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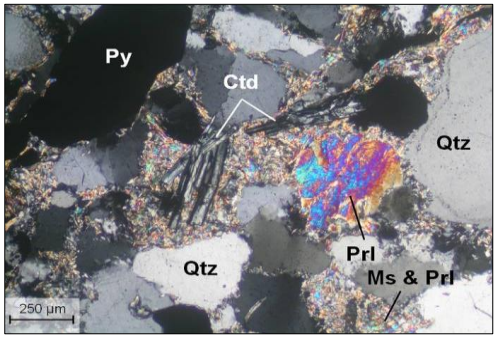
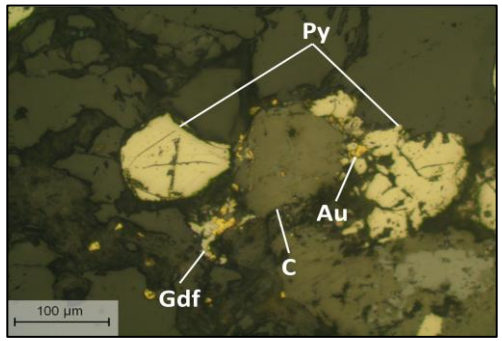
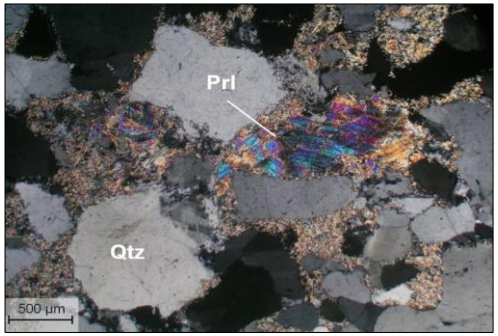
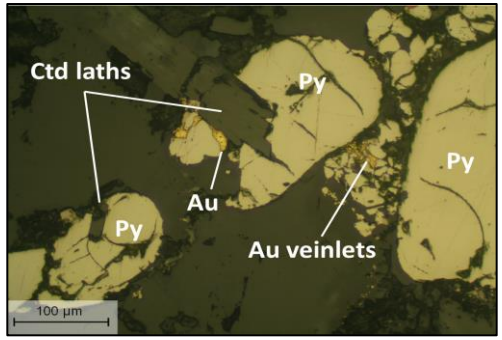
A quantitative analysis of alteration in the Carbon Leader Reef in the West Wits Line Goldfield: an application of Shortwave Infrared Reflectance Spectroscopy

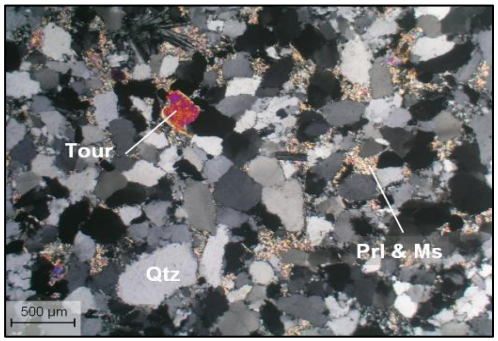
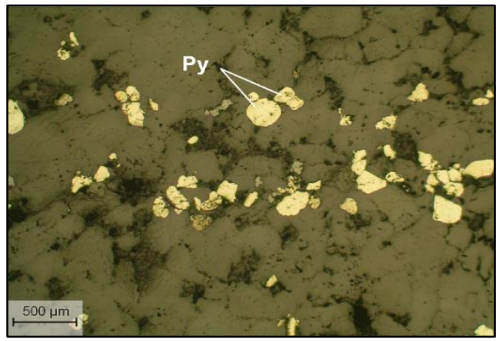
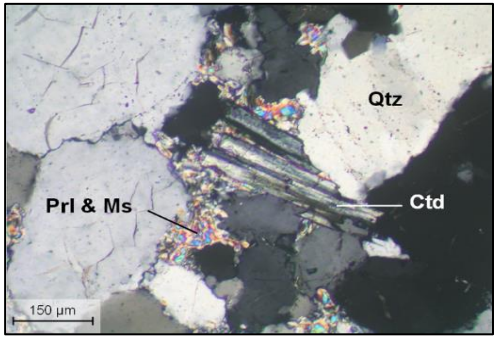
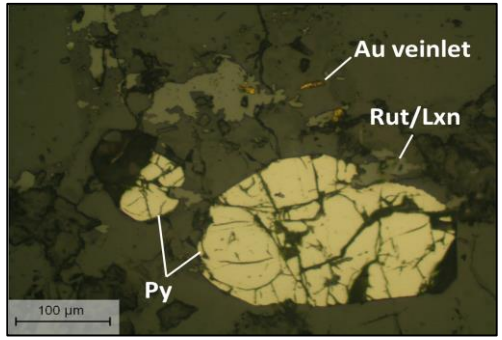
Eliot, Adrienne

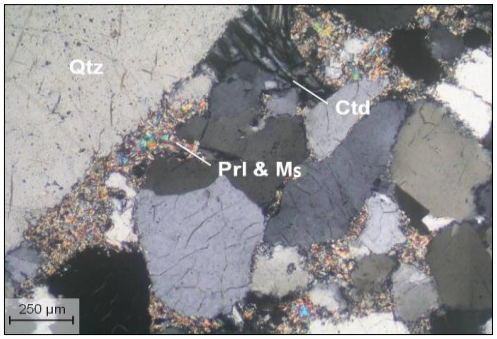
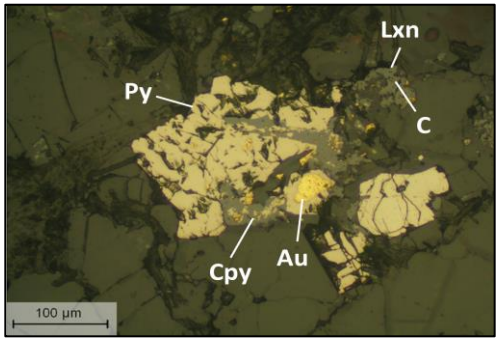
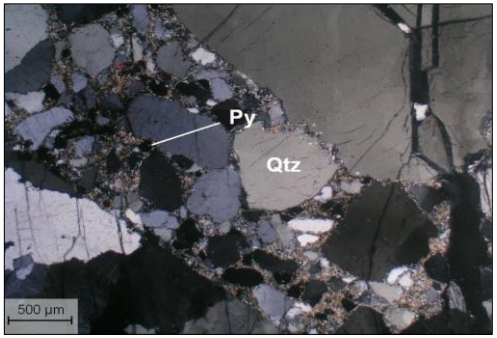
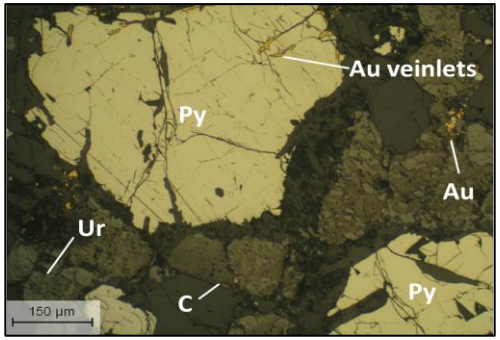
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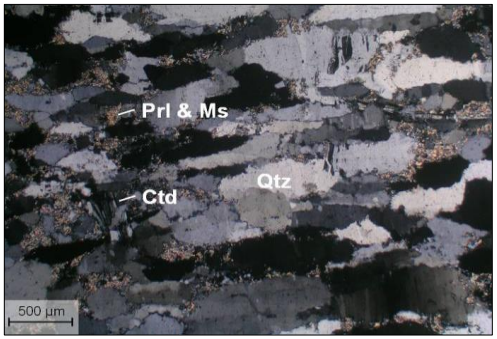
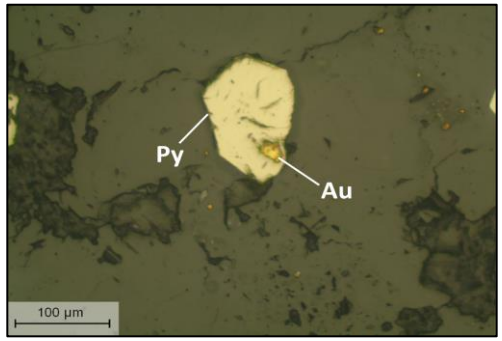
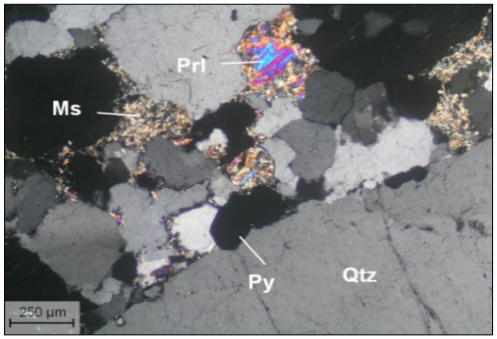
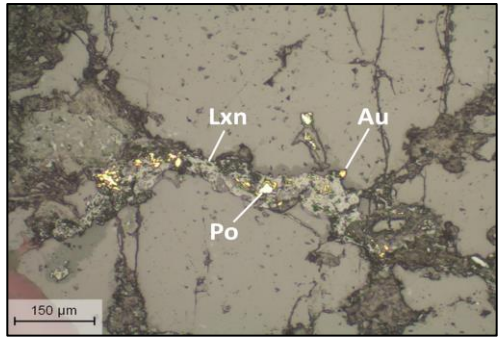
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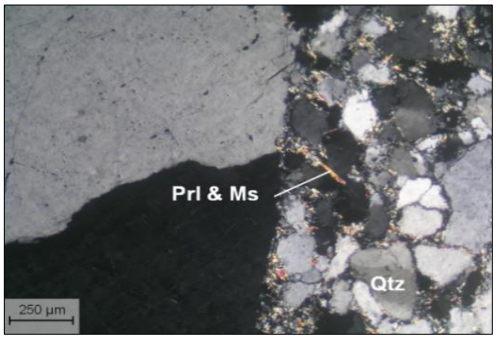
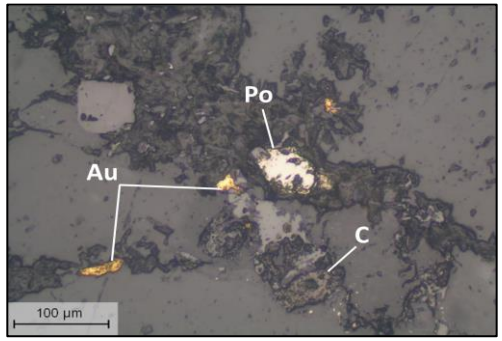
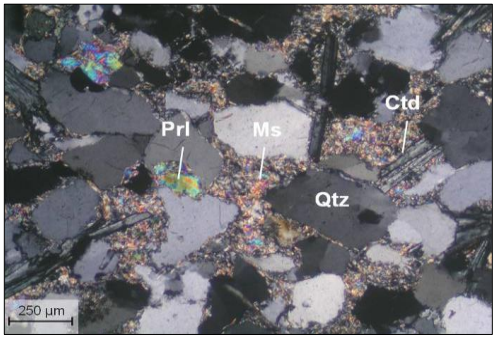
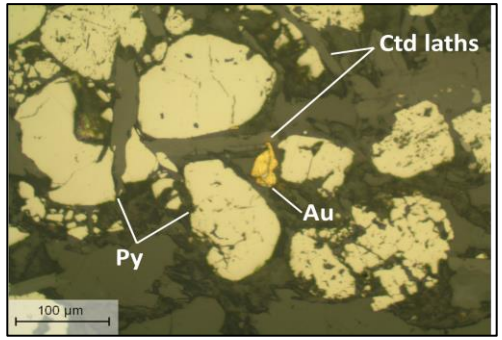
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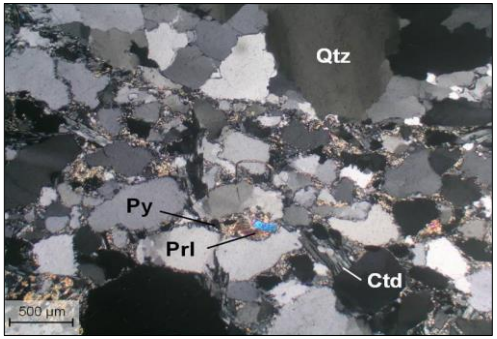
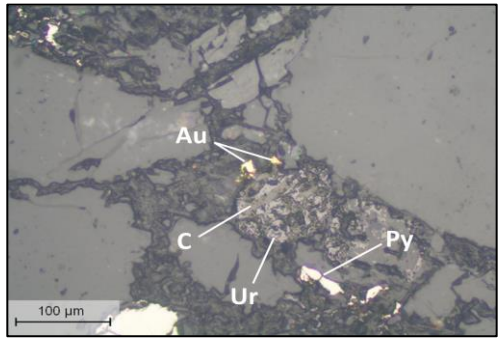
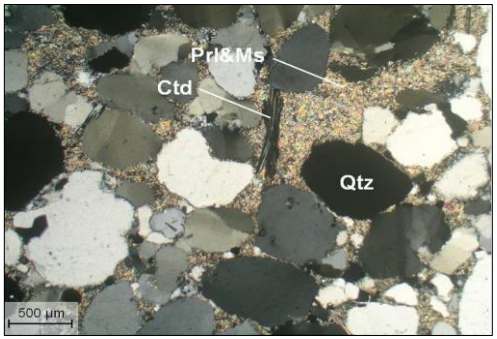
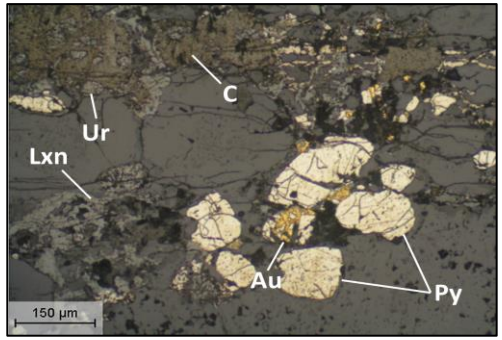
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Name	**Unit**	**Transmitted Light**		**Reflected Light**	
Sample 1 94-94 E1	No. 1 Facies		Subrounded to rounded quartz (Qtz) clasts, typically of monocrystalline quartz. Polycrystalline quartz grains are also observed, but these are less common. The matrix consists of fine to medium-grained angular to subrounded quartz, pyrophyllite (Prl), sericitic muscovite (Ms), chloritoid (Ctd) and chlorite. *Modal Abundance:* *Qtz - 88%; Prl - 5%; Ms -2%;* *Chl - 3%; Ctd - 1%;* *Sulphides - 1%.*		Subrounded to rounded grains of pyrite (Py) and zircon (Zr) are seen in the sample. Rounded pyrite with inclusions of pyrrhotite and chalcopyrite can be seen as well as anhedral pyrite and pyrrhotite. Gold (Au) is present mainly along microfractures associated with microscopic carbon (C) seams, but also present as inclusions in the anhedral pyrite. *Modal Abundance:* *Py - 90%; Cr - 3%; Cpy - 1%;* *Au - 1%; C - 1%; Po - 1%;* *Gdf - 1%; Zr -1%;* *Rut/Lxn - 1%.*
Sample 2 99-94 E2	No. 2B Facies		The reef is made up predominantly of angular to subrounded coarse-grained quartz (Qtz), which is seen in both monocrystalline and polycrystalline form. Angular to subrounded pyrophyllite (Prl), sericitic muscovite and chlorite occur between the quartz clasts. *Modal Abundance:* *Qtz - 83%; Prl - 9%;* *Ms - 3%; Chl - 2%;* *Ctd - 1%; Sulphides - 2%.*		Pyrite (Py) is present in two forms: rounded detrital grains and later anhedral hydrothermal grains. Most pyrite occurs along a foreset associated with pyrophyllite and detrital zircon. Gold (Au) is observed as occurring with pyrite, pyrrhotite and gersdorffite as well as in fractures. *Modal Abundance:* *Py - 87%; Cpy - 3%;* *Po - 2%; Zr - 1%; Ur - 1%;* *C - 1%; Au - 1%; Cr - 1%;* *Rut/Lxn - 2%; Gdf - 1%.*

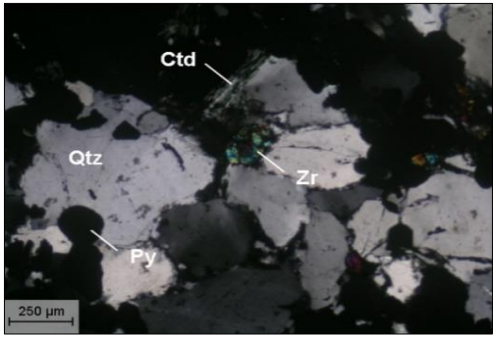
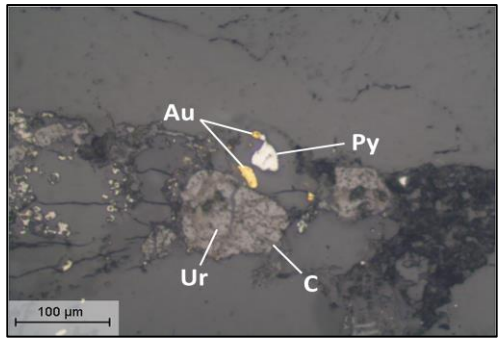
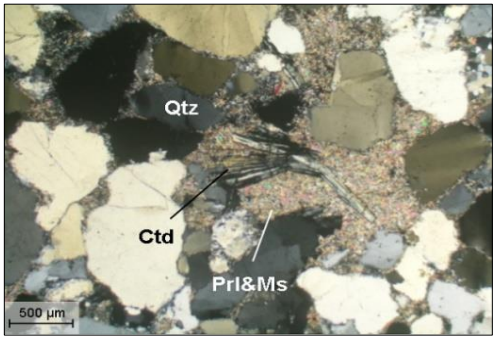
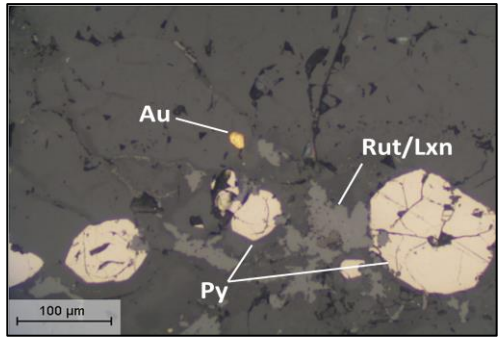
Sample ID	Descriptions				
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Sample 2 99-94 E2	Pale Pebbly Quartzite		Angular to subrounded monocrystalline quartz (Qtz) clasts with pyrophyllite (Prl), muscovite (Ms), chlorite and chloritoid occuring interstitially between grains. Chloritoid is seen to have bladed grains (laths). A grain of tourmaline (Tour) is observed in thin section. *Modal Abundance:* *Qtz - 83%; Prl - 8%;* *Ms - 3%; Chl - 2%;* *Ctd - 1%; Tour - 1%;* *Sulphides - 2%.*		Rounded detrital pyrite (Py) grains as well as anhedral hydrothermal grains occur along foresets, with the hydrothermal grains occurring as disseminated. Detrital zircon grains are observed. Chalcopyrite grains are seen to occur as inclusions within the pyrite grains. No gold is observed. *Modal Abundance:* *Py - 92%; Cr - 3%;* *Cpy - 1%; Po - 1%;* *Zr - 1%; Rut/Lxn - 2%.*
Sample 2 99-94 E2	No. 2A Facies		Coarse to angular monocrystalline and polycrystalline quartz (Qtz) clasts. Pyrophyllite (Prl), sericitic muscovite (Ms), chlorite and chloritoid (Ctd) grains are seen in between the quartz clasts. *Modal Abundance:* *Qtz - 86%; Prl - 7%;* *Ms - 2%; Chl - 1%;* *Ctd - 1%; Tour - 1%;* *Sulphides - 2%.*		Both rounded and anhedral pyrite (Py) grains are present. Anhedral grains of rutile (Rut) are observed alongside leucoxene (Lxn). Detrital zircon is seen within pyrite foresets. Gold (Au) is seen occuring along microfractures as well as along pyrite foresets and in veinlets. *Modal Abundance:* *Py - 93%; Rut/Lxn - 1%;* *Zr - 1%; C - 1%;* *Cpy - 1%; Gdf - 1%; Po - 1%;* *Au - 1%.*

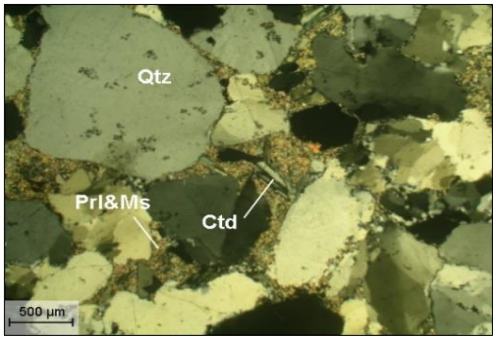
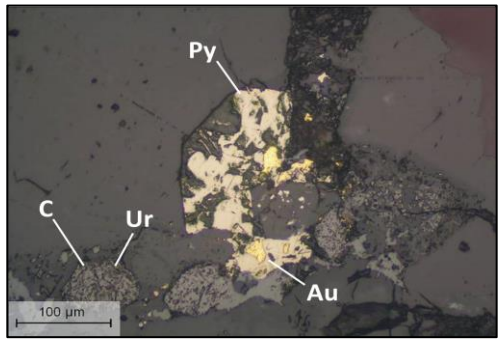
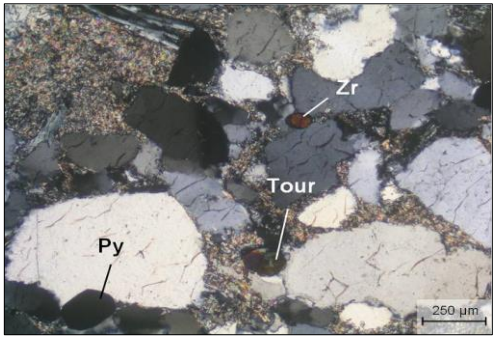
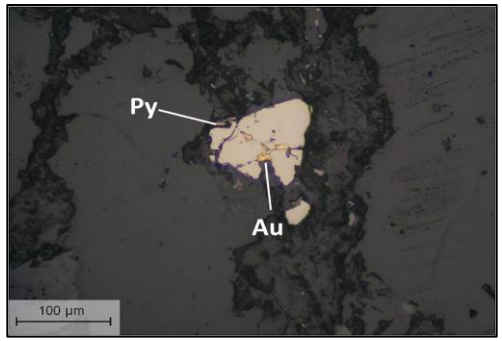
Sample ID	Descriptions					
Name	**Unit**	**Transmitted Light**		**Reflected Light**		
Sample 3 104-88 W6	No. 1 Facies		The reef is a matrix-supported conglomerate, with a matrix of angular to subrounded medium-grained quartz (Qtz), as well as pyrophyllite (Prl), sericitic muscovite (Ms) and chloritoid (Ctd). Predominantly monocrystalline alongside polycrystalline quartz clasts are seen. *Modal Abundance:* *Qtz - 85%; Prl - 8%;* *Ms - 3%; Ctd - <1%;* *Sulphides - 3%.*		In addition to rounded detrital pyrite (Py), anhedral grains are also observed. Carbon (C) is present along fractures in the matrix and is often associated with leucoxene (Lxn). Rutile occurs with leucoxene and chromite. The sample is gold-rich and there is gold (Au) concentrated in the lower portion of the reef. Gold is seen in microfractures as well as in association with sulphides. *Modal Abundance:* *Py - 92%; Au - 1%;* *Rut/Lxn - 1%; Cr - 1%;* *C - 1%; Zr - 1%; Cpy - 1%;* *Po - 1%.*
Sample 4 105-86 E2	No. 1 Facies		Clast-supported conglomerate consisting of subrounded to rounded monocrystalline quartz clasts, set within a matrix of medium to coarse-grained, angular to subrounded monocrystalline quartz, pyrophyllite, sericitic muscovite, chlorite and chloritoid. *Modal Abundance:* *Qtz - 82%; Prl - 9%; Ms - 3%; Chl - 2%; Ctd - 1%; Sulphides - 3%.*		Pyrite (Py) grains are rounded and anhedral, and interstitially occuring. Carbon (C) occurs along microfractures and shows a strong association with uraninite (Ur). Gold (Au) shows a strong association with pyrite and carbon. Rounded detrital grains of uraninite are strongly associated with the carbon. Anhedral rutile grains are seen to be associated with the presence of leucoxene. *Modal Abundance:* *Py - 90%; Cpy - 1%; Ur - 1%;* *Po - 1%; Zr - 1%; C - 1%;* *Rut/Lxn - 1%; Gdf -1%;* *Au - 1%; Cr - 2%.*

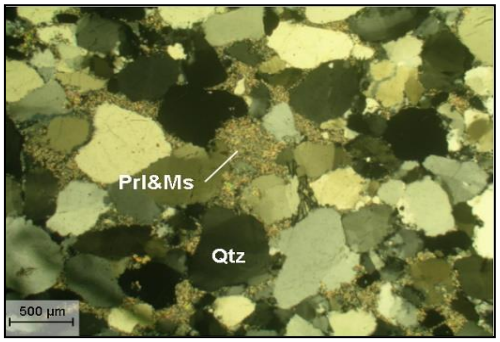
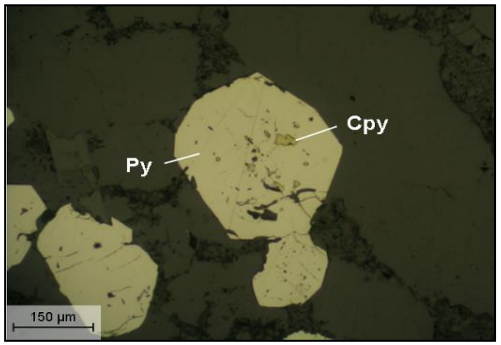
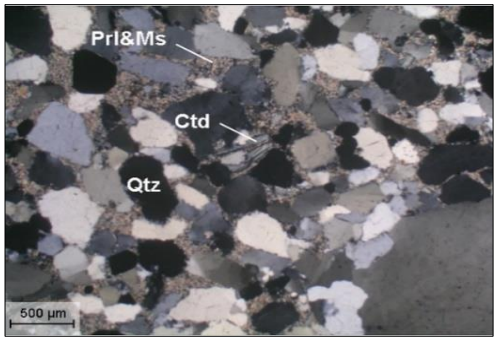
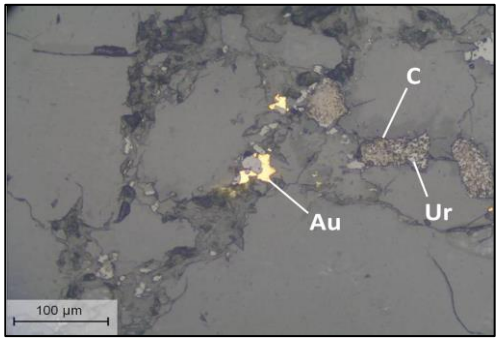
Sample ID	Descriptions					
Name	**Unit**	**Transmitted Light**		**Reflected Light**		
Sample 5 112-83 W3	No. 1 Facies		Angular to subhedral medium to coarse-grained, mainly monocrystalline quartz clasts with pyrophyllite (Prl), sericitic muscovite (Ms), chlorite and chloritoid (Ctd) are also seen in the reef. Chloritoid laths are seen within the matrix. A single grain of tourmaline is present within the matrix. *Modal Abundance:* *Qtz - 85%; Prl - 6%; Ms - 2%; Chl - 4%; Ctd - 1%; Tour - 1%; Sulphides - 1%.*		Very few detrital heavy minerals are seen. Rounded zircon and euhedral hydrothermal pyrite (Py) grains are present. Rutile is seen associated with leucoxene. Pyrrhotite is seen in the form of fine veinlets within pyrite grains. Gold (Au) is observed alongside pyrite as well as inclusions within pyrite. *Modal Abundance:* *Py - 95%; Cpy - 1%; Po - 1%; Zr - 1%; Au - 1%;* *Rut/Lxn - 1%.*
Sample 6 112-83 W4	No. 1 Facies		The matrix has angular to subrounded, mainly monocrystalline quartz (Qtz) clasts. Angular to subrounded pyrophyllite (Prl), chlorite, sericitic muscovite (Ms) and rare chloritoid are also observed in the sample. *Modal Abundance:* *Qtz - 87%; Prl - 6%;* *Ms - 2%; Chl - 3%;* *Ctd - 1%; Sulphides - 1%.*		Rounded detrital pyrite and anhedral hydrothermal pyrite grains are present within the matrix. Fractured rounded detrital grains of uraninite are seen. Chalcopyrite is present as inclusions within pyrite grains as well as independently. Gold (Au) occurs mainly along microfractures in the matrix, with a strong association with pyrite and pyrrhotite (Po). *Modal Abundance:* *Py - 90%; Au - 1%; Cpy - 1%;* *Po - 1%; Zr - 1%; Cr - 2%;* *Rut/Lxn - 2%; Gdf - 1%;* *Ur - 1%*

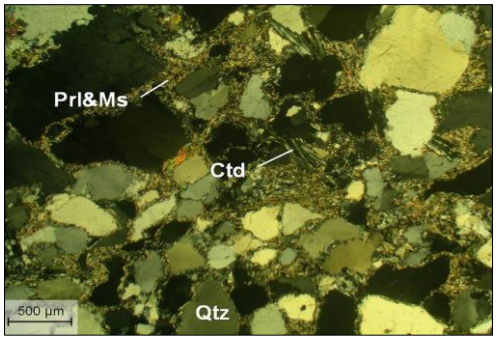
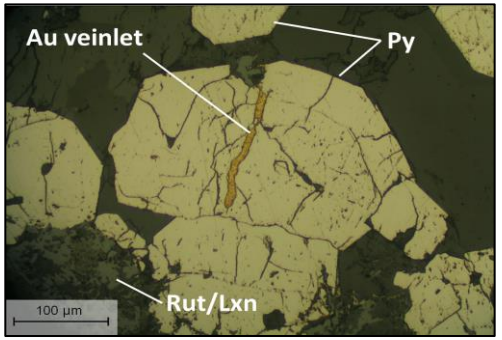
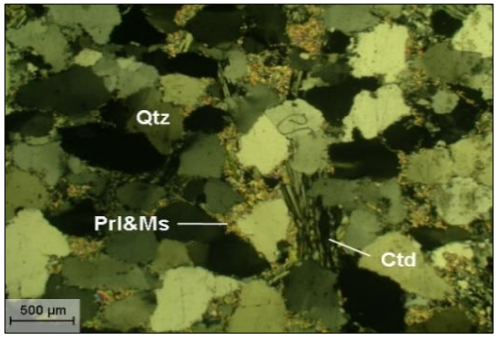
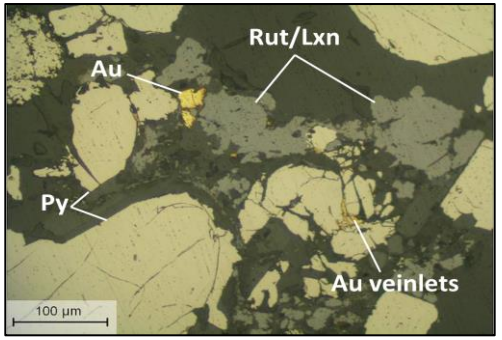
Sample ID	Descriptions				
Name	**Unit**	**Transmitted Light**		**Reflected Light**	
Sample 7 114-78 E1	No. 1 Facies		The matrix consists of coarse angular to subrounded, mainly monocrystalline quartz (Qtz) clasts. Angular to subrounded pyrophyllite (Prl), chlorite, sericitic muscovite (Ms) and chloritoid grains make up the matrix composition. Chloritoid laths are seen. *Modal Abundance:* *Qtz - 89%; Prl - 4%; Ms - 2%; Chl - 3%; Ctd - 1%; Sulphides - 1%.*		Detrital pyrite and zircon are present in the sample. Anhedral pyrite is also seen in the reef. Gold (Au) occurs mainly along microfractures where it is associated with carbon (C) and pyrrhotite (Po). Gold grains associated with pyrite and silicates are also observed. *Modal Abundance:* *Py - 91%; Au - 1%; Cpy - 1%; Po - 1%; Zr - 1%; C -1%; Rut/Lxn - 2%; Gdf - 1%; Cr - 1%.*
Sample 8 120-55 W4	No. 3 Facies		Matrix-supported with angular to subrounded, monocrystalline quartz clasts. Angular to subrounded pyrophyllite (Prl), sericitic muscovite (Ms), chloritoid (ctd) and pyrite are observed. Very fine grains of chlorite occur within the matrix. Chloritoid laths are also seen within the matrix. *Modal Abundance:* *Qtz - 72%; Prl - 15%; Ms - 5%; Chl - 5%; Ctd - 1%; Sulphides - 2%.*		Detrital pyrite (Py) and zircon is observed. Anhedral to euhedral grains of pyrite are also seen. Pyrrhotite and chalcopyrite occurs as inclusions within pyrite grains. Rounded grains of chromite occur within pyrite-rich bands. Gold (Au) is most abundant in and around the pyrite-rich bands and is seen in microfractures, as well as in the form of veinlets in pyrite. *Modal Abundance:* *Py - 92%; Au - 1%; Cr - 2%; Rut/Lxn - 1%; Cpy - 1%; Po - 1%; Zr - 1%; C -1.*

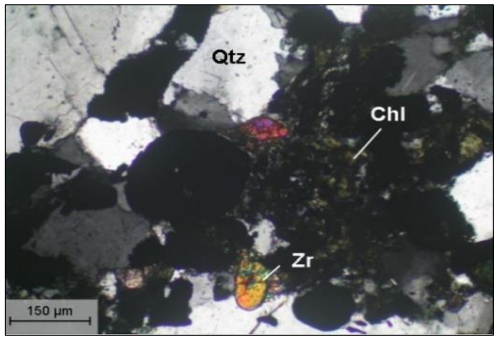
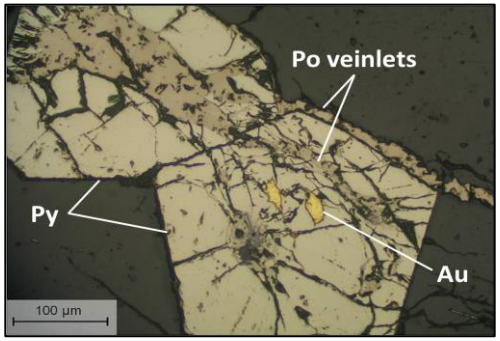
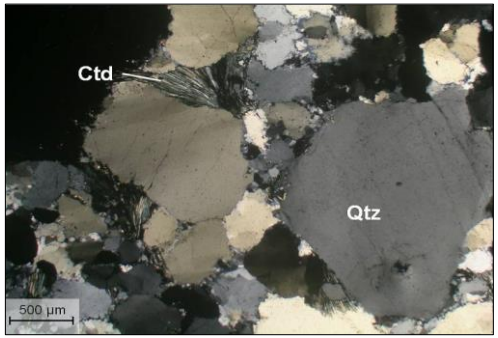
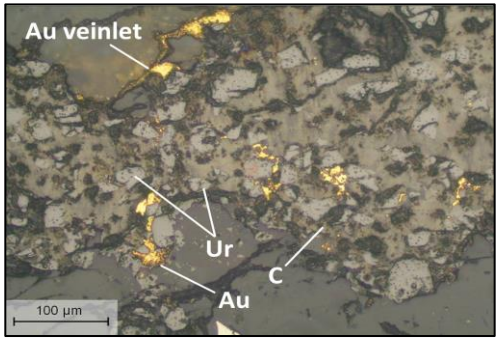
Sample ID	Descriptions				
Name	**Unit**	**Transmitted Light**		**Reflected Light**	
Sample 9 120-77 S1	No. 3 Facies		The matrix consists of medium, angular to subrounded, mainly monocrystalline quartz (Qtz), pyrophyllite (Prl), chlorite, sericitic muscovite and chloritoid (Ctd) grains. *Modal Abundance:* *Qtz - 86%; Prl - 5%; Chl - 3%; Ms - 2%; Ctd - 1%; Sulphides - 3%.*		Rounded detrital pyrite (Py), zircon and uraninite (Ur) are seen in the sample. Anhedral hydrothermal pyrite is also observed. Gold (Au) is associated with carbon (C), pyrite, uraninite, silicates and also occurs along microfractures. Pyrrhotite and chalcopyrite occur as inclusions in pyrite. *Modal Abundance:* *Py - 88%; Cr - 3%;* *Rut/Lxn - 2%; Cpy - 1%;* *Au - 1%; Po - 1%; Zr - 1%;* *C -1%; Ur -1%; Gdf - 1%.*
Sample 10 96-94 E2	No. 1 Facies		The reef is matrix-supported. with subangular to rounded, mainly monocrystalline, quartz clasts, as well as pyrophyllite (Prl), sericitic muscovite (Ms) grains and chloritoid (Ctd) laths. No chlorite is observed. *Modal Abundance:* *Qtz - 86%; Prl - 5%; Ms - 5%; Ctd - 2%; Tour - 1%; Sulphides - 1%.*		Rounded and anhedral to euhedral pyrite (Py) grains and detrital zircon occur in the reef. Carbon (C) occurs with (rounded) uraninite (Ur) grains and gold (Au) along microfractures. Gold is mainly associated with uraninite, carbon, pyrite and gersdorffite. *Modal Abundance:* *Py - 92%; Au - 1%; Zr - 1%;* *C -1%; Ur -1%; Rut/Lxn - 2%;* *Gdf - 1%; Cr - 1%.*

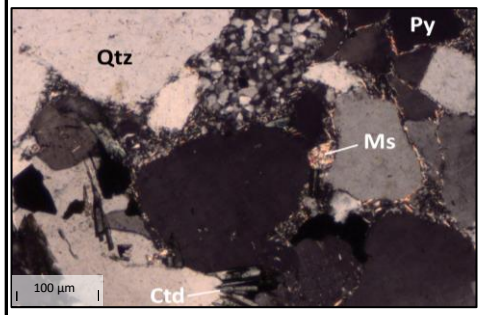
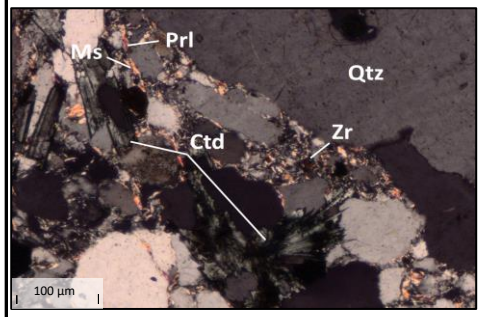
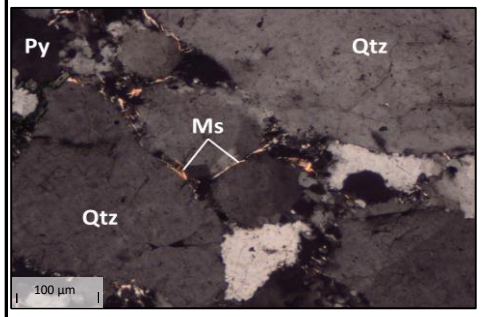
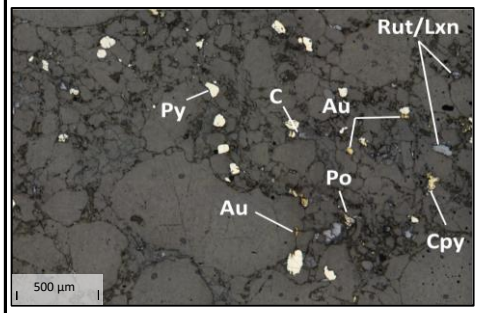
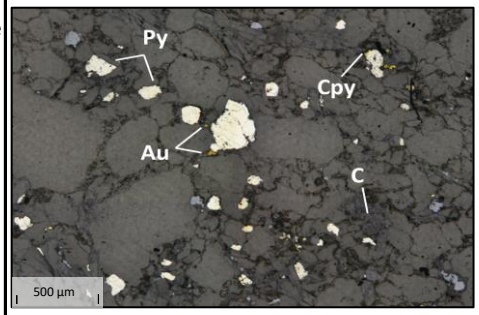
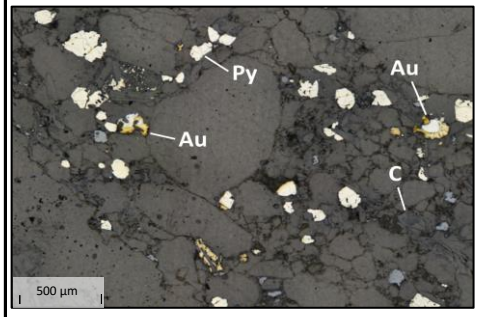
Sample ID	Descriptions				
Name	**Unit**	**Transmitted Light**		**Reflected Light**	
Sample 11 100-92 Wze	No. 2A Facies		The matrix consists of mostly monocrystalline and medium-grained quartz (Qtz) clasts. The matrix also contains chlorite, very fine pyrophyllite and sericitic muscovite as well as chloritoid (Ctd) laths. Thin fractures filled with chlorite, carbon sulphides and quartz are seen. *Modal Abundance:* *Qtz - 92%; Prl - 3%;* *Ms - 1%; Chl - 2%;* *Ctd - 1%; Sulphides - 1%.*		Detrital pyrite (Py), zircon, and uraninite (Ur) are observed. Anhedral to euhedral pyrite (some of which have formed around detrital cores) and colloform grains are observed. Pyrrhotite and chalcopyrite are also present. Gold (Au) is seen in the sample and is associated with pyrite, pyrrhotite and chalcopyrite. In microfractures, the gold is associated with uraninite and carbon (C). *Modal Abundance:* *Py - 94%; Cpy -1%; Zr - 1%; Au - 2%; C -1%; Ur -1%.*
Sample 12 104-88 E1A	No. 1 Facies		The matrix comprises subangular to well-rounded, monocrystalline medium quartz clasts with sericitic muscovite (Ms), pyrophyllite (Prl) and chloritoid (Ctd). The muscovite is not easily distinguishable from the pyrophyllite in this sample, however the pyrophyllite grains tend to be slightly larger than the muscovite. No chlorite is present in the sample. *Modal Abundance:* *Qtz - 88%; Prl - 3%; Ms - 4%; Ctd - 2%; Sulphides - 3%.*		Both detrital pyrite (Py) and zircon are present and are concentrated along particular horizons in the matrix forming enriched bands and stringers. Gold (Au) does not occur exclusively along these horizons, however they do contain the majority of the gold. Gold grains are associated with silicates, sulphides and uraninite as well as in microfractures. *Modal Abundance:* *Py - 89%; Au - 1%; Cpy -1%; Zr - 1%; Ur -1; Cr - 3%; Rut/Lxn - 2%; Po -1%; Gdf - 1%*

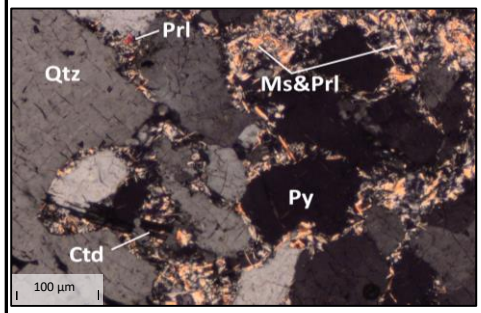
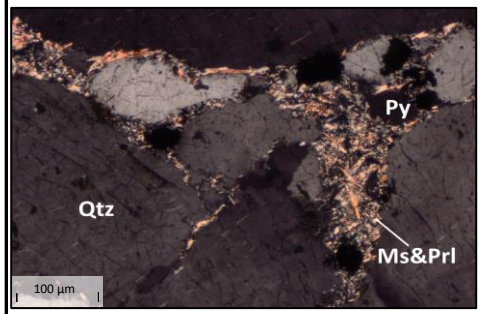
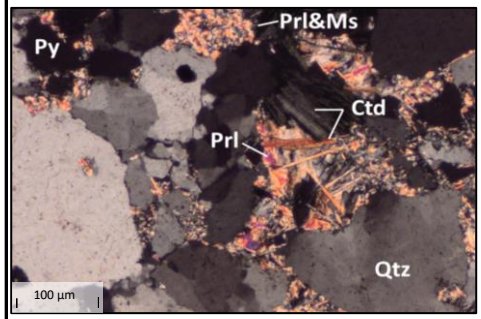
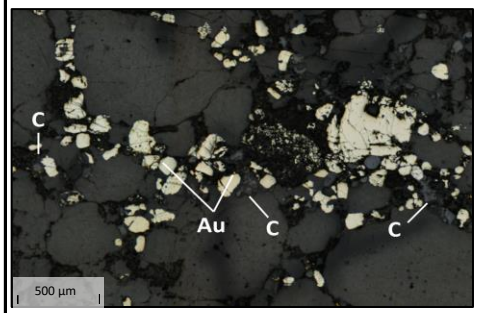
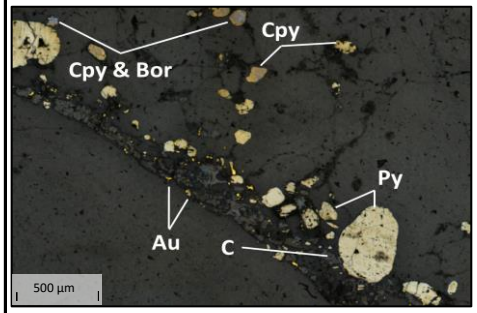
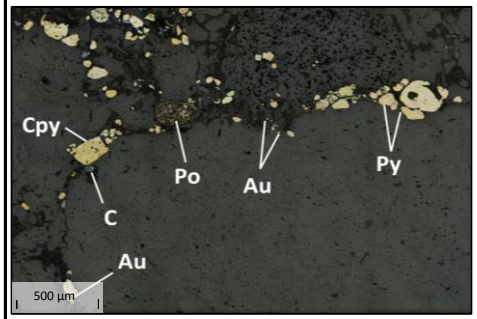
Sample ID	Descriptions				
Name	**Unit**	**Transmitted Light**		**Reflected Light**	
Sample 13 104-88 W7	No. 1 Facies		The matrix consists mainly of monocrystalline coarse quartz (Qtz) clasts with sericitic muscovite (Ms), pyrophyllite (Prl) and chloritoid (Ctd). Chloritoid occurs as laths within the matrix. No chlorite is present in this sample. *Modal Abundance:* *Qtz - 88%; Prl - 3%;* *Ms - 5%; Ctd - 3%;* *Sulphides - 1%.*		Rounded and anhedral to euhedral pyrite (Py) is present alongside zircon and uraninite (Ur). Carbon (C) occurs in masses and is mainly associated with uraninite. The majority of the gold (Au) occurrences that are observed in this sample were within a pyrite-rich horizon, with a significant number of these occurrences observed along a single microfracture near the base of the pyrite-rich horizon. *Modal Abundance:* *Py - 88%; Cpy - 1%;* *Au - 1%; Zr - 1%; Ur -1%;* *Cr - 3%; Rut/Lxn - 2;* *Po - 1%; Gdf - 1%; C - 1%.*
Sample 14 109-87 E2	No. 1 Facies		Matrix consists of angular to subrounded, mainly monocrystalline coarse quartz, pyrophyllite, sericitic muscovite grains and chloritoid laths. No chlorite is present in the sample. *Modal Abundance:* *Qtz - 88%; Prl - 4%; Ms - 4%; Ctd - 2%; Tour - 1%; Sulphides - 1%.*		Detrital and anhedral to euhedral pyrite (Py) alongside zircon, and uraninite are seen in the sample. Gold (Au) occurs mainly along microfractures and in association with silicates. *Modal Abundance:* *Py - 89%; Au - 1%; Cpy - 1%;* *Zr - 1%; Ur -1%; Cr - 3%;* *Rut/Lxn - 2%; Po - 1%;* *Gdf - 1%.*

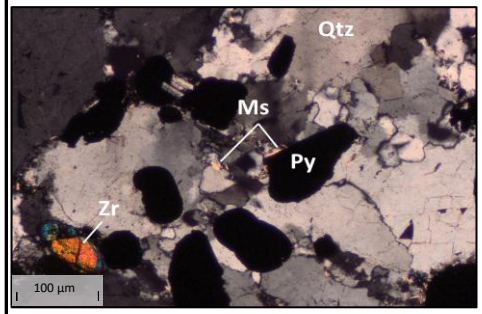
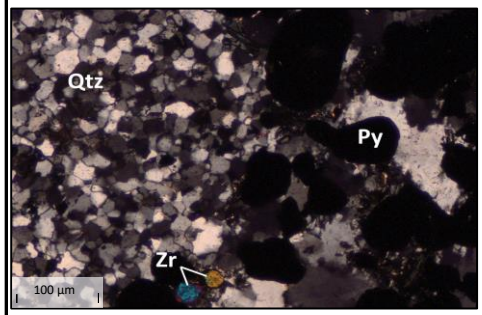
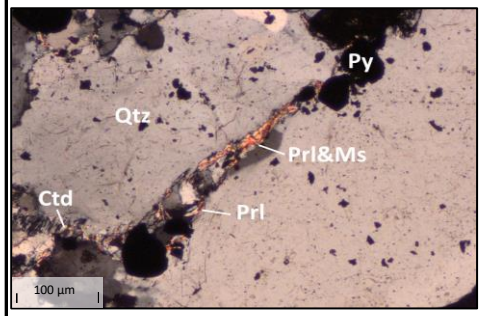
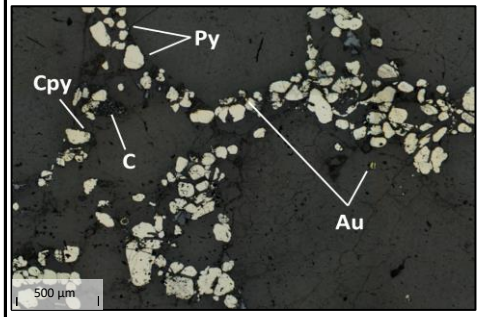
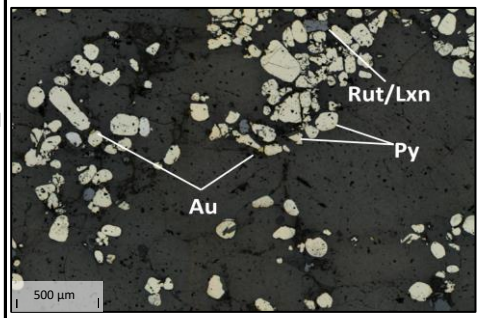
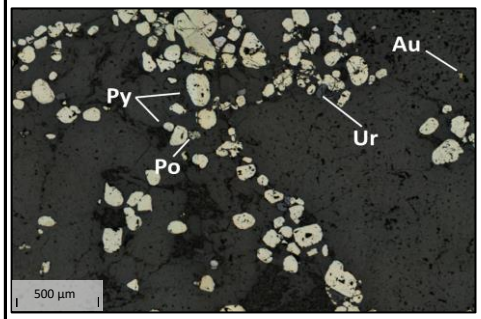
Sample ID	Descriptions				
Name	**Unit**	**Transmitted Light**		**Reflected Light**	
Sample 15 112-84 Rse	Internal Quartzite		Angular to rounded monocrystalline quartz (Qtz) clasts make up most of the sample, with sericitic muscovite (Ms), pyrophyllite (Prl) grains and chloritoid laths occuring interstitially. No chlorite is present in the sample. *Modal Abundance:* *Qtz - 88%; Ms - 5%;* *Prl - 3%; Ctd - 2%;* *Sulphides - 2%.*		Mostly anhedral to euhedral grains of pyrite (Py) within the sample. Angular to rounded grains of zircon are present and chalcopyrite (Cpy) occurs as inclusions in pyrite. A single gold grain is seen in the sample. *Modal Abundance:* *Py - 95%; Rut/Lxn - 2%;* *Zr - 1%; Cpy - 1%;* *Au - 1%.*
Sample 15 112-84 Rse	No. 1 Facies		Sericitic muscovite (Ms), pyrophyllite (Prl), chlorite grains and chloritoid (Ctd) laths occur in the matrix between grains of monocrystalline, coarse quartz (Qtz) clasts. *Modal Abundance:* *Qtz - 88%; Prl - 4%; Ms - 3%; Chl - 2%; Ctd - 2%; Sulphides - 1%.*		Pyrite occurs as detrital and anhedral hydrothermal grains. Many of the coarser anhedral to euhedral grains have detrital cores. Zircon and uraninite (Ur) are also present as detrital phases. Gold (Au) mineralization occurs mainly along microfractures, where it is associated with silicates, pyrite, carbon (C), uraninite, leucoxene and pyrrhotite. *Modal Abundance:* *Py - 91%; Cpy - 1%; Au - 1%; Po - 1%; Zr - 1%; Ur - 1%; Rut/Lxn - 3%; C - 1%*

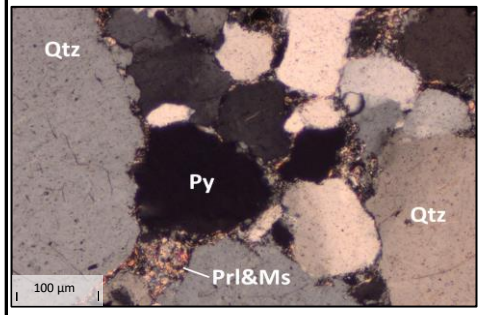
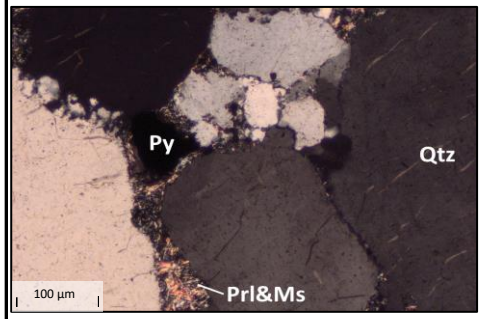
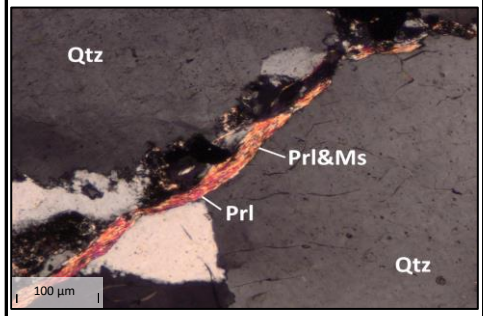
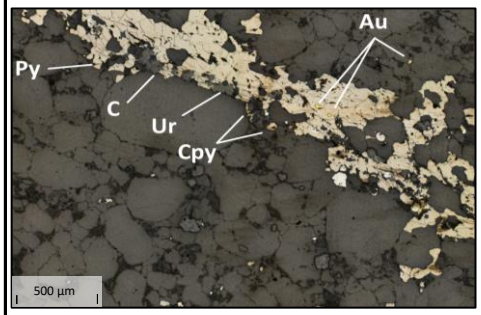
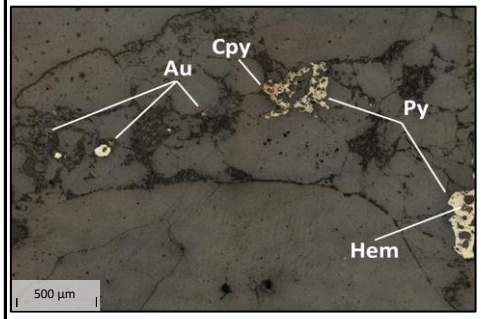
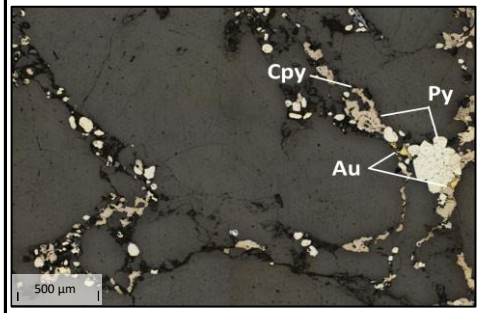
Sample ID	Descriptions				
Name	**Unit**	**Transmitted Light**		**Reflected Light**	
Sample 16 120-55 NE7	No. 3 Facies		The reef has both clast- and matrix-supported portions. The matrix consists of sericitic muscovite (Ms), chlorite, chloritoid (Ctd) and pyrophyllite (Prl) between medium quartz (Qtz) clasts. The grains are monocrystalline and angular to subrounded. Pyrophyllite is noticeably less in this sample. *Modal Abundance:* *Qtz - 85%; Prl - 2%;* *Ms - 5%; Chl - 3%;* *Ctd - 2%; Tour - 1%;* *Sulphides - 2%.*		Rounded and anhedral to euhedral pyrite (Py) grains are observed, with rare granular pyrite. Chalcopyrite occurs both as inclusions in pyrite and as independent grains. Carbon occurs mainly along pyrite foresets and is strongly associated with uraninite. Gold (Au) is mainly associated with silicates or occurs along microfractures; however rare grains occurring with pyrite are observed. *Modal Abundance:* *Py - 91%; Au - 1%; Cpy -1%; Zr - 1%; Ur - 1%; Cr - 2%; Rut/Lxn - 2; C - 1%*
Sample 17 120-55 W5	No. 3 Facies		The majority of the reef has monocrystalline, angular to subrounded, medium quartz (Qtz) clasts. Angular to subrounded sericitic muscovite (Ms), pyrophyllite (Prl), chloritoid (Ctd) and chlorite occur between these sand grains. A single tourmaline grain is seen in the sample. *Modal Abundance:* *Qtz - 83%; Prl - 4%;* *Ms - 5%; Chl - 2%;* *Ctd - 3%; Tour - 1%; Sulphides - 2%.*		Pyrite (Py) foresets seen in the sample contain both detrital and anhedral to euhedral pyrite grains. Anhedral grains of rutile (Rut)/leucoxene (Lxn) are seen within the pyrite stringers. Pyrrhotite occurs as veinlets in pyrite. Gold (Au) occurs with pyrite, leucoxene and in microfractures, creating veinlets. *Modal Abundance:* *Py - 93%; Au - 1%; Po - 1%;* *Zr - 1%; C - 1%;* *Rut/Lxn - 2%; Gdf - 1%.*

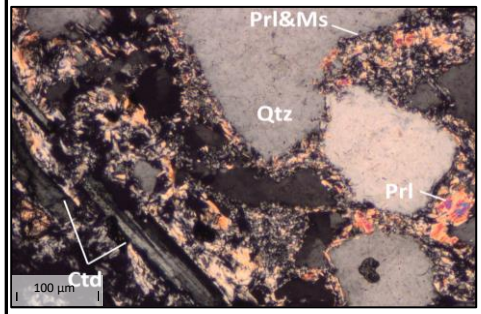
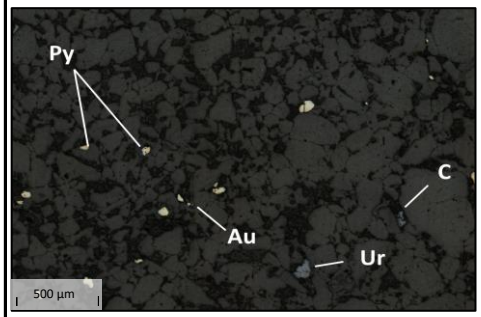
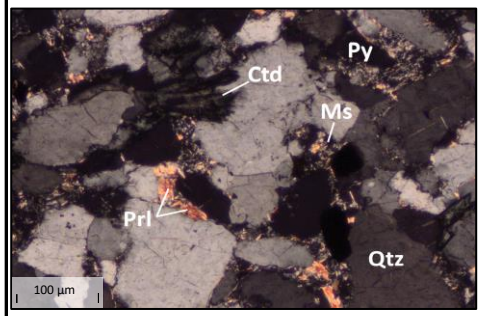
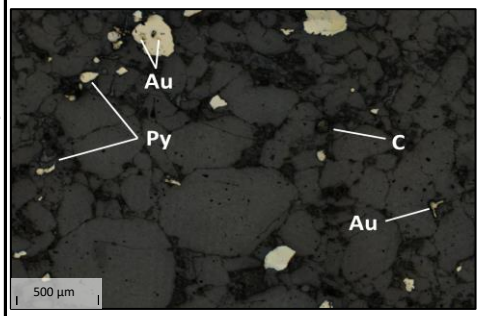
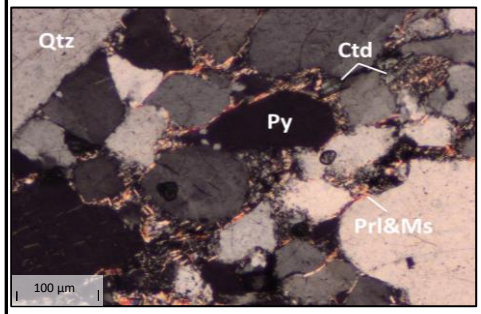
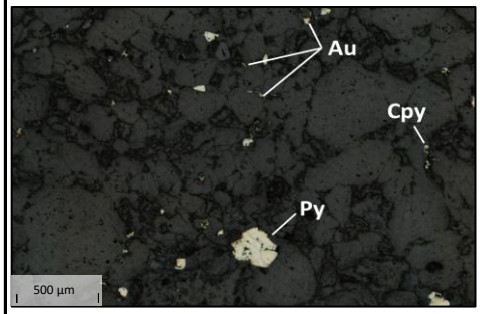
Sample ID	Descriptions				
Name	**Unit**	**Transmitted Light**		**Reflected Light**	
Sample 18 120-55 W7	No. 3 Facies		The reef is clast-supported with clasts of subrounded, mainly polycrystalline quartz (Qtz) and a matrix of medium grains and fine to very fine chlorite (Chl), pyrophyllite, muscovite grains and chloritoid laths. *Modal Abundance:* *Qtz - 89%; Prl - 2%; Ms - 2%; Chl - 2%; Ctd - 1%, Sulphides - 4%.*		Pyrite (Py) occurs as detrital rounded grains, as anhedral to euhedral grains, and as granular colloform grains. Other sulphides include pyrrhotite (Po), gersdorffite and chalcopyrite. Gold (Au) occurs along the carbon seams in the lower portion of the rock and in the more pyrite-rich matrix in the upper portion. *Modal Abundance:* *Py - 89%; Cpy - 1%; Au - 1%;* *Po - 1%; Zr - 1%; C - 1%;* *Gdf - 1%; Cr - 3%; Ur - 1%; Rut/Lxn - 1%.*
Sample 19 120-70 W1	No. 3 Facies		Clast-supported conglomerate. The matrix consists of subangular to subrounded, mainly monocrystalline coarse quartz (Qtz) clasts with fine sericitic muscovite and chlorite, as well as bladed chloritoid (Ctd) laths. No pyrophyllite is present in the sample. *Modal Abundance:* *Qtz - 90%; Ms - 3%;* *Chl - 2%; Ctd - 2%;* *Sulphides - 3%.*		Detrital, anhedral to euhedral and granular pyrite are all observed. Several of the granular grains also contain chloritoid laths. Other sulphides include pyrrhotite, gersdorffite and chalcopyrite. Gold (Au) occurs mainly with uraninite (Ur) and carbon (C). Those that occur outside of the carbon are associated with pyrite, in microfractures with silicates, with pyrrhotite and gersdorffite. *Modal Abundance:* *Py - 91%; Au - 1%; Cpy - 1%;* *Po - 1%; Zr - 1%; C - 1%;* *Ur - 1%; Gdf - 1%;* *Rut/Lxn - 1%; Cr - 1%.*

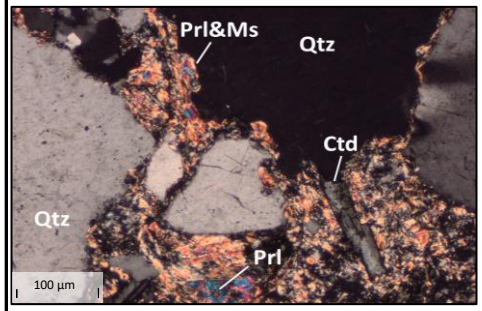
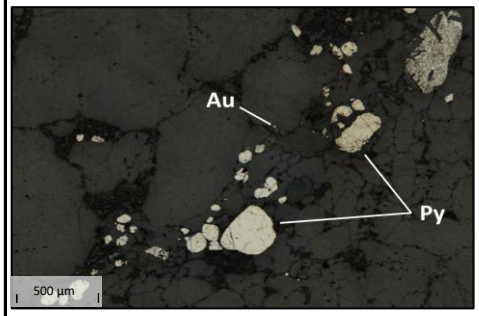
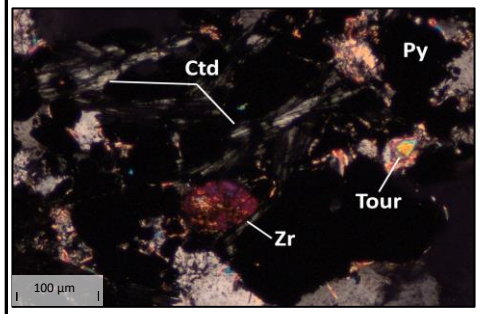
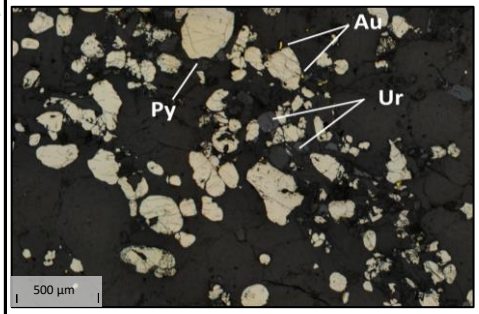
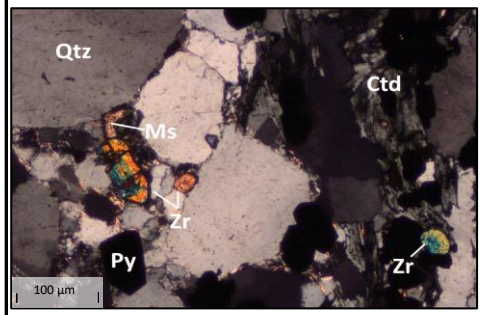
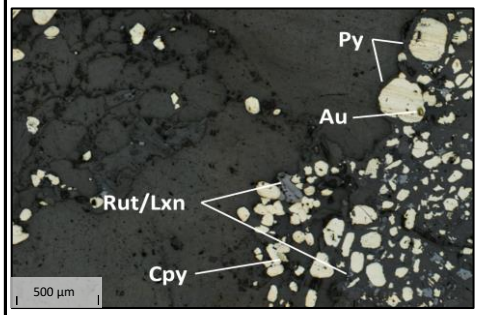
Sample ID	Descriptions				
Name	**Unit**	**Transmitted Light**		**Reflected Light**	
Sample 20 DPH 3883	No. 2A Facies	  	The reef is a clast-supported conglomerate with rounded to subrounded quartz (Qtz) clasts. Predominantly monocrystalline quartz clasts are seen however there are polycrystalline clasts present. Sulphides occur interstitially between the clasts, and are hosted within a matrix. The matrix has fine to medium-grained angular to subangular grains of quartz, pyrophyllite (Prl), muscovite (Ms) and chloritoid (Ctd). *Modal Abundance:* *Qtz - 90%; Ctd - 2%;* *Prl - 3%; Ms - 3%;* *Sulphides - 2%.*	  	Euhedral to anhedral pyrite (Py) grains interstitally placed. Chalcopyrite (Cpy) growth seen on pyrite grain edges. Gold (Au) is present and is seen in the form of veinlets, nuggets as well as growth on pyrite grains and inclusions within quartz (Qtz) clasts. Small amounts of carbon (C) are present, alongside predominantly pyrite. *Modal Abundance:* *Py - 92%; Cpy - 2%;* *Po - 1%; Au - 1%;* *C - 1%; Ur - 1%;* *Zr - 1; Rut/Lxn - 1%.*

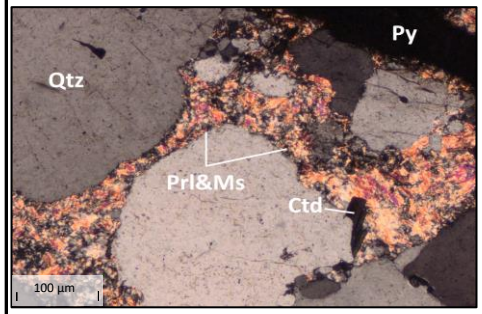
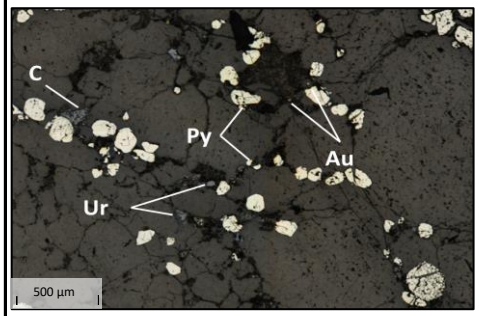
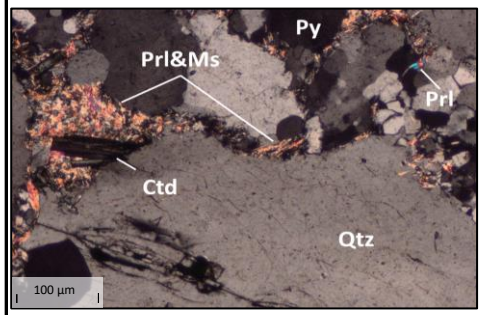
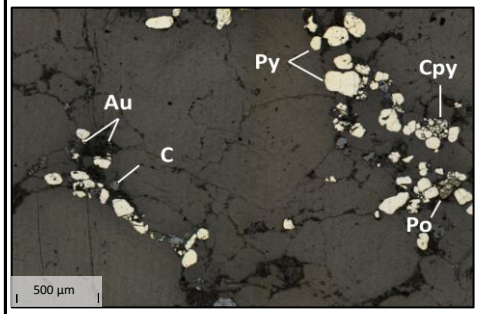
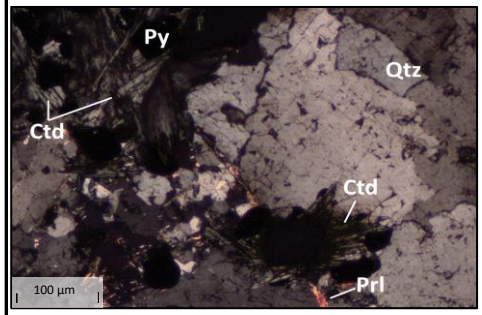
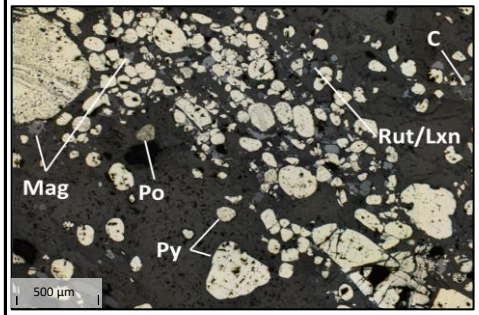
Sample ID	Descriptions				
Name	**Unit**	**Transmitted Light**		**Reflected Light**	
Sample 21 DPH 4057	No. 3 Facies	  	Clast-supported conglomerate with rounded to subrounded clasts of medium-grained quartz (Qtz). Monocrystalline quartz is seen in the larger clasts, with the finer-grained clasts being polycrystalline and typically found within the matrix. Sulphides are seen to be hosted within the matrix. The matrix is fine-grained, and is made up of muscovite (Ms), pyrophyllite (Prl), quartz and blades of chloritoid (Ctd). The chloritoid laths are larger than the much finer-grained pyrophyllite and muscovite combination. *Modal Abundance:* *Qtz - 81%; Prl - 8%;* *Ms - 5%; Ctd - 3%;* *Sulphides - 3%.*	  	Rounded detrital pyrite(Py) grains with a few anhedral to euhedral hydrothermal pyrite grains are seen. Gold (Au) is interstitial, with some instances alongside carbon (C). The gold typically occurs as tiny nuggets or as veinlets within the matrix. Very little chalcopyrite (Cpy) is seen throughout the sample, with a single chalcopyrite grain as an inclusion within a pyrite grain. Pyrrhotite (Po) is seen rarely, as well as bornite (Bor). *Modal Abundance:* *Py - 93%; C - 1%; Au - 1%;* *Cpy - 1%; Bor - 1%;* *Po - 1%; Zr - 1%; Ur - 1%..*

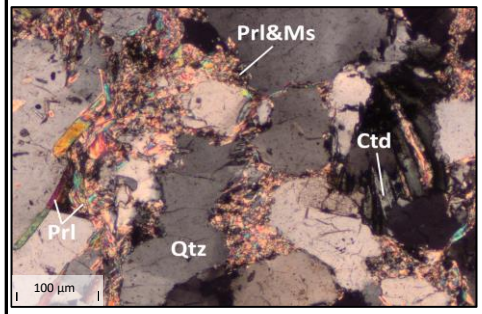
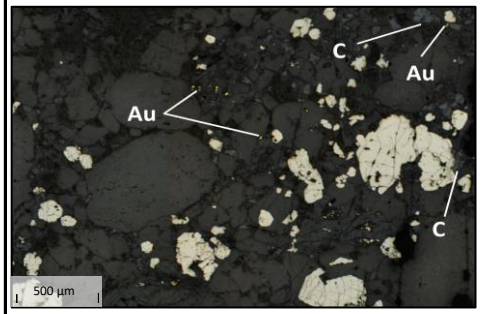
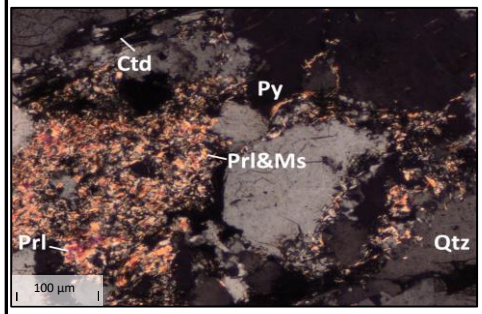
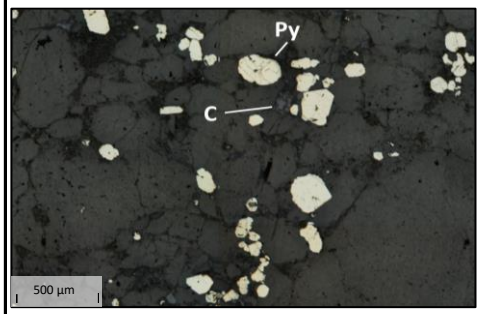
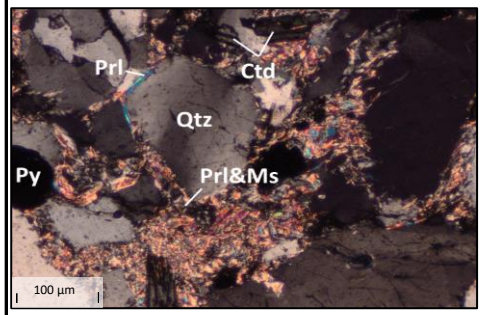
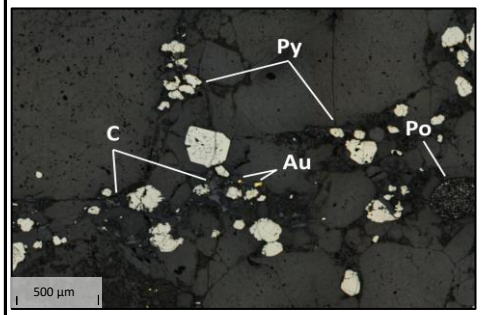
Sample ID	Descriptions				
Name	**Unit**	**Transmitted Light**		**Reflected Light**	
Sample 22 GBH 1000 D6	No. 2A Facies	  	Mostly well-rounded to rounded monocrystalline quartz (Qtz) clasts are seen within this clast-supported reef. Polycrystalline quartz is also seen in this sample. Sulphides occur interstitially between the larger grains of quartz within a fine-grained pyrophyllite (Prl), chlorite (Chl) and muscovite (Ms)-rich matrix. Chloritoid (Ctd) laths are also seen within the matrix. *Modal Abundance:* *Qtz - 84%; Prl - 3%;* *Ctd - 2%; Ms - 5%;* *Chl - 2%; Sulphides 4%.*	  	Pyrite (Py) grains are rounded (detrital) with a few anhedral to euhedral grains, and are concentrated around quartz (Qtz) clasts. Very little gold (Au) is seen within the sample with a small nugget inside a quartz clast. Grains of rutile (Rut) are seen as well as small amounts of pyrrhotite (Po) and chalcopyrite (Cpy). Carbon (C) is seen alongside pyrite grains. *Modal Abundance:* *Py - 94%; Au - 1%;* *C - 1%; Cpy - 1%; Po - 1%;* *Zr - 1%; Rut/Lxn - 1%.*

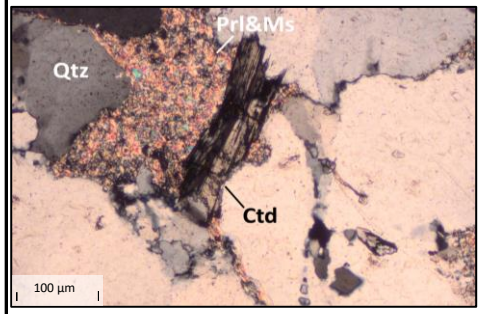
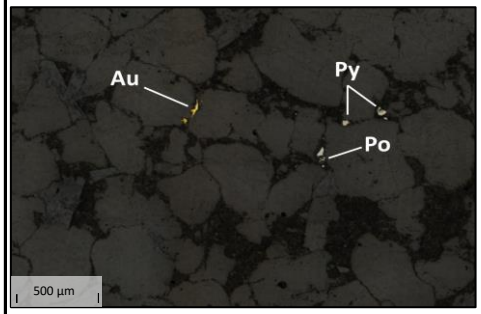
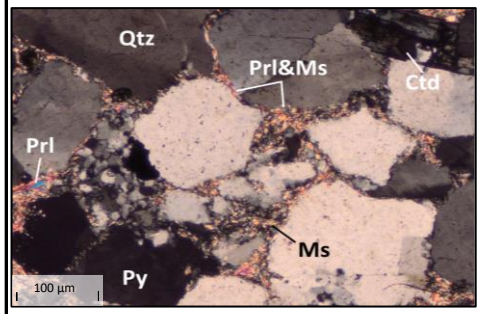
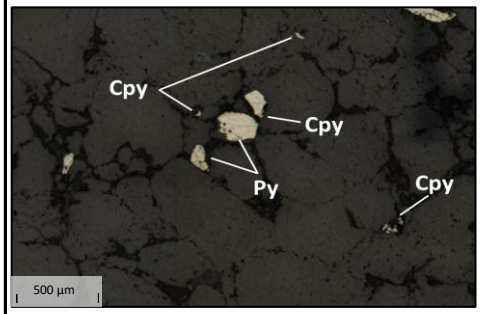
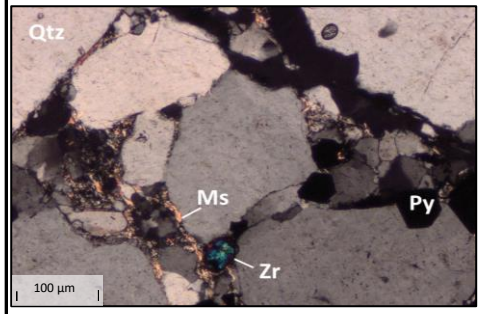
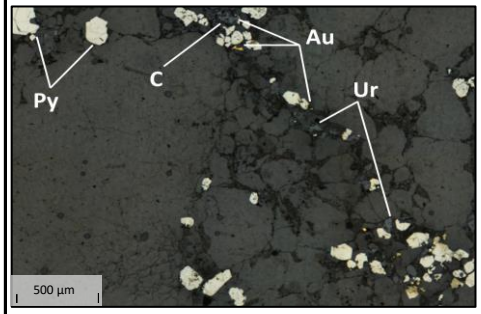
Sample ID	Descriptions				
Name	**Unit**	**Transmitted Light**		**Reflected Light**	
Sample 23 GBH 2788	No. 2B Facies	  	Clast-supported conglomerate with rounded to subrounded clasts of medium-grained quartz (Qtz). Sulphides are seen to occur interstitially between the quartz clasts and set within the matrix. The matrix is fine-grained, with pyrophyllite (Prl), chloritoid (Ctd), chlorite (Chl) and sericitic muscovite (Ms) making up the content of the matrix. Pyrophyllite content is noticeably low within the sample. *Modal Abundance:* *Qtz - 87%; Prl - 2%;* *Ms - 5%; Ctd - 1%;* *Chl - 2%; Sulphides - 3%.*	  	Pyrite (Py) grains are irregular throughout the sample. Carbon (C) and gold (Au) is visible alongside and within the pyrite grains, respectively. Chalcopyrite (Cpy), pyrrhotite (Po) and hematite (Hem) are also present in smaller amounts. *Modal Abundance:* *Py - 94%; C - 1%;* *Hem - 1%; Cpy - 1%;* *Au - 1%; Rut/Lxn - 1%;* *Po - 1%.*

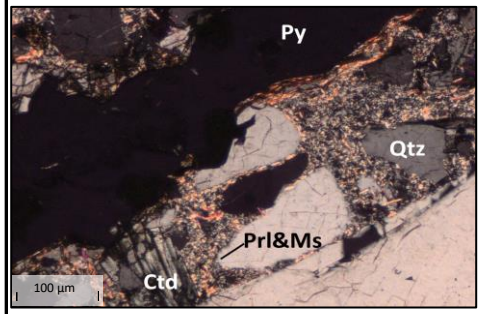
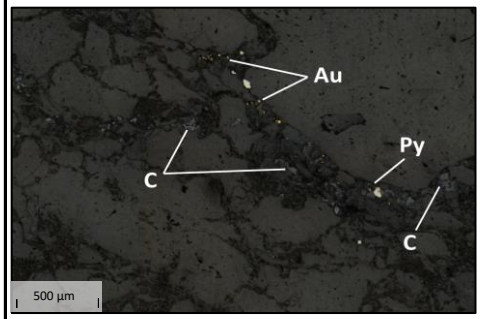
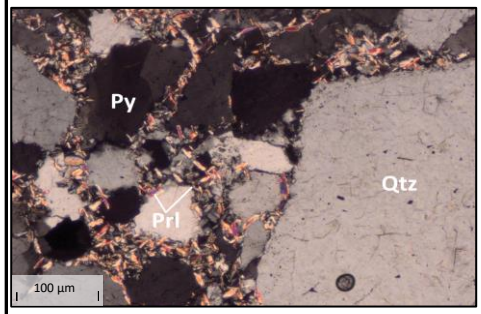
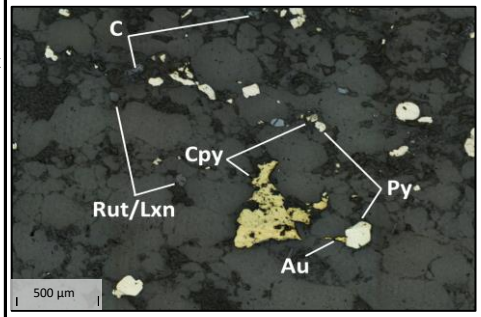
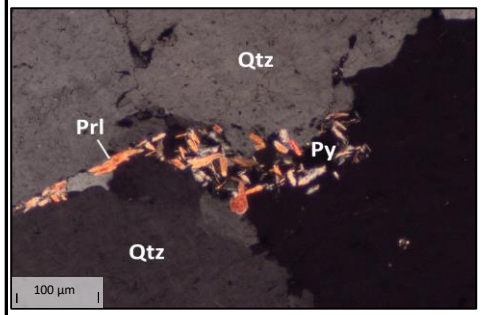
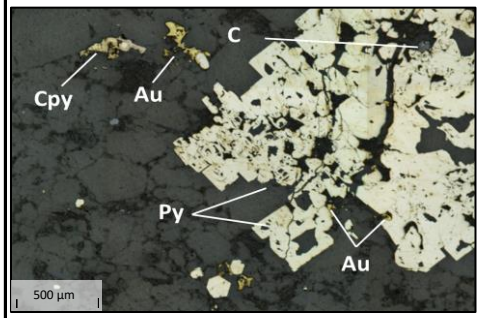
Sample ID	Descriptions				
Name	**Unit**	**Transmitted Light**		**Reflected Light**	
Sample 24 GBH 3763	No. 1 Facies		Rounded to subrounded fine- to medium-grained quartz pebbles are set within a pyrophyllite-rich and muscovite-rich fine-grained matrix. Chloritoid blades are seen within the matrix. Sulphides are set alongside the quartz clasts within the matrix. *Modal Abundance:* *Qtz - 88%; Prl - 5%;* *Ms - 3%; Chl - 1%;* *Ctd - 2%; Sulphides - 1%.*		Rounded detrital pyrite (Py) and anhedral to euhedral hydrothermal pyrite grains are seen. Carbon (C) and chalcopyrite (Cpy) present in smaller amounts within the sample. Gold (Au) appears in small nuggets within the matrix as well as inclusions within pyrite grains. *Modal Abundance:* *Py - 94%; Cpy - 1%; Au - 1%;* *C - 1%; Po - 1% Ur - 1%; Rut/Lxn - 1%.*
					
					

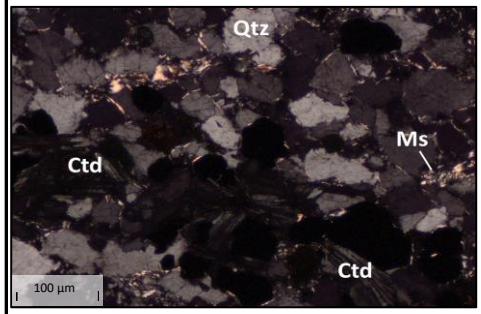
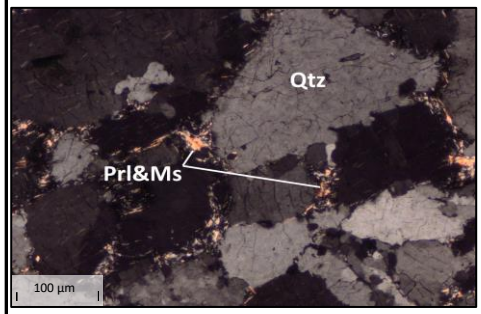
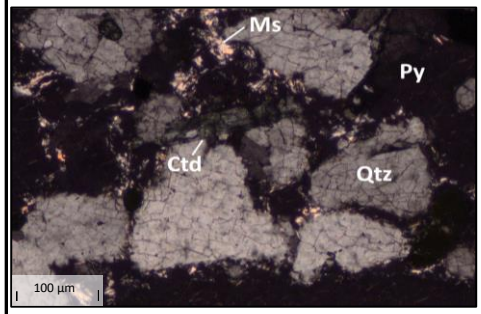
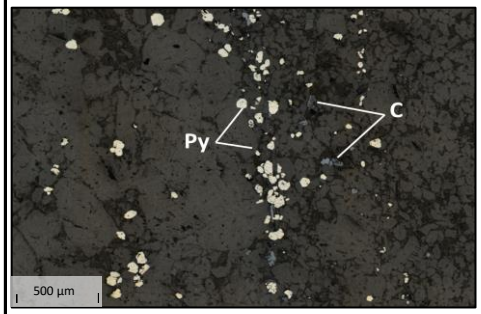
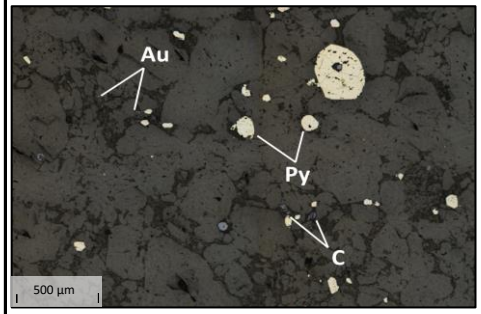
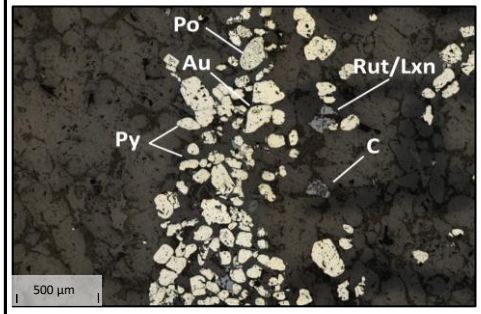
Sample ID	Descriptions				
Name	**Unit**	**Transmitted Light**		**Reflected Light**	
Sample 25 GBH 3844	No. 3 Facies		Fine-grained, rounded to subrounded quartz (Qtz) clasts make up most of the reef sample. The clasts are set within a pyrophyllite (Prl)-rich matrix. The matrix is also made up of sericitic muscovite (Ms), chlorite (Chl) and chloritoid (Ctd) clasts. *Modal Abundance:* *Qtz - 87%; Prl - 3%;* *Ms - 4%; Chl - 1%;* *Ctd - 2%; Tour - 1%; Sulphides - 2%.*		Pyrite (Py) grains are rounded (detrital), and anhedral to euhedral (hydrothermal). Small amounts of chalcopyrite (Cpy) are seen as well as uraninite (Ur). Gold (Au) is seen in the form of small nuggets set within the matrix as well as inclusions within pyrite grains. Zircon (Zr) is seen to occur interstitially between larger quartz clasts. *Modal Abundance:* *Py - 93%; Po - 1%;* *Cpy - 1%; Au - 1%;* *Hem - 1%; Ur - 1%;* *Zr - 1%; Rut/Lxn - 1%.*
					
					

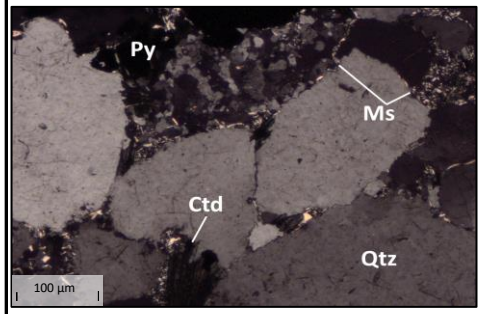
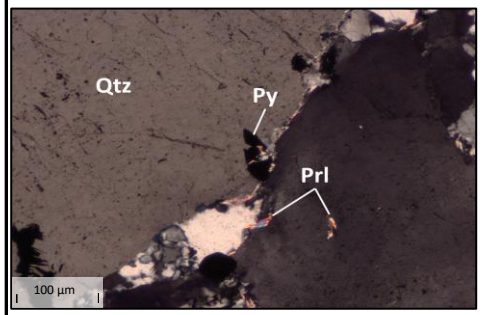
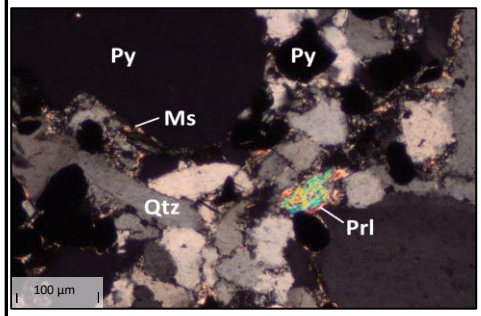
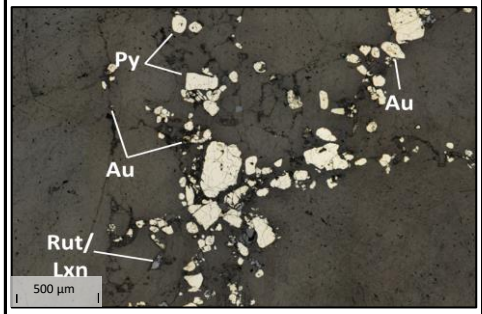
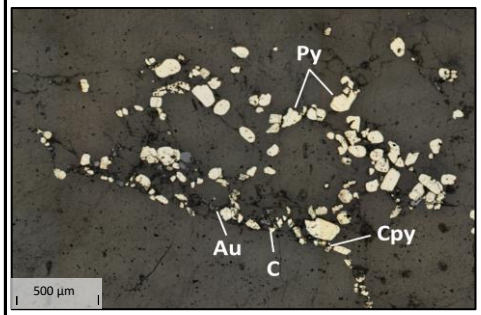
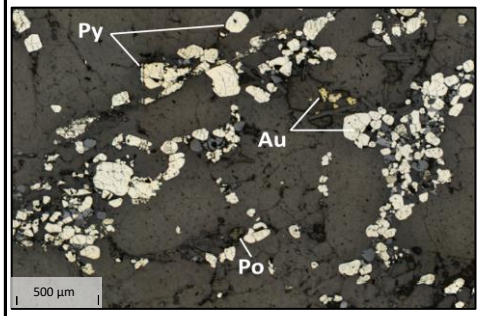
Sample ID	Descriptions				
Name	**Unit**	**Transmitted Light**		**Reflected Light**	
Sample 26 GBH 3845	No. 3 Facies		Clast-supported conglomerate, with predominantly fine to medium-grained, rounded to subrounded, monocrystalline quartz (Qtz) clasts. Chloritoid (Ctd) laths, pyrophyllite (Prl), sericitic muscovite (Ms) and polycrystalline quartz grains make up the fine-grained matrix. Sulphides are hosted within the matrix. *Modal Abundance:* *Qtz - 84%; Prl - 7%;* *Ms - 3%; Chl - 1%;* *Ctd - 3%; Sulphides - 2%.*		Rounded and anhedral to euhedral pyrite (Py) grains present. Small gold (Au) nuggets are set within the matrix. Pyrrhotite (Po) is seen within quartz clasts as well as alongside pyrite grains. Carbon (C) is present within the sample (lesser amounts) as well as chalcopyrite (Cpy). *Modal Abundance:* *Py - 94%; Po - 1%;* *C - 1%; Cpy - 1%;* *Au - 1%, Ur -1%,* *Rut/Lxn - 1%*
					
					

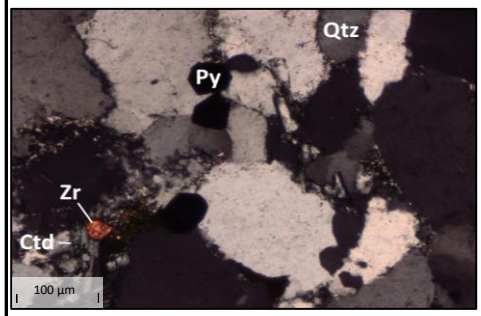
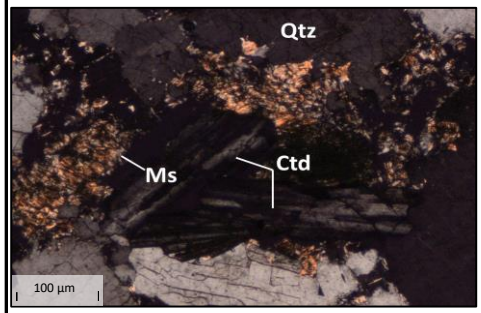
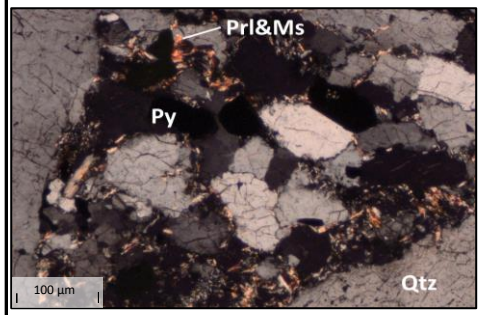
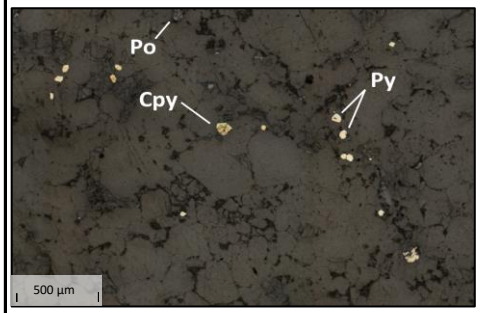
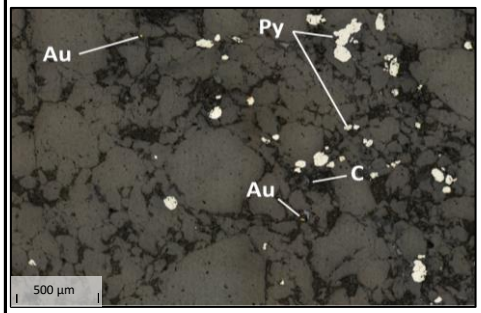
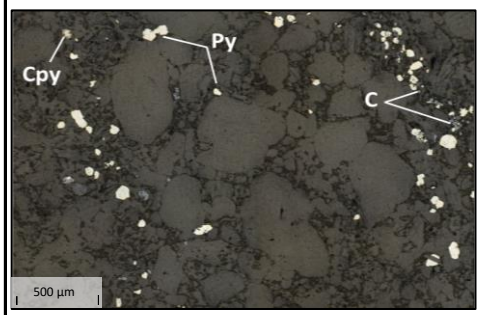
Sample ID	Descriptions				
Name	**Unit**	**Transmitted Light**		**Reflected Light**	
Sample 27 GBH 4003	No. 1 Facies		Medium to fine-grained quartz (Qtz) clasts are present within the clast-supported reef. Sulphides are seen to occur interstitially between the quartz clasts and are hosted in a very fine-grained muscovite (Ms) and pyrophyllite (Prl) rich matrix. Angular to subrounded grains of muscovite and chlorite (Chl) are seen within the matrix as well as polycrystalline quartz grains. *Modal Abundance:* *Qtz - 86%; Prl - 4%; Ms - 3%; Ctd - 3%; Chl - 2%;* *Sulphides - 2%.*		Rounded detrital pyrite (Py) and anhedral to subhedral hydrothermal pyrite grains are seen. Chalcopyrite (Cpy) and pyrrhotite (Po) are seen in the sample. Small gold (Au) nuggets are present within the matrix as well as inclusions in pyrite grains. *Modal Abundance:* *Py - 94%; C - 1%;* *Po - 1%; Cpy - 1%; Au - 1%; Ur - 1%; Rut/Lxn - 1%.*
					
					

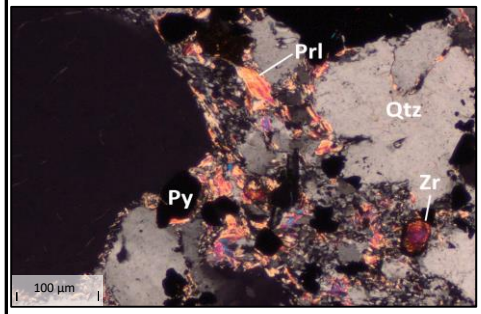
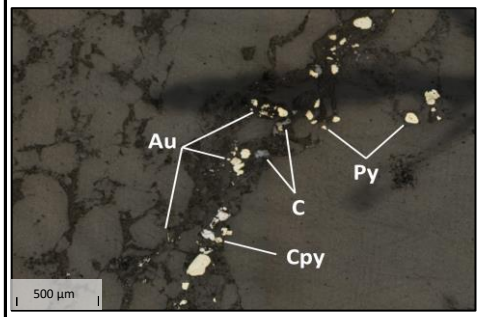
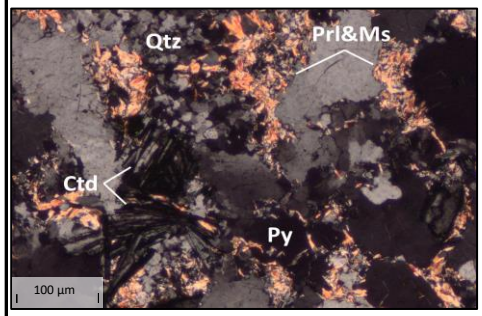
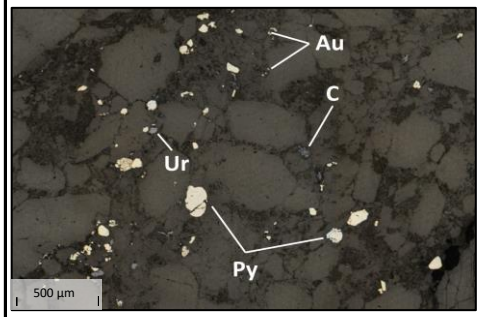
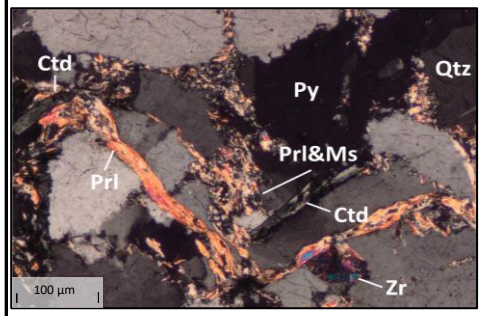
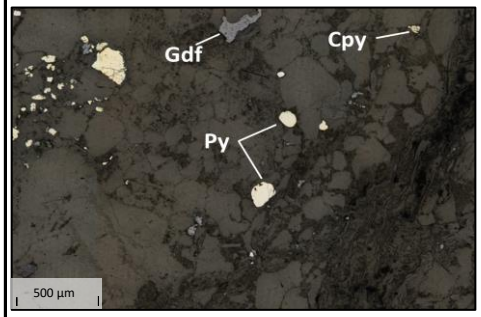
Sample ID	Descriptions				
Name	**Unit**	**Transmitted Light**		**Reflected Light**	
Sample 28 GBH 6000	No. 1 Facies		Fine-grained to very fine-grained, subrounded to rounded monocrystalline quartz (Qtz) clasts are set within a very fine-grained pyrophyllite (Prl)-rich and muscovite (Ms)-rich matrix. Fine grains of polycrystalline quartz are seen alongside the larger monocrystalline clasts. Sulphides are concentrated around the smaller quartz clasts. The matrix is also made up of angular fine grains of chloritoid (Ctd). *Modal Abundance:* *Qtz - 86%; Prl - 3%;* *Ms - 6%; Chl - 1%;* *Ctd - 2%; Sulphides - 2%.*		Very few sulphides present within the sample. Pyrite (Py) is the dominant mineral with mostly rounded detrital grains, with hydrothermal anhedral to euhedral grains. The gold (Au) within the sample occurs interstitially. Chalcopyrite (Cpy) and pyrrhotite (Po) are seen in negligable amounts. *Modal Abundance:* *Py - 94 %; Cpy - 1%;* *Au - 1%; Po - 1%; Zr - 1%;* *Ur - 1%; C - 1%.*
					
					

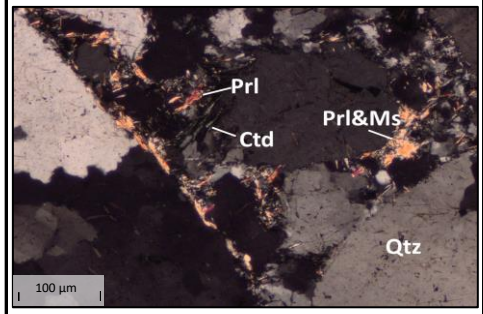
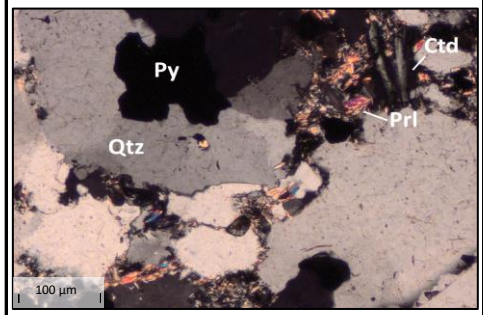
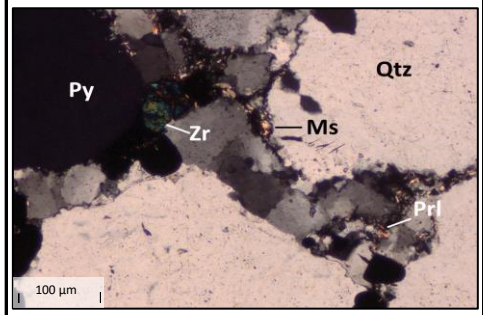
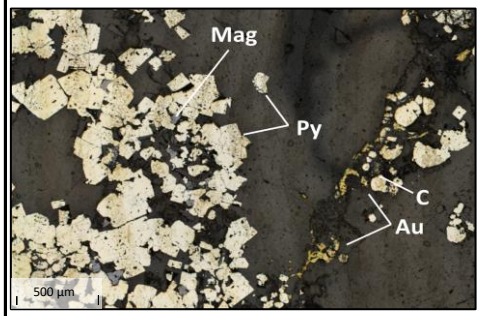
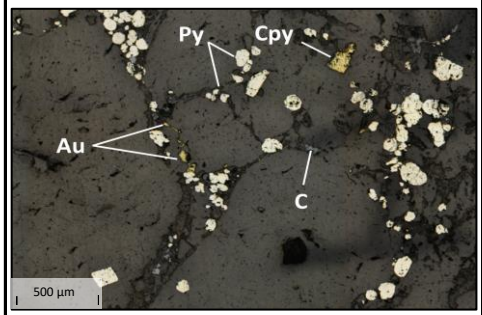
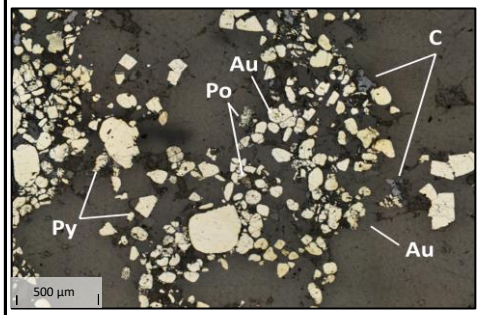
Sample ID	Descriptions				
Name	**Unit**	**Transmitted Light**		**Reflected Light**	
Sample 29 GBH 6001	No. 3 Facies		Predominantly fine to medium-grained monocrystalline quartz (Qtz) clasts are present in the clast-supported conglomerate. The matrix hosts the sulphides, and is made up of angular to subrounded pyrophyllite (Prl), muscovite (Ms), chlorite (Chl), chloritoid (Ctd) and polycrystalline quartz grains. *Modal Abundance:* *Qtz - 82%; Prl - 3%;* *Ms - 7%; Chl - 3%;* *Ctd - 3%; Sulphides - 2%.*		Pyrite (Py) occurs in two forms: euhedral to anhedral (hydrothermal) and rounded (detrital) grains. Chalcopyrite (Cpy) is present in the sample as well as carbon (C). Gold (Au) occurs between pyrite grains as well as independently within the reef matrix. Gold is also seen as growths around pyrite grains. *Modal Abundance:* *Py - 95%; Cpy - 1%;* *Au - 1%; C - 1%;* *Rut/Lxn - 1%; Ur - 1%*
					
					

Sample ID	Descriptions				
Name	**Unit**	**Transmitted Light**		**Reflected Light**	
Sample 30 GBH 6003	No. 1 Facies	  	Very fine to fine-grained quartz (Qtz) clasts are seen within the sample. The reef is clast-supported with a variety of both monocrystalline and polycrystalline quartz clasts. There is very little matrix present, however the portions seen are pyrophyllite (Prl)-rich with lesser amounts of sericitic muscovite (Ms), chlorite (Chl) and chloritoid (Ctd). Sulphides are seen to occure interstitially. *Modal Abundance:* *Qtz - 88%; Prl - 3%;* *Chl - 1%; Ms - 3%;* *Ctd - 3%; Sulphides - 2%.*	  	Mostly rounded pyrite (Py) grains within sample. Gold (Au) is seen in quartz clasts as well as inclusions within pyrite grains. Carbon (C) is seen in the sample as well as pyrrhotite (Po), chalcopyrite (Cpy) and uraninite (Ur). *Modal Abundance:* *Py - 94%; Au - 1%;* *Cpy - 1%; C - 1%;* *Po - 1%; Rut/Lxn - 1%;* *Ur - 1%.*

Sample ID	Descriptions				
Name	**Unit**	**Transmitted Light**		**Reflected Light**	
Sample 31 GBH 6004	No. 2B Facies	  	Polycrystalline and monocrystalline quartz (Qtz) clasts are seen within the clast-supported conglomerate. The clasts are rounded to subrounded, ranging from very fine-grained to fine-grained. The quartz clasts are set within a pyrophyllite (Prl)-rich matrix. There is very little matrix however the portions visible also contain angular to subrounded fine grains of sericitic muscovite (Ms) and chloritoid (Ctd). *Modal Abundance:* *Qtz - 89%; Prl - 3%;* *Ms - 2%; Chl - 1%;* *Ctd - 2%; Sulphides - 3%.*	  	Pyrite (Py) grains are concentrated around quartz clasts. Both gold (Au) and pyrite occur interstitially. Rutile (Rut) and leucoxene (Lxn) are seen as well as chalcopyrite (Cpy) within the sample. *Modal Abundance:* *Py - 94%; C - 1%; Cpy - 1%;* *Au - 1%; Rut/Lxn - 1%;* *Po - 1%.*

Sample ID	Descriptions				
Name	**Unit**	**Transmitted Light**		**Reflected Light**	
Sample 32 GBH 6014	No. 1 Facies	  	The reef is a clast-supported conglomerate with rounded to subrounded quartz (Qtz) clasts. Predominantly monocrystalline quartz clasts are seen alongside polycrystalline clasts. The matrix hosts very fine to fine grains of rounded to angular pyrophyllite (Prl), sericitic muscovite (Ms), chlorite (Chl) and chloritoid (Ctd). *Modal Abundance:* *Qtz - 86%; Prl - 3%;* *Chl - 3%; Ms - 6%;* *Ctd - 1%; Sulphides - 1%.*	  	Pyrite (Py) grains are rounded (detrital), anhedral to euhedral (hydrothermal) and occur alongside pyrrhotite (Po) and chalcopyrite (Cpy) grains. Gold (Au) occurs interstitially, and as very small nuggets. Subrounded to rounded grains of zircon (Zr) can also be seen within the matrix. *Modal Abundance:* *Py - 94%; Cpy - 1%;* *Au - 1%; C - 1%;* *Rut/Lxn - 1%; Zr - 1%;* *Ur - 1%.*

Sample ID	Descriptions				
Name	**Unit**	**Transmitted Light**		**Reflected Light**	
Sample 33 GBH 6028	No. 1 Facies		Fine-grained subrounded to rounded quartz (Qtz) clasts within a clast-supported conglomerate. Both polycrystalline and monocrystalline quartz clasts are present. The matrix is made up of angular to subrounded pyrophyllite (Prl), sericitic muscovite (Ms) as well as chloritoid (Ctd) blades. *Modal Abundance:* *Qtz - 84%; Prl - 7%;* *Ms - 4%; Ctd - 3%;* *Chl - 1%; Sulphides - 1%.*		Rounded detrital grains as well as anhedral to euhedral pyrite (Py) grains are seen. Gold (Au) occurs interstitially in the matrix. Uraninite (Ur) and carbon (C) are seen in the sample. Rounded zircon (Zr) grains are set within the matrix. *Modal Abundance:* *Py - 93%; Cpy - 1%; Au - 1%;* *Rut/Lxn - 1%; C - 1%;* *Zr - 1%; Gdf - 1%; Ur - 1%.*
					
					

Sample ID	Descriptions				
Name	**Unit**	**Transmitted Light**		**Reflected Light**	
Sample 34 GBH 6036	No. 1 Facies	  	Medium to fine-grained quartz (Qtz) clasts are present within the clast-supported reef. Sulphides are seen to occur interstitially between the quartz clasts and are hosted in a very fine-grained pyrophyllite (Prl)-rich matrix. Muscovite (Ms) and chloritoid (Ctd) grains are seen in the matrix, as well as very fine-grained polycrystalline quartz clasts. *Modal Abundance:* *Qtz - 85%; Prl - 5%;* *Ms - 4%; Chl - 3%;* *Ctd - 2%; Sulphides - 1%.*	  	Anhedral to euhedral hydrothermal grains as well as rounded pyrite (Py) grains are set within the matrix. Gold (Au) occurs as nuggets and interstitially within the matrix. Anhedral to euhedral chalcopyrite (Cpy) grains are seen. Rounded grains of zircon (Zr) are also set within the matrix. Rutile (Rut) and leucoxene (Lxn) are seen occurring together in the sample. *Modal Abundance:* *Py - 94%; Cpy - 1%;* *Rut/Lxn - 1%; Au - 1%;* *C - 1%; Ur - 1%; Zr - 1%.*