

APPENDIX B

Petrography

Petrographic descriptions of polished thin sections are summarized below. Table B1 lists the sample number, lithology and location. The description of each sample is accompanied by scanned images in plane light, cross-polarized light and autoradiograph. Images are accompanied by description of the minerals and textures observed. Table B2 lists the minerals, their commonly used symbols and formulae for minerals identified petrographically.

Table B1. List of samples selected for petrographic study.

Sample No.	Lithology	Location
PNA10-06A	Calc-Silicate Gneiss	Dyno Mine
PNA10-06B	Quartzo-Feldspathic Gneiss	Dyno Mine
PNA10-06C	Calc-Silicate Gneiss	Dyno Mine
PNA10-10	Calcite-Fluorite Marble	Cardiff Mine
PNA11-01A	Calcite Marble	Silver Crater Mine
PNA11-01C	Calc-Silicate Gneiss	Silver Crater Mine
PNA11-03A	Quartzo-Feldspathic Gneiss	Blue Rock Rare Earth Mine 2
PNA11-03C	Mafic Gneiss	Blue Rock Rare Earth Mine 2
PNA11-04	Calcite Marble	Richardson-Fission Mine
PNA11-05A	Calc-Silicate Gneiss	Halo Mine
PNA11-05C	Mafic Gneiss	Halo Mine
PNA11-06A	Pegmatitic Perthite	Halo Mine
PNA11-06B	Calc-Silicate Gneiss	Halo Mine
PNA11-08B	Calc-Silicate Gneiss	Cardiff mine
PNA11-09A	Layered Mafic Gneiss	Croft Mine
PNA11-09B	Mafic Gneiss	Croft Mine
PNA11-09C	Garnet-Sillimanite Metapelite	Croft Mine
PNA11-09D	Quartzo-Feldspathic Gneiss	Croft Mine
PNA11-09E	Mafic Gneiss	Croft Mine
PNA11-09F	Quartzo-feldspathic Gneiss	Croft Mine
PNA12-03C	Mafic Gneiss	Blue Rock Rare Earth Mine 2
PNA12-03D	Calc-Silicate Gneiss	Blue Rock Rare Earth Mine 2
PNA12-03E	Mafic Gneiss	Blue Rock Rare Earth Mine 2
PNA12-06A	Mafic Gneiss	Saranac Mine
PNA12-06C	Calc-Silicate Gneiss	Saranac Mine
PNA12-10B	Calc-Silicate Gneiss	Kenmac Chibougamou
PNA12-10D	Mafic Gneiss	Kenmac Chibougamou
PNA12-12C	Calc-Silicate Gneiss	Tripp (Nu-Age) Mine
PNA12-12D	Layered Mafic Gneiss	Tripp (Nu-Age) Mine
PNA12-12G	Calc-Silicate Gneiss	Tripp (Nu-Age) Mine

Table B2. Mineral group, mineral name, symbol (Kretz, 1983; Warr, 2021) and formula of minerals observed by petrographic study.

Mineral Group/Name	Symbol	Formula
Silicates		
Amphibole Group	Amp	
Gedrite	Ged	$(\text{Mg,Fe}^{+2})_5\text{Al}_2(\text{Si}_6\text{Al}_2)\text{O}_{22}(\text{OH})_2$
Hastingsite	Hs	$\text{NaCa}_2(\text{Fe}^{+2},\text{Mg})_4\text{Fe}^{+3}(\text{Si}_6\text{Al}_2)\text{O}_{22}(\text{OH})_2$
Hornblende	Hbl	$\text{Ca}_2(\text{Fe}^{+2},\text{Mg})_4\text{Al}(\text{Si}_7\text{Al})\text{O}_{22}(\text{OH},\text{F})_2$
Epidote Group	Ep	
Allanite	Aln	$(\text{Ce,Ca,Y})_2(\text{Al,Fe}^{+2},\text{Fe}^{+3})_3(\text{SiO}_4)_3(\text{OH})$
Epidote	Ep	$\text{Ca}_2(\text{Fe}^{+3},\text{Al})_3(\text{SiO}_4)_3(\text{OH})$
Feldspar Group		
Plagioclase Feldspar	Pl	$\text{NaAlSi}_3\text{O}_8 - \text{CaAl}_2\text{Si}_2\text{O}_8$
K-Feldspar	Kfs	KAlSi_3O_8
Garnet Group	Grt	
Spessartine*	Sps	$\text{Mn}_3^{+2}\text{Al}_2(\text{SiO}_4)_3$
Pyroxene Group	Px	
Diopside	Cpx/Dp	$\text{CaMgSi}_2\text{O}_6$
Enstatite**	Opx/En	$\text{Mg}_2\text{Si}_2\text{O}_6$
Quartz	Qtz	SiO_2
Scapolite group	Sep	
Marialite*	Mar	$\text{Na}_4\text{Al}_3\text{Si}_9\text{O}_{24}\text{Cl}$
Silvialite*	Svl	$(\text{Ca,Na})_4\text{Al}_6\text{Si}_6\text{O}_{24}(\text{CO}_3,\text{SO}_4)$
Sillimanite	Sil	Al_2SiO_5
Thorite	Thr	$(\text{Th,U})\text{SiO}_4$
Titanite	Ttn	CaTiSiO_5
Tourmaline Group	Tur	
Schorl**	Srl	$\text{NaFe}_3^{+2}\text{Al}_6(\text{BO}_3)\text{Si}_6\text{O}_{18}(\text{OH})_4$
Zircon	Zrn	ZrSiO_4
Phyllosilicates		
Biotite	Bt	$\text{K}(\text{Mg,Fe}^{+2})_3(\text{Al,Fe}^{+3})\text{Si}_3\text{O}_{10}(\text{OH},\text{F})_2$
Muscovite	Ms	$\text{KAl}_2(\text{AlSi}_3\text{O}_{10})(\text{F},\text{OH})_2$
Chlorite	Chl	$\text{Mg,Fe}_3(\text{Si,Al})_4\text{O}_{10}(\text{OH})_2 \cdot (\text{Mg,Fe})_3(\text{OH})_6$
Carbonates		
Calcite	Cal	CaCO_3
Dolomite	Dol	$\text{CaMg}(\text{CO}_3)_2$
Phosphates		
Fluorapatite	Fap	$\text{Ca}_5(\text{PO}_4)_3\text{F}$
Monazite	Mnz	$(\text{Ce,L a,Nd,Th})\text{PO}_4$
Sulphates		
Barite	Br t	BaSO_4

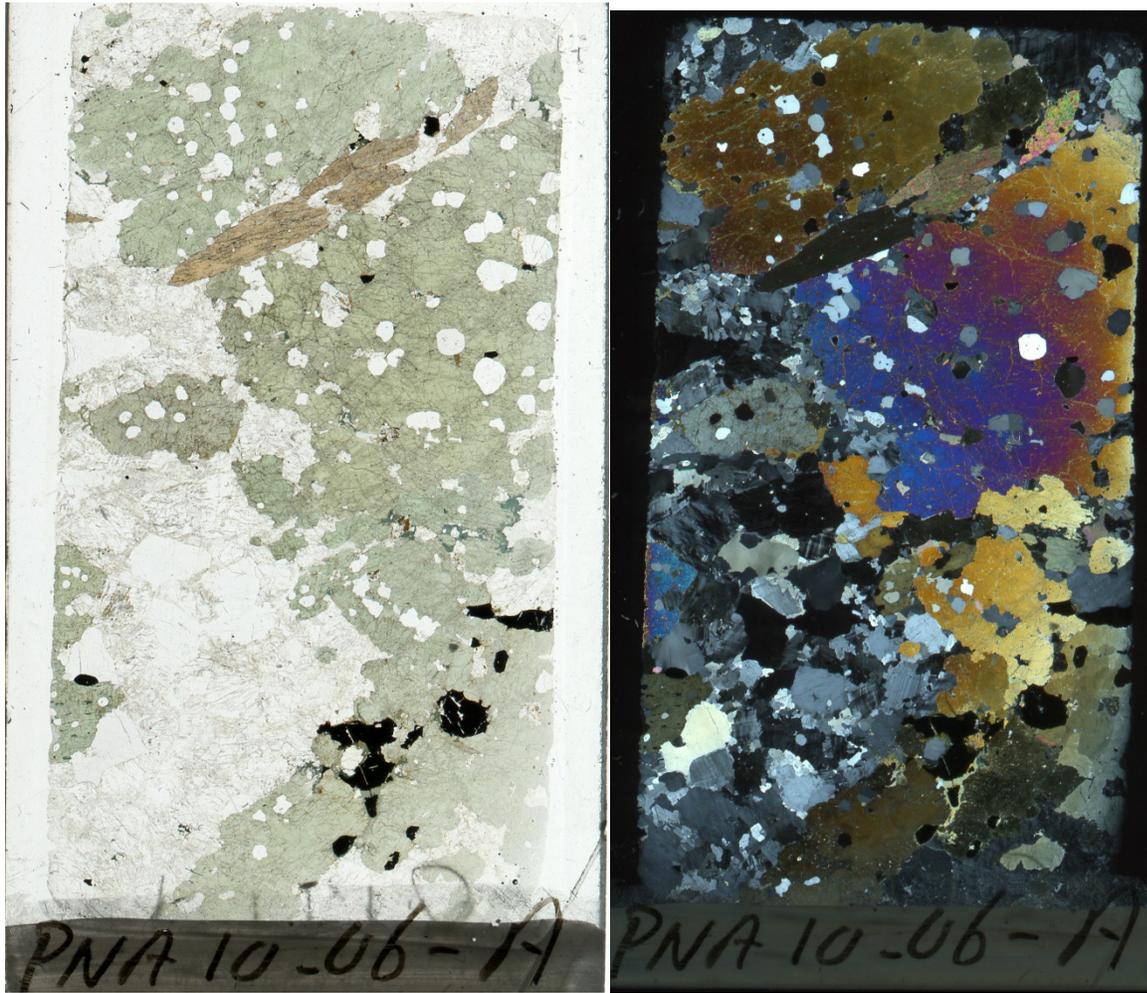
Table B2 continued

Mineral	Symbol	Formula
Sulphides		
Chalcopyrite	Ccp	CuFeS ₂
Galena	Gn	PbS
Pyrrhotite	Po	Fe _{1-x} S
Pyrite	Py	FeS ₂
Oxides		
Goethite	Gt	α -Fe ⁺³ O(OH)
Hematite	Hem	α -Fe ₂ O ₃
Ilmenite	Ilm	Fe ⁺² TiO ₃
Magnetite	Mag	Fe ⁺² Fe ₂ ⁺³ O ₄
Rutile	Rt	TiO ₂
Uraninite	Ur	UO ₂
Halides		
Fluorite	Fl	CaF ₂

*Best fit from XRD analyses

** Confirmed by SEM-EDS or EPMA analyses

PNA10-06A: Calc-Silicate Gneiss



Mineralogy:

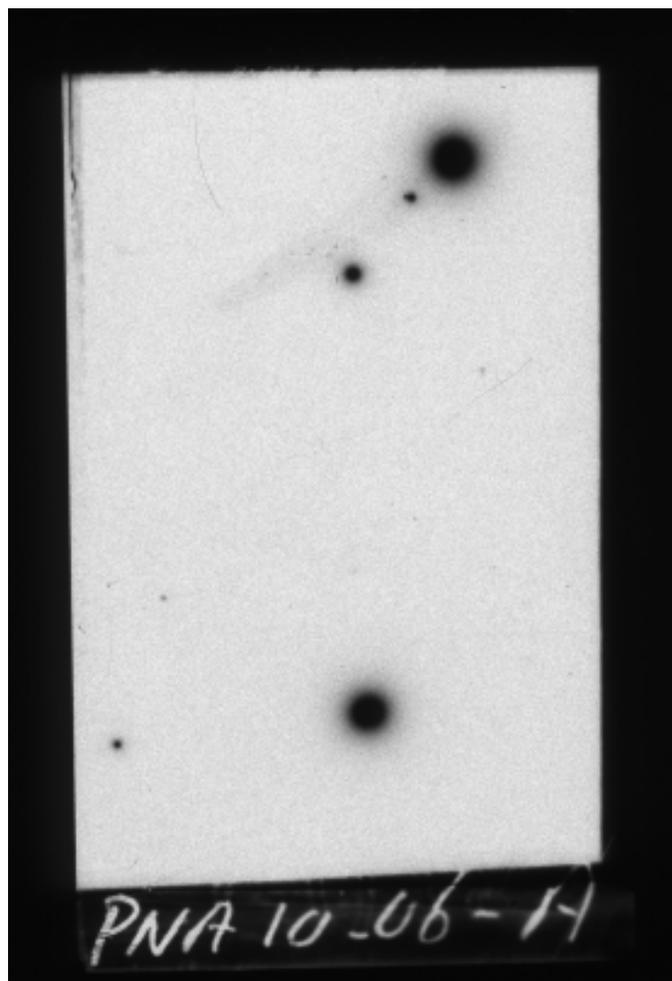
Quartz
Potassium Feldspar (Microcline)
Plagioclase
Clinopyroxene (Diopside)
Ca-Amphibole
Calcite
Accessory: Titanite, Apatite, Uraninite,
Pyrite, Pyrrhotite, Chalcopyrite

Mineralogy verified by SEM.

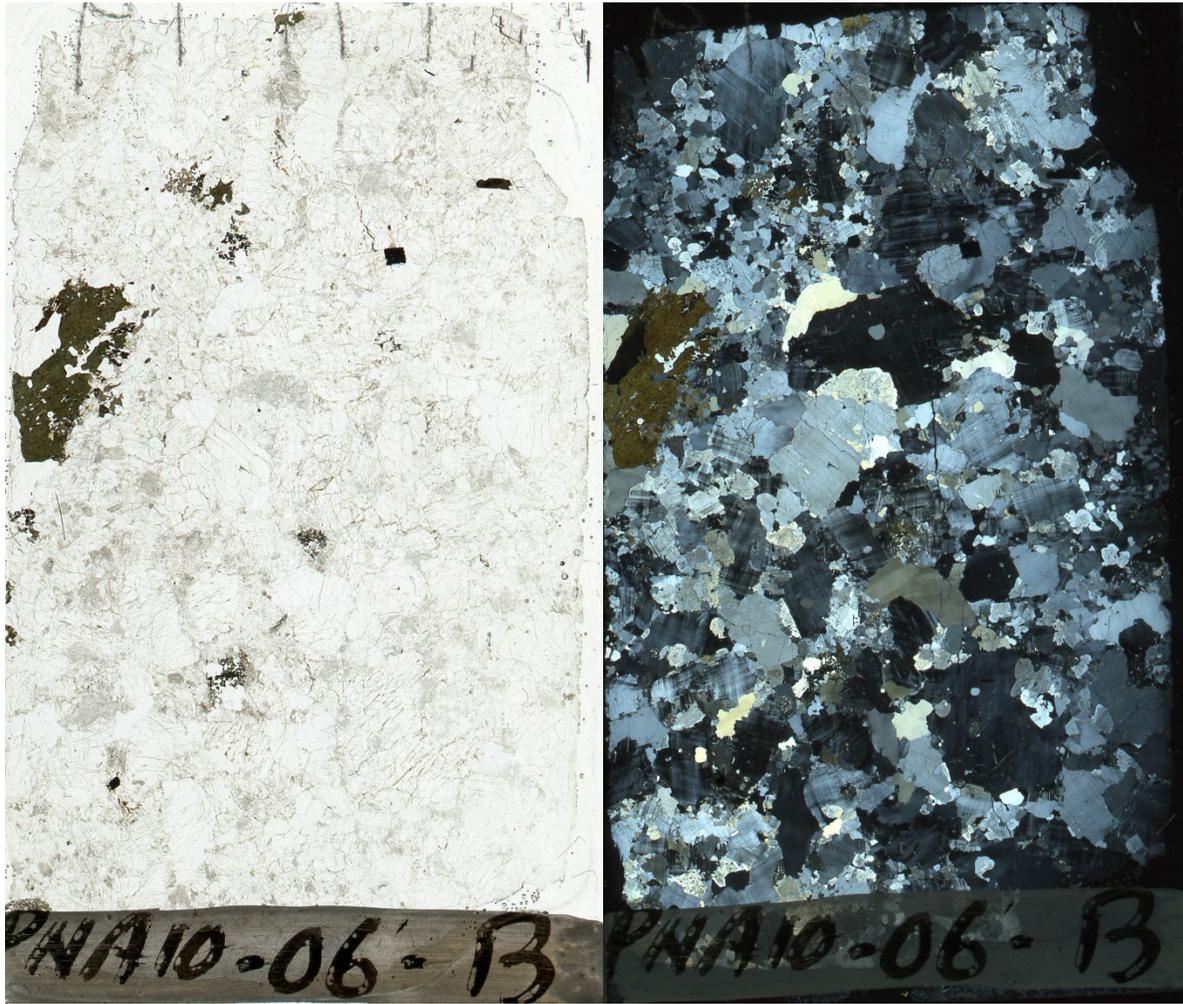
Petrography:

Poikiloblasts of diopside include quartz, titanite and plagioclase. Amphibole occurs as overgrowths on diopside, and is associated with late opaque minerals. Coarse-grained titanite is euhedral. Feldspars and quartz have consertal texture; the latter displays undulose extinction. Minor calcite is present.

Autoradiograph: Dark spots are uraninite.



PNA10-06B : Quartzo-Feldspathic Gneiss



Mineralogy:

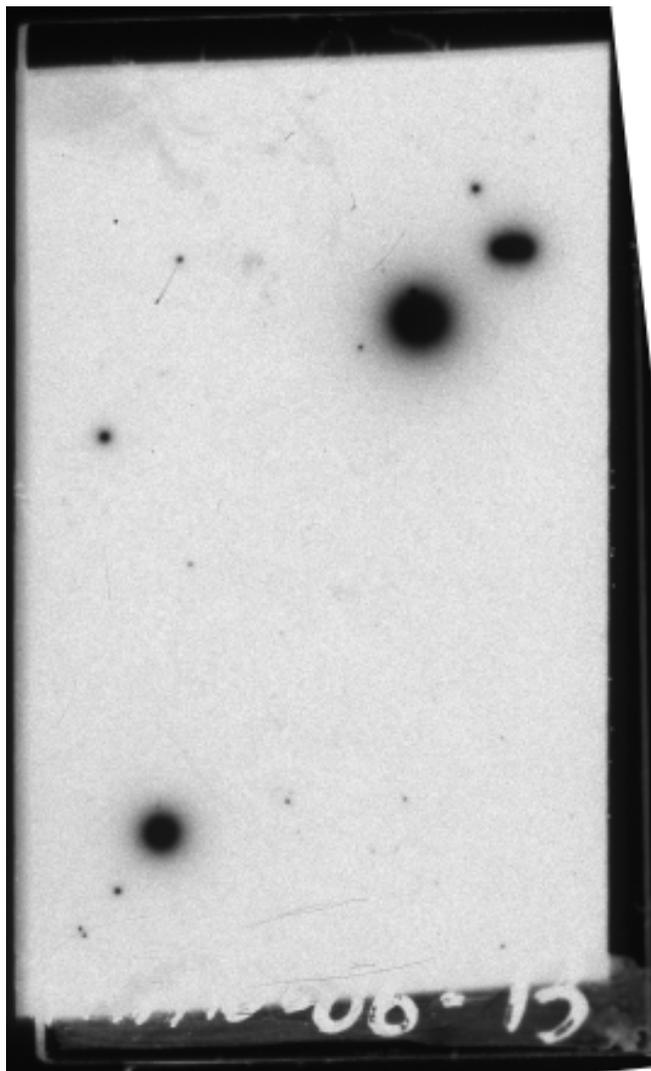
Quartz
Potassium Feldspar (Microcline)
Plagioclase
Amphibole (Gedrite)
Biotite
Accessory: Calcite, Titanite, Apatite,
Allanite, Monazite, Zircon, Tourmaline,
Uraninite, Galena, Thorite, Pyrite

Mineralogy verified by SEM.

Petrography:

Coarse-grained recrystallized, undulose quartz and feldspar have consertal texture; feldspar is moderately altered. There is no oriented fabric. Minor late tourmaline.

Autoradiograph: Dark spots are uraninite, thorite.



PNA10-06C: Quartzo-Feldspathic Gneiss



Mineralogy:

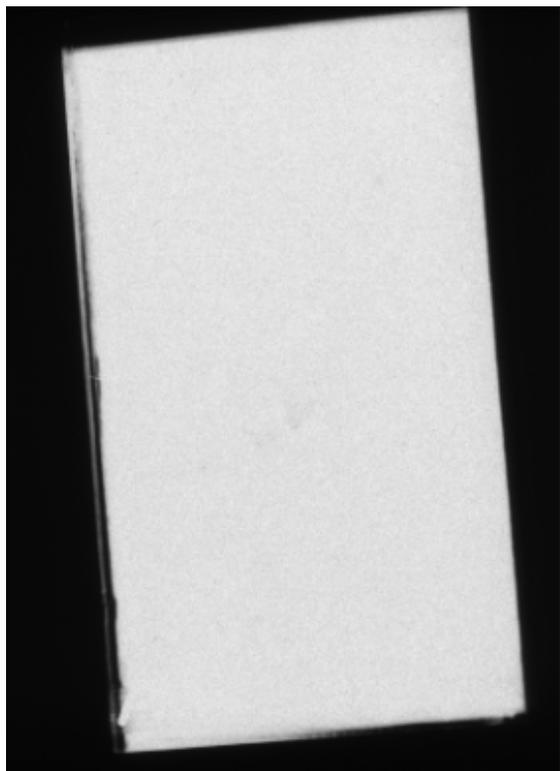
Quartz
Potassium Feldspar (Microcline)
Plagioclase
Biotite
Muscovite (trace)
Accessory: Calcite, Apatite, Zircon, Fe-Oxide

Mineralogy verified by SEM.

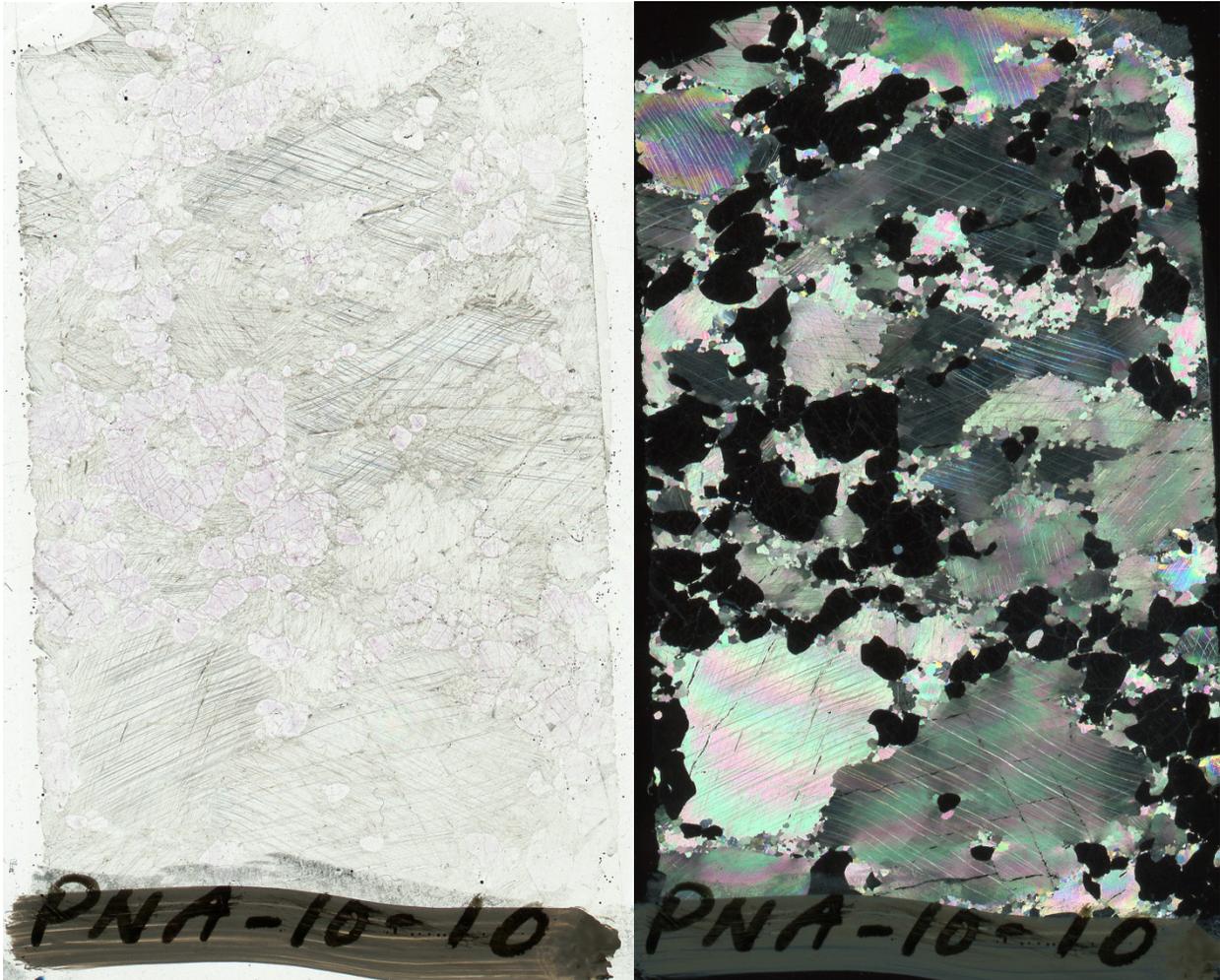
Petrography:

Granoblastic with no apparent fabric. Biotite (with minor retrograde chlorite) and Fe-oxide lenses occur in layers of quartz and feldspar. Coarse-grained biotite is included in plagioclase cores, surrounded by potassium feldspar.

Autoradiograph: No detectable radioactivity.



PNA10-10: Calcite Fluorite Marble



Mineralogy:

Calcite
Fluorite

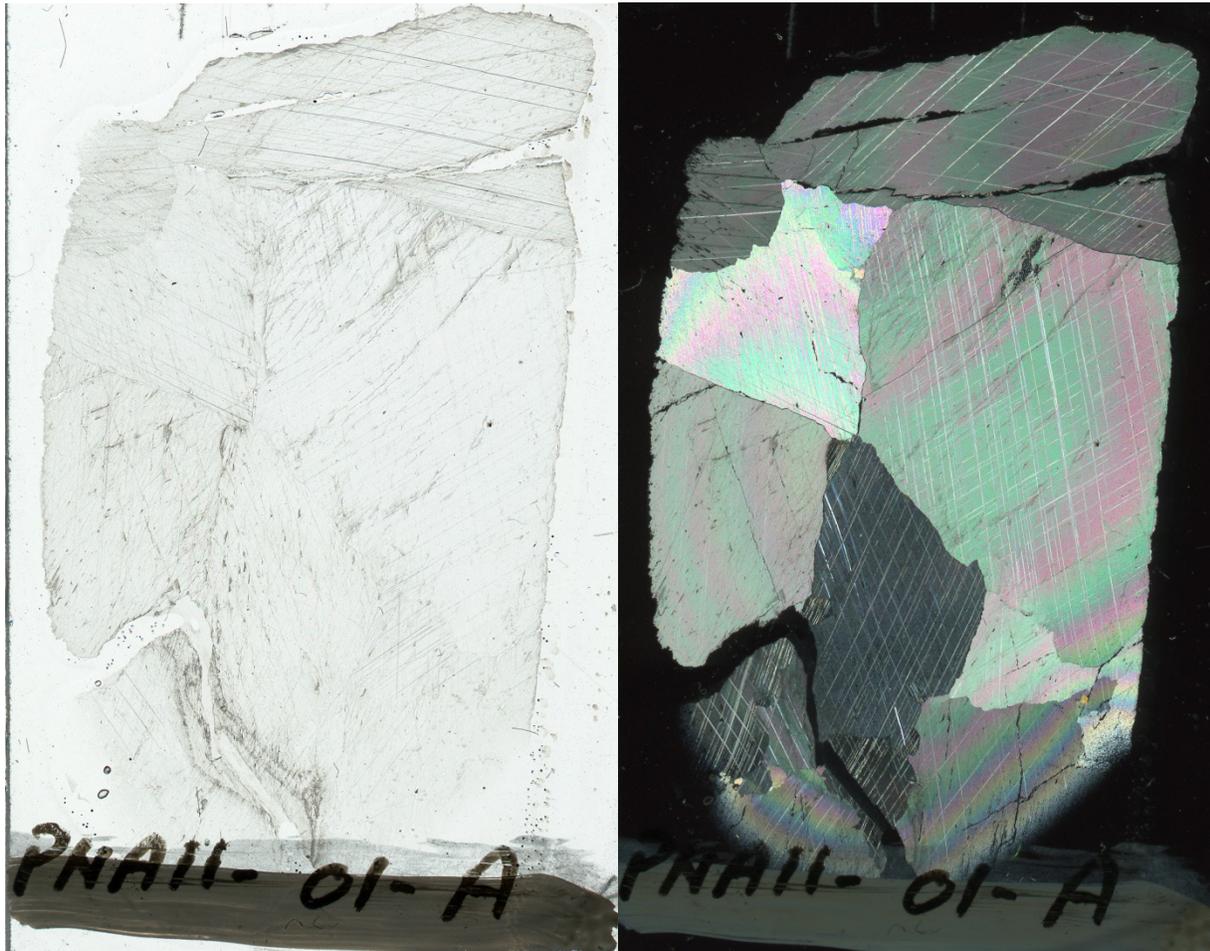
Petrography:

Coarse-grained anhedral calcite with finer-grained calcite at sutured grain edges.
Abundant, coarse-grained, subhedral to anhedral faintly-purple fluorite.

Autoradiograph: No detectable radioactivity.



PNA11-01A Calcite Marble



Mineralogy:

Calcite
Fluorite
Clinopyroxene (Diopside)

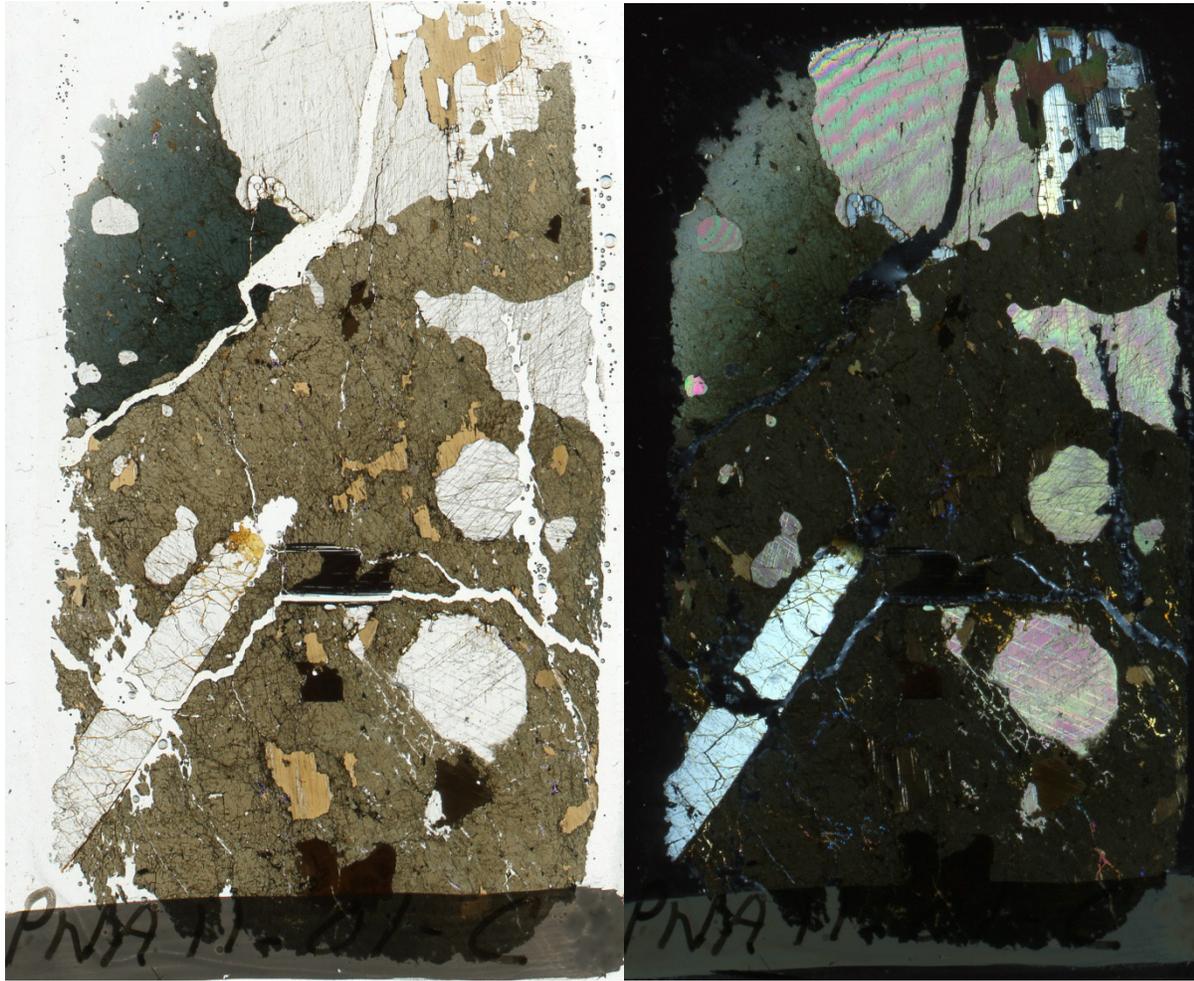
Petrography:

Very coarse-grained, recrystallized calcite is well-equilibrated with straight edges. There is a trace amount of fracture-filling pale purple fluorite and one grain of clinopyroxene.

Autoradiograph: No detectable radioactivity.



PNA11-01C Calc-Silicate Gneiss



Mineralogy:

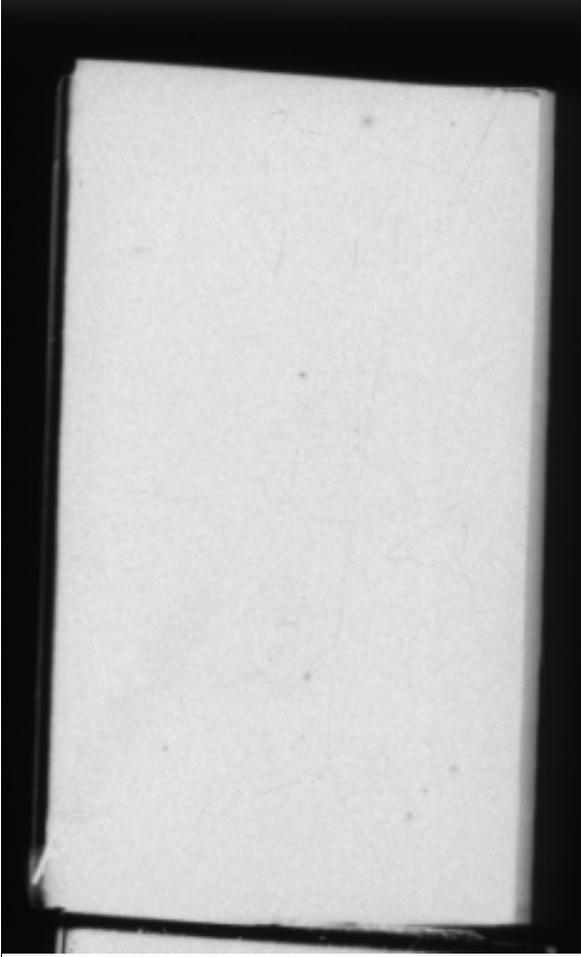
Calcite
Ca-Amphibole (Hastingsite)
Plagioclase
Biotite
Apatite
Accessory: Fluorite, Ilmenite, Pyrite

Amphibole chemistry verified by EPMA

Petrography:

Coarse-grained blue-green-brown pleochroic amphibole (hastingsite) contains coarse inclusions of calcite, subhedral apatite, biotite and ilmenite; pyrite is included in biotite. Late fluorite infills fractures and vugs.

Autoradiograph: Faint spots indicate possible radioactive grains.



PNA11-03A: Quartzo-Feldspathic Gneiss



Mineralogy:

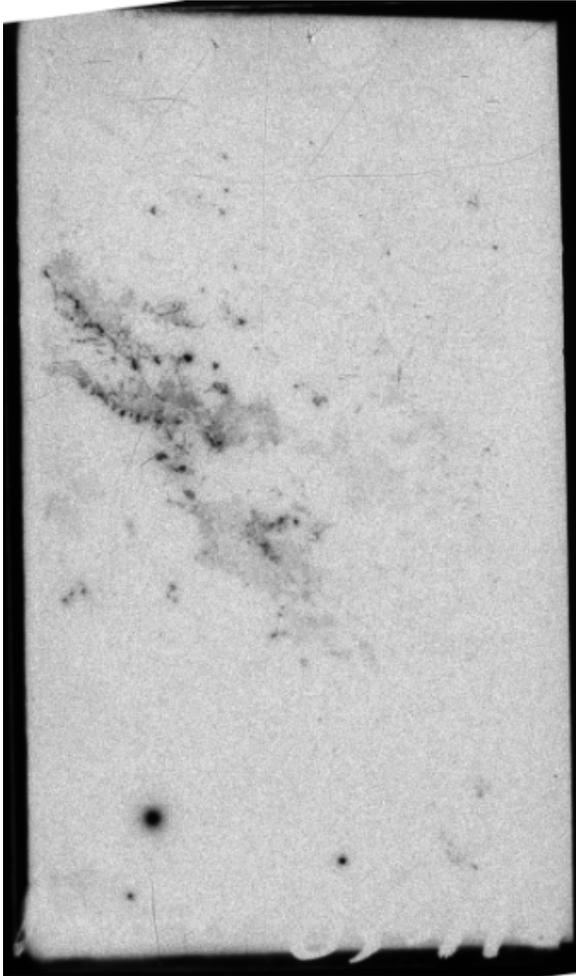
Quartz
Potassium Feldspar (Microcline)
Plagioclase
Amphibole (Gedrite)
Orthopyroxene? (severely altered)
Biotite
Titanite
Calcite
Accessory: Apatite, Rutile, Pyrite, Ilmenite,
Uraninite, Fe-Ti-U-oxide

Mineralogy verified by SEM.

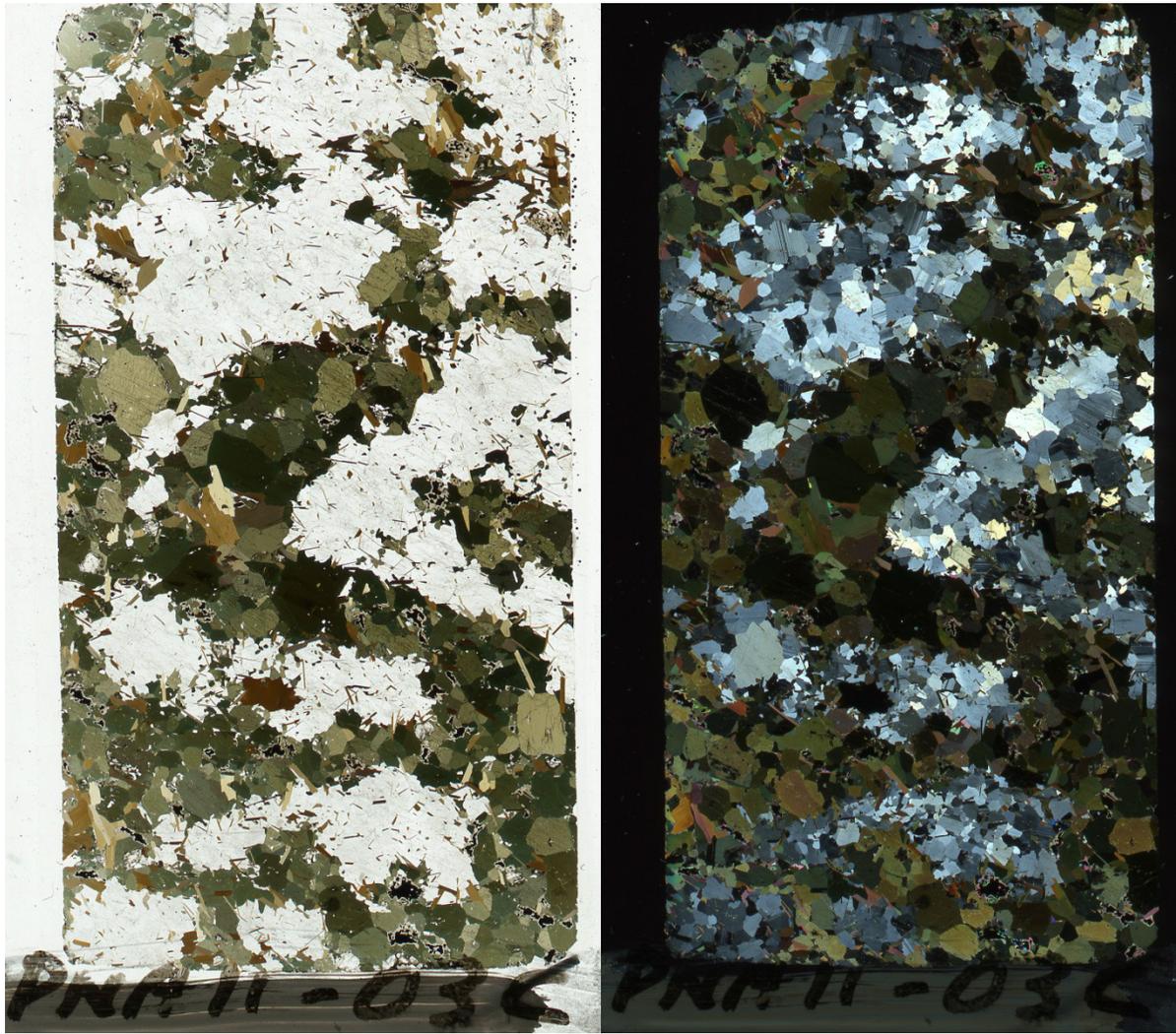
Petrography:

A matrix of quartz and feldspar is cut by late calcite-filled fractures / foliation. Mafic layers are comprised of biotite, possible orthopyroxene - it is severely altered (no calcium)-, and titanite rimmed by rutile which is in turn mantled by Fe-Ti-U oxide. A single uraninite grain has a pyrite rim, then mantled by calcite.

Autoradiograph: Dark spots are uraninite, U-bearing Ti-Fe Oxide.



PNA11-03C : Mafic Gneiss



Mineralogy:

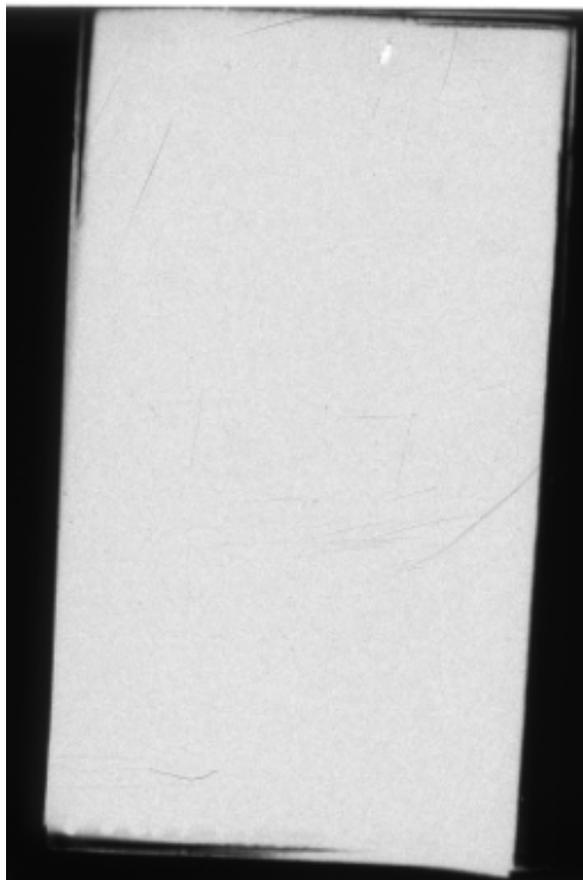
Quartz
Potassium Feldspar (Microcline)
Plagioclase
Ca-Amphibole
Biotite
Accessory: Titanite, Apatite, Ilmenite, Pyrite
(1 tiny grain)

Mineralogy verified by SEM.

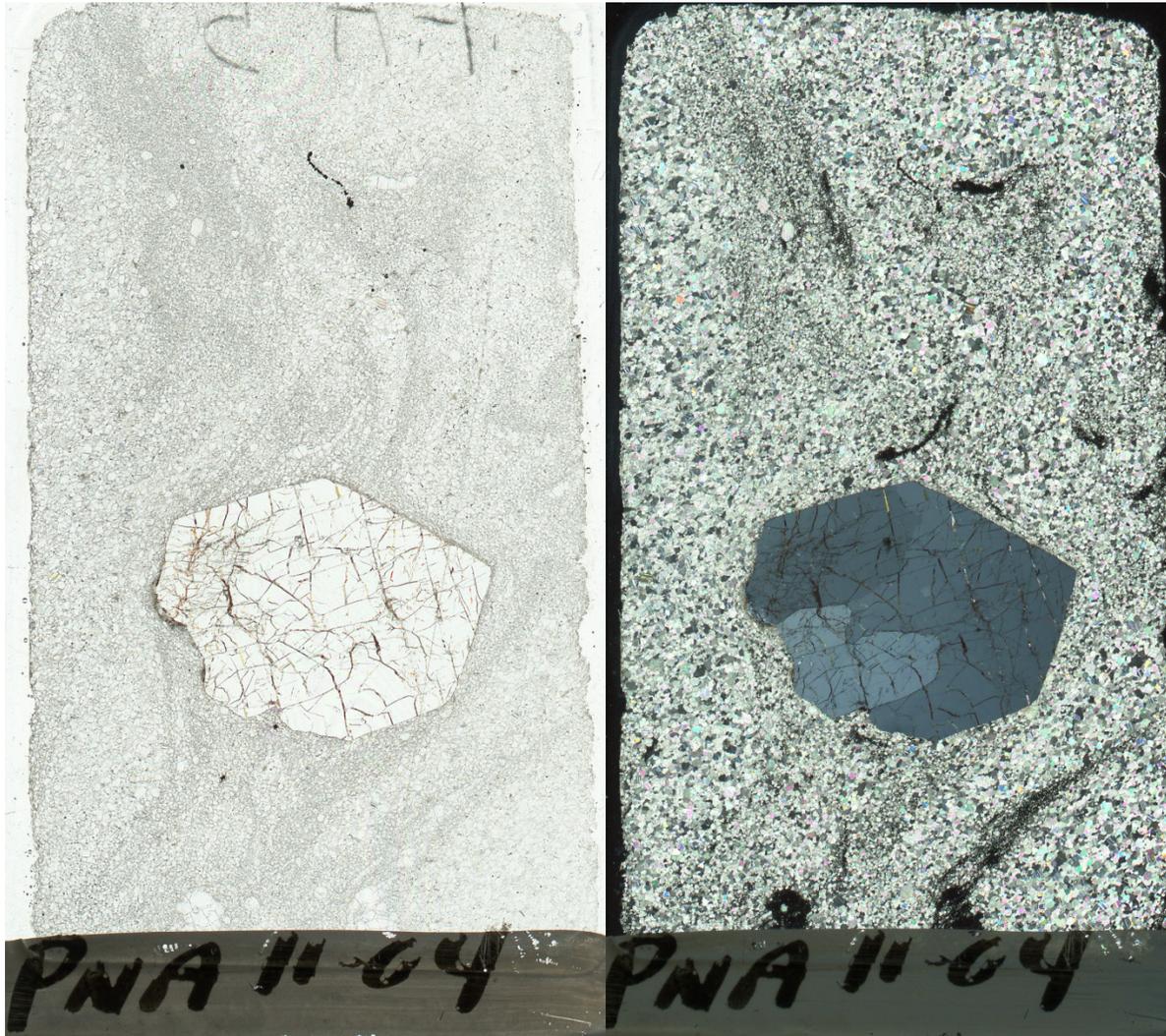
Petrography:

Coarse-grained biotite occurs in mafic lenses with hornblende; finer-grained biotite is in plagioclase-rich lenses. The texture is anhedral with no noticeable fabric. Ilmenite is mantled by titanite.

Autoradiograph: No detectable radioactivity.



PNA11-04: Calcite Marble



Mineralogy:

Calcite
Apatite
Fluorite

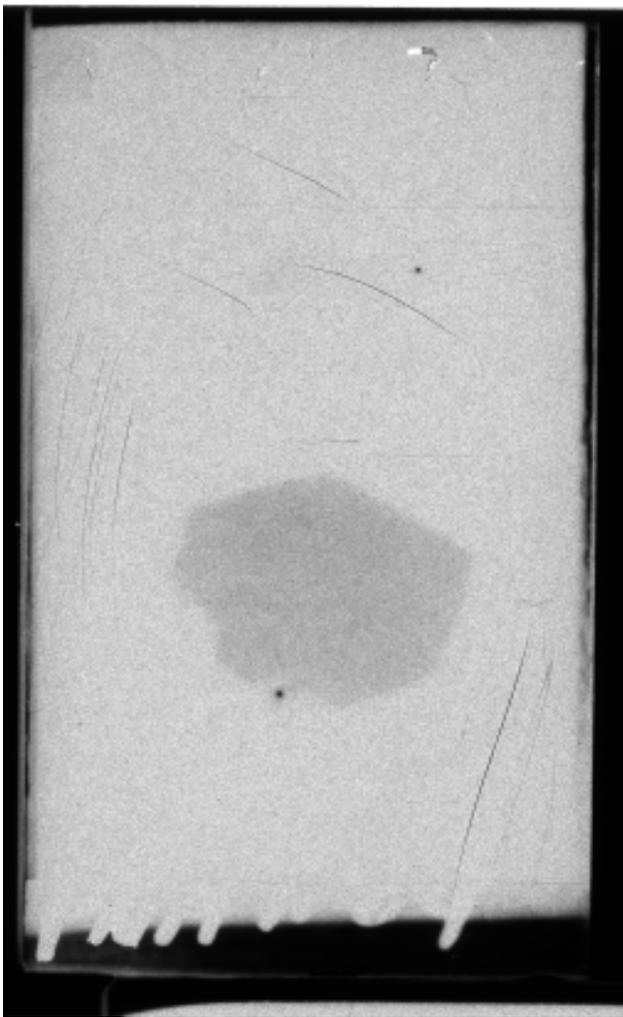
Accessory: REE-carbonate, Fe-Oxide,
Uraninite, Pyrite, REE-oxide

Mineralogy verified by SEM.

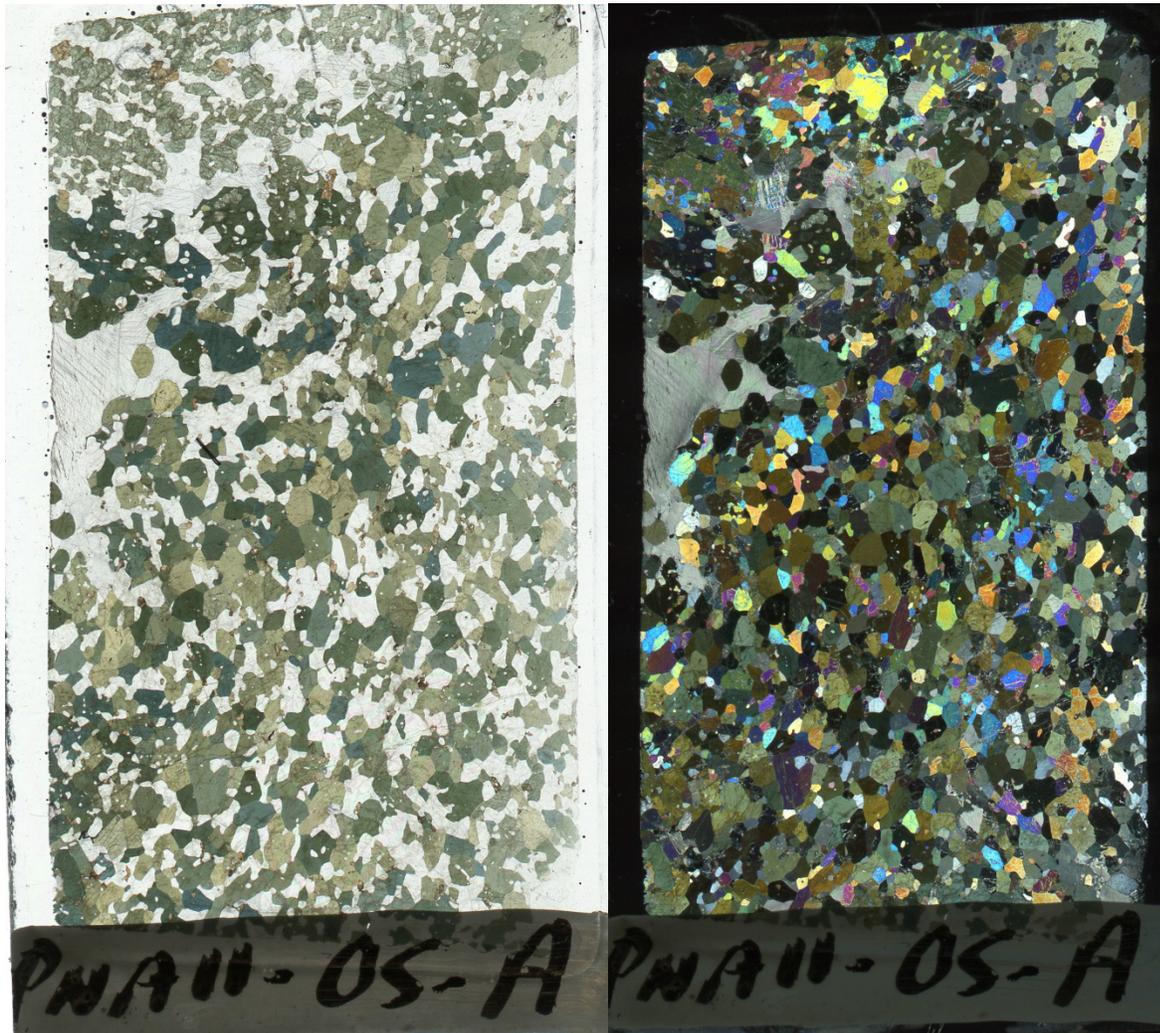
Petrography:

The matrix is comprised of granoblastic calcite and fluorite. One euhedral apatite porphyroblast has fluorite (and pyrite) growth on rim and in fractures. Pyrite, uraninite, REE carbonate (Ca, Ce, La, Nd) and REE oxide (Ce, Ca, Nd, Pr) occur in trace amounts in the matrix.

Autoradiograph: Dark spots are uraninite, REE-carbonate, REE-oxide. Note apatite visible in image.



PNA11-05A: Calc-Silicate Gneiss



Mineralogy:

Ca-Amphibole (Hastingsite)
Clinopyroxene (Diopside)
Scapolite
Calcite
Titanite

Mineralogy verified by SEM; amphibole chemistry by EPMA analysis.

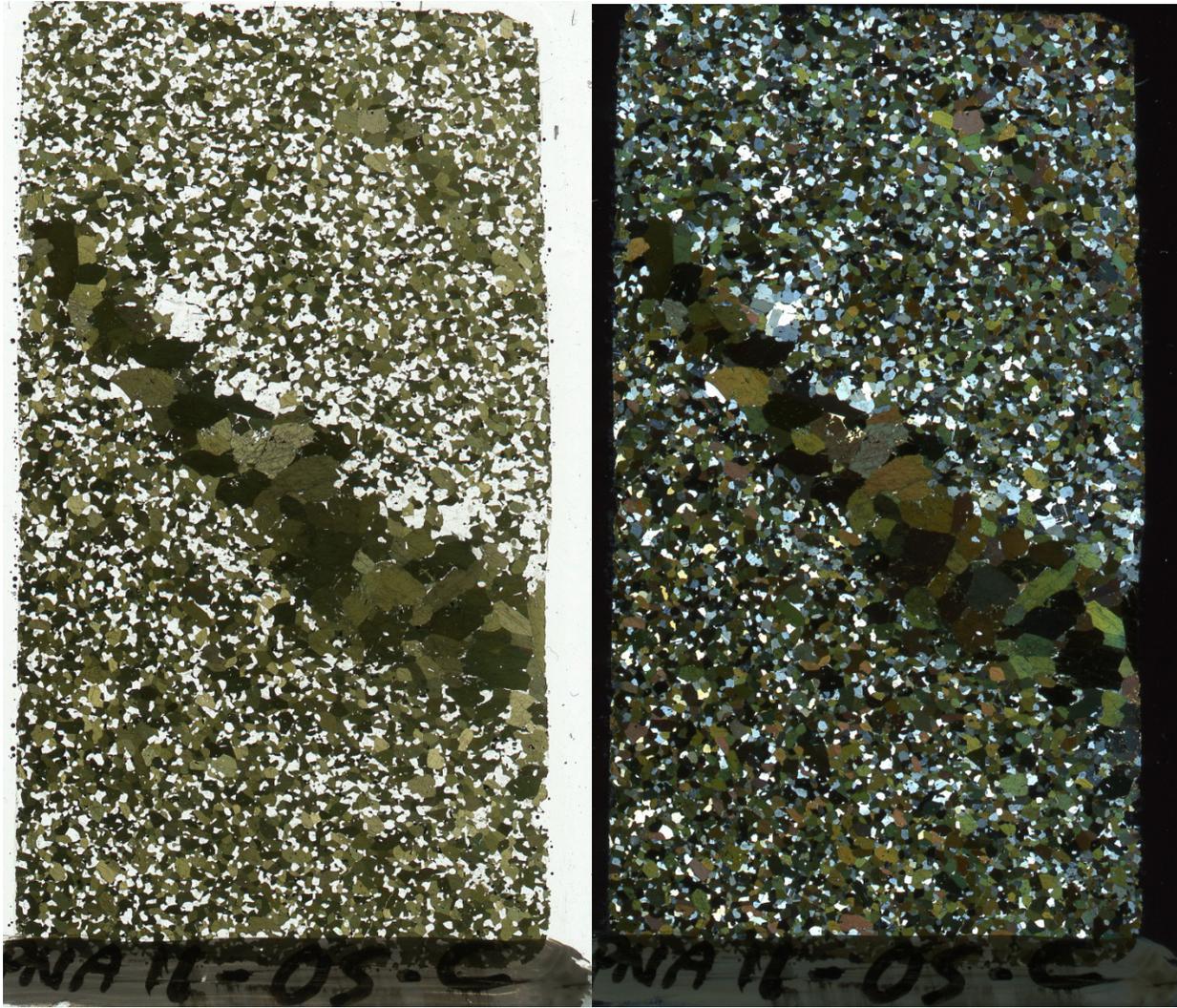
Petrography:

Medium-to coarse-grained, granoblastic texture; anhedral blue-green-yellow pleochroic amphibole, calcite, diopside, scapolite, and titanite (lamellar twinning) has a weak fabric. One diopside-rich/amphibole-poor layer is comprised of diopside-calcite-titanite-scapolite.

Autoradiograph: No detectable radioactivity.



PNA11-05C: Layered Mafic Gneiss



Mineralogy:

Quartz
Potassium Feldspar
Plagioclase
Ca-Amphibole (Hastingsite)
Accessory: Titanite, Apatite, Fe-oxide,
Pyrite

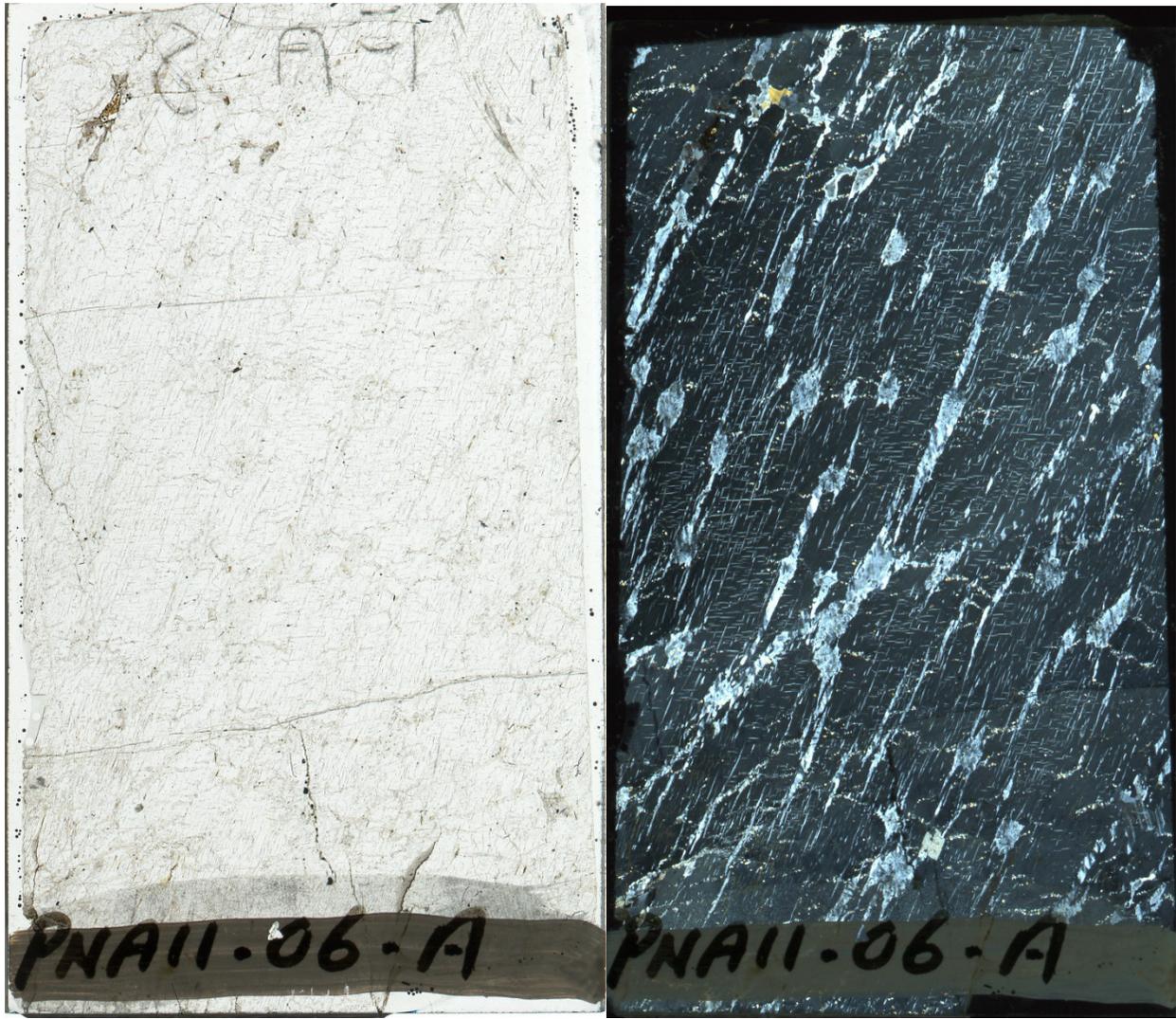
Petrography:

Medium-coarse-grained, granoblastic inequigranular banded mafic gneiss, mostly hornblende and feldspar with trace late pyrite.

Autoradiograph: No detectable radioactivity.



PNA11-06A: Perthite



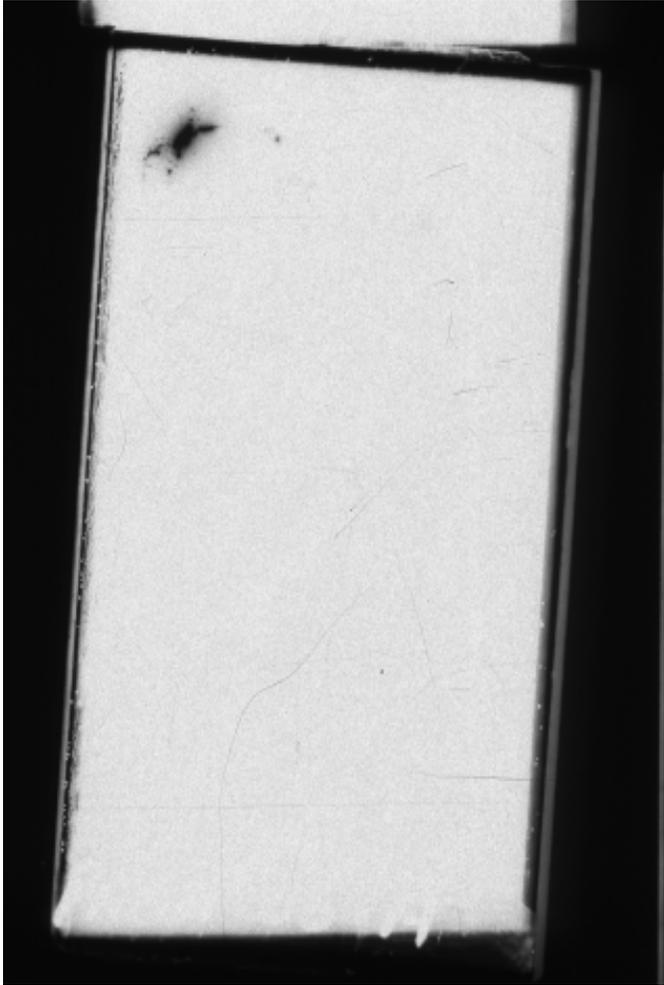
Mineralogy:

Quartz
Potassium Feldspar
Plagioclase
Accessory: Barite, Pyrite, Thorite

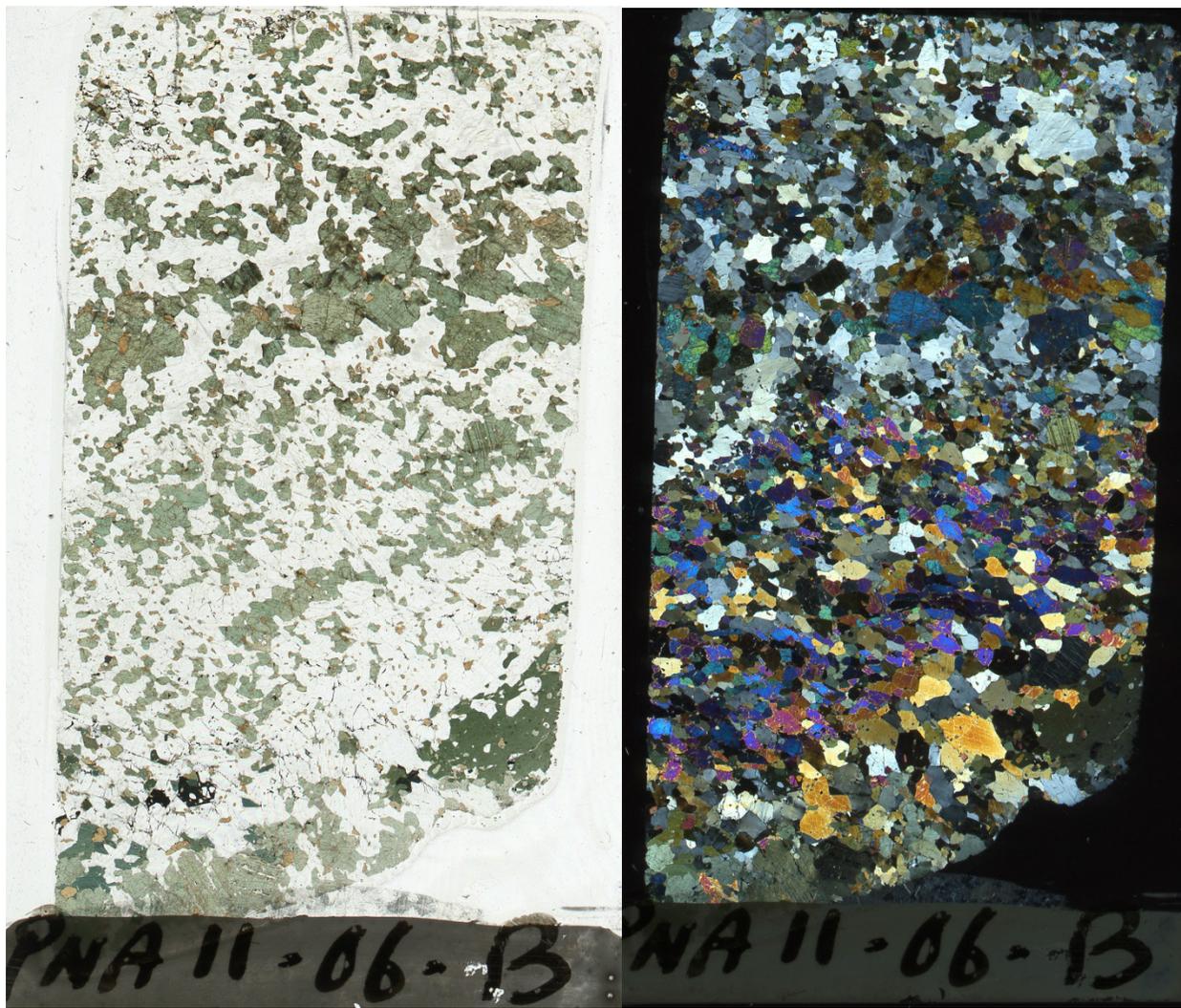
Petrography:

A single pegmatitic grain of perthite has microperthitic texture. Late fractures are infilled with fine pyrite; pyrite surrounds a thorite- and barite-filled vug.

Autoradiograph: Dark spot is thorite.



PNA11-06B: Calc-Silicate Gneiss



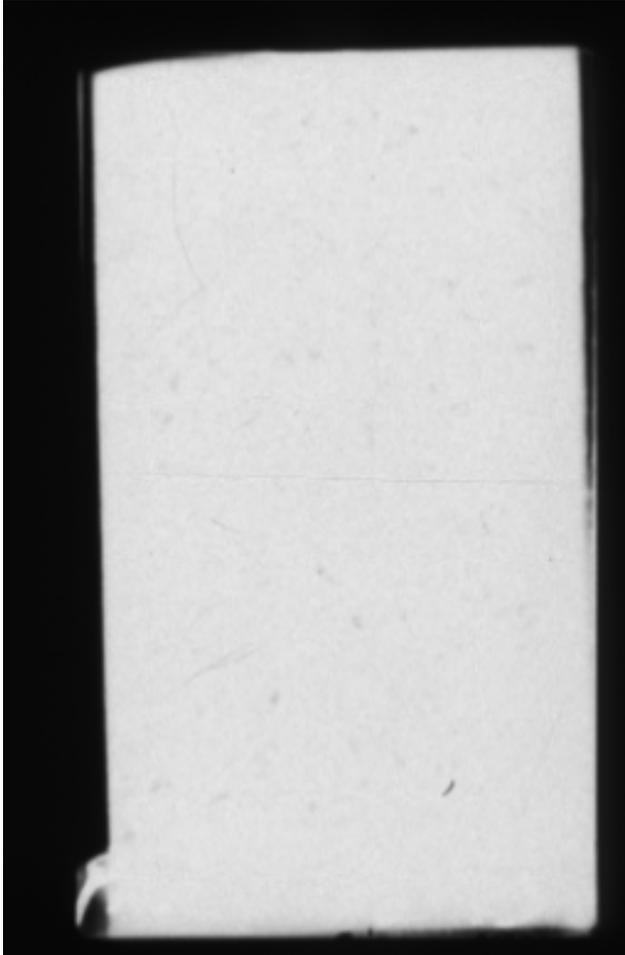
Mineralogy:

Quartz
Feldspar (Plagioclase)
Ca-Amphibole (Hornblende)
Amphibole (Hastingsite)
Scapolite
Clinopyroxene (Diopside)
Titanite
Epidote
Accessory: Allanite, Pyrite, Tourmaline
Mineralogy verified by SEM.

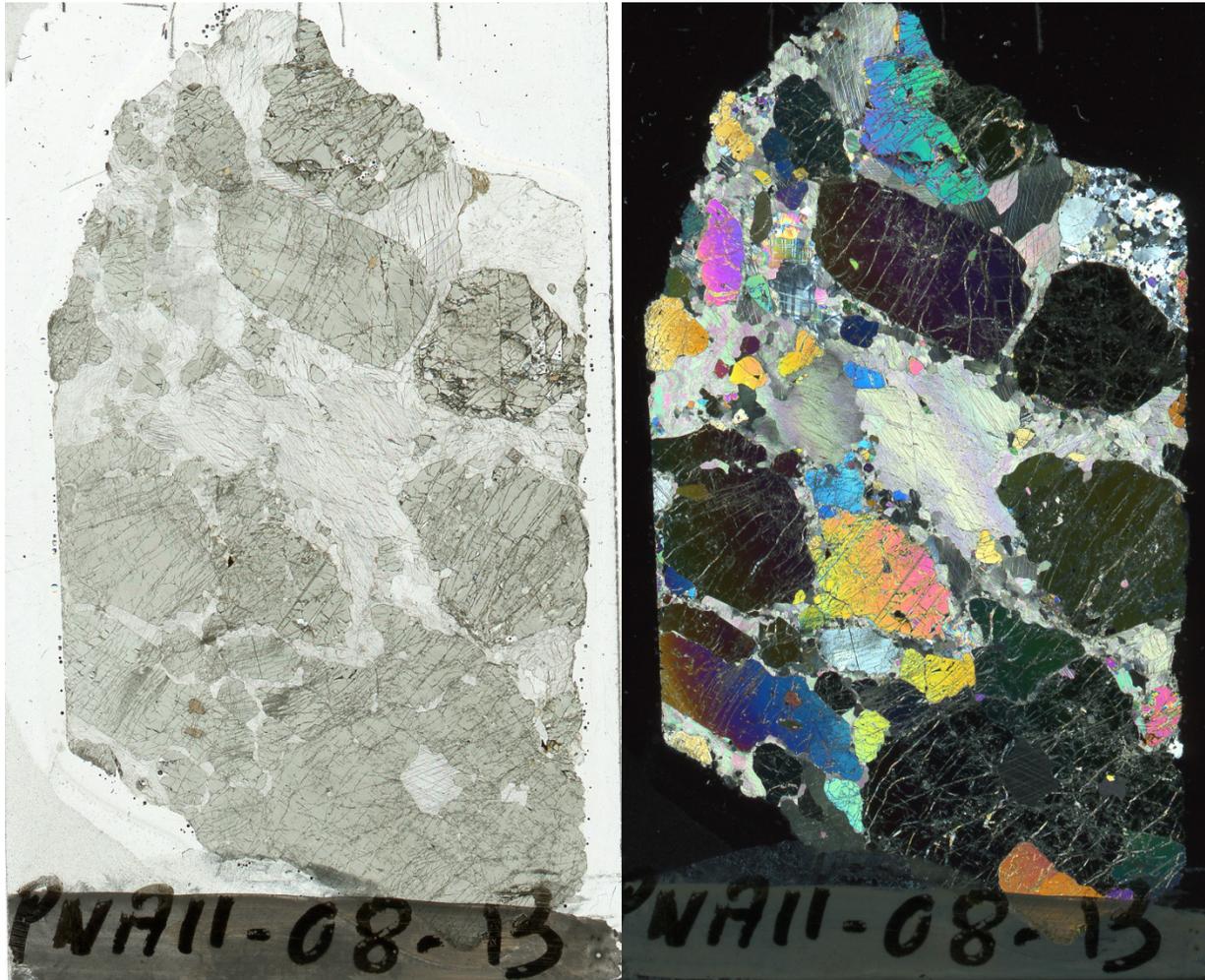
Petrography:

Layered with no obvious fabric. Medium to coarse-grained with subhedral texture. Late, euhedral, black tourmaline includes hornblende and hastingsite amphibole. Scapolite is rimmed by pyrite in fractures. Titanite and allanite are mantled by epidote.

Autoradiograph: Faint spots may indicate radioactive grains.



PNA11-08B: Calc-Silicate Gneiss



Mineralogy:

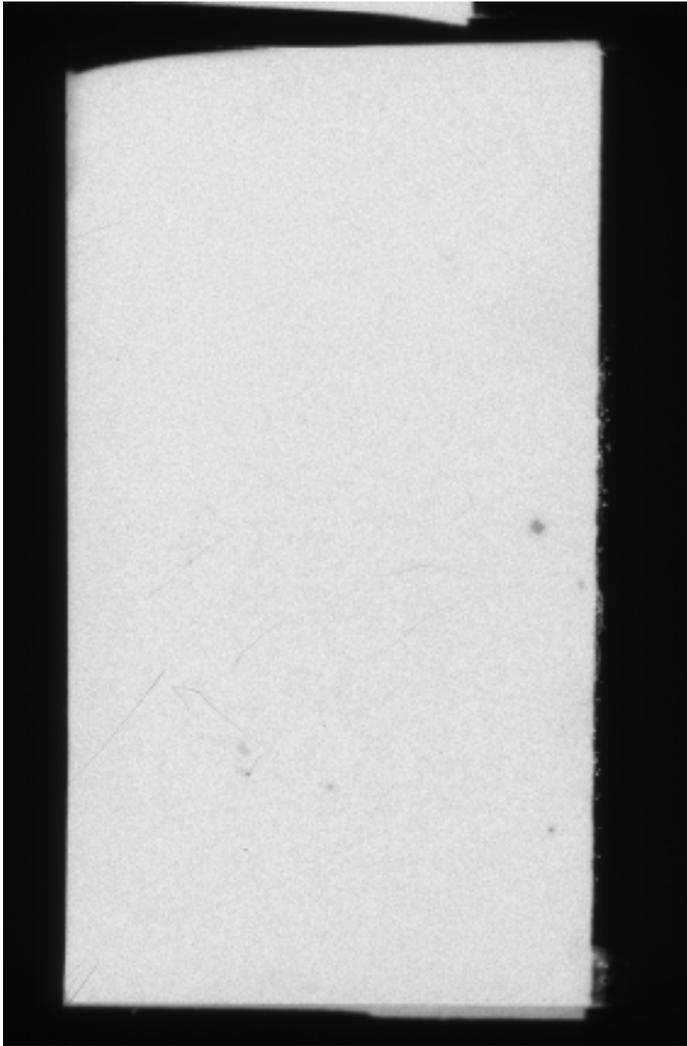
Clinopyroxene (Diopside)
Calcite
Potassium Feldspar
Plagioclase
Titanite
Biotite
Accessory: Zircon, Pyrrhotite

Mineralogy verified by SEM.

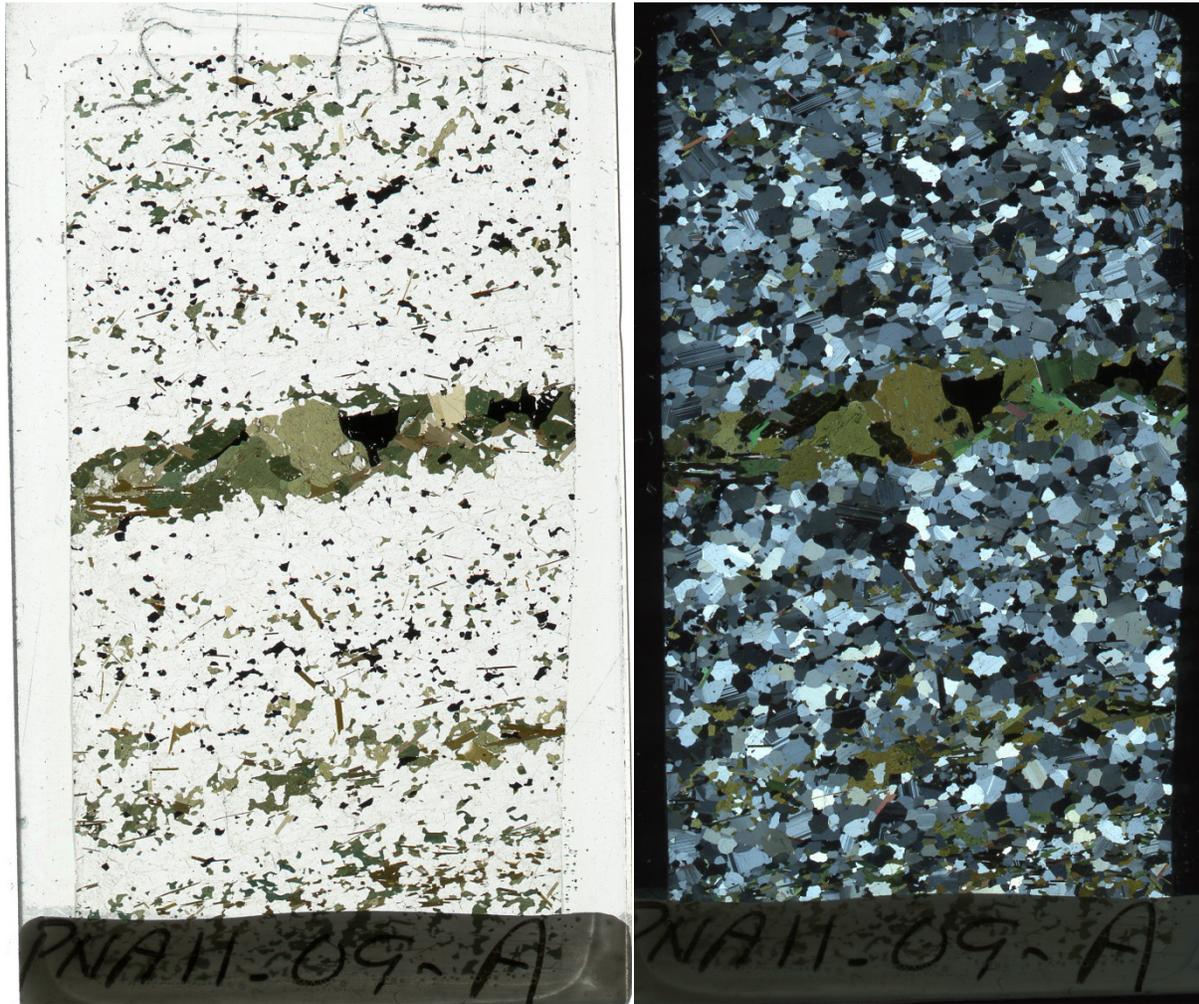
Petrography:

Biotite is included in very coarse-grained diopside. The matrix of calcite and feldspar has sutured boundaries.

Autoradiograph: Dark spots are zircon.



PNA11-09A: Layered Mafic Gneiss



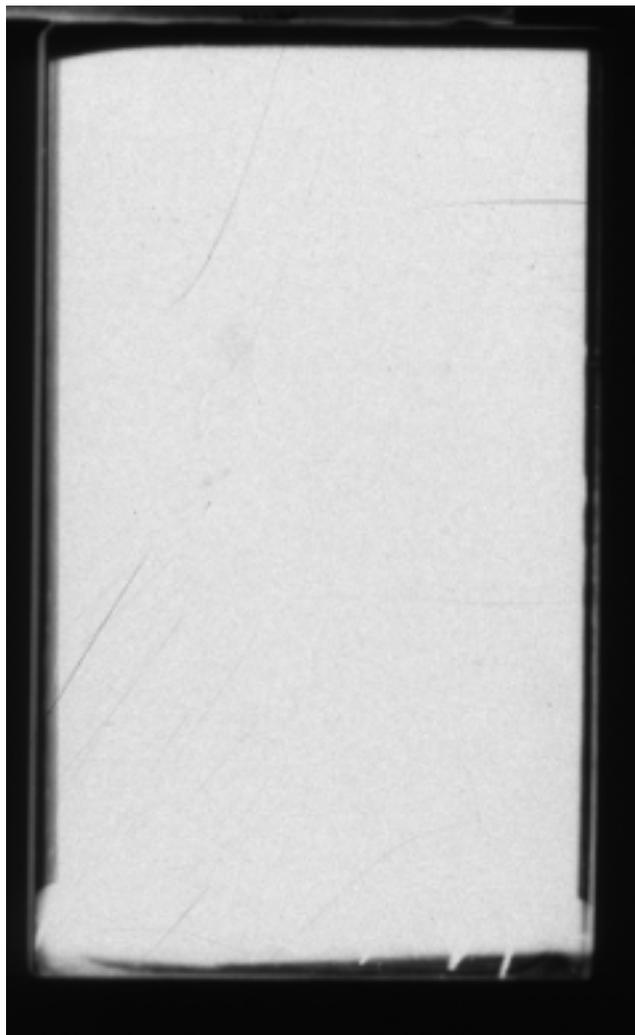
Mineralogy:

Quartz
Potassium Feldspar (Microcline)
Plagioclase
Amphibole (Hornblende)
Biotite
Accessory: Titanite, Calcite, Apatite,
Magnetite, Ilmenite, Hematite

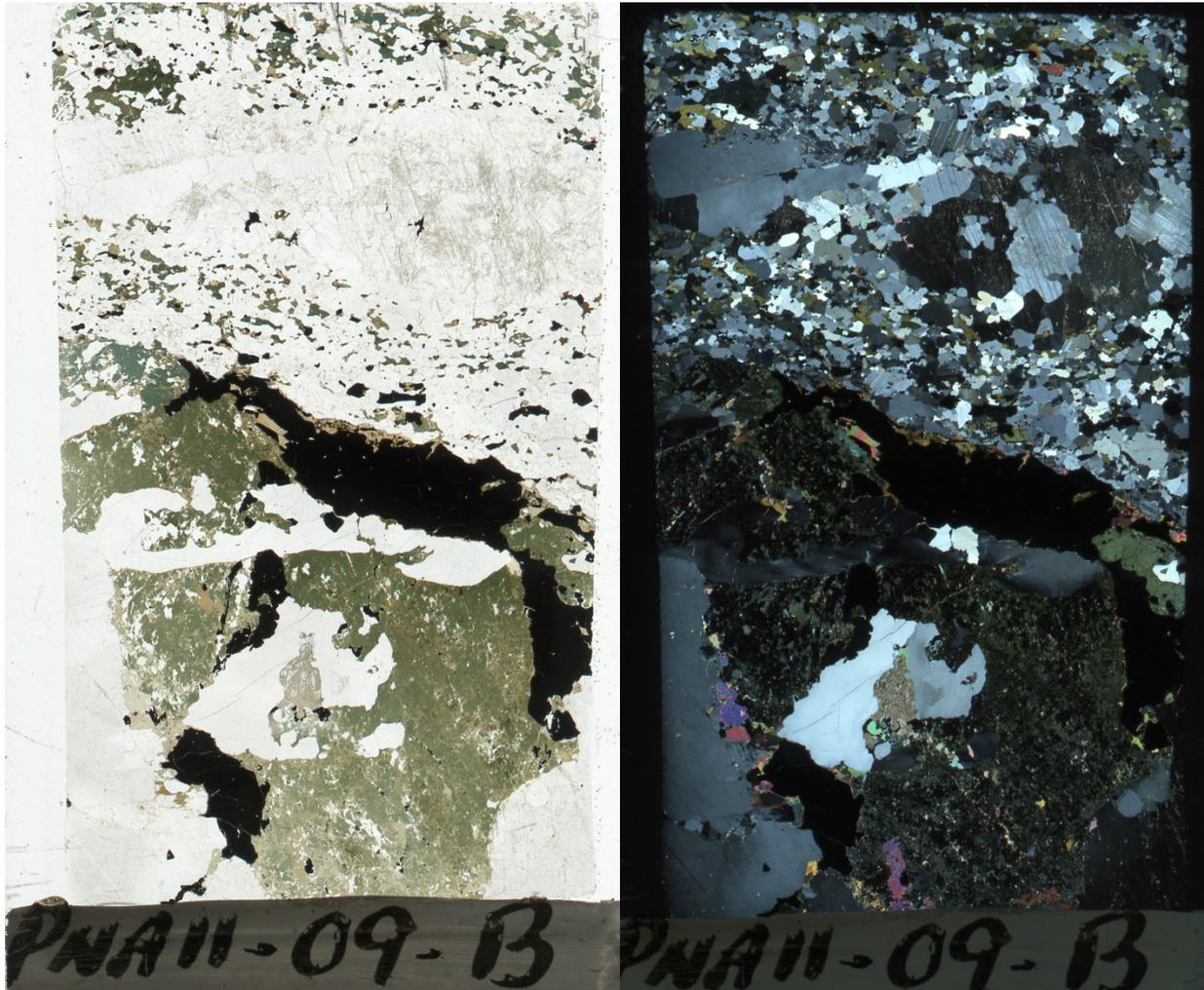
Petrography:

Consertal to subhedral texture with no obvious fabric. Compositional layers are variably coarse-grained. The main opaque is subhedral magnetite, with minor ilmenite and hematite in veins. Magnetite is often mantled by titanite.

Autoradiograph: No detectable radioactivity.



PNA11-09B: Mafic Gneiss



Mineralogy:

Quartz
Potassium Feldspar (Microcline)
Plagioclase
Amphibole (Hornblende, later Hastingsite)
Biotite
Accessory: Titanite, Calcite, Apatite,
Tourmaline, Zircon, Rutile, Magnetite,
Ilmenite, Pyrite

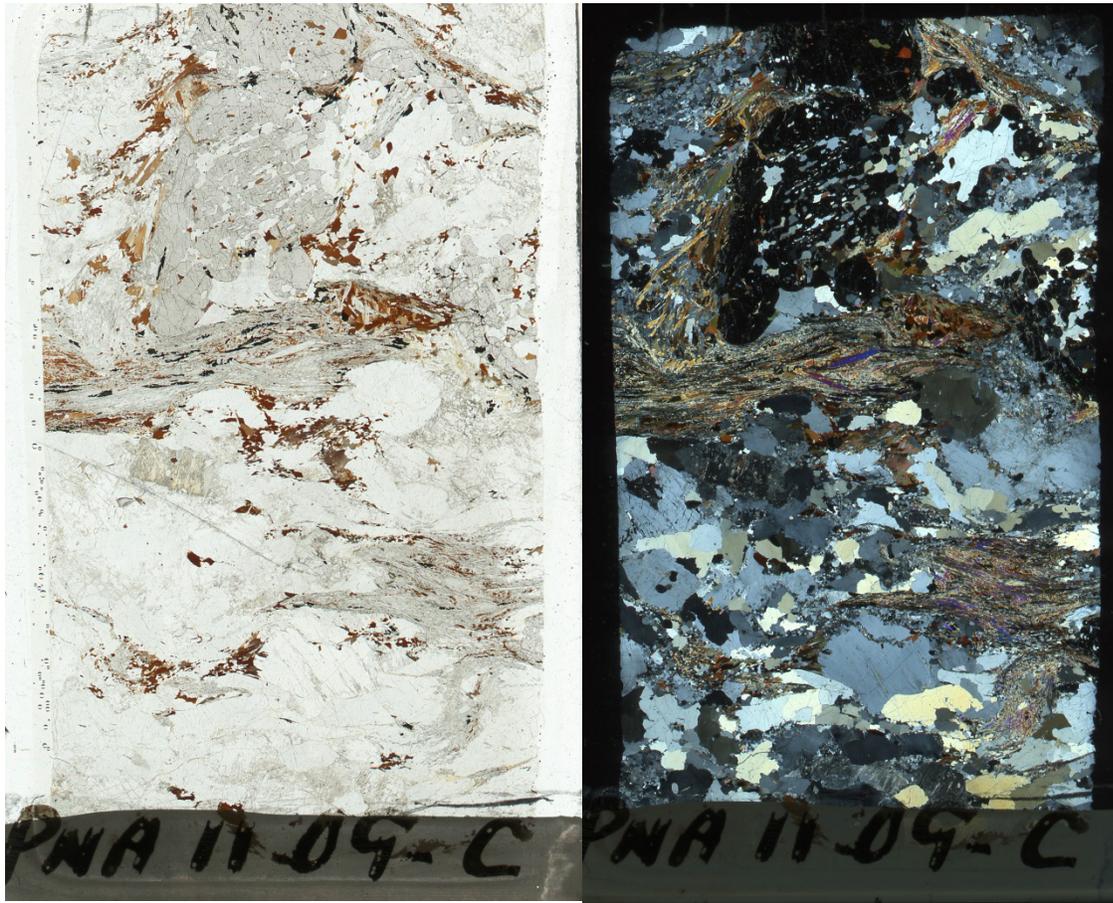
Petrography:

Layers of quartz and feldspar have consertal texture. Quartz displays undulose extinction. Trace amounts of tourmaline are present as late infill.

Autoradiograph: Faint textural features visible in image.



PNA11-09C: Garnet Sillimanite Metapelite



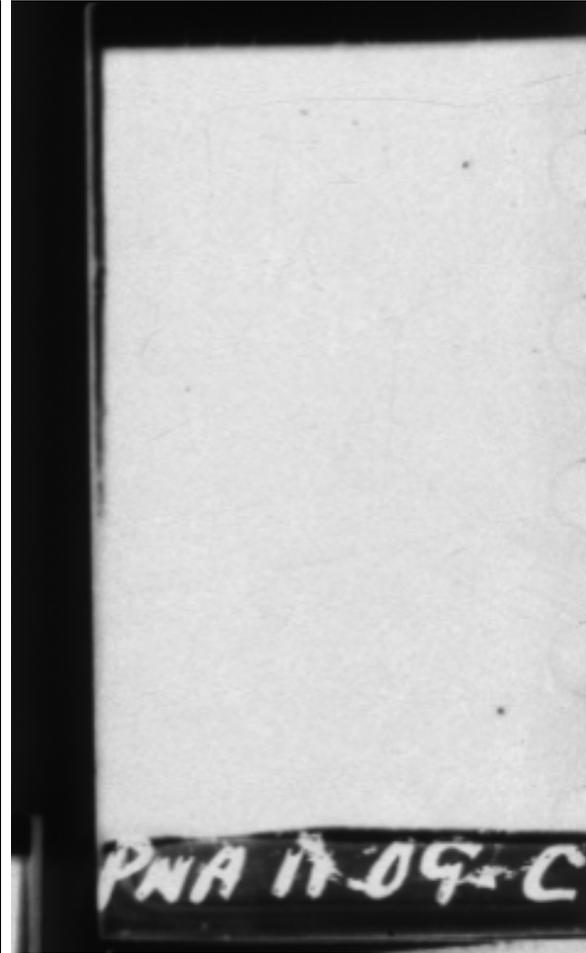
Mineralogy:

Quartz
Potassium Feldspar
Plagioclase
Garnet
Sillimanite
Biotite
Accessory: Epidote, Titanite, Allanite,
Pyrite, Magnetite, Ilmenite

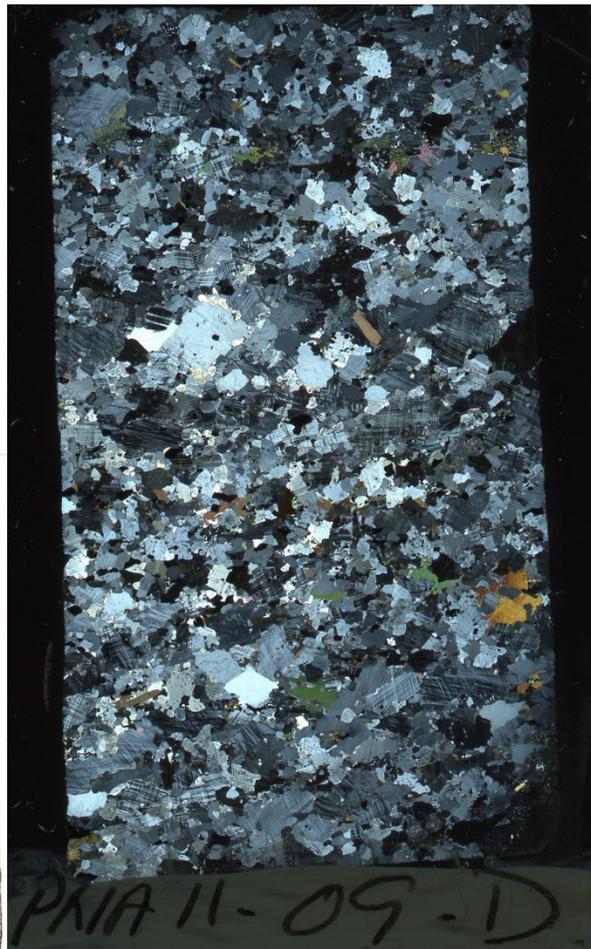
Petrography:

A garnet porphyroblast, the core of which has a linear fabric marked by inclusions of quartz and biotite, has a rim zone which contains a later foliation marked by inclusions of sillimanite and biotite. This same fabric continues in a different orientation in the matrix, wrapping around the garnet, and in the matrix is marked by ilmenite and sillimanite. Biotite is contained within this later fabric. Cloudy, coarse-grained plagioclase in the matrix is altered /sericitized. Matrix quartz is coarse-grained and undulose with mostly consertal edges, though some are anhedral.

Autoradiograph: Faint spots indicate some radioactive grains.



PNA11-09D: Quartzo-Feldspathic Gneiss



Mineralogy:

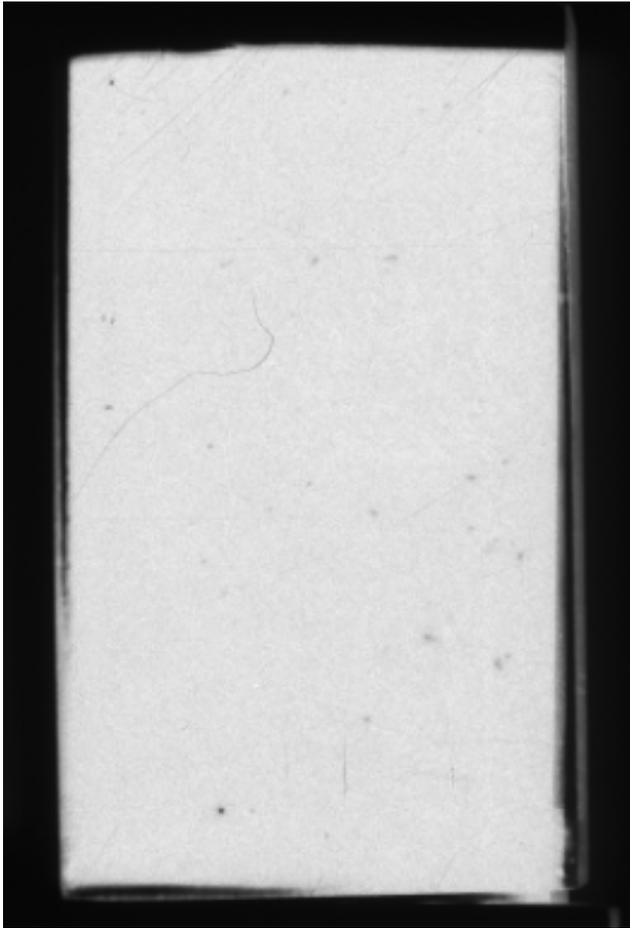
Quartz
Potassium Feldspar (Microcline)
Plagioclase
Ca-Amphibole
Biotite
Muscovite (late)
Goethite
Accessory: Zircon, Calcite, Tourmaline
(Schorl), Magnetite, Rutile, Pyrite

Petrography:

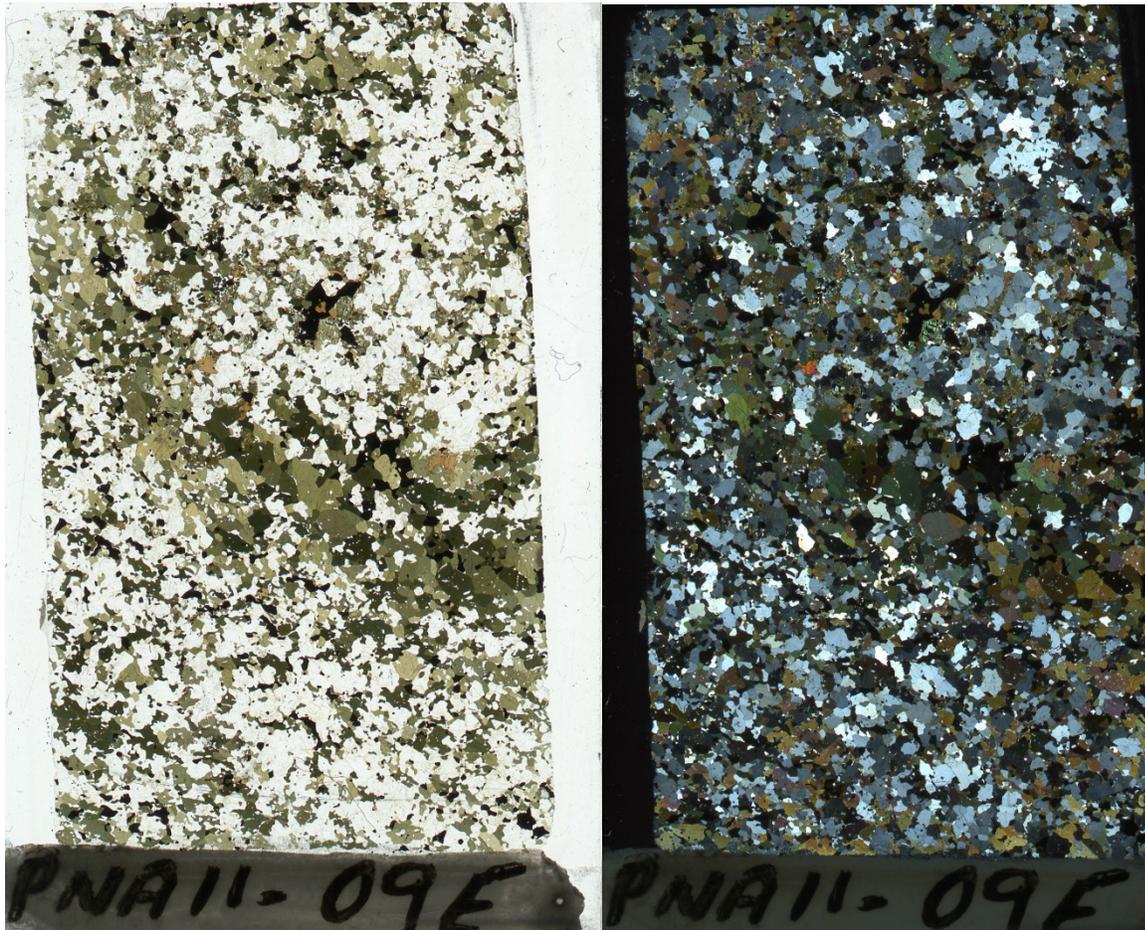
Medium-grained, equigranular, quartz and feldspar with consertal texture. Quartz is undulose. Cores of plagioclase are highly included. Blue-green amphibole (hastingsite) is partially altered to biotite. There are abundant large, zoned subhedral zircons, goethite in crack and minor late tourmaline.

Mineralogy verified by SEM.

Autoradiograph: Faint spots indicate radioactive grains.



PNA11-09E : Mafic Gneiss



Mineralogy:

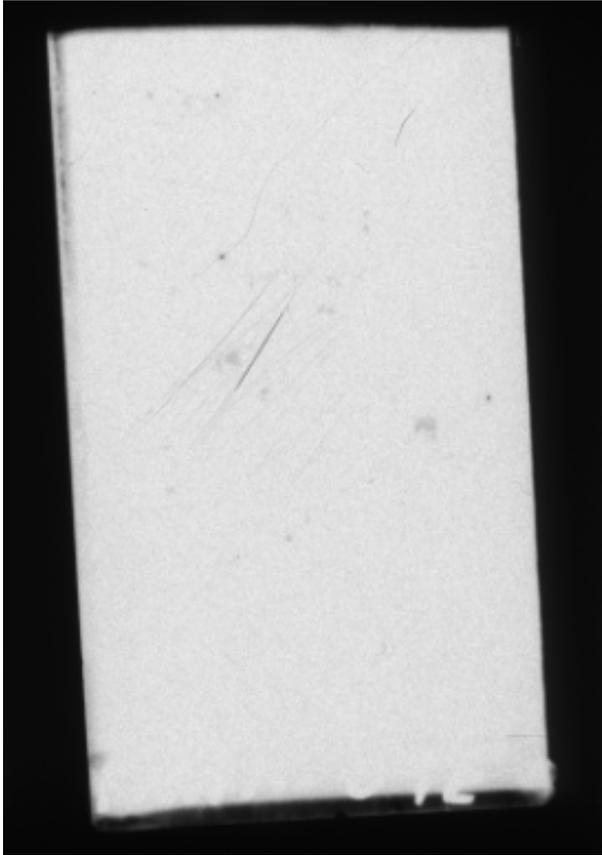
Quartz
Potassium Feldspar
Plagioclase
Ca-Amphibole
Clinopyroxene (Diopside)
Accessory: Titanite Apatite, Calcite
Pyrrhotite, Chalcopyrite, Pyrite

Mineralogy verified by SEM.

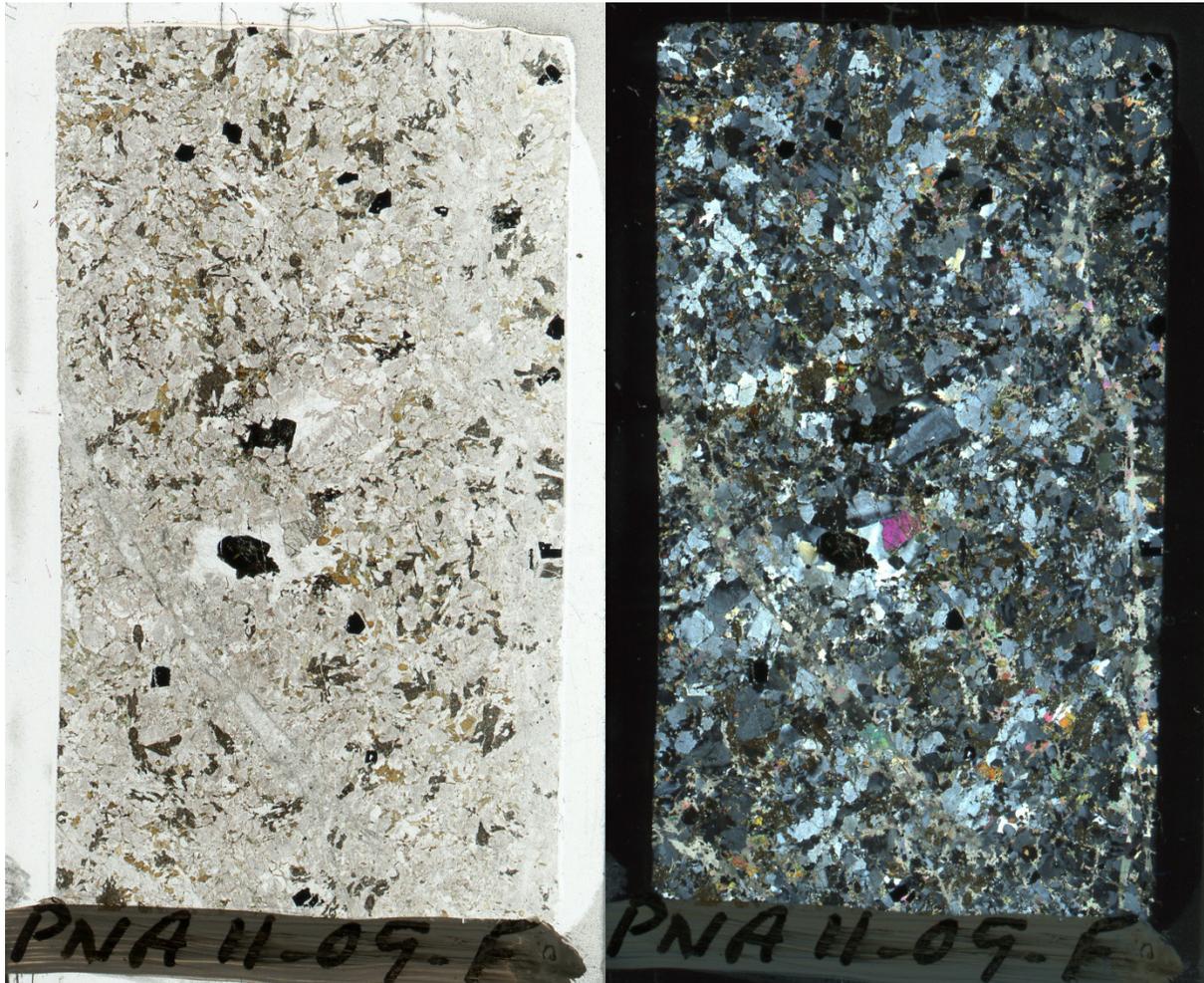
Petrography:

Medium-grained, equigranular, anhedral amphibole gneiss, with some more mafic-rich lenses. There is no fabric visible. Titanite is usually found as rims on pyrite. Green-pink pleochroic diopside alters to calcite and hornblende. The main opaque is subhedral pyrrhotite, in places partially replaced by pyrite, with minor chalcopyrite.

Autoradiograph: Faint spots indicate some radioactive grains.



PNA11-09F: Quartzo-Feldspathic Gneiss



Mineralogy:

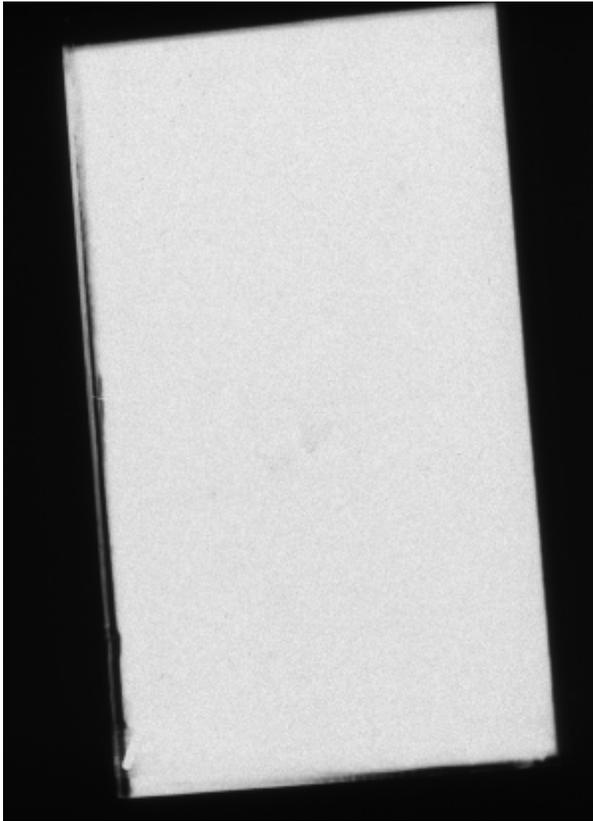
Quartz
Potassium Feldspar
Plagioclase
Biotite
Chlorite
Accessory: Apatite, Dolomite, Zircon,
Barite, Ilmenite, Rutile

Mineralogy verified by SEM.

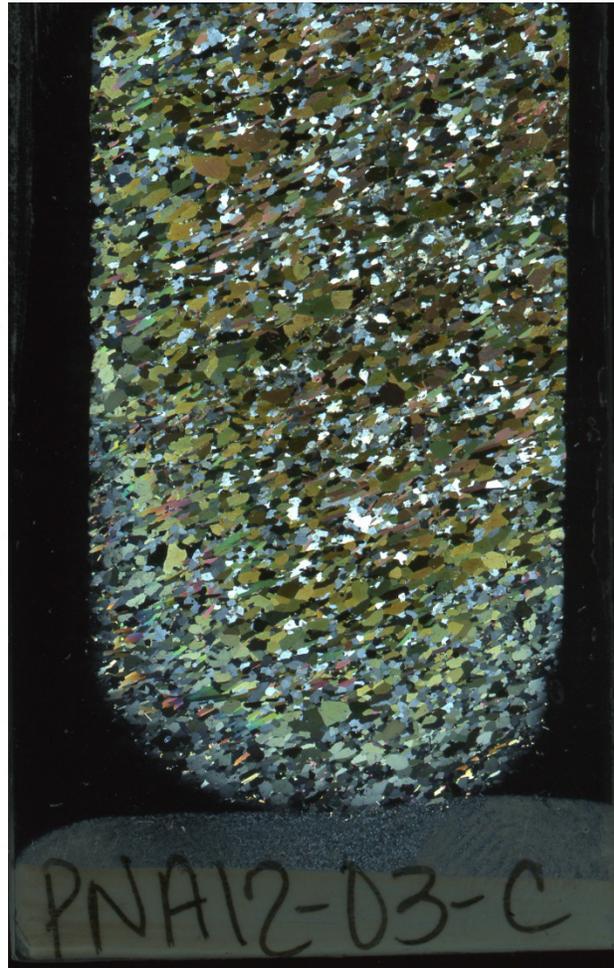
Petrography:

The matrix is quartz- and feldspar-rich with no fabric and is ratty and altered. Rutile replaces ilmenite. Biotite is retrograded to chlorite. Feldspar has abundant oriented tiny inclusions of rutile. There is one large fragment of zircon. A late dolomite vein cross-cuts the sample.

Autoradiograph: No detectable radioactivity.



PNA12-03C : Mafic Gneiss



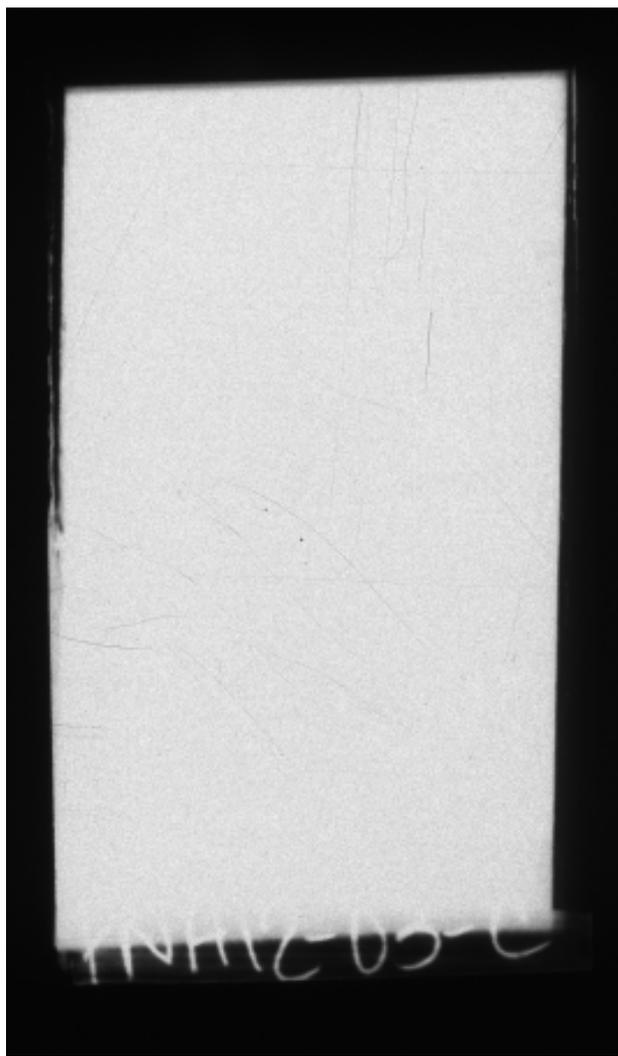
Mineralogy:

Quartz
Potassium Feldspar
Plagioclase
Ca-Amphibole
Biotite
Accessory: Titanite, Pyrite, Ilmenite

Petrography:

Medium-grained, equigranular, anhedral mafic gneiss with decussate texture of mostly amphibole and biotite.

Autoradiograph: No detectable radioactivity.



PNA12-03D: Calc-Silicate Gneiss



Mineralogy:

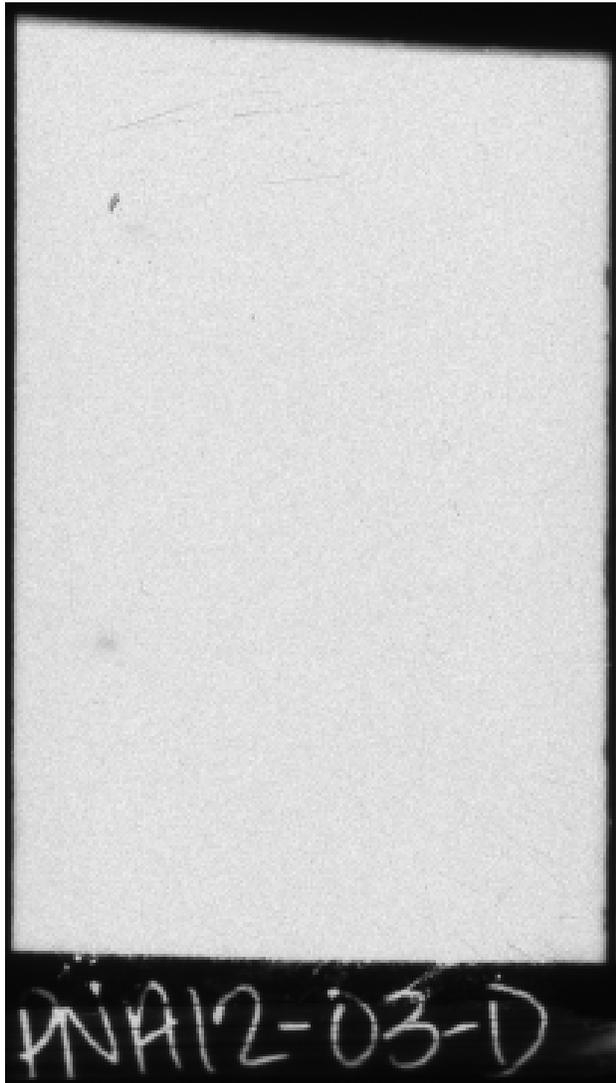
Quartz
Potassium Feldspar (Microcline)
Plagioclase
Calcite
Clinopyroxene (Diopside)
Titanite
Scapolite
Accessory: Tourmaline, Pyrrhotite, Pyrite,
Chalcopyrite (Po>Py>Ccp)

Mineralogy verified by SEM.

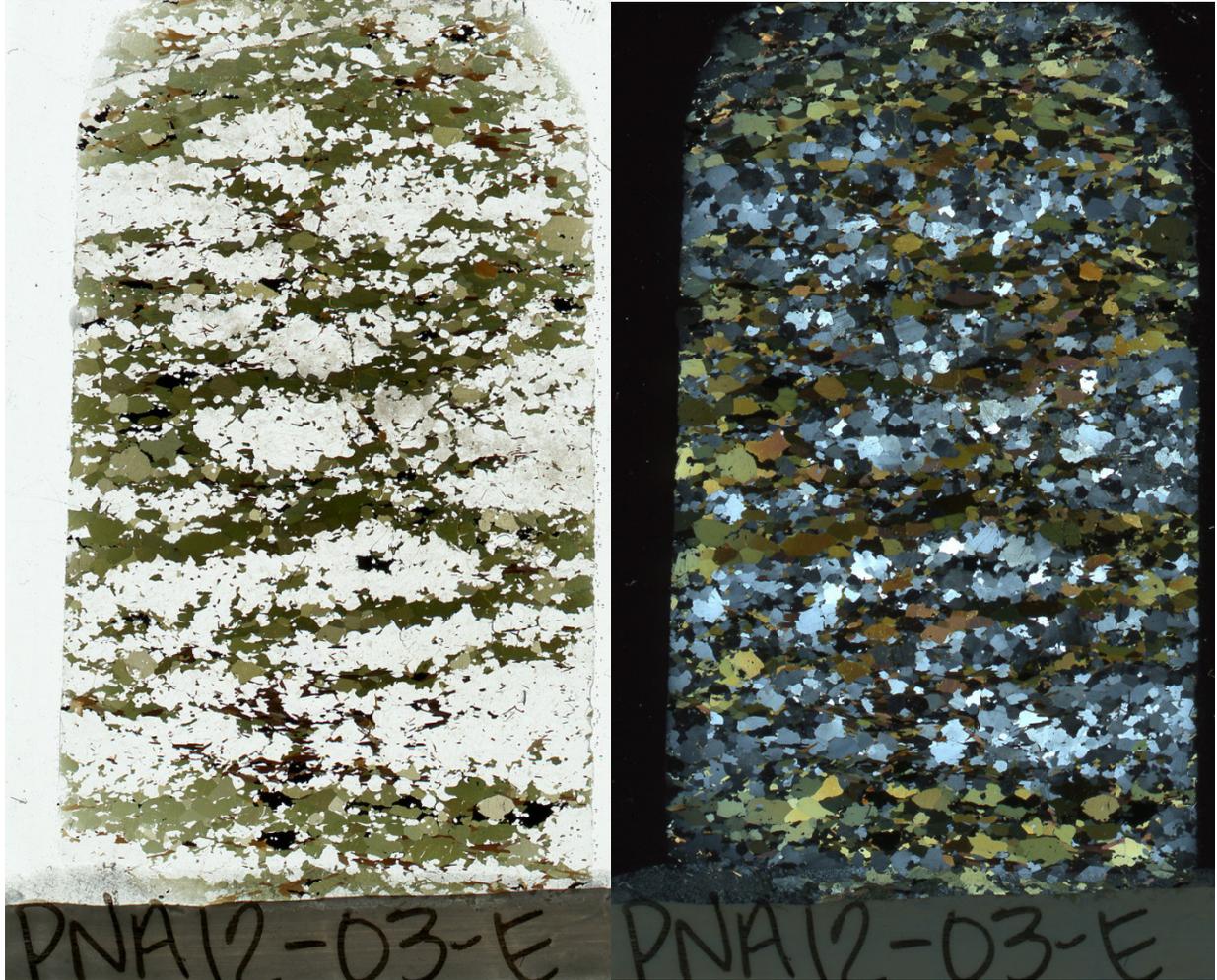
Petrography:

Compositionally layered with granoblastic texture. Medium-grained with a coarser-grained band of carbonate. A weak fabric runs perpendicular to layering which is, in one part of the sample, marked by sericite (might be carbonate). Scapolite often encloses islands of diopside. Late fracturing is marked with dark, fine-grained gouge and sulfides.

Autoradiograph: Faint spots indicate radioactive grains.



PNA12-03E : Mafic Gneiss



Mineralogy:

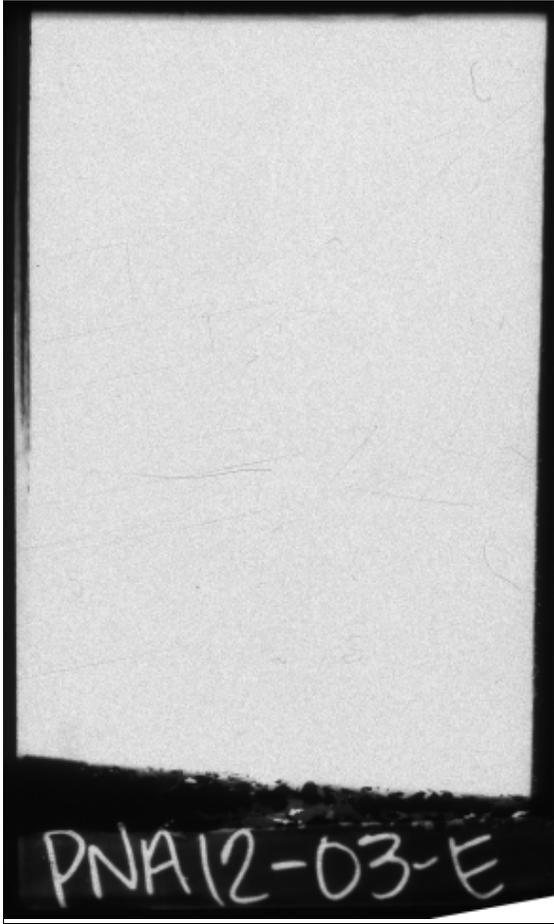
Quartz
Potassium Feldspar
Plagioclase
Ca-Amphibole (Hornblende, in places replaced by Hastingsite)
Accessory: Apatite, Magnetite, Pyrite, Pyrrhotite, Ilmenite

Mineralogy verified by SEM.

Petrography:

Decussate-textured amphibolite gneiss. Ca-amphibole (hornblende) in places is replaced by blue-green pleochroic more sodic amphibole (hastingsite) along cleavage plane. Pyrite: solid cores, rims are included, euhedral vuggy texture. Feldspar has rims of pyrite

Autoradiograph: No detectable radioactivity.



PNA12-06A: Mafic Gneiss



Mineralogy:

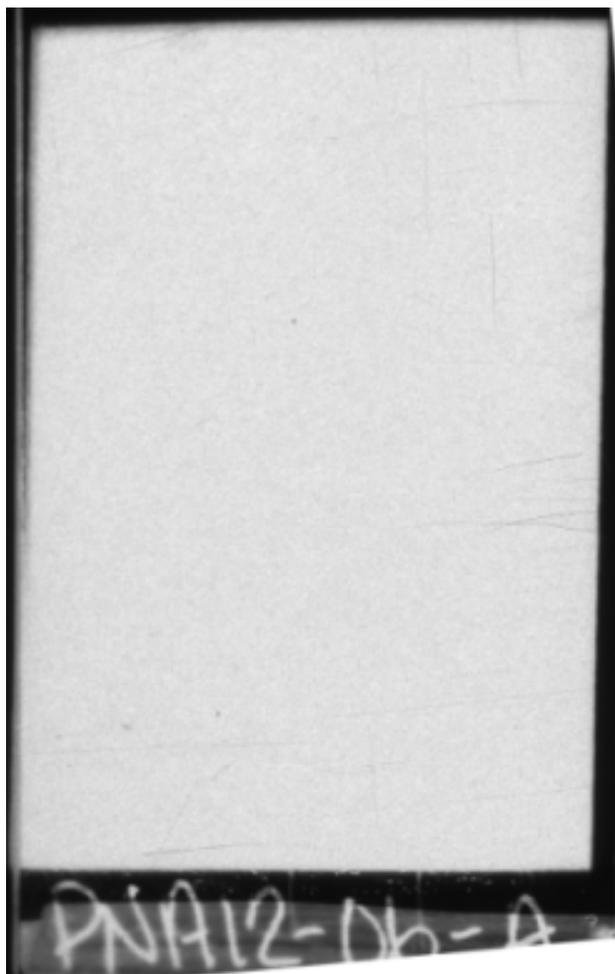
Quartz
Potassium Feldspar (Microcline)
Plagioclase
Ca-Amphibole (secondary Hastingsite)
Biotite
Garnet
Orthopyroxene
Accessory: Calcite, Apatite, Zircon, Fe-oxide, Pyrite, Unknown

Mineralogy verified by SEM.

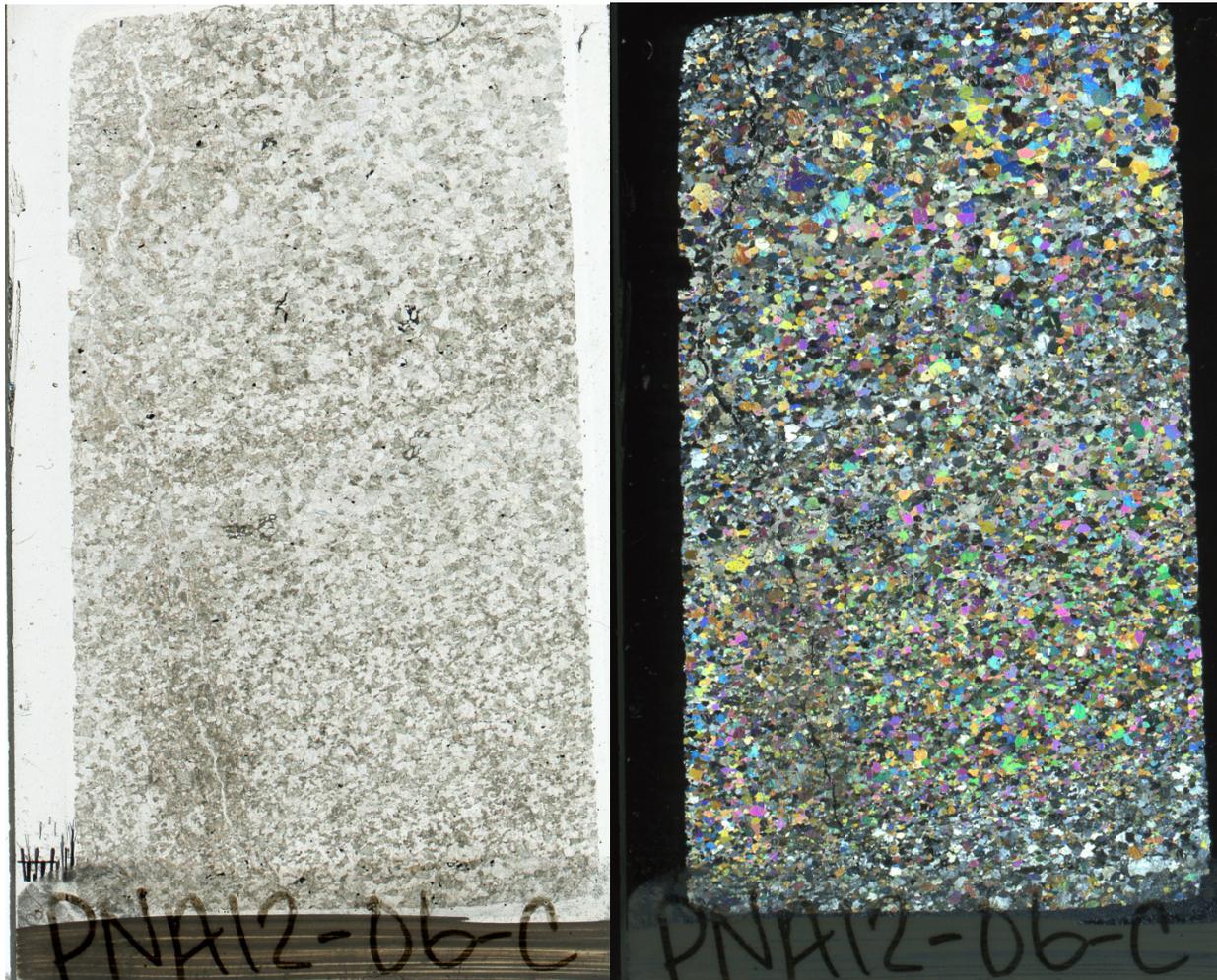
Petrography:

Compositionally-layered garnet amphibole gneiss. Main amphibole is hornblende, with change to blue-green hastingsite on some cleavage planes and rims. Equigranular with a moderate foliation marked by biotite, mainly seen in quartzo-feldspathic layer. Quartz shows undulose extinction and consertal texture with recrystallized grains at boundaries of larger grains. Small garnets are euhedral. Relic orthopyroxene occurs as rare inclusions in hornblende. One large broken zircon porphyroclast is present. There is abundant subhedral apatite and calcite. The main opaque mineral is Fe-oxide; pyrite has inclusions of an unidentified needle-shaped opaque.

Autoradiograph: No detectable radioactivity.



PNA12-06C: Calc-Silicate Gneiss



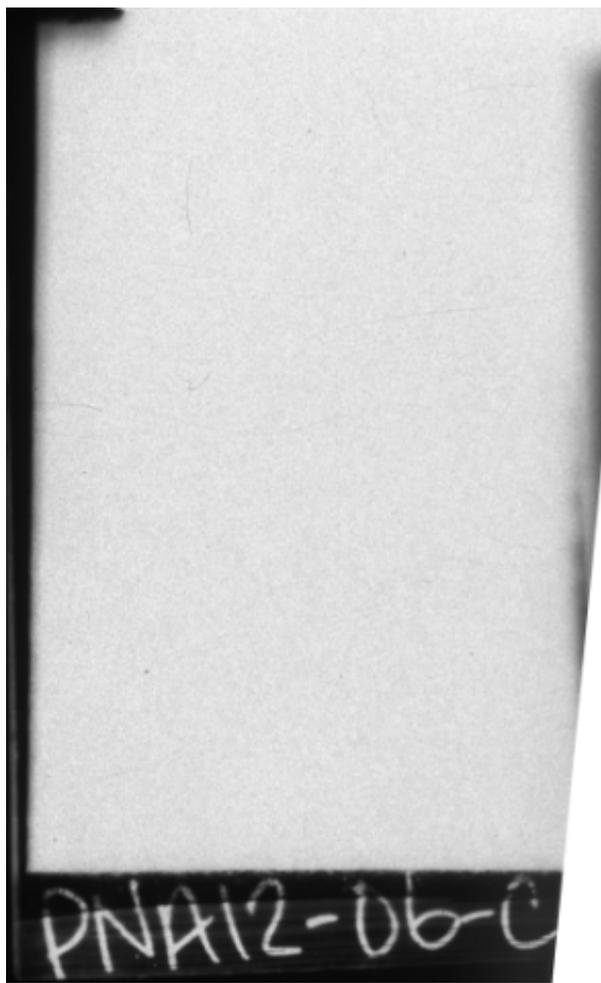
Mineralogy:

Quartz
Potassium feldspar
Plagioclase
Clinopyroxene (Diopside)
Calcite
Titanite
Scapolite
Accessory: Tourmaline, Graphite (?),
Pyrrhotite, Pyrite
Mineralogy verified by SEM.

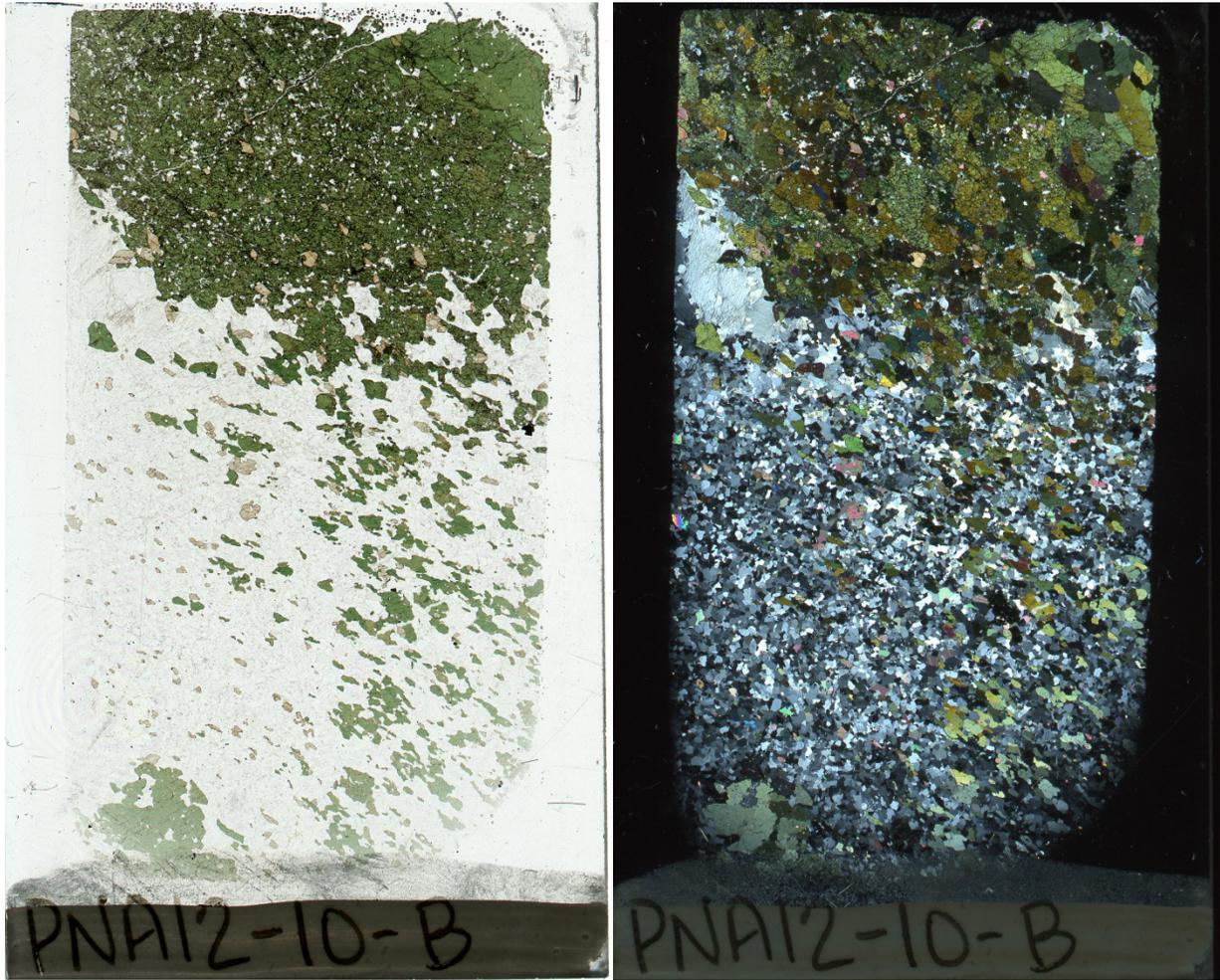
Petrography:

Granoblastic, anhedral texture. Scapolite alters to a fine-grained, brown, fibrous, birefringent mineral(s), largely in alteration halo next to fracture. Late quartz and tourmaline infill around grains. Vague suggestion of a fabric at high angle to compositional layering.

Autoradiograph: No detectable radioactivity.



PNA12-10B: Calc-Silicate Gneiss



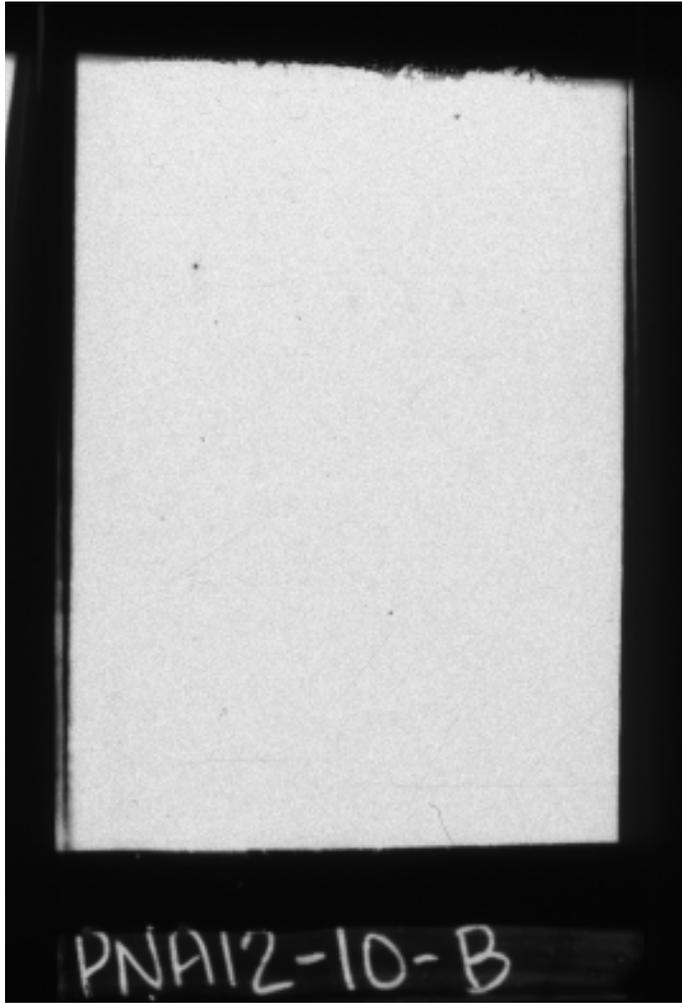
Mineralogy:

Quartz
Potassium Feldspar (Microcline,
Microperthite)
Plagioclase
Clinopyroxene (Aegerine?)
Titanite
Calcite
Accessory: Magnetite, Hematite, Pyrite

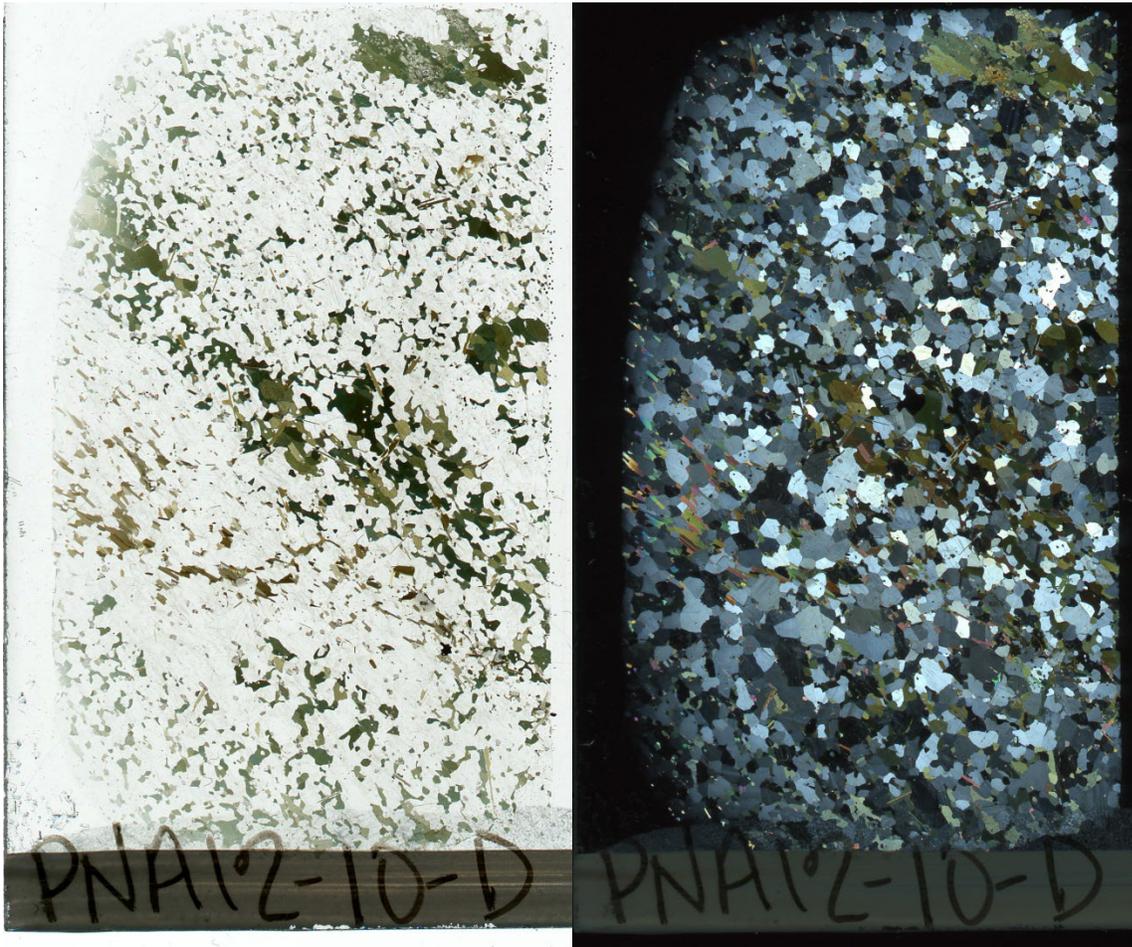
Petrography:

Granoblastic texture with no oriented fabric. Large euhedral titanite wedges, showing parting. Minor quartz shows undulose extinction. Green clinopyroxene is shot through with fine-grained hematite and larger magnetite. Feldspar and calcite in matrix are anhedral.

Autoradiograph: Faint spots indicate radioactive grains.



PNA12-10D: Mafic Gneiss



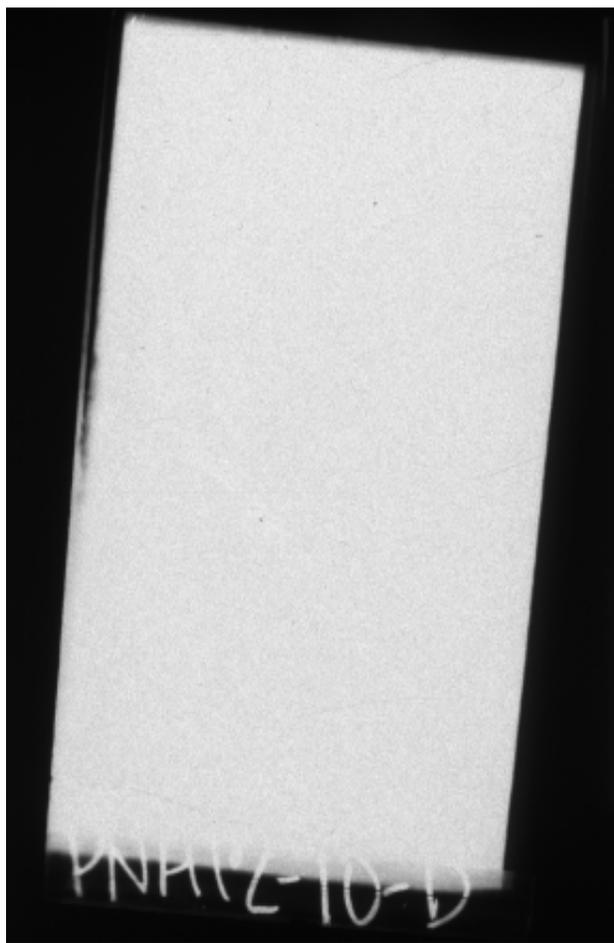
Mineralogy:

Quartz
Potassium Feldspar
Plagioclase
Ca-Amphibole
Clinopyroxene (Diopside)
Biotite
Accessory: Titanite, Calcite, Apatite, Zircon,
Fe-oxide, Tourmaline

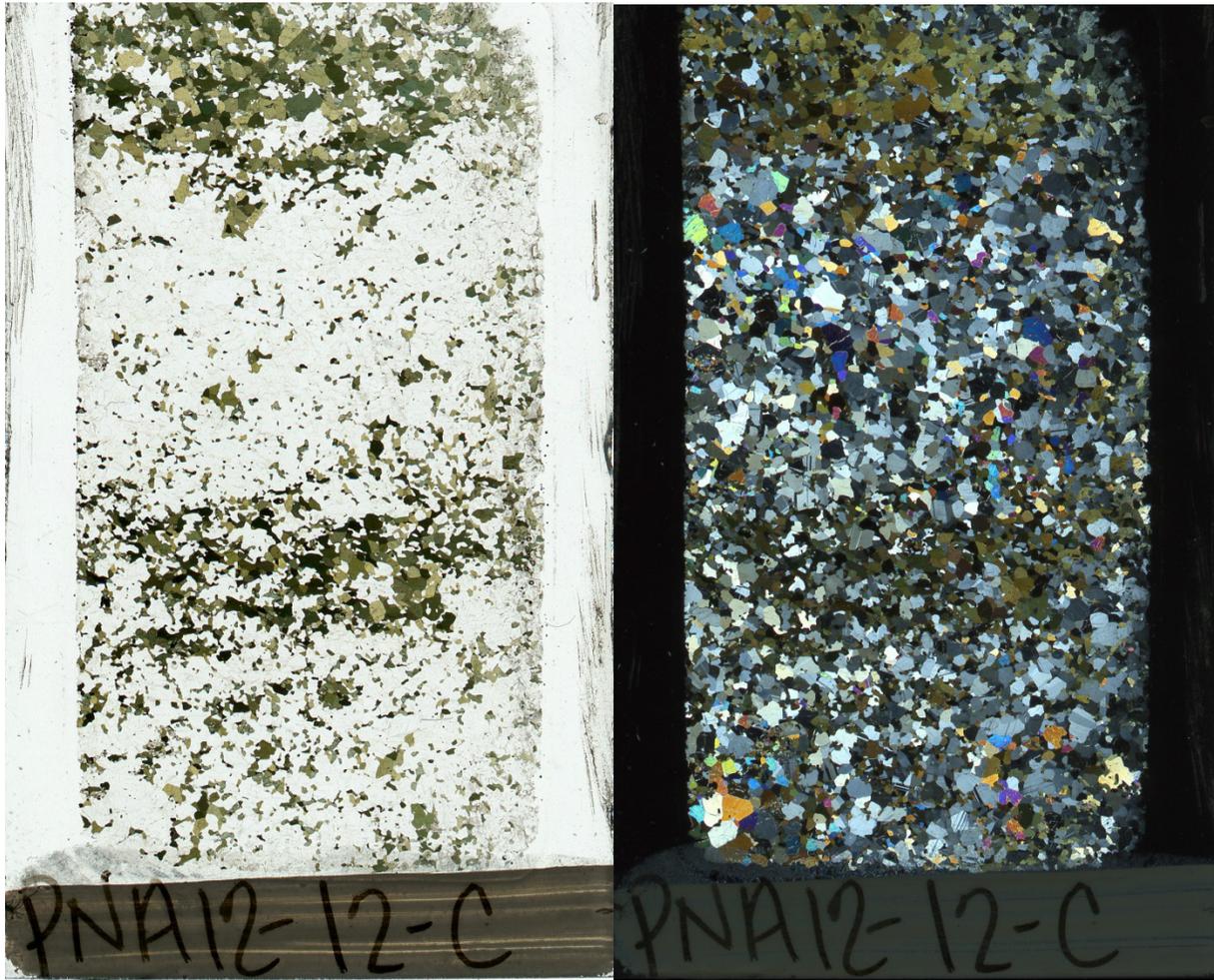
Petrography:

Layered, granoblastic to decussate textured.
Mafic bands of amphibole (hornblende to arfvedsonite), biotite and diopside, which are severely altered to a felted yellow/black mass. No obvious fabric.

Autoradiograph: No detectable radioactivity.



PNA12-12C: Calc-Silicate Gneiss



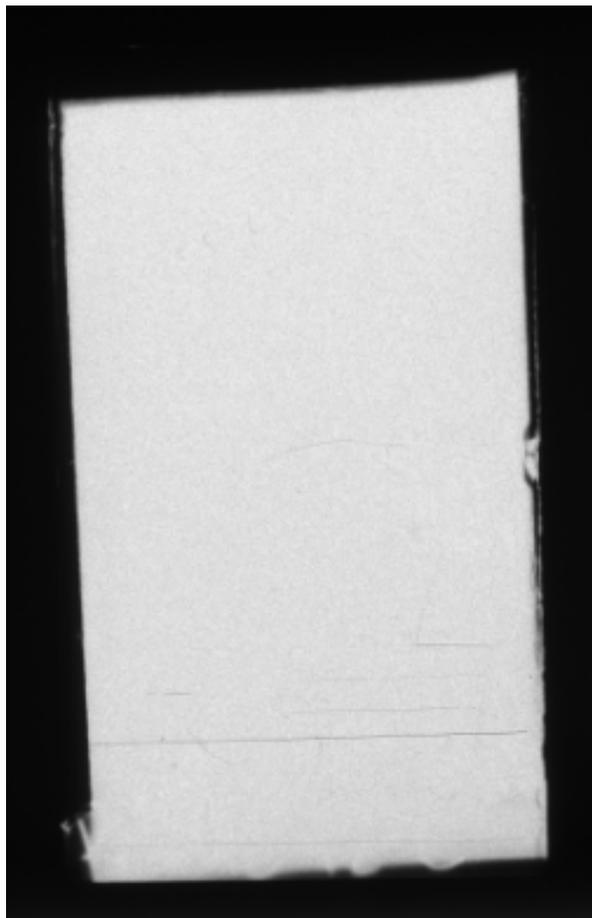
Mineralogy:

Ca-Amphibole
Clinopyroxene (Diopside)
Potassium Feldspar
Plagioclase
Scapolite
Titanite
Accessory: Apatite, Pyrite

Petrography:

Compositionally layered, medium-grained
with granoblastic texture.

Autoradiograph: No detectable radioactivity.



PNA12-12D: Layered Mafic Gneiss



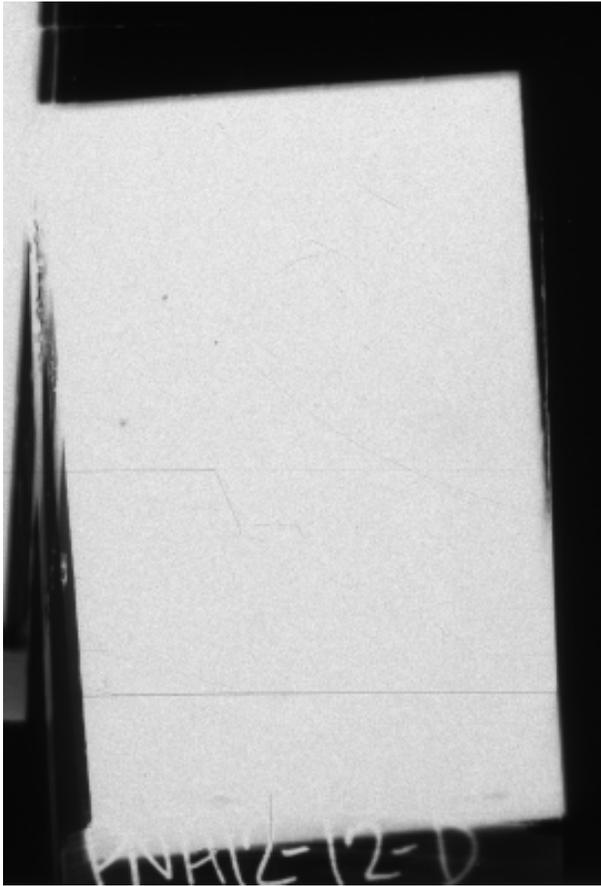
Mineralogy:

Quartz
Potassium Feldspar (Microcline)
Plagioclase Feldspar
Ca-Amphibole
Accessory: Titanite, Calcite, Fe-oxide

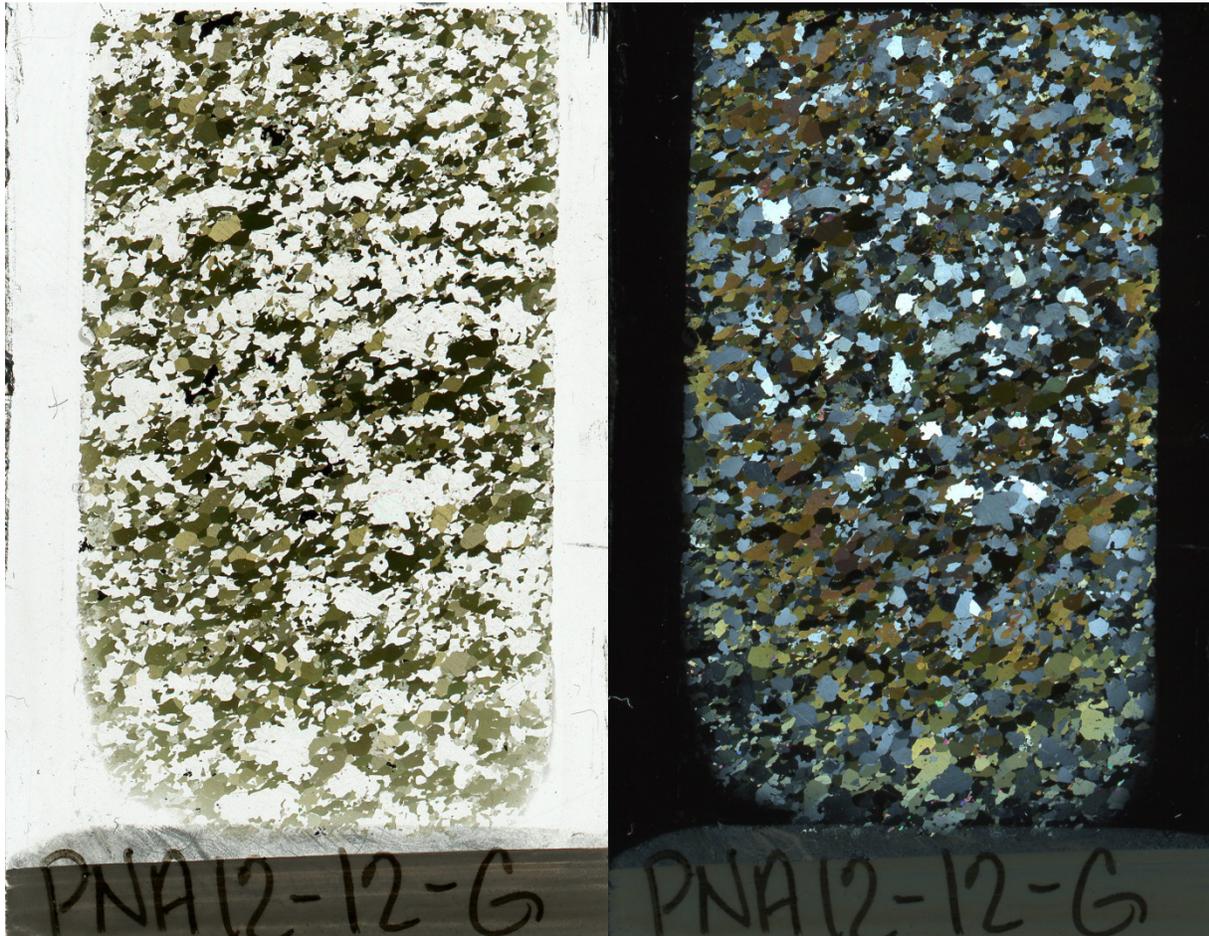
Petrography:

Layered, medium-grained granoblastic quartz and feldspar with coarser bands of mafic minerals: blue-green pleochroic amphibole possibly altered pyroxene.

Autoradiograph: Faint spots indicate radioactive grains.



PNA12-12G: Calc-Silicate Gneiss



Mineralogy:

Quartz
Potassium Feldspar
Plagioclase
Ca-Amphibole
Clinopyroxene (Diopside)
Scapolite
Titanite
Biotite
Accessory: Apatite, Zircon, Magnetite,
Pyrite

Petrography:

Medium-grained, granoblastic texture with a weak fabric.

Autoradiograph: No detectable radioactivity.

