in a); Numbers in boxes on contours are δS^{34}_{pyrite} values calculated using $\delta S^{34}_{\Sigma S} = 0$ ‰ (right side) and $\delta S^{34}_{\Sigma S} = 18$ ‰ (left side). The shaded oval shows approximate fluid conditions at Slab.

The position of sulphur isotope contours were calculated using the method of Ohmoto (1972) and the following conditions: temperature = 300 °C, pressure = 2.5 kb, ionic strength = 3.2 (based on fluid inclusion data). Molality of species was calculated using the programme "The Geochemists Workbench"® release 4.0.2; the following species were most abundant.

Species	Molality	Mole Fraction
$NaSO_4^-$	0.6985	0.497
$CaSO_4(aq)$	0.3741	0.266
KSO_4^-	0.165	0.117
SO_4^{--}	0.1623	0.115
$H_2S(aq)$	2.51E-03	0.002
HSO_4^-	1.54E-03	0.001
HS^-	1.30E-03	0.001


a
Log a_{H_2S} = -2.60
-22 = $\delta^{34}S_{pyrite}$ when $\delta^{34}S_{\Sigma S}$= 0‰
-3.4 = $\delta^{34}S_{pyrite}$ when $\delta^{34}S_{\Sigma S}$= 18‰
Slab prospect fluid composition
HEMATITE
PYRITE
MAGNETITE
PYRRHOTITE
HSO_4^-
SO_4^{--}
H_2S
HS^-
Fe^{++}
$Fe(OH)_3^-$
Log fO_2
pH
b
Log a_{H_2S} = -3.23
Hematite
Pyrite
H_2S(aq)
Magnetite
c
Log a_{H_2S} = -1.97
Pyrrhotite

SECTION C - TABLES

Stable isotope (C,O,S,H) and fluid inclusion constraints on the origin of Wernecke Breccia and associated iron oxide-copper-gold mineralisation

Table 1: Summary of fluid inclusion data for samples from the Wernecke Mountains area. Tfm = temperature of first melting, Tm_{ice} = ice melting temperature, Tm_{hh} = hydrohalite melting temperature, Thv = vapour homogenization temperature, Ths = halite dissolution temperature, Th = final homogenization temperature. Temperatures in ^{o}C. NaCl eq. wt. % = equivalent weight % NaCl. NaCl eq. wt. % values for Slab were approximated using the graphical methods of Vanko *et al.* (1988) and Zwart & Touret (1994). Values for other areas were calculated from Tm_{ice}, $Tm_{hydrohalite}$, Th_{halite} using the programme FlinCalc (J. Cleverly, written communication) which uses information from Zhang and Frantz (1987) and Brown (1998). In the paragenesis column P = primary, S = secondary and PS = pseudo secondary. In the FI (fluid inclusion) Type column L = liquid, V = vapour, H = halite and Op = opaque.

Location (sample #)	**Paragenesis**	**n**	**FI Type**	**Tfm**	**Tm_{ice}**	**Tm_{hh}**	**Thv**	**Ths**	**Th**	**NaCl eq wt %**	**Na:Ca (wt %)**
Slab (Slab SW)	P, Stage 3	10	L+V+H	-92 to -83	-50 to -36	na	154 - 175	226 - 245	226 - 245	41 - 42	1.3 - 1.4
Hoover (JH01-5-7A)	S, Stage 3	7	L+V	-78 to -67	-34 to -25	na	153 - 172	na	153 - 172	26 - 32	0.4, 0.7
Hoover (JH01-5-7A)	S, Stage 3	1	L+V+H	-64	-30	na	165	188	188	38	1.20
Slats-F (STF95-1-20.30 m)	PS, Stage 3	6	L+V	-91 to -72	-28 to -23	-12, -8	112 - 160	na	112 - 160	24 - 28	0.8 - 1.1
Slats-F (STF95-1-20.30 m)	PS, Stage 3	6	L+V+H	-89 to -75	-28 to -23	-4 to 3	89 - 160	> 160	> 160	24 - 29	1.0 - 1.6
Slats-F (STF95-1-20.30 m)	PS, Stage 3	4	L+V+Op	-103 to -77	-35 to -26	-22 to 0	68 - 130	> 130	> 130	27 - 32	1.0 - 1.6
Slats-F (STF95-1-20.30 m)	PS, Stage 3	1	L+V+H+Op	-77	-28	-7	124	> 124	> 124	29	0.9
Igor (JH02-10-17B)	P, Stage 3	3	L+V	-77	-54 to -50	-26	220 - 250	na	220 - 250	~ 34	~ 0.1
Olympic 1 (JH02-21-5A)	P, Stage 2	7	L+V	-67 to -60	-29 to -26	na	158 - 170	na	158 - 170	26 - 28	na
Olympic 2 (OY94-3-24.70 m)	P, Post stage 2	11	L+V	-64	-30 to -25	na	188 - 223	na	188 - 223	26 - 35	~ 0.1

Table 2: Summary of carbon and oxygen isotope results. * mean value for *ca*. 1.8 to 1.7 Ba carbonates is from Shields and Veizer (2002).

Sample	**n**	**$\delta^{13}C$ ‰ V-PDB**	**$\delta^{18}O$ ‰ V-SMOW**
All WSG Limestone & dolostone	23	-2.0 to 1.6	11.8 to 24.6
Fairchild Lake Group	6	-2.0 to 0.5	11.8 to 14.4
Quartet Group carbonate	3	-1.9 to -0.3	13.9 to 15.9
Quartet Group carbonaceous shale	4	-26.7 to -20.8	N/A
Gillespie Lake Group	14	-1.9 to 1.6	16.4 to 24. 6
*Mean value for *ca*. 1.8-1.7 Ba carbonates		-2 to 2	18 to 22
All breccia-related carbonates	94	-10.6 to 1.5	-2.1 to 20.0
Slab (stage 2)	11	-3.7 to -1.2	10.9 to 14.8
Slab (stage 3)	13	-3.7 to 1.5	-2.1 to 15.3
Slab (stage 4)	6	-2.7 to 1.2	10.1 to 14.6
Hoover (stage 3)	8	-6.8 to -2.3	9.4 to 13.5
Slats F (stages 2, 3 & 4)	9	-4.4 to -0.2	13.7 to 20.1
Slats W (stages 5 & 6)	11	-10.6 to -2.2	14.1 to 16.8
Igor (stage 3 & 4)	14	-6.1 to -1.4	14.6 to 20.0
Olympic (stages 1,2, 3 & 5)	19	-5.1 to 0.4	14.8 to 18.7

Table 3: $\delta^{18}O_{water}$ values calculated from measured $\delta^{18}O$ values of syn-breccia carbonate samples. (See text for discussion)

Prospect name	**Measured $\delta^{18}O_{carbonate}$ ‰ V-SMOW**	**Calculated $\delta^{18}O_{water}$ ‰ V-SMOW**
Slab (Stage 3: 300 ^{o}C)	-2.1 to 15.3	-7.9 to 9.5
Hoover (Stage 3: 285 ^{o}C)	9.4 to 13.5	3.0 to 7.2
Slats-Frosty (Stage 3: 235 ^{o}C)	13.7 to 20.1	5.4 to 11.6
Igor (Stage 3: 355 ^{o}C)	14.6 to 20.0	9.4 to 14.7
Olympic (Stage 2: 185 ^{o}C)	16.6 to 18.7	5.7 to 7.8

Table 4: Summary of sulphur isotope results

Sample	**n**	**$\delta^{34}S$ ‰ CDT**
All breccia-related samples	49	-12.4 to 17.1
Slab	20	-11.5 to 7.1
Hoover	8	-12.4 to 13.4
Slats W	4	-6.8 to -1.7
Slats F	1	4.2
Igor (sulphides)	8	-8.4 to 4.8
Igor (barite)	5	7.7 to 17.1
Olympic	3	-10.8 to 5.3

Table 5: Summary of hydrogen and oxygen isotope results. Also shown are calculated δD and $\delta^{18}O$ values for co-existing water. #duplicate analysis. See figure 11 caption for calculation details.

Area	**Sample**	**Mineral**	**δD ‰ V-SMOW**	**$\delta^{18}O$ ‰ V-SMOW**	**δD_{water} ‰ V-SMOW**	**$\delta^{18}O_{water}$ ‰ V-SMOW**
Slab	SB94-1-33.7m	Muscovite	-21	11.6	27.2	10.2
Slab	01JH-20-3	Muscovite	-45	10.6	3.2	9.2
Slab	02JH-14-IA2	Muscovite	-54	11.1	-5.8	9.7
Igor	02JH-12-1	Muscovite	-55	9.9	-6.8	8.5
Slab	01JH-19-1	Biotite	-141	6.7	-73.4	7.8
Slab	01JH-20-6A	Biotite	-115	8.3	-47.4	9.4
Slab	02JH-20-2	Biotite	-84	9.5	-16.4	10.6
Hoover	HV94-1-695'	Biotite	-119	7.8	-38.4	8.1
Slab	JH01-20-10C	Actinolite	-22	10.96	-0.3	11.0
Slab	JH01-20-10C	Actinolite	-18	10.96	3.7	11.0
Not used in figure						
Hoover	JH01-8-2	Muscovite	no data	11.1		
Slab	SB94-1-345.1m	Muscovite	no data	11.5		
Slab	SB97-19-70.1m	Muscovite	no data	10.1		
Slab	JH01-20-10C**	Biotite	-23	8.1		
Slab	JH01-35-2**	Biotite	-34	8.7		
	** possible chloritization of biotite					

Table 6: Estimates of fluid temperature from fluid inclusion and stable isotope data. * All direct fluid inclusion analyses are minimum temperatures, i.e. not trapped during phase separation. ** Using fractionation factors of Sheppard and Schwarcz (1970) and Golyshev *et al.* (1981). *** Using fractionation factors of Ohmoto and Lasaga (1982).

Location	Analysis	T ^{o}C
Slab	Fluid inclusion analyses	226 – 245*
Slab	δ^{18}O: dolomite-calcite mineral pair	~300**
Hoover	Fluid inclusion analyses	153 - 188
Slats-F	Fluid inclusion analyses	> 160
Igor	Fluid inclusion analyses	220 - 250
Igor	δ^{34}S: barite-chalcopyrite mineral pair	~350***
Olympic	Fluid inclusion analyses	158 - 170

Table 7: Estimates of: 1) thickness of strata overlying the IOCG prospects based on stratigraphic measurements (Delaney, 1981); 2) depth of the prospects based on pressure estimates; 3) pressure from fluid inclusion data + stable isotope geothermometry; and 4) trapping temperature of fluid (see text for discussion).

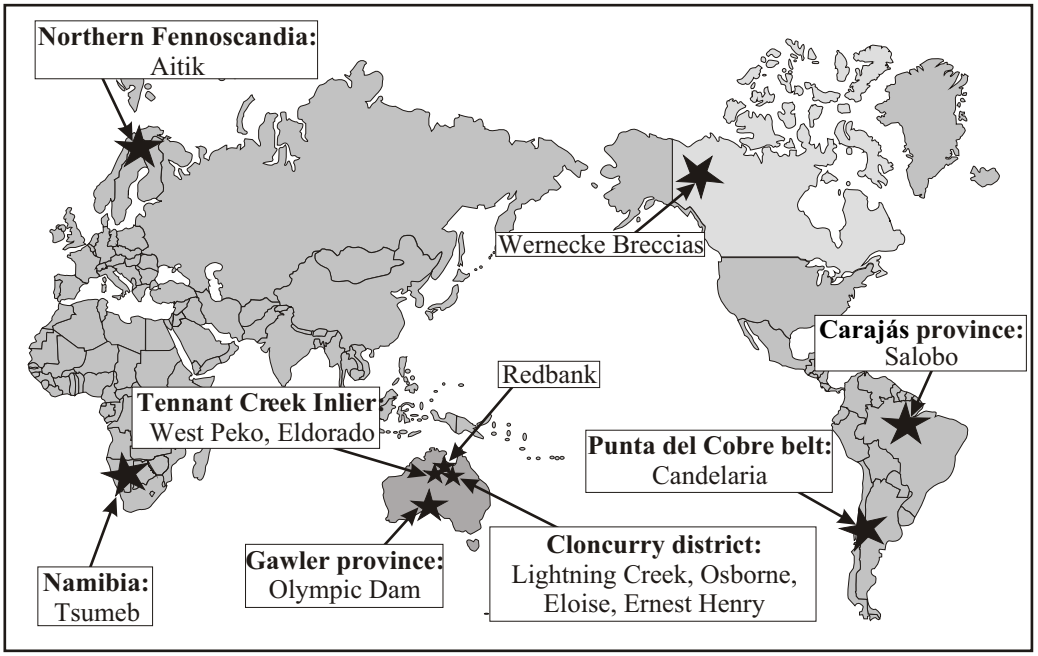
Location	Thickness km	Depth km	Estimated P kb	Estimated T ^{o}C
Slab	7.4 – 9.0	9.1 – 11.3	2.4 – 3.0	300
Hoover	7.0 – 9.0			285
Slats-F	7.0 – 9.0			235
Igor	> 4	5.7 – 7.2	1.5 – 1.9	350
Slats-W	2.1 – 4.0			N/A
Olympic	0.4 – 1.5			185

SECTION D - FIGURES

Wernecke Breccias, Yukon, Canada: an example of a non-magmatic end-member IOCG system and implications for IOCG genesis and classification

Figure 1:

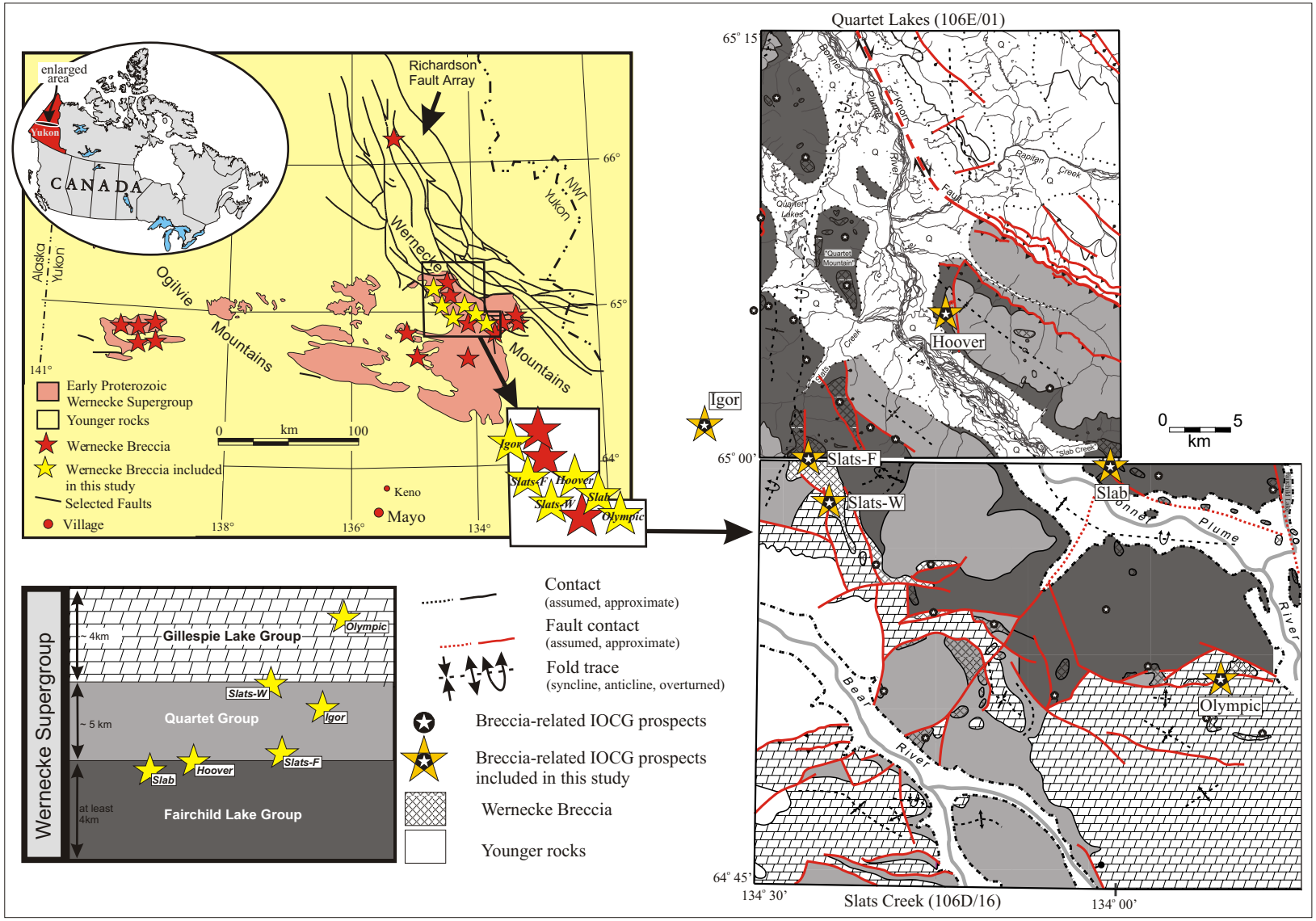
Location of selected IOCG districts. Modified from Hitzman (2000).



Section D: Figure 1

Figure 2:

Location of Wernecke belt, distribution of Wernecke Breccia and location of breccia-associated IOCG prospects included in this study (modified from Thorkelson, 2000) plus simplified bedrock geology map of the study area (for details see Thorkelson, 2000 and Thorkelson *et al.*, 2002, 2003). Legend shows approximate stratigraphic position of IOCG prospects studied.



Section D: Figure 2

Figure 3:

Typical examples of Wernecke Breccia and associated IOCG mineralisation and alteration: a) grey sodic-altered breccia, b) red potassic-altered breccia, c) breccia with abundant clasts of earlier breccia, Slab area, d) photomicrograph of Wernecke Breccia matrix (crossed polars) made up dominantly of sedimentary rock fragments, carbonate, feldspar, lesser quartz and minor hematite and magnetite, e) calcite-chalcopyrite vein cutting FLG, Slab prospect, f) massive chalcopyrite-pyrite vein cutting FLG, Slab prospect, g) chalcopyrite forming matrix to breccia, Hoover prospect, h) massive magnetite-coarsely crystalline hematite-ankerite-quartz vein, Slats-Frosty area and i) photomicrograph of hematite overgrown by pyrite with chalcopyrite filling fractures (reflected light), Olympic prospect.

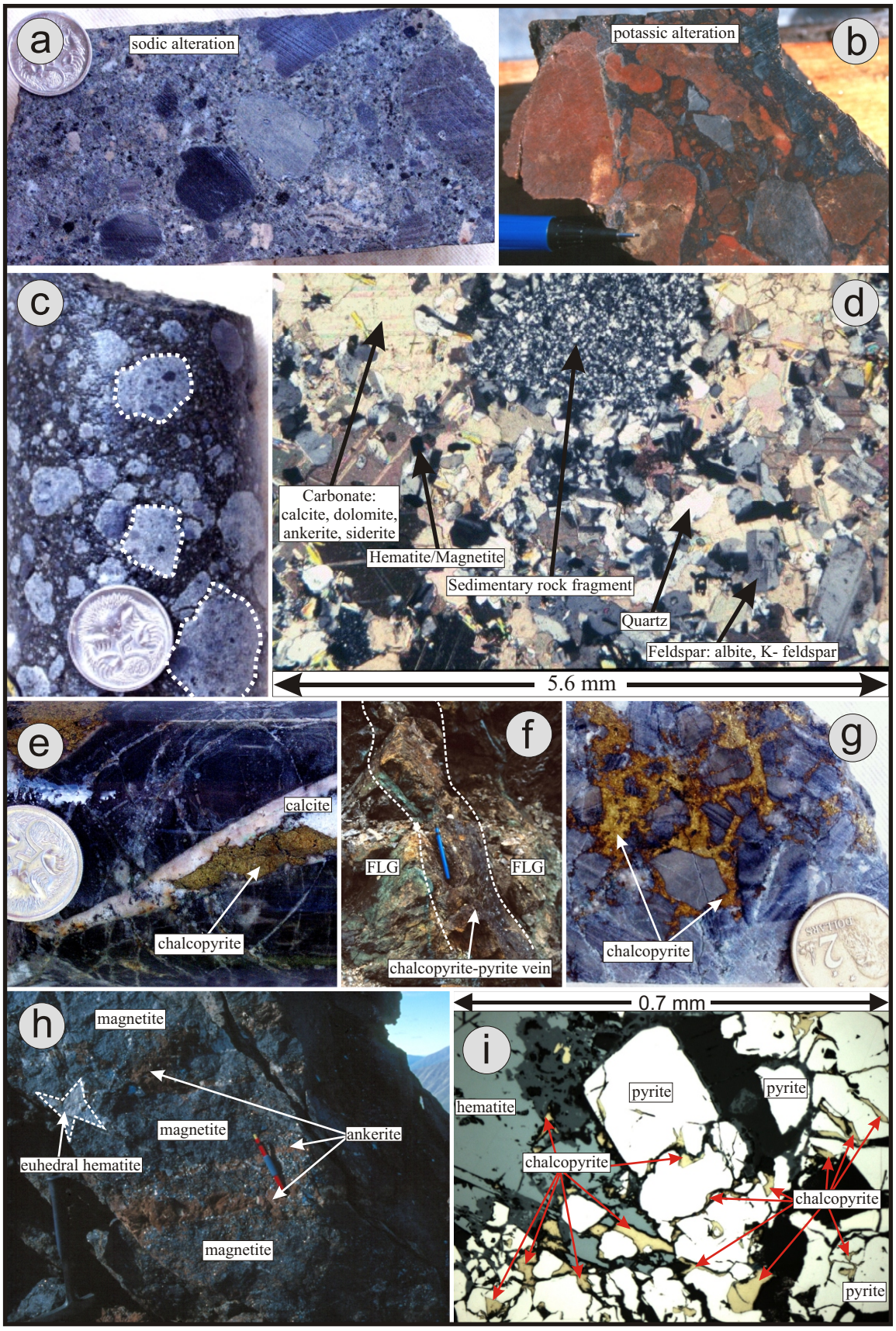
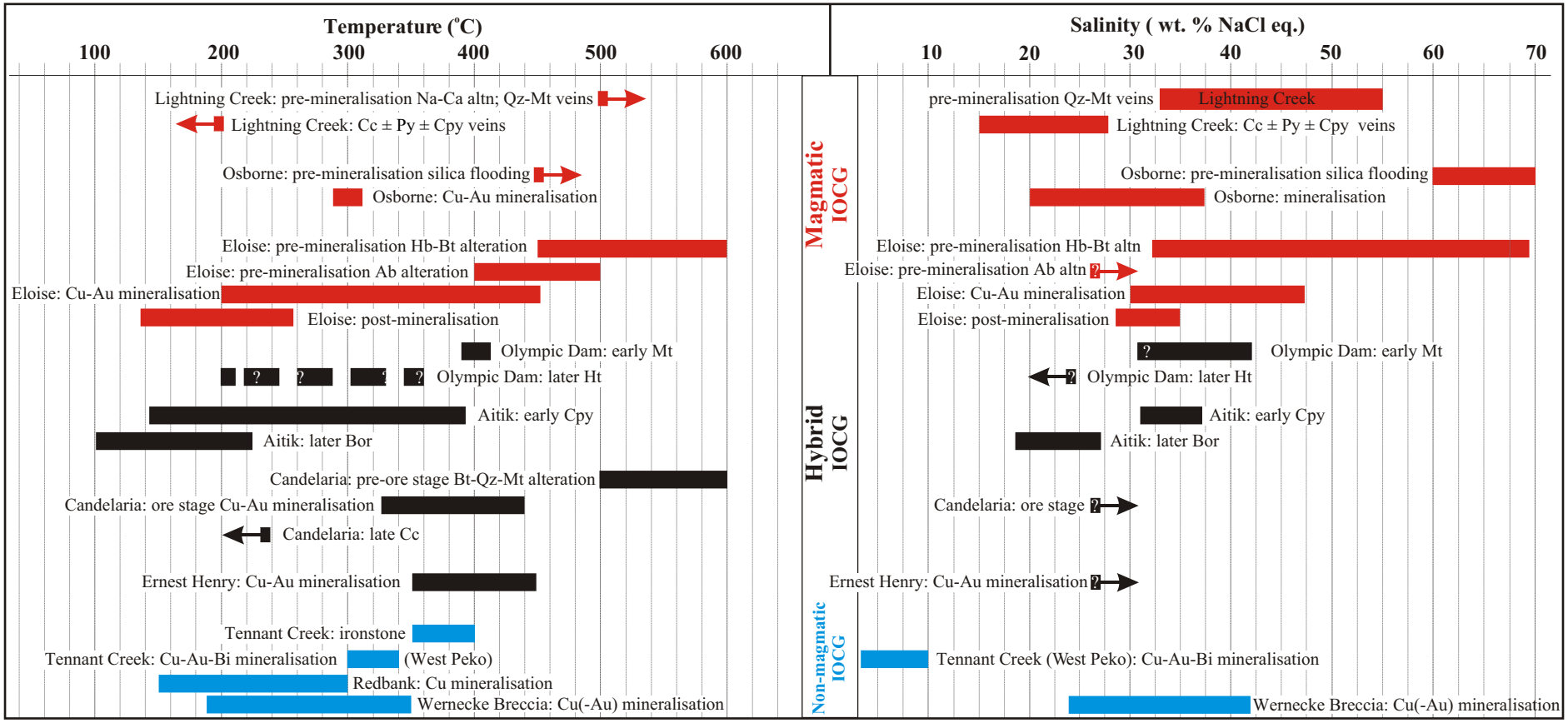

a
sodic alteration
b
potassic alteration
c
d
Carbonate:
calcite, dolomite,
ankerite, siderite
Hematite/Magnetite
Sedimentary rock fragment
Quartz
Feldspar: albite, K- feldspar
5.6 mm
e
calcite
chalcopyrite
f
FLG
FLG
chalcopyrite-pyrite vein
g
chalcopyrite
h
magnetite
magnetite
ankerite
euhedral hematite
magnetite
0.7 mm
i
pyrite
pyrite
hematite
chalcopyrite
chalcopyrite
pyrite

Figure 4:

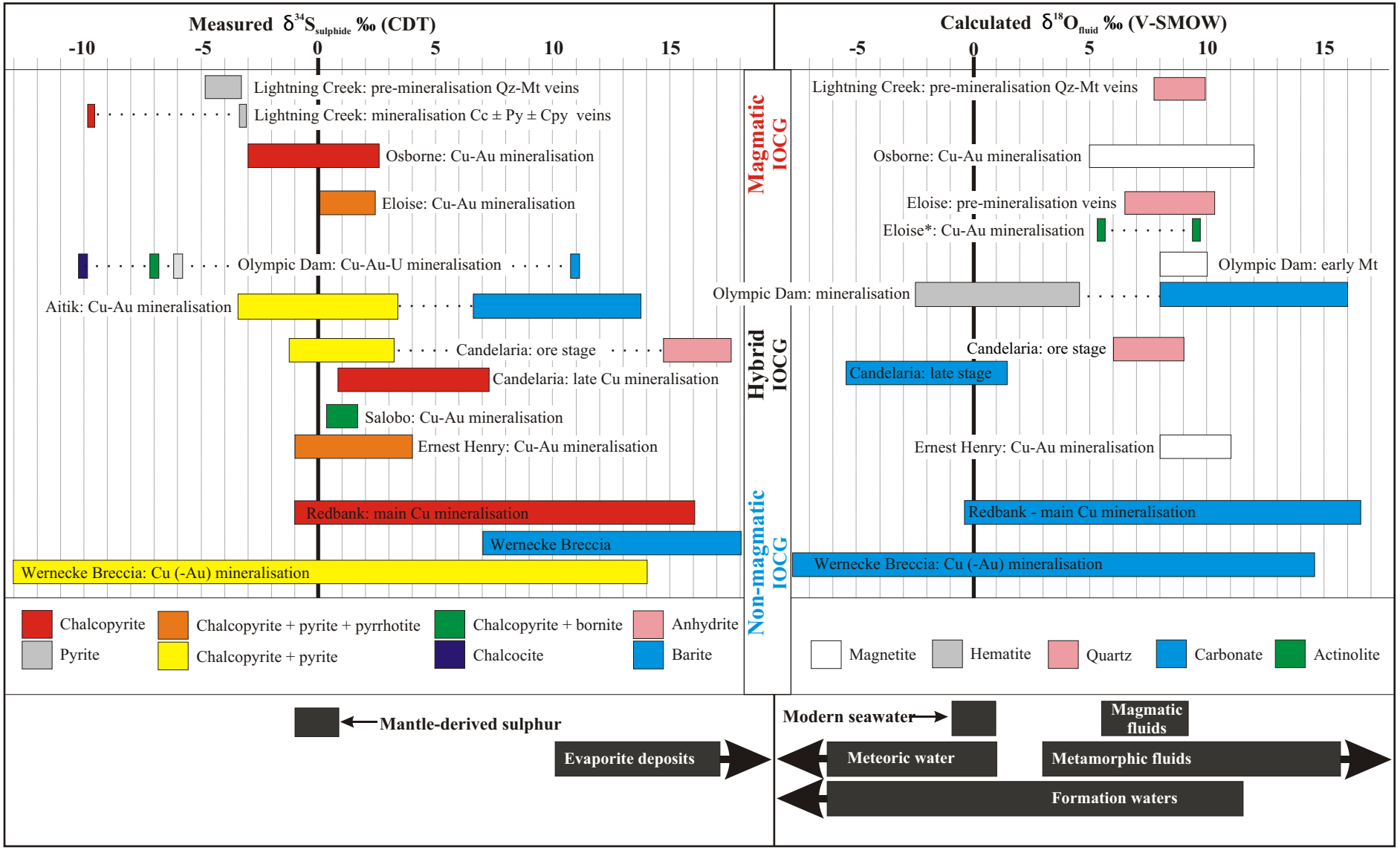
Fluid temperature and salinity for selected IOCG deposits and prospects. References and abbreviations as in Table 1.



Section D: Figure 4

Figure 5:

Measured sulphur isotope compositions for mineralisation and calculated oxygen isotope compositions for mineralising fluid from various IOCG deposits. Legend shows mineral(s) used for sulphur isotope analysis and mineral used to calculated oxygen isotopic composition of fluid. References and abbreviations as in Table 1. * Values calculated from actinolite are 5.4 if temperature of 200 ^{o}C is used or 9.5 if temperature of 450 ^{o}C is used (see text for details). For $\delta^{18}O$ values for magmatic, metamorphic, formation and meteoric waters and modern seawater – *cf.* Sheppard, 1986; Rollinson, 1993. For $\delta^{34}S$ values for mantle and evaporite sources –*cf.* Ohmoto and Goldhaber, 1997.



Section D: Figure 5

Figure 6:

Suggested classification of IOCG systems into magmatic and non-magmatic end-members with hybrid IOCG systems in between. Placement in the classification indicates the degree of involvement of magmatic and/or non-magmatic fluids in the formation of the IOCG system. Placement is also affected by the environment of formation of the IOCG system, i.e., magmatic or non-magmatic, which is determined by whether or not there is a **temporal** association with igneous rocks. At the non-magmatic end of the IOCG spectrum it is possible for an IOCG system to have formed from non-magmatic fluids but to have a temporal relationship with a magmatic system, e.g. Salton Sea. See text for discussion and references.

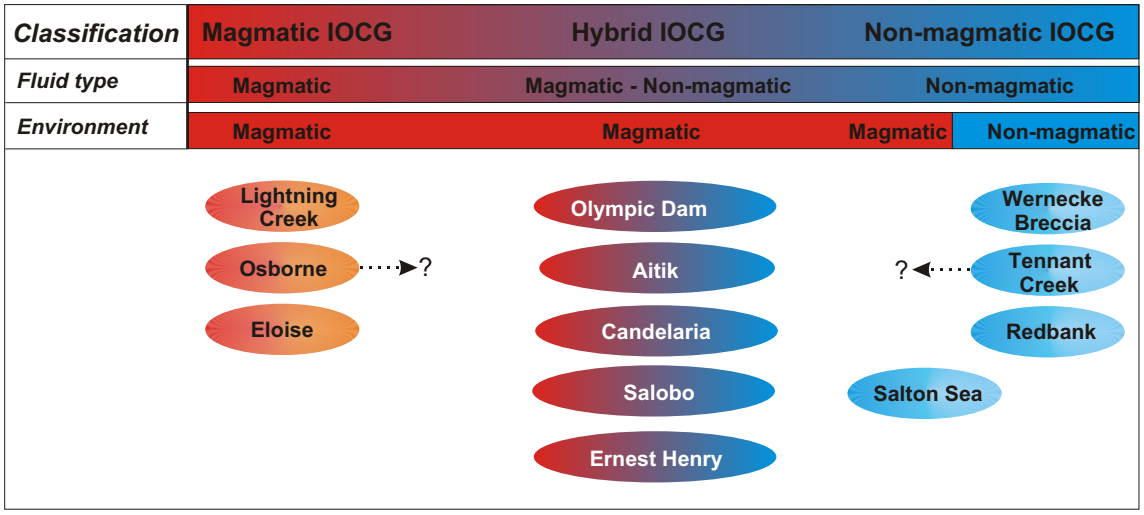
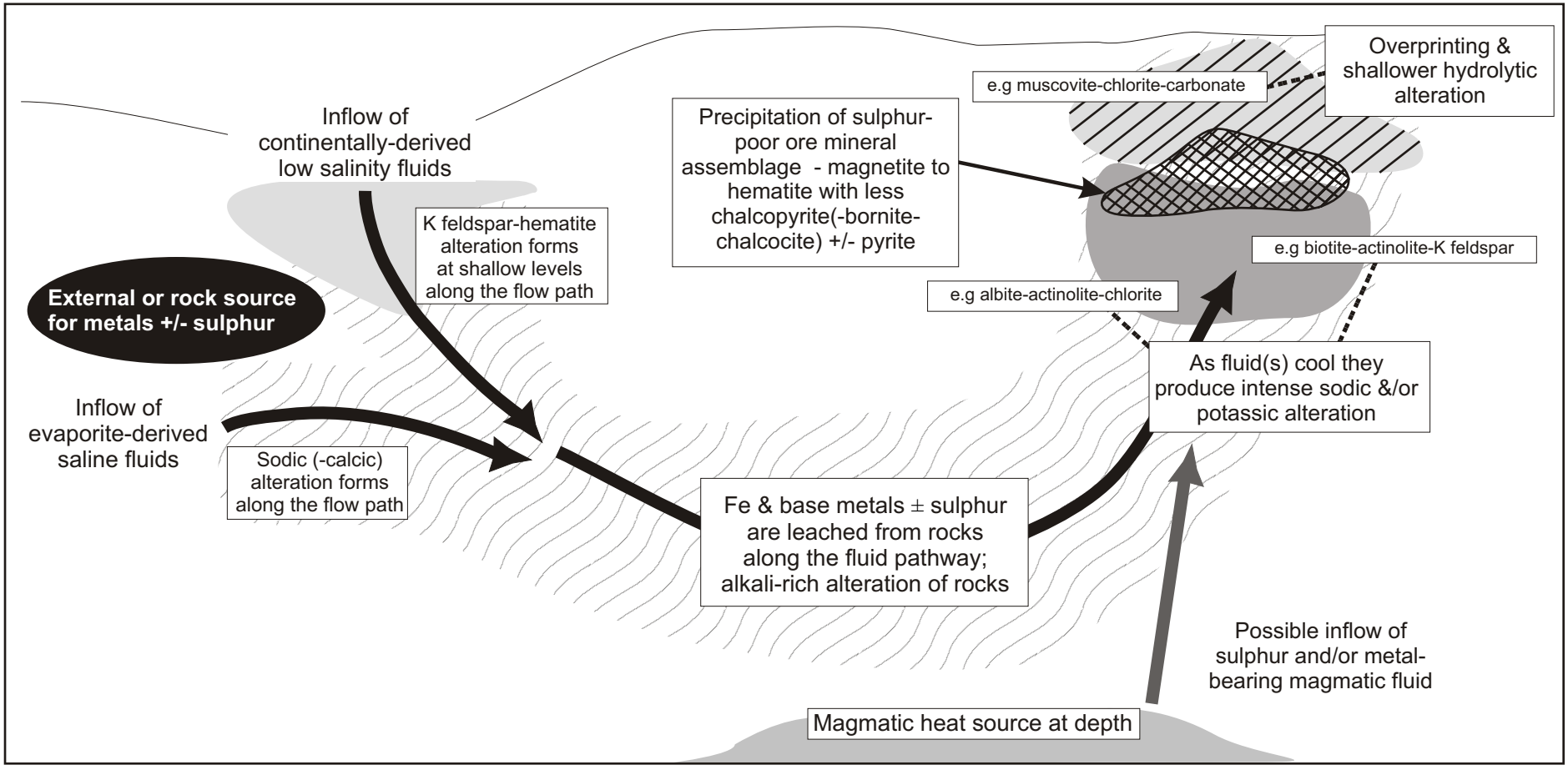

Classification
Magmatic IOCG
Hybrid IOCG
Non-magmatic IOCG
Fluid type
Magmatic
Magmatic - Non-magmatic
Non-magmatic
Environment
Magmatic
Magmatic
Magmatic
Non-magmatic
Lightning Creek
Osborne
?
Eloise
Olympic Dam
Aitik
Candelaria
Salobo
Ernest Henry
Wernecke Breccia
?
Tennant Creek
Redbank
Salton Sea

Figure 7:

Schematic model showing examples of hydrothermal alteration and mineralisation produced by the circulation of non-magmatic fluids (adapted from Barton and Johnson, 2000). Voluminous metal-depleted, sodic(-calcic) ± shallow K feldspar-hematite alteration forms in inflow zones and along the fluid pathway(s) (*cf.* Barton and Johnson, 1996, 2000). Fluids are heated and as they rise and cool they produce intense sodic and/or potassic alteration (depends on host rock composition) plus overprinting and shallow hydrolytic alteration. Metals are leached along the flow path and precipitate due to cooling and/or fluid mixing.



Section D: Figure 7

SECTION D - TABLES

Wernecke Breccias, Yukon, Canada: an example of a non-magmatic end-member IOCG system and implications for IOCG genesis and classification

Table 1: Size and grade of selected IOCG deposits. References: **Lightning Creek** – Perring *et al.*, 2000; Williams *et al.*, 1999; **Osborne** – Adshead, 1995; Perkins and Wyborn, 1996, 1998; Adshead *et al.*, 1998; Gauthier *et al.*, 2001; Rubenach *et al.*, 2001; **Eloise** – Baker, 1998; Baker and Laing, 1998; Baker *et al.*, 2001; **Olympic Dam** – Roberts and Hudson, 1983, 1984; Creaser, 1989; Reeve *et al.*, 1990; Johnson and Cross, 1991; Oreskes and Einaudi, 1992; Oreskes and Hitzman, 1993; Eldridge and Danti, 1994; Haynes *et al.*, 1995; Reynolds, 2000; **Aitik** – Frietsch *et al.*, 1995, 1997; Carlon, 2000; Wanhainen *et al.*, 2003; **Candelaria** – Ullrich and Clark, 1999; Marschik and Fontboté, 1996, 2001; Marschik *et al.*, 2000; **Salobo** – Requia and Fontboté, 2000; Souza and Vieira, 2000; **Ernest Henry** – Twyerould, 1997; Ryan, 1998; Mark and Crookes, 1999; Mark *et al.*, 2000; Williams *et al.*, in progress; **Wernecke Breccia (Slab)** – Hunt *et al.*, 2004, 2005; **Tennant Creek (West Peko, Eldorado)** – Ahmad *et al.*, 1999; Skirrow and Walshe, 2002; **Redbank** – Orridge and Mason (1975); Knutson *et al.* (1979).

Abbreviations used in tables and figures:

Ab = albite
Act = actinolite
Altn = alteration
Anhy = anhydrite
Ank = ankerite
Assoc = associated
Avg = average
Bar = barite
Bor = bornite
Bt = biotite
Bx = breccia
Cc = calcite
Cct = chalcocite
Cl = chlorite
Cov = covellite
Cpy = chalcopyrite
CS = cover sequence
Dec = decrease
Diss = disseminated
Dt = dolomite
dst = dolostone
Ep = epidote
eq = equivalent
Ft = fluorite
Gt = garnet
Hb = hornblende
Ht = hematite
Inc = increase
Ksp = potassium feldspar
lst = limestone
Mal = malachite
minz = mineralisation
mm = metamorphism
mtm = metasomatism
Musc = muscovite
Mt = magnetite
Pitch = pitchblende
Py = pyrite
Qz = quartz
Sd = siderite
Ser = sericite
SG = Supergroup
Spg = supergene
ss = sandstone
sst = siltstone
St = salinity
T = temperature
Th = homogenisation temperature
Tour = tourmaline
Urt = uraninite
wt = weight

Deposit	Tonnes (x 10^6)	Commodity	Grade	Associated metals	Mineralisation styles
MAGMATIC END MEMBER					
Lightning Ck	-	Cu (%) Au (g/t)	minor minor	-	Narrow Cc ± Cl ± Py ± Cpy veins x-cut Qz-Mt veins
Osborne	11.2	Cu (%) Au (g/t)	3.51 1.49	Co, Ag, Mo, Bi, Te, Se, Hg, Sn, W	Mineralisation occurs mainly in silicified zones at the contact between psammite & iron stone
Eloise	3.2	Cu (%) Au (g/t) Ag (g/t)	5.8 1.5 19	Co, Ni, Zn, As, Bi	Veins, stockwork veins, massive sulphide
HYBRID MAGMATIC - NON-MAGMATIC					
Olympic Dam	2320	Cu (%) Au (g/t) Ag (g/t) U_3O_8 (kg/t)	1.3 0.5 2.9 0.4	Co, REE (dominantly La & Ce), Ni, As	Disseminations, veinlets & fragments within bx zones, primarily within bx matrix
Aitik	800	Cu (%) Au (g/t) Ag (g/t)	0.3 0.2 2	Mo	Disseminations & veins
Candelaria	470	Cu (%) Au (g/t) Ag (g/t)	0.95 0.22 3.1	Zn, Mo, As, LREE	Vein, bx hosted, mantos, overprints Mt replacement bodies
Salobo	450	Cu (%) Au (g/t)	1.15 0.5	Ag, U, Co, Mo, F, LREE	Lenses, veins
Ernest Henry	166	Cu (%) Au (g/t)	1.1 0.54	Co, Mo, U, REE, F, Mn, As, Ba	In bx
NON-MAGMATIC END MEMBER					
Wernecke Bx	Slab: 20	Cu (%)	0.35	U, Co, Mo	Disseminations, veins, bx infill
Tennant Creek	West Peko: 3.2 Eldorado: 0.0292	Cu (%) Au (g/t) Ag (g/t) Bi (%) Au (g/t)	4 3.5 14 0.2 20.8	Bi	Massive & vein mineralisation overprinting ironstone
Redbank	Bluff: 2 Sandy Flat: 1.5	Cu (%) Cu (%)	1.66 2	Pb, Zn, REE	Breccia infill, veins, disseminations

Table 2 Tectonic setting, main host rocks, confining structure(s) and age of mineralisation for selected IOCG deposits. References and abbreviations as in Table 1. ** *The tectonic settings for most IOCG districts are poorly understood, even in areas that host well studied deposits such as Olympic Dam.*

Deposit	Tectonic setting**	Main host rocks	Confining structure(s)	Age of mineralization (Ma)	Coeval intrusions
MAGMATIC END MEMBER					
Lightning Ck	Intracratonic basin associated with high heat flow & plutonism	*ca* . 1540-1500 intrusive rocks	-	Coeval with late stage sills	Yes
Osborne		Feldspathic psammite & Mt-Qz iron stone of the Soldiers Cap Group of CS 3 (*ca* . 1670-1600 Ma)	Fault bends	*ca* . 1595 (Ar-Ar, Hb,Bt; U-Pb, titanite; Re-Os, Moly)	?
Eloise		Meta-arkose, schist, amphibolite of the Soldiers Cap Group of CS 3 (*ca* . 1670-1600 Ma)	Shear zones	*ca* . 1536-1512 (Ar-Ar, Bt, Hb)	Inferred
HYBRID MAGMATIC - NON-MAGMATIC					
Olympic Dam	Anorogenic intracontinental environment above a mantle plume; or arc - back-arc	Granite & felsic, mafic & ultramafic volcanic rocks of the *ca* . 1590 Ma Hiltaba Suite/Gawler Range volcanics	Dilational zone in regional-scale fault	*ca.* 1590	Yes
Aitik	Volcanic arcs-back arc basins above a subduction zone	*ca* . 1910-1880 Ma intermediate to felsic metavolcanic rocks	Fault/shear zones	*ca* . 1870	Yes
Candelaria	Arc - back-arc	Early Cretaceous intrusive, volcanic, volcaniclastic & sedimentary rocks	Intersection of shear zone & faults with lithologic contact	Oxide: *ca* . 116-114; copper sulphide: *ca* . 112-110	Yes
Salobo	Continental rift	Metagreywacke & amphibolite of the *ca* . 2750 Ma Itacaiúnas Super Group	Shear zone	*ca* . 2500 (Re-Os, Pb-Pb)	Yes
Ernest Henry	Intracratonic basin associated with high heat flow & plutonism	Brecciated, altered, intermediate to felsic *ca* . 1740 Ma volcanic rocks of CS 2 (*ca* . 1780-?1720 Ma)	Shear zones	*ca* . 1510-1500 (Ar-Ar, Bt)	Yes
NON-MAGMATIC END MEMBER					
Wernecke Breccia	Rifted continent	> *ca* . 1710 Ma meta-ss, siltstone, dlst, lst & evaporites of the WSG	Shear zones, faults, fold axes	> *ca.* 1860 & ≤ *ca* . 1830	No
Tennant Creek	Pull apart sedimentary basin	*ca* . 1860 Ma Warramunga Formation	Iron stone in shear zones & Fold axes	-	?
Redbank	Rifted continent	Middle Proterozoic Tawallah Group, in part ca. 1575 ± 120 Ma	Faults	-	?

Table 3: Regional and ore-related alteration types for selected IOCG deposits. References and abbreviations as in Table 1. Main copper minerals in the ore stage are shown in brackets.

Deposit	Regional alteration	Dominant IOCG-related mineralisation		
		Early	Main	Late
MAGMATIC END MEMBER				
Lightning Ck	Sodic-calcic	Ca-Fe ± Na	Ca ± Cl	-
Osborne	Na, Ca, Fe, Si	Na, Ca, Fe, Si	Na, Ca, Fe, Si	-
Eloise	Pervasive albitisation	Hb, Bt, Qz veins & alteration	Qz, Cc, Act/Hb, Cl, Bt, Musc, Ksp	Cl, Ksp, Sd-Ht, Cc veins; silicification & Cl-Cc veins; Py-Qz-adularia veins
HYBRID MAGMATIC - NON-MAGMATIC				
Olympic Dam	Weak pervasive Ht, Ser, & Cl.	Mt ± Ht, Cl, Ser, Sd	Intense Ht & Cl is assoc. with minz. in the lower part of the deposit; Ser & silica predominates in the upper part	Ht ± Qz ± Bar
Aitik	Scapolite, Ab ± Tour	-	Bt and Ser in the ore zone; Ksp and Ep in fault zones	Ser/musc
Candelaria	Pervasive albitization	Bt-Qz-Mt ± Ksp	Calcic amphibole-Ab ± Ksp	Ep-Cl; Ht-Cc-Cpy; Anhy & Cc-Cl
Salobo	Na, K	Mt, Ht	Ksp, Bt	Calcic; Cl
Ernest Henry	Na-Ca	Diss Bt-Mt; Gt-Ksp-Bt.	Ksp-Ht	Dominantly Cc-Dt; minor Qz-Bt-Act-Py-Mt-± Gt ± Cpy veins and bx
NON-MAGMATIC END MEMBER				
Wernecke Breccia	Greenschist facies mm	Sodic ± potassic; potassic ± sodic; local pervasive Bt; local Mt-Ank	Sodic ± potassic; potassic ± sodic; Ca; local Ser	Cc or Dt-Ank or Bar ± Sd ± Ank-Dt; local overprinting Cl-Mt
Tennant Ck	Weakly mm	Mt-Ht-Qz ± Cl ironstone	Cl ± stilpnomelane ± talc ± Sd ± Cc (reduced end member); Cl-Ser-Ht (oxidised end member)	-
Redbank	Pervasive K	Cl-Ht-Ksp	Dt	-

Table 4: Fluid temperature, salinity, composition and source plus precipitation mechanisms for selected IOCG deposits. References and abbreviations as in Table 1.

Deposit	Phase	Temperature (°C)	Salinity (wt. % NaCl eq)	Fluid source(s)	Precipitation mechanism(s)
MAGMATIC END MEMBER					
Lightning Creek	Na-Ca alteration	> 500	-	Magmatic	Dec. in T & St; fluid mixing
	Quartz-Mt veins	> 500	33 - 55	Magmatic	
	Cc±Cl±Py±Cpy	< 200	15 - 28	Magmatic + meteoric	
Osborne	Pre-minz silica flooding	> 450	60 - 70	-	Dec. in T & St & inc. in pH
	Mineralisation	~ 300	20 - 37	Magmatic &/or retrograde mm	
Eloise	Pre-minz Hb-Bt altn	450 - 600	32 - 68	? Magmatic	Dec. in T & St, inc. in pH & dilution due to fluid mixing; sulphidation of Fe-silicates
	Pre-minz Ab altn	400 - 500	> 26	? Magmatic	
	Mineralisation	200 - 450	30 - 47	Magmatic	
	Post-mineralisation	137 - 258	29 - 35	?Magmatic mixed with meteoric	
HYBRID MAGMATIC - NON-MAGMATIC					
Olympic Dam	Early Mt & Sd	~ 400	?31 - 42	Magmatic or deeply circulating water	Fluid mixing; superimposed hot & cooler fluids; cooling
	Ore formation (Ht)	200-300	< 24	Surficial/connate	
	Ft & Qz with Bor & Cct	Th = avg 240	-	-	
	Ft & Qz with Cpy	Th = avg 160	-	-	
Aitik	Cpy	140 - 373	31 - 37	Magmatic ± evaporitic	?Fluid mixing
	Bor	100 - 222	18 - 27		
Candelaria	Bt-Qz-Mt altn	500 - 600	-		Cooling ± fluid mixing
	Cu-Au	330 - 440	> 26	Magmatic ± non Magmatic	
	Late Cc	≤ 236	-		
Salobo	-	-	-	Magmatic + connate + more oxidized fluid	Fluid mixing
Ernest Henry	Ore fluid	350-450	> 26	Magmatic + ?	Fluid mixing &/or cooling
NON-MAGMATIC END MEMBER					
Wernecke Bx	Ore fluid	185 - 350	24 - 42	Formation/mm water	? Cooling, ? fluid mixing
Tennant Creek	West Peko: ore fluid	300 - 340	3 to 10 (low)	Mm/formation water	Reaction of reducing fluid with ironstone
	Eldorado: ore fluid	~ 300	low to moderate	Mm/formation water + ?	Fluid mixing in presence of iron stone
Redbank	Carbonate	150 - 300	-	Formation water ± sea water	Cooling, ? fluid mixing

APPENDIX I

Results of microprobe analyses

JCU #	Sample #	SiO_2	TiO_2	Al_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	Cl	TOTAL	Meionite	Marialite
Slab - metaevaporite-related scapolite													(Atomic %)	
70569	band 1 outer edge	55.70	0.00	22.41	0.03	0.03	0.00	6.86	1.60	0.65	3.26	97.15	30.44	69.56
70569	band 1 middle	55.90	0.00	22.22	0.03	0.02	0.00	6.85	1.61	0.68	3.21	98.41	27.47	72.53
70569	band 1 middle	55.74	0.00	22.13	0.06	0.01	0.00	6.59	9.41	0.45	3.19	97.59	27.43	72.57
70569	band 1 middle	55.39	0.03	22.39	0.00	0.00	0.00	7.00	9.15	0.48	3.12	97.55	29.08	70.92
70569	band 1 middle	55.73	0.00	22.03	0.02	0.03	0.00	7.13	9.36	0.44	2.90	97.63	29.05	70.95
70569	band 1 middle	56.37	0.02	21.52	0.09	0.00	0.00	6.12	9.84	0.56	3.26	97.78	25.14	74.86
70569	band 1 middle	55.84	0.02	22.20	0.02	0.04	0.00	6.67	9.67	0.50	3.17	98.13	27.01	72.99
70569	band 1 middle	56.15	0.00	21.79	0.05	0.04	0.00	6.31	9.60	0.51	3.28	97.73	26.09	73.91
70569	band 1 middle	55.92	0.00	22.18	0.05	0.00	0.00	6.79	9.63	0.60	3.09	98.25	27.34	72.66
70569	band 1 middle	56.31	0.00	22.23	0.04	0.02	0.00	6.54	9.77	0.53	3.23	98.67	26.42	73.58
70569	band 1 middle	57.33	0.01	21.53	0.05	0.00	0.00	5.55	10.24	0.59	3.46	98.77	22.55	77.45
70569	band 1 middle	56.58	0.03	21.96	0.02	0.00	0.00	6.54	9.85	0.50	3.27	98.76	26.33	73.67
70569	band 1 middle	55.62	0.00	21.14	0.04	0.00	0.00	6.06	9.61	0.48	3.25	96.21	25.33	74.67
70569	band 1 inner edge	55.46	0.00	21.28	0.07	0.00	0.00	6.22	9.63	0.45	3.26	96.37	25.89	74.11
70569	band 1 inner edge	55.21	0.01	21.31	0.05	0.00	0.00	5.92	9.78	0.47	3.34	96.09	24.62	75.38
70569	band 1 inner edge	57.02	0.00	21.82	0.03	0.00	0.00	5.90	7.94	0.55	3.42	96.68	28.26	71.74
70569	band 1 inner edge	55.94	0.03	22.08	0.05	0.04	0.00	6.58	9.48	0.49	3.19	97.88	27.23	72.77
70569	band 1 inner edge	55.43	0.00	22.26	0.07	0.02	0.00	7.04	9.48	0.47	3.10	97.87	28.60	71.40
70569	band 1 inner edge	56.84	0.00	21.85	0.01	0.02	0.00	5.91	9.87	0.73	3.44	98.68	24.01	75.99
70569	band 1 inner edge	56.70	0.00	21.84	0.07	0.00	0.00	6.08	9.85	0.54	3.34	98.42	24.93	75.07
70569	band 1 inner edge	56.08	0.00	21.88	0.06	0.01	0.00	6.92	9.68	0.50	3.17	98.30	27.77	72.23
70569	band 1 inner edge	56.57	0.00	22.02	0.04	0.00	0.00	6.30	9.96	0.55	3.31	98.75	25.32	74.68
70569	band 2 outer edge	55.54	0.03	21.38	0.03	0.01	0.00	5.85	9.60	0.59	3.37	96.39	24.59	75.41
70569	band 2 outer edge	55.39	0.00	21.48	0.03	0.00	0.00	6.19	9.56	0.53	3.34	96.52	25.75	74.25
70569	band 2 outer edge	55.07	0.00	21.92	0.04	0.00	0.00	6.88	9.32	0.60	3.25	97.09	28.23	71.77
70569	band 2 outer edge	54.61	0.00	21.92	0.02	0.02	0.00	7.02	9.44	0.46	3.17	96.66	28.53	71.47
70569	band 2 outer edge	55.05	0.00	21.77	0.04	0.03	0.00	6.65	9.58	0.48	3.31	96.91	27.17	72.83
70569	band 2 outer edge	55.44	0.00	21.59	0.04	0.03	0.00	6.33	9.87	0.46	3.24	97.00	25.69	74.31
70569	band 2 outer edge	56.30	0.00	21.12	0.04	0.00	0.00	5.68	10.04	0.55	3.49	97.23	23.28	76.72
70569	band 2 outer edge	55.58	0.01	21.54	0.00	0.02	0.00	5.82	9.85	1.21	3.46	97.48	23.20	76.80
70569	band 2 outer edge	55.81	0.02	21.44	0.00	0.00	0.00	5.84	9.67	1.01	3.44	97.23	23.84	76.16

JCU #	Sample #	SiO_2	TiO_2	Al_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	Cl	TOTAL	Meionite	Marialite
Slab - metaevaporite-related scapolite													(Atomic %)	
70569	band 2 outer edge	55.58	0.00	21.68	0.02	0.00	0.00	6.61	9.30	0.77	3.19	97.15	27.18	72.82
70569	band 2 inner edge	55.41	0.00	21.57	0.05	0.01	0.00	6.27	9.40	0.48	3.18	96.37	26.40	73.60
70569	band 2 inner edge	55.73	0.01	21.67	0.05	0.02	0.00	6.42	9.53	0.47	3.28	97.18	26.63	73.37
70569	band 2 inner edge	55.64	0.00	21.80	0.00	0.02	0.00	6.50	9.51	0.52	3.31	97.30	26.72	73.28
70569	band 2 inner edge	56.13	0.00	21.54	0.02	0.00	0.00	5.98	9.75	0.49	3.29	97.20	24.75	75.25
70569	band 2 inner edge	56.37	0.00	21.20	0.06	0.00	0.00	5.84	10.21	0.53	3.47	97.68	23.55	76.45
70569	band 2 inner edge	55.75	0.00	21.60	0.00	0.00	0.00	6.57	9.75	0.45	3.23	97.35	26.55	73.45
70569	band 2 inner edge	56.53	0.00	21.42	0.02	0.03	0.00	5.76	9.85	0.47	3.38	97.46	23.89	76.11
70569	band 2 inner edge	55.02	0.00	22.28	0.00	0.01	0.00	7.04	9.39	0.55	3.21	97.51	28.52	71.48
70569	band 2 inner edge	56.52	0.00	21.41	0.04	0.04	0.00	5.62	9.90	0.69	3.40	97.62	23.18	76.82
70569	band 2 inner edge	56.64	0.00	21.68	0.02	0.04	0.00	5.94	10.01	0.58	3.37	98.29	24.05	75.95
70569	band 3 outer edge	56.18	0.00	21.85	0.00	0.00	0.00	6.50	9.65	0.51	3.24	97.93	26.45	73.55
70569	band 3 outer edge	56.16	0.04	21.71	0.05	0.00	0.00	6.01	10.08	0.57	3.41	98.03	24.30	75.70
70569	band 3 outer edge	56.19	0.00	21.92	0.03	0.04	0.00	6.55	9.74	0.46	3.28	98.20	26.56	73.44
70569	band 3 outer edge	56.15	0.00	21.68	0.04	0.00	0.00	6.40	9.82	0.49	3.22	97.80	25.93	74.07
70569	band 3 outer edge	55.86	0.00	22.12	0.06	0.02	0.00	6.98	9.49	0.48	3.15	98.16	28.38	71.62
70569	band 3 outer edge	56.81	0.00	21.34	0.08	0.01	0.00	6.06	10.17	0.53	3.35	98.35	24.35	75.65
70569	band 3 outer edge	56.95	0.01	21.80	0.01	0.00	0.00	6.04	10.09	0.52	3.37	98.80	24.29	75.71
70569	band 3 outer edge	55.88	0.02	22.22	0.07	0.03	0.01	6.86	9.63	0.54	3.23	98.49	27.82	72.18
70569	band 3 outer edge	56.17	0.00	22.09	0.06	0.00	0.00	6.70	9.69	0.48	3.23	98.42	27.14	72.86
70569	band 3 inner edge	56.47	0.00	21.70	0.02	0.00	0.00	6.26	9.75	0.55	3.31	98.07	25.54	74.46
70569	band 3 inner edge	56.69	0.00	21.96	0.07	0.00	0.00	6.30	9.78	0.56	3.30	98.66	25.71	74.29
70569	band 3 inner edge	56.93	0.01	21.75	0.02	0.03	0.00	5.97	9.99	0.58	3.35	98.62	24.18	75.82
70569	band 3 inner edge	55.53	0.00	22.54	0.03	0.00	0.00	7.13	9.46	0.55	3.16	98.41	28.70	71.30
70569	band 3 inner edge	57.05	0.02	21.59	0.06	0.00	0.00	5.87	10.24	0.65	3.49	98.97	23.50	76.50
70569	band 3 inner edge	57.73	0.00	21.42	0.02	0.02	0.00	5.34	9.96	0.68	3.55	98.72	22.12	77.88
70569	band 3 inner edge	57.50	0.02	21.42	0.01	0.01	0.00	5.61	10.23	0.70	3.43	98.92	22.55	77.45
70569	band 3 inner edge	56.29	0.01	22.00	0.08	0.04	0.00	6.86	9.79	0.53	3.14	98.73	27.38	72.62
	Average	56.08	0.01	21.78	0.04	0.01	0.00	6.34	9.43	0.56	3.29	97.77	25.98	74.02
	Maximum	57.73	0.04	22.54	0.09	0.04	0.01	7.13	10.24	1.21	3.55	98.97	30.44	77.88
	Minimum	54.61	0.00	21.12	0.00	0.00	0.00	5.34	1.60	0.44	2.90	96.09	22.12	69.56

JCU #	Sample #	SiO_2	TiO_2	Al_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	Cl	TOTAL
Slab - metaevaporite-related biotite												
70287	SB94-4-79.6-1 biot 1	39.93	1.48	14.73	14.18	0.43	14.59	0.37	0.00	10.12	0.46	96.30
70287	SB94-4-79.6-1 biot 2	37.95	1.33	14.76	12.97	0.11	14.40	0.15	0.08	10.00	0.62	92.37
70287	SB94-4-79.6-1 biot 3	39.27	1.53	14.79	13.95	0.17	14.14	0.24	0.00	10.37	0.55	95.02
70219	SB94-1-57.43 circle 1 biot 1	39.66	2.44	13.23	13.43	0.07	14.20	0.14	0.00	10.24	0.72	94.13
70219	SB94-1-57.43 circle 1 biot 2	39.65	1.98	13.55	13.31	0.04	14.50	0.00	0.06	10.47	0.57	94.15
70219	SB94-1-57.43 circle 1 biot 3	40.64	2.35	13.83	14.41	0.28	14.22	0.23	0.61	10.32	0.61	97.49
70219	SB94-1-57.43 circle 1 biot 3	38.68	2.04	14.48	14.90	0.04	13.04	0.31	0.00	10.40	0.56	94.44
70219	SB94-1-57.43 circle 2 biot 1	37.27	1.96	13.29	14.94	0.33	12.76	0.04	0.04	9.96	0.61	91.21
70219	SB94-1-57.43 circle 2 biot 2	37.50	2.57	13.64	15.53	0.22	12.81	0.13	0.00	10.17	0.63	93.21
70219	SB94-1-57.43 circle 2 biot 3	38.63	2.35	13.68	15.21	0.20	12.86	0.05	0.00	10.63	0.56	94.17
	Maximum	40.64	2.57	14.79	15.53	0.43	14.59	0.37	0.61	10.63	0.72	97.49
	Minimum	37.27	1.33	13.23	12.97	0.04	12.76	0.00	0.00	9.96	0.46	91.21
	Average	38.92	2.00	14.00	14.28	0.19	13.75	0.17	0.08	10.27	0.59	94.25

JCU #	Sample #	Si	Ti	Al	Fe	Mn	Mg	Ca	Na	K	CL	Na/Al	Ca+Na+K	Albite	Kspar	Anorthite
ALBITE																
Igor																
70922	JH02-8-6 circle 1 albite 1	6.06	0.00	2.58	0.00	0.00	0.00	0.02	7.60	0.04	0.00	2.94	7.66	0.99	0.01	0.00
70922	JH02-8-6 circle 1 feldspar 1	6.01	0.00	2.63	0.05	0.00	0.10	0.07	7.28	0.00	0.00	2.77	7.36	0.99	0.00	0.01
70922	JH02-8-6 circle 1 feldspar 2	6.10	0.00	2.50	0.00	0.00	0.00	0.00	7.84	0.00	0.02	3.14	7.84	1.00	0.00	0.00
70922	JH02-8-6 circle 1 feldspar 3	6.07	0.03	2.50	0.03	0.00	0.00	0.06	7.39	0.03	0.04	2.95	7.49	0.99	0.00	0.01
70922	JH02-8-6 circle 1 feldspar 4	6.11	0.00	2.49	0.02	0.00	0.00	0.02	7.52	0.03	0.01	3.02	7.57	0.99	0.00	0.00
70922	JH02-8-6 circle 1 Kspar 4	6.06	0.00	2.58	0.00	0.00	0.00	0.02	7.60	0.04	0.00	2.94	7.66	0.99	0.01	0.00
70922	JH02-8-6 circle 2 albite 1	6.04	0.01	2.54	0.02	0.01	0.07	0.06	7.69	0.01	0.02	3.03	7.77	0.99	0.00	0.01
70922	JH02-8-6 circle 2 albite 2	6.11	0.00	2.56	0.05	0.02	0.00	0.04	6.73	0.05	0.03	2.63	6.82	0.99	0.01	0.01
Slab																
70233	SB94-1-128.6 circle 1 albite 1	6.12	0.01	2.50	0.04	0.03	0.06	0.06	6.47	0.01	0.00	2.58	6.54	0.99	0.00	0.01
70233	SB94-1-128.6 circle 1 albite 2	6.04	0.01	2.41	0.00	0.00	0.13	0.55	6.70	0.03	0.02	2.78	7.28	0.92	0.00	0.08
70247	SB94-1-190.90 circle 1 albite 1	6.04	0.00	2.61	0.03	0.00	0.00	0.03	7.58	0.01	0.02	2.90	7.62	0.99	0.00	0.00
70247	SB94-1-190.90 circle 2 albite 1	2.24	0.00	1.01	0.01	0.01	0.00	0.03	2.76	0.00	0.00	2.73	2.80	0.99	0.00	0.01
70247	SB94-1-190.90 circle 2 albite 1	5.98	0.00	2.70	0.03	0.04	0.00	0.07	7.37	0.01	0.00	2.73	7.45	0.99	0.00	0.01
70247	SB94-1-190.90 circle 2 albite 2	6.05	0.01	2.62	0.00	0.00	0.03	0.03	7.23	0.00	0.00	2.76	7.26	1.00	0.00	0.00
70247	SB94-1-190.90 circle 2 albite 3	6.09	0.00	2.60	0.00	0.00	0.00	0.03	7.02	0.00	0.00	2.70	7.05	1.00	0.00	0.00
70247	SB94-1-190.90 circle 2 albite 4	6.05	0.00	2.63	0.00	0.02	0.00	0.07	7.10	0.01	0.00	2.69	7.18	0.99	0.00	0.01
70255	SB94-1-332.5 circle 2 albite 1	6.00	0.00	2.69	0.02	0.00	0.05	0.06	7.25	0.02	0.00	2.69	7.33	0.99	0.00	0.01
70255	SB94-1-332.5 circle 2 albite 2	6.06	0.00	2.64	0.00	0.00	0.02	0.05	6.80	0.05	0.00	2.58	6.91	0.99	0.01	0.01
70255	SB94-1-332.5 circle 2 albite 3	6.02	0.00	2.65	0.00	0.00	0.00	0.09	7.39	0.03	0.00	2.79	7.51	0.98	0.00	0.01
70257	SB94-1-345.1 circle 1 albite 1	6.03	0.00	2.63	0.04	0.00	0.00	0.13	7.08	0.04	0.00	2.70	7.25	0.98	0.01	0.02
70257	SB94-1-345.1 circle 1 albite 2	6.01	0.00	2.69	0.00	0.00	0.00	0.05	7.45	0.02	0.00	2.77	7.53	0.99	0.00	0.01
70257	SB94-1-345.1 circle 2 albite `	5.92	0.00	2.77	0.00	0.05	0.11	0.09	7.29	0.02	0.02	2.64	7.40	0.98	0.00	0.01
70257	SB94-1-345.1 circle 1 albite 4 2nd try	6.00	0.00	2.66	0.00	0.02	0.09	0.09	7.31	0.03	0.01	2.75	7.43	0.98	0.00	0.01
70257	SB94-1-345.1 circle 1 albite 5 2nd try	6.00	0.00	2.67	0.03	0.00	0.07	0.07	7.14	0.03	0.00	2.68	7.24	0.99	0.00	0.01
70257	SB94-1-345.1 circle 1 albite 6 2nd try	6.03	0.00	2.63	0.02	0.03	0.00	0.11	7.21	0.02	0.03	2.75	7.35	0.98	0.00	0.02
70257	SB94-1-345.1 circle 2 albite 1	6.05	0.00	2.53	0.00	0.00	0.02	0.01	8.16	0.03	0.00	3.22	8.20	1.00	0.00	0.00
70257	SB94-1-345.1 circle 2 albite 3 2nd try	6.01	0.00	2.67	0.00	0.00	0.05	0.08	7.28	0.03	0.00	2.73	7.40	0.98	0.00	0.01
70221	SB94-1-59.5 circle 1 albite 1	6.03	0.00	2.62	0.00	0.01	0.00	0.07	7.49	0.03	0.01	2.85	7.58	0.99	0.00	0.01

JCU #	Sample #	Si	Ti	Al	Fe	Mn	Mg	Ca	Na	K	CL	Na/Al	Ca+Na+K	Albite	Kspar	Anorthite
70221	SB94-1-59.5 circle 1 albite 2	6.00	0.00	2.68	0.00	0.00	0.05	0.06	7.49	0.01	0.00	2.80	7.57	0.99	0.00	0.01
70221	SB94-1-59.5 circle 1 albite 3	6.36	0.01	2.16	0.02	0.01	0.10	0.03	6.12	0.00	0.02	2.84	6.15	1.00	0.00	0.00
70287	SB94-4-79.6 circle 4 albite 2	6.05	0.00	2.64	0.01	0.00	0.00	0.12	6.93	0.00	0.00	2.63	7.05	0.98	0.00	0.02
70287	SB94-4-79.6 circle 4 albite 3	5.99	0.00	2.68	0.00	0.03	0.16	0.03	7.14	0.02	0.03	2.67	7.19	0.99	0.00	0.00
70287	SB94-4-79.6 circle 4 albite1	6.01	0.00	2.64	0.00	0.03	0.04	0.09	7.40	0.00	0.00	2.80	7.49	0.99	0.00	0.01
70378	SB97-10-19.4 circle 1 albite 1	6.07	0.00	2.60	0.03	0.00	0.04	0.04	6.91	0.02	0.05	2.66	6.98	0.99	0.00	0.01
70378	SB97-10-19.4 circle 1 albite 2	5.97	0.01	2.68	0.02	0.00	0.04	0.26	6.97	0.01	0.02	2.60	7.23	0.96	0.00	0.04
70378	SB97-10-19.4 circle 1 albite 3	6.02	0.00	2.60	0.02	0.00	0.04	0.18	7.30	0.02	0.03	2.81	7.49	0.97	0.00	0.02
70378	SB97-10-19.4 circle 2 albite 1	6.00	0.01	2.61	0.00	0.00	0.01	0.24	7.33	0.03	0.02	2.80	7.60	0.97	0.00	0.03
70378	SB97-10-19.4 circle 2 albite 2	6.02	0.01	2.65	0.00	0.01	0.03	0.04	7.37	0.01	0.07	2.78	7.42	0.99	0.00	0.01
70378	SB97-10-19.4 circle 2 albite 3	6.02	0.00	2.63	0.01	0.01	0.00	0.06	7.57	0.02	0.04	2.88	7.66	0.99	0.00	0.01
70378	SB97-10-19.4 circle 3 albite 1	6.00	0.00	2.70	0.00	0.00	0.02	0.09	7.17	0.00	0.00	2.65	7.26	0.99	0.00	0.01
70378	SB97-10-19.4 circle 3 albite 2	6.03	0.00	2.63	0.05	0.00	0.03	0.03	7.33	0.01	0.04	2.78	7.37	0.99	0.00	0.00
70378	SB97-10-19.4 circle 3 albite 3	6.13	0.00	2.51	0.00	0.00	0.00	0.11	6.86	0.01	0.00	2.73	6.98	0.98	0.00	0.02
70378	SB97-10-19.4 circle 3 albite 4	5.97	0.00	2.69	0.04	0.01	0.05	0.08	7.45	0.03	0.03	2.77	7.56	0.99	0.00	0.01
70378	SB97-10-19.4 circle 5 albite 1	5.93	0.01	2.74	0.00	0.01	0.07	0.14	7.38	0.01	0.00	2.69	7.53	0.98	0.00	0.02
70378	SB97-10-19.4 circle 5 albite 2	6.12	0.00	2.51	0.03	0.00	0.00	0.15	6.75	0.00	0.02	2.69	6.90	0.98	0.00	0.02
70378	SB97-10-19.4 circle 5 albite 3	6.43	0.01	2.03	0.00	0.00	0.12	0.08	5.95	0.00	0.03	2.93	6.03	0.99	0.00	0.01
70393	SB97-19-21.45 circle 1 albite 1	6.18	0.00	2.45	0.01	0.00	0.05	0.11	6.40	0.00	0.02	2.61	6.50	0.98	0.00	0.02
70393	SB97-19-21.45 circle 1 albite 2	7.34	0.00	0.84	0.00	0.00	0.05	0.05	2.53	0.00	0.00	3.00	2.57	0.98	0.00	0.02
70393	SB97-19-21.45 circle 1 albite 3	6.00	0.00	2.65	0.02	0.00	0.08	0.09	7.37	0.02	0.01	2.78	7.49	0.98	0.00	0.01
70393	SB97-19-21.45 circle 1 albite 4	6.02	0.01	2.66	0.04	0.02	0.04	0.02	7.12	0.01	0.02	2.67	7.15	1.00	0.00	0.00
70332	SB97-9-58,65 circle 1 albite 1	6.07	0.00	2.55	0.01	0.00	0.04	0.11	7.25	0.00	0.09	2.85	7.36	0.98	0.00	0.02
70332	SB97-9-58,65 circle 1 albite 2	6.06	0.01	2.63	0.02	0.00	0.00	0.00	7.09	0.04	0.00	2.69	7.13	0.99	0.01	0.00
70332	SB97-9-58,65 circle 1 albite 3	6.06	0.00	2.61	0.03	0.00	0.03	0.00	7.31	0.00	0.02	2.80	7.31	1.00	0.00	0.00
70332	SB97-9-58,65 circle 1 albite 4	5.99	0.00	2.67	0.05	0.00	0.12	0.04	7.35	0.00	0.00	2.76	7.39	0.99	0.00	0.01
70332	SB97-9-58,65 circle 2 albite 1	6.01	0.01	2.62	0.01	0.00	0.05	0.04	7.76	0.01	0.00	2.96	7.81	0.99	0.00	0.01
70332	SB97-9-58,65 circle 2 albite 2	6.08	0.00	2.54	0.03	0.00	0.05	0.01	7.37	0.03	0.02	2.90	7.41	1.00	0.00	0.00
70332	SB97-9-58,65 circle 2 albite 3	6.03	0.00	2.60	0.02	0.03	0.08	0.00	7.48	0.01	0.02	2.88	7.50	1.00	0.00	0.00
70332	SB97-9-58,65 circle 2 albite 4	6.57	0.01	1.85	0.08	0.01	0.03	0.01	5.65	0.02	0.00	3.05	5.67	1.00	0.00	0.00
70332	SB97-9-58,65 circle 5 albite 1	6.02	0.00	2.65	0.00	0.01	0.06	0.00	7.51	0.02	0.02	2.83	7.52	1.00	0.00	0.00
70332	SB97-9-58,65 circle 5 albite 2	6.08	0.01	2.58	0.01	0.00	0.02	0.00	7.18	0.01	0.09	2.78	7.19	1.00	0.00	0.00

JCU #	Sample #	Si	Ti	Al	Fe	Mn	Mg	Ca	Na	K	CL	Na/Al	Ca+Na+K	Albite	Kspar	Anorthite
70332	SB97-9-58.65 circle 1 albite 1	6.03	0.01	2.64	0.00	0.00	0.05	0.02	7.44	0.00	0.01	2.82	7.46	1.00	0.00	0.00
70332	SB97-9-58.65 circle 1 albite 2	6.01	0.00	2.60	0.00	0.04	0.09	0.03	7.73	0.03	0.05	2.97	7.78	0.99	0.00	0.00
70332	SB97-9-58.65 circle 1 albite 3	6.00	0.00	2.66	0.01	0.00	0.02	0.04	7.70	0.02	0.00	2.90	7.76	0.99	0.00	0.00
70332	SB97-9-58.65 circle 1 albite 4	6.04	0.00	2.58	0.00	0.00	0.00	0.00	8.23	0.00	0.00	3.20	8.23	1.00	0.00	0.00
70332	SB97-9-58.65 circle 2 albite 1	6.02	0.00	2.65	0.00	0.01	0.03	0.03	7.51	0.01	0.00	2.83	7.56	0.99	0.00	0.00
70332	SB97-9-58.65 circle 2 albite 2	6.01	0.00	2.64	0.01	0.00	0.07	0.05	7.61	0.03	0.03	2.89	7.69	0.99	0.00	0.01
70332	SB97-9-58.65 circle 2 albite 2	6.01	0.00	2.64	0.01	0.00	0.07	0.05	7.61	0.03	0.03	2.89	7.69	0.99	0.00	0.01
70332	SB97-9-58.65 circle 2 albite 3	6.02	0.00	2.60	0.02	0.03	0.06	0.00	7.81	0.00	0.02	3.00	7.81	1.00	0.00	0.00
70332	SB97-9-58.65 circle 2 albite 4	6.04	0.00	2.61	0.01	0.00	0.05	0.01	7.59	0.00	0.01	2.91	7.60	1.00	0.00	0.00
70332	SB97-9-58.65 circle 5 albite 1	6.02	0.00	2.60	0.02	0.02	0.05	0.00	7.94	0.04	0.00	3.06	7.98	1.00	0.00	0.00
70332	SB97-9-58.65 circle 5 albite 2	6.02	0.00	2.64	0.03	0.00	0.12	0.02	7.22	0.00	0.02	2.73	7.24	1.00	0.00	0.00
70544	JH01-35-2 circle 1 albite 1	6.03	0.02	2.61	0.01	0.00	0.02	0.03	7.49	0.03	0.02	2.87	7.55	0.99	0.00	0.00
70544	JH01-35-2 circle 1 albite 2	6.08	0.00	2.53	0.00	0.00	0.00	0.03	7.71	0.00	0.01	3.05	7.74	1.00	0.00	0.00
70544	JH01-35-2 circle 2 albite 1	6.08	0.00	2.52	0.01	0.00	0.02	0.04	7.67	0.04	0.00	3.04	7.75	0.99	0.00	0.00
Hoover																
70686	HV94-1-695 circle 2 albite 1	6.09	0.00	2.50	0.04	0.00	0.03	0.06	7.57	0.02	0.00	3.02	7.64	0.99	0.00	0.01
70686	HV94-1-695 circle 2 albite 2	6.06	0.01	2.58	0.06	0.00	0.00	0.05	7.18	0.00	0.00	2.78	7.23	0.99	0.00	0.01
70686	HV94-1-695 circle 2 albite 3	6.05	0.00	2.61	0.00	0.00	0.00	0.06	7.44	0.01	0.01	2.85	7.50	0.99	0.00	0.01
70686	HV94-1-695 circle 3 albite 1	6.08	0.00	2.58	0.00	0.00	0.00	0.01	7.40	0.02	0.02	2.87	7.43	1.00	0.00	0.00
70686	HV94-1-695 circle 3 albite 2	6.06	0.01	2.56	0.01	0.01	0.00	0.05	7.64	0.01	0.03	2.99	7.70	0.99	0.00	0.01
70686	HV94-1-695 circle 3 albite 3	6.05	0.01	2.62	0.06	0.00	0.00	0.03	7.17	0.00	0.03	2.74	7.20	1.00	0.00	0.00
70686	HV94-1-695 circle 3 albite 4	6.07	0.01	2.58	0.04	0.00	0.08	0.03	7.03	0.00	0.03	2.73	7.06	1.00	0.00	0.00
70724	JH01-5-7A circle 2 albite 2	6.10	0.01	2.54	0.03	0.00	0.00	0.00	7.33	0.00	0.03	2.89	7.33	1.00	0.00	0.00
70727	JH01-6-1a circle 2 albite 1	5.99	0.00	2.66	0.00	0.00	0.04	0.02	7.92	0.00	0.05	2.98	7.94	1.00	0.00	0.00
70727	JH01-6-1a circle 2 albite 2	6.06	0.00	2.60	0.05	0.00	0.07	0.00	7.14	0.04	0.03	2.74	7.17	0.99	0.01	0.00
70727	JH01-6-1a circle 2 albite 3	6.08	0.00	2.61	0.00	0.01	0.02	0.02	7.00	0.00	0.08	2.68	7.02	1.00	0.00	0.00
70727	JH01-6-1a circle 3 albite 1	6.06	0.00	2.58	0.00	0.00	0.02	0.04	7.44	0.00	0.01	2.88	7.48	0.99	0.00	0.01
70727	JH01-6-1a circle 3 albite 2	6.01	0.00	2.64	0.00	0.02	0.12	0.02	7.30	0.03	0.02	2.77	7.36	0.99	0.00	0.00
70727	JH01-6-1a circle 3 albite 3	6.05	0.01	2.64	0.02	0.00	0.00	0.02	7.05	0.03	0.00	2.67	7.10	0.99	0.00	0.00
70727	JH01-6-1a circle 4 albite 1	6.00	0.00	2.67	0.00	0.02	0.09	0.00	7.58	0.03	0.01	2.84	7.61	1.00	0.00	0.00
70727	JH01-6-1a circle 4 albite 2	6.05	0.01	2.63	0.06	0.01	0.00	0.00	7.05	0.00	0.00	2.68	7.05	1.00	0.00	0.00
70727	JH01-6-1a circle 4 albite 3	6.03	0.00	2.62	0.00	0.03	0.10	0.00	7.32	0.01	0.01	2.80	7.33	1.00	0.00	0.00

JCU #	Sample #	Si	Ti	Al	Fe	Mn	Mg	Ca	Na	K	CL	Na/Al	Ca+Na+K	Albite	Kspar	Anorthite
70728	JH01-6-1b circle 1 albite 1	6.06	0.00	2.60	0.04	0.00	0.00	0.08	7.10	0.04	0.01	2.73	7.22	0.98	0.01	0.01
70728	JH01-6-1b circle 1 albite 2	6.03	0.00	2.65	0.03	0.00	0.01	0.05	7.18	0.02	0.00	2.71	7.25	0.99	0.00	0.01
70728	JH01-6-1b circle 1 albite 3	6.07	0.00	2.59	0.00	0.00	0.04	0.00	7.34	0.01	0.00	2.83	7.35	1.00	0.00	0.00
70728	JH01-6-1b circle 1 albite 3	6.07	0.00	2.59	0.00	0.00	0.04	0.00	7.34	0.01	0.00	2.83	7.35	1.00	0.00	0.00
70728	JH01-6-1b circle 1 albite 4	6.10	0.00	2.53	0.01	0.00	0.05	0.00	7.35	0.01	0.01	2.90	7.36	1.00	0.00	0.00
70728	JH01-6-1b circle 1 albite 5	6.10	0.00	2.56	0.04	0.01	0.00	0.02	7.01	0.02	0.00	2.74	7.05	0.99	0.00	0.00
70728	JH01-6-1b circle 1 albite 6	6.03	0.00	2.62	0.05	0.01	0.02	0.05	7.33	0.04	0.00	2.80	7.42	0.99	0.00	0.01
70728	JH01-6-1b circle 1 albite 7	6.02	0.00	2.66	0.00	0.00	0.04	0.07	7.26	0.01	0.00	2.73	7.34	0.99	0.00	0.01
70729	JH01-6-1c circle 1 albite 1	6.06	0.00	2.61	0.04	0.00	0.04	0.07	6.82	0.03	0.00	2.61	6.92	0.99	0.00	0.01
70729	JH01-6-1c circle 1 albite 2	6.02	0.01	2.60	0.05	0.00	0.10	0.04	7.41	0.00	0.03	2.85	7.45	0.99	0.00	0.01
70729	JH01-6-1c circle 1 albite 3	6.01	0.00	2.62	0.00	0.00	0.06	0.01	7.90	0.00	0.02	3.01	7.91	1.00	0.00	0.00
70729	JH01-6-1c circle 2 albite 1	6.05	0.00	2.62	0.03	0.00	0.03	0.05	7.15	0.00	0.03	2.73	7.20	0.99	0.00	0.01
70729	JH01-6-1c circle 2 albite 2	5.98	0.01	2.70	0.04	0.02	0.03	0.10	6.98	0.02	0.04	2.59	7.10	0.98	0.00	0.01
70729	JH01-6-1c circle 2 albite 2	5.98	0.01	2.70	0.04	0.02	0.03	0.10	6.98	0.02	0.04	2.59	7.10	0.98	0.00	0.01
70729	JH01-6-1c circle 2 albite 3	6.04	0.01	2.63	0.00	0.00	0.04	0.02	7.32	0.03	0.04	2.78	7.36	0.99	0.00	0.00
70729	JH01-6-1c circle 3 albite 1	6.02	0.00	2.64	0.01	0.02	0.00	0.07	7.43	0.00	0.00	2.81	7.50	0.99	0.00	0.01
70729	JH01-6-1c circle 3 albite 2	6.03	0.00	2.66	0.00	0.01	0.00	0.04	7.27	0.01	0.06	2.74	7.33	0.99	0.00	0.01
70729	JH01-6-1c circle 3 albite 3	6.06	0.00	2.60	0.03	0.00	0.03	0.05	7.17	0.00	0.01	2.76	7.22	0.99	0.00	0.01
70729	JH01-6-1c circle 5 albite 1	6.03	0.00	2.63	0.00	0.00	0.04	0.05	7.42	0.01	0.00	2.82	7.48	0.99	0.00	0.01
70729	JH01-6-1c circle 5 albite 2	6.12	0.00	2.58	0.00	0.00	0.00	0.01	6.87	0.00	0.01	2.66	6.88	1.00	0.00	0.00
70729	JH01-6-1c circle 5 albite 3	6.11	0.00	2.60	0.00	0.02	0.00	0.02	6.65	0.00	0.00	2.56	6.68	1.00	0.00	0.00
70734	JH01-6-3c-circle 1 albite 1	6.04	0.00	2.67	0.00	0.00	0.00	0.05	7.00	0.04	0.02	2.62	7.09	0.99	0.01	0.01
70734	JH01-6-3c-circle 1 albite 2	6.02	0.00	2.67	0.00	0.01	0.07	0.05	7.16	0.02	0.01	2.69	7.23	0.99	0.00	0.01
70734	JH01-6-3c-circle 1 albite 3	6.00	0.00	2.72	0.01	0.00	0.01	0.11	6.87	0.04	0.04	2.52	7.01	0.98	0.01	0.02
70737	JH01-6-5B-circle 1 albite 1	6.10	0.00	2.53	0.00	0.00	0.00	0.01	7.55	0.00	0.01	2.98	7.57	1.00	0.00	0.00
70737	JH01-6-5B-circle 1 albite 2	6.02	0.00	2.63	0.06	0.01	0.05	0.01	7.44	0.01	0.03	2.82	7.47	1.00	0.00	0.00
70737	JH01-6-5B-circle 1 albite 3	6.06	0.00	2.64	0.00	0.00	0.08	0.02	6.89	0.00	0.00	2.61	6.92	1.00	0.00	0.00
70748	JH01-7-13 circle 2 albite 1	6.07	0.01	2.65	0.00	0.01	0.02	0.04	6.63	0.00	0.02	2.50	6.67	0.99	0.00	0.01
70748	JH01-7-13 circle 2 albite 2	6.02	0.00	2.63	0.01	0.01	0.05	0.00	7.65	0.02	0.01	2.91	7.67	1.00	0.00	0.00
70748	JH01-7-13 circle 4 albite 1	6.02	0.01	2.64	0.01	0.00	0.08	0.03	7.29	0.00	0.00	2.76	7.33	0.99	0.00	0.00
70748	JH01-7-13 circle 4 albite 2	5.98	0.00	2.72	0.05	0.00	0.09	0.05	6.83	0.08	0.00	2.51	6.96	0.98	0.01	0.01
70748	JH01-7-13 circle 4 albite 3	6.05	0.00	2.64	0.00	0.03	0.06	0.02	7.07	0.00	0.00	2.67	7.08	1.00	0.00	0.00

JCU #	Sample #	Si	Ti	Al	Fe	Mn	Mg	Ca	Na	K	CL	Na/Al	Ca+Na+K	Albite	Kspar	Anorthite
70752	JH01-8-2 circle 1 albite 1	6.02	0.00	2.65	0.00	0.00	0.00	0.03	7.59	0.01	0.01	2.86	7.63	1.00	0.00	0.00
70752	JH01-8-2 circle 1 albite 2	6.03	0.01	2.62	0.00	0.02	0.05	0.03	7.34	0.04	0.00	2.81	7.41	0.99	0.01	0.00
70752	JH01-8-2 circle 1 albite 3	6.09	0.00	2.54	0.02	0.00	0.00	0.04	7.42	0.00	0.03	2.92	7.46	0.99	0.00	0.01
70752	JH01-8-2 circle 1 albite 4	5.98	0.01	2.66	0.01	0.00	0.00	0.00	8.16	0.00	0.00	3.06	8.16	1.00	0.00	0.00
70752	JH01-8-2 circle 1 albite 5	6.04	0.01	2.64	0.02	0.00	0.00	0.00	7.41	0.00	0.02	2.81	7.41	1.00	0.00	0.00
70766	JH01-9-11d circle 1 albite 1	6.23	0.00	2.29	0.01	0.00	0.00	0.04	7.43	0.01	0.02	3.24	7.49	0.99	0.00	0.01
70766	JH01-9-11d circle 1 albite 2	6.25	0.01	2.24	0.05	0.00	0.00	0.01	7.50	0.00	0.00	3.34	7.51	1.00	0.00	0.00
70766	JH01-9-11d circle 2 albite 1	6.14	0.00	2.45	0.02	0.00	0.00	0.00	7.63	0.00	0.01	3.11	7.63	1.00	0.00	0.00
K-FELDSPAR																
Igor																
70922	02JH-8-5 circle 1 Ksp 1	4.51	0.06	5.15	0.15	0.03	0.38	0.01	0.60	2.82	0.04	0.12	3.43	0.18	0.82	0.00
70922	02JH-8-5 circle 1 Ksp 2	4.59	0.05	5.10	0.16	0.01	0.29	0.00	0.36	2.82	0.03	0.07	3.18	0.11	0.89	0.00
70922	02JH-8-5 circle 1 Ksp 3	4.58	0.06	5.07	0.21	0.00	0.34	0.03	0.17	2.84	0.00	0.03	3.04	0.05	0.93	0.01
70922	02JH-8-5 circle 1 Ksp 4	4.60	0.03	5.14	0.15	0.01	0.29	0.01	0.26	2.79	0.03	0.05	3.06	0.09	0.91	0.00
70922	02JH-8-5 circle 1 Ksp 5	4.69	0.02	5.00	0.12	0.00	0.22	0.03	0.32	2.94	0.01	0.06	3.29	0.10	0.89	0.01
70923	JH02-8-6 circle 1 Kspar 2	6.01	0.00	2.55	0.02	0.03	0.04	0.04	0.11	4.15	0.00	0.04	4.30	0.03	0.96	0.01
70923	JH02-8-6 circle 1 Kspar 3	6.03	0.00	2.51	0.00	0.00	0.01	0.05	0.37	4.16	0.00	0.15	4.58	0.08	0.91	0.01
70923	JH02-8-6 circle 1 Kspar 4	6.02	0.02	2.51	0.01	0.00	0.00	0.03	0.53	4.09	0.01	0.21	4.64	0.11	0.88	0.01
Olympic																
71016	02JH-21-5 circle 3 fs 2 clast	5.93	0.02	2.58	0.00	0.01	0.09	0.02	0.43	4.30	0.00	0.17	4.75	0.09	0.91	0.00
71016	02JH-21-5 circle 3 fs1 clast	6.02	0.01	2.48	0.03	0.01	0.09	0.00	0.00	4.28	0.05	0.00	4.28	0.00	1.00	0.00
71019	olympic F1 circle 2 fs 1 clast	5.94	0.02	2.57	0.00	0.00	0.12	0.08	0.28	4.27	0.05	0.11	4.63	0.06	0.92	0.02
71019	olympic F1 circle 2 fs 1 v	5.94	0.04	2.56	0.04	0.01	0.14	0.00	0.15	4.22	0.02	0.06	4.37	0.03	0.97	0.00
71019	olympic F1 circle 2 fs 2 clast	5.97	0.01	2.58	0.01	0.00	0.00	0.06	0.38	4.18	0.03	0.15	4.62	0.08	0.90	0.01
71019	olympic F1 circle 2 fs 2 v	5.99	0.00	2.57	0.01	0.00	0.00	0.01	0.00	4.37	0.05	0.00	4.39	0.00	1.00	0.00
71019	olympic F1 circle 2 fs 3 clast	6.00	0.00	2.58	0.00	0.02	0.05	0.01	0.06	4.14	0.00	0.02	4.21	0.01	0.98	0.00
71019	olympic F1 circle 2 fs 3 v	5.99	0.04	2.54	0.00	0.00	0.02	0.04	0.00	4.27	0.00	0.00	4.31	0.00	0.99	0.01
71019	olympic F1 circle 2 fs 4 v	5.96	0.04	2.57	0.00	0.00	0.00	0.01	0.06	4.36	0.00	0.02	4.44	0.01	0.98	0.00
71023	Olympic F5 circle 2 Ksp 1	5.91	0.00	2.49	0.08	0.06	0.12	0.28	0.31	4.25	0.02	0.12	4.84	0.06	0.88	0.06
Slab																
70233	SB94-1-128.6 circle 1 Kspar 1	5.95	0.02	2.60	0.01	0.00	0.09	0.04	0.55	3.99	0.06	0.21	4.58	0.12	0.87	0.01
70233	SB94-1-128.6 circle 1 Kspar 2	5.98	0.01	2.63	0.01	0.02	0.06	0.00	0.04	3.97	0.00	0.01	4.01	0.01	0.99	0.00

JCU #	Sample #	Si	Ti	Al	Fe	Mn	Mg	Ca	Na	K	CL	Na/Al	Ca+Na+K	Albite	Kspar	Anorthite
70247	SB94-1-190.90 circle 1 Ksp `	2.25	0.01	0.96	0.00	0.00	0.01	0.01	0.11	1.52	0.00	0.11	1.63	0.07	0.93	0.00
70247	SB94-1-190.90 circle 1 Ksp 2	5.97	0.01	2.57	0.02	0.00	0.10	0.05	0.56	3.95	0.02	0.22	4.57	0.12	0.87	0.01
70247	SB94-1-190.90 circle 2 Ksp 1	2.26	0.00	0.95	0.00	0.00	0.00	0.03	0.08	1.54	0.00	0.09	1.65	0.05	0.93	0.02
70247	SB94-1-190.90 circle 2 Ksp 2	2.27	0.00	0.93	0.00	0.00	0.00	0.02	0.18	1.55	0.01	0.19	1.75	0.10	0.89	0.01
70247	SB94-1-190.90 circle 2 Ksp 3	2.25	0.00	0.96	0.01	0.02	0.01	0.03	0.05	1.55	0.00	0.05	1.63	0.03	0.95	0.02
70247	SB94-1-190.90 circle 2 Ksp 4	5.97	0.01	2.59	0.01	0.00	0.05	0.01	0.74	3.93	0.01	0.29	4.69	0.16	0.84	0.00
70255	SB94-1-332.5 circle 2 Ksp 1	5.97	0.01	2.61	0.00	0.00	0.05	0.07	0.31	4.05	0.06	0.12	4.43	0.07	0.92	0.02
70255	SB94-1-332.5 circle 2 Ksp 2	5.92	0.03	2.66	0.01	0.00	0.12	0.03	0.51	3.84	0.01	0.19	4.38	0.12	0.88	0.01
70257	SB94-1-345.1 circle 1 Kspar 1	6.01	0.01	2.55	0.00	0.00	0.00	0.01	0.39	4.07	0.00	0.15	4.47	0.09	0.91	0.00
70257	SB94-1-345.1 circle 1 Kspar 2	6.00	0.01	2.57	0.03	0.00	0.02	0.02	0.20	4.12	0.00	0.08	4.34	0.05	0.95	0.01
70257	SB94-1-345.1 circle 1 Kspar 3	5.98	0.01	2.57	0.00	0.00	0.08	0.07	0.17	4.10	0.01	0.07	4.33	0.04	0.95	0.02
70257	SB94-1-345.1 circle 2 Kspar 1 2nd try	5.99	0.00	2.62	0.00	0.00	0.02	0.00	0.44	4.02	0.05	0.17	4.46	0.10	0.90	0.00
70257	SB94-1-345.1 circle 2 Kspar 2 2nd try	6.00	0.00	2.55	0.00	0.02	0.04	0.05	0.48	4.07	0.01	0.19	4.60	0.10	0.88	0.01
70257	SB94-1-345.1 circle 2 Kspar 3 2nd try	6.00	0.01	2.54	0.02	0.02	0.08	0.04	0.52	3.97	0.02	0.20	4.53	0.11	0.88	0.01
70219	SB94-1-57.43 circle 3 Ksp 1	4.53	0.01	1.90	0.00	0.01	0.02	0.04	0.00	3.00	0.02	0.00	3.05	0.00	0.99	0.01
70219	SB94-1-57.43 circle 3 Ksp 1	6.03	0.02	2.53	0.00	0.02	0.02	0.05	0.00	4.01	0.03	0.00	4.06	0.00	0.99	0.01
70219	SB94-1-57.43 circle 3 Ksp 2	5.91	0.06	2.63	0.00	0.00	0.05	0.06	0.58	3.86	0.03	0.22	4.50	0.13	0.86	0.01
70219	SB94-1-57.43 circle 3 Ksp 3	5.99	0.01	2.57	0.00	0.00	0.06	0.04	0.31	4.04	0.03	0.12	4.40	0.07	0.92	0.01
70221	SB94-1-59.5 circle 2 Kspar 1	6.02	0.00	2.57	0.03	0.02	0.05	0.00	0.05	4.05	0.00	0.02	4.11	0.01	0.99	0.00
70221	SB94-1-59.5 circle 2 Kspar 2	5.99	0.00	2.55	0.01	0.00	0.09	0.06	0.39	4.09	0.03	0.15	4.54	0.09	0.90	0.01
70221	SB94-1-59.5 circle 2 Kspar 3	5.96	0.03	2.61	0.02	0.01	0.03	0.04	0.25	4.00	0.00	0.10	4.29	0.06	0.93	0.01
70286	SB94-4-69.6 circle 1 Kspar 1	5.94	0.02	2.64	0.00	0.00	0.09	0.02	0.31	3.99	0.03	0.12	4.32	0.07	0.92	0.00
70286	SB94-4-69.6 circle 1 Kspar 2	5.97	0.00	2.59	0.00	0.00	0.12	0.03	0.52	4.03	0.13	0.20	4.58	0.11	0.88	0.01
70286	SB94-4-69.6 circle 1 Kspar 3	5.97	0.01	2.61	0.00	0.00	0.08	0.01	0.31	4.05	0.01	0.12	4.37	0.07	0.93	0.00
70286	SB94-4-69.6 circle 2 Kspar 1	5.98	0.01	2.57	0.00	0.04	0.12	0.07	0.38	3.89	0.03	0.15	4.34	0.09	0.90	0.02
70286	SB94-4-69.6 circle 2 Kspar 2	5.99	0.01	2.56	0.00	0.00	0.10	0.07	0.15	4.06	0.06	0.06	4.28	0.04	0.95	0.02
70286	SB94-4-69.6 circle 2 Kspar 3	6.02	0.01	2.61	0.00	0.00	0.04	0.00	0.03	3.94	0.02	0.01	3.97	0.01	0.99	0.00
70286	SB94-4-79.6 circle 4 Ksp 3	4.66	0.06	4.70	0.46	0.01	0.63	0.03	0.06	2.84	0.01	0.01	2.93	0.02	0.97	0.01
70309	SB95-5-8.7 circle 1 Kspar 2	5.95	0.00	2.66	0.04	0.00	0.10	0.01	0.21	4.06	0.00	0.08	4.29	0.05	0.95	0.00
70378	SB97-10-19.4 circle 1 Ksp 1	4.65	0.01	4.74	0.76	0.03	0.41	0.03	0.12	2.89	0.03	0.02	3.04	0.04	0.95	0.01
70378	SB97-10-19.4 circle 1 Ksp 2	4.68	0.02	4.38	0.83	0.02	0.65	0.46	0.22	2.68	0.03	0.05	3.36	0.07	0.80	0.14
70378	SB97-10-19.4 circle 2 Ksp 1	4.67	0.01	4.58	0.88	0.00	0.60	0.04	0.28	2.79	0.00	0.06	3.11	0.09	0.90	0.01

JCU #	Sample #	Si	Ti	Al	Fe	Mn	Mg	Ca	Na	K	CL	Na/Al	Ca+Na+K	Albite	Kspar	Anorthite
70378	SB97-10-19.4 circle 2 Ksp 2	4.64	0.02	4.71	0.82	0.01	0.46	0.09	0.00	2.81	0.00	0.00	2.91	0.00	0.97	0.03
70378	SB97-10-19.4 circle 2 Ksp 3	4.64	0.00	4.84	0.75	0.01	0.26	0.01	0.37	2.86	0.00	0.08	3.24	0.11	0.88	0.00
70544	JH01-35-2 circle 2 Kspar 1	6.01	0.01	2.53	0.03	0.00	0.02	0.05	0.22	4.17	0.02	0.09	4.43	0.05	0.94	0.01
Slats-Frosty																
70772	STF95-1-16.70m circle 1 fs 1 m	6.01	0.00	2.55	0.00	0.04	0.00	0.00	0.10	4.29	0.01	0.04	4.39	0.02	0.98	0.00
70772	STF95-1-16.70m circle 1 fs 2 m	6.02	0.01	2.51	0.00	0.01	0.00	0.02	0.26	4.30	0.02	0.10	4.58	0.06	0.94	0.00
70772	STF95-1-16.70m circle 1 fs 3 m	5.99	0.01	2.53	0.00	0.01	0.03	0.06	0.22	4.27	0.03	0.09	4.55	0.05	0.94	0.01
70772	STF95-1-16.70m circle 3 fs 1 bx matrix	6.01	0.01	2.51	0.05	0.00	0.07	0.02	0.00	4.27	0.02	0.00	4.30	0.00	0.99	0.01
Hoover																
70729	JH01-6-1c circle 2 Kspar 1	4.77	0.00	4.41	0.49	0.00	1.03	0.05	0.22	2.75	0.01	0.05	3.02	0.07	0.91	0.02
70729	JH01-6-1c circle 2 Kspar 2	4.78	0.02	4.40	0.37	0.00	1.01	0.03	0.35	2.78	0.04	0.08	3.16	0.11	0.88	0.01
70743	JH01-7-6a-circle 3 Kspar 1	6.94	0.01	1.57	0.01	0.00	0.12	0.04	0.11	0.93	0.00	0.07	1.08	0.10	0.86	0.04

JCU #	Sample #	FeO	MnO	MgO	CaO	TOTAL
CARBONATE						
Igor						
70923	02JH-08-06 circle 1 carb 1	2.46	0.00	19.30	30.60	52.37
70923	02JH-08-06 circle 1 carb 2	2.60	0.08	19.63	30.30	52.61
70923	02JH-08-06 circle 1 carb 2	2.60	0.08	19.63	30.30	52.61
70923	02JH-08-06 circle 1 carb 3	2.57	0.36	18.53	30.11	51.57
70923	02JH-08-06 circle 2 carb 1	6.03	0.50	17.17	29.67	53.37
70923	02JH-08-06 circle 2 carb 2	6.84	0.27	17.60	29.61	54.31
70923	02JH-08-06 circle 2 carb 3	2.24	0.67	19.07	29.67	51.66
70923	02JH-08-06 circle 2 carb 4	12.31	1.91	5.41	35.11	54.74
70923	02JH-08-06 circle 4 fe calcite 1	9.95	0.02	1.27	44.75	56.02
70942	02JH-10-17B circle 1 carb 1 x	55.92	3.28	3.08	0.30	62.58
70942	02JH-10-17B circle1 carb 1 x	55.93	3.30	3.08	0.27	62.57
70942	02JH-10-17B circle 1 carb 2 x	56.39	2.42	4.55	0.14	63.50
70942	02JH-10-17B circle 1 carb 3 x	55.84	3.82	3.84	0.19	63.70
70942	02JH-10-17B circle 1 carb 1 m	48.77	4.55	4.60	3.85	61.76
70942	02JH-10-17B circle 1 carb 2 m	56.35	2.50	3.31	0.97	63.13
70942	02JH-10-17B circle 1 carb 3 m	58.40	2.65	1.97	0.88	63.91
70942	02JH-10-17B circle 1 carb 4 m	56.70	2.66	3.06	0.37	62.79
70942	02JH-10-17B circle 3 carb 2 v	14.88	2.52	11.10	28.59	57.08
70942	02JH-10-17B circle 3 carb 3v	14.19	2.07	11.62	28.51	56.39
70914	I80-14-500 circle 1 carb xtl 1	45.01	5.55	9.50	0.42	60.48
70914	I80-14-500 circle 1 carb xtl 2	44.35	5.53	9.45	0.64	59.98
70914	I80-14-500 circle 1 carb xtl 3	56.21	3.30	2.62	0.36	62.49
70914	I80-14-500 circle 1 carb xtl 4	54.38	3.34	3.22	0.25	61.18
70914	I80-14-500 circle 1 carb xtl 5	14.58	2.71	10.44	28.57	56.29
70914	I80-14-500 circle 2 carb v 1	42.22	3.67	11.97	0.58	58.44
70914	I80-14-500 circle 2 carb v 2	50.23	3.92	6.08	0.30	60.53
70914	I80-14-500 circle 2 carb v 3	10.69	1.11	13.46	28.41	53.67
70893	I80-10-228 circle 2 carb 1	55.64	2.89	2.77	0.09	61.38
70893	I80-10-228 circle 2 carb 2	48.57	5.72	5.92	0.40	60.60
70893	I80-10-228 circle 2 carb 3	48.84	6.43	5.90	0.26	61.43
70864	I80-10-43'10" circle 1 carbx 1	6.49	2.73	15.49	29.72	54.43
70864	I80-10-43'10" circle 1 carbx 2	6.91	3.32	15.03	28.79	54.05
70864	I80-10-43'10" circle 1 carbx 3	5.91	2.21	16.29	29.26	53.68
70864	I80-10-43'10" circle 1 carbx 4	16.52	2.62	9.46	28.23	56.83
70864	I80-10-43'10" circle 1 carbgm 1	6.32	2.68	15.90	29.21	54.10
70864	I80-10-43'10" circle 1 carbgm 2	19.84	2.04	7.83	27.21	56.93
70864	I80-10-43'10" circle 2 carbv 1	6.87	4.58	13.13	29.33	53.91
70864	I80-10-43'10" circle 2 carbv 2	6.06	2.46	14.96	29.60	53.09
70864	I80-10-43'10" circle 2 carbv 3	10.50	2.58	13.32	28.48	54.87
70864	I80-10-43'10" circle 2 carbv 4	6.29	3.97	14.76	29.24	54.27
Olympic						
71016	02JH-21-5 circle 1 carb 1	0.32	0.17	1.48	58.68	60.66
71016	02JH-21-5 circle 2 carb 1	10.02	2.91	13.18	28.62	54.74
71016	02JH-21-5 circle 2 carb 2	10.15	2.99	12.60	29.29	55.02
71016	02JH-21-5 circle 2 carb 3	7.72	2.50	11.48	33.59	55.29
71016	02JH-21-5 circle 3 carb 1 x	6.90	3.25	14.97	30.01	55.13
71016	02JH-21-5 circle 3 carb 2 x	7.74	3.83	14.56	30.20	56.32
71016	02JH-21-5 circle 3 carb 3 x	6.43	3.52	15.45	29.62	55.01
71016	02JH-21-5 circle 4 carb 1 x	4.57	2.20	17.51	30.57	54.85
71016	02JH-21-5 circle 4 carb 2 x	9.76	2.12	13.95	30.19	56.03

JCU #	Sample #	FeO	MnO	MgO	CaO	TOTAL
71016	02JH-21-5 circle 4 carb 3 x	6.11	1.70	17.47	30.35	55.64
71019	Olympic F1 circle 1 carb 1 m	2.23	1.14	19.83	31.11	54.31
71019	Olympic F1 circle 1 carb 2 m	1.99	0.87	19.63	32.21	54.70
71019	Olympic F1 circle 1 carb 3 m	2.91	1.58	19.58	31.64	55.72
71019	Olympic F1 circle 2 carb 1 m	2.81	1.26	19.57	31.88	55.51
71019	Olympic F1 circle 2 carb 2 m	3.02	1.47	18.96	31.76	55.20
71019	Olympic F1 circle 2 carb 1v m	7.15	3.02	12.31	27.37	49.85
71019	Olympic F1 circle 2 carb 2v	7.15	3.02	12.31	27.37	49.85
71019	Olympic F1 circle 3 carb 1 v	8.63	3.46	13.75	30.28	56.12
71019	Olympic F1 circle 3 carb 2 v	8.18	3.50	13.49	29.43	54.60
71019	Olympic F1 circle 3 carb 3 v	7.54	3.37	13.80	29.61	54.31
71019	Olympic F1 circle 3 carb 1 m	2.30	1.34	19.05	29.61	52.29
71019	Olympic F1 circle 3 carb 2 m	2.47	1.49	19.10	30.25	53.30
71019	Olympic F1 circle 3 carb 3 m	2.38	1.55	18.13	29.86	51.92
71023	Olympic F5 circle 1 carb 1	5.10	1.01	17.66	29.78	53.54
71023	Olympic F5 circle 1 carb 2	5.28	1.24	18.16	29.77	54.46
71023	Olympic F5 circle 1 carb 3	3.93	1.37	18.12	31.16	54.58
71023	Olympic F5 circle 2 carb 1	5.47	0.88	16.21	29.36	51.91
71023	Olympic F5 circle 2 carb 2	5.13	0.93	17.30	29.42	52.78
71023	Olympic F5 circle 2 carb 3	4.98	1.65	15.93	28.76	51.32
71023	Olympic F5 circle 2 carb 5	6.50	5.94	12.03	29.06	53.52
71023	Olympic F5 circle 2 carb 6	4.45	0.81	17.55	29.63	52.45
Slats-Frosty						
70772	STF95-1-16.70m circle 2 carb 1 v	6.02	1.87	17.32	29.50	54.70
70772	STF95-1-16.70m circle 2 carb 2 v	6.49	1.39	16.78	29.47	54.14
70772	STF95-1-16.70m circle 2 carb 3 v	4.24	2.39	17.39	29.28	53.30
70772	STF95-1-16.70m circle 2 carb 1 clast	9.76	1.78	14.38	28.71	54.63
70772	STF95-1-16.70m circle 2 carb 2 clast	9.23	1.82	14.79	28.62	54.46
70772	STF95-1-16.70m circle 2 carb 3 clast	6.59	1.01	10.23	21.90	39.73
Slab						
70445	01JH-20-3 circle 2 carb 1	0.23	1.20	0.06	60.11	61.61
70445	01JH-20-3 circle 2 carb 2	0.10	1.17	0.14	59.61	61.01
70445	01JH-20-3 circle 2 carb 3	0.27	1.05	0.06	59.92	61.30
70456	01JH-20-10C circle 1 carb XTL 1	4.32	1.15	16.43	30.04	51.93
70456	01JH-20-10C circle 1 carb XTL 2	4.60	1.14	16.61	29.68	52.03
70456	01JH-20-10C circle 1 carb XTL 3	5.04	0.66	16.99	29.63	52.32
70456	01JH-20-10C circle 1 carb GM 1	0.69	1.03	0.46	58.30	60.48
70456	01JH-20-10C circle 1 carb GM 2	2.61	1.08	4.96	48.63	57.29
70456	01JH-20-10C circle 1 carb GM 3	0.63	0.78	0.07	59.56	61.05
70456	01JH-20-10C circle 1 carb GM 4	0.47	1.24	0.41	59.53	61.66
70207	SB94-1 -1.3 circle 1 1st carb 1	0.00	0.71	0.00	59.77	60.48
70207	SB94-1 -1.3 circle 1 1st carb 2	0.02	0.63	0.00	57.46	58.10
70207	SB94-1 -1.3 circle 1 1st carb 3	0.00	0.69	0.15	56.69	57.55
70207	SB94-1 -1.3 circle 1 1st carb 4	0.00	0.51	0.00	56.44	56.94
70207	SB94-1 -1.3 circle 1 1st carb 5	0.00	0.52	0.00	57.21	57.72
70207	SB94-1-1.3 circle 2 carb 1	0.20	0.32	0.10	55.60	56.22
70207	SB94-1-1.3 circle 2 carb 2	0.02	0.55	0.06	56.75	57.38
70207	SB94-1-1.3 circle 2 carb 3	0.00	0.76	0.04	55.37	56.17
70207	SB94-1-1.3 circle 3 carb 1	0.00	0.64	0.14	56.78	57.56
70207	SB94-1-1.3 circle 3 carb 2	0.00	0.53	0.00	55.16	55.68
70207	SB94-1-1.3 circle 3 carb 3	0.31	0.66	0.00	56.15	57.13
70219	SB94-1-57.43 circle 3 carb 1	0.00	1.38	0.00	54.98	56.37
70219	SB94-1-57.43 circle 3 carb 2	0.01	1.01	0.01	55.56	56.58

JCU #	Sample #	FeO	MnO	MgO	CaO	TOTAL
70219	SB94-1-57.43 circle 3 carb 3	0.15	0.71	0.01	54.35	55.22
70219	SB94-1-57.43 circle 4 carb 1	0.05	0.72	0.08	54.44	55.29
70219	SB94-1-57.43 circle 4 carb 2	0.16	0.64	0.00	54.87	55.66
70219	SB94-1-57.43 circle 4 carb 3	0.24	0.34	0.29	57.19	58.05
70233	SB94-1-128.6 circle 1 carb 1	0.40	0.58	0.20	55.00	56.18
70233	SB94-1-128.6 circle 1 carb 2	0.16	0.47	0.05	54.26	54.93
70233	SB94-1-128.6 circle 1 carb 3	0.00	0.00	0.00	52.93	52.93
70247	SB94-1-190.90 circle 2 carb 1	0.02	0.00	0.03	52.86	52.92
70247	SB94-1-190.90 circle 5 carb 1	0.07	0.48	0.36	53.62	54.54
70247	SB94-1-190.90 circle 5 carb 2	0.00	0.54	0.00	57.75	58.29
70247	SB94-1-190.90 circle 5 carb 3	0.00	0.69	0.27	55.97	56.92
70255	SB94-1-332.5 circle 1 vein carb 1	0.18	0.61	0.46	55.34	56.59
70255	SB94-1-332.5 circle 1 vein carb 2	0.19	0.68	0.01	55.32	56.21
70255	SB94-1-332.5 circle 1 vein carb 3	0.14	0.64	0.50	57.08	58.37
70255	SB94-1-332.5 circle 1 vein carb 4	0.00	0.53	0.00	56.20	56.73
70255	SB94-1-332.5 circle 2 carb 1	0.23	0.17	0.96	51.48	52.83
70255	SB94-1-332.5 circle 2 carb 2	0.45	0.30	0.32	51.93	53.00
70255	SB94-1-332.5 circle 2 carb 3	0.44	1.32	0.82	54.95	57.53
70287	SB94-4-79.6 circle 4 carb 1	0.22	1.37	0.21	54.62	56.41
70287	SB94-4-79.6 circle 4 carb 2	0.18	1.11	0.37	54.55	56.21
70287	SB94-4-79.6 circle 4 carb 3	0.28	0.79	0.00	55.86	56.94
70287	SB94-4-79.6 circle 5 carb 1	0.00	0.67	0.13	56.15	56.96
70287	SB94-4-79.6 circle 5 carb 2	0.33	1.04	0.29	56.37	58.04
70287	SB94-4-79.6 circle 5 carb 3	0.00	1.01	0.29	56.34	57.63
70286	SB94-4-69.6 circle 2 carb 1	0.18	0.00	0.00	53.11	53.29
70286	SB94-4-69.6 circle 2 carb 2	0.00	0.09	0.00	52.42	52.51
70286	SB94-4-69.6 circle 2 carb 3	0.04	0.01	0.49	52.20	52.75
70309	SB95-5-8.7 circle 1carb 1	0.31	0.57	0.42	56.04	57.35
70309	SB95-5-8.7 circle 1carb 2	0.10	0.27	0.00	57.30	57.67
70309	SB95-5-8.7 circle 1carb 3	0.00	0.43	0.28	57.38	58.10
70332	SB97-9-58,65 circle 3 carb 1	0.71	0.78	0.46	52.15	54.10
70332	SB97-9-58,65 circle 1 carb 1	0.48	0.39	0.19	50.99	52.06
70332	SB97-9-58,65 circle 3 carb 1	0.44	0.52	0.37	50.70	52.03
70332	SB97-9-58,65 circle 3 carb 2	0.75	0.83	0.52	51.02	53.12
70332	SB97-9-58,65 circle 3 carb 3	0.45	0.69	0.14	50.65	51.93
70332	SB97-9-58,65 circle 2 carb 1	0.13	0.00	0.18	52.78	53.10
70332	SB97-9-58,65 circle 2 carb 2	0.39	0.43	0.13	51.90	52.85
70332	SB97-9-58,65 circle 2 carb 3	0.66	0.67	0.21	52.50	54.05
70332	SB97-9-58,65 circle 5 carb 1	0.96	0.19	0.21	51.82	53.17
70332	SB97-9-58,65 circle 5 carb 2	0.36	0.16	0.16	52.72	53.41
70378	SB97-10-19.4 circle 1 carb 1	1.17	0.92	0.32	48.61	51.03
70378	SB97-10-19.4 circle 2 carb 1	1.06	0.49	0.11	48.65	50.30
70378	SB97-10-19.4 circle 2 carb 2	0.92	1.00	0.00	48.60	50.53
70378	SB97-10-19.4 circle 4 carb 2	10.92	0.97	12.09	26.85	50.83
70378	SB97-10-19.4 circle 4 carb 3	11.79	1.74	10.78	27.13	51.46
70378	SB97-10-19.4 circle 4 carb 4	14.88	2.52	9.11	26.69	53.20
70378	SB97-10-19.4 circle 4 carb 5	11.52	1.40	11.65	26.43	51.01
70378	SB97-10-19.4 circle 4 carb 6	12.59	1.19	12.22	27.44	53.45
70378	SB97-10-19.4 circle 4 carb 7	12.09	1.06	11.64	27.80	52.59
70393	SB97-19-21.45 circle 2 vein carb 1	0.22	0.92	0.26	49.34	50.74
70393	SB97-19-21.45 circle 2 vein carb 2	0.01	0.45	0.22	50.77	51.45
70393	SB97-19-21.45 circle 2 vein carb 3	0.30	0.90	0.20	48.81	50.22
70393	SB97-19-21.45 circle 4 carb 1	0.51	0.64	0.63	50.34	52.12

JCU #	Sample #	FeO	MnO	MgO	CaO	TOTAL
70393	SB97-19-21.45 circle 4 carb 2	0.94	0.18	0.26	52.12	53.50
70393	SB97-19-21.45 circle 5 carb 1	0.66	0.90	0.32	50.35	52.23
70393	SB97-19-21.45 circle 5 carb 2	0.76	1.42	0.19	49.74	52.09
70393	SB97-19-21.45 circle 5 carb 3	0.92	0.92	1.68	47.32	50.84
Hoover						
70724	01JH-5-7A circle 2 carb 1	4.31	0.60	18.43	30.09	53.43
70724	01JH-5-7A circle 2 carb 2	8.39	1.07	15.38	29.36	54.20
70724	01JH-5-7A circle 3 carb 1	0.58	0.00	0.42	57.61	58.62
70724	01JH-5-7A circle 3 carb 2	0.36	0.33	0.30	58.97	59.96
70724	01JH-5-7A circle 3 carb 3	9.48	0.76	14.74	29.22	54.21
70724	01JH-5-7A circle 3 carb 4	9.58	1.01	14.52	29.30	54.41
70724	01JH-5-7A circle 3 carb 5	11.38	1.60	11.70	29.05	53.73
70727	01JH-6-1A circle 2 carb 1	0.06	1.39	0.43	54.17	56.07
70727	01JH-6-1A circle 2 carb 2	0.32	0.85	0.00	54.02	55.19
70727	01JH-6-1A circle 2 carb 3	0.29	0.91	0.07	54.66	55.92
70727	01JH-6-1A circle 2 carb 4	0.30	0.92	0.10	56.72	58.03
70727	01JH-6-1A circle 3 carb 1	0.29	1.46	0.40	57.04	59.19
70727	01JH-6-1A circle 3 carb 2	0.46	1.06	0.34	58.06	59.92
70727	01JH-6-1A circle 3 carb 3	0.50	1.42	0.02	56.00	57.94
70727	01JH-6-1A circle 3 carb 4	0.58	1.35	0.25	56.86	59.04
70727	01JH-6-1A circle 3 carb 5	0.16	0.72	0.20	56.56	57.66
70727	01JH-6-1A circle 3 carb 6	0.53	1.04	0.29	55.19	57.05
70727	01JH-6-1A circle 4 carb 1	0.45	2.05	0.39	50.82	53.72
70727	01JH-6-1A circle 4 carb 2	0.60	0.60	0.19	53.06	54.45
70727	01JH-6-1A circle 4 carb 3	0.78	1.78	0.11	53.32	55.99
70728	01JH-6-1B circle 1 carb 1	0.20	0.30	0.06	55.49	56.06
70728	01JH-6-1B circle 1 carb 2	0.30	0.54	0.50	55.24	56.58
70728	01JH-6-1B circle 1 carb 3	0.26	0.86	0.27	55.12	56.51
70729	01JH-6-1C circle 1 carb 1	0.92	1.21	0.34	53.92	56.40
70729	01JH-6-1C circle 1 carb 2	0.43	1.29	0.16	55.01	56.89
70729	01JH-6-1C circle 1 carb 3	6.04	0.70	15.54	28.27	50.55
70729	01JH-6-1C circle 1 carb 4	0.63	0.96	0.54	53.79	55.91
70729	01JH-6-1C circle 2 carb 1	0.33	2.12	0.35	54.29	57.10
70729	01JH-6-1C circle 2 carb 2	0.44	1.05	0.41	54.36	56.25
70729	01JH-6-1C circle 2 carb 3	0.04	0.00	0.00	52.89	52.93
70734	01JH-6-3C-circle 1 carb 1	0.01	0.35	0.00	53.63	54.00
70734	01JH-6-3C-circle 1 carb 2	0.79	0.34	0.24	50.51	51.88
70734	01JH-6-3C-circle 1 carb 3	0.01	0.69	0.00	53.25	53.96
70734	01JH-6-3C-circle 1 carb 4	0.09	0.68	0.00	53.21	53.98
70734	01JH-6-3C-circle 1 carb 5	0.08	0.51	0.24	52.50	53.34
70734	01JH-6-3C-circle 1 carb 6	0.50	0.61	0.09	53.06	54.27
70737	01JH-6-5B-circle 2 carb 1	0.77	0.27	0.53	56.65	58.23
70737	01JH-6-5B-circle 2 carb 2	0.51	0.35	0.68	55.01	56.55
70737	01JH-6-5B-circle 2 carb 3	0.44	0.35	0.14	55.79	56.70
70737	01JH-6-5B-circle 2 carb 3	0.00	0.36	0.30	51.54	52.20
70743	01JH-7-6A-circle 3 carb band 1	0.17	0.26	0.17	53.87	54.47
70743	01JH-7-6A-circle 3 carb band 2	0.00	0.00	0.55	54.35	54.90
70743	01JH-7-6A-circle 3 carb granular 1	0.00	0.05	0.20	55.37	55.62
70743	01JH-7-6A-circle 3 carb granular 2	0.05	0.00	0.00	56.04	56.09
70743	01JH-7-6A-circle 3 carb granular 3	0.41	0.03	0.14	55.54	56.13
70766	01JH-9-11D circle 1 carb 1	1.13	0.53	0.49	55.14	57.29
70766	01JH-9-11D circle 2 carb 2	0.99	0.20	0.13	56.85	58.18
70766	01JH-9-11D circle 2 carb 3	3.81	0.49	17.67	28.80	50.78

JCU #	Sample #	FeO	MnO	MgO	CaO	TOTAL
70766	01JH-9-11D circle 2 carb 4	4.48	0.09	17.39	29.22	51.18
70766	01JH-9-11D circle 2 carb 5	1.27	0.30	0.60	57.31	59.49
70686	HV94-1-695 circle 1 carb 1	0.57	0.95	0.71	59.20	61.43
70686	HV94-1-695 circle 1 carb 2	0.69	0.83	0.40	58.74	60.66
70686	HV94-1-695 circle 1 carb 3	0.52	1.04	0.63	56.77	58.96
70686	HV94-1-695 circle 1 carb 4	0.50	0.52	0.36	56.94	58.33
70686	HV94-1-695 circle 1 carb 5	0.42	0.56	0.29	58.36	59.63
70686	HV94-1-695 circle 1 carb 6	0.55	0.68	0.16	57.29	58.68
70686	HV94-1-695 circle 3 carb 1	0.67	1.24	0.39	61.10	63.40
70686	HV94-1-695 circle 3 carb 2	0.21	0.97	0.11	58.84	60.14
70686	HV94-1-695 circle 3 carb 3	0.04	1.11	0.24	60.16	61.55

APPENDIX II

Analytical protocols for Ar/Ar, U-Pb, Pb-Pb and Re-Os analyses

Analytical protocols for $^{40}Ar/^{39}Ar$ analyses (M. Villeneuve, written communication, 2004)

Selected samples were processed for $^{40}Ar/^{39}Ar$ analysis by standard mineral separation techniques, including hand-picking of clear, unaltered crystals in the size range 0.5 to 1 mm. Individual mineral separates were loaded into aluminum foil packets along with a single grain of Fish Canyon Tuff Sanidine (FCT-SAN) to act as flux monitor (apparent age = 28.03 ± 0.28 Ma; Renne et al., 1998). The sample packets were arranged radially inside an aluminum can. The samples were then irradiated for 12 hours at the research reactor of McMaster University in a fast neutron flux of approximately $3x10^{16}$ neutrons/cm^2 . Laser $^{40}Ar/^{39}Ar$ step-heating analysis was carried out at the Geological Survey of Canada laboratories in Ottawa, Ontario. Upon return from the reactor, samples were split into several aliquots and loaded into individual 1.5 mm-diameter holes in a copper planchet. The planchet was then placed in the extraction line and the system evacuated. Heating of individual sample aliquots in steps of increasing temperature was achieved using a Merchantek MIR10 10W CO_2 laser equipped with a 2 mm x 2 mm flat-field lens. The released Ar gas was cleaned over getters for ten minutes, and then analyzed isotopically using the secondary electron multiplier system of a VG3600 gas source mass spectrometer; details of data collection protocols can be found in Villeneuve and MacIntyre (1997) and Villeneuve *et al*. (2000). Error analysis on individual steps follows numerical error analysis routines outlined in Scaillet (2000); error analysis on grouped data follows algebraic methods of Roddick (1988). In gas release diagrams, analyses are displayed whereby the fraction of ^{39}Ar released relative to the sum total of ^{39}Ar released forms the x-axis. Thus, the apparent $^{40}Ar/^{39}Ar$ age of each heating step is plotted against the cumulative amount of ^{39}Ar released from the sample, normalized to 100% for the total ^{39}Ar released. Upon ascertaining reproducibility of individual steps in the plateau regions, data was combined by integrating plateau portions (marked by line above steps) weighted by analytical error. Alternatively, data may be presented on inverse isochron diagrams which essentially provide a graphical display of mixtures of pure atmospheric ($^{36}Ar/^{40}Ar$, marked by the y-intercept) and pure radiogenic Ar ($^{40}Ar/^{39}Ar$ marked by the x-intercept). In this case, relationship between temperature of heating and apparent age are lost, but the most radiogenic steps are considered to give the best estimate of the age.

Neutron flux gradients throughout the sample canister were evaluated by analyzing the sanidine flux monitors included with each sample packet and interpolating a linear fit against calculated J-factor and.sample position. The error on individual J-factor values is conservatively estimated at ±0.6% (2s). Because the error associated with the J-factor is systematic and not related to individual analyses, correction for this uncertainty is not applied until calculation of dates from isotopic correlation diagrams (Roddick, 1988). No evidence for excess ^{40}Ar was observed in any of the samples and, therefore, all regressions are assumed to pass through the $^{36}Ar/^{40}Ar$ value for atmospheric air (295.5). All errors are quoted at the 2σ level of uncertainty."

References

Renne P. R., Swisher C. C., Deino A. L., Karner D. B., Owens T. L., and DePaolo D. J., 1998. Intercalibration of standards, absolute ages and uncertainties in $^{40}Ar/^{39}Ar$ dating. ChemicalGeology 145:117-152.

Roddick, J.C., 1988. The assessment of errors in $^{40}Ar/^{39}Ar$ dating. In: Radiogenic Age and Isotopic Studies, Report 2. Geological Survey of Canada, Paper 88-2, pp. 7–16.

Scaillet, S., 2000. Numerical error analysis in $^{40}Ar/^{39}Ar$ dating, Chemical Geology 62: 269–298.

Villeneuve, M.E. and MacIntyre, D.G, 1997. Laser $^{40}Ar/^{39}Ar$ ages of the Babine porphyries and Newman Volcanics, Fulton Lake map area, west-central British Columbia. In: Radiogenic Age and Isotopic Studies, Report 10. Geological Survey of Canada, Current Research 1997-F, pp.131–139.

Villeneuve, M.E., Sandeman, H.A. and Davis, W.J., 2000. A method for the intercalibration of U-Th-Pb and $^{40}Ar/^{39}Ar$ ages in the Phanerozoic. Geochimica et Cosmochimica Acta 64:4017-4030.

U-Pb analytical techniques (from Friedman *et al.*, 2001)

Titanite was separated using conventional crushing, grinding and Wilfley table techniques, followed by final concentration using heavy liquids and magnetic separations. Mineral fractions were selected for analysis based on grain morphology, quality, size and magnetic susceptibility. All geochemical separations were done in the Geochronology Laboratory at The University of British Columbia following the methods outlined in Mortensen *et al.* (1995).

Titanite samples were dissolved in concentrated HF and HNO_3 in the presence of a mixed $^{233-235}U$ – ^{205}Pb isotopic tracer. Titanite fractions were dissolved in Savillex PFA beakers on a hot plate at 80 ^{o}C. HF was evaporated and fluorides were dissolved in 6.2 N HCl on a hot plate for 24 hours. This solution was evaporated to dryness, and chlorides were dissolved on the hot plate for 24 hours. Separation and purification of Pb and U from titanite fractions employed modified ion exchange column techniques (see Friedman *et al.*, 2001). Pb and U were eluted separately and loaded together on a single Re filament using a phosphoric acid – silica gel emitter. Isotopic ratios were measured using a modified single collector VG-54R thermal ionization mass spectrometer equipped with a Daly photomultiplier. U and Pb analytical blanks were in the range of 1 pg and 1-5 pg, respectively during the course of the study. U fractionation was determined directly on individual runs using the $^{233-235}U$ tracer. Pb isotopic rations were corrected for a fractionation of 0.12 %/amu and 0.35 %/amu for Faraday and Daly runs, respectively, based on replicate analyses of the NBS-981 Pb standard and the values recommended by Todt *et al.*, (1984). All analytical errors were propagated through the entire age calculation using the technique of Roddick (1987). Errors for Pb/Pb ages are quoted at the 2σ level.

References

Friedman, R.M., Diakow, L.J., Lane, R.A. and Mortensen, J.K., 2001. New U-Pb age constraints on latest Cretaceous magmatism and associated mineralization in the Fawnie Range, Nechako Plateau, central British Columbia. Canadian Journal of Earth Science 38:619-637.

Mortensen, J.K., Gosh, D. and Ferri, F., 1995. U-Pb age constraints of intrusive rocks associated with copper-gold porphyry deposits in the Canadian Cordillera. In: Schroeter, T.G. (ed.) Porphyry deposits of the northwestern Cordillera of North America. Canadian Institute of Mining and Metallurgy, Special volume 46:142-158.

Roddick, J.C., 1987. Generalized numerical error analysis with application to geochronology and thermodynamics. Geochimica et Cosmochimica Acta 51: 2129-2135.

Todt, W., Cliff, R., Hanser, A. and Hofman, A.W.,1984. 202Pb + 205Pb double spike for lead isotopic analyses. Terra Cognita 4:209.

Pb-Pb analytical techniques (from Woodhead and Hergt, 1997)

Carbonate samples were first crushed to coarse sand-sized fragments using a steel press and then washed repeatedly in ultrapure water to remove adhered rock powder. After drying, fresh fragments, free from any obvious signs of alteration and veining, were hand-picked under a stereo dynascope. Approximately 300 mg of this material were weighed into an acid-cleaned polymethylpentate (PMP) beaker. Beakers were discarded after a single use.

Samples were first washed in ultrapure water with ultrasonic agitation for 30 minutes. After repeated rinsing, 2 ml of ultrapure water was added to each sample and 6 N HCl added dropwise to maintain a slow but steady effervescence (dolomite samples were gently warmed if necessary to promote this reaction). After complete reaction (no more effervescence when HCl was added) the samples were centrifuged and the supernatant dried down in a 6 ml Teflon vessel. Residues were weighed in order to determine the total carbonate content of each sample – information used to optimise spiking. Once dry, samples were taken up in HBr and processed using a standard Pb extraction procedure incorporating a double pass through anion exchange microcolumns, Pb being eluted in 6 N HCl. Samples were split for spiking prior to mass spectrometry, with the ^{207}Pb – ^{204}Pb double spike added to the smaller aliquot. Full details of the spiking procedure are in Woodhead *et al.* (1995). Spiked and unspiked samples were loaded using the conventional silica gel-phosphoric acid method on single Re filaments and run on a Finnigan MAT 262 mass spectrometer, operated in static multicollector mode.

References

Woodhead, J.D. and Hergt, J.M., 1997. Application of the "double spike" technique to Pb-isotope geochronology. Chemical Geology (Isotope Geoscience) 138:311-321.

Woodhead, J.D., Volker, F.and McCulloch, M.T., 1995. Routine lead isotope determinations using a ^{207}Pb – ^{204}Pb double spike: a long-term assessment of analytical precision and accuracy. Analyst 120: 35-39.

Re-Os analytical techniques (from Selby and Creaser, 2001)

Sample preparation

The Re and Os contents of molybdenite were determined by isotope dilution mass spectrometry at the University of Alberta Radiogenic Isotope Facility. Molybdenite seperates were obtained by scraping the mineral surface of by crushing the sample in a porcelain disk mill, with molybdenite separated by heavy liquid techniques or by flotation using high-purity water. The samples were handpicked under a microscope to remove any impurities.

Re-Os methodology

Molybdenite is naturally Re enriched and contains insignificant nonradiogenic Os (Morgan *et al.* 1986; Markey *et al.* 1998), meaning that effectively all ^{187}Os is derived from the decay of ^{187}Re (*cf.* Faure, 1986). The abundance of ^{187}Re and ^{187}Os in the molybdenite samples was measured by isotope dilution, using mixed tracer solutions that contained isotopically enriched ^{185}Re together with isotopically normal Os, in the form of a gravimetric and isotopic Os standard. The ^{185}Re abundance in the tracer solution is calibrated directly against a gravimetric Re standard solution made from 99.9999 % Re metal. By using an isotopically normal Os solution, the abundance of ^{187}Os in molybdenite is calculated by measuring the ^{187}Os abundance after equilibrating ^{187}Os in molybdenite and common Os in the tracer solution (*cf.* Suzuki *et al.* 1992). In this way, the isotopic analysis of Os can be correlated for instrumental fractionation during analysis (*cf.* Markey *et al.* 1998). Ammonium hexachloro-osmate (Johnson and Mtthey, 99.999 % metal basis purity) was used as the source of Os in the tracer solutions. This salt was reduced to metallic Os in 98 % N_2 and 2 % H_2 gas at ~500 ^{o}C for ~ 2 hours in order to obtain the metallic Os weight fraction. This determination was used together with the measured isotopic composition of the salt to determine the ^{187}Os abundance in molybdenite.

The Carius tube method was used for the dissolution of molybdenite and equilibration of sample and tracer Re and Os (*cf.* Creaser *et al.,* 1993; Shirey and Walker, 1995; Shen *et al.,* 1996). Molybdenite samples of 1 to 8 mg were dissolved and equilibrated with a known amount of tracer in reverse aqua regia (2:1 16*N* HNO_3 and 12*N* HCl, 3 ml) at 240 ^{o}C for 24 hours then cooled and refrigerated prior to Os and Re separation.

Extraction of OsO_4 from the acid sample mix was achieved by using modified solvent extraction and microdistillation techniques (Cohen and Waters, 1996; Birck *et al.*, 1997). The Carius tube contents were frozen using liquid nitrogen, the tube opened, and carbon tetrachloride (CCl_4, 3.5 ml) added. After thawing, the contents were place in a 50-ml centrifuge tube in a water bath of ~ 25 ^oC for ~ 15 minutes. The mixture was agitated for 1 minute, centrifuged, and the Os-bearing CCl_4 removed to a PFA Teflon vial containing 9*N* HBr (3 ml). This procedure was completed 3 times. Back extraction of Os from CCl_4 was achieved by heating the CCl_4-HBr mix at ~60 ^oC for ~12 hours under a heat lamp. The CCl_4 was removed and the Os-bearing HBr evaporated to dryness at ~60 ^oC in HEPA filtered air. This Os fraction was then purified by microdistillation. The Os fraction dissolved in 9*N* HBr (30 µl) was dried onto the lid of a conical Teflon vial, oxidized using CrO_3 at ~80 ^oC for 3 hours, with the OsO_4 reduced by 9*N* HBr (20 µl) held in the tip of the conical Teflon vial. The Os-bearing HBr was then evaporated to dryness under nitrogen gas at ~60 ^oC.

Mo was removed by solvent extraction from the acid sample mixture after Os separation. The aqua regia residuum was evaporated at ~60 ^oC and converted to a chloride form using 6*N* HCl (5 ml), heated for ~2 hours at ~ 60 ^oC, placed in a centrifuge tube with Amyl acetate (5 ml), and agitated ~ 1 minute. The Mo-bearing Amyl acetate was then removed to waste. This procedure is repeated, and the sample solution (Re-bearing HCl) was evaporated to dryness at ~ 60 ^oC, converted to nitric form using 0.2*N* HNO_3 (3 ml), and heated at ~ 60 ^oC for ~ 2 hours. Re was then purified by HNO_3-HCl based anion exchange chromatography using standard techniques (Morgan *et al.*, 1991).

The purified Os fraction was loaded onto a Pt filament in 9*N* HBr (0.5 µl) drying in air at 0.8 A, with a $Ba(OH)_2$/NaOH solution (0.2 µl) added to the dried solution. The purified Re fraction was loaded onto a Pt filament in 16*N* HNO_3 (0.3 µl) with an equal amount of $Ba(NO_3)_2$ solution drying in air at 0.8 A. The Re and Os isotope compositions were measured using negative thermal ionization mass spectrometry (Creaser *et al.*, 1991; Volkening *et al.*, 1991) on a Micromass Sector 54 mass spectrometer. All Re and Os fractions were measured using the Faraday collector.

References

Birck, J.L., Roy Barman, M. and Capmas, F., 1997. Re-Os isotopic measurements at the femtomole level in natural samples. Geostandards Newsletter – Journal of Geostandards and Geoanalysis 20:19-27.

Cohen, A.S. and Waters, F.G., 1996. Separation of osmium from geological materials by solvent extraction for analysis by thermal ionization mass spectrometry. Analytica Chimica Acta 332:269-275.

Creaser, R.A., Papanastassiou, D.A. and Wasserburg, G.J., 1991. Negative thermal ion mass spectrometry of osmium, rhenium and iridium. Geochimica et Cosmochimica Acta 55:397-401.

Creaser, R.A., Papanastassiou, D.A. and Wasserburg, G.J., 1993. Rhenium-osmium isotope systematics of group IIA and group IVA iron meteorites. Lunar and planetary science conference, 24th, 1993, Houston, TX, Abstracts, pp. 339-340.

Faure, G., 1986. Principles of isotope geology. New York, John Wiley and Sons, 589p.

Markey, R., Stein, H. and Morgan, J., 1998. Highly precise Re-Os dating for molybdenite using alkaline fusion and NTIMS. Talanta 45:935-946.

Morgan, J.W., Lovering, J.F. and Ford, R.J., 1986. Rhenium and non-radiogenic osmium in australian molybdenites and other sulphide minerals by neutron activation analysis. Journal of the Geological Society of Australia 15:189-194.

Morgan, J.W., Golightly, D.W. and Dorrzapf, A.F., 1991. Methods for the separation of rhenium, osmium and molybdenum applicable to isotope geochemistry. Talanta 38: 259-265.

Selby, D. and Creaser, R.A., 2001. Re-Os Geochronology and systematics in molybdenite from the Endako porphyry molybdenum deposit, British Columbia, Canada. Economic Geology 96:1:197-204.

Shen, J.J., Papanastassiou, D.A. and Wasserburg, G.J., 1996. Precise Re-Os determinations and systematics of iron meteorites. Geochimica et Cosmochimica Acta 60:2887-2900.

Shirey, S.B. and Walker, R.J., 1995. Carius tube digestion for low blank Re-Os analysis. Analytical Chemistry 67:2136-2141.

Suzuki, K., Li, Q., Shimizu, H. and Masuda, A., 1992. Determination of osmium abundance in molybdenite mineral by using isotope dilution mass spectrometry with microwave digestion using potassium dichromate as oxidizing agent. Analyst 117: 1151-1156.

Völkening, J., Walczyk, T. and Heumann, K.G., 1991. Osmium isotope ration determinations by negative thermal ion mass spectrometry. International Journal of mass spectrometry Ion Processes 105: 147-159.

APPENDIX III

Fluid inclusion thermometric data

WERNECKE PROJECT FLUID INCLUSION RESULTS

Sample #	Phases	generation	Ti	Tmice	Tmhh	Thv	Ths	Th	Wt % NaCl	Wt % $CaCl_2$	NaCl eq wt %	Na:Ca ratio (Wt %)	moles of NaCl	moles of $CaCl_2$
Slab - quartz crystal from Wernecke Breccia matrix														
slab SW qz	L+V+H	p	-83.1	-50.4	na	158.3	226	226	22.3	17.5	40.7	1.3	3.82	1.58
slab SW qz	L+V+H	p	-90.3	-44.4	na	175	236.6	236.6	23.6	17.1	41.6	1.4	4.04	1.54
slab SW qz	L+V+H	p	-91.6	-50.1	na	168.5	236	236	23.5	17.0	41.4	1.4	4.02	1.53
slab SW qz	L+V+H	p	na	na	na	172	233.8	233.8	na	na	na	na		
slab SW qz	L+V+H	p	-88.5	-45.3	na	171	229	229	22.7	17.1	40.7	1.3	3.88	1.54
slab SW qz	L+V+H	p	-83.7	-49.3	na	168.7	236	236	23.5	17.0	41.4	1.4	4.02	1.53
slab SW qz	L+V+H	p	-84.3	-50.3	na	166	232.8	232.8	23.0	16.9	40.8	1.4	3.94	1.52
slab SW qz	L+V+H	p	na	na	na	167	na	na	na	na	na	na		
slab SW qz	L+V+H	p	-89.1	-36.3	na	154.2	245	245	24.2	17.3	42.4	1.4	4.14	1.56
slab SW qz	L+V+H	p	-89	-48.8	na	157.8	244.6	244.6	24.2	17.3	42.4	1.4	4.14	1.56
Hoover - quartz from a clast within Wernecke Breccia														
01JH-5-7A (B)	L+V+H	s	-64	-29.6	na	165	188	188	20.0	17.0	37.9	1.2	3.42	1.53
01JH-5-7A (B)	L+V	s	-67	-35	na	172	na	172	32.0	na	32.0			
01JH-5-7A (B)	L+V	s	-68	-29	na	166	na	166	28.0	na	28.0			
01JH-5-7A (B)	L+V	s	-67	-30	0.9	165	na	165	12.2	16.8	29.9	0.7	2.09	1.51
01JH-5-7A (B)	L+V	s	-74	-25	na	167	na	167	25.6	na	25.6			
01JH-5-7A (B)	L+V	s	-76	-34	-1	168	na	168	8.5	21.1	30.7	0.4	1.45	1.90
01JH-5-7A (B)	L+V	s	-74	-30	na	163	na	163	28.7	na	28.7			
01JH-5-7A (B)	L+V	s	-78	-34	na	153	na	153	31.3	na	31.3			
Slats - fluorite-ferroan dolomite-pyrite-chalcopyrite vein that cuts hematite-altered metasiltstone														
stf95-1-20.30	L+V	ps	-72.3	-28.1	-12.5	112.1	na	112.1	12.3	15.0	28.1	0.8	2.10	1.35
stf95-1-20.30	L+V	ps	-75	-27.1	-8.3	> 158.6	na	> 158.6	14.2	13.4	28.3	1.1	2.43	1.21
stf95-1-20.30	L+V	ps	-90.8	-23.1	na	111.9	na	111.9	24.4	na	24.4			
stf95-1-20.30	L+V	ps	-76	-24.9	na	>160	na	>160	25.5	na	25.5			
stf95-1-20.30	L+V	ps	-77.8	-23.3	na	116.3	na	116.3	24.5	na	24.5			
stf95-1-20.30	L+V	ps	-77.4	-23.6	na	121.8	na	121.8	24.7	na	24.7			
stf95-1-20.30	L+V+H	ps	-76.6	-25.7	1.5	113	na	>113	17.3	10.8	28.7	1.6	2.96	0.97
stf95-1-20.30	L+V+H	ps	-77	-22.9	na	89	na	>89	24.3	na	24.3			
stf95-1-20.30	L+V+H	ps	-75.4	-23.6	na	>160	na	>160	24.7	na	24.7			
stf95-1-20.30	L+V+H	ps	-75.6	-28.0	3.0	101.1	na	>101	14.5	14.3	29.6	1.0	2.48	1.29
stf95-1-20.30	L+V+H	ps	-89.2	-26.6	-0.1	141.8	na	>142	16.3	12.3	29.3	1.3	2.79	1.11
stf95-1-20.30	L+V+H	ps	-85	-27.5	-3.7	134.9	na	>135	14.4	13.8	28.9	1.0	2.46	1.24

Sample #	Phases	generation	Ti	Tmice	Tmhh	Thv	Ths	Th	Wt % NaCl	Wt % $CaCl_2$	NaCl eq wt %	Na:Ca ratio (Wt %)	moles of NaCl	moles of $CaCl_2$
stf95-1-20.30	L+V+Op	ps	-90.5	-26.5	-22.1	124.4	na	>124	13.0	13.0	26.7	1.0	2.22	1.17
stf95-1-20.30	L+V+Op	ps	-103.1	-25.8	0	125	na	>125	17.2	11.0	28.8	1.6	2.94	0.99
stf95-1-20.30	L+V+Op	ps	-82.7	-27.6	-6.5	129.5	na	>130	13.9	14.1	28.7	1.0	2.38	1.27
stf95-1-20.30	L+V+Op	ps	-77.4	-34.6	na	68	na	>68	31.7	na	31.7			
stf95-1-20.30	L+V+H+Op	ps	-76.6	-27.8	-7.1	123.8	na	>124	13.5	14.4	28.7	0.9	2.31	1.30
Igor -barite from Wernecke Breccia matrix at the edge of massive pyrite-hematite-chalcopyrite ± magnetite mineralization														
02JH-10-17B (A)	L+V	p	na	-54		250	na	250	54.9	na	54.9			
02JH-10-17B (A)	L+V	p	-77	-50	-26	250	na	250	2.2	30.1	33.9	0.1	0.38	2.71
02JH-10-17B (A)	L+V	p	no changes seen on reheating			220	na	220	na	na	na			
Olympic - quartz crystal in Wernecke Breccia matrix (fluid inclusions in the outermost growth zone)														
02JH-21-5 A	L+V	p	-60	-28	na	168	na	168	27.4	na	27.4			
02JH-21-5 A	L+V	p	na	-26	na	158	na	158	26.2	na	26.2			
02JH-21-5 A	L+V	p	na	-29	na	160	na	160	28.0	na	28.0			
02JH-21-5 A	L+V	p	-67	-27	na	170	na	170	26.8	na	26.8			
02JH-21-5 A	L+V	p	na	na	na	165	na	165	na	na	na			
02JH-21-5 A	L+V	p	na	na	na	167	na	167	na	na	na			
02JH-21-5 A	L+V	p	na	na	na	162	na	162	na	na	na			
Olympic - ferroan dolomite-quartz-chalcopyrite ± pyrite vein cutting Wernecke Breccia														
OY94-3-24.70m	L+V	p	-64	-25	na	212	na	212	25.6	na	25.6			
OY94-3-24.70m	L+V	p	na	-29.6	na	188	na	188	28.4	na	28.4			
OY94-3-24.70m	L+V	p	na	-56	-13	205	na	205	2.6	31.0	35.2	0.1	0.44	2.79
OY94-3-24.70m	L+V	p	na	na	na	212	na	212	na	na	na			
OY94-3-24.70m	L+V	p	na	na	na	213	na	213	na	na	na			
OY94-3-24.70m	L+V	p	na	na	na	214	na	214	na	na	na			
OY94-3-24.70m	L+V	p	na	na	na	215	na	215	na	na	na			
OY94-3-24.70m	L+V	p	na	na	na	223	na	223	na	na	na			
OY94-3-24.70m	L+V	p	na	na	na	216	na	216	na	na	na			
OY94-3-24.70m	L+V	p	na	na	na	194	na	194	na	na	na			
OY94-3-24.70m	L+V	p	na	na	na	218	na	218	na	na	na			

L = liquid, V = vapour, S = solid, Ox = oxide, p = primary, ps = pseudosecondary, s = secondary

Ti = initial melting; Tmice = final melting temperature of ice; Tmhh = final melting temperature of hydrohalite

Thv = temperature of vapour bubble disappearance;

Ths = temperature of halite dissolution; Th = final homogenisation temperature

(eq) Wt % = (equivalent) weight percent;

APPENDIX IV

Results of stable isotope analyses

WERNECKE PROJECT STABLE ISOTOPE RESULTS												
Sample ID	$\delta^{13}C$ carbonate (V-PDB)	$\delta^{18}O$ carbonate (V-SMOW)	$\delta^{13}C$ shale (V-PDB)	$\delta^{34}S$ pyrite (CDT)	$\delta^{34}S$ chalcopyrite (CDT)	$\delta^{34}S$ barite (CDT)	$\delta^{18}O$ muscovite (V-SMOW)	$\delta^{18}O$ biotite (V-SMOW)	$\delta^{18}O$ actinolite (V-SMOW)	δ D muscovite (V-SMOW)	δ D biotite (V-SMOW)	δ D actinolite (V-SMOW)
Wernecke Breccia related samples												
HOOVER												
01JH-05-05B			-26.70									
01JH-07-01A				-7.99								
01JH-07-11A	-6.76	12.21										
01JH-07-11B				13.39								
01JH-07-12 (breccia)	-4.52	12.03										
01JH-07-12 (vein)	-5.45	9.40										
01JH-08-02							11.13			na		
01JH-08-07A	-3.82	13.46										
01JH-09-5A			-20.80									
01JH-09-11A				4.55								
01JH-09-11E					8.78							
HV94-01-036'				-5.53								
HV94-01-120.5'	-3.87	11.15										
HV94-01-507.3'	-2.41	11.23		-12.41								
HV94-01-599.6'				-6.99								
HV94-01-642.5'	-2.30	11.92										
HV94-01-650'	-2.39	12.08										
HV94-01-695'								7.77			-119	
HV94-01-936.4'				-1.56								
SLAB												
01JH-13-08A					3.78							
01JH-15-10	-0.10	12.35										
01JH-19-01								6.7			-141	
01JH-19-02D	-0.01	12.16										
01JH-19-02E	0.17	6.72										

Sample ID	δ ^{13}C carbonate	δ ^{18}O carbonate	δ ^{13}C shale	δ ^{34}S pyrite	δ ^{34}S chalcopyrite	δ ^{34}S barite	δ ^{18}O muscovite	δ ^{18}O biotite	δ ^{18}O actinolite	δ D muscovite	δ D biotite	δ D actinolite
	(V-PDB)	(V-SMOW)	(V-PDB)	(CDT)	(CDT)	(CDT)	(V-SMOW)	(V-SMOW)	(V-SMOW)	(V-SMOW)	(V-SMOW)	(V-SMOW)
01JH-20-02								9.5			-84	
01JH-20-03							10.63			-45		
01JH-20-06A								8.25			-115	
01JH-20-06F	0.14	12.60										
01JH-20-08	-0.70	14.60										
01JH-20-10C								8.14	10.96		-23	-22; -18
01JH-27-03D				-5.40								
01JH-29-02B	1.24	14.06										
01JH-29-02C	1.48	15.32										
01JH-29-05C	-1.08	2.73										
01JH-29-15D					-3.97							
01JH-30-04B	-1.61	13.99										
01JH-30-07A	-0.56	12.78										
01JH-32-04C				-2.41								
01JH-32-04D	-1.23	14.78										
01JH-32-04F			-24.90									
01JH-32-06B	-3.69	7.18										
01JH-32-07A	-2.74	10.13										
01JH-32-07D					-10.99							
01JH-34-11C	-3.18	13.67										
01JH-34-11D (dark brown)	-3.16	13.78										
01JH-34-11D (medium brown)	-3.32	10.94										
01JH-34-11E	-2.61	-2.11										
01JH-35-01B	-3.24	13.01										
01JH-35-01C	-3.71	12.67										
01JH-35-02	-1.51	3.04						8.74			-34	

Sample ID	δ ^{13}C carbonate	δ ^{18}O carbonate	δ ^{13}C shale	δ ^{34}S pyrite	δ ^{34}S chalcopyrite	δ ^{34}S barite	δ ^{18}O muscovite	δ ^{18}O biotite	δ ^{18}O actinolite	δ D muscovite	δ D biotite	δ D actinolite
	(V-PDB)	(V-SMOW)	(V-PDB)	(CDT)	(CDT)	(CDT)	(V-SMOW)	(V-SMOW)	(V-SMOW)	(V-SMOW)	(V-SMOW)	(V-SMOW)
01JH-35-03B					2.40							
01JH-35-05B	-2.75	14.03										
02JH-14-01A2							11.13			-54		
02JH-14-01B					-11.48							
02JH-20-02								9.46			-84	
SB94-01-009.90m	-1.08	14.75										
SB94-01-033.70m	-0.23	14.09					11.61			-21		
SB94-01-128.60m				-3.29								
SB94-01-198.60m				-1.51	-2.69							
SB94-01-345.10m							11.47			na		
SB94-01-358.30m				-1.05								
SB94-04-177.60m				-0.66	-0.76							
SB95-05-107.30m				6.49								
SB97-09-051.50m	-3.00	14.27		7.09								
SB97-09-119.90m (beige)	-2.84	14.08										
SB97-09-119.90m (vein)	-2.77	13.04			-4.05							
SB97-09-166.10m				-5.76								
SB97-09-166.10m (pink)	-3.41	9.03										
SB97-09-166.10m (tan)	-2.61	13.55										
SB97-09-200.10m (brown)	-2.14	12.53										
SB97-09-200.30m (tan)	-2.41	13.03										
SB97-09-200.30m (white)	-2.62	6.69										
SB97-10-043.70m					-7.35							
SB97-19-070.10m	-2.29	4.25					10.09			na		
SLAB FL1				-3.24	-2.95							
SLATS												
02JH-04-01A				4.21								

Sample ID	δ ^{13}C carbonate	δ ^{18}O carbonate	δ ^{13}C shale	δ ^{34}S pyrite	δ ^{34}S chalcopyrite	δ ^{34}S barite	δ ^{18}O muscovite	δ ^{18}O biotite	δ ^{18}O actinolite	δ D muscovite	δ D biotite	δ D actinolite
	(V-PDB)	(V-SMOW)	(V-PDB)	(CDT)	(CDT)	(CDT)	(V-SMOW)	(V-SMOW)	(V-SMOW)	(V-SMOW)	(V-SMOW)	(V-SMOW)
02JH-04-01B	-4.37	15.35										
02JH-04-01G	-2.92	15.61										
02JH-05-01 (brown)	-7.26	15.39										
02JH-05-02	-2.21	16.78										
02JH-05-05B (vein)	-6.54	14.27										
02JH-06-03 (matrix)	-6.23	16.48										
02JH-06-04A	-10.46	14.54										
02JH-06-04C	-10.57	14.59			-1.73							
STW95-01-05.75m	-6.15	14.89										
STW95-01-11.10m tan	-5.12	15.68										
STW95-02-14.60m	-2.94	14.11			-6.78							
STW95-02-25.50m					-4.79							
STW95-03-05.20m (vein or matrix)	-4.14	16.11										
STW95-03-05.20m (vein or matrix)	-6.47	14.65										
STW95-03-41-10m				-6.23								
STF95-01-12.70m	-2.00	13.84										
STF95-01-62.50m	-0.80	13.97										
STF95-01-67.70m	-1.12	17.66										
STF95-01-110.60m (carb-hem vein)	-0.19	14.90										
STF95-01-110.60m (red carb-qz vein)	-0.45	14.14										
STF95-05-60.65m	-3.59	13.71										
STF95-05-74.90m	-4.33	20.12										
IGOR												
02JH-09-06C					-4.73							

Sample ID	δ ^{13}C carbonate	δ ^{18}O carbonate	δ ^{13}C shale	δ ^{34}S pyrite	δ ^{34}S chalcopyrite	δ ^{34}S barite	δ ^{18}O muscovite	δ ^{18}O biotite	δ ^{18}O actinolite	δ D muscovite	δ D biotite	δ D actinolite
	(V-PDB)	(V-SMOW)	(V-PDB)	(CDT)	(CDT)	(CDT)	(V-SMOW)	(V-SMOW)	(V-SMOW)	(V-SMOW)	(V-SMOW)	(V-SMOW)
02JH-10-17A				4.75								
02JH-12-01							9.92			-55		
02JH-12-05					-4.02							
02JH-12-13D					-7.86	17.12						
I80-10-045' 6	-2.95	16.70										
I80-10-113' tan	-6.14	16.42										
I80-10-115' 6"	-4.77	19.96										
I80-10-181' (tan)	-3.87	19.03										
I80-10-181' (brown)	-4.29	18.89										
I80-10-182' (white)	-2.91	17.26				11.29						
I80-10-208'	-2.59	15.45										
I80-10-210' (tan)	-1.35	15.94										
I80-10-216'	-1.85	16.55			-8.37	8.66						
I80-14-046'	-3.03	15.38										
I80-14-150'	-3.58	16.25										
I80-14-234'					-4.39							
I80-14-236'				-7.36								
I80-14-402.5' (white)	-3.12	18.56										
I80-14-441'	-2.84	17.24										
I80-14-500'	-4.61	14.62										
I80-14-539.5'				3.27		7.66						
IGOR						8.38						
OLYMPIC												
02JH-22-04A				-0.52								
OLYMPIC	-0.81	16.75										
OY94-01-021.30m	-1.46	7.97										
OY94-01-117.60m	0.08	16.69										
OY94-03-016.70m	-1.38	17.37										
OY94-03-024.70m	-5.06	16.94			5.31							

Sample ID	$\delta^{13}C$ carbonate	$\delta^{18}O$ carbonate	$\delta^{13}C$ shale	$\delta^{34}S$ pyrite	$\delta^{34}S$ chalcopyrite	$\delta^{34}S$ barite	$\delta^{18}O$ muscovite	$\delta^{18}O$ biotite	$\delta^{18}O$ actinolite	δD muscovite	δD biotite	δD actinolite
	(V-PDB)	(V-SMOW)	(V-PDB)	(CDT)	(CDT)	(CDT)	(V-SMOW)	(V-SMOW)	(V-SMOW)	(V-SMOW)	(V-SMOW)	(V-SMOW)
OY94-03-025.60m	-3.07	18.26										
OY94-03-038.60 (tan)	-2.91	16.98										
OY94-03-046.30m	-1.13	16.57										
OY94-03-063.50m (vein1)	0.41	16.61			-10.75							
OY94-03-063.50m (vein2)	-0.90	15.73										
OY94-03-132.8m	-1.10	17.12										
OY94-04-013.00m (white)	-0.61	16.70										
OY94-04-013.00m (tan)	-1.52	18.53										
OY94-04-021.90m	-1.65	14.97										
OY94-04-038.90m (tan)	-2.73	15.58										
OY94-04-038.90m (pink)	-2.79	14.76										
OY94-04-067.60m (bx matrix)	-2.15	16.79										
OY94-04-067.60m (post bx)	-2.49	16.89										
OY94-04-089.00m (white)	-1.64	18.71										
OY94-04-089.0m (carb-cp)	-1.89	16.34										
Host Wernecke Super Group samples												
Fairchild Lake Group												
DT02-9-2-1	-2.02	13.59										
01JH-09-07i	0.44	13.30										
01JH-09-07ii	0.40	13.14										
01JH-15-03	-1.41	11.80										
01JH-23-12	0.03	14.36										
01JH-29-15C	0.05	14.08										
Quartet Group												
02JH-10-12	-0.28	13.94										
02JH-12-09C	-1.68	15.44										
02JH-12-14	-1.86	15.91										
JH01 5 5B	-26.70											
JH01 9 5A	-20.80											

Sample ID	$\delta^{13}C$ carbonate	$\delta^{18}O$ carbonate	$\delta^{13}C$ shale	$\delta^{34}S$ pyrite	$\delta^{34}S$ chalcopyrite	$\delta^{34}S$ barite	$\delta^{18}O$ muscovite	$\delta^{18}O$ biotite	$\delta^{18}O$ actinolite	δD muscovite	δD biotite	δD actinolite
	(V-PDB)	(V-SMOW)	(V-PDB)	(CDT)	(CDT)	(CDT)	(V-SMOW)	(V-SMOW)	(V-SMOW)	(V-SMOW)	(V-SMOW)	(V-SMOW)
JH01 32 4F	**-24.90**											
Gillespie Lake Group												
CW92-53-01	**-1.28**	**19.23**										
DT92-51-1	**-0.16**	**24.56**										
02JH-04-02	**-1.31**	**19.55**										
02JH-04-03 (matrix)	**-1.91**	**16.39**										
02JH-04-04	**-1.81**	**19.19**										
02JH-06-01 (matrix)	**0.71**	**19.91**										
02DG-01	**1.63**	**20.28**										
02DG-02	**0.36**	**22.88**										
02JH-21-01	**0.22**	**20.03**										
02JH-21-04 (clasts)	**1.17**	**17.47**										
02JH-21-04 (matrix)	**0.32**	**16.62**										
02JH-22-03B	**-1.16**	**19.31**										
02JH-04-03 (clasts)	**-4.17**	**15.54**										

WERNECKE PROJECT STA			
Sample ID	**Paragenetic Stage**	**Mineral**	**Sample Description**
Wernecke Breccia related samples			
HOOVER			
01JH-05-05B		carbon	Quartet Group carbonaceous shale
01JH-07-01A	H2 or H3	pyrite	sulphides forming breccia matrix
01JH-07-11A	HU	calcite + kutnohorite	carbonate vein cutting black slate (Quartet Group)
01JH-07-11B	HU	pyrite	carbonate-sulphide vein cutting black slate (Quartet Group)
01JH-07-12 (breccia)	H3	calcite + ankerite + dolomite	carbonate breccia (upper breccia)
01JH-07-12 (vein)	HU	ankerite + dolomite	carbonate vein cutting carbonate breccia (upper breccia)
01JH-08-02	H3	muscovite	quartz-muscovite-malachite-hematite vein cutting siltstone (Fairchild Lake Group)
01JH-08-07A	H3	calcite	carbonate from breccia matrix
01JH-09-5A		carbon	Quartet Group carbonaceous shale
01JH-09-11A	H3	pyrite	sulphide vein at contact of upper breccia and black slate
01JH-09-11E	H2 or H3	chalcopyrite	talus sample from below breccia
HV94-01-036'	H3	pyrite	disseminated pyrite at breccia-siltstone contact
HV94-01-120.5'	H1 or H3	calcite	carbonate-magnetite vein
HV94-01-507.3'	H3	calcite + dolomite; pyrite	carbonate-pyrite vein brecciating siltstone
HV94-01-599.6'	H3 or H4	pyrite	carbonate-chlorite-pyrite-chalcopyrite vein cuts feldspar-quartz altered siltstone
HV94-01-642.5'	H3	calcite	carbonate brecciating siltstone clasts in breccia
HV94-01-650'	H3	calcite	carbonate-pyrite-chalcopyrite veinlet cutting a siltstone clast
HV94-01-695'	H3 or H4	biotite	biotite porphyroblasts in breccia matrix and clasts
HV94-01-936.4'	H3	pyrite	quartz-chlorite-pyrite vein cutting phyllitic siltstone
SLAB			
01JH-13-08A	S4	chalcopyrite	quartz-chalcopyrite vein parallel to layering in Fairchild Lake Group
01JH-15-10	S4	calcite	pink carbonate-hematite vein cutting breccia
01JH-19-01	S3	biotite	quartz-carbonate-hematite-biotite vein cutting breccia
01JH-19-02D	S4	calcite + magnesite	pink carbonate-actinolite-quartz vein cutting a siltstone clast in breccia
01JH-19-02E	S2	calcite + kutnohorite	carbonate±magnetite clast in breccia

Sample ID	Paragenetic Stage	Mineral	Sample Description
01JH-20-02		biotite	quartz-carbonate-hematite-biotite pyrite-chalcopyrite vein cutting breccia clast
01JH-20-03	S3 or S4	muscovite	muscovite from breccia matrix
01JH-20-06A	S3	biotite	biotite from breccia matrix
01JH-20-06F	S3	calcite	brown-weathering carbonate crystals in breccia matrix
01JH-20-08	S3	calcite	carbonate-quartz-pyrite vein at contact between breccia and siltstone
01JH-20-10C	S4	biotite; actinolite	carbonate-actinolite-biotite vein cutting siltstone near siltstone-breccia contact. Siltstone has been crackle brecciated by chlorite-quartz fluids - biotite may be chloritized.
01JH-27-03D	S1	pyrite	quartz-?feldspar-pyrite-chalcopyrite-molybdenite vein cutting siltstone
01JH-29-02B	S3	calcite	pink carbonate vein cutting breccia
01JH-29-02C	S3	calcite + quartz + albite	brown carbonate brecciating siltstone
01JH-29-05C	S3	calcite + ankerite + siderite + dolomite …	carbonate matrix to breccia proximal to slab volcanics
01JH-29-15D	S3 or S4	chalcopyrite	quartz-carbonate-chalcopyrite vein cutting Fairchild Lake Group siltstone
01JH-30-04B	S3	calcite + kutnohorite + azurite	brown carbonate-quartz ± chalcopyrite crackle brecciating siltstone
01JH-30-07A	S4	calcite	large carbonate crystals from calcite-muscovite/chlorite-quartz-fluorite breccia matrix
01JH-32-04C	S2	pyrite	quartz-magnetite-carbonate-garnet-pyrite-biotite vein cutting Fairchild Lake Group siltstone
01JH-32-04D	S2	calcite + dolomite	quartz-carbonate-magnetite pod in siltstone
01JH-32-04F		carbon	Quartet Group carbonaceous shale
01JH-32-06B	S3	calcite + ankerite + rhodochrosite …	carbonate-epidote crackle brecciating siltstone
01JH-32-07A	S3	calcite + huntite	pink carbonate-chlorite veins cutting breccia
01JH-32-07D	S4	chalcopyrite	chalcopyrite bleb 15x5 cm in a coarse-grained carbonate-quartz-magnetite vein cutting siltstone around bx with quartz-carbonate-magnetite-chalcopyrite matrix
01JH-34-11C	S2	ankerite	carbonate-magnetite-quartz vein cutting siltstone
01JH-34-11D (dark brown)	S2	ankerite + dolomite …	dark brown carbonate from dark brown carbonate-magnetite- medium brown carbonate vein cutting siltstone
01JH-34-11D (medium brown)	S2	calcite	medium brown carbonate from dark brown carbonate-magnetite- medium brown carbonate vein cutting siltstone
01JH-34-11E	S3	calcite + huntite + rhodochrosite	carbonate matrix from breccia that cuts above carbonate-magnetite veins
01JH-35-01B	S2	ankerite	carbonate-magnetite alteration
01JH-35-01C	S2	ankerite + dolomite + magnesite + azurite	carbonate-quartz vein (xcuts carbonate-magnetite alteration)
01JH-35-02	S3	calcite + kutnohorite + rhodochrosite; biotite	carbonate and biotite from matrix of breccia that cuts above carbonate-magnetite veins

Sample ID	Paragenetic Stage	Mineral	Sample Description
01JH-35-03B	S3	chalcopyrite	chalcopyrite from sulphide veinlet at edge of pyrite-chalcopyrite-quartz-carbonate-muscovite vein cutting
01JH-35-05B	S2	calcite + dolomite	carbonate-magnetite vein (xcuts carbonate-magnetite breccia)
02JH-14-01A2	S3	muscovite	pyrite-chalcopyrite-quartz-carbonate-muscovite vein cutting carbonate-magnetite-altered sediments.
02JH-14-01B	S3	chalcopyrite	pyrite-chalcopyrite-quartz-carbonate-muscovite vein cutting carbonate-magnetite-altered sediments.
02JH-20-02	S3	biotite	biotite from breccia matrix (rubble breccia)
SB94-01-009.90m	S3	calcite	carb-ms vein cutting biotite altered FLG siltstone
SB94-01-033.70m	S3	calcite; muscovite	carbonate-quartz-muscovite-pyrite-chalcopyrite-vein cutting feldspar altered FLG siltstone
SB94-01-128.60m	S3	pyrite	pyrite clast in breccia
SB94-01-198.60m	S3	pyrite; chalcopyrite	carbonate-chlorite-pyrite-chalcopyrite vein cuts Kfeldspar-quartz altered siltstone
SB94-01-345.10m	S3	muscovite	carbonate-quartz-muscovite/chlorite-chalcopyrite-molybdenite vein cutting biotite altered FLG siltstone
SB94-01-358.30m	S3	pyrite	massive coarse-grained pyrite with interstitial chalcopyrite overprinting purple quartz-fluorite altered siltstone
SB94-04-177.60m	S3	pyrite; chalcopyrite	chalcopyrite-pyrite from carbonate-muscovite/chlorite-chalcopyrite-pyrite-biotite vein cutting siltstone
SB95-05-107.30m	S3	pyrite	pyrite ± chalcopyrite overprinting massive magnetite-carbonate
SB97-09-051.50m	S2	dolomite; pyrite	carbonate-magnetite vein overprinted by hematite-pyrite
SB97-09-119.90m (beige)	S2	calcite + dolomite	white carbonate blebs in crackle breccia (overprinting carbonate-magnetite altered siltstone)
SB97-09-119.90m (vein)	S2	ankerite + minor dolomite; chalcopyrite	carbonate-chalcopyrite vein cutting crackle brecciated siltstone (overprinting carbonate-magnetite altered siltstone)
SB97-09-166.10m	S3	pyrite	pyrite ± chalcopyrite forming breccia matrix and overprinting massive magnetite-carbonate
SB97-09-166.10m (pink)	S3	ankerite + dolomite + huntite	tan carbonate overprinting carbonate-magnetite
SB97-09-166.10m (tan)	S2	ankerite + dolomite	pink carbonate cutting above tan carbonate
SB97-09-200.10m (brown)	S2	ankerite	brown-weathering carbonate (?part of carbonate-magnetite alteration)
SB97-09-200.30m (tan)	S2	ankerite	tan-weathering carbonate (?part of carbonate-magnetite alteration)
SB97-09-200.30m (white)	S5	calcite + albite	white carbonate vein that cuts above tan carbonate
SB97-10-043.70m	S3	chalcopyrite	chalcopyrite clast in breccia
SB97-19-070.10m	S4	ferroan dolomite; muscovite	carbonate-quartz-rutile blebs/bx cut ms-rich breccia
SLAB FL1	S3 or S4	pyrite; chalcopyrite	carbonate-pyrite-chalcopyrite forming breccia matrix
SLATS			
02JH-04-01A	FU	pyrite	hematite-pyrite-quartz veinlet cutting phyllite

Sample ID	Paragenetic Stage	Mineral	Sample Description
02JH-04-01B	FU	dolomite	quartz-carbonate-hematite vein
02JH-04-01G	FU	dolomite	2m wide massive hematite-magnetite-carbonate vein cutting phyllite
02JH-05-01 (brown)	W5	siderite	carbonate-quartz (tension) vein cutting diorite
02JH-05-02	W5	ferroan dolomite	carbonate vein cutting interlayered shale and dolomite
02JH-05-05B (vein)	W5	dolomite	carbonate-quartz vein cutting red breccia
02JH-06-03 (matrix)	W5	ferroan dolomite	Wernecke Breccia matrix
02JH-06-04A	W6	ankerite	carbonate-pyrite-chalcopyrite-fluorite vein cutting massive magnetite at contact between Wernecke breccia and Gillespie Lake Group interlayered dolomite and black shale
02JH-06-04C	W6	ankerite; chalcopyrite	carbonate-pyrite-chalcopyrite-quartz vein cutting massive magnetite at contact between Wernecke breccia and Gillespie Lake Group interlayered dolomite and black shale
STW95-01-05.75m	W5	ferroan dolomite	carbonate-chalcopyrite vein cutting Wernecke Breccia
STW95-01-11.10m tan	W5	ankerite	breccia matrix (replacing earlier ser matrix)
STW95-02-14.60m	W5	ferroan dolomite + ankerite; chalcopyrite	carbonate-chalcopyrite vein at breccia-siltstone contact
STW95-02-25.50m	W5	pyrite	albite-quartz-chlorite-chalcopyrite vein cutting hematite altered sediments in breccia zone
STW95-03-05.20m (vein or matrix)	W5	dolomite	carbonate-albite-quartz-pyrite vein cutting breccia or carbonate matrix to breccia (mix up at lab and samples were not labelled)
STW95-03-05.20m (vein or matrix)	W5	dolomite	carbonate-albite-quartz-pyrite vein cutting breccia or carbonate matrix to breccia (mix up at lab and samples were not labelled)
STW95-03-41-10m	W5	pyrite	massive pyrite vein cutting crackle-brecciated siltstone
STF95-01-12.70m	F4	ferroan dolomite	Quartz-albite-carbonate-± chalcopyrite ± hematite vein cutting K-altered siltstone
STF95-01-62.50m	F3	ferroan dolomite	Quartz-albite-carbonate-± chalcopyrite ± hematite vein cutting brecciated phyllite
STF95-01-67.70m	F3	ferroan dolomite	Quartz-albite-carbonate-± chalcopyrite vein cutting phyllite
STF95-01-110.60m (carb-hem vein)	F2	dolomite	quartz-carbonate-albite-specular hematite vein cutting sericite altered phyllite
STF95-01-110.60m (red carb-qz vein)	F3	ferroan dolomite	quartz-carbonate-red hematite vein cutting above vein
STF95-05-60.65m	F3	ferroan dolomite	carbonate-quartz vein cutting breccia
STF95-05-74.90m	F3	ankerite	carbonate vein cutting breccia
IGOR			
02JH-09-06C	I3	chalcopyrite	quartz-carbonate-pyrite-chalcopyrite vein/pod in foliated breccia

Sample ID	Paragenetic Stage	Mineral	Sample Description
02JH-10-17A	I3	pyrite	massive pyrite breccia
02JH-12-01	I4	muscovite	muscovite from breccia matrix
02JH-12-05	I3	chalcopyrite	carbonate-chalcopyrite-hematite vein cutting foliated K-chlorite-carbonate altered rock
02JH-12-13D	I4	chalcopyrite; barite	barite-chalcopyrite vein
I80-10-045' 6	I4	ferroan dolomite	carbonate-barite vein cutting breccia
I80-10-113' tan	I4	siderite	tan carbonate-red barite vein cutting breccia
I80-10-115' 6"	I3	siderite	carbonate-chalcopyrite vein cutting Wernecke Breccia and cross-cut by pyrite-chalcopyrite-magnetite vein
I80-10-181' (tan)	I4	ferroan dolomite	tan carbonate-brown carbonate-barite-pyrite-chalcopyrite vein cutting breccia
I80-10-181' (brown)	I4	siderite	tan carbonate-brown carbonate-barite-pyrite-chalcopyrite vein cutting breccia
I80-10-182' (white)	I4	ferroan dolomite; barite	carbonate-barite vein cutting breccia
I80-10-208'	I4	siderite	carbonate vein cutting semi-massive magnetite
I80-10-210' (tan)	I4	siderite	carbonate-?feldspar-barite-chalcopyrite vein cutting breccia
I80-10-216'	I4	siderite; chalcopyrite; barite	carbonate-barite-chalcopyrite-pyrite vein cutting breccia
I80-14-046'	I3	siderite	carbonate overprinting breccia
I80-14-150'	I3	siderite	carbonate vein cutting breccia
I80-14-234'	IU	chalcopyrite	quartz-chalcopyrite vein cutting breccia
I80-14-236'	I3	pyrite	massive pyrite overprinting breccia
I80-14-402.5' (white)	I3	ferroan dolomite	carbonate-feldspar-chalcopyrite-hematite vein cutting breccia
I80-14-441'	I3	ferroan dolomite	carbonate-barite-pyrite vein cutting breccia
I80-14-500'	I3	siderite	carbonate-pyrite vein cutting breccia
I80-14-539.5'	I4	pyrite; barite	barite-pyrite vein
IGOR	I4	barite	1m wide barite-magnetite vein cutting breccia
OLYMPIC			
02JH-22-04A	OU	pyrite	pyrite from diorite-breccia contact zone
OLYMPIC	O5	ferroan dolomite	brown-weathering carbonate cutting Wernecke breccia
OY94-01-021.30m	O3	calcite	carbonate vein cutting WBx
OY94-01-117.60m	O1	dolomite	dark brown-weathering carbonate veins cut breccia
OY94-03-016.70m	O3	dolomite	carbonate-quartz vein cut WBx
OY94-03-024.70m	O3	ferroan dolomite; chalcopyrite	carbonate-quartz-chalcopyrite ± pyrite vein cutting WBx

Sample ID	Paragenetic Stage	Mineral	Sample Description
OY94-03-025.60m	O2	ferroan dolomite	carbonate-quartz-chalcopyrite-pyrite-arsenopyrite vein cutting WBx
OY94-03-038.60 (tan)	O5	ferroan dolomite	carbonate-quartz vein cutting WBX and quartz-hematite-pyrite veinlets
OY94-03-046.30m	O3	ferroan dolomite	pink carbonate cutting hematite-altered WBx
OY94-03-063.50m (vein1)	O2	dolomite; chalcopyrite	carbonate-hematite-chalcopyrite-quartz vein cutting WBX
OY94-03-063.50m (vein2)	O5	dolomite	carbonate vein cutting above vein
OY94-03-132.8m	O2	dolomite	carbonate-quartz-chalcopyrite vein
OY94-04-013.00m (white)	O3	dolomite	white carbonate±chalcopyrite vein cutting siltstone
OY94-04-013.00m (tan)	O5	ferroan dolomite	tan carbonate±chalcopyrite vein cutting above vein
OY94-04-021.90m	O3	ankerite	carbonate-quartz-?feldspar vein cutting WBX
OY94-04-038.90m (tan)	O3	dolomite	tan and pink carbonate-quartz-?feldspar vein cutting WBX
OY94-04-038.90m (pink)	O3	ankerite	tan and pink carbonate-quartz-?feldspar vein cutting WBX
OY94-04-067.60m (bx matrix)	O1	dolomite	WBX matrix
OY94-04-067.60m (post bx)	O3	ferroan dolomite	carbonate-quartz vein cutting WBX
OY94-04-089.00m (white)	O2	dolomite	carbonate-quartz-hematite vein cutting fine-grained sediments
OY94-04-089.0m (carb-cp)	O3	ankerite	carbonate-quartz-chalcopyrite vein cutting above vein
Host Wernecke Super Group samp			
Fairchild Lake Group			
DT02-9-2-1		dolomite	carbonate layer
01JH-09-07i		calcite	carbonate band in sediments
01JH-09-07ii		calcite	carbonate band in sediments
01JH-15-03		calcite + rhodochrosite + kutnohorite ..	carbonate-muscovite layer in siltstone
01JH-23-12		calcite	carbonate layer in biotite-altered siltstone
01JH-29-15C		calcite	carbonate layer in siltstone
Quartet Group			
02JH-10-12		ankerite	brown-weathering carbonate layers in QG siltstone overlying foliated breccia
02JH-12-09C		ferroan dolomite	dolostone clast from breccia
02JH-12-14		ferroan dolomite + ankerite	carbonate clast in breccia
JH01 5 5B			carbonaceous shale
JH01 9 5A			carbonaceous shale

Sample ID	Paragenetic Stage	Mineral	Sample Description
JH01 32 4F			carbonaceous shale
Gillespie Lake Group			
CW92-53-01		ferroan dolomite	carbonate layer
DT92-51-1		dolomite	carbonate layer
02JH-04-02		dolomite	orange weathering, fine-grained, grey dolostone (Gillespie Lake Group)
02JH-04-03 (matrix)		dolomite	brecciated dolomite (Gillespie Lake Group)
02JH-04-04		dolomite	Orange weathering, fine-grained, grey dolostone (Gillespie Lake Group)
02JH-06-01 (matrix)		dolomite	brecciated dolomite (Gillespie Lake Group)
02DG-01		ferroan dolomite	Gillespie Lake Group dolostone
02DG-02		ferroan dolomite	Gillespie Lake Group dolostone
02JH-21-01		dolomite	Gillespie Lake Group stromatolitic dolostone
02JH-21-04 (clasts)		dolomite	brecciated dolostone
02JH-21-04 (matrix)		dolomite	brecciated dolostone
02JH-22-03B		dolomite	clast of brecciated dolostone from Wernecke Breccia
02JH-04-03 (clasts)		ankerite	brecciated dolomite (Gillespie Lake Group)

APPENDIX V

Calculations for log fO_2 versus log fS_2 plots

WERNECKE PROJECT LOG fO_2 VERSUS LOG fS_2 PLOTS

log K values were calculated using the programme "The Geochemists Workbench release 4.0.2"
using T=300oC, P=2.5kb and the following equations:

Pyrite-Magnetite: 3 FeS2 + 2 O2(g) = Fe3O4 + 3 S2(g)
Pyrite-Hematite: 4 FeS2 + 3 O2(g) = 2 Fe2O3 + 4 S2 (g)
Pyrrhotite-Magnetite: 6 FeS + 4 O2(g) = 2 Fe3O4 + 3 S2
Bornite-Chalcopyrite: Cu5FeS4 + 4 FeS2 = 5 CuFeS2 + S2
Graphite-CO2(g): C + O2(g) = CO2(g)
Calcite-gypsum: 2 CaCO3 + S2(g) + 3 O2(g) + 4 H2O = 2 CaSO4 + 2 CO2(g)
Witherite-Barite: 2 BaCO3 + S2(g) + 3O2(g) = 2 BaSO4 + 2 CO2(g)
Siderite-Pyrite: FeCO3 + S2(g) = FeS2 + CO2(g) + 0.5O2(g)
Ferrodolomite-(Calcite + Pyrite): (Ca, Fe)2CO3 + S2(g) = CaCO3 + FeS2 + CO2(g) + 0.5 O2(g)
Log K = activity of products - activity of reactants. Assume activity of solid phases = 1; Remember Log 1 = 0

	Log K	**fCO2(g)**
Pyrite-Pyrrhotite; Log fS2 = 2 Log K	-4.6	100
Pyrite-Magnetite; Log fS2 = 0.33 (Log K + 2 Log fO2); Log fO2 = 0.5 (3 Log fS2 - Log K)	33.88	0.01
Pyrite-Hematite; Log fS2 = 0.25 (Log K + 3 Log fO2); Log fO2 = 0.33 (4 Log fS2 - Log K)	55.34	
Pyrrhotite-Magnetite; Log fS2 = 0.33 (Log K + 4 Log fO2); Log fO2 = 0.25 (3 Log fS2 - Log K)	83.64	
Bornite-Chalcopyrite; Log fS2 = Log K	-6.93	
Graphite-CO2(g); Log fO2 = Log f CO2 - Log K	36.13	
Calcite-Gypsum; Log fO2 = 0.33 (2 Log fCO2 - Log fS2 - Log K); Log fS2 = 2 Log fCO2 - 3 Log fO2 - Log K	101.53	
Witherite-Barite; Log fO2 = 0.33 (2 Log fCO2 - Log fS2 - Log K); Log fS2 = 2 Log fCO2 - 3 Log fO2 - Log K	111.29	
Siderite-Pyrite; Log fO2 = 2 (Log fCO2 - Log fS2 - Log K); Log fS2 = Log fCO2 + 0.5 Log fO2 - Log K	-3.74	
Magnetite-Hematite: Log fO2 = -2 Log K	15.25	
Ferrodolomite-Calcite+pyrite: Log fS2 = Log fCO2 + 0.5 Log fO2 - Log K	-3.72	

APPENDIX VI

Calculations for log pH versus logf_{O_2} plots

WERNECKE PROJECT CALCULATION OF $\delta^{34}S_i$ VALUES FOR LOG fO_2 VERSUS pH PLOTS

Fluid Conditions

T =	300oC
P =	2500bars
pH	variable
logfO2(g)	variable
Cl-	2.539
Na	3
K	0.35
Ca	1
H2O	1 (kg)
logaH2S	-2.6
Fe++	0.5

*Estimates of log fO2 and logS2 were made from mineral stability fields on a log fO2 vs log fS2 plot using the mineral assemblage at Slab. Na & Ca values are from Slab fluid inclusion salinity data

Ionic strength =3.2 (calculated for above fluid by GWB)

Conditions for the fluid were fixed at the following conditions in order to be in the H2S dominant field and obtain a concentration for S:
Log fS2 = -8.5
Log fO2 = -31.24 [calculated from: 0.5S2(g) + H2O = 0.5O2(g) + H2S(aq) using Log fS2 = -8.5]
LogaH2S = -2.6 (mid value calculated from range of log fO2 and log fS2 values for the Slab area
pH = 5
This gives a sulphur concentration of 0.0032 (molality) ≈ 75ppm

Examples of molality calculated in "The Geochemists Workbench" programme:

Species	Molality	Mole fraction (X)
NaSO4-	0.6985	0.497
CaSO4(aq)	0.3741	0.266
KSO4-	0.165	0.117
SO4--	0.1623	0.115
H2S(aq)	2.51E-03	0.002
HSO4-	1.54E-03	0.001

HS-	1.30E-03	0.001
NaHS(aq)	5.66E-04	0.000
KHS(aq)	1.52E-05	0.000
KHSO4(aq)	1.04E-05	0.000
S2O3--	5.82E-06	0.000
HSO3-	4.07E-06	0.000
SO2(aq)	6.66E-08	0.000
SO3--	2.54E-08	0.000
S2--	1.21E-08	0.000
Total	1.405851288	

Isotope enrichment factors from Ohmoto (1972):

$\Delta i = \delta^{34}Si - \delta^{34}SH_2S$ ‰

species	**250 oC**	**300 oC**	**350 oC**	**$\delta 34S_{\Sigma S}$ ‰**	
HS-	-1.4	-1.4	-1.3	0	magmatic
S-2	-6.2	-5.5	-4.8	23	middle Proterozoic seawater
SO-2 & other sulphates	26.5	22	19	12	
FeS, ZnS	-1.4	-1.5	-1	17	higest barite value at Igor
FeS2	-0.3	-0.6	-0.2		
PbS	-4.1	-3.8	-2.9		

Examples of δ34Si from the calculated molalities - using the method of Ohmoto (1972):

$\delta^{34}Si = \delta 34S_{\Sigma S} + \Delta i - [(\Delta HS^- * XHS^-) + (\Delta S^{-2} * XS^{-2}) + (\Delta SO4^{-2} * XSO4^{-2}) + (\Delta HSO4- * XHSO4-)$

$+ (\Delta KSO4- * XKSO4-) + (\Delta NaSO4- * XNaSO4-) + (\Delta CaSO4 * XCaSO4)]$

using 300 oC	$\delta^{34}S_{\Sigma S} = 0$‰	$\delta^{34}S_{\Sigma S} = 23$‰	$\delta^{34}S_{\Sigma S} = 12$‰	$\delta^{34}S_{\Sigma S} = 17$‰
δ^{34}Spy	-22.53	0.47	-10.53	-5.53
δ^{34}S HS-	-23.33	-0.33	-11.33	-6.33

δ^{34}S S-2	-27.43	-4.43	-15.43	-10.43
δ^{34}S SO4-2	0.07	23.07	12.07	17.07
δ^{34}S HSO4-2	0.07	23.07	12.07	17.07
δ^{34}S KSO4-	0.07	23.07	12.07	17.07
δ^{34}S NaSO4-	0.07	23.07	12.07	17.07
δ^{34}S CaSO4-	0.07	23.07	12.07	17.07

APPENDIX VII

Rock sample descriptions and locations

Abbreviations used in Appendix VII

Ab = albite
Act = actinolite
Altn = alteration
Aspy = arsenopyrite
Bar = barite
Bor = bornite
Bt = biotite
Bx = breccia
Carb = carbonate
Cbx = crackle breccia
Cc = calcite
Ck = creek
Cl = chlorite
Cpy = chalcopyrite
Dec = decrease
Diss = disseminated
Dt = dolomite
Ep = epidote
Feldspar = feldspar
FG = fine-grained
Fracs = fractures
Ft = fluorite
CG = coarse-grained
Gt = garnet
Hb = hornblende
Ht = hematite
Inc = increase
Ksp = potassium feldspar
Moly = molybdenite
Musc = muscovite
Mt = magnetite
Mtn = mountain
OP = overprint(s) or overprinting
Py = pyrite
Po = pyrrhotite
Qz = quartz
Repl = replaced
Ser = sericite
Slc = siliceous
ss = sandstone
sst = siltstone
Tour = tourmaline
Vlts = veinlets
XC = cross-cutting

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Location	NTS map sheet	Datum (NAD)	Easting	Northing	Thin Section	Isotopes				Fluid Inclusions	Geochron
										O	C	S	D		
SLAB PROPERTY: DRILL CORE SAMPLES															
70207	SB94-1	1.30	-	Slab Mtn	D/16	27	0545727	7208459	**Y**						
70208	SB94-1	4.29	-	Slab Mtn	D/16	27	0545727	7208459	**Y**						
70209	SB94-1	5.80	-	Slab Mtn	D/16	27	0545727	7208459							
70210	SB94-1	6.90	-	Slab Mtn	D/16	27	0545727	7208459	**Y**						**U-Pb**
70211	SB94-1	9.90	-	Slab Mtn	D/16	27	0545727	7208459		**Y**	**Y**				
70212	SB94-1	10.80	-	Slab Mtn	D/16	27	0545727	7208459							
70213	SB94-1	15.40	-	Slab Mtn	D/16	27	0545727	7208459							
70214	SB94-1	29.10	-	Slab Mtn	D/16	27	0545727	7208459							
70215	SB94-1	31.50	-	Slab Mtn	D/16	27	0545727	7208459							
70216	SB94-1	33.70	-	Slab Mtn	D/16	27	0545727	7208459	**Y**	**Y**	**Y**		**Y**		
70217	SB94-1	41.40	-	Slab Mtn	D/16	27	0545727	7208459							
70218	SB94-1	51.40	-	Slab Mtn	D/16	27	0545727	7208459							
70219	SB94-1	57.43	-	Slab Mtn	D/16	27	0545727	7208459	**Y**						
70220	SB94-1	58.30	-	Slab Mtn	D/16	27	0545727	7208459							
70221	SB94-1	59.50	-	Slab Mtn	D/16	27	0545727	7208459	**Y**						
70222	SB94-1	63.00	-	Slab Mtn	D/16	27	0545727	7208459							
70223	SB94-1	64.90	-	Slab Mtn	D/16	27	0545727	7208459							
70224	SB94-1	70.40	-	Slab Mtn	D/16	27	0545727	7208459							
70225	SB94-1	71.40	-	Slab Mtn	D/16	27	0545727	7208459							
70226	SB94-1	75.80	-	Slab Mtn	D/16	27	0545727	7208459							
70227	SB94-1	77.10	-	Slab Mtn	D/16	27	0545727	7208459							
70228	SB94-1	79.85	-	Slab Mtn	D/16	27	0545727	7208459							
70229	SB94-1	90.50	-	Slab Mtn	D/16	27	0545727	7208459							
70230	SB94-1	91.80	-	Slab Mtn	D/16	27	0545727	7208459							
70231	SB94-1	94.50	-	Slab Mtn	D/16	27	0545727	7208459							
70232	SB94-1	100.00	-	Slab Mtn	D/16	27	0545727	7208459							
70233	SB94-1	128.60	-	Slab Mtn	D/16	27	0545727	7208459	**Y**			**Y**			
70234	SB94-1	129.10	-	Slab Mtn	D/16	27	0545727	7208459							
70235	SB94-1	130.60	-	Slab Mtn	D/16	27	0545727	7208459							

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Lithology
70207	SB94-1	1.30	-	Carb-Mt bands
70208	SB94-1	4.29	-	Fs vlts, Bt altn & grey-green altn
70209	SB94-1	5.80	-	Carb with Py & Pyrrhotite
70210	SB94-1	6.90	-	Sulphide vein
70211	SB94-1	9.90	-	Carb vein with Musc
70212	SB94-1	10.80	-	Carb-sulphide veinlet
70213	SB94-1	15.40	-	White to pink spots
70214	SB94-1	29.10	-	Aspy
70215	SB94-1	31.50	-	Carb crystals
70216	SB94-1	33.70	-	Carb-Qz-Musc-sulphide vein
70217	SB94-1	41.40	-	Multiple veins
70218	SB94-1	51.40	-	
70219	SB94-1	57.43	-	Bt Cbx
70220	SB94-1	58.30	-	Qz-Fs altn cut by bright white Qz altn & cross-cut by Qz-Fs vlts
70221	SB94-1	59.50	-	Grey slc altn repl by bright white Qz altn
70222	SB94-1	63.00	-	Bright white Qz-Ft vein
70223	SB94-1	64.90	-	Ft veinlet
70224	SB94-1	70.40	-	Carb vein
70225	SB94-1	71.40	-	Grey-green altn
70226	SB94-1	75.80	-	White spots
70227	SB94-1	77.10	-	Sulphide spots
70228	SB94-1	79.85	-	Pink Fs-Qz altn overprinting Bt, Cl-Carb-Cpy-Po, overprinting Fs-Qz, all cut by white Carb vlts
70229	SB94-1	90.50	-	Carb with Cpy & Aspy
70230	SB94-1	91.80	-	Fs altn & Carb-Ft
70231	SB94-1	94.50	-	General lithology
70232	SB94-1	100.00	-	White spots
70233	SB94-1	128.60	-	Py clast
70234	SB94-1	129.10	-	Pale brown spots
70235	SB94-1	130.60	-	Late glassy Qz veins & blebs

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Location	NTS map sheet	Datum (NAD)	Easting	Northing	Thin Section	Isotopes				Fluid Inclusions	Geochron
										O	C	S	D		
70236	SB94-1	134.30	-	Slab Mtn	D/16	27	0545727	7208459							
70237	SB94-1	137.40	-	Slab Mtn	D/16	27	0545727	7208459							
70238	SB94-1	138.60	-	Slab Mtn	D/16	27	0545727	7208459							
70239	SB94-1	144.60	-	Slab Mtn	D/16	27	0545727	7208459							
70240	SB94-1	146.60	-	Slab Mtn	D/16	27	0545727	7208459							
70241	SB94-1	160.90	-	Slab Mtn	D/16	27	0545727	7208459							
70242	SB94-1	168.10	-	Slab Mtn	D/16	27	0545727	7208459							
70243	SB94-1	178.80	-	Slab Mtn	D/16	27	0545727	7208459							
70244	SB94-1	179.50	-	Slab Mtn	D/16	27	0545727	7208459							
70245	SB94-1	179.70	-	Slab Mtn	D/16	27	0545727	7208459							
70246	SB94-1	186.00	-	Slab Mtn	D/16	27	0545727	7208459							
70247	SB94-1	190.90	-	Slab Mtn	D/16	27	0545727	7208459	**Y**						
70248	SB94-1	198.60	-	Slab Mtn	D/16	27	0545727	7208459	**Y**			**Y**			
70249	SB94-1	202.40	-	Slab Mtn	D/16	27	0545727	7208459							
70250	SB94-1	227.65	-	Slab Mtn	D/16	27	0545727	7208459							
70251	SB94-1	264.50	-	Slab Mtn	D/16	27	0545727	7208459							
70252	SB94-1	270.95	-	Slab Mtn	D/16	27	0545727	7208459							
70253	SB94-1	285.90	-	Slab Mtn	D/16	27	0545727	7208459							
70254	SB94-1	319.00	-	Slab Mtn	D/16	27	0545727	7208459							
70255	SB94-1	332.50	-	Slab Mtn	D/16	27	0545727	7208459	**Y**						
70256	SB94-1	335.60	-	Slab Mtn	D/16	27	0545727	7208459							
70257	SB94-1	345.10	-	Slab Mtn	D/16	27	0545727	7208459	**Y**				**Y**		**Re-Os, Ar-Ar**
70258	SB94-1	345.80	-	Slab Mtn	D/16	27	0545727	7208459							
70259	SB94-1	357.00	-	Slab Mtn	D/16	27	0545727	7208459							
70260	SB94-1	358.10	-	Slab Mtn	D/16	27	0545727	7208459							
70261	SB94-1	358.30	-	Slab Mtn	D/16	27	0545727	7208459	**Y**			**Y**			
70262	SB94-1	364.00	-	Slab Mtn	D/16	27	0545727	7208459							
70263	SB94-1	368.85	-	Slab Mtn	D/16	27	0545727	7208459							
70264	SB94-2	15.90		Slab Mtn	D/16	27	0544765	7208465							
70265	SB94-2	205.10	-	Slab Mtn	D/16	27	0544765	7208465							

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Lithology
70236	SB94-1	134.30	-	Qz-Fs vein with Moly
70237	SB94-1	137.40	-	Glassy Qz in centre of white Carb vein
70238	SB94-1	138.60	-	Vug lined with Carb crystals + Py + Cpy
70239	SB94-1	144.60	-	Cl spots & vlts
70240	SB94-1	146.60	-	Fs-Qz-Cl-sulphide
70241	SB94-1	160.90	-	Moly in Carb-Cl altn with Py & Cpy
70242	SB94-1	168.10	-	Massive Bt altered rock
70243	SB94-1	178.80	-	Cpy
70244	SB94-1	179.50	-	Mt-Py-Ep
70245	SB94-1	179.70	-	Cpy
70246	SB94-1	186.00	-	Cl-Carb altn replacing Bt
70247	SB94-1	190.90	-	Bright white Qz-Ft vein with Diss Moly & Py
70248	SB94-1	198.60	-	Carb overprinting
70249	SB94-1	202.40	-	Cl-Fs ?-scapolite?-Ep vein cut by white Qz ? Vein with Moly
70250	SB94-1	227.65	-	Qz-Fs-Cpy-Py veins cut by Carb-Qz-Fs ?-Cpy-Py veins +/- Ft
70251	SB94-1	264.50	-	Bt in Carb + veins
70252	SB94-1	270.95	-	Gt??
70253	SB94-1	285.90	-	Bt overprinted by bright white to purple Qz-Ft ?veins with Diss Cpy-Py, cut by chalky white vlts
70254	SB94-1	319.00	-	Typical Bt altn
70255	SB94-1	332.50	-	Bxted sst
70256	SB94-1	335.60	-	Moly in Slc rock
70257	SB94-1	345.10	-	Moly in Carb altn
70258	SB94-1	345.80	-	CG Bt vein
70259	SB94-1	357.00	-	Qz-Ft veins overprinted by Carb-Cl altn & Cpy-Py
70260	SB94-1	358.10	-	Brannerite??
70261	SB94-1	358.30	-	Py
70262	SB94-1	364.00	-	Large Carb crystals in Bt altn
70263	SB94-1	368.85	-	Py overgrowing Carb + altn (wormy texture)
70264	SB94-2	15.90		Bt-Cl altered sst & Fs-Qz altn cross cut by Carb vein
70265	SB94-2	205.10	-	Bt altered sst

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Location	NTS map sheet	Datum (NAD)	Easting	Northing	Thin Section	Isotopes				Fluid Inclusions	Geochron
										O	C	S	D		
70266	SB94-3	126.85		Slab Mtn	D/16	27	0545784	7208084							
70267	SB94-3	240.75	-	Slab Mtn	D/16	27	0545784	7208084							
70268	SB94-3	283.25	-	Slab Mtn	D/16	27	0545784	7208084							
70269	SB94-4	4.30		Slab Mtn	D/16	27	0545397	7208280							
70270	SB94-4	17.00	-	Slab Mtn	D/16	27	0545397	7208280							
70271	SB94-4	23.70	-	Slab Mtn	D/16	27	0545397	7208280							
70272	SB94-4	32.50	-	Slab Mtn	D/16	27	0545397	7208280							
70273	SB94-4	40.30	-	Slab Mtn	D/16	27	0545397	7208280							
70274	SB94-4	44.00	-	Slab Mtn	D/16	27	0545397	7208280							
70275	SB94-4	45.30	-	Slab Mtn	D/16	27	0545397	7208280							
70276	SB94-4	47.60	-	Slab Mtn	D/16	27	0545397	7208280							
70277	SB94-4	48.40	-	Slab Mtn	D/16	27	0545397	7208280							
70278	SB94-4	53.70	-	Slab Mtn	D/16	27	0545397	7208280							
70279	SB94-4	55.80	-	Slab Mtn	D/16	27	0545397	7208280							
70280	SB94-4	58.50	-	Slab Mtn	D/16	27	0545397	7208280							
70281	SB94-4	62.30	-	Slab Mtn	D/16	27	0545397	7208280							
70282	SB94-4	61.70	-	Slab Mtn	D/16	27	0545397	7208280							
70283	SB94-4	63.70	-	Slab Mtn	D/16	27	0545397	7208280							
70284	SB94-4	63.20	-	Slab Mtn	D/16	27	0545397	7208280							
70285	SB94-4	67.60	-	Slab Mtn	D/16	27	0545397	7208280							
70286	SB94-4	69.60	-	Slab Mtn	D/16	27	0545397	7208280	**Y**						
70287	SB94-4	79.60	-	Slab Mtn	D/16	27	0545397	7208280	**Y**						
70288	SB94-4	108.00	-	Slab Mtn	D/16	27	0545397	7208280							
70289	SB94-4	109.50	-	Slab Mtn	D/16	27	0545397	7208280							
70290	SB94-4	115.40	-	Slab Mtn	D/16	27	0545397	7208280							
70291	SB94-4	125.00	-	Slab Mtn	D/16	27	0545397	7208280							
70292	SB94-4	152.70	-	Slab Mtn	D/16	27	0545397	7208280							
70293	SB94-4	177.60	-	Slab Mtn	D/16	27	0545397	7208280				**Y**			
70294	SB94-4	180.60	-	Slab Mtn	D/16	27	0545397	7208280							
70295	SB94-4	186.80	-	Slab Mtn	D/16	27	0545397	7208280							
70296	SB94-4	187.30	-	Slab Mtn	D/16	27	0545397	7208280							

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Lithology
70266	SB94-3	126.85		Friable, bleached Bx
70267	SB94-3	240.75	-	Scapolite-bearing calc-silicate
70268	SB94-3	283.25	-	Scapolite-bearing calc-silicate
70269	SB94-4	4.30		Multiple altn stages
70270	SB94-4	17.00	-	Retrograde Cl
70271	SB94-4	23.70	-	White spots overprinting Bt altn, cut by blue-white vlts
70272	SB94-4	32.50	-	Yellow Carb & tan Carb
70273	SB94-4	40.30	-	Yellow Carb altn overprints typical white Carb altn & is overprinted by pale pink Carb
70274	SB94-4	44.00	-	XC veins
70275	SB94-4	45.30	-	Faults
70276	SB94-4	47.60	-	Fs-Cl-Carb veins offset by fractures
70277	SB94-4	48.40	-	White Carb-Qz-Cl overprinting yellow Carb
70278	SB94-4	53.70	-	Bt altn cut by Qz-Bt veins with CG black Bt, overprinted by Py
70279	SB94-4	55.80	-	Grey-purple Qz veins cross cut by white Carb + altn
70280	SB94-4	58.50	-	Grey-purple Qz veins cross cut by bright white Qz-scapolite? Veins
70281	SB94-4	62.30	-	Pervasive Cl
70282	SB94-4	61.70	-	White vlts in fractures offset layers in sst
70283	SB94-4	63.70	-	Sst cut by Qz-Bt veins
70284	SB94-4	63.20	-	CG Bt layers with red Gt? & Ht; also Gt? in or overprinting Qz +/- Bt vlts
70285	SB94-4	67.60	-	Red uranium mineral?
70286	SB94-4	69.60	-	Tension fractures filled with black (Bt?)-Py
70287	SB94-4	79.60	-	White Carb-Qz -Cl -Py cutting bright white Qz/scapolite? veins
70288	SB94-4	108.00	-	CG vuggy Carb-Qz-Cl-Py vein + Gt? + martite?
70289	SB94-4	109.50	-	Fracture with white mineral; fracture with Py & red coating
70290	SB94-4	115.40	-	Bleached section cut by Qz-Fs-Ft veins
70291	SB94-4	125.00	-	Pervasive Bt Altn
70292	SB94-4	152.70	-	Yellow-brown weathering CG Carb vein cuts Carb-Musc-Qz-Cpy altn
70293	SB94-4	177.60	-	CG Carb-Qz-Musc/Cl -Cpy-Py-Bt vein
70294	SB94-4	180.60	-	Anastamosing bright white veins & XC Carb + altn with Cpy
70295	SB94-4	186.80	-	Bleached Cbx
70296	SB94-4	187.30	-	Qz-Bt/Cl flooding

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Location	NTS map sheet	Datum (NAD)	Easting	Northing	Thin Section	Isotopes				Fluid Inclusions	Geochron
										O	C	S	D		
70297	SB94-4	188.00	-	Slab Mtn	D/16	27	0545397	7208280							
70298	SB94-4	204.60	-	Slab Mtn	D/16	27	0545397	7208280							
70299	SB94-4	217.90	-	Slab Mtn	D/16	27	0545397	7208280							
70300	SB94-4	234.40	-	Slab Mtn	D/16	27	0545397	7208280							
70301	SB94-4	238.10	-	Slab Mtn	D/16	27	0545397	7208280							
70302	SB94-4	243.00	-	Slab Mtn	D/16	27	0545397	7208280							
70303	SB94-4	251.00	-	Slab Mtn	D/16	27	0545397	7208280							
70304	SB94-4	254.70	-	Slab Mtn	D/16	27	0545397	7208280	**Y**						
70305	SB94-4	264.30	-	Slab Mtn	D/16	27	0545397	7208280							
70306	SB94-4	269.00	-	Slab Mtn	D/16	27	0545397	7208280							
70307	SB94-4	273.50	-	Slab Mtn	D/16	27	0545397	7208280							
70308	SB94-4	343.50	-	Slab Mtn	D/16	27	0545397	7208280							
70309	SB95-5	8.70		Slab ck	E/1	27	0544990	7209488	**Y**						
70310	SB95-5	18.70	-	Slab ck	E/1	27	0544990	7209488							
70311	SB95-5	64.60	-	Slab ck	E/1	27	0544990	7209488	**Y**						
70312	SB95-5	72.70	-	Slab ck	E/1	27	0544990	7209488	**Y**						
70313	SB95-5	74.90	-	Slab ck	E/1	27	0544990	7209488	**Y**						
70314	SB95-5	75.10	-	Slab ck	E/1	27	0544990	7209488							
70315	SB95-5	88.30	-	Slab ck	E/1	27	0544990	7209488							
70316	SB95-5	93.65	-	Slab ck	E/1	27	0544990	7209488	**Y**						
70317	SB95-5	107.30	-	Slab ck	E/1	27	0544990	7209488				**Y**			
70318	SB97-9	8.43		Slab ck	E/1	27	0545500	7209490							
70319	SB97-9	8.93	-	Slab ck	E/1	27	0545500	7209490							
70320	SB97-9	13.60	-	Slab ck	E/1	27	0545500	7209490							
70321	SB97-9	18.00	-	Slab ck	E/1	27	0545500	7209490							
70322	SB97-9	23.77	-	Slab ck	E/1	27	0545500	7209490							
70323	SB97-9	24.55	-	Slab ck	E/1	27	0545500	7209490							
70324	SB97-9	25.36	-	Slab ck	E/1	27	0545500	7209490							
70325	SB97-9	25.85	-	Slab ck	E/1	27	0545500	7209490							
70326	SB97-9	26.90	-	Slab ck	E/1	27	0545500	7209490							
70327	SB97-9	30.20	-	Slab ck	E/1	27	0545500	7209490							

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Lithology
70297	SB94-4	188.00	-	Cpy & Qz crystals in a Qz vein; drusy Qz lining vugs
70298	SB94-4	204.60	-	Bleached rock veined & crackled Bxted by white to cream coloured Fs?
70299	SB94-4	217.90	-	Pale pink Fs? Veins with Cl XC grey-purple Qz & cross cut by Carb-Cl altn
70300	SB94-4	234.40	-	Bx
70301	SB94-4	238.10	-	Bx
70302	SB94-4	243.00	-	Bx
70303	SB94-4	251.00	-	Bx
70304	SB94-4	254.70	-	Bx
70305	SB94-4	264.30	-	Bx
70306	SB94-4	269.00	-	Bx
70307	SB94-4	273.50	-	Bx
70308	SB94-4	343.50	-	Bx
70309	SB95-5	8.70		Carb-Ep altn of sst (beginnings of Cbxtion)
70310	SB95-5	18.70	-	Bt altered sst
70311	SB95-5	64.60	-	Carb-Mt altered Bx
70312	SB95-5	72.70	-	Green rubble Bx with Carb-Mt clasts
70313	SB95-5	74.90	-	Dark matrix Bx with clasts of massive Mt
70314	SB95-5	75.10	-	Dark Bx/Bxted phyllite contact
70315	SB95-5	88.30	-	Cbxted sst with Carb matrix; cut by green Ft
70316	SB95-5	93.65	-	Green rubble Bx with Bt crystals
70317	SB95-5	107.30	-	Massive Mt-Carb overprinted by Py +/- Cpy (in phyllite)
70318	SB97-9	8.43		XC veins
70319	SB97-9	8.93	-	Cpy with Ht
70320	SB97-9	13.60	-	Cpy + Py
70321	SB97-9	18.00	-	XC relationships & Py-Cpy blebs
70322	SB97-9	23.77	-	Slc repl Bt
70323	SB97-9	24.55	-	Ht vein Bxting slc
70324	SB97-9	25.36	-	Slc sst cut by Carb vein
70325	SB97-9	25.85	-	XC Carbs
70326	SB97-9	26.90	-	Carb with Ser
70327	SB97-9	30.20	-	Carb-Mt with rare Cpy

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Location	NTS map sheet	Datum (NAD)	Easting	Northing	Thin Section	Isotopes				Fluid Inclusions	Geochron
										O	C	S	D		
70328	SB97-9	35.00	-	Slab ck	E/1	27	0545500	7209490							
70329	SB97-9	36.80	-	Slab ck	E/1	27	0545500	7209490							
70330	SB97-9	38.50	-	Slab ck	E/1	27	0545500	7209490							
70331	SB97-9	51.50	-	Slab ck	E/1	27	0545500	7209490	**Y**	**Y**	**Y**	**Y**			
70332	SB97-9	58.65	-	Slab ck	E/1	27	0545500	7209490	**Y**						
70333	SB97-9	61.50	-	Slab ck	E/1	27	0545500	7209490							
70334	SB97-9	65.80	-	Slab ck	E/1	27	0545500	7209490							
70335	SB97-9	73.70	-	Slab ck	E/1	27	0545500	7209490							
70336	SB97-9	81.70	-	Slab ck	E/1	27	0545500	7209490							
70337	SB97-9	86.70	-	Slab ck	E/1	27	0545500	7209490							
70338	SB97-9	93.70	-	Slab ck	E/1	27	0545500	7209490							
70339	SB97-9	94.20	-	Slab ck	E/1	27	0545500	7209490							
70340	SB97-9	94.55	-	Slab ck	E/1	27	0545500	7209490							
70341	SB97-9	98.50	-	Slab ck	E/1	27	0545500	7209490							
70342	SB97-9	99.43	-	Slab ck	E/1	27	0545500	7209490							
70343	SB97-9	99.85	-	Slab ck	E/1	27	0545500	7209490							
70344	SB97-9	107.35	-	Slab ck	E/1	27	0545500	7209490							
70345	SB97-9	111.70	-	Slab ck	E/1	27	0545500	7209490	**Y**						
70346	SB97-9	115.50	-	Slab ck	E/1	27	0545500	7209490							
70347	SB97-9	119.90	-	Slab ck	E/1	27	0545500	7209490		**Y**	**Y**	**Y**			
70348	SB97-9	121.50	-	Slab ck	E/1	27	0545500	7209490							
70349	SB97-9	123.50	-	Slab ck	E/1	27	0545500	7209490							
70350	SB97-9	129.00	-	Slab ck	E/1	27	0545500	7209490							
70351	SB97-9	132.30	-	Slab ck	E/1	27	0545500	7209490							
70352	SB97-9	135.50	-	Slab ck	E/1	27	0545500	7209490							
70353	SB97-9	136.45	-	Slab ck	E/1	27	0545500	7209490							
70354	SB97-9	139.20	-	Slab ck	E/1	27	0545500	7209490							
70355	SB97-9	140.00	-	Slab ck	E/1	27	0545500	7209490	**Y**						
70356	SB97-9	146.50	-	Slab ck	E/1	27	0545500	7209490							
70357	SB97-9	150.80	-	Slab ck	E/1	27	0545500	7209490							

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Lithology
70328	SB97-9	35.00	-	Ht vein Bxting
70329	SB97-9	36.80	-	XC Carbs
70330	SB97-9	38.50	-	Bt altered sst with Diss Mt xcut by Carb fracs
70331	SB97-9	51.50	-	Bt & slc altered sst cut by Carb-Mt veins. Ht replc Mt & then OP by Py. Trace Diss Cpy intergrown with Py. XC by white Carb veins
70332	SB97-9	58.65	-	CG Carb with Cpy (may not belong here)
70333	SB97-9	61.50	-	Sst with Cpy & CG Carb
70334	SB97-9	65.80	-	Bx & cbx with Ht/Mt matrix
70335	SB97-9	73.70	-	Carb-Mt cut by Ht veins
70336	SB97-9	81.70	-	Sst cut by Qz-Mt veins
70337	SB97-9	86.70	-	Py crystals
70338	SB97-9	93.70	-	Slc sst cbx (tectonic?) with Qz-Mt matrix xcut by Qz-Fs vlts
70339	SB97-9	94.20	-	Bx
70340	SB97-9	94.55	-	Bx-sst lower contact
70341	SB97-9	98.50	-	Cpy & Qz cutting Carb-Mt
70342	SB97-9	99.43	-	"vague" Bx
70343	SB97-9	99.85	-	Ht cutting white Carb & Carb-Mt
70344	SB97-9	107.35	-	Slc Carb-Mt Bxted by Ht
70345	SB97-9	111.70	-	Ht Bx with Cpy & Py
70346	SB97-9	115.50	-	Cpy & Py are intergrown & op Mt.
70347	SB97-9	119.90	-	Ht Bxtion of Carb-Mt altered slc sst. Cpy bleb surrounded by Mt in Carb vein. Cpy blebs in Bx matrix
70348	SB97-9	121.50	-	Ht Bxtion of Carb-Mt altered slc sst. Cpy bleb surrounded by Mt in Carb vein. Cpy blebs in Bx matrix
70349	SB97-9	123.50	-	Pinkish Carb
70350	SB97-9	129.00	-	Dark green Ft
70351	SB97-9	132.30	-	Carb vein
70352	SB97-9	135.50	-	Py-Cpy-Ht vlts
70353	SB97-9	136.45	-	Carb-Mt & Carb-Qz altn
70354	SB97-9	139.20	-	Carb-Mt & Carb-Qz altn
70355	SB97-9	140.00	-	Py + Cpy in fracs, vlts & blebs op Carb-mg
70356	SB97-9	146.50	-	Carb Cbx
70357	SB97-9	150.80	-	Laminated sst xcut by Qz veins

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Location	NTS map sheet	Datum (NAD)	Easting	Northing	Thin Section	Isotopes				Fluid Inclusions	Geochron
										O	C	S	D		
70358	SB97-9	152.70	-	Slab ck	E/1	27	0545500	7209490							
70359	SB97-9	156.50	-	Slab ck	E/1	27	0545500	7209490	Y						
70360	SB97-9	158.40	-	Slab ck	E/1	27	0545500	7209490							
70361	SB97-9	164.70	-	Slab ck	E/1	27	0545500	7209490							
70362	SB97-9	165.20	-	Slab ck	E/1	27	0545500	7209490							Re-Os
70363	SB97-9	166.10	-	Slab ck	E/1	27	0545500	7209490		Y	Y	Y			
70364	SB97-9	173.20	-	Slab ck	E/1	27	0545500	7209490							
70365	SB97-9	175.25	-	Slab ck	E/1	27	0545500	7209490	Y						
70366	SB97-9	177.55	-	Slab ck	E/1	27	0545500	7209490							
70367	SB97-9	183.80	-	Slab ck	E/1	27	0545500	7209490							
70368	SB97-9	188.10	-	Slab ck	E/1	27	0545500	7209490							
70369	SB97-9	197.12	-	Slab ck	E/1	27	0545500	7209490							
70370	SB97-9	200.10	-	Slab ck	E/1	27	0545500	7209490		Y	Y				
70371	SB97-9	200.30	-	Slab ck	E/1	27	0545500	7209490		Y	Y				
70372	SB97-9	206.00	-	Slab ck	E/1	27	0545500	7209490							
70373	SB97-9	206.50	-	Slab ck	E/1	27	0545500	7209490							
70374	SB97-9	208.50	-	Slab ck	E/1	27	0545500	7209490							
70375	SB97-9	210.00	-	Slab ck	E/1	27	0545500	7209490							
70376	SB97-9	210.10	-	Slab ck	E/1	27	0545500	7209490							
70377	SB97-9	211.10	-	Slab ck	E/1	27	0545500	7209490							
70378	SB97-10	19.40		Slab ck	E/1	27	0544470	7209760	Y						
70379	SB97-10	37.00	-	Slab ck	E/1	27	0544470	7209760							
70380	SB97-10	43.70	-	Slab ck	E/1	27	0544470	7209760				Y			
70381	SB97-11	10.55		Slab ck	E/1	27	0545255	7209490							
70382	SB97-12	23.97		Slab ck	E/1	27	0545560	7209410							
70383	SB97-12	38.35	-	Slab ck	E/1	27	0545560	7209410							
70384	SB97-12	39.50	-	Slab ck	E/1	27	0545560	7209410	Y						
70385	SB97-12	58.30	-	Slab ck	E/1	27	0545560	7209410							
70386	SB97-14	46.20		Slab ck	E/1	27	0545350	7209365	Y						
70387	SB97-14	53.70	-	Slab ck	E/1	27	0545350	7209365	Y						
70388	SB97-16	46.45		Slab ck	E/1	27	0547540	7209860							

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Lithology
70358	SB97-9	152.70	-	Cl altn
70359	SB97-9	156.50	-	Carb-Cpy vein bxting sst
70360	SB97-9	158.40	-	Vuggy Carb vein with minor Cpy
70361	SB97-9	164.70	-	Sulphide network
70362	SB97-9	165.20	-	Py-Cpy-Mt vein
70363	SB97-9	166.10	-	Massive Mt-Carb op by Py +/- Cpy
70364	SB97-9	173.20	-	Bleached sst
70365	SB97-9	175.25	-	Slc sst op by Carb
70366	SB97-9	177.55	-	Py vein cutting sst
70367	SB97-9	183.80	-	Cpy + Py
70368	SB97-9	188.10	-	Massive white Fs-Carb vein
70369	SB97-9	197.12	-	Py + Cpy
70370	SB97-9	200.10	-	Carb-Mt bxting laminated sst
70371	SB97-9	200.30	-	Tan Carb cut by white Carb vein
70372	SB97-9	206.00	-	Pink & white altn & sulphides
70373	SB97-9	206.50	-	Sulphides in fracs in Slc altn
70374	SB97-9	208.50	-	Laminated sst xcut by Qz+/- Carb veins. Op by tan Carb. Minor sulphide vlts & net texture.
70375	SB97-9	210.00	-	Laminated sst cut by Carb-Mt & white Carb veins
70376	SB97-9	210.10	-	Py & Cpy op Carb-Mt & is xcut by white Carb?
70377	SB97-9	211.10	-	Mt altered to ???
70378	SB97-10	19.40		Bx
70379	SB97-10	37.00	-	Bx
70380	SB97-10	43.70	-	Bx
70381	SB97-11	10.55		Bt altered sst clast in green matrix Bx - "flow texture" in matrix
70382	SB97-12	23.97		Bx
70383	SB97-12	38.35	-	Bx
70384	SB97-12	39.50	-	Bx
70385	SB97-12	58.30	-	Bx
70386	SB97-14	46.20		Friable green Bx
70387	SB97-14	53.70	-	Cbxted sst with Carb matrix
70388	SB97-16	46.45		Bx

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Location	NTS map sheet	Datum (NAD)	Easting	Northing	Thin Section	Isotopes				Fluid Inclusions	Geochron
										O	C	S	D		
70389	SB97-16	51.40	-	Slab ck	E/1	27	0547540	7209860	Y						
70390	SB97-17	37.00		Slab ck	E/1	27	0545070	7209290							
70391	SB97-19	14.53		Slab ck	E/1	27	0545915	7209110							
70392	SB97-19	17.20	-	Slab ck	E/1	27	0545915	7209110							
70393	SB97-19	21.45	-	Slab ck	E/1	27	0545915	7209110	Y						
70394	SB97-19	25.45	-	Slab ck	E/1	27	0545915	7209110	Y						
70395	SB97-19	27.20	-	Slab ck	E/1	27	0545915	7209110							
70396	SB97-19	27.35	-	Slab ck	E/1	27	0545915	7209110							
70397	SB97-19	30.20	-	Slab ck	E/1	27	0545915	7209110							
70398	SB97-19	30.60	-	Slab ck	E/1	27	0545915	7209110	Y						
70399	SB97-19	34.30	-	Slab ck	E/1	27	0545915	7209110	Y						
70400	SB97-19	37.00	-	Slab ck	E/1	27	0545915	7209110							
70401	SB97-19	44.25	-	Slab ck	E/1	27	0545915	7209110							
70402	SB97-19	46.60	-	Slab ck	E/1	27	0545915	7209110							
70403	SB97-19	62.30	-	Slab ck	E/1	27	0545915	7209110	Y						
70404	SB97-19	65.90	-	Slab ck	E/1	27	0545915	7209110							
70405	SB97-19	68.00	-	Slab ck	E/1	27	0545915	7209110							
70406	SB97-19	70.10	-	Slab ck	E/1	27	0545915	7209110	Y	Y	Y		Y		
SLAB PROPERTY: OUTCROP SAMPLES															
70407	JH01-3-1	-	-	Slab ck	E/1	27	0545915	7209110							
70408	JH01-4-2	-	-	Top Slab Mtn	D/16	27	0545146	7208902							
70409	JH01-4-3	-	-	Slab Mtn	D/16	27	0545146	7208902							
70410	JH01-13-6A	-	-	west end Slab Mtn	D/16	27	0545212	7208361							
70411	JH01-13-7A	-	-	west end Slab Mtn	D/16	27	0545279	7208459							
70412	JH01-13-7B	-	-	west end Slab Mtn	D/16	27	0545343	7208486							
70413	JH01-13-8A	-	-	west end Slab Mtn	D/16	27	0545467	7208412				S			
70414	JH01-13-8B	-	-	west end Slab Mtn	D/16	27	0545467	7208412							
70415	JH01-13-8C	-	-	west end Slab Mtn	D/16	27	0545467	7208412							
70416	JH01-13-8D	-	-	west end Slab Mtn	D/16	27	0545467	7208412							
70417	JH01-13-8E	-	-	west end Slab Mtn	D/16	27	0545467	7208412							
70418	JH01-13-9A	-	-	west end Slab Mtn	D/16	27	0545510	7208412							

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Lithology
70389	SB97-16	51.40	-	Bx
70390	SB97-17	37.00		Intensely Cl altered? Bx
70391	SB97-19	14.53		Green Bx with varicoloured sst clasts; Mt & Musc in Carb matrix
70392	SB97-19	17.20	-	Sst Cbxted by green Bx matrix
70393	SB97-19	21.45	-	Green Bx similar to 14.53 but less Carb in the matrix
70394	SB97-19	25.45	-	Cl altered clast with pink splotches
70395	SB97-19	27.20	-	Diorite clast ??
70396	SB97-19	27.35	-	Brown matrix in the Bx at the contact with diorite
70397	SB97-19	30.20	-	Diorite?
70398	SB97-19	30.60	-	Ht altered Bx with phyllite clasts
70399	SB97-19	34.30	-	Green Bx cutting Ht altered Bx (may be Ht altn of green Bx) at HW contact of a 3m thick rubble zone
70400	SB97-19	37.00	-	Slc bleached Bx in footwall of rubble zone
70401	SB97-19	44.25	-	Chloritic sst?? Cut by bright white/purple scapolite? veins
70402	SB97-19	46.60	-	Dark green siliceous Bx (dark Bx??)
70403	SB97-19	62.30	-	Bx (Bxtion of massive Mt)
70404	SB97-19	65.90	-	Two phases of Bx
70405	SB97-19	68.00	-	Bx - Carb matrix with lots of Musc (footwall to above Bx)
70406	SB97-19	70.10	-	Rutile (or titanite) in Carb-Qz blebs - possible age of younger Bx phase
70407	JH01-3-1	-	-	White mica from a Carb-Mt vein
70408	JH01-4-2	-	-	Qz-Musc-Ft vein
70409	JH01-4-3	-	-	Bx with Fs & Mt crystals in the matrix
70410	JH01-13-6A	-	-	CG Qz crystals in Qz vein with malachite
70411	JH01-13-7A	-	-	Boudinaged Qz-Py-Cpy vein
70412	JH01-13-7B	-	-	Qz-Carb-Ft-Py vein cutting sst
70413	JH01-13-8A	-	-	Qz-sulphide vein
70414	JH01-13-8B	-	-	Hornfelsed' sst with white spots
70415	JH01-13-8C	-	-	Qz-Carb-sulphide vein with large Qz crystals
70416	JH01-13-8D	-	-	Qz flooding
70417	JH01-13-8E	-	-	Qz-sulphide vein
70418	JH01-13-9A	-	-	Qz-Carb-Py-Cpy-malachite vein

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Location	NTS map sheet	Datum (NAD)	Easting	Northing	Thin Section	Isotopes				Fluid Inclusions	Geochron
										O	C	S	D		
70419	JH01-13-9B	-	-	west end Slab Mtn	D/16	27	0545510	7208412							
70420	JH01-13-9C	-	-	west end Slab Mtn	D/16	27	0545510	7208412							
70421	JH01-13-9D	-	-	west end Slab Mtn	D/16	27	0545510	7208412							
70422	JH01-13-9E	-	-	west end Slab Mtn	D/16	27	0545510	7208412							
70423	JH01-13-10	-	-	west end Slab Mtn	D/16	27	0545372	7208365	Y						
70424	JH01-15-3	-	-	Slab Ridge	C/13	27	0548802	7207740		Y	Y				
70425	JH01-15-8A	-	-	Slab Ridge	C/13	27	0547731	7208040	Y						
70426	JH01-15-8B	-	-	Slab Ridge	C/13	27	0547731	7208040							
70427	JH01-15-9	-	-	Slab Ridge	C/13	27	0547635	7208141							
70428	JH01-15-10A	-	-	Slab Ridge	C/13	27	0547616	7208166		Y	Y				
70429	JH01-15-10B	-	-	Slab Ridge	C/13	27	0547616	7208166	Y						
70430	JH01-15-10C	-	-	Slab Ridge	C/13	27	0547616	7208166							
70431	JH01-18-1A	-	-	east end Slab ck	D/16	27	0547943	7210043	Y						
70432	JH01-18-1B	-	-	east end Slab ck	D/16	27	0547943	7210043							
70433	JH01-18-1C	-	-	east end Slab ck	D/16	27	0547943	7210043							
70434	JH01-18-2	-	-	south saddle	D/16	27	0546451	7208204	Y						
70435	JH01-19-1	-	-	east end Slab Mtn	D/16	27	0545880	7207549	Y				Y		
70436	JH01-19-2A	-	-	east end Slab Mtn	D/16	27	0545994	7207645	Y						
70437	JH01-19-2B	-	-	east end Slab Mtn	D/16	27	0545994	7207645	Y						
70438	JH01-19-2C	-	-	east end Slab Mtn	D/16	27	0545994	7207645							
70439	JH01-19-2D	-	-	east end Slab Mtn	D/16	27	0545994	7207645		Y	Y				
70440	JH01-19-2E	-	-	east end Slab Mtn	D/16	27	0545994	7207645		Y	Y				
70441	JH01-19-3	-	-	east end Slab Mtn	D/16	27	0545985	7207931							
70442	JH01-19-5A	-	-	east end Slab Mtn	D/16	27	0546239	7207942	Y						
70443	JH01-19-5B	-	-	east end Slab Mtn	D/16	27	0546239	7207942	Y						
70444	JH01-20-2	-	-	west front Slab Mtn	D/16	27	0544747	7208098							
70445	JH01-20-3	-	-	west front Slab Mtn	D/16	27	0544768	7208086	Y				Y		
70446	JH01-20-6A	-	-	west front Slab Mtn	D/16	27	0545007	7208248	Y				Y		
70447	JH01-20-6B	-	-	west front Slab Mtn	D/16	27	0545007	7208248	Y						
70448	JH01-20-6C	-	-	west front Slab Mtn	D/16	27	0545007	7208248							
70449	JH01-20-6D	-	-	west front Slab Mtn	D/16	27	0545007	7208248							

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Lithology
70419	JH01-13-9B	-	-	Qz-Carb-Py-Cpy vein
70420	JH01-13-9C	-	-	Hornfelsed & Qz flooding
70421	JH01-13-9D	-	-	Qz-Fs-sulphide vein
70422	JH01-13-9E	-	-	Qz-sulphide vein
70423	JH01-13-10	-	-	Rusty weathering sst
70424	JH01-15-3	-	-	Sst with Carb-Musc interbeds
70425	JH01-15-8A	-	-	Bx
70426	JH01-15-8B	-	-	Qz vein clast
70427	JH01-15-9	-	-	Bx with rounded clasts
70428	JH01-15-10A	-	-	Pink Carb vein with Ht blebs
70429	JH01-15-10B	-	-	Piece of large sst clast from contact with pink Carb vein
70430	JH01-15-10C	-	-	Bx from contact with pink Carb vein
70431	JH01-18-1A	-	-	Phyllite
70432	JH01-18-1B	-	-	Sulphide layer
70433	JH01-18-1C	-	-	Qz vein
70434	JH01-18-2	-	-	Bx with phyllite clasts
70435	JH01-19-1	-	-	Qz-Carb-Ht-Bt vein cutting sst clast in Bx
70436	JH01-19-2A	-	-	Qz-Fs altn
70437	JH01-19-2B	-	-	Bx
70438	JH01-19-2C	-	-	Carb clast
70439	JH01-19-2D	-	-	Carb veins in sst clast
70440	JH01-19-2E	-	-	Carb clast
70441	JH01-19-3	-	-	Carb-Qz-Ht vein cutting Bx matrix
70442	JH01-19-5A	-	-	Slc Bx-volcanic contact
70443	JH01-19-5B	-	-	Amygdaloidal Slab Volcanics
70444	JH01-20-2	-	-	Qz-Carb-Ht vein cutting sst clast
70445	JH01-20-3	-	-	Crystalline Qz coating fractures in Bx
70446	JH01-20-6A	-	-	Bx
70447	JH01-20-6B	-	-	Bx
70448	JH01-20-6C	-	-	Bx
70449	JH01-20-6D	-	-	Bx with Carb crystals

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Location	NTS map sheet	Datum (NAD)	Easting	Northing	Thin Section	Isotopes				Fluid Inclusions	Geochron
										O	C	S	D		
70450	JH01-20-6E	-	-	west front Slab Mtn	D/16	27	0545007	7208248							
70451	JH01-20-6F	-	-	west front Slab Mtn	D/16	27	0545007	7208248		Y	Y				
70452	JH01-20-8	-	-	west front Slab Mtn	D/16	27	0545117	7208209		Y	Y				
70453	JH01-20-9	-	-	west front Slab Mtn	D/16	27	0545201	7208182							
70454	JH01-20-10A	-	-	west front Slab Mtn	D/16	27	0545230	7208182	Y						
70455	JH01-20-10B	-	-	west front Slab Mtn	D/16	27	0545230	7208182							
70456	JH01-20-10C	-	-	west front Slab Mtn	D/16	27	0545230	7208182	Y				Y		
70457	JH01-23-6	-	-	west end Slab Mtn	D/16	27	0544941	7208307							
70458	JH01-23-10A	-	-	west end Slab Mtn	D/16	27	0545103	7208419							
70459	JH01-23-10B	-	-	west end Slab Mtn	D/16	27	0545103	7208419							
70460	JH01-23-10C	-	-	west end Slab Mtn	D/16	27	0545103	7208419							
70461	JH01-23-10D	-	-	west end Slab Mtn	D/16	27	0545103	7208419							
70462	JH01-23-10E	-	-	west end Slab Mtn	D/16	27	0545103	7208419							
70463	JH01-23-10F	-	-	west end Slab Mtn	D/16	27	0545103	7208419							
70464	JH01-23-11A	-	-	west end Slab Mtn	D/16	27	0545173	7208431							
70465	JH01-23-11B	-	-	west end Slab Mtn	D/16	27	0545173	7208431							
70466	JH01-23-11C	-	-	west end Slab Mtn	D/16	27	0545173	7208431							
70467	JH01-23-11D	-	-	west end Slab Mtn	D/16	27	0545173	7208431							
70468	JH01-23-12	-	-	west end Slab Mtn	D/16	27	0545172	7208515		Y	Y				
70469	JH01-23-13	-	-	west end Slab Mtn	D/16	27	0545212	7208598							
70470	JH01-27-1	-	-	centre front Slab Mtn	D/16	27	0545543	7207957	Y						
70471	JH01-27-2A	-	-	centre front Slab Mtn	D/16	27	0545578	7208023							
70472	JH01-27-2B	-	-	centre front Slab Mtn	D/16	27	0545578	7208023	Y						
70473	JH01-27-3A	-	-	centre front Slab Mtn	D/16	27	0545639	7208014							
70474	JH01-27-3B	-	-	centre front Slab Mtn	D/16	27	0545639	7208014							
70475	JH01-27-3C	-	-	centre front Slab Mtn	D/16	27	0545639	7208014							
70476	JH01-27-3D	-	-	centre front Slab Mtn	D/16	27	0545639	7208014				Y			Re-Os, Ar-
70477	JH01-29-1	-	-	Slab Ridge	C/13	27	0547188	7208877							
70478	JH01-29-2A	-	-	Slab Ridge	C/13	27	0547148	7208790							
70479	JH01-29-2B	-	-	Slab Ridge	C/13	27	0547148	7208790		Y	Y				
70480	JH01-29-2C	-	-	Slab Ridge	C/13	27	0547148	7208790		Y	Y				

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Lithology
70450	JH01-20-6E	-	-	Carb crystals
70451	JH01-20-6F	-	-	Brown weathering Carb crystals
70452	JH01-20-8	-	-	Carb-Qz-Py vein
70453	JH01-20-9	-	-	Bleached & Slc sst at Bx contact
70454	JH01-20-10A	-	-	Slc & rusty sst
70455	JH01-20-10B	-	-	Bleached & chalky sst
70456	JH01-20-10C	-	-	Carb vein with Act & Bt
70457	JH01-23-6	-	-	Bx with silty Dt clasts
70458	JH01-23-10A	-	-	White Carb vein
70459	JH01-23-10B	-	-	Pink Carb crystals
70460	JH01-23-10C	-	-	Qz crystals
70461	JH01-23-10D	-	-	Carb & Qz crystals
70462	JH01-23-10E	-	-	Sst & Carb blebs
70463	JH01-23-10F	-	-	Sst with Py fractures
70464	JH01-23-11A	-	-	Carb-Act Qz vein
70465	JH01-23-11B	-	-	Qz vein
70466	JH01-23-11C	-	-	Sulphide & Slc sst
70467	JH01-23-11D	-	-	Qz crystals
70468	JH01-23-12	-	-	Carb
70469	JH01-23-13	-	-	Sst with white spots
70470	JH01-27-1	-	-	Sst
70471	JH01-27-2A	-	-	Carb layer in sst
70472	JH01-27-2B	-	-	Carb-Tour vein cutting sst
70473	JH01-27-3A	-	-	Sst
70474	JH01-27-3B	-	-	Carb-Cl veins
70475	JH01-27-3C	-	-	Float sample of multiply folded rock
70476	JH01-27-3D	-	-	Qz-Moly-Musc vein
70477	JH01-29-1	-	-	Bx
70478	JH01-29-2A	-	-	Carb-Qz pod
70479	JH01-29-2B	-	-	Carb vein
70480	JH01-29-2C	-	-	Carb Bx

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Location	NTS map sheet	Datum (NAD)	Easting	Northing	Thin Section	Isotopes				Fluid Inclusions	Geochron
										O	C	S	D		
70481	JH01-29-4	-	-	Slab Ridge	C/13	27	0546973	7208856							
70482	JH01-29-5A	-	-	Slab Ridge	C/13	27	0546912	7208804							
70483	JH01-29-5B	-	-	Slab Ridge	C/13	27	0546912	7208804							
70484	JH01-29-5C	-	-	Slab Ridge	C/13	27	0546912	7208804		**Y**	**Y**				
70485	JH01-29-5D	-	-	Slab Ridge	C/13	27	0546912	7208804							
70486	JH01-29-5E	-	-	Slab Ridge	C/13	27	0546912	7208804							
70487	JH01-29-5F	-	-	Slab Ridge	C/13	27	0546912	7208804							
70488	JH01-29-8A	-	-	Slab Ridge	C/13	27	0546494	7208754							
70489	JH01-29-8B	-	-	Slab Ridge	C/13	27	0546494	7208754							
70490	JH01-29-8C	-	-	Slab Ridge	C/13	27	0546494	7208754							
70490	JH01-29-10	-	-	north side of saddle	D/16	27	0546270	7208710							
70491	JH01-29-12	-	-	north side of saddle	D/16	27	0546013	7208562							
70492	JH01-29-14	-	-	south side of saddle	D/16	27	0545717	7208344							
70493	JH01-29-15A	-	-	Top Slab Mtn	D/16	27	0545830	7208279							
70494	JH01-29-15B	-	-	Top Slab Mtn	D/16	27	0545830	7208279							
70495	JH01-29-15C	-	-	Top Slab Mtn	D/16	27	0545830	7208279		**Y**	**Y**				
70496	JH01-29-15D	-	-	Top Slab Mtn	D/16	27	0545830	7208279				**Y**			
70497	JH01-30-1A	-	-	Saddle south end	D/16	27	0546085	7208185							
70498	JH01-30-1B	-	-	Saddle south end	D/16	27	0546085	7208185							
70499	JH01-30-2A	-	-	Saddle south end	D/16	27	0546049	7208275							
70500	JH01-30-2B	-	-	Saddle south end	D/16	27	0546049	7208275							
70501	JH01-30-2C	-	-	Saddle south end	D/16	27	0546049	7208275							
70502	JH01-30-2D	-	-	Saddle south end	D/16	27	0546049	7208275							
70503	JH01-30-2E	-	-	Saddle south end	D/16	27	0546049	7208275	**Y**						
70504	JH01-30-2F	-	-	Saddle south end	D/16	27	0546049	7208275							
70505	JH01-30-2G	-	-	Saddle south end	D/16	27	0546049	7208275							
70506	JH01-30-4A	-	-	Top Slab Mtn	D/16	27	0545973	7208257							
70507	JH01-30-4B	-	-	Top Slab Mtn	D/16	27	0545973	7208257		**Y**	**Y**				
70508	JH01-30-7A	-	-	Top Slab Mtn	D/16	27	0545980	7208230		**Y**	**Y**				
70509	JH01-30-7B	-	-	Top Slab Mtn	D/16	27	0545980	7208230	**Y**						
70510	JH01-30-7C	-	-	Top Slab Mtn	D/16	27	0545980	7208230							

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Lithology
70481	JH01-29-4	-	-	White CG Carb vein
70482	JH01-29-5A	-	-	Amygdaloidal Slab Volcanics
70483	JH01-29-5B	-	-	Bxted Slab Volcanics
70484	JH01-29-5C	-	-	Sst Bx with rusty Carb matrix & large Carb crystals
70485	JH01-29-5D	-	-	Vesicular rock
70486	JH01-29-5E	-	-	Diorite?
70487	JH01-29-5F	-	-	Amygdaloidal Slab Volcanics
70488	JH01-29-8A	-	-	Carb-Act-Qz vein
70489	JH01-29-8B	-	-	Carb-Qz
70490	JH01-29-8C	-	-	Altered sst at edge of vein
70490	JH01-29-10	-	-	Kink banded phyllite
70491	JH01-29-12	-	-	Phyllite with blebs & veins of massive white Qz-Cl
70492	JH01-29-14	-	-	Sst
70493	JH01-29-15A	-	-	Qz-Carb-Cpy-Py veins in sst
70494	JH01-29-15B	-	-	Carb-Ft veins in sst
70495	JH01-29-15C	-	-	Carb layer in sst
70496	JH01-29-15D	-	-	Grab sample of Qz-Carb-Cpy veining
70497	JH01-30-1A	-	-	Bx
70498	JH01-30-1B	-	-	Carb in fractures & tension gashes cutting Bx
70499	JH01-30-2A	-	-	Bx
70500	JH01-30-2B	-	-	Original white Qz layer in phyllite - pre Bx
70501	JH01-30-2C	-	-	Pink Qz-Carb vein phyllite
70502	JH01-30-2D	-	-	Qz-Carb-Cl-Musc-Mt vein cutting phyllite
70503	JH01-30-2E	-	-	Altered phyllite with veins
70504	JH01-30-2F	-	-	Highly altered phyllite
70505	JH01-30-2G	-	-	White Fs-Qz vein
70506	JH01-30-4A	-	-	Bleached Bx
70507	JH01-30-4B	-	-	Brown weathering Carb in sst
70508	JH01-30-7A	-	-	Carb, Ft & Qz crystals from Bx matrix
70509	JH01-30-7B	-	-	Bx 20 cm from contact with sst
70510	JH01-30-7C	-	-	Sst-Bx contact

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Location	NTS map sheet	Datum (NAD)	Easting	Northing	Thin Section	Isotopes				Fluid Inclusions	Geochron
										O	C	S	D		
70511	JH01-30-10	-	-	Slab Mtn north side	D/16	27	0545576	7208588							
70512	JH01-31-1	-	-	Slab Mtn centre front	D/16	27	0545818	7208021							
70513	JH01-31-2	-	-	Slab Mtn centre front	D/16	27	0545914	7207957							
70514	JH01-32-1	-	-	Slab ck west end	E/1	27	0544397	7209415	**Y**						
70515	JH01-32-3	-	-	Slab ck west end	E/1	27	0544522	7209444	**Y**						
70516	JH01-32-4A	-	-	Slab ck west end	E/1	27	0544581	7209481							
70517	JH01-32-4B	-	-	Slab ck west end	E/1	27	0544581	7209481							
70518	JH01-32-4C	-	-	Slab ck west end	E/1	27	0544581	7209481				**Y**			
70519	JH01-32-4D	-	-	Slab ck west end	E/1	27	0544581	7209481		**Y**	**Y**				
70520	JH01-32-4E	-	-	Slab ck west end	E/1	27	0544581	7209481							
70521	JH01-32-4F	-	-	Slab ck west end	E/1	27	0544581	7209481			**Y**				
70522	JH01-32-5A	-	-	Slab ck west end	E/1	27	0544775	7209464	**Y**						
70523	JH01-32-5B	-	-	Slab ck west end	E/1	27	0544775	7209464							
70524	JH01-32-6A	-	-	Slab ck Hindoit zone	E/1	27	0544923	7209504							
70525	JH01-32-6B	-	-	Slab ck Hindoit zone	E/1	27	0544923	7209504		**Y**	**Y**				
70526	JH01-32-7A	-	-	Slab ck Hindoit zone	E/1	27	0545001	7209549		**Y**	**Y**				
70527	JH01-32-7B	-	-	Slab ck Hindoit zone	E/1	27	0545001	7209549							
70528	JH01-32-7C	-	-	Slab ck Hindoit zone	E/1	27	0545001	7209549	**Y**						
70529	JH01-32-7D	-	-	Slab ck Hindoit zone	E/1	27	0545001	7209549				**Y**			
70530	JH01-32-7E	-	-	Slab ck Hindoit zone	E/1	27	0545001	7209549	**Y**						
70531	JH01-34-3	-	-	Slab ck Canyon zone	E/1	27	0545192	7209582	**Y**						
70532	JH01-34-7	-	-	Slab ck Canyon zone	E/1	27	0545446	7209612							
70533	JH01-34-8	-	-	Slab ck Canyon zone	E/1	27	0545411	7209605	**Y**						
70534	JH01-34-10	-	-	Slab ck Canyon zone	E/1	27	0545460	7209631	**Y**						
70535	JH01-34-11A	-	-	Slab ck Canyon zone	E/1	27	0545498	7209644							
70536	JH01-34-11B	-	-	Slab ck Canyon zone	E/1	27	0545498	7209644							
70537	JH01-34-11C	-	-	Slab ck Canyon zone	E/1	27	0545498	7209644		**Y**	**Y**				
70538	JH01-34-11D	-	-	Slab ck Canyon zone	E/1	27	0545498	7209644		**Y**	**Y**				
70539	JH01-34-11E	-	-	Slab ck Canyon zone	E/1	27	0545498	7209644		**Y**	**Y**				
70540	JH01-35-1A	-	-	Slab ck Canyon zone	E/1	27	0545599	7209664							
70541	JH01-35-1B	-	-	Slab ck Canyon zone	E/1	27	0545599	7209664		**Y**	**Y**				

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Lithology
70511	JH01-30-10	-	-	Bx
70512	JH01-31-1	-	-	Bx
70513	JH01-31-2	-	-	Bx
70514	JH01-32-1	-	-	Unaltered banded grey sst
70515	JH01-32-3	-	-	Banded sst
70516	JH01-32-4A	-	-	Banded sst 70 cm away from Qz-Mt + vein
70517	JH01-32-4B	-	-	Sst 10 cm away from vein contact
70518	JH01-32-4C	-	-	Qz-Carb-Mt-Gt-Py-Bt vein
70519	JH01-32-4D	-	-	Carb-Mt pod
70520	JH01-32-4E	-	-	Sst 1 m below vein
70521	JH01-32-4F	-	-	Sst 20 m upstream
70522	JH01-32-5A	-	-	Brown-grey sst (Bt altered?)
70523	JH01-32-5B	-	-	Float sample of Cbxted folded sst with Carb matrix (like Slab Ridge)
70524	JH01-32-6A	-	-	Dark & light grey sst
70525	JH01-32-6B	-	-	Cbxted sst
70526	JH01-32-7A	-	-	Sst with pink Carb-Cl veins
70527	JH01-32-7B	-	-	Bx
70528	JH01-32-7C	-	-	Micro Bx
70529	JH01-32-7D	-	-	Carb vein
70530	JH01-32-7E	-	-	Carb-Mt Bx
70531	JH01-34-3	-	-	Sst cut by Qz-Cl veins, Mt pophyroblasts
70532	JH01-34-7	-	-	Bx with white Carb matrix
70533	JH01-34-8	-	-	Diorite? or Slab Volcanics?
70534	JH01-34-10	-	-	Sericitized, phyllitic sst with 10% Diss, CG Mt
70535	JH01-34-11A	-	-	Carb-Mt vein
70536	JH01-34-11B	-	-	Sst cut by siliceous veins
70537	JH01-34-11C	-	-	Ser altered sst cut by Qz vein
70538	JH01-34-11D	-	-	Carb vein with two types of Carb
70539	JH01-34-11E	-	-	Bx
70540	JH01-35-1A	-	-	Mt
70541	JH01-35-1B	-	-	Carb from Carb-Mt altn

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Location	NTS map sheet	Datum (NAD)	Easting	Northing	Thin Section	Isotopes				Fluid Inclusions	Geochron
										O	C	S	D		
70542	JH01-35-1C	-	-	Slab ck Canyon zone	E/1	27	0545599	7209664		Y	Y				
70543	JH01-35-1D	-	-	Slab ck Canyon zone	E/1	27	0545599	7209664							
70544	JH01-35-2	-	-	Slab ck Canyon zone	E/1	27	0545599	7209670	Y	Y	Y		Y		
70545	JH01-35-3A	-	-	Slab ck Canyon zone	E/1	83	0545492	7209860							
70546	JH01-35-3B	-	-	Slab ck Canyon zone	E/1	83	0545492	7209860				Y			
70547	JH01-35-3C	-	-	Slab ck Canyon zone	E/1	83	0545492	7209860							
70548	JH01-35-3D	-	-	Slab ck Canyon zone	E/1	83	0545492	7209860							
70549	JH01-35-4	-	-	Slab ck Canyon zone	E/1	27	0545636	7209684							
70550	JH01-35-5A	-	-	Slab ck Canyon zone	E/1	27	0545636	7209684							
70551	JH01-35-5B	-	-	Slab ck Canyon zone	E/1	27	0545636	7209684		Y	Y				
70552	JH01-35-5C	-	-	Slab ck Canyon zone	E/1	27	0545636	7209684							
70553	JH01-35-5D	-	-	Slab ck Canyon zone	E/1	27	0545636	7209684							
70554	JH01-35-9	-	-	Slab ck Canyon zone	E/1	27	0545755	7209600							
70555	JH01-35-10	-	-	Slab ck Canyon zone	E/1	27	0545692	7209649							
70556	JH01-36-20	-	-	Slab ck Canyon zone	E/1	27	0545631	7209710							
70557	JH01-37-2?	-	-	north side of saddle	D/16	27	0545587	7208979							
70558	JH01-37-3	-	-	north side of saddle	D/16	27	0545514	7209205							
70559	JH01-37-12	-	-	Slab ck Canyon zone	E/1	27	0545860	7209769							
70560	02JH-13-001	-	-	ck between Slab Mtn and Slab ridge	D/16	27	0544746	7208319							
70561	02JH-14-001A	-	-	Slab ck Canyon zone	E/1	27	0545610	7209676	Y				Y		**Ar-Ar**
70562	02JH-14-001B	-	-	Slab ck Canyon zone	E/1	27	0545610	7209676	Y			Y			
70563	02JH-20-002	-	-	Slab ck Canyon zone	E/1		0545610	7209676	Y				Y		**Ar-Ar**
70564	Slab SW	-	-	Slab Mtn	D/16	27	0545372	7208365						Y	
70565	Slab float 1	-	-	Slab	D/16		-	-				Y			
70566	Slab float 2	-	-	Slab	D/16		-	-							
70567	Slab float 3	-	-	Slab	D/16		-	-							
70568	Slab float 4	-	-	Slab	D/16		-	-							
70569	SLAB CREEK 1	-	-	Slab ck	E/1		0545610	7209676	Y						
70570	Marble Breccia	-	-	Slab ck	E/1	27	0545610	7209676	Y						
70571	quartz xtls	-	-	Slab ck Canyon zone	E/1	27	0545610	7209676							

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Lithology
70542	JH01-35-1C	-	-	Carb-Qz vein cutting Carb-Mt altn
70543	JH01-35-1D	-	-	Cl on fractures & replacing sst (2 pieces)
70544	JH01-35-2	-	-	Bt from rubble Bx matrix. Rubble Bx cuts Carb-Mt altn
70545	JH01-35-3A	-	-	Sulphide vein on fracture cutting sst & Carb-Mt altn. Qz-Musc on vein selvages
70546	JH01-35-3B	-	-	Sulphide veinlet in sst at edge of vein
70547	JH01-35-3C	-	-	Brown banded sst at Bx contact
70548	JH01-35-3D	-	-	Bx cutting Carb-Mt altn & containing Mt clasts
70549	JH01-35-4	-	-	Pink Carb vein cutting Carb-Mt altered siltstone
70550	JH01-35-5A	-	-	Carb-sulphide vein at sst-Bx contact
70551	JH01-35-5B	-	-	Dark Bx cut by Carb-Mt vein
70552	JH01-35-5C	-	-	Bx
70553	JH01-35-5D	-	-	Bx with Mt clast
70554	JH01-35-9	-	-	Contact - pale green Bx cuts dark Bx
70555	JH01-35-10	-	-	Sulphide clast from pale green Bx
70556	JH01-36-20	-	-	Fs-Musc veins cutting Qz-Tour veins in sst
70557	JH01-37-2?	-	-	Phyllite
70558	JH01-37-3	-	-	Bx (2 pieces)
70559	JH01-37-12	-	-	Sst cut by Carb-Mt veins & altn
70560	02JH-13-001	-	-	Float of Bx with sst clasts in a white Carb matrix
70561	02JH-14-001A	-	-	Musc from selvage of Py-Cpy-Qz-Carb-Musc vein cutting Carb-Mt altered seds.
70562	02JH-14-001B	-	-	Py-Cpy-Qz-Carb-Musc vein cutting Carb-Mt altered seds
70563	02JH-20-002	-	-	Bx with abundant Bt in matrix
70564	Slab SW	-	-	Qz crystals used for fluid inclusions (+ calcite xtls + Ft xtls)
70565	Slab float 1	-	-	Bx with Carb matrix & abundant Cpy (fallen from top of slab mtn)
70566	Slab float 2	-	-	Pervasively Bt altered sediments op by scapolite
70567	Slab float 3	-	-	FG sediments with minor sulphides & minor scapolite altn
70568	Slab float 4	-	-	Ab/scapolite altd FG sediments, minor Cpy in Ab-?Qz vein
70569	SLAB CREEK 1	-	-	Scapolite in calc-silicate layers
70570	Marble Breccia	-	-	Deformed sst clasts in Carb matrix = solution bx?
70571	quartz xtls	-	-	Qz crystals

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Location	NTS map sheet	Datum (NAD)	Easting	Northing	Thin Section	Isotopes				Fluid Inclusions	Geochron
										O	C	S	D		
70572	MBJH01-01-7a	-	-	Slab Mtn north end	E/1	27	0545372	7208365							
70573	MBJH01-03-1b	-	-	Slab Mtn north end	E/1	27	0545372	7208365							
70574	MBJH01-03-9a	-	-	Slab Mtn north end	E/1	27	0545372	7208365							
70575	MBJH01-03-13c	-	-	Slab Mtn north end	E/1	27	0545372	7208365							
70576	MBJH01-04-9a	-	-	Slab Mtn north end	E/1	27	0545372	7208365							
70577	MBJH01-04-10a	-	-	Slab Mtn north end	E/1	27	0545372	7208365							
70578	MBJH01-04-11a	-	-	Slab Mtn north end	E/1	27	0545372	7208365							
HOOVER PROPERTY: DRILL CORE SAMPLES															
70579	HV94-1	2.42	8	Hoover lower slope	E/1	27	0535191.53	7217860							
70580	HV94-1	5.24	17.3	Hoover lower slope	E/1	27	0535191.53	7217860							
70581	HV94-1	6.67	22	Hoover lower slope	E/1	27	0535191.53	7217860							
70582	HV94-1	9.55	31.5	Hoover lower slope	E/1	27	0535191.53	7217860							
70583	HV94-1	10.00	33	Hoover lower slope	E/1	27	0535191.53	7217860							
70584	HV94-1	10.45	34.5	Hoover lower slope	E/1	27	0535191.53	7217860							
70585	HV94-1	10.91	36	Hoover lower slope	E/1	27	0535191.53	7217860				Y			
70586	HV94-1	13.79	45.5	Hoover lower slope	E/1	27	0535191.53	7217860							
70587	HV94-1	13.94	46	Hoover lower slope	E/1	27	0535191.53	7217860							
70588	HV94-1	15.53	51.25	Hoover lower slope	E/1	27	0535191.53	7217860							
70589	HV94-1	16.36	54	Hoover lower slope	E/1	27	0535191.53	7217860							
70590	HV94-1	16.52	54.5	Hoover lower slope	E/1	27	0535191.53	7217860							
70591	HV94-1	16.67	55	Hoover lower slope	E/1	27	0535191.53	7217860							
70592	HV94-1	16.97	56	Hoover lower slope	E/1	27	0535191.53	7217860							
70593	HV94-1	17.27	57	Hoover lower slope	E/1	27	0535191.53	7217860							
70594	HV94-1	19.55	64.5	Hoover lower slope	E/1	27	0535191.53	7217860							
70595	HV94-1	22.42	74	Hoover lower slope	E/1	27	0535191.53	7217860							
70596	HV94-1	22.73	75	Hoover lower slope	E/1	27	0535191.53	7217860							
70597	HV94-1	26.97	89	Hoover lower slope	E/1	27	0535191.53	7217860							
70598	HV94-1	31.52	104	Hoover lower slope	E/1	27	0535191.53	7217860							
70599	HV94-1	31.82	105	Hoover lower slope	E/1	27	0535191.53	7217860							
70600	HV94-1	32.73	108	Hoover lower slope	E/1	27	0535191.53	7217860							
70601	HV94-1	34.55	114	Hoover lower slope	E/1	27	0535191.53	7217860							

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Lithology
70572	MBJH01-01-7a	-	-	Bx with phyllite clasts & Bt in matrix
70573	MBJH01-03-1b	-	-	Qz-Musc vein
70574	MBJH01-03-9a	-	-	Cl altd seds
70575	MBJH01-03-13c	-	-	Phyllite
70576	MBJH01-04-9a	-	-	Qz xtls
70577	MBJH01-04-10a	-	-	Pink Carb-Act vein
70578	MBJH01-04-11a	-	-	White Carb-Act vein
70579	HV94-1	2.42	8	Qz-Cl vein
70580	HV94-1	5.24	17.3	Sst
70581	HV94-1	6.67	22	Qz vein cutting Qz-Cl vein
70582	HV94-1	9.55	31.5	Chloritic sst with Fs-Qz replacement & cut by Qz-Cl+/-Ht vein
70583	HV94-1	10.00	33	Chloritic sst & Bx with Fs-Qz replacement; Diss Ht in the Bx
70584	HV94-1	10.45	34.5	Bx
70585	HV94-1	10.91	36	Fs-Qz altn along a Bx-sst contact; Py porphyroblasts
70586	HV94-1	13.79	45.5	Fs-Qz flooding & bands of Mt-Carb
70587	HV94-1	13.94	46	Fs-Qz altn?
70588	HV94-1	15.53	51.25	Sst Cbx
70589	HV94-1	16.36	54	Fs-Qz altered sst being replaced by Cl-Qz
70590	HV94-1	16.52	54.5	Contact with Cbx
70591	HV94-1	16.67	55	Bleached contact with Mt
70592	HV94-1	16.97	56	Fs-Qz altered rock with Ht replacing? Mt
70593	HV94-1	17.27	57	Bx cut by Ht & ? vein
70594	HV94-1	19.55	64.5	Gt? + Mt-Cl
70595	HV94-1	22.42	74	Mt porphyroblasts
70596	HV94-1	22.73	75	Phyllite
70597	HV94-1	26.97	89	Carb veinlet cut by Cl veinlet then Cl porphyroblasts
70598	HV94-1	31.52	104	Bx & Qz-Fs altn
70599	HV94-1	31.82	105	Qz-Mt-Ht vein in chloritic sst at contact with Bx
70600	HV94-1	32.73	108	Sst
70601	HV94-1	34.55	114	Qz vein cutting Mt band

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Location	NTS map sheet	Datum (NAD)	Easting	Northing	Thin Section	Isotopes				Fluid Inclusions	Geochron
										O	C	S	D		
70602	HV94-1	35.15	116	Hoover lower slope	E/1	27	0535191.53	7217860							
70603	HV94-1	36.52	120.5	Hoover lower slope	E/1	27	0535191.53	7217860		**Y**	**Y**				
70604	HV94-1	39.70	131	Hoover lower slope	E/1	27	0535191.53	7217860							
70605	HV94-1	41.21	136	Hoover lower slope	E/1	27	0535191.53	7217860							
70606	HV94-1	43.48	143.5	Hoover lower slope	E/1	27	0535191.53	7217860							
70607	HV94-1	43.64	144	Hoover lower slope	E/1	27	0535191.53	7217860							
70608	HV94-1	43.94	145	Hoover lower slope	E/1	27	0535191.53	7217860							
70609	HV94-1	44.55	147	Hoover lower slope	E/1	27	0535191.53	7217860							
70610	HV94-1	44.70	147.5	Hoover lower slope	E/1	27	0535191.53	7217860							
70611	HV94-1	45.76	151	Hoover lower slope	E/1	27	0535191.53	7217860							
70612	HV94-1	46.36	153	Hoover lower slope	E/1	27	0535191.53	7217860							
70613	HV94-1	46.36	153	Hoover lower slope	E/1	27	0535191.53	7217860							
70614	HV94-1	48.48	160	Hoover lower slope	E/1	27	0535191.53	7217860							
70615	HV94-1	50.00	165	Hoover lower slope	E/1	27	0535191.53	7217860							
70616	HV94-1	55.45	183	Hoover lower slope	E/1	27	0535191.53	7217860							
70617	HV94-1	59.09	195	Hoover lower slope	E/1	27	0535191.53	7217860							
70618	HV94-1	68.79	227	Hoover lower slope	E/1	27	0535191.53	7217860							
70619	HV94-1	70.15	231.5	Hoover lower slope	E/1	27	0535191.53	7217860							
70620	HV94-1	74.24	245	Hoover lower slope	E/1	27	0535191.53	7217860							
70621	HV94-1	75.76	250	Hoover lower slope	E/1	27	0535191.53	7217860							
70622	HV94-1	78.64	259.5	Hoover lower slope	E/1	27	0535191.53	7217860							
70623	HV94-1	80.30	265	Hoover lower slope	E/1	27	0535191.53	7217860							
70624	HV94-1	80.76	266.5	Hoover lower slope	E/1	27	0535191.53	7217860							
70625	HV94-1	81.21	268	Hoover lower slope	E/1	27	0535191.53	7217860							
70626	HV94-1	81.82	270	Hoover lower slope	E/1	27	0535191.53	7217860							
70627	HV94-1	85.15	281	Hoover lower slope	E/1	27	0535191.53	7217860							
70628	HV94-1	85.76	283	Hoover lower slope	E/1	27	0535191.53	7217860							
70629	HV94-1	87.76	289.6	Hoover lower slope	E/1	27	0535191.53	7217860							
70630	HV94-1	87.88	290	Hoover lower slope	E/1	27	0535191.53	7217860							
70631	HV94-1	90.61	299	Hoover lower slope	E/1	27	0535191.53	7217860							
70632	HV94-1	90.91	300	Hoover lower slope	E/1	27	0535191.53	7217860							

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Lithology
70602	HV94-1	35.15	116	Qz-Cl vein cutting folded sst
70603	HV94-1	36.52	120.5	Carb-Mt vein
70604	HV94-1	39.70	131	Fs-Qz vein cutting Carb veins that cut Cl-Mt altn
70605	HV94-1	41.21	136	Altered sst
70606	HV94-1	43.48	143.5	Sst Cbx
70607	HV94-1	43.64	144	Carb vein
70608	HV94-1	43.94	145	Carb-Cl vlts cutting Fs-Qz altered Cbxted sst with Ht
70609	HV94-1	44.55	147	Cl-Mt Carb altn replaced by Fs-Qz altn
70610	HV94-1	44.70	147.5	Pink staining
70611	HV94-1	45.76	151	Cl-Mt-Carb altn cut by Carb vein
70612	HV94-1	46.36	153	Chloritic phyllite
70613	HV94-1	46.36	153	Cl-Mt-Carb altn
70614	HV94-1	48.48	160	Cl-Mt altn cut by sulphide veinlet
70615	HV94-1	50.00	165	Cl replacing sst clasts
70616	HV94-1	55.45	183	Folded sst with flattened Mt porphyroblasts
70617	HV94-1	59.09	195	Qz-Fs vlts in sst
70618	HV94-1	68.79	227	Sst Cbx
70619	HV94-1	70.15	231.5	Fs-Qz altn?
70620	HV94-1	74.24	245	Banded sst
70621	HV94-1	75.76	250	Christmas tree altn around Qz-Fs veins
70622	HV94-1	78.64	259.5	Folded sst
70623	HV94-1	80.30	265	Cbx
70624	HV94-1	80.76	266.5	Pink spots
70625	HV94-1	81.21	268	Carb vein
70626	HV94-1	81.82	270	Mt veins & blebs
70627	HV94-1	85.15	281	Mt needles in Carb vein
70628	HV94-1	85.76	283	Bx clasts; Ht
70629	HV94-1	87.76	289.6	Bx
70630	HV94-1	87.88	290	Sst with Diss Ht being replaced by Fs-Qz altn
70631	HV94-1	90.61	299	Sst with Fs-Qz altn cut by Qz-Cl veins & Cl-Qz+/-malachite fractures
70632	HV94-1	90.91	300	Qz-Carb lined vugs

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Location	NTS map sheet	Datum (NAD)	Easting	Northing	Thin Section	Isotopes				Fluid Inclusions	Geochron
										O	C	S	D		
70633	HV94-1	92.12	304	Hoover lower slope	E/1	27	0535191.53	7217860							
70634	HV94-1	93.03	307	Hoover lower slope	E/1	27	0535191.53	7217860							
70635	HV94-1	95.52	315.2	Hoover lower slope	E/1	27	0535191.53	7217860							
70636	HV94-1	96.36	318	Hoover lower slope	E/1	27	0535191.53	7217860							
70637	HV94-1	96.97	320	Hoover lower slope	E/1	27	0535191.53	7217860							
70638	HV94-1	98.79	326	Hoover lower slope	E/1	27	0535191.53	7217860							
70639	HV94-1	101.82	336	Hoover lower slope	E/1	27	0535191.53	7217860							
70640	HV94-1	106.67	352	Hoover lower slope	E/1	27	0535191.53	7217860							
70641	HV94-1	108.64	358.5	Hoover lower slope	E/1	27	0535191.53	7217860							
70642	HV94-1	110.85	365.8	Hoover lower slope	E/1	27	0535191.53	7217860							
70643	HV94-1	122.79	405.2	Hoover lower slope	E/1	27	0535191.53	7217860							
70644	HV94-1	124.55	411	Hoover lower slope	E/1	27	0535191.53	7217860							
70645	HV94-1	126.36	417	Hoover lower slope	E/1	27	0535191.53	7217860							
70646	HV94-1	129.09	426	Hoover lower slope	E/1	27	0535191.53	7217860							
70647	HV94-1	131.21	433	Hoover lower slope	E/1	27	0535191.53	7217860							
70648	HV94-1	134.55	444	Hoover lower slope	E/1	27	0535191.53	7217860							
70649	HV94-1	141.52	467	Hoover lower slope	E/1	27	0535191.53	7217860							
70650	HV94-1	142.73	471	Hoover lower slope	E/1	27	0535191.53	7217860							
70651	HV94-1	146.67	484	Hoover lower slope	E/1	27	0535191.53	7217860							
70652	HV94-1	148.18	489	Hoover lower slope	E/1	27	0535191.53	7217860							
70653	HV94-1	149.85	494.5	Hoover lower slope	E/1	27	0535191.53	7217860							
70654	HV94-1	152.42	503	Hoover lower slope	E/1	27	0535191.53	7217860							
70655	HV94-1	153.73	507.3	Hoover lower slope	E/1	27	0535191.53	7217860		**Y**	**Y**	**Y**			
70656	HV94-1	155.30	512.5	Hoover lower slope	E/1	27	0535191.53	7217860							
70657	HV94-1	156.36	516	Hoover lower slope	E/1	27	0535191.53	7217860							
70658	HV94-1	157.58	520	Hoover lower slope	E/1	27	0535191.53	7217860							
70659	HV94-1	158.33	522.5	Hoover lower slope	E/1	27	0535191.53	7217860							
70660	HV94-1	160.61	530	Hoover lower slope	E/1	27	0535191.53	7217860							
70661	HV94-1	163.03	538	Hoover lower slope	E/1	27	0535191.53	7217860							
70662	HV94-1	165.61	546.5	Hoover lower slope	E/1	27	0535191.53	7217860							
70663	HV94-1	168.18	555	Hoover lower slope	E/1	27	0535191.53	7217860							

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Lithology
70633	HV94-1	92.12	304	Sst
70634	HV94-1	93.03	307	Bt? overprinting Fs-Qz altn & Qz-Cl veins
70635	HV94-1	95.52	315.2	Qz-Ft? vein cutting Fs-Qz altn
70636	HV94-1	96.36	318	Vug with Qz-sulphide; malachite
70637	HV94-1	96.97	320	Bx intruding chloritic phyllite; Fs-Qz altn
70638	HV94-1	98.79	326	Christmas tree altn around Qz-Fs veins
70639	HV94-1	101.82	336	Qz-Cl+/-Carb veins cutting chloritic phyllite
70640	HV94-1	106.67	352	Chloritic phyllite
70641	HV94-1	108.64	358.5	Qz+/-Ft? Vein cutting folded Qz-Cl vein
70642	HV94-1	110.85	365.8	Mt blebs; Qz vug
70643	HV94-1	122.79	405.2	Mt porphyroblasts in chloritic phyllite
70644	HV94-1	124.55	411	Vuggy Qz-Fs-Carb vein +/- cpy, po, py
70645	HV94-1	126.36	417	Vuggy Qz-Ht vein
70646	HV94-1	129.09	426	Qz-Ht vein cutting phyllite with Mt porphyroblasts
70647	HV94-1	131.21	433	Early Qz-Mt-Cl vein
70648	HV94-1	134.55	444	Phyllite with Mt porphyroblasts overprinted by Cl-Mt altn & cut by Qz-Carb vein
70649	HV94-1	141.52	467	Qz-Carb tension veins
70650	HV94-1	142.73	471	Qz-Mt vein
70651	HV94-1	146.67	484	Qz-Ht veins cut by Carb veins
70652	HV94-1	148.18	489	Mt blebs parallel to foliation, Qz-Carb veins, tan spots
70653	HV94-1	149.85	494.5	Carb vein cutting sst
70654	HV94-1	152.42	503	Slc rock cut by Carb vein
70655	HV94-1	153.73	507.3	Bxted & bleached sst cut by Carb vein & Py bleb
70656	HV94-1	155.30	512.5	30 cm thick Carb vein
70657	HV94-1	156.36	516	Slc Carb veined sst
70658	HV94-1	157.58	520	Carb vein & siliceous rock
70659	HV94-1	158.33	522.5	Orange & black sst & Qz-Ht-Cu vein
70660	HV94-1	160.61	530	Qz veins following crenulation axes
70661	HV94-1	163.03	538	Cbx
70662	HV94-1	165.61	546.5	Musc-Cl replacing sst clasts
70663	HV94-1	168.18	555	XC Qz-Py-Cpy fractures & blebs

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Location	NTS map sheet	Datum (NAD)	Easting	Northing	Thin Section	Isotopes				Fluid Inclusions	Geochron
										O	C	S	D		
70664	HV94-1	169.70	560	Hoover lower slope	E/1	27	0535191.53	7217860							
70665	HV94-1	171.52	566	Hoover lower slope	E/1	27	0535191.53	7217860							
70666	HV94-1	174.09	574.5	Hoover lower slope	E/1	27	0535191.53	7217860							
70667	HV94-1	175.15	578	Hoover lower slope	E/1	27	0535191.53	7217860							
70668	HV94-1	177.12	584.5	Hoover lower slope	E/1	27	0535191.53	7217860							
70669	HV94-1	180.45	595.5	Hoover lower slope	E/1	27	0535191.53	7217860							
70670	HV94-1	181.36	598.5	Hoover lower slope	E/1	27	0535191.53	7217860							
70671	HV94-1	181.70	599.6	Hoover lower slope	E/1	27	0535191.53	7217860				**Y**			
70672	HV94-1	182.27	601.5	Hoover lower slope	E/1	27	0535191.53	7217860							
70673	HV94-1	183.42	605.3	Hoover lower slope	E/1	27	0535191.53	7217860							
70674	HV94-1	185.61	612.5	Hoover lower slope	E/1	27	0535191.53	7217860							
70675	HV94-1	190.30	628	Hoover lower slope	E/1	27	0535191.53	7217860							
70676	HV94-1	190.76	629.5	Hoover lower slope	E/1	27	0535191.53	7217860							
70677	HV94-1	194.70	642.5	Hoover lower slope	E/1	27	0535191.53	7217860		**Y**	**Y**				
70678	HV94-1	196.21	647.5	Hoover lower slope	E/1	27	0535191.53	7217860							
70679	HV94-1	196.67	649	Hoover lower slope	E/1	27	0535191.53	7217860							
70680	HV94-1	196.97	650	Hoover lower slope	E/1	27	0535191.53	7217860		**Y**	**Y**				
70681	HV94-1	198.55	655.2	Hoover lower slope	E/1	27	0535191.53	7217860							
70682	HV94-1	199.09	657	Hoover lower slope	E/1	27	0535191.53	7217860							
70683	HV94-1	199.39	658	Hoover lower slope	E/1	27	0535191.53	7217860							
70684	HV94-1	202.12	667	Hoover lower slope	E/1	27	0535191.53	7217860							
70685	HV94-1	209.45	691.2	Hoover lower slope	E/1	27	0535191.53	7217860							
70686	HV94-1	210.61	695	Hoover lower slope	E/1	27	0535191.53	7217860	**Y**				**Y**		
70687	HV94-1	213.18	703.5	Hoover lower slope	E/1	27	0535191.53	7217860							
70688	HV94-1	216.97	716	Hoover lower slope	E/1	27	0535191.53	7217860							
70689	HV94-1	217.88	719	Hoover lower slope	E/1	27	0535191.53	7217860							
70690	HV94-1	222.52	734.3	Hoover lower slope	E/1	27	0535191.53	7217860							
70691	HV94-1	222.58	734.5	Hoover lower slope	E/1	27	0535191.53	7217860							
70692	HV94-1	226.52	747.5	Hoover lower slope	E/1	27	0535191.53	7217860							
70693	HV94-1	230.00	759	Hoover lower slope	E/1	27	0535191.53	7217860							
70694	HV94-1	241.36	796.5	Hoover lower slope	E/1	27	0535191.53	7217860							

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Lithology
70664	HV94-1	169.70	560	Fs-Cl altered Bx
70665	HV94-1	171.52	566	Carb-Mt altered Bx
70666	HV94-1	174.09	574.5	Cbx
70667	HV94-1	175.15	578	Fs-Mt altered Bx
70668	HV94-1	177.12	584.5	Fs-Qz altered Bx cut by Carb fractures
70669	HV94-1	180.45	595.5	Bx
70670	HV94-1	181.36	598.5	Carb-Mt +/- Py vein
70671	HV94-1	181.70	599.6	Carb-Cl-Py-Cpy vein
70672	HV94-1	182.27	601.5	Patchy silicification
70673	HV94-1	183.42	605.3	Carb-Mt altn
70674	HV94-1	185.61	612.5	Ht-Carb flooding
70675	HV94-1	190.30	628	Sst-Bx contact
70676	HV94-1	190.76	629.5	Sst clasts with Carb pophyroblasts
70677	HV94-1	194.70	642.5	Carb Bxting sst clasts
70678	HV94-1	196.21	647.5	Bxtion process
70679	HV94-1	196.67	649	Bxtion process
70680	HV94-1	196.97	650	Carb-Cpy veinlet cutting sst clast & offsetting layers
70681	HV94-1	198.55	655.2	Py blebs
70682	HV94-1	199.09	657	Cpy blebs
70683	HV94-1	199.39	658	Sst clast
70684	HV94-1	202.12	667	Overprinting relationships
70685	HV94-1	209.45	691.2	Fs-Qz overprinted by Cl & Mt-Carb
70686	HV94-1	210.61	695	Bt porphyroblasts
70687	HV94-1	213.18	703.5	Fs-Qz & Ser altn
70688	HV94-1	216.97	716	Qz-py-Carb-Mt vein
70689	HV94-1	217.88	719	Diorite contact with Qz-Fs altered phyllite
70690	HV94-1	222.52	734.3	Carb-sulphide vlts
70691	HV94-1	222.58	734.5	Qz-cl vein cut by Mt veinlet
70692	HV94-1	226.52	747.5	Patches of Mt (+/- Ht)- Cpy-Qz
70693	HV94-1	230.00	759	Mt porphyroblasts & Cl-Py-Mt vlts
70694	HV94-1	241.36	796.5	Fs-Mt +/-Ht-Py-Carb

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Location	NTS map sheet	Datum (NAD)	Easting	Northing	Thin Section	Isotopes				Fluid Inclusions	Geochron
										O	C	S	D		
70695	HV94-1	244.70	807.5	Hoover lower slope	E/1	27	0535191.53	7217860							
70696	HV94-1	260.00	858	Hoover lower slope	E/1	27	0535191.53	7217860							
70697	HV94-1	261.82	864	Hoover lower slope	E/1	27	0535191.53	7217860							
70698	HV94-1	266.67	880	Hoover lower slope	E/1	27	0535191.53	7217860							
70699	HV94-1	283.76	936.4	Hoover lower slope	E/1	27	0535191.53	7217860				**Y**			
70700	HV94-1	299.39	988	Hoover lower slope	E/1	27	0535191.53	7217860							
70701	HV94-1	304.55	1005	Hoover lower slope	E/1	27	0535191.53	7217860							
70702	HV94-1	315.15	1040	Hoover lower slope	E/1	27	0535191.53	7217860							
70703	HV94-1	317.88	1049	Hoover lower slope	E/1	27	0535191.53	7217860							
70704	HV94-1	325.91	1075.5	Hoover lower slope	E/1	27	0535191.53	7217860							
70705	HV94-3	1.82 m		Hoover lower slope	E/1	27	0535552.78	7216989							
70706	HV94-3	2.6 m	-	Hoover lower slope	E/1	27	0535552.78	7216989							
70707	HV94-3	6.4 m	-	Hoover lower slope	E/1	27	0535552.78	7216989							
70708	HV94-3	13.85	-	Hoover lower slope	E/1	27	0535552.78	7216989							
70709	HV94-3	29.30	-	Hoover lower slope	E/1	27	0535552.78	7216989							
70710	HV94-3	35.60	-	Hoover lower slope	E/1	27	0535552.78	7216989							
70711	HV94-3	61.00	-	Hoover lower slope	E/1	27	0535552.78	7216989							
70712	HV94-3	64.10	-	Hoover lower slope	E/1	27	0535552.78	7216989							
70713	HV94-3	69.60	-	Hoover lower slope	E/1	27	0535552.78	7216989							
70714	HV94-3	101.50	-	Hoover lower slope	E/1	27	0535552.78	7216989							
70715	HV94-3	104.80	-	Hoover lower slope	E/1	27	0535552.78	7216989							
70716	HV94-3	124.80	-	Hoover lower slope	E/1	27	0535552.78	7216989							
70717	HV94-3	143.25	-	Hoover lower slope	E/1	27	0535552.78	7216989							
70718	HV94-3	154.80	-	Hoover lower slope	E/1	27	0535552.78	7216989							
70719	HV94-3	176.70	-	Hoover lower slope	E/1	27	0535552.78	7216989							
70720	HV94-3	177.10	-	Hoover lower slope	E/1	27	0535552.78	7216989							
70721	HV94-3	201.60	-	Hoover lower slope	E/1	27	0535552.78	7216989							
HOOVER AREA: OUTCROP SAMPLES															
70722	JH01-5-5A	-	-	Top of Radio ck	E/1	27	0535567	7220398	**Y**						
70723	JH01-5-5B	-	-	Top of Radio ck	E/1	27	0535567	7220398			**Y**				
70724	JH01-5-7A	-	-	Top of Radio ck	E/1	27	0536396	7218147						**Y**	

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Lithology
70695	HV94-1	244.70	807.5	General lithology
70696	HV94-1	260.00	858	White porphyroblasts
70697	HV94-1	261.82	864	Qz-Cl-Fs-Bt vein
70698	HV94-1	266.67	880	Boudinaged Qz-Cl-Py-Cpy vein
70699	HV94-1	283.76	936.4	White spots & Qz-Cl vein
70700	HV94-1	299.39	988	White spots & Cl porphyroblasts
70701	HV94-1	304.55	1005	Cl-Aspy-Cpy vlt
70702	HV94-1	315.15	1040	Bt? Porphyroblasts
70703	HV94-1	317.88	1049	Chloritic sst Bxted by pink & white Fs-Qz veins +/- Py
70704	HV94-1	325.91	1075.5	General lithology
70705	HV94-3	1.82 m		Cl altered sst + tan Carb veins + Mt-Carb-Bt altn + sulphide's
70706	HV94-3	2.6 m	-	Carb-Mt veins cut by pink Fs-Qz veins
70707	HV94-3	6.4 m	-	Tan Carb vein with large Qz xtls
70708	HV94-3	13.85	-	Sulphide's op Mt & Fs-Qz veins; sulphide's in Mt grains
70709	HV94-3	29.30	-	Gt porphyroblasts op Mt & cut by white Carb vein
70710	HV94-3	35.60	-	Gt porphyroblasts
70711	HV94-3	61.00	-	Sulphide's replacing Mt
70712	HV94-3	64.10	-	Gt + Bt + Qz in Carb
70713	HV94-3	69.60	-	Sulphide's replacing Ht replacing Mt
70714	HV94-3	101.50	-	Altered marble Bx
70715	HV94-3	104.80	-	Po & Aspy with sulphide's; Musc? with Carb-Cl altn
70716	HV94-3	124.80	-	Clear pink Ft? cutting white Carb-Cl veins & sulphide's
70717	HV94-3	143.25	-	Ht needles overprinting sulphide's
70718	HV94-3	154.80	-	Sulphide's in fracture network; white Carb-Cl & XC pink Ft
70719	HV94-3	176.70	-	Bt altn causing Bxtion of sst; Bt matrix replaced by white Carb
70720	HV94-3	177.10	-	Sulphide's op white Carb in matrix
70721	HV94-3	201.60	-	White Carb vein with Cpy, Py, Ser, Gt
70722	JH01-5-5A	-	-	Sst
70723	JH01-5-5B	-	-	Slate
70724	JH01-5-7A	-	-	Bx

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Location	NTS map sheet	Datum (NAD)	Easting	Northing	Thin Section	Isotopes				Fluid Inclusions	Geochron
										O	C	S	D		
70725	JH01-5-7B	-	-	Top of Radio ck	E/1	27	0536396	7218147							
70726	JH01-5-7C	-	-	Top of Radio ck	E/1	27	0536396	7218147	Y						
70727	JH01-6-1A	-	-	old workings	E/1	27	0535032	7217710	Y						
70728	JH01-6-1B	-	-	old workings	E/1	27	0535032	7217710	Y						
70729	JH01-6-1C	-	-	old workings	E/1	27	0535032	7217710	Y						
70730	JH01-6-1D	-	-	old workings	E/1	27	0535032	7217710							
70731	JH01-6-1E	-	-	old workings	E/1	27	0535032	7217710							
70732	JH01-6-3A	-	-	lower slope	E/1	27	0535307	7217620							
70733	JH01-6-3B	-	-	lower slope	E/1	27	0535307	7217620	Y						
70734	JH01-6-3C	-	-	lower slope	E/1	27	0535307	7217620	Y						
70735	JH01-6-4A	-	-	lower slope	E/1	27	0535354	7217602							
70736	JH01-6-5A	-	-	old workings	E/1	27	0535032	7217710							
70737	JH01-6-5B	-	-	old workings	E/1	27	0535032	7217710	Y						
70738	JH01-6-5C	-	-	old workings	E/1	27	0535032	7217710							
70739	JH01-7-1A	-	-	lower slope	E/1	27	0535054	7217625				Y			
70740	JH01-7-1B	-	-	lower slope	E/1	27	0535054	7217625							
70741	JH01-7-1C	-	-	lower slope	E/1	27	0535054	7217625	Y						
70742	JH01-7-5A	-	-	middle slope	E/1	27	0535583	7217672							
70743	JH01-7-6A	-	-	middle slope	E/1	27	0535629	7217687	Y						
70744	JH01-7-11A	-	-	upper slope	E/1	27	0535946	7218158		Y	Y				
70745	JH01-7-11B	-	-	upper slope	E/1	27	0535946	7218158				Y			
70746	JH01-7-11C	-	-	upper slope	E/1	27	0535946	7218158							
70747	JH01-7-12A	-	-	upper slope	E/1	27	0535999	7218235		Y	Y				
70748	JH01-7-13A	-	-	upper slope	E/1	27	0536025	7218296	Y						
70749	JH01-7-16	-	-	middle slope	E/1	27	0535242	7218235							
70750	JH01-8-1A	-	-	lower slope	E/1	27	0535093	7217505	Y						
70751	JH01-8-1B	-	-	lower slope	E/1	27	0535093	7217505							
70752	JH01-8-2	-	-	lower slope	E/1	27	0535140	7217436	Y				Y		
70753	JH01-8-3A	-	-	lower slope	E/1	27	0535171	7217429							
70754	JH01-8-6A	-	-	lower slope	E/1	27	0535315	7217346							
70755	JH01-8-7A	-	-	lower slope	E/1	27	0535401	7217428		Y	Y				

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Lithology
70725	JH01-5-7B	-	-	Cbxted sst
70726	JH01-5-7C	-	-	Slate with spots
70727	JH01-6-1A	-	-	Clast supported Bx
70728	JH01-6-1B	-	-	Sulphides in Cl altn
70729	JH01-6-1C	-	-	Black sulphide clast
70730	JH01-6-1D	-	-	Clast of black sulphide in Bx
70731	JH01-6-1E	-	-	Mt crystals in Carb vein
70732	JH01-6-3A	-	-	Diorite at contact with Bx
70733	JH01-6-3B	-	-	Diorite 4 m from contact with Bx
70734	JH01-6-3C	-	-	Bx at diorite contact
70735	JH01-6-4A	-	-	Qz vein cutting Qz-Fs altered sst
70736	JH01-6-5A	-	-	Float of coarsely crystalline Carb vein cutting Bx
70737	JH01-6-5B	-	-	Float of coarsely crystalline Carb vein with pods of sulphide
70738	JH01-6-5C	-	-	Float of white Qz vein with blebs of sulphide, Tour?
70739	JH01-7-1A	-	-	Qz-Fs-Carb veins at contact between a large sst clast & Bx. Later Cpy, malachite & Ht in pods in the vein
70740	JH01-7-1B	-	-	Qz-Fs veins within a sst clast
70741	JH01-7-1C	-	-	Muscovite
70742	JH01-7-5A	-	-	Qz-Carb-Cl-Ht vein parallel to layering in black slate (boudinaged)
70743	JH01-7-6A	-	-	10 m thick Carb band - marker horizon
70744	JH01-7-11A	-	-	Carb vein cutting black slate
70745	JH01-7-11B	-	-	Carb vein with sulphides
70746	JH01-7-11C	-	-	Large crystals in Carb layers in slate
70747	JH01-7-12A	-	-	Carb vein in Carb Bx at contact between slate & overlying sst
70748	JH01-7-13A	-	-	2 m thick banded brown & white Fs-Qz-Bt layer in sst
70749	JH01-7-16	-	-	Banded rust & tan weathering Carb cut by Carb vlts
70750	JH01-8-1A	-	-	Qz-Fs-Cl-Musc vein cutting sst
70751	JH01-8-1B	-	-	Qz-Cl-Bt vein cutting sst
70752	JH01-8-2	-	-	Qz-Musc-malachite-Ht vein about 0.5 m thick cutting sst (2 pieces)
70753	JH01-8-3A	-	-	Ksp vein cutting sst
70754	JH01-8-6A	-	-	Sst with white spots & Fs-Qz-Cl veins
70755	JH01-8-7A	-	-	Carb matrix from Bx

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Location	NTS map sheet	Datum (NAD)	Easting	Northing	Thin Section	Isotopes				Fluid Inclusions	Geochron
										O	C	S	D		
70756	JH01-8-8A	-	-	lower slope	E/1	27	0535487	7217444	**Y**						
70757	JH01-8-8B	-	-	lower slope	E/1	27	0535487	7217444							
70758	JH01-8-8C	-	-	lower slope	E/1	27	0535487	7217444							
70759	JH01-8-11	-	-	lower slope	E/1	27	0535508	7217269							
70760	JH01-9-1B	-	-	lower slope	E/1	27	0534946	7217718							
70761	JH01-9-5A	-	-	middle slope	E/1	27	0535178	7217922	**Y**		**Y**				
70762	JH01-9-7A	-	-	middle slope	E/1	27	0535367	7218127		**Y**	**Y**				
70763	JH01-9-11A	-	-	upper slope	E/1	27	0535942	7218416				**Y**			
70764	JH01-9-11B	-	-	upper slope	E/1	27	0535942	7218416	**Y**						
70765	JH01-9-11C	-	-	upper slope	E/1	27	0535942	7218416							
70766	JH01-9-11D	-	-	upper slope	E/1	27	0535942	7218416	**Y**						
70767	JH01-9-11E	-	-	upper slope	E/1	27	0535942	7218416				**Y**			

JCU #	Sample # or Drill Hole	Depth (m)	Depth (feet)	Lithology
70756	JH01-8-8A	-	-	Phyllite with Mt
70757	JH01-8-8B	-	-	Bx from contact
70758	JH01-8-8C	-	-	Mt veinlet
70759	JH01-8-11	-	-	Qz vein float
70760	JH01-9-1B	-	-	Sst
70761	JH01-9-5A	-	-	Bt on foliation planes in slate (2 pieces)
70762	JH01-9-7A	-	-	Carb band
70763	JH01-9-11A	-	-	Sulphide vein at contact of Fs-Qz layer & Cbxted slate
70764	JH01-9-11B	-	-	Bx
70765	JH01-9-11C	-	-	Bx
70766	JH01-9-11D	-	-	Bx
70767	JH01-9-11E	-	-	Talus of mineralization

JCU #	Sample # or Drill Hole	Depth (m)	Location	NTS map sheet (106)	Datum (NAD)	Easting	Northing	Thin Section	Isotopes				Fluid Inclusions	Geochron
									O	C	S	D		
SLATS - FROSTY PROPERTY: DRILL CORE SAMPLES														
70768	STF95-1	4.90	Slats - F	E/1	27	0527784	7208640	**Y**						
70769	STF95-1	5.80	Slats - F	E/1	27	0527784	7208640							
70770	STF95-1	6.10	Slats - F	E/1	27	0527784	7208640							
70771	STF95-1	12.70	Slats - F	E/1	27	0527784	7208640		**Y**	**Y**				
70772	STF95-1	16.70	Slats - F	E/1	27	0527784	7208640	**Y**						
70773	STF95-1	18.20	Slats - F	E/1	27	0527784	7208640							
70774	STF95-1	20.30	Slats - F	E/1	27	0527784	7208640						**Y**	
70775	STF95-1	36.30	Slats - F	E/1	27	0527784	7208640							
70776	STF95-1	41.20	Slats - F	E/1	27	0527784	7208640							
70777	STF95-1	42.70	Slats - F	E/1	27	0527784	7208640							
70778	STF95-1	45.50	Slats - F	E/1	27	0527784	7208640		**Y**	**Y**				
70779	STF95-1	48.20	Slats - F	E/1	27	0527784	7208640		**Y**	**Y**				
70780	STF95-1	50.30	Slats - F	E/1	27	0527784	7208640							
70781	STF95-1	52.30	Slats - F	E/1	27	0527784	7208640							
70782	STF95-1	52.35	Slats - F	E/1	27	0527784	7208640							
70783	STF95-1	54.50	Slats - F	E/1	27	0527784	7208640	**Y**						
70784	STF95-1	62.50	Slats - F	E/1	27	0527784	7208640		**Y**	**Y**				
70785	STF95-1	67.70	Slats - F	E/1	27	0527784	7208640		**Y**	**Y**				
70786	STF95-1	70.90	Slats - F	E/1	27	0527784	7208640							
70787	STF95-1	78.10	Slats - F	E/1	27	0527784	7208640							
70788	STF95-1	79.10	Slats - F	E/1	27	0527784	7208640							
70789	STF95-1	90.70	Slats - F	E/1	27	0527784	7208640	**Y**						
70790	STF95-1	110.60	Slats - F	E/1	27	0527784	7208640		**Y**	**Y**				
70791	STF95-5	5.58	Slats - F	E/1	27	0527297	7208372							
70792	STF95-5	8.70	Slats - F	E/1	27	0527297	7208372							
70793	STF95-5	10.40	Slats - F	E/1	27	0527297	7208372	**Y**						
70794	STF95-5	20.20	Slats - F	E/1	27	0527297	7208372							
70795	STF95-5	22.40	Slats - F	E/1	27	0527297	7208372							

JCU #	Sample # or Drill Hole	Depth (m)	Lithology
70768	STF95-1	4.90	Qz-Ab-Carb-Cpy vein cutting K-altered laminated sediments
70769	STF95-1	5.80	Red haloes around Cpy blebs
70770	STF95-1	6.10	XC veins & K-altered sediments
70771	STF95-1	12.70	Qz-Ab-Carb vein cutting K-altered sediments
70772	STF95-1	16.70	CG K-altered layer in sediments
70773	STF95-1	18.20	Fault Bx
70774	STF95-1	20.30	Purple Ft in vein
70775	STF95-1	36.30	FG dark purple sediments with grey blebs xcut by Qz-Ab-Carb-Cpy vein
70776	STF95-1	41.20	Bx at contact with sediments
70777	STF95-1	42.70	Bx with clast of Qz vein with Ht needles
70778	STF95-1	45.50	Carb-Qz vein cutting Bx clasts & matrix
70779	STF95-1	48.20	Clast in Bx with Qz-Ab-Carb vein
70780	STF95-1	50.30	Bxtion process
70781	STF95-1	52.30	Bx with Carb replacing/forming matrix
70782	STF95-1	52.35	Py fracture XC Bx & Qz-Carb matrix
70783	STF95-1	54.50	Wispy grey clasts in Bx
70784	STF95-1	62.50	Bx with chloritic matrix cut by Qz-Ab-Carb-Ht vein
70785	STF95-1	67.70	Phyllite xcut by Qz-Ab-Carb veins & blebs
70786	STF95-1	70.90	Phyllite/Sst xcut by Carb-Qz veins
70787	STF95-1	78.10	Py vein XC Bx
70788	STF95-1	79.10	Bx with abundant Carb-Qz in matrix, xcut by Py vein
70789	STF95-1	90.70	Red stained Bx
70790	STF95-1	110.60	Ser-altered phyllite xcut by Qz-Carb-Ab-Ht veins
70791	STF95-5	5.58	Bx
70792	STF95-5	8.70	Early clasts
70793	STF95-5	10.40	Carb replaced K-altered clasts
70794	STF95-5	20.20	Black mineral
70795	STF95-5	22.40	Ht clast in Bx

JCU #	Sample # or Drill Hole	Depth (m)	Location	NTS map sheet (106)	Datum (NAD)	Easting	Northing	Thin Section	Isotopes				Fluid Inclusions	Geochron
									O	C	S	D		
70796	STF95-5	60.65	Slats - F	E/1	27	0527297	7208372		Y	Y				
70797	STF95-5	74.90	Slats - F	E/1	27	0527297	7208372	Y	Y	Y				
70798	STF95-5	80.30	Slats - F	E/1	27	0527297	7208372							
70799	STF95-5	94.00	Slats - F	E/1	27	0527297	7208372							
70800	STF95-5	104.90	Slats - F	E/1	27	0527297	7208372							
SLATS - FROSTY PROPERTY: OUTCROP SAMPLES														
70801	02JH-3-005 (2)	-	Slats - F	E/1	27	0527142	7208991	Y						
70802	02JH-3-007	-	Slats - F	E/1	27	0527223	7208996	Y						
70803	02JH-4-001A	-	Slats - F	E/1	27	0528457	7209628	Y			Y			
70804	02JH-4-001B	-	Slats - F	E/1	27	0528457	7209628		Y	Y				
70805	02JH-4-001C	-	Slats - F	E/1	27	0528457	7209628	Y						
70806	02JH-4-001D	-	Slats - F	E/1	27	0528457	7209628							
70807	02JH-4-001E	-	Slats - F	E/1	27	0528457	7209628							
70808	02JH-4-001F	-	Slats - F	E/1	27	0528457	7209628							
70809	02JH-4-001G	-	Slats - F	E/1	27	0528457	7209628		Y	Y				
70810	02JH-4-001extra	-	Slats - F	E/1	27	0528457	7209628							
SLATS-WALLBANGER PROPERTY: DRILL CORE SAMPLES														
70811	STW95-1	5.75	Slats - W	D/16	27	0529502	7203323		Y	Y				
70812	STW95-1	9.60	Slats - W	D/16	27	0529502	7203323							
70813	STW95-1	11.10	Slats - W	D/16	27	0529502	7203323		Y	Y				
70814	STW95-1	12.30	Slats - W	D/16	27	0529502	7203323	Y						
70815	STW95-1	12.80	Slats - W	D/16	27	0529502	7203323							
70816	STW95-2	8.20	Slats - W	D/16	27	0529717	7203294							
70817	STW95-2	14.60	Slats - W	D/16	27	0529717	7203294		Y	Y	Y			
70818	STW95-2	15.94	Slats - W	D/16	27	0529717	7203294							
70819	STW95-2	16.64	Slats - W	D/16	27	0529717	7203294							
70820	STW95-2	19.55	Slats - W	D/16	27	0529717	7203294							
70821	STW95-2	23.16	Slats - W	D/16	27	0529717	7203294							
70822	STW95-2	25.50	Slats - W	D/16	27	0529717	7203294	Y			Y			
70823	STW95-2	33.90	Slats - W	D/16	27	0529717	7203294							

JCU #	Sample # or Drill Hole	Depth (m)	Lithology
70796	STF95-5	60.65	Ser replacing Ksp
70797	STF95-5	74.90	Bx with massive recrystallised Ht matrix xcut by Carb veins
70798	STF95-5	80.30	Ser Altn?
70799	STF95-5	94.00	Bx with Cl matrix
70800	STF95-5	104.90	Diorite
70801	02JH-3-005 (2)	-	Diorite (BPRI?)
70802	02JH-3-007	-	Massive specular Ht
70803	02JH-4-001A	-	Ht-Py-Qz fracture vein
70804	02JH-4-001B	-	Qz-Carb-Ht vein
70805	02JH-4-001C	-	Massive Mt-specular Ht
70806	02JH-4-001D	-	Bx ted phyllite
70807	02JH-4-001E	-	Phyllite
70808	02JH-4-001F	-	Ht-Qz-Cl veins/fractures
70809	02JH-4-001G	-	Carb
70810	02JH-4-001extra	-	CG crystalline Ht
70811	STW95-1	5.75	Carb-Qz-Cpy veins cut Bx
70812	STW95-1	9.60	Carb veins cutting Bx
70813	STW95-1	11.10	Bx with Carb matrix (Carb is replacing Ser)
70814	STW95-1	12.30	Bx
70815	STW95-1	12.80	Shale clasts with CG Ser
70816	STW95-2	8.20	Sediments
70817	STW95-2	14.60	Carb veins in sediments at Bx contacts
70818	STW95-2	15.94	Bx with Cl-Mt matrix, Qz-Ht veins, pink clasts replaced by white
70819	STW95-2	16.64	Ht-Cl-altered sediments?
70820	STW95-2	19.55	Cl-altered sediments
70821	STW95-2	23.16	CBx (white replacing red?)
70822	STW95-2	25.50	Bx (purple Ht & Ab-Qz-Cl-Cpy vein)
70823	STW95-2	33.90	Cl-altered sediments cut by Qz-Ab-Ht vein

JCU #	Sample # or Drill Hole	Depth (m)	Location	NTS map sheet (106)	Datum (NAD)	Easting	Northing	Thin Section	Isotopes				Fluid Inclusions	Geochron
									O	C	S	D		
70824	STW95-2	40.95	Slats - W	D/16	27	0529717	7203294							
70825	STW95-2	44.30	Slats - W	D/16	27	0529717	7203294	Y						
70826	STW95-2	45.30	Slats - W	D/16	27	0529717	7203294							
70827	STW95-2	67.10	Slats - W	D/16	27	0529717	7203294							
70828	STW95-2	103.00	Slats - W	D/16	27	0529717	7203294							
70829	STW95-2	110.90	Slats - W	D/16	27	0529717	7203294							
70830	STW95-2	114.00	Slats - W	D/16	27	0529717	7203294							
70831	STW95-3	7.40	Slats - W	D/16	27	0529501	7203259	Y						
70832	STW95-3	5.20	Slats - W	D/16	27	0529501	7203259		Y	Y				
70833	STW95-3	18.10	Slats - W	D/16	27	0529501	7203259							
70834	STW95-3	20.25	Slats - W	D/16	27	0529501	7203259							
70835	STW95-3	38.50	Slats - W	D/16	27	0529501	7203259							
70836	STW95-3	41.10	Slats - W	D/16	27	0529501	7203259				Y			
70837	STW95-3	72.50	Slats - W	D/16	27	0529501	7203259	Y	Y	Y				
70838	STW95-3	74.40	Slats - W	D/16	27	0529501	7203259							
70839	STW95-3	100.20	Slats - W	D/16	27	0529501	7203259							
70840	STW95-3	118.70	Slats - W	D/16	27	0529501	7203259							
70841	STW95-3	132.20	Slats - W	D/16	27	0529501	7203259							
70842	STW95-3	144.20	Slats - W	D/16	27	0529501	7203259							
70843	STW95-3	154.85	Slats - W	D/16	27	0529501	7203259							
70844	STW95-3	168.20	Slats - W	D/16	27	0529501	7203259							
SLATS-WALLBANGER PROPERTY: OUTCROP SAMPLES														
70845	02JH-4-002		Slats - W	D/16	27	0529941	7202007		Y	Y				
70846	02JH-4-003	-	Slats - W	D/16	27	0529888	7202133		Y	Y				
70847	02JH-4-004	-	Slats - W	D/16	27	0529883	7202313		Y	Y				
70848	02JH-4-006	-	Slats - W	D/16	27	0529877	7202644	Y						
70849	02JH-4-011	-	Slats - W	D/16	27	0529567	7203452							
70850	02JH-5-001	-	Slats - W	D/16	27	0529441	7203224		Y	Y				
70851	02JH-5-002	-	Slats - W	D/16	27	0529360	7203312		Y	Y				
70852	02JH-5-005A	-	Slats - W	D/16	27	0528793	7204105							

JCU #	Sample # or Drill Hole	Depth (m)	Lithology
70824	STW95-2	40.95	Banded sediments with white porphyroblasts & XC Qz-Ab vein
70825	STW95-2	44.30	Bx - red Ht outlining lams in sediments
70826	STW95-2	45.30	Meta sandstone - meta?tuff contact
70827	STW95-2	67.10	Volcanic or diorite
70828	STW95-2	103.00	Ab??
70829	STW95-2	110.90	Dark purple xcut by Qz-earthy Ht-Py vein with bleached selvage
70830	STW95-2	114.00	Tuff?
70831	STW95-3	7.40	Fault Bx contact with FG sediments
70832	STW95-3	5.20	XC Carb s in fault Bx
70833	STW95-3	18.10	Pink blebs
70834	STW95-3	20.25	Purple fault Bx
70835	STW95-3	38.50	Sediments with Ab Altn xcut by Ab-Qz vein
70836	STW95-3	41.10	Py veins in fault Bx
70837	STW95-3	72.50	Ab-altered Bx ted shale xcut by Ab-Qz that is xcut by Carb-Qz vein
70838	STW95-3	74.40	Bx ted shale with Cl matrix
70839	STW95-3	100.20	Diorite
70840	STW95-3	118.70	Fault Bx with Cl matrix & H stained Clasts
70841	STW95-3	132.20	Cl matrix Bx with red clasts & Bt repl Cl
70842	STW95-3	144.20	Diorite
70843	STW95-3	154.85	Intense red & Ht & silicification
70844	STW95-3	168.20	Cl matrix Bx
70845	02JH-4-002		GLG dolostone - regional sample
70846	02JH-4-003	-	Bx ted dolomite
70847	02JH-4-004	-	GLG dolostone - regional sample
70848	02JH-4-006	-	Diorite?
70849	02JH-4-011	-	Bx
70850	02JH-5-001	-	Diorite cut by brown-weathering Carb-white Qz vein
70851	02JH-5-002	-	Black shale cut by brown-weathering Carb vein
70852	02JH-5-005A	-	Grey Bx - hard to see clasts on fresh surface

JCU #	Sample # or Drill Hole	Depth (m)	Location	NTS map sheet (106)	Datum (NAD)	Easting	Northing	Thin Section	Isotopes				Fluid Inclusions	Geochron
									O	C	S	D		
70853	02JH-5-005B	-	Slats - W	D/16	27	0528793	7204105		Y	Y				
70854	02JH-5-006	-	Slats - W	D/16	27	0528782	7204050							
70855	02JH-6-001	-	Slats - W	D/16	27	0529591	7202664		Y	Y				
70856	02JH-6-003	-	Slats - W	D/16	27	0529852	7202526		Y	Y				
70857	02JH-6-004A	-	Slats - W	D/16	27	0529877	7202526		Y	Y				
70858	02JH-6-004B	-	Slats - W	D/16	27	0529877	7202526							
70859	02JH-6-004C	-	Slats - W	D/16	27	0529877	7202526		Y	Y	Y			
70860	02JH-6-004D	-	Slats - W	D/16	27	0529877	7202526	Y						
70861	02DG-01	-	Slats - W	D/16	27	0528958	7203032		Y	Y				
70862	02DG-02	-	Slats - W	D/16	27	0528973	7203069		Y	Y				
IGOR PROPERTY: DRILL CORE SAMPLES														
70863	I80-010	44'	Igor	E/2	83	?0517492.72	?7213531.36							
70864	I80-010	43' 10"	Igor	E/2	83	?0517492.72	?7213531.36	Y						
70865	I80-010	45' 6"	Igor	E/2	83	?0517492.72	?7213531.36		Y	Y				
70866	I80-010	83'	Igor	E/2	83	?0517492.72	?7213531.36		Y	Y				
70867	I80-010	108' 2"	Igor	E/2	83	?0517492.72	?7213531.36							
70868	I80-010	113'	Igor	E/2	83	?0517492.72	?7213531.36		Y	Y				
70869	I80-010	115' 6"	Igor	E/2	83	?0517492.72	?7213531.36		Y	Y				
70870	I80-010	118' 6"	Igor	E/2	83	?0517492.72	?7213531.36							
70871	I80-010	129' 8"	Igor	E/2	83	?0517492.72	?7213531.36							
70872	I80-010	126'	Igor	E/2	83	?0517492.72	?7213531.36							
70873	I80-010	131'	Igor	E/2	83	?0517492.72	?7213531.36							
70874	I80-010	133' 6"	Igor	E/2	83	?0517492.72	?7213531.36							
70875	I80-010	141'	Igor	E/2	83	?0517492.72	?7213531.36							
70876	I80-010	143'	Igor	E/2	83	?0517492.72	?7213531.36	Y						
70877	I80-010	143' 4"	Igor	E/2	83	?0517492.72	?7213531.36							
70878	I80-010	144'	Igor	E/2	83	?0517492.72	?7213531.36							
70879	I80-010	144' 6"	Igor	E/2	83	?0517492.72	?7213531.36							
70880	I80-010	145'	Igor	E/2	83	?0517492.72	?7213531.36							
70881	I80-010	150'	Igor	E/2	83	?0517492.72	?7213531.36							

JCU #	Sample # or Drill Hole	Depth (m)	Lithology
70853	02JH-5-005B	-	Bx with Ht matrix cut by brown-weathering Carb-Qz veins
70854	02JH-5-006	-	K-altered sediments cut by Carb-Qz vein & Mt
70855	02JH-6-001	-	Bx ted dolomite
70856	02JH-6-003	-	Bx with Carb matrix
70857	02JH-6-004A	-	Massive Mt cut by brown Carb-Cpy-Bar vein
70858	02JH-6-004B	-	Massive Mt with disseminated Py, Ft, Cpy & Bor
70859	02JH-6-004C	-	Massive Mt cut by brown Carb-Py-Qz veins
70860	02JH-6-004D	-	Massive Mt cut by Qz-Cpy-Ft-brown weathering Carb veinlets & Ft veinlets
70861	02DG-01	-	Dolostone
70862	02DG-02	-	Dolostone
70863	I80-010	44'	Cambrian Bx ted dolostone xcut by cream Carb veins xcut by dark brown veinlets
70864	I80-010	43' 10"	Dolostone CBx ' d by Ht
70865	I80-010	45' 6"	CBx ' d dolostone xcut by Carb-Bar vein
70866	I80-010	83'	CBx ' d dolostone xcut by Carb-Bar vein
70867	I80-010	108' 2"	Bxted dolostone
70868	I80-010	113'	Bxted dolostone xcut by cream Carb-pink Carb vein
70869	I80-010	115' 6"	Bxted dolostone xcut by Carb-Cpy vein & xcut by Py-Cpy-Mt vein & Mt porphyroblasts
70870	I80-010	118' 6"	mineralisation xcut by pink Bar vein
70871	I80-010	129' 8"	Foliated CBx ' d dolostone + Mt porphyroblasts
70872	I80-010	126'	Dolostone Bx ' d by mineralisation
70873	I80-010	131'	Bx
70874	I80-010	133' 6"	Bx xcut by Bar vein
70875	I80-010	141'	Mt-Py-Cpy-Ht mineralisation
70876	I80-010	143'	Mt-Py-Cpy-Ht mineralisation
70877	I80-010	143' 4"	Mt-Py-Cpy-Ht mineralisation
70878	I80-010	144'	Mt-Py-Cpy-Ht mineralisation
70879	I80-010	144' 6"	Mt-Py-Cpy-Ht mineralisation
70880	I80-010	145'	Mt-Py-Cpy-Ht mineralisation
70881	I80-010	150'	Mt-Py-Cpy-Ht mineralisation

JCU #	Sample # or Drill Hole	Depth (m)	Location	NTS map sheet (106)	Datum (NAD)	Easting	Northing	Thin Section	Isotopes				Fluid Inclusions	Geochron
									O	C	S	D		
70882	I80-010	152.8'	Igor	E/2	83	?0517492.72	?7213531.36							
70883	I80-010	159'	Igor	E/2	83	?0517492.72	?7213531.36	Y						
70884	I80-010	161'	Igor	E/2	83	?0517492.72	?7213531.36							
70885	I80-010	173' 6"	Igor	E/2	83	?0517492.72	?7213531.36							
70886	I80-010	181'	Igor	E/2	83	?0517492.72	?7213531.36		Y	Y				
70887	I80-010	181' 8"	Igor	E/2	83	?0517492.72	?7213531.36							
70888	I80-010	182' 2"	Igor	E/2	83	?0517492.72	?7213531.36		Y	Y	Y			
70889	I80-010	194'	Igor	E/2	83	?0517492.72	?7213531.36							
70890	I80-010	208'	Igor	E/2	83	?0517492.72	?7213531.36		Y	Y				
70891	I80-010	210'	Igor	E/2	83	?0517492.72	?7213531.36		Y	Y				
70892	I80-010	216'	Igor	E/2	83	?0517492.72	?7213531.36		Y	Y	Y			
70893	I80-010	228'	Igor	E/2	83	?0517492.72	?7213531.36	Y						
70894	I80-010	263'	Igor	E/2	83	?0517492.72	?7213531.36							
70895	I80-010	264'	Igor	E/2	83	?0517492.72	?7213531.36							
70896	I80-010	291' 4"	Igor	E/2	83	?0517492.72	?7213531.36							
70897	I80-010	343' 6"	Igor	E/2	83	?0517492.72	?7213531.36							
70898	I80-014	21'	Igor	E/2	83	517387.03	7213898.96							
70899	I80-014	46'	Igor	E/2	83	517387.03	7213898.96		Y	Y				
70900	I80-014	30.5'	Igor	E/2	83	517387.03	7213898.96							
70901	I80-014	76'	Igor	E/2	83	517387.03	7213898.96							
70902	I80-014	95.5'	Igor	E/2	83	517387.03	7213898.96							
70903	I80-014	119.5'	Igor	E/2	83	517387.03	7213898.96							
70904	I80-014	150'	Igor	E/2	83	517387.03	7213898.96		Y	Y				
70905	I80-014	189'	Igor	E/2	83	517387.03	7213898.96							
70906	I80-014	234'	Igor	E/2	83	517387.03	7213898.96				Y			
70907	I80-014	236'	Igor	E/2	83	517387.03	7213898.96				Y			
70908	I80-014	291.5'	Igor	E/2	83	517387.03	7213898.96							
70909	I80-014	402.5'	Igor	E/2	83	517387.03	7213898.96		Y	Y				
70910	I80-014	441'	Igor	E/2	83	517387.03	7213898.96		Y	Y				
70911	I80-014	539.5'	Igor	E/2	83	517387.03	7213898.96				Y			

JCU #	Sample # or Drill Hole	Depth (m)	Lithology
70882	I80-010	152.8'	Mt-Py-Cpy-Ht mineralisation
70883	I80-010	159'	Mt-Py-Cpy-Ht mineralisation
70884	I80-010	161'	Mt-Py-Cpy-Ht mineralisation
70885	I80-010	173' 6"	Bx
70886	I80-010	181'	Dark matrix Bx xcut by Carb-pink Bar-Py-Cpy vein
70887	I80-010	181' 8"	Dark matrix Bx xcut by pink Bar veins
70888	I80-010	182' 2"	Dark matrix Bx xcut by pink Bar veins
70889	I80-010	194'	Dark matrix Bx xcut by cream Carb vein
70890	I80-010	208'	Semi-massive Mt xcut by Carb vein
70891	I80-010	210'	Dark matrix Bx xcut by Carb-Cpy vein
70892	I80-010	216'	Dark matrix Bx xcut by Carb-Cpy-Py vein
70893	I80-010	228'	Mt-Py-Cpy-Ht mineralisation
70894	I80-010	263'	Bx ted dolostone xcut by Ht + Ht clast
70895	I80-010	264'	Bx ted dolostone xcut/replaced by Ht
70896	I80-010	291' 4"	Red stained sediments
70897	I80-010	343' 6"	Ht-stained Bx
70898	I80-014	21'	Green matrix cutting pink clasts
70899	I80-014	46'	Carb porphyroblasts overprinting Bx
70900	I80-014	30.5'	Green matrix, pink clasts, overprinted by Py porphyroblasts, Carb porphyroblasts & Mt
70901	I80-014	76'	Euhedral Mt op Ht?
70902	I80-014	95.5'	Green Bxting pink Sst
70903	I80-014	119.5'	Bar vein XC green matrix Bx & euhedral Mt vein
70904	I80-014	150'	Chloritic Bx xcut by Carb vein
70905	I80-014	189'	Foliated Bx
70906	I80-014	234'	Qz-Cpy vein XC Bx
70907	I80-014	236'	Massive Py op Bx
70908	I80-014	291.5'	Euhedral Mt op fabric
70909	I80-014	402.5'	Carb-Qz-Cpy-Ht vein xcuts green matrix Bx & euhedral Mt
70910	I80-014	441'	Carb-Py-Bar vein xcuts green matrix Bx
70911	I80-014	539.5'	Pink Bar-Py vein

JCU #	Sample # or Drill Hole	Depth (m)	Location	NTS map sheet (106)	Datum (NAD)	Easting	Northing	Thin Section	Isotopes				Fluid Inclusions	Geochron
									O	C	S	D		
70912	I80-014	551.3'	Igor	E/2	83	517387.03	7213898.96							
70913	I80-014	546'	Igor	E/2	83	517387.03	7213898.96							
70914	I80-014	500'	Igor	E/2	83	517387.03	7213898.96	**Y**	**Y**	**Y**				
IGOR PROPERTY: OUTCROP SAMPLES														
70915	02JH-7-002	-	Igor	E/2	27	0516409	7211671							
70916	02JH-7-003A	-	Igor	E/2	27	0516608	7211637							
70917	02JH-7-003B	-	Igor	E/2	27	0516608	7211637							
70918	02JH-7-004A	-	Igor	E/2	27	0516740	7211724							
70919	02JH-7-004B	-	Igor	E/2	27	0516740	7211724							
70920	02JH-7-007A (2)	-	Igor	E/2	27	0517375	7212985							
	02JH-7-007B	-	Igor	E/2	27	0517375	7212985						**y - DG**	
	02JH-7-007C	-	Igor	E/2	27	0517375	7212985						**y - DG**	
	02JH-7-007D	-	Igor	E/2	27	0517375	7212985						**y - DG**	
	02JH-7-008	-	Igor	E/2	27	0517586	7213309						**y - DG**	
70921	02JH-8-002	-	Igor	E/2	83	0516705	7212896							
	02JH-8-003	-	Igor	E/2	83	0516638	7212994						**y - DG**	
70922	02JH-8-005A	-	Igor	E/2	83	0516615	7213076	**Y**						
	02JH-8-005B	-	Igor	E/2	83	0516615	7213076						**y - DG**	
70923	02JH-8-006A	-	Igor	E/2	83	0516715	7213092	**Y**						
70924	02JH-8-006B	-	Igor	E/2	83	0516715	7213092							
70925	02JH-8-007A	-	Igor	E/2	83	0516812	7213123							
	02JH-8-007B	-	Igor	E/2	83	0516812	7213123						**y - DG**	
	02JH-8-007C (2)	-	Igor	E/2	83	0516812	7213123						**y - DG**	
	02JH-8-009A	-	Igor	E/2	83	0516891	7213086						**y - DG**	
70926	02JH-8-009B	-	Igor	E/2	83	0516891	7213086							**Ar-Ar**
	02JH-8-009C (2)	-	Igor	E/2	83	0516891	7213086						**y - DG**	
70927	02JH-8-017	-	Igor	E/2	83	0516808	7213875							
	02JH-9-002	-	Igor	E/2	83	0517227	7213148						**y - DG**	
	02JH-9-005	-	Igor	E/2	83	0517162	7213290						**y - DG**	

JCU #	Sample # or Drill Hole	Depth (m)	Lithology
70912	I80-014	551.3'	Py
70913	I80-014	546'	Py
70914	I80-014	500'	Carb vein xcuts green matrix Bx + Mt + Py
70915	02JH-7-002	-	Cambrian Carb
70916	02JH-7-003A	-	Cambrian Carb cut by Carb veins
70917	02JH-7-003B	-	Cambrian Carb
70918	02JH-7-004A	-	Carb veins in Cambrian Carb close to contact with Iltyd
70919	02JH-7-004B	-	Vuggy Qz veins in Cambrian Carb
70920	02JH-7-007A (2)	-	Euhedral Mt in foliated Bx
	02JH-7-007B	-	Carb-Mt vein
	02JH-7-007C	-	Carb-Mt-Qz-Py vein
	02JH-7-007D	-	Carb-Mt-Qz-Py bleb in Bx
	02JH-7-008	-	Massive specular Ht + Mt + Cpy with Qz-Carb vein
70921	02JH-8-002	-	Conglomerate cut by Carb-Qz veins
	02JH-8-003	-	Qz matrix Bx
70922	02JH-8-005A	-	Cl-Ht Bx with Ser-altered clasts
	02JH-8-005B	-	Qz-Ht vein
70923	02JH-8-006A	-	Cl-Ht Bx with pink Fs-altered clasts & Ht in the matrix
70924	02JH-8-006B	-	Syn-Bx Fs-Ep vein
70925	02JH-8-007A	-	Similar Bx to 6A with inc Cl, dec Ksp, dec Ht
	02JH-8-007B	-	Syn-Bx Qz-Ht veins
	02JH-8-007C (2)	-	Syn-Bx Carb-Qz-Ht veins
	02JH-8-009A	-	Syn-Bx Qz-Carb-Ht-Ksp veins
70926	02JH-8-009B	-	Bx with Ser-Ksp-Ht
	02JH-8-009C (2)	-	Syn-Bx Qz-Carb-Ht-Cpy vein
70927	02JH-8-017	-	Ht Bx with pink Fs-altered clasts + others
	02JH-9-002	-	Qz-Ht vein XC sediments
	02JH-9-005	-	Bar-Carb-Py-Ser vein

JCU #	Sample # or Drill Hole	Depth (m)	Location	NTS map sheet (106)	Datum (NAD)	Easting	Northing	Thin Section	Isotopes				Fluid Inclusions	Geochron
									O	C	S	D		
70928	02JH-9-006A	-	Igor	E/2	83	0517136	7213308							
70929	02JH-9-006B	-	Igor	E/2	83	0517136	7213308							
70930	02JH-9-006C sulphides	-	Igor	E/2	83	0517136	7213308				**Y**			
70930	02JH-9-006C vein	-	Igor	E/2	83	0517136	7213308						**y - DG**	
	02JH-9-012 (2)	-	Igor	E/2	83	0517400	7214034						**y - DG**	**Re-Os**
	02JH-9-013 (2)	-	Igor	E/2	83	0517492	7214115						**y - DG**	
	02JH-9-016	-	Igor	E/2	83	0517815	7214109						**y - DG**	
	02JH-9-017	-	Igor	E/2	83	0517817	7214083						**y - DG**	
70931	02JH-10-001A	-	Igor	E/2	83	0517406	7213117							
	02JH-10-001B	-	Igor	E/2	83	0517406	7213117						**y - DG**	
70932	02JH-10-004	-	Igor	E/2	83	0517470	7212994							
	02JH-10-008	-	Igor	E/2	83	0517503	7213344						**y - DG**	
70933	02JH-10-011	-	Igor	E/2	83	0517587	7213739							
70934	02JH-10-012	-	Igor	E/2	83	0517566	7213743		**Y**	**Y**				
70935	02JH-10-015	-	Igor	E/2	83	0517539	7213861							
70936	02JH-10-016-1	-	Igor	E/2	83	0517497	7213833							
70937	02JH-10-016-2	-	Igor	E/2	83	0517497	7213833							
70938	02JH-10-016-3	-	Igor	E/2	83	0517497	7213833	**Y**						
70939	02JH-10-016-4	-	Igor	E/2	83	0517497	7213833							
	02JH-10-016-5	-	Igor	E/2	83	0517497	7213833						**y - DG**	
70940	02JH-10-016-6	-	Igor	E/2	83	0517497	7213833							
70941	02JH-10-017-1A	-	Igor	E/2	83	0517459	7213830				**Y**			
70942	02JH-10-017-1B	-	Igor	E/2	83	0517459	7213830						**Y**	
70943	02JH-10-018A	-	Igor	E/2	83	0517427	7213804							
70944	02JH-10-018B	-	Igor	E/2	83	0517427	7213804							
	02JH-10-018C	-	Igor	E/2	83	0517427	7213804						**y - DG**	
	02JH-10-020A	-	Igor	E/2	83	0517514	7213627						**y - DG**	
70945	02JH-10-020B	-	Igor	E/2	83	0517514	7213627							
70946	02JH-10-020C	-	Igor	E/2	83	0517514	7213627							
70947	02JH-10-021	-	Igor	E/2	83	0517493	7213551							

JCU #	Sample # or Drill Hole	Depth (m)	Lithology
70928	02JH-9-006A	-	Foliated Mt Bx
70929	02JH-9-006B	-	Foliated Mt Bx
70930	02JH-9-006C sulphides	-	Brown-weathering Carb-white Qz-Py pod
70930	02JH-9-006C vein	-	Brown-weathering Carb-white Qz-Py pod
	02JH-9-012 (2)	-	Massive Mt-Py-Ht-Cpy-Carb
	02JH-9-013 (2)	-	Massive Qz-Ht-Py cut by Qz-Cpy-Carb , Qz-Ht-Carb , Qz-Py-Carb veins
	02JH-9-016	-	Qz-Carb veins cutting sediments (away from mineralisation)
	02JH-9-017	-	Qz-Py vein (away from mineralisation)
70931	02JH-10-001A	-	Ser-Ksp-altered Bx
	02JH-10-001B	-	Carb-Ht-Qz-Cpy vein
70932	02JH-10-004	-	Quartzite
	02JH-10-008	-	Quartzite cut by Qz veins
70933	02JH-10-011	-	Foliated Mt Bx
70934	02JH-10-012	-	Dolostone
70935	02JH-10-015	-	Pink Bar
70936	02JH-10-016-1	-	Foliated Mt Bx
70937	02JH-10-016-2	-	Edge of massive Mt-Ht
70938	02JH-10-016-3	-	Middle of massive Mt-Ht
70939	02JH-10-016-4	-	Top edge of foliated Bx with euhedral Mt
	02JH-10-016-5	-	Carb-Qz vein
70940	02JH-10-016-6	-	Bx
70941	02JH-10-017-1A	-	Py Bx (massive Py-Ht-Cpy-Mt)
70942	02JH-10-017-1B	-	Ser-Cl-altered rock from edge of massive Py+
70943	02JH-10-018A	-	Bx
70944	02JH-10-018B	-	Bar vein
	02JH-10-018C	-	Carb-Qz-Bar-Py vein
	02JH-10-020A	-	Qz-Cpy vein in Bx
70945	02JH-10-020B	-	Carb vein
70946	02JH-10-020C	-	Cl-Ksp-Ht Bx
70947	02JH-10-021	-	Cl-Ht-brown Carb Bx

JCU #	Sample # or Drill Hole	Depth (m)	Location	NTS map sheet (106)	Datum (NAD)	Easting	Northing	Thin Section	Isotopes				Fluid Inclusions	Geochron
									O	C	S	D		
70948	02JH-11-002	-	Igor	E/2	83	0517782	7212074							
70949	02JH-11-003	-	Igor	E/2	83	0517808	7212094							
70950	02JH-11-006	-	Igor	E/2	83	0517528	7212487							
70951	02JH-12-001	-	Igor	E/2	83	0517196	7213545	**Y**				**Y**		**Ar-Ar**
70952	02JH-12-003	-	Igor	E/2	83	0517475	7214054							
70953	02JH-12-004	-	Igor	E/2	83	0517617	7213904							
70954	02JH-12-005	-	Igor	E/2	83	0517522	7213884				**Y**			
70955	02JH-12-006	-	Igor	E/2	83	0517390	7213811							
70956	02JH-12-009A	-	Igor	E/2	83	0517300	7213550							
70957	02JH-12-009B	-	Igor	E/2	83	0517300	7213550							
70958	02JH-12-009C	-	Igor	E/2	83	0517300	7213550		**Y**	**Y**				
70959	02JH-12-009D	-	Igor	E/2	83	0517300	7213550							
70960	02JH-12-009E	-	Igor	E/2	83	0517300	7213550							
70961	02JH-12-012A	-	Igor	E/2	83	0517367	7213631							
	02JH-12-012B	-	Igor	E/2	83	0517367	7213631						**y - DG**	
70962	02JH-12-013A	-	Igor	E/2	83	0517375	7213591							
70963	02JH-12-013B	-	Igor	E/2	83	0517375	7213591							
	02JH-12-013C	-	Igor	E/2	83	0517375	7213591						**y - DG**	
70964	02JH-12-013D	-	Igor	E/2	83	0517375	7213591				**Y**			
70965	02JH-12-014	-	Igor	E/2	83	0517353	7213515		**Y**	**Y**				
70966	02JH-12-015	-	Igor	E/2	83	0517390	7213454							
70967	02JH-12-018	-	Igor	E/2	83	0517495	7213582							
70968	C conglomerate	-	Igor	E/2	-	Float	-							
70969	C conglomerate	-	Igor	E/2	-	Float	-							
70970	C seds	-	Igor	E/2	-	Float	-							
70971	C conglomerate	-	Igor	E/2	-	Float	-							
70972	barite	-	Igor	E/2	-	Float	-				**Y**			
OLYMPIC PROPERTY: DRILL CORE SAMPLES														
70973	OY94-1	6.00	Olympic	C/13	27	0553768	7192316							
70974	OY94-1	21.30	Olympic	C/13	27	0553768	7192315	**Y**	**Y**	**Y**				

JCU #	Sample # or Drill Hole	Depth (m)	Lithology
70948	02JH-11-002	-	Iltyd silty dolomite
70949	02JH-11-003	-	Iltyd silty dolomite with "burrows"
70950	02JH-11-006	-	Dolostone with Cc Altn (labelled 005 by mistake)
70951	02JH-12-001	-	Bx with Musc
70952	02JH-12-003	-	Foliated Bx
70953	02JH-12-004	-	Ser-altered mylonitized Sst (oriented sample)
70954	02JH-12-005	-	Ksp-Cl-Carb-altered rock with Cpy-Ht-Carb veins (within foliated zone)
70955	02JH-12-006	-	Massive Ht with fabric
70956	02JH-12-009A	-	Bx 2 - sst clasts in Carb-Qz matrix
70957	02JH-12-009B	-	Bx with Carb matrix
70958	02JH-12-009C	-	Bx with dol clasts
70959	02JH-12-009D	-	Bx with abundant Carb in matrix
70960	02JH-12-009E	-	Bx 2 with intense Cl & Carb Altn
70961	02JH-12-012A	-	Bx 2 cut by pink Carb veins
	02JH-12-012B	-	Bx with large Bar vein
70962	02JH-12-013A	-	Massive Ht
70963	02JH-12-013B	-	Massive Ht + Py
	02JH-12-013C	-	Bar crystals within massive Ht-Mt
70964	02JH-12-013D	-	Cpy in Bar
70965	02JH-12-014	-	Bx replaced by Ht, Carb clasts
70966	02JH-12-015	-	Qz framework to massive Ht-Mt
70967	02JH-12-018	-	Bx
70968	C conglomerate	-	Conglomerate
70969	C conglomerate	-	Conglomerate
70970	C seds	-	Sediments
70971	C conglomerate	-	Conglomerate
70972	barite	-	Bar
70973	OY94-1	6.00	Bx
70974	OY94-1	21.30	Carb vein cutting Bx

JCU #	Sample # or Drill Hole	Depth (m)	Location	NTS map sheet (106)	Datum (NAD)	Easting	Northing	Thin Section	Isotopes				Fluid Inclusions	Geochron
									O	C	S	D		
70975	OY94-1	29.40	Olympic	C/13	27	0553768	7192315							
70976	OY94-1	60.20	Olympic	C/13	27	0553768	7192315							
70977	OY94-1	70.50	Olympic	C/13	27	0553768	7192315							
70978	OY94-1	71.60	Olympic	C/13	27	0553768	7192315							
70979	OY94-1	117.60	Olympic	C/13	27	0553768	7192315		Y	Y				
70980	OY94-1	139.10	Olympic	C/13	27	0553768	7192315							
70981	OY94-3	14.00	Olympic	C/13	27	0553502	7192334							
70982	OY94-3	16.70	Olympic	C/13	27	0553502	7192334	Y	Y	Y				
70983	OY94-3	19.50	Olympic	C/13	27	0553502	7192334							
70984	OY94-3	24.70	Olympic	C/13	27	0553502	7192334		Y	Y	Y		Y	
70985	OY94-3	25.60	Olympic	C/13	27	0553502	7192334		Y	Y				
70986	OY94-3	38.60	Olympic	C/13	27	0553502	7192334		Y	Y				
70987	OY94-3	37.90	Olympic	C/13	27	0553502	7192334							
70988	OY94-3	46.30	Olympic	C/13	27	0553502	7192334		Y	Y				
70989	OY94-3	46.60	Olympic	C/13	27	0553502	7192334							
70990	OY94-3	50.00	Olympic	C/13	27	0553502	7192334							
70991	OY94-3	63.50	Olympic	C/13	27	0553502	7192334		Y	Y	Y			
70992	OY94-3	11.90	Olympic	C/13	27	0553502	7192334							
70993	OY94-3	132.80	Olympic	C/13	27	0553502	7192334		Y	Y				
70994	OY94-3	142.30	Olympic	C/13	27	0553502	7192334	Y						
70995	OY94-3	155.90	Olympic	C/13	27	0553502	7192334							
70996	OY94-3	204.70	Olympic	C/13	27	0553502	7192334							
70997	OY94-4	13.00	Olympic	C/13	27	553066	7193609		Y	Y				
70998	OY94-4	21.90	Olympic	C/13	27	553066	7193609		Y	Y				
70999	OY94-4	27.70	Olympic	C/13	27	553066	7193609							
71000	OY94-4	33.80	Olympic	C/13	27	553066	7193609							
71001	OY94-4	36.40	Olympic	C/13	27	553066	7193609							
71002	OY94-4	38.90	Olympic	C/13	27	553066	7193609		Y	Y				
71003	OY94-4	53.70	Olympic	C/13	27	553066	7193609							
71004	OY94-4	55.00	Olympic	C/13	27	553066	7193609							

JCU #	Sample # or Drill Hole	Depth (m)	Lithology
70975	OY94-1	29.40	Qz-Fs-Cpy-Ht vein cutting Bx
70976	OY94-1	60.20	CG Qz-Fs vein
70977	OY94-1	70.50	Blebs of Qz replacing matrix xcut by white Qz-Fs veins
70978	OY94-1	71.60	Py porphyroblasts rimmed by Cpy
70979	OY94-1	117.60	Qz-Fs vein xcuts brown Carb veins
70980	OY94-1	139.10	XC veins
70981	OY94-3	14.00	Stylolites
70982	OY94-3	16.70	Carb-Qz vein xcuts stylolites
70983	OY94-3	19.50	Slc rock
70984	OY94-3	24.70	Carb-Qz-Cpy-Py vein
70985	OY94-3	25.60	Carb-Qz-Cpy-Py-Aspy vein
70986	OY94-3	38.60	Tan Carb-brown Carb-Qz vein
70987	OY94-3	37.90	Qz-Ht-Py-Cpy op Bx
70988	OY94-3	46.30	Pink Carb op Bx with Ht Altn
70989	OY94-3	46.60	Cpy in Bx
70990	OY94-3	50.00	Carb-Qz-vein
70991	OY94-3	63.50	Ht-Cpy-Qz vein overprints Bx & is xcut by tan Carb-white Carb vein
70992	OY94-3	11.90	White Carb-brown Carb-Cpy vein xcuts Bx
70993	OY94-3	132.80	Altn at edge of Carb-Qz-Cpy vein
70994	OY94-3	142.30	Bx
70995	OY94-3	155.90	CBx
70996	OY94-3	204.70	Pink zone
70997	OY94-4	13.00	XC veins
70998	OY94-4	21.90	Bx ted dolostone xcut by Carb-Qz-Fs veins
70999	OY94-4	27.70	Purple rock
71000	OY94-4	33.80	Bx + red clast
71001	OY94-4	36.40	Bx dyke
71002	OY94-4	38.90	Carb-Qz-Fs vein xcuts Bx
71003	OY94-4	53.70	Carb-Cpy vein with pink selvages
71004	OY94-4	55.00	Bx xcut by Carb vein & pink Altn

JCU	Sample #	Depth	Location	NTS map sheet (106)	Datum (NAD)	Easting	Northing	Thin Section	Isotopes				Fluid Inclusions	Geochron
#	or Drill Hole	(m)							O	C	S	D		
71005	OY94-4	67.60	Olympic	C/13	27	553066	7193609		**Y**	**Y**				
71006	OY94-4	75.20	Olympic	C/13	27	553066	7193609							
71007	OY94-4	89.00	Olympic	C/13	27	553066	7193609		**Y**	**Y**				
71008	OY94-4	99.80	Olympic	C/13	27	553066	7193609							
71009	OY94-4	112.20	Olympic	C/13	27	553066	7193609	**Y**						
71010	OY94-4	123.70	Olympic	C/13	27	553066	7193609							
OLYMPIC PROPERTY: OUTCROP SAMPLES														
71011	OLYMPIC	-	Olympic	C/13	-	Float	-		**Y**	**Y**				
71012	02JH-21-001	-	Olympic	C/13	83	0555311	7195674		**Y**	**Y**				
71013	02JH-21-002	-	Olympic	C/13	83	0555233	7195612							
71014	02JH-21-003	-	Olympic	C/13	83	0555196	7195542							
71015	02JH-21-004	-	Olympic	C/13	83	0555023	7195171		**Y**	**Y**				
71016	02JH-21-005	-	Olympic	C/13	83	0554971	7195103						**Y**	
71017	02JH-21-006	-	Olympic	C/13	83	0554937	7195055							
71018	547457	-	Olympic	C/13	83	0555322	7195801							
71019	float 1	-	Olympic	C/13	83	0555322	7195801	**Y**						
71020	float 2	-	Olympic	C/13	83	0555322	7195801							
71021	float 3	-	Olympic	C/13	83	0555322	7195801							
71022	float 4	-	Olympic	C/13	83	0555322	7195801							
71023	float 5	-	Olympic	C/13	83	0555322	7195801	**Y**						
71024	float 6	-	Olympic	C/13	83	0555322	7195801	**Y**						
71025	float 7	-	Olympic	C/13	83	0555322	7195801							
71026	float 8	-	Olympic	C/13	83	0555322	7195801							
71027	float 9	-	Olympic	C/13	83	0555322	7195801							
71028	02JH-22-001A	-	Olympic	C/13	83	0554832	7195344							
71029	02JH-22-001B	-	Olympic	C/13	83	0554832	7195344							
71030	02JH-22-002	-	Olympic	C/13	83	0554825	7195266							
71031	02JH-22-003A (2)	-	Olympic	C/13	83	0554542	7194914	**Y**						
71032	02JH-22-003B	-	Olympic	C/13	83	0554542	7194914		**Y**	**Y**				
71033	02JH-22-004A	-	Olympic	C/13	83	0554847	7195043				**Y**			

JCU #	Sample # or Drill Hole	Depth (m)	Lithology
71005	OY94-4	67.60	Bx xcut by Carb-Qz-Ht xcut by Carb-Qz veins
71006	OY94-4	75.20	Contact between purple sediments & bleached sediments
71007	OY94-4	89.00	Sediments xcut by Carb-Qz-Ht, xcut by Carb-Qz-Cpy vein
71008	OY94-4	99.80	Gritty sedimentary clasts
71009	OY94-4	112.20	Bx with CG sedimentary clast repl by Ht
71010	OY94-4	123.70	Sst
71011	OLYMPIC	-	Brown Carb vein that cross-cuts Bx
71012	02JH-21-001	-	GLG stromatolitic dolostone
71013	02JH-21-002	-	Bx
71014	02JH-21-003	-	Bx
71015	02JH-21-004	-	Bx ted dolostone
71016	02JH-21-005	-	Bx
71017	02JH-21-006	-	Bx ted dolostone
71018	547457	-	Mineralized sample
71019	float 1	-	Bx
71020	float 2	-	Bx
71021	float 3	-	Bx
71022	float 4	-	Bx
71023	float 5	-	Bx
71024	float 6	-	Bx
71025	float 7	-	Bx
71026	float 8	-	Bx
71027	float 9	-	Bx
71028	02JH-22-001A	-	Wernecke Bx with clast of CBx ted Sst
71029	02JH-22-001B	-	Carb-Qz vein cutting Sst
71030	02JH-22-002	-	Sst with CG SH+Py+Cpy
71031	02JH-22-003A (2)	-	Bx with anorthosite clasts
71032	02JH-22-003B	-	Bx with Bx ted dolostone clast
71033	02JH-22-004A	-	Diorite

JCU #	Sample # or Drill Hole	Depth (m)	Location	NTS map sheet (106)	Datum (NAD)	Easting	Northing	Thin Section	Isotopes				Fluid Inclusions	Geochron
									O	C	S	D		
71034	02JH-22-004B	-	Olympic	C/13	83	0554847	7195043	**Y**						
71035	02JH-22-004C	-	Olympic	C/13	83	0554847	7195043							
71036	02JH-22-004D	-	Olympic	C/13	83	0554847	7195043							
OUTCROP SAMPLES FROM OTHER LOCATIONS														
71037	DT02-9-2-1	-	Quartet Mt	E/11	83	0523962	7231873		**Y**	**Y**				
71038	DT92-51-1	-	Slats Ck	D/16	27	0527600	7205200		**Y**	**Y**				
71039	CW92-53-01	-	Bear River	D/16	27	0555200	7196050		**Y**	**Y**				
71038a	CW93-5-2	-	Olympic	D/16	27	0555200	7196050							

JCU #	Sample # or Drill Hole	Depth (m)	Lithology
71034	02JH-22-004B	-	Diorite
71035	02JH-22-004C	-	Diorite
71036	02JH-22-004D	-	Diorite
71037	DT02-9-2-1	-	Lower FLG Carb
71038	DT92-51-1	-	Carb
71039	CW92-53-01	-	Carb
71038a	CW93-5-2	-	Carb