

803889

GEOCHRONOLOGY AGE DETERMINATION SUBMISSION FORM

Project Number 700059
 Date March 12/92 Geochronologist J. K. Montensen
 Geologist R. V. Kirkham Division MR
 Isotope system: Rb-Sr K-Ar U-Pb Pb-Pb Sm-Nd
 Other _____ Minerals zircon
 Sample number KQ-91-59C Amount submitted ~70-80lbs?
 Country Canada Prov/Terr B.C. NTS 104 B/K
 Lats ~56° 32' Longs ~130° 14' UTM: Zone 9 East 427200m North 6267350
 Location North of Mitchell Glacier very close to sample collected by R. G. Anderson.
 Geological Unit Mount Dilworth Formation
 Geological Locality Mitchell-Sulphurets area
 Rock Type white-weathering, slightly maroon-grey ash tuff
 Rock Description: Setting with scattered lapilli and quartz
 Name _____ Grain size _____
 Texture _____
 Mineral composition _____

Age problem Would date Mount Dilworth Formation in this area. This ash tuff unit is identical to the one on Troy Ridge which R. G. Anderson sampled for zircons (1991) and sits on the welded tuff which R. G. Anderson (and D. Aldrick) has sampled for zircons at this locality.

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Project Number 700059
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 Geologist R. V. Kirkham Division MR

Isotope system: Rb-Sr K-Ar U-Pb Pb-Pb Sm-Nd
 Other _____ Minerals Zircon

Sample number KQ-91-80B (80C) Amount submitted ~70-80 lbs.?

Country Canada Prov/Terr B.C. NTS 104B/8

Lats 56° 27' 30" Longs 130° 4' 30" UTM: Zone 9
 East 433 North 6258020

Location North side of Knipple Glacier about 7km east of Brucejack Lake.

Geological Unit Hazelton Group ("Premier Porphyry")

Geological Locality Sulphurets region

Rock Type pink-to maroon-grey, flow-layered and brecciated

Rock Description: Setting plagioclase - K-spar ^(hornblende) porphyry
(extrusive flow unit)

Name _____ Grain size _____

Texture _____

Mineral composition _____

Age problem Would date extrusive Premier Porphyry and permit rigorous correlation with intrusive Premier Porphyry in the vicinity of the mineral deposits in the Sulphurets area to the west.

KQ-91-80C is somewhat less altered sample about 25m stratigraphically below 80B. KQ-91-80C is probably the best sample to attempt to date first.

TO
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Dr. J. K. Mortensen

FROM
DE

R. V. Kirkham

SUBJECT
OBJETU-Pb zircon samples collected in 1991

SECURITY - CLASSIFICATION - DE SÉCURITÉ

OUR FILE - N/RÉFÉRENCE

YOUR FILE - V/RÉFÉRENCE

DATE

March 13/92

Jim,

I will have thin sections made of all samples to check for zircons.

The samples that I think should be done first and will have the greatest impact are as follows:

- ① Sulphurets Area, B.C. - KQ-91-80B(80C) - extrusive Premier Porphyry
- ② Smithers Area, B.C. - ddh #72 - 1399' to 1448' (and related sandstone) - rhyolitic porphyry plug Glacier Gulch
- ③ " " " - KQ-91-38 (if it contains zircons) - Red tuff member top of Hazelton Group, Ashman Ridge
- ④ " " " - KQ-91-40(40B) - welded ash-flow tuff Telkwa Formation, Ashman Ridge
- ⑤ Chibougamau Area, Quebec - KQ-91-7(8) Clark Lake porphyry Cu-Mo deposit
- ⑥ Eastmain River Area, Quebec - SYA91-8 MacLeod Lake Cu-Mo deposit (or SYA91-6 or KQ-91-16A)

Regards,
Rod

cc W.D. Sinclair

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Isotope system: Rb-Sr K-Ar U-Pb Pb-Pb Sm-Nd

Other Minerals zircon

Sample number KQ-91-7 Amount submitted ~50/65?

Country Canada Prov/Terr Quebec NTS 32 G

Lats 49° 48' Longs 74° 20' UTM: Zone East North

Location North of Clark Lake (north Merrill Island), Chibougamau area.

Geological Unit 2.5m wide dyke
400m E of power line pole #54

Geological Locality Clark Lake porphyry Cu-Mo deposit

Rock Type pale altered ^{pyritic} quartz-feldspar-biotite porphyry

Rock Description: Setting _____

Name _____ Grain size _____

Texture _____

Mineral composition _____

Age problem This is probably an intermineral dyke. Therefore, a date on the dyke should date the porphyry deposit.

KQ-91-8 is a similar dyke to the west. Only one of the two dykes should be dated.

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Isotope system: Rb-Sr K-Ar U-Pb Pb-Pb Sm-Nd

Other Minerals zircon

Sample number KQ-91-8 Amount submitted ~50lbs?

Country Canada Prov/Terr Quebec NTS 326

Lats 49° 48' Longs 74° 20' UTM: Zone East North

Location Northwest of Clark Lake about 20m west of

Geological Unit powerline pole #49 and 7m east of pole #47
~ 0.7m wide dyke

Geological Locality Clark Lake porphyry Cu-Mo deposit

Rock Type quartz-feldspar-biotite porphyry

Rock Description: Setting dyke cuts meta-anorthosite
of the Doné Lake Complex

Name Grain size

Texture

Mineral composition

Age problem This dyke is probably related
to KQ-91-~~8~~7 dyke and is also probably
related to the Clark Lake porphyry
deposit.

Only one of the two dykes
should be dated

GEOCHRONOLOGY AGE DETERMINATION SUBMISSION FORM

Project Number 700059
 Date March 12/92 Geochronologist J. K. Mortensen
 Geologist R. V. Kirkham / W. D. Sinclair Division MR

Isotope system: Rb-Sr K-Ar U-Pb Pb-Pb Sm-Nd

Other Minerals Zircon

Sample number KQ-91-16A Amount submitted ~50/bs?

Country Canada Prov/Terr Quebec NTS 33A/3

Lats 52° 13' 12" Longs 73° 2' 28" UTM: Zone 18
 East 633800m North 5787075m

Location West side of McLeod Lake at Rocky Point showing Eastmain River

Geological Unit deformed granodiorite stock

Geological Locality west end of Eastmain River greenstone belt

Rock Type lineated and foliated

Rock Description: Setting near McLeod Lake Cu-Mo deposit

Name Grain size

Texture

Mineral composition

Age problem This sample is from same body as W.D. Sinclair's samples #SYA91-6 and #SYA91-8. It was collected about 20m west of #SYA91-6. Only one of the 3 samples should be dated. The date on the intrusion can only be inferred to be the age of the deposit based on the close spatial association. #SYA91-8 (diamond-drill core) is probably the best sample to date because of the close spatial association with the main Cu-Mo deposit.

GEOCHRONOLOGY AGE DETERMINATION SUBMISSION FORM

Project Number 700059
 Date March 12/92 Geochronologist J. K. Mortensen
 Geologist R. V. Kirkham Division MR
 Isotope system: Rb-Sr K-Ar U-Pb Pb-Pb Sm-Nd
 Other biotite? Minerals zircon
 Sample number KQ-91-37 Amount submitted ~100lbs?
 Country Canada Prov/Terr B.C. NTS 93L/13
 Lats 55° 52' Longs 127° 50' UTM: Zone _____
 East _____ North _____
 Location north end of Ashman Ridge
 Geological Unit _____
 Geological Locality north end of Ashman Ridge (Type: Section)
 Rock Type plagioclase - augite andesite, breccia (augite?)
 Rock Description: Setting volcanic unit above the Ashman Formation
 Name _____ Grain size _____
 Texture _____
 Mineral composition _____

Age problem Unit is probably too mafic to yield zircons (will check this section) but collected anyway because had to visit with helicopter at this locality for fog to lift.

If this unit can be dated it would bracket the ages of the Smithers and Ashman Formations. Although not documented yet at this locality, an unconformity might exist under this unit (more mapping is required).

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Isotope system: Rb-Sr K-Ar U-Pb Pb-Pb Sm-Nd

Other Minerals Zircon

Sample number KQ-91-38 Amount submitted

Country Canada Prov/Terr B.C. NTS 93L/13

Lats 55° 50' 30" Longs 127° 51' UTM: Zone
East North

Location Ashman Ridge (central part) (type section)

Geological Unit Top of Hazelton Group (Red tuff member)

Geological Locality type section

Rock Type air fall tuff?

Rock Description: Setting ~50-60cm thick bright pale green
rhyolitic? tuff? ^{bed} _{air} dark maroon tuff with abundant limy
concretion

Name Grain size

Texture

Mineral composition minor quartz eyes?

Age problem A date on this unit should date
the top of the Hazelton volcanic sequence in
this area. The Hazelton Group volcanic rocks
in this area ("Red tuff member") are overlain
by very fossiliferous dark sedimentary rocks of
the Smithers Formation.

KQ-91-39 is a small sample of the maroon tuff
above 3m above the pale green tuff? bed.

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Isotope system: Rb-Sr K-Ar U-Pb Pb-Pb Sm-Nd

Other Minerals Zircon

Sample number KQ-91-40 Amount submitted ~100/lbs?

Country Canada Prov/Terr B.C. NTS 93L/13

Lats 55° 50' Longs 127° 50' 30" UTM: Zone East North

Location Ashman Ridge (south end) (~150m E of KQ-892 a sample with confirmed zircon)

Geological Unit Telkwa Formation

Geological Locality type section

Rock Type rhyolitic welded tuff

Rock Description: Setting pale pink-grey rhyolitic

ash-flow tuff with ~3 to 5% small k-spar quartz phenocrysts

Name Grain size

Texture

Mineral composition

Age problem Should date the Telkwa Formation in this type section and permit accurate correlation with the Ski Hill Rhyolite on Hudson Bay Mountain to the east
KQ-91-40B is a small sample with abundant pale altered aligned and irregular fragments.

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Geologist R. V. Kirkham Division MR

Isotope system: Rb-Sr K-Ar U-Pb Pb-Pb Sm-Nd

Other Minerals zircon

Sample number KQ-91-59C Amount submitted ~70-80lbs?

Country Canada Prov/Terr B.C. NTS 104 B/g

Lats ~56° 32' Longs ~130° 14' UTM: Zone 9 East 427200m North 6267350

Location North of Mitchell Glacier very close to sample collected by R. G. Anderson.

Geological Unit Mount Dilworth Formation

Geological Locality Mitchell-Sulphurets area

Rock Type white-weathering, slightly maroon-grey ash tuff

Rock Description: Setting with scattered lapilli and quartz

Name Grain size

Texture

Mineral composition

Age problem Would date Mount Dilworth Formation in this area. This ash tuff unit is identical to the one on Troy Ridge which R. G. Anderson sampled for zircons (1991) and sits on the welded tuff which R. G. Anderson has (and D. Aldrick) has sampled for zircons at this locality.

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Isotope system: Rb-Sr K-Ar U-Pb Pb-Pb Sm-Nd

Other Minerals Zircon

Sample number KQ-91-80B (80C) Amount submitted ~70-80 lbs.?

Country Canada Prov/Terr B.C. NTS 104 B/B

Lats 56° 27' 30" Longs 130° 4' 30" UTM: Zone 9
 East 433 North 6258020

Location North side of Knipple Glacier about 7km east of Brucejack Lake.

Geological Unit Hazelton Group ("Premier Porphyry")

Geological Locality Sulphurets region

Rock Type pink-to maroon-grey, flow-layered and brecciated

Rock Description: Setting plagioclase - K-spar ^(hornblende) porphyry
(extrusive flow unit)

Name _____ Grain size _____

Texture _____

Mineral composition _____

Age problem Would date extrusive Premier Porphyry and permit rigorous correlation with intrusive Premier Porphyry in the vicinity of the mineral deposits in the Sulphurets area to the west.

KQ-91-80C is somewhat less altered sample about 25m stratigraphically below 80B. KQ-91-80C is probably the best sample to attempt to date first.

GEOCHRONOLOGY AGE DETERMINATION SUBMISSION FORM

Project Number 700059
 Date March 13/92 Geochronologist J. K. Mortensen
 Geologist R. V. Kirkham Division MR
 Isotope system: Rb-Sr K-Ar U-Pb Pb-Pb Sm-Nd
 Other _____ Minerals Zircon
 Sample number ddh #92-289-363 Amount submitted ~15lbs?
 Country Canada Prov/Terr B.C. NTS 93L/K4
 Lats 54° 49' 05" Longs 127° 17' 50" UTM: Zone _____
 East _____ North _____
 Location Hudson Bay Mountain
 Geological Unit Granodiorite Sheet
 Geological Locality Glacier Gulch Mo deposit
 Rock Type intensely hydrothermally altered, "blotchy"
 Rock Description: Setting pyritic (~2-5%) granodiorite

Name _____ Grain size _____
 Texture _____
 Mineral composition _____

Age problem Backup material to date this premineral highly altered intrusion. Related samples from underground dump material are KQ-89-2A and 2B. We should await results on these samples before proceeding with this sample.
*Return all unused material to RVK.

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Project Number 700059

Date March 12/92 Geochronologist J. K. Mortensen

Geologist R. V. Kirkham Division MR

Isotope system: Rb-Sr K-Ar U-Pb Pb-Pb Sm-Nd

Other Minerals Zircon

Sample number Glacier Gulch Amount submitted ~ 15-20 lbs?
ddh #72-

Country Canada Prov/Terr B.C. NTS 93 E L/14
1399' to 1448'

Lats 54°49'05" Longs 127°17'50" UTM: Zone 18
 East North

Location Hudson Bay Mountain

Geological Unit rhyolite porphyry intrusion

Geological Locality Glacier Gulch Mo deposit

Rock Type relatively unaltered, pale salmon pink,

Rock Description: Setting rhyolite porphyry with ~ 4-5% small

rounded quartz phenocrysts and 5-7% indistinct k-spar

Name phenocrysts Grain size

Texture aphitic to aphanitic matrix

Mineral composition

Age problem This rhyolite porphyry plug is in the
core of the porphyry Mo (W) deposit and was
probably the source of the ore fluids and
metals. It cuts the granodiorite sheet (sample
ddh #72-289-363') and is cut by monzonite
of the Hudson Bay Mountain stock (sample ddh #72-
2252-2348')

Related samples of rhyolite porphyry are ddh #72
1347-1383'; 1324'-1347' and 1876-1931' and 2082-2138').
 A date on this intrusion should date the deposit.
 *Return all excess sample material to R.V.K.

GEOCHRONOLOGY AGE DETERMINATION SUBMISSION FORM

Project Number 700059

Date March 12/92 Geochronologist J. K. Mortenson

Geologist R.V. Kirkham Division _____

Isotope system: Rb-Sr K-Ar U-Pb Pb-Pb Sm-Nd

Other biotite Minerals zircon, biotite

Sample number ddl#72 - Amount submitted ~15-20lbs?

Country Canada ^{2252 to 2348} Prov/Terr B.C. NTS 93L/114

Lats 54° 49' 05" Longs 127° 17' 50" UTM: Zone _____
East _____ North _____

Location Hudson Bay Mountain

Geological Unit Hudson Bay Mountain stock

Geological Locality Glacier Gulch Mo deposit

Rock Type porphyritic monzogranite

Rock Description: Setting This stock cuts the overlying rhyolite porphyre plug (samples ddl#72-1399-1448; 1347-1383; 1324-1347; 1876-1931; and 2082-2138)

Name _____ Grain size _____

Texture _____

Mineral composition _____

Age problem The Hudson Bay Mountain stock has only been observed in diamond-drill core. It has at least 2 or 3 distinct phases. This sample was collected to ensure that we have adequate material to complete this detailed dating study. Sample ddl#70-2471 to 2491 feet has yielded a K/Ar age on biotite of 64.2 ± 2.7 Ma. It is also from the Hudson Bay Mountain Stock.
*Return all excess material to R.V. Kirkham

GEOCHRONOLOGY AGE DETERMINATION SUBMISSION FORM

Project Number 770071/700059

Date 13 March 1992 Geochronologist J. K. Mortensen

Geologist W.D. Sinclair / R.V. Kirkham Division Mineral Resources

Isotope system: Rb-Sr K-Ar U-Pb Pb-Pb Sm-Nd

Other Minerals Zircon, monazite?

Sample number SYA91-6 Amount submitted 4-5 kg

Country Canada Prov/Terr Quebec NTS 33A3

Lats 52° 13' 12" N Longs 73° 02' 28" W UTM: Zone 18
East 633800 North 5787075

Location Macleod Lake Cu-Mo deposit, 92.5 km north of Lac Mistassini and 5 km northwest of the Eastmain River. Outcrop (Rocky Point)

Geological Unit

Geological Locality Northeastern Superior Province

Rock Type Granodiorite

Rock Description: Setting Granodiorite appears to have intruded a sequence of metasedimentary and metavolcanic rocks of presumed Precambrian age

Name Has no name? Grain size 2-3 mm

Texture Hypidiomorphic-granular; slightly foliated

Mineral composition Quartz (20-25%), plagioclase (35-40%), K-feldspar (25-30%), hornblende (20-25%), epidote (~1%); accessory minerals include titanite, zircon and monazite (?) - latter two mainly as inclusions (40-60µm) in hornblende.

Age problem All the rocks in the area are presumed to be Precambrian in age but are undated; however, there are diabase dykes that have been dated (regionally) at 1926 to 1960 Ma, and at 1100 Ma. Dating the granodiorite will provide constraints to the age of the metasedimentary and metavolcanic rocks; the age of the granodiorite will also provide an estimate of the age of the associated Macleod Lake porphyry (?) Cu-Mo deposit. Related samples are KQ91-16A and SYA91-8.

GEOCHRONOLOGY AGE DETERMINATION SUBMISSION FORM

Project Number 770071/700059

Date 13 March 1992 Geochronologist J.K. Mortensen

Geologist W.D. Sinclair / R.V. Kirkham Division Mineral Resources

Isotope system: Rb-Sr K-Ar U-Pb Pb-Pb Sm-Nd

Other Minerals Zircon, monazite (?)

Sample number SYA91-8 Amount submitted 3-4 kg

Country Canada Prov/Terr Quebec NTS 33A3

Lats 52°13'47" Longs 73°01'34" UTM: Zone 18
East 634800 North 5788200

Location Macleod Lake Cu-Mo deposit, 92.5 km north of Lac Mistassini and 5 km northwest of the Eastmain River. From drill core (drill #31 - 39 to 42m).

Geological Unit

Geological Locality Northeastern Superior Province

Rock Type Granodiorite

Rock Description: Setting Granodiorite appears to have intruded metasedimentary and metavolcanic rocks of presumed Precambrian age

Name no name? Grain size 2-3 mm

Texture Hypidiomorphic-granular; slightly foliated

Mineral composition Quartz (20-25%), plagioclase (35-40%), K-feldspar (25-30%), hornblende (20-25%), epidote (~1%); accessory minerals include titanite, zircon and monazite (?) - the latter two occur mainly as inclusions (40-60µm) in hornblende.

Age problem The granodiorite and associated metasedimentary and metavolcanic rocks are undated, although they are cut by diabase dykes dated at 1926-1960 Ma. Dating the granodiorite will provide additional constraints to the age of these rocks; it will also provide an estimate of the age of the associated Macleod Lake porphyry (?) Cu-Mo deposit.

Related samples are KQ 91-16A and SYA91-6