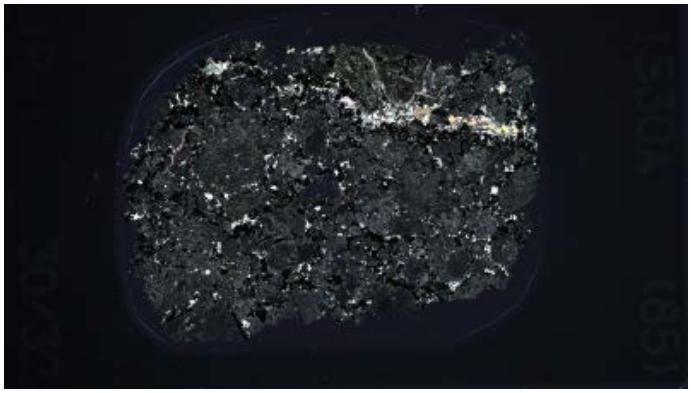
THIN SECTION LABEL ID: **376-U1530A-1R-1-W 30/32-TSB-TS_85** TS no.: 85

Description Group	Summaries
Igneous petrology:	Intensely altered volaniclastic rock. Relicts of clasts, one with open vesicles. No primary igneous phases or pseudomorphs recognizable.
Alteration:	A prominent brecciated texture with clearly distinguishable matrix and clasts. The matrix contains prolific pyrite and gypsum with minor alunite and silica. The clasts are clay rich compared to the matrix. Some clasts are variably replaced with gypsum, pyrite and silica. Primary vesicularity is maintained, and vugs are often rimmed by a white mineral. Pyrite is almost entirely limited to the matrix forming a stockwork mesh texture, very occasionally subhedral disseminations are visible in clasts. A prominent vein is noted containing a core of anhydrite, rim of gypsum and pyrite that is then overgrown by alunite.
Structure:	Vein network of pyrite. Vein crosscuts sample. At least one clast has a volcanic fabric defined by aligned vesicles, that are now filled.

Plane-polarized

47411911

Cross-polarized



47411931

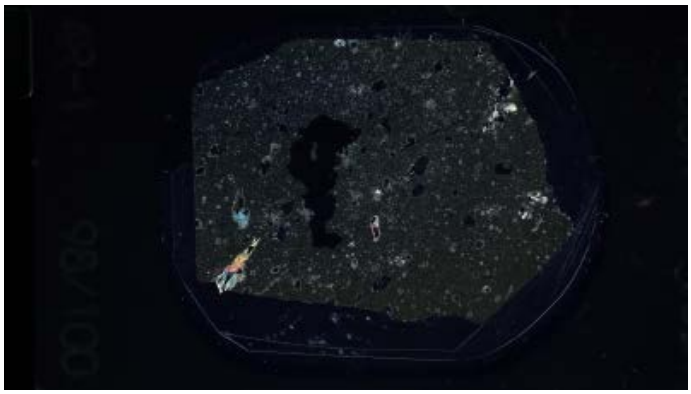
THIN SECTION LABEL ID: **376-U1530A-4R-1-W 98/100-TSB-TS_86** TS no.: 86

Description Group	Summaries
Igneous petrology:	This is a TS from a block/bomb within a lapillistone (or represents an intercalated lava flow). It is an altered, plagioclase-phyric lava. Embedded in a fine-grained matrix of secondary minerals, 5 vol% tabular plagioclase phenocrysts (average size 0.4 mm, maximum size 1 mm) are present albeit partially altered and often occur in glomerocrysts. Otherwise, all original igneous phases have been replaced and no statement can be made regarding the original igneous groundmass. Mostly spherical, infilled vesicles make up 10 vol%, with an average diameter of 0.2 mm and up to 1.4 mm long (largest ones are moderately elongated).
Alteration:	Greenish gray pervasive altered rock. No clast is distinguishable with matrix. This slide is dominated by chlorite-smectite, followed by illite (?), anhydrite and minor quartz, pyrite and apatite (?). Most of plagioclase phenocrysts are pseudomorphed by clay (illite?), but some plagioclase phenocrysts still persist. No crynopyroxene. There are many voids, typically 300 micrometer in diameter, filled with acicular clay (illite?). There are some thin veins of silica with anhydrite in 50 micrometer width, crosscutting void filling clay and plagioclase pseudomorph. Minor subhedral pyrite grains are disseminated throughout the sample, as well as tiny grains of apatite (?).
Structure:	Weakly defined volcanic fabric defined by vesicles (now filled by secondary phases). Few veins crosscut sample.

Plane-polarized

47459071

Cross-polarized

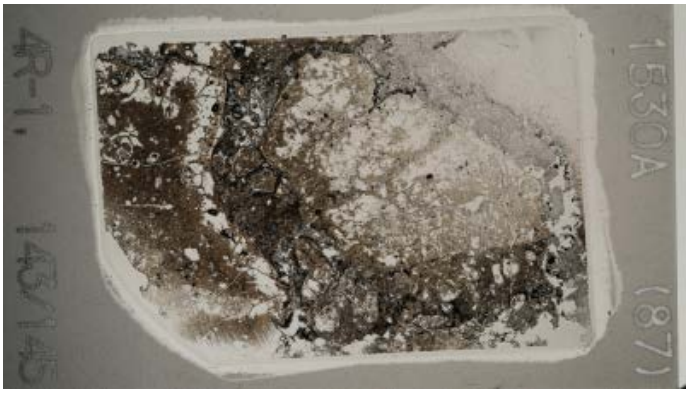


47459091

THIN SECTION LABEL ID: **376-U1530A-4R-1-W 143/145-TSB-TS_87** TS no.: 87

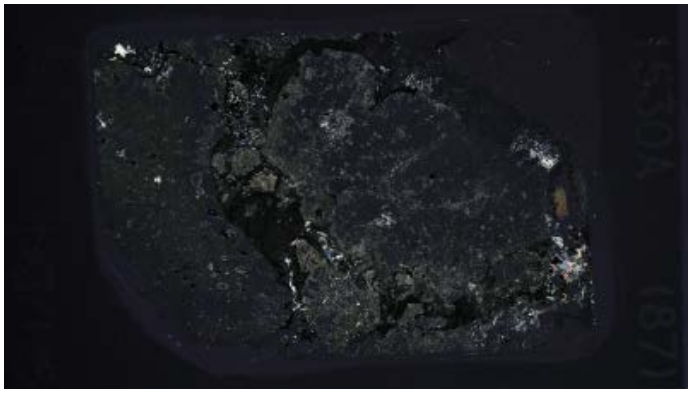
Description Group	Summaries
Igneous petrology:	Clast-supported, polymict lapillistone with blocks/bombs. Clasts and matrix are intensely altered and almost completely altered by secondary minerals. Texture of clasts is preserved as well as pseudomorphs after plagioclase as well as partially altered plagioclase; Plagioclase is usually completely altered at the margins but preserved some of its primary structure in the cores; Plag was likely a phenocryst phase similar to obsevrations in the ubiquitous Brothers dacites
Alteration:	Clasts and matrix are distinguishable. Clasts are more clay rich and commonly rimmed by a fine band of gypsum. Patchy anhydrite is intergrown with gypsum occurring prominently in one area. Pyrite is subhedral, forming discrete veins and local disseminated masses. Its a variably oxidized and resorbed in some areas forming Fe-oxyhydroxides. The occasional blade of alunite was also distinguished within clast material.
Structure:	Network veins through sample. A few discrete veins, especially along clast-matrix boundary.

Plane-polarized



47411951

Cross-polarized



47411971

THIN SECTION LABEL ID: **376-U1530A-5R-1-W 39/41-TSB-TS_88** TS no.: 88

Description Group	Summaries
Igneous petrology:	Clast-supported, polymict lapillistone. Clasts and matrix are intensely altered and completely altered by secondary minerals. No primary phases, pseudomorphs or textures (except for the shape of clasts) preserved. Clasts seem to be of softer material than matrix and most of them is lost during polishing.
Alteration:	Clear brecciated morphology with clasts distinguishable. Pyrite is abundant and localized in the matrix, it forms subhedral to euhedral coarse grains approximately 0.1 mm. The clast mineralogy is difficult to assess as its generally polished out, suggesting it was softer than the surrounding matrix and likely contained more clay. A large, coarse grained 0.7 mm anhydrite-pyrite vein cross cuts the sample. The remaining matrix material is green-grey in color and composed of silica and clay, no clear crystals distinguishable.
Structure:	Network veins throughout sample. Two discrete anhydrite veins cut sample.

Plane-polarized

47412011

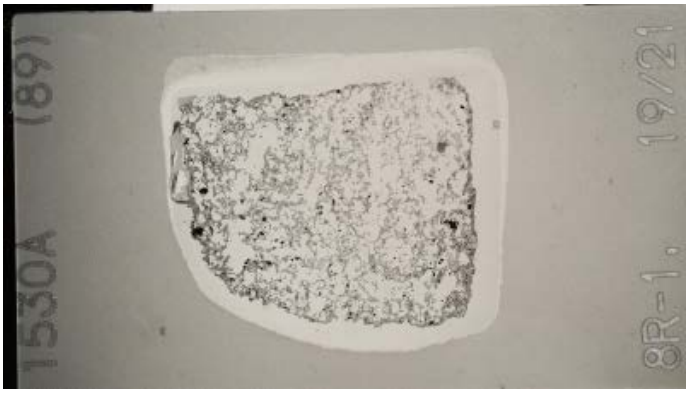
Cross-polarized

47412081

THIN SECTION LABEL ID: **376-U1530A-8R-1-W 19/21-TSB-TS_89** TS no.: 89

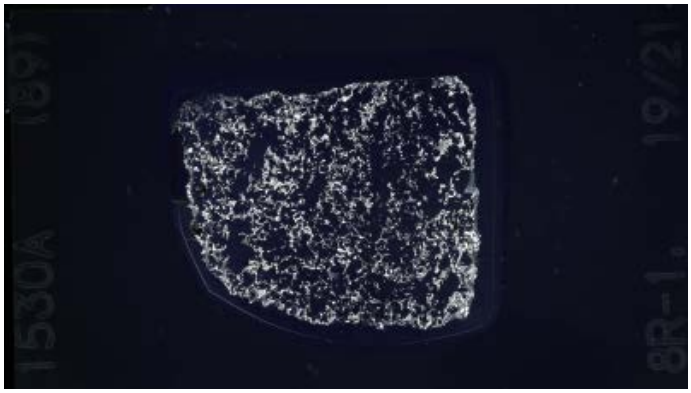
Description Group	Summaries
Igneous petrology:	Silty mudstone; Porous framework of crystalline silica phases; no igneous phases observed
Alteration:	Homogenous light greenish part of the pervasive altered rock. Polish quality is poor and most soft materials are lost during polishing. No clast is distinguishable with matrix. Only four minerals are identified; acicular clay mineral (smectite-chlorite?), silica (qtz?), alunite and pyrite. Silica-alunite-rich part occurs as the network shape enclosing the lost part during polishing. No veins in this slide and vug fillings are lost during polishing. Assuming the lost part as the clayish material, this slide is dominated by clay with silica and pyrite. Subhedral pyrite grains are disseminated throughout the sample.
Structure:	No structure.

Plane-polarized



47412171

Cross-polarized



47412211

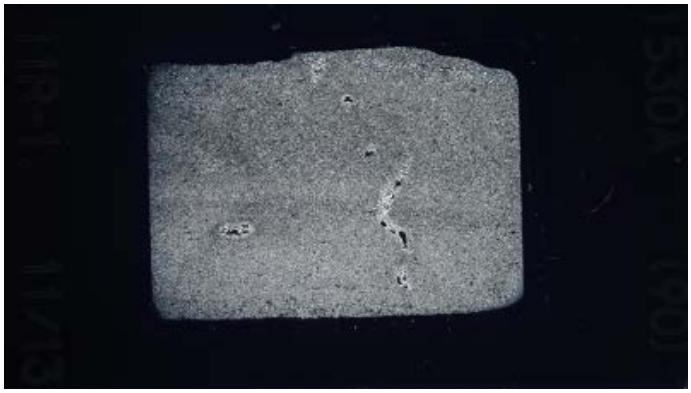
THIN SECTION LABEL ID: **376-U1530A-11R-1-W 11/13-TSB-TS_90** TS no.: 90

Description Group	Summaries
Igneous petrology:	Completely altered, well sorted siltstone composed of subangular clasts. Disseminated subhedral pyrite is present in the matrix. No primary igneous minerals or textures are present.
Alteration:	Homogenous light greenish gray part of the pervasive altered rock. No clast is distinguishable with matrix. Only four minerals are identified; acicular clay mineral (smectite-chlorite??), silica (qtz?), alunite and pyrite. This slide has a very homogenous texture only except for presence of some veins and vugs, filled with euhedral braded alunite. Subhedral pyrite grains are disseminated throughout the sample.
Structure:	No structure.

Plane-polarized

47412301

Cross-polarized



47412321

THIN SECTION LABEL ID: **376-U1530A-12R-1-W 28/30-TSB-TS_91** TS no.: 91

Description Group	Summaries
Igneous petrology:	Plagioclase-phyric volcanic lava is completely altered except for a few scattered pseudomorphs of silica and pyrite after plagioclase; No other texture is preserved, not igneous mineral phase is present
Alteration:	Matrix is altered by silica and a gray clay mineral. Prominent 0.2 mm vein filled by a thin layer of silica and anhydrite in the center. Phenocrysts are pseudomorphed by silica and pyrite. Vugs are filled with pyrite, alunite and minor magnetite.
Structure:	A few veins crosscut sample. One vein is thicker, filled with anhydrite. Anhydrite needles have a random orientation.

Plane-polarized

47412261

Cross-polarized

47412281

THIN SECTION LABEL ID: **376-U1530A-13R-2-W 29/31-TSB-TS_92** TS no.: 92

Description Group	Summaries
Igneous petrology:	A clast-supported lapillistone with vitric textures preserved in clasts. The matrix is intensely silicified, with no primary minerals remaining. There are three types of vitric clasts: (1) light brown with no flow texture, many contain perlitic fractures (88%); (2) dark brown "scoriaceous clasts" with aligned vesicles (10%); (3) light brown with a fluidal texture (2%). Unlike other volcanic clasts observed at this Site, the vitric clasts contain scarce phenocrysts and there is no evidence of glomerocrysts. Any remaining feldspars have been replaced by quartz.
Alteration:	Pervasive altered rock with light green clast and dark gray to green matrix. This slide is dominated by chlorite-smectite, illite, brownish clay, quartz, pyrite and minor anhydrite and apatite (?). Clast is less altered than matrix and often has a relict of perlitic texture. Clast has more abundant chlorite-smectite and brownish clay with less quartz and pyrite. Plagioclase phenocrysts and miclolites are pseudomorphed by chlorite-smectite and brownish clay. There are no veins and vugs are filled with quartz. Subhedral pyrites are disseminated throughout the sample, concentrated in the matrix. These pyrite grains often has framboidal shape. Tiny apatite (??) is also disseminated.
Structure:	Volcanic fabrics within individual clasts, no shared orientation. Vein network of quartz throughout the sample.

Plane-polarized

47459111

Cross-polarized

47459131

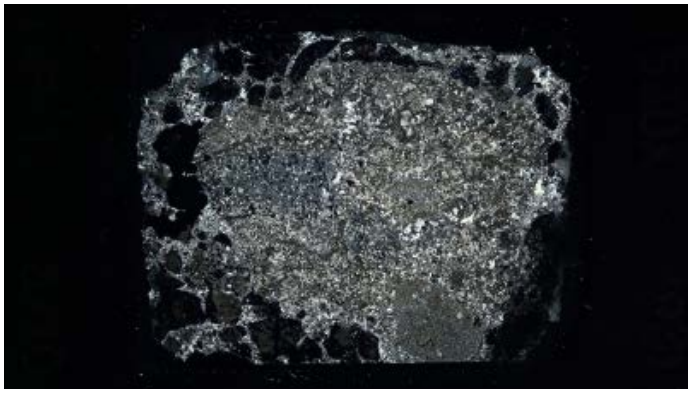
THIN SECTION LABEL ID: **376-U1530A-14R-1-W 8/10-TSB-TS_93** TS no.: 93

Description Group	Summaries
Igneous petrology:	This sample is a clast-supported polymict lapillistone. Captured in the thin section is a single clast (85% of slide) and minor groundmass surrounding the clast. The clast appears to have several textural and mineralogical domains, all appearing as a single clast. The clast is medium gray and a few pseudomorphs after plagioclase may remain. These, however, could be voids that resemble the tabular habit of plagioclase. The matrix is also completely altered and is replaced by secondary minerals such as quartz and clays. Abundant pyrite permeates the sample.
Alteration:	Pervasive altered rock with light green clast and dark gray to green matrix. This slide is dominated by chlorite-smectite, illite, quartz, pyrite and minor anhydrite and apatite (??). Light greenish clast has more abundant chlorite-smectite and lesser amounts of quartz, illite and pyrite compared with dark gray to greenish matrix. Plagioclase is almost pseudomorphed by quartz, but a few plagioclase phenocrysts still persist. Veins and vugs are filled with quartz and pyrite. Clast is often enclosed and cut by silica-pyrite-rich vein. Subhedral pyrites are disseminated throughout the sample, especially in the matrix, as well as tiny apatite (??) grains.
Structure:	Some volcanic clasts have weak volcanic fabrics. Network vein of quartz throughout sample.

Plane-polarized

47459151

Cross-polarized



47459191

THIN SECTION LABEL ID: **376-U1530A-15R-1-W 109/111-TSB-TS_94** TS no.: 94

Description Group	Summaries
Igneous petrology:	Subrounded clasts are completely altered, so that no primary minerals remain - however, the clasts appear distinct from the matrix in plane polarised light. The matrix is also completely altered and veins filled with secondary minerals crosscut the sample. No pseudomorphs or primary phenocrysts were observed, however there were voids that resemble the tabular habit of plagioclase.
Alteration:	TS appears to contain a clast and vein boundary. The clast is composed of microcrystalline silica and clay, likely higher amounts of silica relative to clay. Discrete areas with a tabular morphology are polished out, these may have contained pseudomoprhed plagioclase that were altered to clay. Pyrite is a minor phase in the clasts occurring as subhedral disseminated grains. Minor gypsum is also present in some vugs. In the veined area, material is much more fibrous suggesting increased clay (chlorite?) -alunite (?) component. Pyrite abundance increases, notably forming discontinuous veins.
Structure:	Clasts with volcanic fabric defined by fine, elongated glass pieces. Fabric orientation is distinct between clasts.

Plane-polarized

47412371

Cross-polarized

47412391

THIN SECTION LABEL ID: **376-U1530A-19R-1-W 42/44-TSB-TS_95** TS no.: 95

Description Group	Summaries
Igneous petrology:	This sample is a clast-supported, polymict lapillistone. The thin section capture one large volcanic clast that contains pseudomorphs after plagioclase phenocrysts and a few glomerocrysts. The phenocrysts/glomerocrysts (ave. 1 mm in size, max 1.75 mm) are euhedral to anhedral, and are completely altered to secondary minerals. The crystals make up 20% of the sample. The groundmass is completely altered to a very fine-grained matrix of clay or other secondary minerals. The sample has vesicles which make up 15% of the rock, filled with epoxy, irregular shape. A few veins cut through the section, and pyrite is disseminated throughout.
Alteration:	TS is from grayish altered part of the rock. Clasts are not distinguishable. The matrix is replaced by silica and a grayish clay minerals. Plagioclase is pseudomorphed by alunite and pyrite. Pyrite is infilling small veinlets in association with silica.
Structure:	Volcanic fabric defined by vesicles (filled) and plagioclase (altered) phenocrysts. Some discontinuous veins crosscut sample.

Plane-polarized

47412411

Cross-polarized

47412431

THIN SECTION LABEL ID: **376-U1530A-24R-1-W 70/73-TSB-TS_96** TS no.: 96

Description Group	Summaries
Igneous petrology:	Subangular clasts are completely altered, so that no primary textures or minerals remain - however, the clasts appear distinct from the matrix in plane polarised light. The matrix is also completely altered and veins filled with secondary minerals crosscut the sample. No pseudomorphs or primary phenocrysts were observed.
Alteration:	Greenish gray pervasive altered rock with many pyrite network veins. No clast is distinguishable with matrix. This slide is dominated by chlorite with quartz, illite, pyrite and minor apatite (??). Pyrite-rich part is rounded shape dark green chlorite-illite rich part. Chlorite is often associated with granular quartz. There are no veins in this slide and vugs are filled with quartz. Subhedral pyrite grains are disseminated throughout the sample as well as tiny amounts of apatite (??).
Structure:	Individual volcanic clasts have distinctly oriented volcanic fabrics defined by elongated glass fragments. Network vein of pyrite formed between clasts.

Plane-polarized

47412501

Cross-polarized

47412541

THIN SECTION LABEL ID: **376-U1530A-27R-1-W 86/88-TSB-TS_97** TS no.: 97

Description Group	Summaries
Igneous petrology:	Matrix-supported monomict lapilli-tuff. Possibly blurred subrounded (?) clast textures by higher amount of clay in quartz-cemented matrix; a few euhdral completely replaced plagioclases. Thoroughly and pervasively altered and cemented (clay, quartz, sulfide).
Alteration:	Grayish alteration type. No relict primary features. The matrix is replaced by gray clay minerals and silica. Around vugs, the matrix color is darker than regularly and richer in clay minerals. Vugs are partly filled with alunite. Pyrite is disseminated in the matrix and appears as vein infill.
Structure:	Some volcanic clasts have a volcanic fabric defined by vesicles and plagioclase phenocrysts (altered). Few discontinuous veins through sample.

Plane-polarized

47459211

Cross-polarized

47459231

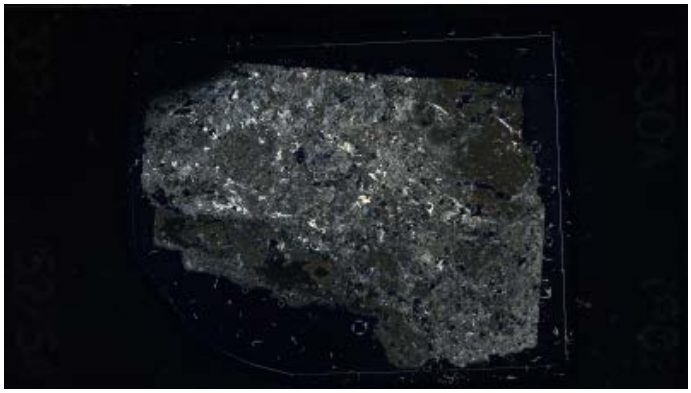
THIN SECTION LABEL ID: **376-U1530A-30R-1-W 52/54-TSB-TS_98** TS no.: 98

Description Group	Summaries
Igneous petrology:	Matrix-supported monomict lapilli-tuff. Residual clastic texture still recognizable, and subangular (?) and vesicular (?) nature of some clasts. Any other volcanic features has vanished. Thoroughly and pervasively altered and cemented (clay, quartz, sulfide).
Alteration:	The matrix is replaced by silica and clay minerals (chlorite and minor smectite). Veins are filled with Fe oxyhdroxides and minor gypsum. Pyrite forms fine disseminated subhedral grains. Some clasts remain visible.
Structure:	Few, discontinuous veins.

Plane-polarized

47459251

Cross-polarized



47459271

THIN SECTION LABEL ID: **376-U1530A-31R-1-W 12/15-TSB-TS_99** TS no.: 99

Description Group	Summaries
Igneous petrology:	Matrix-supported monomict lapilli-tuff. No primary textures identifiable. Possibly blurred subrounded (?) clast textures by higher amount of clay in matrix; possibly very indistinct plagioclase?. Thoroughly and pervasively altered and cemented (clay, quartz, sulfide).
Alteration:	The matrix is replaced by silica and patches of smectite, alunite and chlorite with a relict perlitic texture. Some clasts are still distinguishable. Pyrite is higher enriched if alunite is also abundant. Locally, Fe-oxyhdroxides appears.
Structure:	Some volcanic clasts have a discernable volcanic fabric. Few discontinuous veins.

Plane-polarized

47459291

Cross-polarized

47459311

THIN SECTION LABEL ID: **376-U1530A-38R-1-W 42/44-TSB-TS_100** TS no.: 100

Description Group	Summaries
Igneous petrology:	Altered volcaniclastic with barely any primary textures identifiable. Possibly blurred subrounded (?) clast textures. Thoroughly and pervasively altered and cemented (clay, quartz, sulfide).
Alteration:	Matrix and clasts are extremely hard to distinguish. Silica overprint is well developed in both clast and matrix. Silica forms aggregates of more coarse interlocking grains but generally is intergrown with a green-grey clay phase (chlorite-smectite?). Pyrite is abundant occurring as subhedral disseminations. Occasionally aggregates form rimming a whitish-red phase, likely leucoexe. No anhydrite was observed.
Structure:	Some volcanic clasts have a discernable volcanic fabric.

Plane-polarized

47459331

Cross-polarized

47459351

THIN SECTION LABEL ID: **376-U1530A-39R-1-W 32/34-TSB-TS_101** TS no.: 101

Description Group	Summaries
Igneous petrology:	Altered volcaniclastic (lapilli-tuff) with relict volcanic clasts; plagioclase (about 3 vol.%) is preserved as pseudomorphs, all other primary igneous phases or textures are lost; rock is completely altered by secondary minerals
Alteration:	Patchy veins of silica with clay rich 'clasts' barely distinguishable in PPL/XPL but clearly visible in reflected light. The matrix is characterized by coarse grains of quartz with disseminated pyrite and leucoxene after Ti magnetite. Rarely, magnetite is rimmed by, and progressively replaced by pyrite. Smectite is patchy throughout and associated in many cases with aggregates of pyrite. Pyrite is most abundant in the matrix but also sparsely disseminated in clast material.
Structure:	Some volcanic clasts have volcanic fabrics defined by vesicles (now filled) and plagioclase (altered). Few discontinuous veins and network veins of quartz.

Plane-polarized

47459371

Cross-polarized

47459391

THIN SECTION LABEL ID: **376-U1530A-39R-2-W 77/79-TSB-TS_102** TS no.: 102

Description Group	Summaries
Igneous petrology:	Altered volcaniclastic rock. There are no igneous nor volcaniclastic textures remaining in the thin section. All original phases have been replaced by secondary minerals such as quarz. One tabular shape (1.1 mm) might be a (relic of a) pseudomorph after a plagioclase phenocryst.
Alteration:	Brecciated texture with clasts of patchy smectite, chlorite and quartz. The matrix comprises crystalline silica and disseminated pyrite. Within clasts clear interlayering of smectite with silica and grey-green clay phases is observed. Fe oxyhdroxides occur as a trace phase throughout. Fresh magnetite, magnetite rimmed by pyrite and leucoxene are observed at various stages in in the pseudomoprhing process. Coarse silica is limited to veins but microcrystalline silica is pervasively intergrown with clays in clasts.
Structure:	Networks veins of opaque minerals and quartz.

Plane-polarized

47459411

Cross-polarized

47459431

THIN SECTION LABEL ID: **376-U1530A-44R-1-W 85/88-TSB-TS_103** TS no.: 103

Description Group	Summaries
Igneous petrology:	Altered volcaniclastic rock. There are no igneous nor volcaniclastic textures remaining in the thin section. All original phases have been replaced by secondary minerals, mostly quarz. The TS is cut by veins containing quarz and pyrite. There are finer-grained patches surrounded by coarser grained quarz crystals, which may represent relics of clasts.
Alteration:	Pervasive altered volcanic rock across light green clast and dark gray irregular shape matrix, with one quartz-pyrite vein of 1.5 mm-width cutting the entire sample. This slide is dominated by illite, chlorite-smectite, quartz, pyrite with minor magnetite and apatite (?). Clast is replaced by chlorite-smectite and illite with quartz, but matrix consists of illite, quartz and pyrite. Chlorite-smectite is more abundant in clast, and quartz, pyrite and illite is more abundant in matrix. No plagioclase and crynopyroxene phenocrysts/pseudomorphs. Vugs and veins are filled with quartz and pyrite. Anhedral pyrite grains are disseminated throughout the sample, with minor magnetite showing spinel-like texture and very minor apatite (?).
Structure:	Branching, irregular veins of pyrite and quartz.

Plane-polarized

47459451

Cross-polarized

47459471

THIN SECTION LABEL ID: **376-U1530A-46R-1-W 98/101-TSB-TS_104** TS no.: 104

Description Group	Summaries
Igneous petrology:	Altered volcaniclastic with a single relict volcanic clast; scattered pseudomorphs after plagioclase and some remnants of Fe-Ti oxides, all other primary igneous phases or textures are lost; rock is completely altered by secondary minerals (clay, silica, allunite?, anhydrite, pyrite)
Alteration:	Pervasive altered light gray rock with some black and white dots. No clast is distinguishable with the matrix. This slide is dominated by illite, chlorite-smectite, quartz and pyrite with minor anhydrite, gypsum and magnetite. No plagioclase and crynopyroxene phenocrysts/pseudomorphs. The black and white dots are composed of pyrite and amorphous silica, respectively. Veins are filled with quartz and pyrite. Vugs are filled with quartz, illite and minor anhydrite. Subhedral pyrite grains are disseminated throughout the sample, with minor magnetite.
Structure:	Few discontinuous veins of quartz.

Plane-polarized

47459491

Cross-polarized

47459511

THIN SECTION LABEL ID: **376-U1530A-49R-2-W 10/14-TSB-TS_105** TS no.: 105

Description Group	Summaries
Igneous petrology:	Altered volcanic rock. No primary volcanic textures left. Recrystallized quartz, dissected by veins rich n clay mineral, pyrite and some anhydrite forming patchy, mottled texture.
Alteration:	Pervasive altered light gray rock. No clast is distinguishable with the matrix. This slide is composed of illite, quartz, pyrite and anhydrite. The rock is pervasively replaced by these minerals, but there are some vein-like textures filled with illite, quartz and anhydrite. There are often rounded area mainly composed of illite and pyrite (relict of clast?), which are surrounded by quartz-rich part (matrix origin?). No plagioclase and crynopyroxene phenocrysts/pseudomorphs. No clear vugs and veins structures. Euhedral relatively large pyrite grains (typically 200 micrometer) are disseminated throughout the sample.
Structure:	Discrete vein with fine grained anhydrite and coarser grained quartz. Quartz fills the median of the vein indicating it is younger than anhydrite.

Plane-polarized

47459531

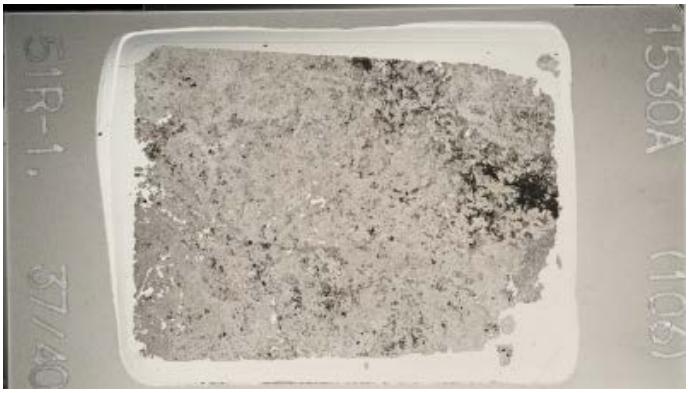
Cross-polarized

47459551

THIN SECTION LABEL ID: **376-U1530A-51R-1-W 37/40-TSB-TS_106** TS no.: 106

Description Group	Summaries
Igneous petrology:	Altered volcanic rock. No primary volcanic textures left. Rich in recrystallized quartz and clay and other secondary minerals, forming patchy, mottled texture that once could have been (volcanic?) clasts embedded into a matrix. Disseminated pyrite.
Alteration:	Pervasive altered light gray rock with some white patches. No clast is distinguishable with matrix. This slide is dominated by illite, quartz, chlorite-smectite, amorphous silica, anhydrite, pyrite and minor apatite (?). Illite/chlorite-smectite and anhydrite are closely associated and interspaces are filled with granular quartz. Some white patches are filled with brownish amorphous silica (?). No plagioclase and crynopyroxene phenocrysts/pseudomorphs. Veins and vugs are filled with illite and anhydrite, often crosscutting quartz - rich part. Subhedral pyrite grains are disseminated throughout the sample with very minor apatite (?).
Structure:	Network veins of quartz and anhydrite.

Plane-polarized



47459571

Cross-polarized

47459591

THIN SECTION LABEL ID: **376-U1530A-53R-1-W 126/128-TSB-TS_107** TS no.: 107

Description Group	Summaries
Igneous petrology:	Altered volcanic rock. All igneous phases have been replaced by secondary minerals, mostly quartz. The shape of some larger quartz crystals suggests that they may represent pseudomorphs after plagioclase phenocrysts, but this is uncertain. The sample contains some vugs, but these are probably not original vesicles. All igneous or volcanic textures are lost and there is no clastic texture recognizable.
Alteration:	Pervasive altered light yellowish gray rock with some white patches and black dots. No clast is distinguishable with the matrix. This slide is dominated by silica (quartz and minor chalcedony?), anhydrite, illite with minor gypsum and magnetite. No pyrite, as well as no plagioclase and crynopyroxene phenocrsts/pseudomorph. White patches are filled with coarse-grained anhydrite with illite. The other parts are replaced by granular silica and its interspaces are filled with anhydrite-illite-network veins. Very minor magnetite is disseminated.
Structure:	No structure.

Plane-polarized

47459611

Cross-polarized

47459631

THIN SECTION LABEL ID: **376-U1530A-55R-1-W 61/63-TSB-TS_108** TS no.: 108

Description Group	Summaries
Igneous petrology:	Altered volcanic rock. All igneous phases have been replaced by secondary minerals, mostly quartz. The sample contains some vugs, but these are probably not original vesicles. All igneous or volcanic textures are lost and there is no clastic texture recognizable.
Alteration:	Silica rich with clear patches of clay. Quartz forms patchy discontinuous veins intercalated with more clay rich zones. Pyrite is sparse and associated mainly with clay rich patches. The section is cut by a prominent fine grained anhydrite vein that is barren of any pyrite. Pyrite forms subhedral disseminated blebs which occasionally exhibit oxidation at grain margins. Additionally, anhydrite occurs as a late overprint occurring as discrete grains within clay and quartz.
Structure:	One discrete vein filled with fine grained anhydrite cuts through quartz-rich host rock. Seems to crosscut earlier, diffuse clay and pyrite vein.

Plane-polarized

47459651

Cross-polarized

47459671

THIN SECTION LABEL ID: **376-U1530A-57R-1-W 78/80-TSB-TS_109** TS no.: 109

Description Group	Summaries
Igneous petrology:	Altered volcanic rock. All igneous phases have been completely replaced by quartz and other alteration minerals. No igneous or volcanic textures remain, no clastic texture recognizable.
Alteration:	Pervasively and intensely silicified. Silica, likely quartz, varies substantially in grain size but always forms interlocking aggregates that form the dominant matrix phase. Clay, pinkish brown in color (illite?) has a patchy texture and occurs intergrown with quartz. Pyrite is sparse, occurring as large subhedral grains unusually associated with clay and anhydrite. Fine-grained anhydrite occurs intergrown with clay forming discrete clusters, it is occasionally coarse grained forming euhedral bladed crystals.
Structure:	No structure.

Plane-polarized

47459691

Cross-polarized

47459711

THIN SECTION LABEL ID: **376-U1530A-60R-1-W 69/71-TSB-TS_110** TS no.: 110

Description Group	Summaries
Igneous petrology:	Altered plagioclase phyric lava. All igneous phases have been replaced by secondary minerals, mostly quartz. There are 5 vol% quartz pseudomorphs after plagioclase present (average 0.5mm, up to 1mm), often in glomerocrysts. About 10 vol% of larger quartz crystals that grew in rounded, spherical shapes suggest that they represent infilled original vesicles (average 0.4mm, up to 2.4mm; the largest ones being only partly infilled). There are also larger quartz crystals present that appear to have grown into elongated vugs/vesicles (up to 4mm long). The thin section appears massive with no clastic texture, suggesting a coherent piece of lava.
Alteration:	Pervasive altered green rock with some vug fillings. No clast is distinguishable with matrix. This slide is dominated by chlorite-smectite, silica (quartz and chalcedony?), illite and minor pyrite. Plagioclase phenocryst is completely pseudomorphed by silica and illite. The sample is pervasively replaced by fine-grained chlorite-smectite and silica, but silica occurring as plagioclase replacement and vug filling is relatively coarse-grained. Vugs are filled with silica with minor illite. There are two thin illite-veins (0.1 mm width) cutting chlorite-smectite-rich part. Subhedral minor pyrite is disseminated.
Structure:	Filled vugs potentially define a volcanic fabric. Thin, discrete clay veins crosscut sample.

Plane-polarized

47459731

Cross-polarized

47459751

THIN SECTION LABEL ID: **376-U1530A-62R-1-W 117/119-TSB-TS_111** TS no.: 111

Description Group	Summaries
Igneous petrology:	Altered volcanic rock. Larger spherical cavities filled with quartz and other secondary minerals (anhydrite) that very likely once were vesicles (0.5 to 1 mm diameter). A few mm-sized crystal shaped structures that might once have been plagioclase. Groundmass fine-grained, recrystallized with quartz and clay minerals and is now massive. Sparsely disseminated pyrite.
Alteration:	No relict primary phases. The matrix is replaced by silica and illite. Locally, coarser grains (0.3 mm) of chalcedony appear. Phenocrysts are pseudomorphed by illite and silica. Vugs and veinlets are filled with anhydrite. Pyrite is very minor, but sometimes appears disseminated in the matrix.
Structure:	No structure.

Plane-polarized

47459771

Cross-polarized

47459791

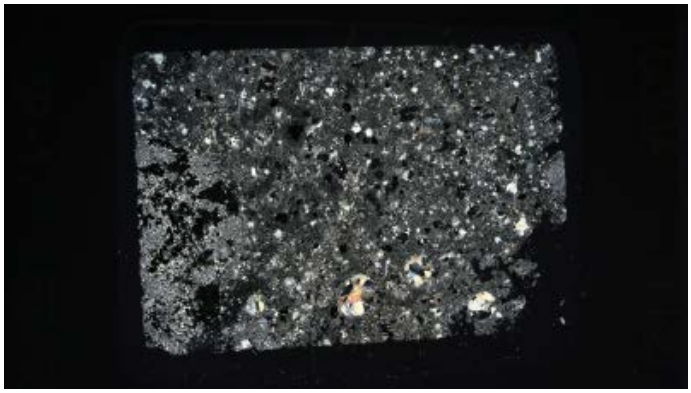
THIN SECTION LABEL ID: **376-U1530A-65R-1-W 53/56-TSB-TS_112** TS no.: 112

Description Group	Summaries
Igneous petrology:	Altered volcanic rock (90%) with clast (10%). Volcanic rock is vesicular and plagioclase-phyric (10 vol%) with up to 2 .5 mm large plagioclase. Plagioclase completely pseudomorphed and only recognizable from euhedral form (sometime void or broken out). Vesicles are spherical, ca. 2 mm in diameter, and filled with radial, undulating quartz and anhydrite. Recrystallized groundmass massive with quartz, chlorite and clay minerals. Clast consists of recrystallized quartz withoutn indication of origin. Abundant disseminated pyrite with sphalerite inclusions.
Alteration:	Patchy quartz and clay rich areas. Quartz rich areas are associated with abundant subhedral to euhedral pyrite forming aggregates as discrete very fine veinlet's. Pyrite hosts numerous inclusion both silica and sphalerite. In the non silicified zone surrounding the quartz dominant area pyrite is inclusion rich but only with anhydrite and quartz. Progressively the matrix becomes less pervasively silicified and more clay (chlorite) rich. Pyrite remain disseminated but forms finer generally euhedral grains, it is inclusion poor. Quartz is limited to vugs (vesicles?) and forms coarse grains exhibiting radial extinction. Anhydrite commonly infills the center of vugs and is occasionally finely intergrown with silica in the groundmass. .
Structure:	Several, thin, discontinuous quartz veins.

Plane-polarized

47459811

Cross-polarized



47459831

THIN SECTION LABEL ID: **376-U1530A-66R-1-W 52/54-TSB-TS_113** TS no.: 113

Description Group	Summaries
Igneous petrology:	Completely altered volcanic rock. No primary igneous textures or minerals remain. Poorly polished/altered grains of Fe-Ti oxide are present in the granular quartz-rich matrix, but based on their texture, they are more likely to be secondary Fe-Ti oxide than primary Fe-Ti oxide.
Alteration:	Massive texture and pervasively silicified. Section is composed of interlocking quartz crystals that vary from coarse to fine grained. Anhydrite is disseminated throughout and is generally fine grained although, larger grains locally infill and are commonly associated with areas of coarse grained quartz. Sulfides form a trace phase with minor magnetite (altered-altering to leucoxene), sphalerite and euhedral pyrite. Quartz is inclusion rich.
Structure:	No structure.

Plane-polarized

47499941

Cross-polarized

47499961

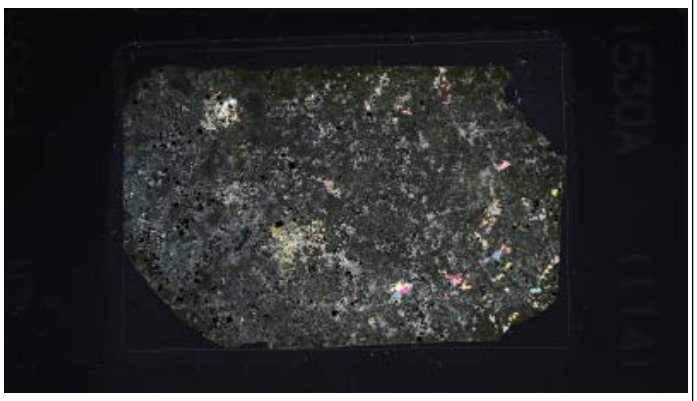
THIN SECTION LABEL ID: **376-U1530A-69R-1-W 10/12-TSB-TS_114** TS no.: 114

Description Group	Summaries
Igneous petrology:	Completely altered volcanic rock. No primary igneous textures or minerals are preserved. The matrix contains a mottled to patchy texture from the alteration overprint. Many vugs are present, all are completely filled.
Alteration:	Pervasive altered green rock. No clast is distinguishable with matrix. This slide is dominated by chlorite-smectite, amorphous silica, illite, anhydrite, pyrite and minor gypsum. Chlorite-smectite is the most dominant mineral and its interspaces are filled with amorphous silica and illite network, as well as coarse anhydrite filling vugs. No plagioclase and crynopyroxene phenocrysts. Plagioclase is completely pseudomorphed by anhydrite. There are also no clear veins and vugs are filled with anhydrite and gypsum. Eubhedral pyrite grains are disseminated throughout the sample.
Structure:	No structure.

Plane-polarized

47459891

Cross-polarized



47459871

THIN SECTION LABEL ID: **376-U1530A-74R-1-W 89/91-TSB-TS_115** TS no.: 115

Description Group	Summaries
Igneous petrology:	Completely altered volcanic rock. No primary igneous textures or minerals remain. Up to 1mm grains of Fe-Ti oxide are present in the quartz and clay-rich matrix, but based on their texture (with inclusions of clay minerals), they are more likely to be secondary Fe-Ti oxide than primary Fe-Ti oxide.
Alteration:	Clear transition in modal mineral abundance and texture across thin section. One area is dominated by crystalline equigranular quartz that is uniformly intergrown with illite. Pyrite is rare occurring as subhedral coarse grains with disseminated anhydrite + minor barite (?). In other areas silica is intergrown with pyrophyllite (?) and is microcrystalline and crosscut by a network of oxidised clay rich veins and pyrite appears more abundant. Separating the two distinct morphologies is a zone of anhydrite rich material.
Structure:	Very thin vein of gypsum and quartz in one half of TS. Other part of TS is cm-thick vein of anhydrite and quartz. Gypsum-quartz vein is crosscut by anhydrite-quartz vein.

Plane-polarized

47499981

Cross-polarized

47500001

THIN SECTION LABEL ID: **376-U1530A-81R-1-W 77/79-TSB-TS_116** TS no.: 116

Description Group	Summaries
Igneous petrology:	This is an altered volcaniclastic rock with a somewhat obvious pinkish clast surrounded my grey-green matrix. The clast has slightly different mineralogy, color and texture from the matrix giving it a volcaniclastic texture. The clast and matrix are completely bereft of primary igneous minerals and textures besides the possible clast/matrix appearance.
Alteration:	Thin section contains a distinct pinkish clast with green-grey matrix. The matrix material contains relatively higher concentrations of chlorite and pyrite compared to the clast material. Pyrite is subhedral and often associated with disseminated anhydrite. The matrix appears to be intergrown clay (illite?) with chlorite and microcrystalline (to coarse in areas) quartz. The clast contains no pyrite and has a fibrous texture. The cause of the pink coloration is not clear, some areas appear green to brown in color but all are intergrown with silica. In some distinct areas surrounding the clast bands are visible, foliated areas of clay are overprinted by pyrite and anhydrite.
Structure:	Volcanic clasts look to have a volcanic fabric, now pseudomorphed by secondary phases.

Plane-polarized

47500021

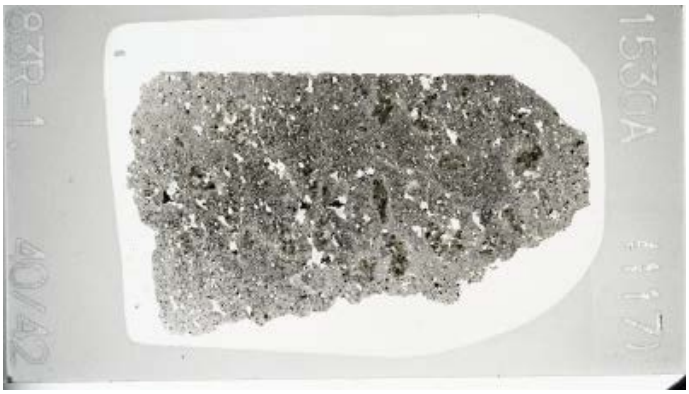
Cross-polarized

47500091

THIN SECTION LABEL ID: **376-U1530A-83R-1-W 40/42-TSB-TS_117** TS no.: 117

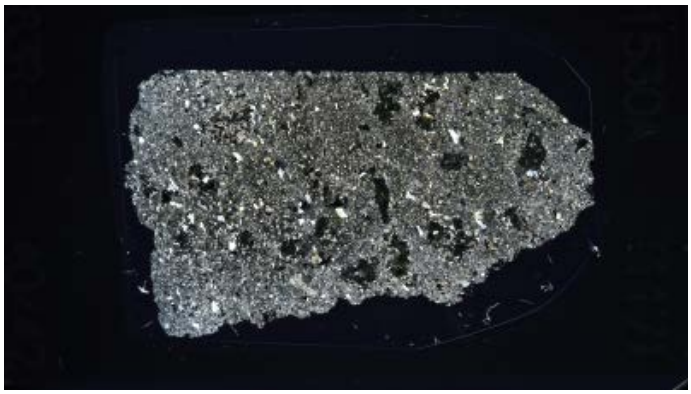
Description Group	Summaries
Igneous petrology:	Altered volcanic lava. Nearly completely altered phyric lava, with relics of mm-large completely replaced euhedral subequant to tabular plagioclase phenocrysts and glomerocrysts or crystal clots (ca. 10 vol). Pervasively impregnated by quartz anhydrite, pyrite and clay minerals.
Alteration:	Matrix comprises intergrown clay and quartz that is overgrown by pyrite. Generally the matrix is 50-50% clay and silica but locally exhibits a patchy appearance where either clay or silica is dominant. Chalcedony is the dominant vug infill phase. Vey rarely silica was observed overprinting and resorbing pyrite. Pyrite occurs abundantly throughout as subhedral to euhedral disseminated grains. Lattice shaped skeletal areas are commonly associated with clay rich patches- these appear to be the product of the progressive breakdown of titanomagnetite > pyrite + leucoxene leaving a skeletal network of semi-opaque material behind, these are commonly overprinted by pyrite. Plagioclase pseudomorphs (very rare) occur, usually infilled with illite-smectite and a white fibrous mineral (pyrophillite?).
Structure:	No structure.

Plane-polarized



47500111

Cross-polarized



47500131

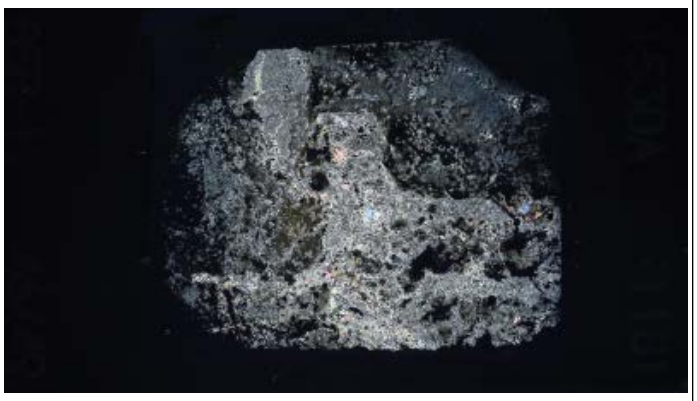
THIN SECTION LABEL ID: **376-U1530A-85R-1-W 47/49-TSB-TS_118** TS no.: 118

Description Group	Summaries
Igneous petrology:	Altered volcaniclastic. Relic 'clastic' textures with unidentifiable clay-rich angular patches partially replaced and cross-cut by quartz-rich, anhydrite-bering veins. Original material probably volcanic, but no primary volcanic features are left. Rather hydrothermal than primary brecciation. Anhydrite-rich vugs.
Alteration:	Pervasive altered volcanic rock with light gray to light grayish pink clast and gray to dark gray irregular shaped matrix. Clast is replaced by illite, amorphous silica and pyrite. Matrix consists of quartz, anhydrite, pyrite and minor gypsum. No plagioclase and crynopyroxene phenocrysts/pseudomorphs. Quartz in matrix is fine-grained, but quartz-anhydrite vein often crosscutting matrix and clast is coarse-grained. This coarse-grained quartz-anhydrite vein is also cut by thin anhydrite-pyrite vein, suggesting at least three stages of alteration. Subhedral pyrite grains are disseminated throughout the sample.
Structure:	No structure.

Plane-polarized

47500151

Cross-polarized



47500171

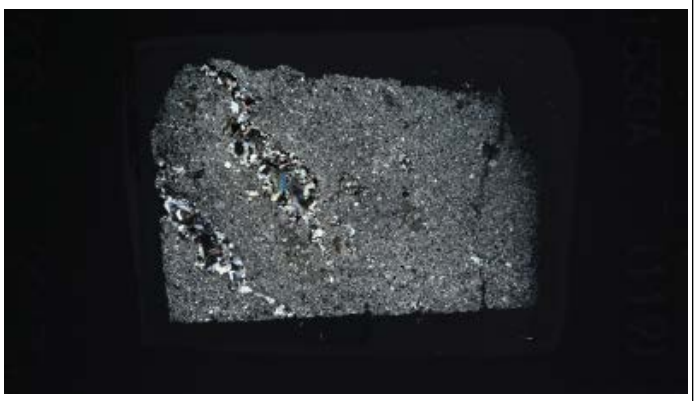
THIN SECTION LABEL ID: **376-U1530A-90R-1-W 29/30-TSB-TS_119** TS no.: 119

Description Group	Summaries
Igneous petrology:	Altered volcanic rock. No primary igneous textures or minerals are preserved. The matrix consists of quartz and clay minerals, with anhydrite and disseminated pyrite. Cross-cut by quartz, anhydrite and pyrite-bearing veins.
Alteration:	Pervasive altered volcanic rock in light to dark gray color with some white patches. Thin section is crosscut by two 1 mm-width veins . No clast is distinguishable with matrix. This slide is dominated by illite, quartz, pyrite, anhydrite and minor gypsum. White patch is soft and dominated by anhydrite. Dark gray part is more abundant quartz and pyrite with less abundance of illite. Fine-grained illite and quartz widely occur, which is crosscut by 1 mm-width anhydrite-quartz vein. Quartz occurring as vein and vug fillings is coarser than the other quartz. No plagioclase and crynopyroxene phenocrysts/pseudomorphs. Subhedral pyrite grains are disseminated throughout the sample.
Structure:	Two sub-parallel veins filled with quartz, anhydrite, and pyrite. Quartz and pyrite tend to be on the vein margins, anhydrite tends to be in the middle. Vein is irregular and varies in thickness from 1 to 3 mm.

Plane-polarized

47500191

Cross-polarized



47500211

THIN SECTION LABEL ID: **376-U1530A-91R-1-W 8/10-TSB-TS_120** TS no.: 120

Description Group	Summaries
Igneous petrology:	Altered volcanic lava. Nearly completely altered phyric lava, with relics of mm-large completely replaced euhedral subequant to tabular plagioclase phenocrysts and glomerocrysts (ca. 8 vol). Pervasively impregnated by quartz anhydrite, pyrite and clay minerals.
Alteration:	Pervasive altered gray volcanic rock with some white plagioclase pseudomorphs. No clast is distinguishable with matrix. This slide is dominated by illite, quartz, amorphous silica, pyrite, anhydrite and minor gypsum. Fine-grained illite,quartz and amorphous silica widely occur, and vug filling of quartz and anhydrite is coarser than the other part. Plagioclase phenocryst is completely pseudomorphed by illite, anhydrite and minor quartz. No crynopyroxene phenocrysts/pseudomorphs. There are no clear veins and vugs are filled with quartz, anhydrite and illite. Subhedral pyrite grains are disseminated throughout the sample.
Structure:	Weak volcanic fabric defined by chalcedony/quartz filled vesicles and elongated pyrite crystals. Few, discontinuous veins filled with quartz and anhydrite.

Plane-polarized

47500271

Cross-polarized

47500291