

GEOLOGY LOG

HOLE: OFF-10-01

INTERVAL			SUB-INTERVAL			LITHOLOGY			STRUCTURE				ALTERATION						MINERALS						Photo	DETAILED DESCRIPTION	
From (m)	To (m)	Interval (m)	From (m)	To (m)	Interval (m)	Unit	Modifier	Texture	Type	Attitude (tca)	Attitude (tfa)	Density (frequency/m)	Oxidation	Carbonate	Silicification	Sericite	Other		Pyrite			Other		Other			
																	Type	Intensity				Type	Intensity	Type			Intensity
0.00	3.96	3.96				OVB																				Overburden. 12 cm recovered. Broken up, rubbly phyllite chips.	
																										Grey to light grey and rusty, foliated, pitted phyllite. Rusty pits are abundant and between 1-4 mm wide. Pits produce a slight to moderate porosity. Foliation is weakly to moderately well developed, and sub-perpendicular TCA. Fine to medium grain, anhedral to subhedral, elongate quartz crystals are cryptic and have undergone deformation. Black rusty seams are between <1 to 1 mm wide, and biotite-rich(?) - no visible crystals. Unit has been broken up into poker chips. White quartz veins are scattered throughout, and range in size between 1 to 3 mm wide, locally 5-10 cm wide. Quartz veins follow foliation.	
3.96	32.10	28.14				PHY			FO	90			m														
				14.18	14.29	0.11			VN																		
				15.58	15.71	0.13			VN																		Rusty white, massive quartz vein. Sharp upper and lower contacts.
																											Buff to tan with a tinge of green chlorite coloured alteration on fractured surfaces. Alteration flakes off as a phyllosilicate. These altered zones are local and between 1-10 cm wide.
				17.50	27.00	9.50																					
				22.65	23.02	0.37			VN								CLY	w									Rusty white quartz vein. Weakly clay altered
				26.50	27.60	1.10	PHY																				Unit has a high concentration of mafics, and slightly darker in colour. Foliation is poorly developed.
				27.60	32.10	4.50	ARG		DE					m						f							Grey to light grey, weakly foliated deformed argillite with abundant rusty pits and fractured surfaces. Outlines of remnant bedding planes have been moderately to strongly folded and deformed. Folds are primarily asymmetric and have a slight stylolitic appearance. The zone is composed of dark pelitic and lighter siltstone layers between 1 to 5 mm wide. Pyrite occurs as faint <1 mm laminations or as discontinuous lenses parallel to foliation.

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																	Type	Intensity				Type	Intensity						
32.10	48.05	15.95				RHY/ARG							w		w	m			f										Dirty white to light grey, moderately hard, rhyolitic tuffaceous beds and black, moderately soft argillite interbeds that have undergone moderate folding and deformation. Locally deformed and intensely folded Black argillite layers are between <1 to 3 mm wide and appear to surround harder tuffaceous layers. This texture is distinct. Tuffaceous layers are between 5 to 40 mm wide. Tuffaceous beds are still preserved, yet folded and show weak to strong foliation. Folding and foliation appear syngenetic. Tuffaceous fragments are scattered throughout producing a unique texture. Pyrite mainly occurs as <1 to 1 mm laminations or as fine grain disseminations. Pitting is variable and ranges from moderate to locally dense, and occasionally filled with limonite. Sericite alteration occurs throughout and locally infills pits.
			35.50	36.10	0.60	RHY							m		m	w			t										Cloudy white to light grey, fine grained, hard, massive rhyolite. Moderately oxidized with moderate to strong limonite staining and sericite alteration along fractured surfaces. Trace pyrite.
			37.17	37.53	0.36	RHY/ARG										w	CHL	m											Forest green chlorite alteration appears flaky and occupies interstitial space between argillitic interbeds. Light tan to buff sericite alteration varies intensity between weak to moderate, and occurs on fractured surfaces. Locally infilling pits.
			46.38	46.52	0.14	QTE										w	CHL	w											White and slightly smoky, medium grained quartzite with few vugs and oxidized patches. Chlorite and sericite alteration intensifies with a corresponding increase in vug concentration.
			47.37	48.05	0.68	RHY							t		m	w							He	t					Cloudy white to light grey, fine grained, massive rhyolite with sericite infilled fractures. From 47.53 to 47.58 m, reddish maroon, soft, clay-like hematitic alteration occurs on a fractured surface.

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																	Type	Intensity					Type	Intensity						
48.05	134.39	86.34				ARG							w		w	m			m										Dark to light grey, moderately hard, folded argillitic beds. Weakly oxidized along fractures. Hard, angular to subangular, grey lithic clasts occur randomly throughout. Clasts are between 1 to 3.5 cm wide. Asymmetric folds are common. Pyrite is fine grained, locally medium grained, and occurs as elongate blebs between 3 to 10 mm wide, or as <1 to 1 mm laminations. Occasionally occurs as blotchy patches. Sericite occurs throughout as whisps, within pits or infills fractures. Pitting is abundant. Note: lighter siltstone layers are harder than dark pelitic layers.	
			58.05	61.32	3.27	ARG			DE							m													Pitting concentration increases. Black clay-rich pelitic unit contains the majority of pits. Interval has undergone weak deformation. Grain boundaries between layers are diffuse and jagged.	
			61.73	62.22	0.49	QTE										m													Cloudy, dirty white, speckled quartzite with moderate sericite alteration. Sericite infills most fractures and voids.	
			62.55	77.30	14.75	ARG							m			m			w										Unit is slightly lighter due to a decrease in pelitic layers and an increase in siltstone layers. Lithic clasts are more abundant (~5%). Clasts are light grey to black and angular, moderately hard. Black clasts leave a black shaley/carbon-like material on fingers when touched. Boundaries between clasts and argillitic units are sharp. Clasts appear to concentrate within distinct layers which have undergone the same folding event as its surroundings. Asymmetric folds are abundant and range in size between 1 to 3 mm. Pyrite occurs as laminations 1 mm wide or as elongate blebs between 1 to 3 mm wide. Rusty seams and fractured surfaces are abundant.	
			77.30	77.50	0.20	QTE										m													Cloudy, dirty white, speckled quartzite with moderate sericite alteration. Sericite infills most fractures and voids.	
			78.30	81.20	2.90	ARG			FO	90						w	CHL	w											Buff green sericite and chlorite alteration occurs interstitially between layers. Foliation is sub-perpendicular TCA, and fold structures are scarce. Alteration appears to preferentially target pelitic, clay rich black layers.	

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																	Type	Intensity				Type	Intensity						
			81.20	104.70	23.50	ARG							w		m	m	CHL	w	f									Faint green chlorite alteration occurs interstitially and along fractured seams. Actinolite occurs as dark grey to black, needle-like, euhedral, prismatic crystals between 1 to 5 mm long. Actinolite is no longer present from 89.21 m onwards. Pyrite mainly occurs on fractured surfaces. Rusty, limonitic alteration mainly occurs on fractured surfaces. Locally with a thick 1 mm rusty coating. Unit is hard. Locally, oxidation increases to moderate. Asymmetric folds occur throughout.	
			86.20	89.21	3.01	QTE							s				CHL	m	w									Cloudy rusty white quartzite with zones of intensely oxidized argillite. Sharp upper and lower contacts. Overall, unit is altered. Few interbeds between 5 to 20 cm have been moderately oxidized and weakly chloritized. Actinolite is still present and best observed on fractured surfaces. Black manganese coating occurs on few surfaces.	
			88.45	89.21	0.76	QTE							i															Intensely oxidized zone. Granular and mushy.	
			102.72	103.06	0.34										s	m			ms									Quartz flooded zone. White quartz with thin black pelitic zones. Fine grained pyrite-rich layers are between 1 to 5 mm. Pyrite crystals are elongate and slightly tarnished. The center of this unit is slightly gougy and soft.	
			104.70	134.39	29.69	ARG							t		s	m			m									Pyrite concentration decreases to moderate, and occurs as patchy blebs between 5 to 13 mm wide. Pyrite crystals mainly occur within quartz veins. Striations on pyrite crystals are observed. Asymmetric folds are abundant. Locally quartz and sericite altered. Alteration occurs alongside each other. Few sericite veins cross-cut white quartz veins, and infills fractures within quartz veins. Unit is hard	
			116.79	116.89	0.10				GO							s	CLY	m	f									Soft, granular, sericite altered. Few white quartz lenses, roughly 6 mm wide. Pyrite is fine grained and disseminated.	
			116.98	117.15	0.17				GO							s	CLY	w	f										
			118.35	130.16	11.81	ARG			FO	90					s	m			s									Greenish tan alteration is scattered throughout the interval, producing a slightly burnt look. Pyrite is fine grained, disseminated throughout and mainly occurs as <1 to 2 mm crystals or as cross-cutting veins. Unit still shows remnant siltstone and pelitic layers. Unit is hard and silicified with local quartz laminations in a well foliated altered argillite. Pits are between 1 to 3 mm wide and mainly filled with a white carbonaceous mineral that weakly effervesces.	

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																	Type	Intensity					Type	Intensity					
			130.16	134.39	4.23	ARG									s	w			ms									Dark grey to black, hard, siliceous/quartz-flooded argillite with strong pyrite mineralization. Pyrite occurs as patchy blebs between 2 to 11 mm wide.	
134.39	161.98	27.59				RHY /AR G										m			f									Greyish green and speckled light pink, white and black, moderately hard, tuffaceous fragmental rhyolite interbedded with 1-2 mm argillitic layers. Few white carbonaceous lenses weakly effervesce, and range in size between 1 to 3 mm. Argillitic layers are best observed on greasy fractured surfaces. Locally soft. Pyrite is disseminated between interbeds. Note: Relatively identical to rhyolitic unit at the top of the hole.	
			135.90	138.00	2.10	ARG									i	m			f									Cloudy to dark grey, hard, intensely silicified and altered argillite with tarnished pyrite along seams. Pyrite often occurs alongside sericite veinlets (1-3 mm wide) or as patchy blebs on fractured surfaces. Sericite occurs within veinlets or as patches infilling fractures and pits.	
			141.32	141.40	0.08				GO							m	CLY	s										Granular, mushy gouge. Moderately sericite altered Sharp upper and lower contacts.	
			141.65	141.80	0.15				VN								CHL	w										White quartz vein with sericite and chlorite veinlets. Sericite also infills fractures. Chlorite appears as splotchy blebs within the quartz matrix. Sharp upper and lower contacts.	
			143.24	144.70	1.46	ARG								t		w	CHL	w	w									Black, hard, siliceous/quartz-flooded argillite with minor sericite alteration. Pyrite is weakly disseminated. Pits are 1 mm wide, and contact a white, weakly effervescing minerals. Chlorite alteration is weak and mainly resembles an alteration that 'acts' as a phyllosilicate (poker chips). Black, needle-like, prismatic actinolite crystals are between 2 to 4 mm long. These crystals are scattered throughout. Best observed along fractures.	
			144.70	147.31	2.61	RHY									m	m			f									Cloudy greenish-gray with a pink halo, moderately homogeneous rhyolite flow with local zones of interbedded argillitic laminations. Unit is hard. Local pyritic stringers are 1 to 2 mm wide. Pyrite also occurs as patchy blebs on fractures.	

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																	Type	Intensity				Type	Intensity				
			147.31	147.48	0.17	ARG								t		w	CHL	w	w								Black, hard, siliceous/quartz-flooded argillite with minor sericite alteration. Pyrite is weakly disseminated. Pits are 1 mm wide, and contact a white, weakly effervescing minerals. Chlorite alteration is weak and mainly resembles an alteration that 'acts' as a phyllosilicate (poker chips). Black, needle-like, prismatic actinolite crystals are between 2 to 4 mm long. These crystals are scattered throughout. Best observed along fractures.
			149.02	150.60	1.58	ARG								t		w	CHL	w	w								Black, hard, siliceous/quartz-flooded argillite with minor sericite alteration. Pyrite is weakly disseminated. Pits are 1 mm wide, and contact a white, weakly effervescing minerals. Chlorite alteration is weak and mainly resembles an alteration that 'acts' as a phyllosilicate (poker chips). Black, needle-like, prismatic actinolite crystals are between 2 to 4 mm long. These crystals are scattered throughout. Best observed along fractures. Black, lithic clasts are angular to subrounded and range in size between 1 to 5 cm. Asymmetric folds are abundant.
			151.90	153.17	1.27	ARG								t		w	CHL	w	w								
			153.86	154.11	0.25				VN								CHL	w									White quartz vein with sericite and chlorite veinlets. Sericite also infills fractures. Chlorite appears as splotchy blebs within the quartz matrix. Sharp upper and lower contacts.
			156.57	156.74	0.17				VN								CHL	w									
			160.60	161.98	1.38	ARG								t		w	CHL	w	w								Black, hard, siliceous/quartz-flooded argillite with minor sericite alteration. Pyrite is weakly disseminated. Pits are 1 mm wide, and contact a white, weakly effervescing minerals. Chlorite alteration is weak and mainly resembles an alteration that 'acts' as a phyllosilicate (poker chips). Black, needle-like, prismatic actinolite crystals are between 2 to 4 mm long. These crystals are scattered throughout. Best observed along fractures. Black, lithic clasts are angular to subrounded and range in size between 1 to 5 cm. Asymmetric folds are abundant.

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																	Type	Intensity				Type	Intensity				
161.98	240.50	78.52				VCL			FO	90						m			s							Dark grey with local light grey patches and layers, siliceous meta-volcaniclastic with disseminated pyrite. Pyrite is mainly disseminated, although also occurs as fine grained, subrounded blebs, as patches on fractures or as laminations between 1 to 3 mm wide. Black shaley layer are common and occur within fine grained quartz-rich tuffaceous layers. Remnant pelitic layers are still visible, although have undergone obvious folding and deformation. Orange-yellow sericite alteration infills pits and appears as yellowish-green stains on core. Note: Texture resembles that of the interbedded ARG/PHY and RHY unit between 32.1 to 48.05 m.	
			167.23	168.87	1.64									t			BIOT	s	m							White, medium grained quartz veins with light tan-brown 'biotitite alteration'. Locally biotitite and chlorite alteration have a skarnified appearance. Pyrite is tarnished and appears as fine grain, semi-crystalline elongate blebs.	
			168.87	240.50	71.63	VCL/RHY								w		w			m							Black to light grey, shaley phyllite interbedded with meta-volcaniclastics. Shaley phyllitic layers are dark grey and black. Remnant bedding is still visible, although has undergone folding. The meta-volcaniclastics in this interval are identical to those between 161.98 - 240.5 m. Pyrite occurs as blebs, elongate blebs and as thin laminations (1-2 mm). Cloudy white to light brown carbonate veins are sparse and between 1 to 15 mm wide. Carbonate veins show moderate to strong effervescence. Sericite alteration occurs on fractured surfaces, and locally infills pits.	
			170.68	171.27	0.59												CHL	M								White, medium grained quartz veins with light tan-brown 'biotitite alteration'. Locally biotitite and chlorite alteration have a skarnified appearance.	
			184.62	185.14	0.52																					Pyrite is tarnished and appears as fine grain, semi-crystalline elongate blebs	
			189.95	196.30	6.35											m	CHL	w	f							Subrounded to rounded, black lithic fragments are scattered and range in size between 2 to 6 cm. Black fragments rub off a black shaley/graphitic coating on fingers. Layers hosting fragments are light grey and hard.	
			195.55	206.00	10.45	VCL/RHY																				Weakly clay altered and slightly gougy	
			214.78	215.38	0.60	VCL/											CLY	w									

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																	Type	Intensity					Type	Intensity				
			224.03	224.18	0.15	SHL													s								Black shaley layer with abundant pyrite. Pyrite is fine grained, and occurs as disseminations and blebs between 1-5 mm wide.	
			226.71	228.70	1.99	RHY										w											Light greyish-pink, fine to medium grained, tuffaceous interbeds. Upper and lower contacts are diffuse and show a gradational change between units.	
			230.90	231.25	0.35	RHY												CLY	w								Weakly clay altered and slightly gougy.	
			236.38	238.14	1.76											m	CHL	w	f								White, medium grained quartz veins with light tan-brown 'biotitite alteration'. Locally biotitite and chlorite alteration have a skarnified appearance. Pyrite is tarnished and appears as fine grain, semi-crystalline elongate blebs. Numerous cross-cutting black shaley lenses that range in size between 5 to 8 cm.	
																											Light grey, fine to medium grained, interbedded rhyolite and altered quartzite. Quartzite layers contain thin black laminations (sub-perpendicular TCA), sericite infilled seams, and patchy chloritic halos. Rhyolitic layers become more prominent towards EOH. Rhyolitic layers contain thin, black, aligned biotite crystals. Sericite and chlorite alteration occur alongside each other and appear syngenetic.	
240.50	244.14	3.64				QTE/ RHY										m	CHL	w										
EOH																												