DIAMOND DRILLING

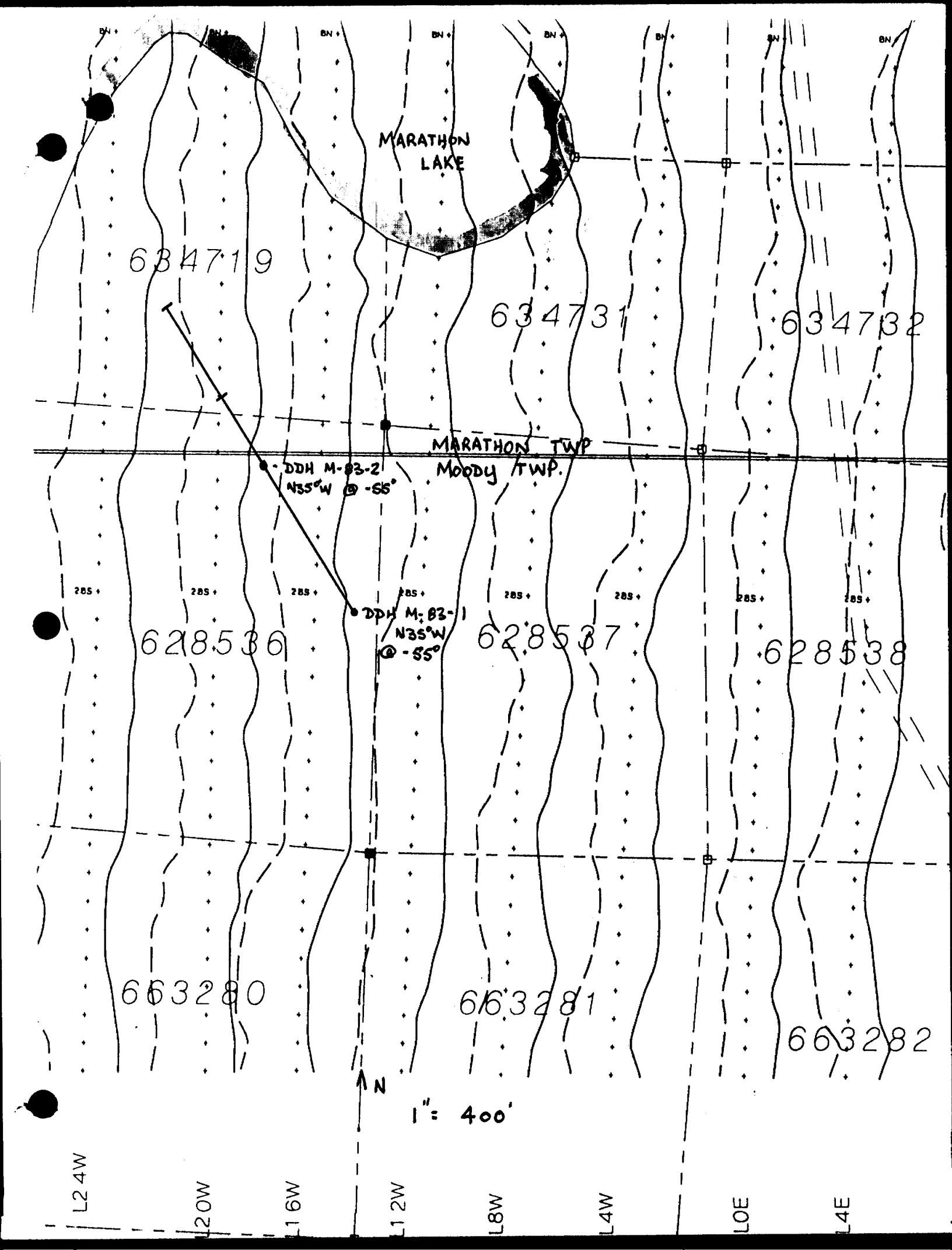
TOWNSHIP: Moody

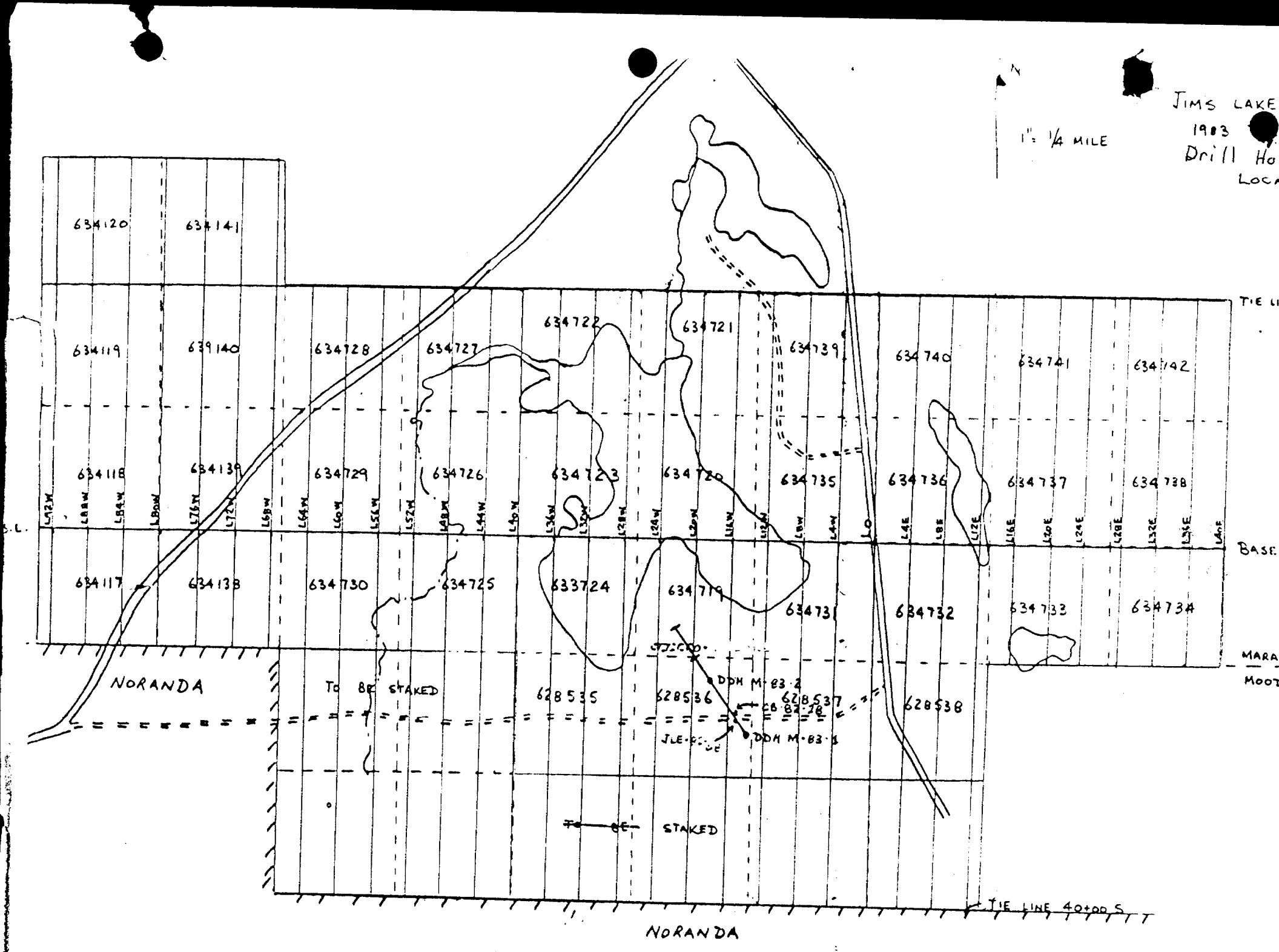
REPORT NO.: 16

WORK PERFORMED BY: Utah Mines Ltd.

CLAIM NO.	HOLE NO.	FOOTAGE	DATE	NOTE
K 628536	M83-2	1176	Apr/83	(1)
	M83-1	1596	Apr/83	(1)

NOTES: (1) #159-83


MARATHON LAKE
634719
634731
634732
MARATHON TWP
MOODY TWP.
DDH M-83-2
N35°W @ -55°
DDH M-83-1
N35°W
@ -55°
628536
628537
628538
663280
663281
663282
N
1" = 400'
L24W
L20W
L16W
L12W
L8W
L4W
L0E
L4E


JIMS LAKE
1983
Drill Ho
Loca
1" = 1/4 MILE
N
634120
634141
634119
639140
634128
634727
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634732
634733
634734
TIE LI
BASE
MARA
MOOT
NORANDA
To BE STAKED
628535
628536
628537
628538
DDH M-83-2
DDH M-83-1
STAKED
TIE LINE 40+00 S
NORANDA

HOLE NO. M-[redacted]
CASING COLLAR ELEV.: 4' above gr. GROUND ELEV.:
COORDINATES: N. E.
INCLINATION: -55° BEARING: N35°W

PROJECT: JIM'S LA[redacted]EXTENSION
DATE STARTED: APRIL 18. 83
DATE FINISHED: APRIL 26. 83
TOTAL DEPTH: 1176'

REF. TO CLAIM CORNER:
SCALE: 1" = 10'
LOGGED BY: D McIVOR

COMMENTS: HOLE COLLARED 500' @ N35°W FROM JLE-83-08, & 190' @ 117° FROM L20W, 15S (MARATHON GRID)
DIP TESTS: (CORRECTED) 300': 55°, 600': 51°, 900': 47°, 1176': 41°.
0-240': OVERBURDEN.
SEE ATTATCHED "DESCRIPTIVE GEOLOGY" NOTES.

AVE CORE REC'Y / HOLE: 100 %

DESCRIPTIVE GEOLOGY

SECTION	CHLORITE	SERICITE	SILICIFICATION	CARBONATE	DESCRIPTIVE GEOLOGY
240'–260'	MINOR FRAC. FILL	MODERATE	NIL	FRACTURE FILL	siltstone interbed; SERICITIZED, SILICEOUS META-GRAYWACKE – small qtz-feld clasts in vfg. siliceous matrix; coarse v. clast rich wacke bed; siltstone interbed; qtz vn
260'–275'	NIL	MODERATE	NIL	PATCHY MOD. ALT.	graywacke interbeds; appears wkly brecciated; ALTERED (SERICITIZED) SILTSTONE – minor diss. limonite; wk fol (bd?) @ 45° cba
275'–285'	MINOR FR FILL	HALOS ON FRACS	HALOS ON FRAC	FRAC FILL	ser-carb alt. bed; SILTSTONE – ser-carb alt. band; ser. alt. patches; a few clast bearing 'zones'
285'–300'	MINOR FRAC FILL	HALOS AROUND FRACS	HALOS AROUND FRACS	FRACTURE FILLING	siltstone interbed; v. clast rich (90%) interbed; GRAYWACKE – 5-10% vfg diss bio.; a few lithic argillic clasts

Mineral column notations: Po (240'–275'), Py (255'–300').

% SULPHIDES	DRILLING INTERVAL	% CORE RECOVERED	CORE SIZE
TRACE	240'–242'	100%	NQ
TRACE	242'–258'	100%	BQ
TRACE	258'–261'	100%	BQ
TRACE	261'–266'	100%	BQ
TRACE	266'–270'	100%	BQ
TRACE	270'–275'	100%	BQ
TRACE	275'–279'	100%	BQ
TRACE	279'–289'	100%	BQ
TRACE	289'–298'	100%	BQ
TRACE	298'–To 306'	100%	BQ

SAMPLE INTERVAL	% REC'Y SAMP. INT.	ESTIMATED
244'–251'	100%	
251'–255'	100%	
255'–259'	100%	
259'–262'	100%	
262'–268'	100%	
268'–275'	100%	
275'–280'	100%	
280'–285'	100%	

HOLE NO. M-[illegible]2		PROJECT: JIM'S LAKE EXTENSION	PAGE NO: 2 OF 16
CASING COLLAR ELEV.: 4' above gr.	GROUND ELEV.:	DATE STARTED: APRIL 18, 83	REF. TO CLAIM CORNER:
COORDINATES:	N. E.	DATE FINISHED: APRIL 26, 83	SCALE: 1" = 10'
INCLINATION: -55°	BEARING: N35°W	TOTAL DEPTH: 1176'	LOGGED BY: D. McIVOR

COMMENTS:

AVE CORE REC'Y / HOLE

DESCRIPTIVE GEOLOGY

SECTION	ALTERATION: CHLORITE	SERICITE	SILICIFICATION	CARBONATE	FRACTURING	MINERAL	DESCRIPTIVE GEOLOGY	% SULPHIDES
300'–305'	NIL	HALOS	HALOS	FRAC FILL		Py	bleached - silica & sericite alt. halos around fractures SILTSTONE grades into graywacke	TRACE
305'–315'	FRAC FILL	MOD. - STRONG	ALT. HALOS	FRAC. FILL		Py	small feld. qtz clasts in siliceous matrix GRAYWACKE qtz-calc vn. lithic arg. qtz. QFP clasts to 1/2"	TRACE
315'–321'	FRAC FILL	MOD.	HALOS	FR. FILL		Py	20% v.f.g. diss bio. aligned @ 45° SILTSTONE	TRACE
321'–334'	MINOR FRAC. FILL	MOD. TO STRONG	NIL	MODERATE		Py	bio rich seam c̄ 0.5% diss Py ALTERED, SILICEOUS META-GRAYWACKE	0.25%
334'–349.5'	NIL	MODERATE	ALT. HALOS ON FRACS	WEAK TO MOD.		Py	'spotted alt.' - white to pale green bleached alt. blebs to 1/2" strongly carbonatized ALTERED SILTSTONE - QUARTZITE bio filled frac spotted alt. blebs affect 30% of rock wk. pervasive bleaching shear zone, mod. ser.-chl.-carb alt. foliation (bd & wk sch) @ 50° grades into graywacke	TRACE
349.5'–353'	NIL	MOD.	NIL	FR. FILL		Py	SERICITIZED, SILICEOUS METAGRAYWACKE	TR.
353'–360'	WK. PATCHY	STRONG	HALOS	MOD.		Py	sch/bd. @ 55° to the c.a. gray siliceous beds ALTERED SILTSTONE soft, strongly sericitized thin chlorite rich bands	TRACE

DRILLING INTERVAL	% CORE RECOVERED	CORE SIZE
– 306'	100%	BQ
306' – 317'	100%	BQ
317' – 325'	100%	BQ
325' – 330'	100%	BQ
330' – 335'	100%	BQ
335' – 346'	100%	BQ
346' – 356'	100%	BQ
356' – To 366'	100%	BQ

SAMPLE INTERVAL	% REC'Y SAMP. INT.	ESTIMATED
300' – 305	100%	
305 – 308	100%	
308 – 312'	100%	
312' – 315	100%	
315 – 321'	100%	
321' – 327'	100%	
327' – 334'	100%	
334' – 342'	100%	
342' – 349.5'	100%	
349.5' – 353'	100%	
353' – 359'	100%	
359' – To 361.5		

SECTION depth marks: 300', 310', 320', 330', 340', 350', 360'

HOLE NO. M[illegible]3-2 | PROJECT: JIM'S LAKE EXTENSION | PAGE NO: 3 OF 16

CASING COLLAR ELEV.: 4' above gr. | GROUND ELEV.: | DATE STARTED: APRIL 18, 88 | REF. TO CLAIM CORNER:

COORDINATES: N. E. | DATE FINISHED: APRIL 25, 83 | SCALE: 1" = 10'

INCLINATION: -55° | BEARING: N35°W | TOTAL DEPTH: 1176' | LOGGED BY: D McIVOR

SECTION	ALTERATION: CHLORITE	ALTERATION: SERICITE	ALTERATION: SILICIFICATION	ALTERATION: CARBONATE	FRACTURING	MINERAL	GEOLOGY	COMMENTS: / DESCRIPTIVE GEOLOGY	% SULPHIDES	DRILLING INTERVAL	% CORE RECOVERED	CORE SIZE	SAMPLE INTERVAL	% REC'Y SAMP. INT.	ESTIMATED
360'	WK	STR	NIL	F.F.		Py		ALTERED SILTSTONE	TR.			BQ	359'		
	NIL	WEAK TO MODERATE ALT. OF MATRIX.	NIL	MINOR DISS. BLEBS; E. STRINGERS		Py		thin clast free siltstone interbeds gtz veins			100%		361.5	100%	
								wk fol. as exhibited by alignment of bio. clasts. @ 55°					364'	100%	
								minor diss bio.		366'					
370'								30-70% small white feld & gtz clasts	TRACE						
								fg. sugary tot gtz vn			100%		372'		
						Ab							373'	100%	
								gtz vn					374.5		
						Ab Cpy							375.5	100%	
								lithic clast & chl alt arg./volc.		376'					
380'								mg granular gtz vns					380'		
						Py Cpy		GRAYWACKE			100%		382'	100%	
								gtz - grey calcite vn							
								tightly packed (clasts to 95%) wacke bed		386'					
390'	NIL		NIL						TRACE		100%				
						R		mg granular gtz vn					394'		
								tightly packed (clasts to 90%) bed					395'	100%	
								gtz - magnesite vn		396'			397'		
400'						Py					100%		403'	100%	
	WEAK	MOD TO STR	WALOS	DISS MIN. TO 5%		Py		thin pink cherty argillite interbeds @ 30° to the c.a							
								large graywacke 'clast'		406'					
								ALTERED SILTSTONE	TRACE					100%	
						Py		cherty arg. bed @ 20°					410.5'		
410'								tightly packed graywacke bed			100%				
	FR. FILL	HALOS	HALOS	FR. FILL		Py		highly contorted bd. ranging 0-90°	TRACE					100%	
								CHERTY SILICEOUS ARGILLITE - SILTSTONE		416'			416.5'		
								thin chl-ser alt. siltstone beds							
	MOD	MOD	NIL	DISS MIN TO 10%		Py		sleeve of sch. chl-ser alt siltstone	0.25%		100%		To 423'	100%	
420'								graywacke intabed		T. 426'					
								ALTERED SILTSTONE							

HOLE NO. M[redacted]3-2 | PROJECT: JIM'S L[redacted] EXTENSION | PAGE NO: 4 OF 16

CASING COLLAR ELEV.: 4' above gr | GROUND ELEV.: | DATE STARTED: APRIL 18. 83 | REF. TO CLAIM CORNER:

COORDINATES: N. E. | DATE FINISHED: APRIL 25. 83 | SCALE: 1" = 10'

INCLINATION: -55° | BEARING: N35°W | TOTAL DEPTH: 1176' | LOGGED BY: D. McIVOR

SECTION	ALTERATION: CHLORITE	ALTERATION: SERICITE	ALTERATION: SILICIFICATION	ALTERATION: CARBONATE	FRACTURING	MINERAL	GEOLOGY	COMMENTS: / DESCRIPTIVE GEOLOGY	% SULPHIDES	DRILLING INTERVAL	% CORE RECOVERED	CORE SIZE	SAMPLE INTERVAL	% REC'Y. SAMP. INT.	ESTIMATED
420'	MOD.	MOD.	NIL	DISS. MM. TO 10%	/	Po Py		thin graywacke interbeds sch. sheared chl-ser alt. siltstone. bd. @ 85° ALTERED SILTSTONE graywacke 'clast'	0.25%	422'	100%	BQ	422'	100%	
													427.5'	100%	
430'	MOD.	MOD.	NIL	TO 10% AS STR. & DISS. MM	/	Py Po		interbedded soft. sch. chl-ser alt. siltstone & sil. graywacke INTERBEDDED GRAYWACKE - ALTERED SILTSTONE slumped, contorted, bd. @ 20° cba (55)	0.25%		100%		431.5'	100%	
440'	MODERATE	MODERATE	NIL	MINOR DISS BLEBS	/	Po Py		thin graywacke interbeds cherty sil. arg. interbed tight pack graywacke interbed ALTERED SILTSTONE thin graywacke interbeds tightly packed chst rich graywacke interbed schistose. thinly bd. soft. chl-ser alt. siltstone.	TRACE	436' 446'	100%		441' 448'	100% 100%	
450'	FR. FILL	FR. FILL	ALT. HALO	FR. FILL	/			INTERBEDDED CHERTY SILICEOUS AAG. & ALT. SILTSTONE	NVS		100%		450.5'	100%	
	MODERATE	MODERATE	NIL	BLEBS. SEAMS.	/	Po Py		thinly bd. strongly sch. chl-ser alt. siltstone ALTERED SILTSTONE siliceous argillite clasts - brecciated flags wk foliation as exhibited by align bo @ 35°	0.5%	455'	100%		456' 461'	100% 100%	
460'	ALT. HALOS	ALT. HALOS	NIL	FRAC FILL	/			GRAYWACKE small fold. qtz clasts to 40%	NVS	463' 467'	100%		470'		
470'	MODERATE	MODERATE	NIL	FR FILL & DISS MIN	/	Po Py		thin sil. arg. siltstone interbeds highly packed chst rich graywacke interbed cherty arg. interbeds graywacke 'clasts' ALTERED (CHLORITE - SERICITE) SILTSTONE & GRAYWACKE & ARGILLITE INTERBEDS graywacke interbed highly packed (clasts to 95%) graywacke interbed. small graywacke clasts - brecciated interbeds.	TRACE	476' To 486'	100%		475' 480'	100%	
480'															

HOLE NO. M-83-2 | PROJECT: TIM'S LAKE EXTENSION | PAGE NO: 5 OF 16

CASING COLLAR ELEV.: 4' above gr. | GROUND ELEV.: | DATE STARTED: APRIL 18, 83 | REF. TO CLAIM CORNER:

COORDINATES: N. E. | DATE FINISHED: APRIL 25, 83 | SCALE: 1" = 10'

INCLINATION: -55° | BEARING: N35°W | TOTAL DEPTH: 1176' | LOGGED BY: D McIvor

SECTION	ALTERATION: CHLORITE	ALTERATION: SERICITE	ALTERATION: SILICIFICATION	ALTERATION: CARBONATE	FRACTURING	MINERAL	GEOLOGY	COMMENTS: / DESCRIPTIVE GEOLOGY	AVE CORE REC'Y / HOLE	% SULPHIDES	DRILLING INTERVAL	% CORE RECOVERED	CORE SIZE	SAMPLE INTERVAL	% REC'Y. SAMP. INT.	ESTIMATED
480'	MODERATE	MODERATE	↑ NIL	FRACTURE FILLING	/	·		- thin graywacke interbeds					BQ			
								- thin graywacke interbeds				100%				
								- graywacke 'clast'								
								- numerous thin tightly packed clast rich (90%) graywacke interbeds			486'					
								sch. chl-ser alt thinly bd. siltstone		TRACE						
490'								ALTERED (CHLORITE-SERICITE) SILTSTONE & GRAYWACKE, ARGILLITE INTERBEDS								
								rounded graywacke clast				100%				
						Py		'tight pack' graywacke beds						495'		
			NIL					'tight pack' graywacke interbeds			496'					
															100%	
500'						Py		graywacke clasts						501'		
								graywacke interbed				100%				
						Py				0.25%					100%	
	V				X			graywacke interbed			506'			506'		
	ALTERED BEDS	ALTERED BEDS	NIL	ALTERED BEDS	/			black strongly carbonatized interbed						508'	100%	
510'								SILTSTONE thinly bd. wkly sch (fol @ 30°) hd. sil. siltstone		NVS						
								grades into a graywacke				100%				
	FR. FILL	WEAK	NIL	FR. FILL				70-80% small fold & qtz clasts								
								GRAYWACKE soft. sch. chl alt. siltstone interbed		NVS						
								graywacke 'clasts' - brecciated interbeds			516'					
520'	FR. FILL	WEAK	NIL	FR. FILL	/	Py		ALTERED SILTSTONE bd. well dev. @ 25°, locally soft. ser(±chl) alt.		TRACE						
								thinly bd interbd graywacke & soft wkly ser-chl alt. siltstone		TR		100%		523'		
	ALTERED WKLY ALT. BEDS	ALTERED WKLY ALT. BEDS	ANIL	ALTERED WKLY ALT. BEDS	Py										100%	
						X		INTERBEDDED GRAYWACKE & ALTERED SILTSTONE			526'			526'		
								graywacke ± 60-70% small qtz. feld clasts		N						
530'								soft. ser alt. siltstone interbeds @ 35°		VS						
												100%		532.5		
								15% vfg diss bio exhibit bd @ 25°								
	FRAC FILL	WEAK	ALT. HALO	FRAC FILL	Py					TRACE					100%	
								SILICEOUS SILTSTONE - ARGILLITE small hexagonal oak blebs (alt. garnet)			534'			538'		
								vfg to argillaceous, gray dusky arg-sltst.			539'	100%		To 542'	100%	
540'																

HOLE NO. M-83-2 | PROJECT: JIM'S LAKE EXTENSION | PAGE NO: 6 OF 16

CASING COLLAR ELEV.: 4' above gr | GROUND ELEV.: | DATE STARTED: APRIL 18 · 83 | REF. TO CLAIM CORNER:

COORDINATES: N. E. | DATE FINISHED: APRIL 25 · 83 | SCALE: 1" = 10'

INCLINATION: -55° | BEARING: N35°W | TOTAL DEPTH: 1176' | LOGGED BY: D. McEVOR

SECTION	ALTERATION: CHLORITE	ALTERATION: SERICITE	ALTERATION: SILICIFICATION	ALTERATION: CARBONATE	FRACTURING	MINERAL	GEOLOGY	COMMENTS: / DESCRIPTIVE GEOLOGY	AVE CORE REC'Y / HOLE	% SULPHIDES	DRILLING INTERVAL	% CORE RECOVERED	CORE SIZE	SAMPLE INTERVAL	% REC'Y SAMP. INT.	ESTIMATED
540'	FRACTURE FILL	WEAK, PATCHY	HALOS AROUND FRACS	FRACTURE FILL		Py		bd. exhibited by align. of fg diss bio @ 20-25°		TRACE		100%	BQ	538'		
														542'	100%	
								SILICEOUS SILTSTONE - ARGILLITE			546'					
														547'	100%	
550'						Py		becomes pred. cherty argillite				100%		550'	100%	
														553.5'	100%	
	WEAK PATCHY ALTN	MODERATE	NIL	MODERATE TO STRONG				weak bd. @ 20°			556'					
								weak sch crosscuts bd @ 60°								
								qtz vn						559'	100%	
560'						Py		ALTERED (CARBONATIZED, SERICITIZED) SILTSTONE				100%				
								strongly carbonatized, c vfg diss calcite to 40% of rock in places.			566'			565'	100%	
														571'	100%	
570'						Py, Ank, Cpy		qtz-calc-bio? vn @ 10° cherty alt. halo around vn				100%		572'	100%	
														574'	100%	
	SMS	FR. FILL	NIL	FR. FILL		Py		INTERBEDDED SIL. SILTSTONE & CHERTY SIL. ARG. highly contorted bd., ev or. To°		TR.	576'			577.5'	100%	
	WEAK, PATCHY	STRONG	NIL	MODERATE		Py, Ank		weak bedding @ 30°		0.5%				581'	100%	
580'								mg granular qtz vn & minor calcite cross-cutting schistosity @ 55°				100%				
								qtz-calc vn						586'	100%	
								thin contorted cherty siliceous argillite interbeds.			686'					
								ALTERED (CARBONATIZED, SERICITIZED) SILTSTONE		TRACE				591'	100%	
590'												100%				
								chlorite clots						596'	100%	
								becomes less altered, harder, more siliceous			596'					
600'											To 606'	100%		To 601'	100%	

HOLE NO. M-83-2 | PROJECT: JIM'S LAKE EXTENSION | PAGE NO: 7 OF 16

CASING COLLAR ELEV.: 4' above gr. | GROUND ELEV.: | DATE STARTED: APRIL 18, 83 | REF. TO CLAIM CORNER:

COORDINATES: N. E. | DATE FINISHED: APRIL 25, 83 | SCALE: 1" = 10'

INCLINATION: -55° | BEARING: N35°W | TOTAL DEPTH: 1176' | LOGGED BY: D. McIVOR

SECTION	ALTERATION: CHLORITE	SERICITE	SILICIFICATION	CARBONATE	FRACTURING	MINERAL	GEOLOGY	COMMENTS: DESCRIPTIVE GEOLOGY
600'	WK	MOD	NIL	MOD		Py		thin dk gray wkly chl. & calcite rich interbeds
	A FEW ALT. BEDS	FR. FILL & ALT. HALOS	HALOS AROUND FRACS	A FEW ALT BEDS		Po		bd. exhibited by thin bio rich beds @ 15°
								1" cherty argillite intbed.
						Py		SILICEOUS SILTSTONE sil. arg bed c num thin cross-cutting calcite stringers
610'								thin black chl-calcite rich beds to 40% locally
								qtz-magnesite 'blebs'
						Py		silicified blebs - boud. sil arg interbeds
	WK ALT + A FEW BEDS	WK ALT + A FEW BDS	NIL	A FEW BEDS 10% DISS		Py		thinly bd @ 15° interbedded light green chl-ser alt. siltstone & gray to black chl-calcite rich argillite
620'						Py		INTERBEDDED ALTERED SILTSTONE & ARGILLITE Py-calc filled frac.
						Po		
	MINOR FRAC FILL	WEAK	ALT. HALOS AROUND FRACS	FRACTURE FILLING		Py		graywacke clast.
630'								'spotted alteration' - white siliceous bleached alt. blebs to 1/2".
						Py		WEAKLY ALTERED SILTSTONE 15% v.f.g diss bio, exhibits highly contorted bd @ ∠ ≈ av. 20-30°.
640'								grayish-green siliceous argillite interbeds
						Py		graywacke 'clasts' to 2"
650'	NIL	WEAK	NIL	FRAC. FILL		Py		wk. fol. @ 60° exhibited by alignment of diss bio. & small feld, qtz clasts about larger green arg/volc. lithic clasts.
								GRAYWACKE
660'	NIL	WK	NIL	F.F.		Py		

AVE CORE REC'Y / HOLE	% SULPHIDES	DRILLING INTERVAL	% CORE RECOVERED	CORE SIZE	SAMPLE INTERVAL	% REC'Y SAMP. INT.	ESTIMATED
	TR				596' – 601'	100%	
	TRACE	– 606'	100%	BQ	601' – 603'	100%	
		– 616'	100%		608' – 610'	100%	
					611' – 614'	100%	
					614' – 617'		
		– 621'	100%		617' – 621'	100%	
	2%	– 622'	100%		621' – 625.5'	100%	
	TRACE	– 633'	100%		625.5' – 633'	100%	
		– 643'	100%				
	TRACE	– 651'	100%				
		– 656'	100%				
	TR	To 666'	100%	↓			

HOLE NO. M-83-2

CASING COLLAR ELEV.: 4 above gr GROUND ELEV.:

COORDINATES: N. E.

INCLINATION: -55° BEARING: N35°W

PROJECT: JIM'S LAKE EXTENSION

DATE STARTED: APRIL 18. 83

DATE FINISHED: APRIL 25. 83

TOTAL DEPTH: 1176'

REF. TO CLAIM CORNER:

SCALE: 1" = 10'

LOGGED BY: D. McEVOR

COMMENTS:

AVE CORE REC'Y / HOLE

DESCRIPTIVE GEOLOGY

SECTION	ALTERATION: CHLORITE	ALTERATION: SERICITE	ALTERATION: SILICIFICATION	ALTERATION: CARBONATE	FRACTURING	MINERAL	GEOLOGY	DESCRIPTIVE GEOLOGY
660'	NIL	V. WEAK	OCC ALT BLEB	FRAC. FILL				bio rich siltstone. bio rich beds exhibit bd @ 25°
						Py		INTERBEDDED SILTSTONE & GRAYWACKE chert rich (60%) graywacke bed @ 25°.
								interbedded siltstone - graywacke (graded contacts)
670'								'clast free' siltstone interbed.
	MINOR FRAC FILL	PATCHY, WEAK	NIL	FRACTURE FILLING		Py		1" coll. chl alt andesite lithic clast 30-40% small feld-qtz clasts in vfg granular siliceous matrix
								clast free siltstone interbed
								GRAYWACKE fg sugary qtz vn
680'								clast free siltstone interbed.
								qtz-calcite stringers
						Py		bd wkly dev. @ 20°.
								abnt silica 'spotted alt.' blebs
690'	MINOR FRAC FILL	PATCHY, WEAK	A FEW SPOTTED ALT. ZONES	FRACTURE FILLING		Py		graywacke clast
								qtz vn
						Py		interbedded hard siliceous siltstone (60%) & graywacke (40%). bd @ 60° or. 20°
								INTERBEDDED SILTSTONE & GRAYWACKE
								graywacke clast
700'								graywacke interbed
						Py		abnt thin calcite - biotite seams @ 80°
								'light punk' wacke bed
710'	NIL	FR. FILL	NIL	FR. FILL				SILICEOUS METAGRAYWACKE angular siltstone chips
								siltstone - arg interbeds. bd well dev. @ 45° to the cba
	NIL	F.F.	MINOR	F.F.				CHERTY SILICEOUS ARGILLITE
	WK. PATCHY	WEAK	NIL	WK. PATCHY				10-15% fg diss bio.
								mod chl-carb alt. bed. bd @ 25°
								few thin graywacke interbeds
						Py		SILTSTONE
720'								

% SULPHIDES	DRILLING INTERVAL	% CORE RECOVERED	CORE SIZE	SAMPLE INTERVAL	% REC'Y. SAMP. INT.	ESTIMATED
TRACE	666'	100%	BQ			
	676'	100%				
TRACE	686'	100%				
TRACE	696'	100%		695'		
				699'	100%	
TRACE	706'	100%				
NVS		100%		712'		
NVS				713'	100%	
TRACE	716'			715'	100%	
	To 726'	100%		717'	100%	
				To 723'	100%	

HOLE NO. [redacted]83-2 | PROJECT: JIM'S LAKE EXTENSION | PAGE NO: 9 OF 16

CASING COLLAR ELEV.: 4' above gr. | GROUND ELEV.: | DATE STARTED: APRIL 18. 83 | REF. TO CLAIM CORNER:

COORDINATES: N. E. | DATE FINISHED: APRIL 25. 83 | SCALE: 1" = 10'

INCLINATION: ~ 55° | BEARING: N35°W | TOTAL DEPTH: 1176' | LOGGED BY: D. McIVOR

SECTION	ALTERATION: CHLORITE	ALTERATION: SERICITE	ALTERATION: SILICIFICATION	ALTERATION: CARBONATE	FRACTURING	MINERAL	GEOLOGY	DESCRIPTIVE GEOLOGY	% SULPHIDES	DRILLING INTERVAL	% CORE RECOVERED	CORE SIZE	SAMPLE INTERVAL	% REC'Y SAMP. INT.	ESTIMATED
720'	WK PATCHY ALT. A FEW BEDS	WEAK PATCHY ALT	NIL	WK PATCHY ALT	/	Py		COMMENTS: AVE CORE REC'Y / HOLE 80					717'		
								- chrty sil. arg interbeds @ 25°					723'	100%	
								- 10-15% vfg diss bio in bd sil. siltstone. thinly bd @ ar 25°	TRACE	721'	100%				
								- dk v. calcite rich interbeds						100%	
								SILTSTONE					729'		
730'						Py							730'	100%	
								- 1" dol. vn @ 55°			100%		733'	100%	
								- thin dark calcite rich beds to 25% of rock		735'			735'	100%	
						Py		- a few coarse clastic graywacke interbeds							
						Py		- thinly bd @ 20°, interbd bd. black weakly chloritic argillite & softer wkly chl-ser-carb alt. siltstone.					738'	100%	
740'	WEAK	WEAK	NIL	WEAK	/	Py Py Py Py		INTERBEDDED SILTSTONE & ARGILLITE	0.5%	742'	100%		744'	100%	
						Py		- poorly dev. bd @ 10-15°.							
	NIL	UNWEAK, PATCHY	NIL	IRREG. FILL	/	Py		- chrty argillite clast	TRACE		100%				
								- 5-10% vfg diss bio.							
750'						Py		SILTSTONE		752'					
								- thin bd gray sil. arg interbeds locally to 20%							
								- coarse clastic graywacke interbed.							
						Py		- locally bd highly contorted & numerous thin clast bearing graywacke interbeds					752.5'		
								- qtz-calc vn.	TRACE		100%		758.5'	100%	
760'	NIL	MODERATE	NIL	FRAC. FILL	/	Py		- lichute? clast		762'					
								ALTERED (SERICITIZED) SILTSTONE							
								- num thin graywacke interbeds							
								- 'spotted alt' & spherical bio rich blebs in bd.							
								- a few thin graywacke interbeds							
	MINOR FILL	WEAK	NIL	PATCHY	/	Py		- wk sch @ 40 to recrts, wk bedding @ 20°			100%				
770'								- locally v chert rich to 90% (ov. 40-50% prod. feld. qtz)	TRACE	772'			772'		
								GRAYWACKE							
						Py		- weakly carbonatized.					774'	100%	
	MOD.	MOD.	NIL	MOD.		Py		- calt. grayish-green chl-ser-carb alt. siltstone, bd @ 20°							
								INTERBEDDED, ALTERED (CHL-SER) SILTSTONE & ARGILLITE			100%			100%	
780'								- chrty sil. arg interbeds & thin graywacke interbeds to 60% rock locally		To 782'			To 781.5'		

HOLE NO. M-83-2 | PROJECT: JIM'S LAKE EXTENSION | PAGE NO: 10 OF 16

CASING COLLAR ELEV.: 4' above gr. | GROUND ELEV.: | DATE STARTED: APRIL 18, 83 | REF. TO CLAIM CORNER:

COORDINATES: N. E. | DATE FINISHED: APRIL 25, 83 | SCALE: 1" = 10'

INCLINATION: -55° | BEARING: N35°W | TOTAL DEPTH: 1176' | LOGGED BY: D. McIVOR

SECTION	ALTERATION: CHLORITE	ALTERATION: SERICITE	ALTERATION: SILICIFICATION	ALTERATION: CARBONATE	FRACTURING	MINERAL	GEOLOGY	COMMENTS: / DESCRIPTIVE GEOLOGY	% SULPHIDES	DRILLING INTERVAL	% CORE RECOVERED	CORE SIZE	SAMPLE INTERVAL	% REC'Y SAMP. INT.	ESTIMATED
								AVE CORE REC'Y / HOLE					774		
780'	MOD	MOD	NIL	MOD	/	Py			TR.		100%	BQ	781.5	100%	
	N I L	N I L	N I L	F.R. FILL	/			10-15% vfg diss Py highly contorted bd @ 85° SILTSTONE light gray green, vfg granular hard siliceous siltstone	N V S	785'					
790'	N I L	W K	N I L	F.R. FILL	/			hard siliceous siltstone ± 5-10% vfg diss bio, bd at 25° numerous thin siliceous argillite interbeds.	N V S	793'	100%		788'		
	N I L	M O D	N I L	M O D	/	Py		becomes softer, mod ser-carb alt., schistose // bd @ 25° thin dusky siliceous arg interbeds to 15% of rock ALTERED (CHLORITE-SERICITE-CARBONATE) SILTSTONE ± GRAYWACKE-ARGILLITE INTERBEDS	T R A C E				795'	100%	
800'	M O D	M O D	N I L	M O D	/	Py		becomes chl-ser-carb alt, strongly sch // bd @ 25-40°; ± 0.25 Py as ff ± thin seams // bd.		803'	100%		798'	100%	
	N I L	W E A K	N I L	M O D	/	Py		becomes harder, more siliceous	0.25%	813'	100%		802'	100%	
820'	FR FILL	FR FILL	N I L	W K	/			vfg hard siliceous siltstone ± 10% vfg diss bio, no apparent bd. SILTSTONE	N V S	819'	100%		807'	100%	
	N I L	HALOS	HALOS	FR. FILL	/	Py		magnesite-qtz vn highly contorted bd, prod hard siliceous siltstone grading into clast bearing graywacke in places. ALTERED SILTSTONE-GRAYWACKE	T R A C E	826'	100%		817'	100%	
830'	MINOR FR FILL	↑ MOD ↓	N I L	FRAC FILL	/	Py		wkly sch-fol sil-ser alt. matrix ± 5-10% vfg diss bio 50-60% small fold qtz clasts. SERICITIZED META-GRAYWACKE altered calcite vns.	T R A C E	836'	100%		821'	100%	
840'	FR.F.	MOD	MOD	FR.F.	/	Py		qtz-magnesite vn ± altered small Py blebs SILTSTONE	TR	To 846'	100%		825' 830'	100%	

HOLE NO. M[redacted]-2 | PROJECT: TIM[redacted] LAKE EXTENSION | PAGE NO: 11 OF 16

CASING COLLAR ELEV.: 4' above gr. | GROUND ELEV.: | DATE STARTED: APRIL 18. 83 | REF. TO CLAIM CORNER:

COORDINATES: N. E. | DATE FINISHED: APRIL 25. 83 | SCALE: 1" = 10'

INCLINATION: - 55° | BEARING: N35°W | TOTAL DEPTH: 1176' | LOGGED BY: D. McLVOR

SECTION	ALTERATION: CHLORITE	ALTERATION: SERICITE	ALTERATION: SILICIFICATION	ALTERATION: CARBONATE	FRACTURING	MINERAL	GEOLOGY	COMMENTS: / DESCRIPTIVE GEOLOGY	AVE CORE REC'Y / HOLE	% SULPHIDES	DRILLING INTERVAL	% CORE RECOVERED	CORE SIZE	SAMPLE INTERVAL	% REC'Y SAMP. INT.	ESTIMATED
840'	MINOR AS FRACTURE FILLING	WEAK AS ALTERATION HALOS AROUND FRACTURES & SPOTTED ALT. BLEBS	OCCASIONAL ALT. HALO AROUND FRACTURES & SPOTTED ALT. BLEBS	FRACTURE FILLING & OCCASIONAL VEINS		Py		bio rich 'spotted alt' blebs affect 50% of rock locally - magnesite vn & minor epidote 5-10% vfg diss bio, num thin bio rich beds - thin graywacke interbed, gradational contacts - bd. variable, ev. 30° - graywacke, siltstone matrix & 20% small feld-ghs clasts. - ghs vn		TRACE	846'	100%	BQ			
850'						Py					856'	100%				
								- numerous strong sericite alteration halos to ½" around fractures SILTSTONE								
860'						Py		- abnr thin siliceous argillite interbeds - thin graywacke interbed @ 20°.			866'	100%				
								num thin cherty argillite interbeds		TRACE		100%				
870'								numerous thin cherty arg. interbeds & boud-breccia 'flags' graywacke interbed @ 30°, & 20% small feld. ghs clasts in siltstone matrix			872'					
						Py		- magnesite & minor ghs vn @ 90°, & strong ser alt. halo num gray sil. arg interbeds.						874'		
								graywacke interbed.				100%		876'	100%	
880'								- abnr thin clast bearing graywacke interbeds		TRACE	882'					
								- spotted alteration blebs, (bio rich, bleached) affect 40% of rock from 882-897'.				100%				
890'						Py					892'					
												100%				
900'								- ghs-calc. vn			To 902'					

HOLE NO. [redacted]-2 | PROJECT: JIM'S [redacted] EXTENSION | PAGE NO: 12 OF 16

CASING COLLAR ELEV.: 4' above gr. | GROUND ELEV.: | DATE STARTED: APRIL 18, 83 | REF. TO CLAIM CORNER:

COORDINATES: N. E. | DATE FINISHED: APRIL 25, 83 | SCALE: 1" = 10'

INCLINATION: -55° | BEARING: N35°W | TOTAL DEPTH: 1176' | LOGGED BY: D McIVOR

ALTERATION: CHLORITE | SERICITE | SILICIFICATION | CARBONATE

FRACTURING | MINERAL | GEOLOGY

COMMENTS:

AVE CORE REC'Y / HOLE

DESCRIPTIVE GEOLOGY

SECTION	DESCRIPTIVE GEOLOGY	% SULPHIDES	DRILLING INTERVAL	% CORE RECOVERED	CORE SIZE	SAMPLE INTERVAL	% REC'Y. SAMP. INT.	ESTIMATED
900'			902'	100%	BQ			
	- greywacke interbed @ 35°					906'		
	- greywacke interbed ± av 40% small feld. qtz clasts	TRACE						
	- locally carbonatized around several calc-ser filled fracs.			100%		908'	100%	
	- small yellow carbonatized 'patches'							
910'	- magnesite vn					910'	100%	
			912'					
	- magnesite vn ± minor qtz-ser.					915'		
						917'	100%	
	- greywacke interbed ± 15% small feld. qtz clasts.			100%				
920'	SILTSTONE							
	- locally becomes argillaceous, highly contorted bd. @ 5V or 30°		922'					
		TRACE		100%				
			929'					
930'	- magnesite ± minor qtz vn ± strong sericite alt. halo					931'		
						932'	100%	
	- fg sugary recrystallized qtz vn.			100%				
			936'			936'		
	} 3" strongly sericitized 'zone', ± halos to 1/2" around num. calcite-sericite filled fractures.					939'	100%	
940'				100%				
	- magnesite ± minor qtz, calcite, sericite vn @ 90°	TRACE						
	- magnesite vn ± minor qtz, calc, sericite.		946'			946'		
						947'	100%	
	- qtz-magnesite vn					949'		
950'	- magnesite vn ± minor qtz.					951'	100%	
	- hard gray siliceous argillite interbed.			100%				
	- afew thin sil. arg interbeds							
			956'					
960'	- 4" sil. argillite interbed @ 20°		To 966'	100%				

HOLE NO. M-82-2 | PROJECT: JIM'S LAKE EXTENSION | PAGE NO: 13 OF 16

CASING COLLAR ELEV.: 4' above gr. GROUND ELEV.: | DATE STARTED: APRIL 18. 83 | REF. TO CLAIM CORNER:

COORDINATES: N. E | DATE FINISHED: APRIL 25. 83 | SCALE: 1" = 10'

INCLINATION: -55° BEARING: N35°W | TOTAL DEPTH: 1" = 10' | LOGGED BY: D McIVOR

SECTION	ALTERATION: CHLORITE	ALTERATION: SERICITE	ALTERATION: SILICIFICATION	ALTERATION: CARBONATE	FRACTURING	MINERAL	GEOLOGY	COMMENTS: / DESCRIPTIVE GEOLOGY	AVE CORE REC'Y / HOLE	% SULPHIDES	DRILLING INTERVAL	% CORE RECOVERED	CORE SIZE	SAMPLE INTERVAL	% REC'Y. SAMP. INT.	ESTIMATED
960'	MINOR AS FRACTURE FILLING →	WEAK ALT. HALOS AROUND FRACTURES →	OCCASIONAL HALO AROUND FRACS & SPOTTED ALT. BLEBS	FRACTURE FILLING & OCCASIONAL VEINS →		Py				TRACE	946'	100%	BQ			
970'						Py		numerous thin siliceous argillite interbeds to 20% of rock from 960-979'						970'		
						Py		numerous thin ¼" magnesite vns to 30% of rock.						971'	100%	
						Py		silicified - bio rich spotted alt. blebs affect 30% of rock			976'	100%				
								SILTSTONE						979'		
980'																
						Py		siliceous argillite interbeds to 35% from 979-990'. bd. very contorted. slumped. from 0-30°		TRACE		100%		984'	100%	
								qtz-magnesite vn @ 60°			986'					
								¼" magnesite bleb								
						Py		magnesite vn ± minor qtz. ser. calc. Py.								
						Py		1" magnesite vn ± minor qtz. calc. Py							100%	
990'						Py						100%		990'		
											996'					
1000'						Py				TRACE		100%		1000'		
	MINOR FRAC FILL →	ALT. HALOS AROUND FR.	ALT. HALOS AROUND F.F.	FRAC FILLINGS →		Py		bedding highly contorted. slumped. dr 10-20° as exhibited by thin bio rich beds			1006'					
						Py								1008'	100%	
1010'						Py		alter breccia-boud. dk green hard carb. rich argillite interbeds.						1010'	100%	
						Py		INTERBEDDED SILTSTONE & ARGILLITE						1012'		
						Py		locally intensely fractured. ± talc. sericite. calcite frac fill & strong bleaching of surrounding host.				100%		1014'	100%	
								gradational contacts between hard siliceous argillite & slightly coarser. granular. siltstone			1015'					
								magnesite ± minor qtz vn @ 75°.						1017'		
						h.		numerous thin magnesite seams ± thin cherty alt. halos.						1018'	100%	
1020'						Py					To 1023'	100%				

HOLE NO. M-[illegible]2 | PROJECT: JIM'S LAKE EXTENSION | PAGE NO: 14 OF 16

CASING COLLAR ELEV.: 4' above gr. | GROUND ELEV.: | DATE STARTED: APRIL 18, 83 | REF. TO CLAIM CORNER:

COORDINATES: N. E. | DATE FINISHED: APRIL 25, 83 | SCALE: 1" = 10'

INCLINATION: -55° | BEARING: N35°W | TOTAL DEPTH: 1176' | LOGGED BY: D McIVOR

SECTION	ALTERATION: CHLORITE	ALTERATION: SERICITE	ALTERATION: SILICIFICATION	ALTERATION: CARBONATE	FRACTURING	MINERAL	GEOLOGY	COMMENTS: / DESCRIPTIVE GEOLOGY	AVE CORE REC'Y / HOLE	% SULPHIDES	DRILLING INTERVAL	% CORE RECOVERED	CORE SIZE	SAMPLE INTERVAL	% REC'Y. SAMP. INT.	ESTIMATED
1020'	MINOR AS FRACTURE FILLING	ALTERATION HALOS AROUND FRACTURES	ALTERATION HALOS AROUND FRACTURES	FRACTURE FILLING & OCCASIONAL VEINS, STRINGERS		Py					1023'	100%	Ba			
1030'								bedding very contorted, slumped, @ 5° or 10-20° to the ca.		TRACE						
								gradational contacts between v. hard siliceous grayish green argillite & slightly coarser, granular siltstone.			1033'	100%				
						Py					1036'	100%				
1040'								INTERBEDDED SILTSTONE & ARGILLITE				100%				
								bd. exhibited by thin bio rich beds.			1045'					
1050'										TRACE		100%				
											1055'					
1060'												100%				
						Po'					1065'					
1070'						Py		gh vn		TRACE		100%		1069'	100%	
														1072'		
											1075'					
1080'						Py					To 1085'	100%				

HOLE NO. M[redacted]3-2 | PROJECT: JIM'S L[redacted] EXTENSION | PAGE NO: 15 OF 16

CASING COLLAR ELEV.: 4' above gr. | GROUND ELEV.: | DATE STARTED: APRIL 18, 83 | REF. TO CLAIM CORNER:

COORDINATES: N. E. | DATE FINISHED: APRIL 25, 83 | SCALE: 1" = 10'

INCLINATION: -55° | BEARING: N35°W | TOTAL DEPTH: 1176' | LOGGED BY: D McIVOR

SECTION	ALTERATION: CHLORITE	ALTERATION: SERICITE	ALTERATION: SILICIFICATION	ALTERATION: CARBONATE	FRACTURING	MINERAL	GEOLOGY	COMMENTS: / DESCRIPTIVE GEOLOGY	AVE CORE REC'Y / HOLE	% SULPHIDES	DRILLING INTERVAL	% CORE RECOVERED	CORE SIZE	SAMPLE INTERVAL	% REC'Y. SAMP. INT.	ESTIMATED
1080'													BQ			
	MINOR AS FRACTURE FILLING	ALTERATION HALOS AROUND FRACTURES	ALTERATION HALOS AROUND FRACTURES	FRACTURE FILLING ETC. VEINS		Py		- magnesite vn & minor qtz, sericite		TRACE	1085'	100%		1087'		
						Py		numerous thin magnesite vns @ 90° to the c.a. & minor qtz & strong chorty alt. halos						1089'	100%	
1090'						Py Po		- a few thin calcite seams & tr. diss Po - Py				100%		1091'	100%	
								INTERBEDDED SILTSTONE & ARGILLITE			1095'					
						Py		from 1092. becomes predominantly argillite								
1100'												100%				
								numerous thin magnesite veins @ 80-90°			1106'			1105'		
								num thin magnesite veins to 1/4" & 5%						1107'	100%	
1110'						Py								1109'	100%	
								a few small diss. calcite blebs		TRACE		100%		1114'	100%	
	MINOR FRACS	WEAK	MIL	FRAC. FILL		Py		vfg granular light green wkly sericitized hard siliceous matrix minor (5%) vfg diss Lio.			1118'					
								ag grain recrystallized qtz vn & tr. diss sph.							100%	
								SERICITIZED, SILICEOUS METAGRAYWACKE						1120'		
1120'						Py		40% small white feld. qtz clasts								
						Py		massive appearing; no apparent bd./fol. 1/2" qtz vn @ 20°. & a few diss Py blebs to 1/32"				100%			100%	
														1129.5'		
	A FEW WALLANT BDS	A FEW ALT. BEDS	HALOS AROUND FRACS	FRACTURE FILLING		Py		- magnesite vn.			1126'					
								predominantly thinly bd gray v. siliceous argillite & a few thin softer wkly chl-ser alt. siltstone interbeds.							100%	
1130'														1130'		
								INTERBEDDED SILICEOUS ARGILLITE & SILTSTONE		TRACE		100%			100%	
														1135'		
						Py		a few thin qtz-magnesite vns @ 65-75° to the c.a.			1136'					
1140'						Po					TO 1146'	100%		1140'	100%	

HOLE NO. M[redacted]-2 | PROJECT: JIM'S LA[redacted] EXTENSION | PAGE NO: 16 OF 16

CASING COLLAR ELEV.: 4' above gr. | GROUND ELEV.: | DATE STARTED: APRIL 18, 83 | REF. TO CLAIM CORNER:

COORDINATES: N. E. | DATE FINISHED: APRIL 25, 83 | SCALE: 1" = 10'

INCLINATION: -55° | BEARING: N35° W | TOTAL DEPTH: 1176' | LOGGED BY: D. McIVOR

SECTION	ALTERATION: CHLORITE	ALTERATION: SERICITE	ALTERATION: SILICIFICATION	ALTERATION: CARBONATE	FRACTURING	MINERAL	GEOLOGY
1140'	A FEW WKLY ALTERED BEDS	A FEW WEAKLY ALTERED BEDS	ALTERATION HALOS AROUND FRACTURES	FRACTURE FILLING		Po	
						Po	
1150'						Py	
1160'						Py	
						Po	
1170'						Py	
1176'							

COMMENTS:

AVE CORE REC'Y / HOLE

DESCRIPTIVE GEOLOGY

eff. chl-ser all. siltstone ± 1% vfg diss Po-Py

- from 1149' becomes coarser. pred siltstone ± abv thin argillite interbeds.

INTERBEDDED SILICEOUS ARGILLITE & SILTSTONE

118 SAMPLES SPLIT FOR ASSAY

Duncan McIvor
05/24/83.

% SULPHIDES	DRILLING INTERVAL	% CORE RECOVERED	CORE SIZE	SAMPLE INTERVAL	% REC'Y. SAMP. INT.	ESTIMATED
			BQ	1140'		
TRACE	1146'	100%		1146'	100%	
				1149'	100%	
	1156'	100%		1155'	100%	
TRACE				1160'	100%	
	1166'	100%			100%	
				1170'		
	1176'	100%	V	1176'	100%	

DIAMOND DRILL HOLE M-83-2

Descriptive Geology Notes

240'-259' Sericitized, Siliceaus, Metagraywacke.

-Graywacke to lithic wacke, matrix is very fine grained to argillaceous, light green, moderately sericitized, weakly foliated(schistosity-bedding)at average orientation 50°to 60° to the core axis.

-Average 10% (highly variable, from 1% to 2% to 15%) fine grained disseminated biotite and biotite clots to 1/16" at prefered orientation parallel foliation.

-very clast rich, average 50 to 60%, in places to 80%, predominately quartz, feldspar, as small white angular to sub-rounded clasts up to 1/4 inch, average 1/32 to 1/8", with occasional lithic clasts to 1/2", usually very angular, and oriented parallel foliation.

-occasional lath shaped feldspar clasts give very porphyritic appearance to rock in places, ie. dacite-porphyry.

lithic fragments predominantly cherty argillite light green sericitized argillite/volcanic,QFP, chloritized argillite/volcanic.

-weakly to moderately fractured, at prefered orientation of 0 to 10° to the core axis,although other orientations present, with predominately calcite fracture filling + or - trace amounts of pyrite-pyrrhotite, occasional thin sericite alteration halos, vuggy proximal to surface (from 240'to 250')

-trace very fine grained disseminated pyrite-pyrrhotite (clastic ?) in matrix and minor mineralization associated with calcite-sericite fracture filling.

-numerous small calcite blebs(less than 1/32") and stringers parallel foliation to 5% of rock.

-from 240' to 242' silt-stone interbed, fine grain, granular, relatively siliceous, 5% to 10% disseminated biotite clots to 1/32", locally foliation at 50° to the core axis, weakly fractured at random orientations, with calcite fracture fillings and 1/4" sericite alteration halos, no visible sulphides.
-from 242' to 244', very clasts rich, clast supported, (to 80%) tightly packed, with clast size average less than 1/16", coarsens from 244'.
-from 245' to 248' very lithic clast rich, with large light green chlorite to sericite altered argilite/ volcanic and quartz clasts to 1/2" and 25% locally parallel foliation.
-from 248' to 251', matrix is very sericitized, only very minor biotite (less than 1.%) very coarse the average clast size to 1/8", very poorly sorted.
-from 251' to 255', interbed of silt stone-very fine grawacke, with a very fined grained granular hard siliceous light brownish gray silt-stone matrix and 5 to 10% very small (less than 1/32") quartz-feldspar clasts, 5 to 10% disseminated biotite upper contact at 45° to the core axis, lower contact at 60° to the core axis, at 252.5' a few 1/2" coarse clast rich wacke beds at 60° to the core axis, from 253' to 255' número us (to 20%) small biotite clots to 1/8" parallel foliation locally at 65° to the core axis and numerous small calcite blebs (to 1/32") to 5% locally, at 254.5' 1/2" quartz vein cross-cuts foliation at 55° to the core axis, with minor calcite at rims.
-255.3', a very fine grain clast free sericitized siliceaus silt-stone-argillite bed, light green, with a few small (to 1/4"and elongate parallel bedding) siliceaus blebs - altered clasts or alteration blebs.

-from 255'matrix is very sericitized green, very little biotite (less than 5%)
-contact with underlying unit at 40° to the core axis.

259' to 275' -altered (sericitized-carbonitized) siltstone

-rock consists predominately of a very fine grained, granular, light green, relatively siliceous (to very soft altered in places) siltstone.
-weakly foliated, (schistosity-bedding?)at 40 to 60° to the core axis, highly variable, average 45 to 50° to the core axis.
-several zones of soft intensely altered sericitized, carbonitized rock-moderately to strongly fractured, in sets, at low angle orientations 0 to 20°, and sub-parallel to bedding at 40 to 60°, with calcite sericite iron oxide fracture filling, often vuggy around fractures.
-brecciated appearing in places by carbonitized lighter green argillaceous seams.
-very fine grained disseminated iron oxide in places
-at 259.5' 1/2" coarse clastic wacke bed at 60° to the core axis
-from 259' to 262' relitively fresh, hard, siliceous, strongly fractured at random orientations, with calcite, sericite, and minor iron oxide (limonite-hematite) fracture filling.
-at 262', 1/2" coarse clastic wacke bed at 55° to the core axis.
-from 262', becomes increasingly softer, increasingly altered with moderate sericitization and carbonitization very modelled appearing, foliation (schistosity) becomes stronger at 45° to the core axis, becomes very strongly fractured at prefered low angle orientation (0 to 20°) with calcite sericite and minor limonite fracture filling very vuggy around fractures.

-from 263' to 268', appears brecciated by lighter green carbonate rich argillaceous seams + or - minor hematite-limonite, host rock occurs as small (1/2") spherical to slightly elongate parallel foliation at 45° to the core axis brecciated fragments .
-from 268', less altered, more siliceous, remains weakly brecciated by carbonitized seams, with minor disseminated iron oxide - limonite and limonite fracture filling, a few small cherty zones-overall sulphide content trace Po, Py associated with calcite-iron oxide fracture filling.

275' to 285' Siltstone -predominately a very fine grained, granular, relitively hard, siliceous light greenish gray to brownish gray biotite rich (5 to 10% very fine grained disseminated) siltstone.
-bedding very poorly developed at variable orientations from 35 to 60° from the ca.
-appears weakly schistose in places parallel sub-parallel bedding at 35° to 60° to the core axis.
-very intensley fractured in sets at prefered orientations of 0 to 20°, 40 to 60°, and 80 to 90° to the core axis, with predominately calcite, minor sericite, quartz, fracture filling, with strong with 1/2" bleached-silica and lesser sericite alteration halos affecting approx., 30% of rock.
-minor iron oxide earthy orange fracture filling and minor disseminated iron oxide throughout rock(maybe altered very fine grained disseminated sulphides)
-calcite fill fractures vuggy in places.
-occasional bright green chlorite (fuchsite appearing in places)

-at 278', 3 " soft very schistose light green strongly sericitized carbonitized bed/band at 35° at the core axis.
-from 279' to 280.5', 1/4" major fracture at 0° to the core axis, filled with calcite, quartz, chlorite, sericite, and trace pyrite-pyrrhotite, with 1/2" strong sericite alteration halo.
-at 280', 1/2" very soft strongly sericitized-carbonitized altered band at 90° to the core axis
-at 281', 1/4" quartz-calcite-chlorite vein/filled fracture at 65° to the core axis
-from 281 to 281.5', irregular patches to 2" of soft light green strongly sericitized rock.
-alteration rims around fractures appear to weakly brecciated rock in places.
-from 282.5' to 285', a few clast rich (quartz,feldspar, very small to 1/32" and 5 to 10%)graywacke zone/interbeds orientation difficult to determine due to severe alteration associated with fractures.
-overall sulphide content trace Py-Po associated with calcite fracture filling.

285' to 300' <u>-Graywacke</u>

-very fine grain,granular to argillaceous, dark gray to light green (sericitized) relitively hard, siliceaus matrix, weakly schistose, foliated, at average orientation of 50 to 60° to the core axis, as exhibited by alignment of small disseminated biotite clots to 5 to 10% (biotite present where unit not sericitized) and prefered orientation of elongate larger clasts.
-clasts average 40%, although highly variable(20 to 80%)

predominately small (from 1/32" to 1/16") sub angular to sub rounded white feldspar and quartz clasts, occasionally larger (to 1/4") lithic clasts of green sericite to chlorite altered argillite/volcanic, and QFP.
-moderately fractured in sets, at 60 to 80° to the core axis, and 10 to 30° to the core axis,with predominantly calcite fracture filling, occasionally quartz, sericite, with a few bleached - silica and sericite alteration halos to 1/4".
-feldspar clasts often lath shaped, lending porphyritic appearance to rock (dacite and porphyry)
-a few grated sequences coarsening down hole, bedding very poorly developed at approx., 45° to the core axis.
-from 287.5 to 288.5' clast poor silt stone interbedzone(clasts less than 5%)
-from 289.5 to 290.5', interbedded very clast poor silt stone and clast rich graywacke, beds 2 to 3", grated, coarsening down hole, with weakly develope bedding at 45° to the core axis, locally strong sericite chlorite alteration halos to 1/2" on calcite + pyrite filled fractures.
-at 290.5', 3" very clast rich (90%) tightly packed graywacke bed at 70° to the core axis, light green, sericitized, and weakly carbonitized matrix.
-from 294', matrix becomes increasing sericitized, biotite to less than 5%, with average clast size increasing to 1/8", very poorly sorted, schistosity becomes 50°, increased lithic clast content, with clast to 1/2" of light green sericitized argillite/volcanic, and QFP.
-overall sulphide content trace Py associated with calcite fracture filling.

300' to 305' Silt Stone- very fine grained,granular, dark brown, biotite rich,(15 to 20% very fined grained, disseminated) silt stone.
-weakly foliated as exhibited by a alignment of biotite at 50° to the core axis, no appearant bedding.
-moderate to strongly fractured, with sets at 80 to 90°, 40 to 60°, and 0 to 20° to the core axis, with predominantly calcite, minor quartz, sericite, fracture filling with sericite and bleached-silica alteration halos affecting approx., 25% of rock.
-trace pyrite associated with calcite fracture filling
-a few small scattered (less than 1/64") calcite blebs and stringers in places.
-a few zones with minor very small quartz, feldspar clasts to less than 5% of rock, very small(less than 1/32")
-from 303 to 305', becomes increasingly clast rich,grades into a graywacke.

305'to 315' Graywacke- from 305 to 308', dark grayish brown, biotite rich(15 to 20% disseminated, weakly aligned parallel foliation at 60° to the core axis) hard, siliceaus, silt stone matrix with 20 to 60% highly variable clast content, very small (less than 1/32") white feldspar, quartz clasts.
-moderately fractured, with sets at 50 to 60°, and 80 to 90°, with calcite fracture filling and sericite, bleached silica alteration halos to 1/4", no visible sulphides.
-graduationly from 307 to 308' matrix becomes very strongly sericitized, clasts become coarser.

-from 308 to 315', matrix becomes strongly sericitized light green, softer, clasts average 50%, average 1/16 to 1/8", (to 1/4" in places), predominently angular to sub rounded feldspar, quartz, occasionaly large lithic clasts of light green sericitized argillite/ volcanic, and QFP
-weakly schistose, foliated at 55° to the core axis, biotite to less than 5%.
-strongly fractured, prominent set at 0 to 20° to the core axis with other orientations present, with quartz calcite chlorite sericite fracture filling, and weak sericite alteration halos.
-from 308 to 310', major 1/4" fracture at 5° to the core axis with quartz, calcite, chlorite, and epidote ?, fracture filling trace Py trace iron oxide.
-numerous thin calcite seams-stringeres-blebs (very small less than 1/64") throughout the rock to 5%.
-from 311 to 313', foliation at 55° to the core axis, very coarse, with large quartz, QFP, chlorite-sericite altered lithic clasts to 1/2" and 30%, with numerous smaller quartz, feldspar clasts, locally matrix is very sericite carbonate rich.
-at 313', 1/2" predominently quartz with minor calcite vein at 90° to the core axis.
-at 314', 1/4" quartz-gray calcite vein at 45° to the core axis with a few small 1/8" pyrite blebs.
-from 314 to 315', strongly fractured with white powdery calcite and crystalline calcite, crystalline pyrite, crystalline unknown mafic mineral, fracture filling.

315' to 321' Silt Stone- very fine grained, granular, relatively hard, siliceaus silt stone.
-light brown, biotite rich, to 20% very fine grained disseminated.
-weakly sericitized, light green in places
-strongly fractured, with sets at 80 to 90°, 40 to 60°, and 0 to 20°, with bleached silica alteration halos, and lesser sericite alteration halos, to 1/4", predominently calcite, minor quartz, chlorite, sericite, pyrite, iron oxide fracture filling.
-weakly foliated as exhibited by alignment of biotite at 45° to the core axis(maybe bedding).
-numerous small (less than 1/64") calcite blebs, stringers, throughout rock parallel foliation.
-a few clast rich (to 5%) zones with small (less than 1/32") quartz, feldspar clasts.
-from 319 to 321', sericitization increasing, becomes more clast rich,arbitrary contact with underlying clast poor sericitized graywacke.
-overall sulphur content, trace pyrite associated with fracture filling, often crystalline, cubic, and very fine grained.

321' to 334' Altered Siliceaus Metagraywacke-(carbonitized, sericitized)
-very fine grained, granular, light green, moderate to strongly sericitized matrix, weakly schistose-foliated at average orientation of 50° to the core axis.
-average 15 to 20% very small (less than 1/32") feldspar, quartz, white sub angular to sub rounded clasts, very porphyritic appearing in places with lath shaped feldspar clasts.

-a few clast rich vrs. clast poor beds-zones(ie. grated bedding)
-numerous thin calcite streamers, seams, small blebs, oriented parallel foliation to 20% of rock.
-weakly fractured, one predominent set at 20 to 40° to the core axis, with predominently calcite fracture filling, minor chlorite and iron oxide fracture filling.
-at 324.5', 1/2", biotite rich seam-filled fracture at 30° to the core axis with locally 0.5% very fine grained disseminated pyrite, locally intensity carbonitized
-from 328 to 331.5', relatively clast rich to 35 to 40% clast to 1/16", less carbonate rich(5 to 10%)
-overall sulphide content 0.25%, predominently pyrite associated with calcite, sericite, fracture filling, often crystalline, cubic, and minor very fine grained disseminated pyrite throughout rock.
-arbitrary contact with underlying unit clasts decrease.

334' to 349.5' Altered Silt Stone-Quartzite-rock comprised of predominently of a fine grained to a very fine grained, granular, siliceaus, relatively hard, weakly sericitized, light green, course silt stone to fine quartzite, occasionaly with a few small quartz, feldspar clast (less than 1 to 2%, technically a few thin graywacke zones)
-weakly foliated - schistose at 55 to 60° to the core axis.
-moderately fractured (strong in places) at prefered low angle orientation of 0 to 30° to the core axis, with predominently calcite fracture filling minor quartz, a few bleached-silica and stronger sericite alteration halos.

-numerous (average 5 to 10%) small calcite blebs (less than 1/64") and stringers parallel foliation, in places becomes strongly carbonitized.
-from 334 to 335.5', small (to 1/2") spherical to slight elongate parallel foliation at 60° to the core axis white to pale green bleached-silica spotted alteration blebs to 30% of rock, maybe very altered clasts but diffuse appearing, indistinct contact with matrix, and close association with fracturing.
-at 336', 1/4" sugary fine grain, granular, recrystallized quartz vein with minor calcite at 55° to the core axis, with trace of disseminated pyrite.
-from 338 to 340', strongly carbonitized.
-at 340.5', 1/4" slicken sided, smeared, hard, very fine grained biotite fill fracture at 35° to the core axis.
-from 340.5 to 342', spherical to elongate parallel foliation at 60° to the core axis, white, bleached-silica spotted alteration blebs to 30% of rock and 1/2".
-from 343.5 to 344', bleached alteration blebs to 10% of rock, locally moderately carbonate rich.
-from 344.5 to 346.3', weak pervasive bleaching.
-from 346.3 to 346.7', very soft, shearing appearing, very strongly carbonitized, moderately cericitized and chloritized.
-from 347 to 349.5', foliation (bedding and schistosity) well developed at 50° to the core axis, with thin (1 to 2") bands of bleaching-silicification, often light redish-brown with minor very fine grained disseminated biotite, and bands-beds of light green sericitized silt stone.
-from 349 to 349.5', grades into a graywacke.
-overall sulphide content, trace, very fine grained pyrite associated with calcite fracture filling, and very minor very fine grained disseminated pyrite throughout matrix.

353' to 361.5' Altered Silt Stone- well developed foliation of(moderate schistosity and weak bedding) at 50 to 55° to the core axis.
-rock consists of a very fine grained, light green, soft, moderate to strongly sericitized, with places chloritized and places mildly carbonitized (very fine grained disseminated calcite blebs throughout unit average 10%, in places to 30% where appear strongly carbonitized) altered silt stone.
-weak remanant granular texture.
-numerous thin (1/16") silicia beds-bands parallel bedding occasional zones of less altered light green sericitized hard siliceaus silt stone.
-weakly fractured at random orientations, predominently calcite fracture filling.
-a few bleached appearing siliceaus beds parallel foliation to 2 to 3".
-from 359 to 361.5', numerous thin dark black chloritic seams give banded appearance to rock, with trace pyrite as thin seams-slips parallel to foliation.
-overall sulphide content trace, as fracture filling, and disseminated mineralization from 359 to 361.5'

361.5'to 403' Graywacke-predominently a very fine grained, granular, light green to gray, weakly to moderately sericitized, siliceaus (relatively hard) matrix with 5 to 10% very fine grained disseminated redish brown biotite(except were strongly sericitized)
-weakly foliated-schistose (with weakly developed bedding) as exhibited by alignment of biotite and elongate larger clasts,at 55° to the core axis.

-weakly fractured at random orientations, with calcite fracture filling and occasional thin sericite alteration halos.
-clast content is highly variable, ranging from 30 to 70% average 40 to 50%, predominently sub rounded to sub angular small (1/32" to 1/16") white quartz, feldspar clasts, with occasional larger lithic sericite to chlorite/volcanic argillite clasts.
-numerous small calcite blebs and stringers throughout rock.
-from 361.5 to 364.5', numerous thin clast free biotite rich silk stone beds with brecciated fragments/clasts to 2" of silt stone, locally orientations at 55° to the core axis.
-at 362.5', 1/4" quartz vein at 55° to the core axis.
-at 362.8', 1/2" quartz vein at 30° to the core axis.
-from 364.5 to 376', very clast rich, clasts to 50 to 60%, matrix weakly sericitized, 10% biotite, clasts slightly coarser to 1/8" average 1/16",
-372.5', 1" fine grained sugary granular re crystallized quartz vein with minor calcite at rims, vein at 90° to the core axis.
-at 375', 1" predominently quartz with minor calcite sericite chlorite vein at 50° to the core axis, a few small 1/16" Po Cpy blebs.
-from 376 to 388', matrix is strongly sericitized, light green, with no biotite, very siliceaus,
-at 377', 1" dark green angular chloritized lithic clast, locally numerous small dark green lithic fragments/clasts
-at 381', 1" quartz with minor gray calcite vein at 55° to the core axis.

-at 381.5', 1" quartz gray calcite vein at 55° to the core axis, with a few small Po Cpy blebs to 1/32" at rims.
-from 382.5 to 385', minor fine grained disseminated diotite to 5%.
-at 385', 2" quartz with minor gray calcite vein at 90° to the core axis.
-at 385.5', 3" zone with white silicified clasts to 1/32" tightly packed, to 95% of rock, with a soft sericite calcite matrix, oriented at 90° to the core axis, numerous thin quartz seams cut rock at 90° to the core axis.
-from 388 to 393', less sericite rich biotite to 10%
-from 388 to 391', relatively clast poor, 10 to 15%, very small(less than 1/32")
-from 391 to 393', clast rich, to 40 to 50%, with a few large chlorite altered argillite/volcanic lithic clasts and chlorite alteration patches to 1"
-from 393 to 397', matrix is very grained, sericitized, siliceaus, with no biotite, clasts locally to 40%, average 1/32 to 1/16", a few small 1/2" slightly softer chlorite altered patches
-at 394.8, 2" medium grained granular crystalline quartz vein at 90° to the core axis, with gray calcite fracture filling and a few small Po blebs
-at 395.5', 1" band at 90° to the core axis of small (to 1/32") white, angular, quartz? clasts to 90% of rock tightly packed, in sericite carbonate matrix
-at 397', 1/2" quartz with minor hard white magnesite vein at 75° to the core axis
-from 397 to 403', becomes very fine grained, strongly sericitized, hard, siliceaus matrix, with 60 to 70% very small (average less than 1/32") angular to sub rounded white feldspar, quartz clasts, very carbonate rich in places, numerous tightly packed clasts rich beds, contact with underlying unit at 35° to the core axis

-overall sulphur content, trace Po, Py, Cpy, associated with quartz veining, and with carbonate fracture filling.

403' to 410.5' Altered Silt Stone-rock comprised predominently of a very fine grained light green, soft, moderate to strongly sericitized, weakly chloritized in places, weakly schistose parallel to poorly developed bedding, altered silt stone.
-numerous very small disseminated calcite blebs and stringers to 5% of rock, occasionaly appears weakly carbonitized.
-bedding - schistosity is highly irregular, ranging from 10° to 40° to the core axis, predominently at 30° to the core axis.
-rock is moderately fractured, predominently parallel to bedding at 10 to 40° to the core axis, with predominently calcite, minor chlorite, quartz, sericite, fracture filling, and trace Py.
-overall sulphide content, trace, pyrite fracture filling associated with calcite, chlorite, sericite, and trace of very fine grained disseminated pyrite in a few places
-from 403.5 to 404', numerous thin (to 1/2") gray to light pinkish white cherty argillite beds at 30° to the core axis
-from 405.6 to 406.5', large conglomeratic clasts ? or boudinaged interbed at 0° to the core axis, of graywacke (fine grained, siliceaus, weakly sericitized matrix with 10 to 15% very small quartz,feldspar clasts, schistosity at 70° to the core axis, cross cutting bedding in matrix, numerous thin calcite seams parallel schistosity, clasted in enveloped by 1/2" cherty halo)
-from 407 to 407.5', 1" cherty silica bed, crenulated, (ripple marks?) at 20° to the core axis.

-from 408 to 409', at 30° to the core axis, bed of tightly packed small white angular to sub rounded small (to 1/32") quartz feldspar clasts to 95% of rock with minor sericite matrix, trace very fine grained disseminated pyrite,
-from 409 to 410.5',numerous thin (to 1") irregular, contorted, "tightly packed graywacke interbeds as above to 10% of rock"

410.5'to 416.5' Cherty Siliceaus Argillite-Silt Stone-bedding very irregular, contorted, ranging from 0 to 90° to the core axis
-rock comprised predominently of very hard, siliceaus, to cherty light brown (with very fine grained disseminated biotite) to light green (weakly sericitized, often as alteration halos around fractures) to gray cherty very fine grained silt stone to argillite
-highly fractured at random orientations, with calcite, chlorite, sericite, quartz fracture filling, and with alteration halos to 1" of bleached cherty silica and sericite
-some movement along fractures up to 1/4"
-in places softer, strongly sericitized, possibly altered clasts to 1/2"
-in places fine grained disseminated chlorite "blebs" to 1/32"
-overall sulphide content,trace, pyrite associated with fracture filling, and very fine grained minor disseminated pyrite
-from 415 to 416.5', numerous thin softer weakly chlorite-sericite altered black silt stone "beds",

416.5' to 427.5'Altered Silt Stone-foliation (bedding to moderate to strong schistosity) is highly variable, ranging from 20 to 50° to the core axis, average is 35° to the core axis.

-rock comprised predominently of very soft, moderate to strongly sericite-chlorite altered, schistose, sheered appearing, dark green to gray altered silt stone

-numerous thin(less than 1/64") calcite blebs and stringers parallel to foliation, in places rock appears to be weakly carbonitized, carbonate to 5 to 10% of rock

-a few small less altered "windows" with weak remanant granular texture, and slightly harder

-a few zones with small (less than 1/32") feldspar, quartz clasts, predominently altered to carbonate

-moderately fractured at random orientations, one set at prefered orientation of 0 to 20° to the core axis, with predominently calcite, minor chlorite sericite, fracture filling, occasionaly with trace pyrite

-overall sulphide content, 0.25%, predominently pyrite minor pyrrhotite, as very fine grained disseminated mineralization throughout rock, and minor mineralization associated with fracture filling

-from 419 to 419.5', graywacke interbed at 40°to the core axis, very fine grained hard granular siliceaus matrix with 20 to 30% small (less than 1/32") feldspar, quartz clasts, light green sericitized in places, weakly schistose at 65° to the core axis, with thin calcite stringers parallel to schistosity

-from 419.5 to 421.5', numerous thin 1/2 to 1" graywacke interbeds, locally at 45° to the core axis, a few thin pyrrhotite blebs parallel to schistosity in surrounding silt stone.

-at 423', 4" elongate spherical graywacke "clast" at 0° to the core axis, maybe brecciated or boudinaged interbed

427.5' to 434.5' Interbedded Graywacke and Altered Silt Stone-rock comprised of approximately 50% light green, soft, schistose, chlorite sericite altered silt stone, with 5 to 10% small calcite blebs in seams and 50% graywacke, very fine grained, light green, gray siliceaus weakly sericitized matrix with 50 to 60% small white feldspar, quartz clast(less than 1/32"), minor disseminated biotite, weakly schistose cross cutting bedding at 70° at the core axis.
-foliation bedding is highly irregular, with abundant slumping and soft sediment defermation features, average orientation at 20° to the core axis.
-from 427.5 to 430', bedding at 0° to the core axis
-from 430 to 432', predominently soft altered silt stone with thin (to 2") tightly packed clast rich graywacke beds
-sulphides to 0.25%, as very fine grained disseminated pyrite with trace pyrrhotite in silt stone beds, and thin blebs parallel to foliation, minor fracture filling
-from 432 to 434.5', bedding ranges from 0 to 70° to the core axis, highly contorted, with numerous thin tightly packed graywacke interbeds, and very soft chlorite-sericite altered silt stone- argillite interbeds.

434.5 to 448' Altered Silt Stone-bedding-schistosity highly variable, ranging from 20 to 50° to the core axis, average orientation is 35° to the core axis
-rock predominently a relatively a soft, moderately sericitized to chloritized, moderate to strongly schistose, thinly bedded, altered siltstone(bedding ranges from 1/4" to 1")
-a few thin clast rich graywacke interbeds
-a few large (to 1") clast of graywacke (possibly brecciated fragments or boudinaged interbeds)
-numerous small disseminated calcite blebs, and a few thin stringers parallel to foliation
-weakly to moderately fractured at random orientation with calcite chlorite and minor quartz, sericite, pyrite fracture filling
-a few unaltered windows where rock is harder, relatively siliceaus, and granular
-overall sulphide content, a trace, pyrite with minor pyrrhotite associated with calcite fracture filling, and trace of very fine grained disseminated pyrrhotite-pyrite throughout rock
-from 435.5 to 436', numerous 1" quartz-feldspar clast rich "clasts" of graywacke
-at 436.1', 1/2" cherty siliceaus argillite "clasts" (possibly a boudinaged interbed) at 65° to the core axis
-at 439', 1/2" contorter cherty silica bed at 45° to the core axis
-from 439.5 to 439.9', 2" contorter siliceaus granular very fine grained tightly packed graywacke interbed at 30° to the core axis
-from 442 to 443', numerous thin clast rich graywacke"beds" (maybe based of grated unit) very irregular orientations slumped, at 20 to 30° to the core axis

-from 443 to 444',a few thin siliceaus argillite and graywacke interbeds to 1/2"
-from 445 to 445.5',3" tightly packed graywacke bed at 20° to the core axis
-at 446', 1/2" tightly packed graywacke bed at 20° to the core axis, locally a few brecciated fragments ? or large clasts to 1/2" of graywacke
-from 446.8 to 447.3', 1" tightly packed graywacke bed at 20° to the core axis
-from 447.5 to 448', a few thin siliceaus argillite beds

448' to 450.5' Interbedded Cherty Siliceaus Argillite and Altered Silt Stone-bedding very irregular average orientation is 25° to the core axis
-rock consists predominently of thinly bedded (less than 1/4"to 1") hard very cherty gray to light green weakly sericitized siliceaus argillite (60%) with 40% slightly coarser, granular, hard silt stone with 5 to 10% very fine grained disseminated biotite and thin biotite seams parallel to bedding
-rock is weakly fractured predominently parallel sub-parallel to bedding, with a few bleached alteration halos, and calcite chlorite fracture filling
-from 450 to 450.5', numerous thin softer schistose light green chlorite sericite altered silt stone interbeds
-no visible sulphides

450.5'to 461' Altered Silt Stone- bedding orientation averages 30° to the core axis, highly variable in places ranging from 25 to 45° to the core axis
-rock comprised predominently of a strongly schistose, thinly bedded, light green, soft, chlorite-sericite altered silt stone, occasionaly very carbonate rich with small disseminated calcite blebs and thin seams parallel to foliation.

-a few less altered harder granular siliceaus silt stone zones-beds
-weakly to moderately fractured predominently parallel sub-parallel foliation, with calcite chlorite and minor pyrite fracture filling, overall sulphide content 0.5%, as very fine grained disseminated pyrrhotite-pyrite, usually as thin seams-blebs parallel to foliation, pyrrhotite often manteled by very minor calcopyrite
-a few thin (less than 1/4") graywacke beds, maybe grated bases of sequences
-from 458', becomes less altered, harder, more siliceaus, with minor disseminated biotite, and a few thin siliceaus, argellite interbeds.
-at 459.8', a few siliceaus argillite "frags" - clasts to 1", maybe brecciated interbed

461'to470' Graywacke-very fine grained gray to light green, granular, hard, siliceaus matrix, weakly foliated-schistose, as exhibited by prefered orientation of 5% very fine grained disseminated biotite, at average orientation of 35° to the core axis
-weakly fractured at random orientations with calcite, minor biotite, quartz, chlorite, sericite fracture filling with a few weak chlorite-sericite alteration halos
-clast average 25% of rock predominently small sub rounded to sub angular white feldspar, quartz clast to 1/16" average less than 1/32"
-from 461 to 466', clast poor,
-from 466'clast become 40% of rock, coarser, average 1/8"
-no visible sulphides
-weakly developed grated sequences coarsening down hole from 466' to 470'
-a few clast free sericite altered seams to 1/4" parallel foliation

470'to 506' Altered (Chlorite,Sericite) Silt Stone with Graywacke, Argillite Interbeds - rock consists predominently of a very fine grained, dark green, moderately chloritized to sericitized altered silt stone with numerous thin graywacke interbeds and a few larger clast (conglomeratic) of few thin argillite interbeds

-strongly foliated (schistosity and weakly developed bedding) at highly variable orientations ranging from 20 to 60° to the core axis, predominently at 20° to the core axis

-silt stone often with a few small quartz, feldspar clasts to approximately 5% in places

-occasionaly calcite rich with small disseminated blebs and thin stringers parallel to foliation

-unit is moderately fractured at random orientations with predominently calcite, minor chlorite, sericite fracture filling

-occasional very fine grained disseminated biotite in silt stone

-bedding is often crenulated, tightly contorted, with soft sediment deformation features

-numerous thin dark green to black and lighter green to gray beds lending banded appearance to rock (primarily a function of grain size as opposed to distinct mineralogical composition)

-from 470 to 470.5', very fine grained siliceaus light gray silt stone-argillite, interbed at 55° to the core axis

-from 471 to 471.5', thin 1" thightly packed graywacke interbed highly contorted with average orientation at 10° to the core axis, locally light green chloritized matrix with a few small quartz feldspar clasts to 1/16" locally 0.5° very fine grained disseminated pyrrhotite-pyrite with trace calcopyrite.

-at 472', a few thin 1/2" graywacke interbeds-elongate clasts at 45° to the core axis
-from 472 to 472.5', numerous 1/2 to 1" graywacke clasts
-from 472.5 to 473.5',numerous thin (to 1") gray to black cherty siliceaus argillite interbeds at 55° to the core axis
-at 474.5 ', 3" rounded graywacke clast, elongate at 0° to the core axis
-at 475.3' 2" rounded graywacke clast
-at 475.8', 1/2" quartz vein at 25° to the core axis at contact with silt stone graywacke interbed
-from 475.8 to 476.3', graywacke interbed at 25° to the core axis
-from 477 to 478', tightly packed graywacke bed at 30° to the core axis, feldspar and quartz clasts to 1/32" and 95% of rock, well sorted
-from 478' to 478.5', numerous small 1/4 to 1/2" graywacke clasts
-from 478.5 to 478.8', 3" irregular graywacke bed, clast, crudely orriented at 30° to the core axis
-from 478.8 to 479.5', numerous small 1/4 to 1/2" graywacke clasts and a few thin 1/4" contorted bed at 30° to the core axis
-from 481.9 to 482.3', a few thin 1/2" irregular graywacke beds at 30° to the core axis, with a few small bright blueish green fuchsite clasts to 1/32"
-from 483 to 484', numerous thin graywacke beds to 2" and irregular clasts to 2" are 70% of rock bedding locally at 55° to the core axis, graywacke very coarse with feldspar quartz clasts to 1/8"
-at 485', 2" rounded graywacke clast, with 80% small white feldspar clasts in chlorite-sericite matrix (very "oolitic" appearing

-from 485 to 486.5',numerous thin tightly packed graywacke interbeds with small (less than 1/32") white sub angular to sub rounded feldspar clasts in chlorite sericite matrix locally foliation at 40° to the core axis
-at 487.5', 1/2" graywacke bed at 20° to the core axis
-from 487.5 to 491', schistosity and bedding locally at 0 to 10° to the core axis
-at 491', 3" rounded graywacke clasts at 0° to the core axis
-from 491.5 to 492.5', tightly packed thin graywacke beds in clasts to 2" at 55° to the core axis are 50% of rock
-from 495 to 497', tightly packed graywacke beds in clasts to 2" become 40% of the rock, foliation locally at 45° to the core axis
-from 498 to 499.8', locally very siliceaus light green graywacke, with clast to 60% weakly foliated at 20° to the core axis, highly fractured with quartz calcite fracture filling at weak prefered orientation of 80 to 90° to the core axis
-from 500 to 500.5', light green hard siliceaus clast rich (80%) graywacke bed at 5° to the core axis
-500.8', 3" hard siliceaus light green clast rich (80%, less than 1/32") wacke rounded clast.
-501 to 503', locally very fine grained disseminated pyrite blebs (almost nodular appearing) to 1/64" and .25%
-from 503 to 504', siliceaus light green clasted poor (10%) wacke interbed at 20° to the core axis, with a few clast rich (40% seams) weakly schistose parallel bedding, locally 0.5% disseminated Po with trace Cpy as small blebs along schistosity planes

-from 505.5 to 506',tightly packed graywacke bed at 40° to the core axis
-overall sulphide content, variable,
from 470 to 501', is trace from 501' to 506' 0.25%, sulphides orrur as very fine grained disseminated Po-Py with trace Cpy, and mineralization associated with calcite-cericite fracture filling

506' to 512' Silt Stone- very fine grained gray to black, relatively hard, siliceaus, granular silt stone
-weakly schistose parallel bedding at average orientation of 30° to the core axis, although variable, contorted, throughout unit
-a few softer light green weakly chlorite-sericite altered beds-zones
-weakly fractured at random orientations, predominently calcite fracture filling
-minor very fine grained disseminated biotite
-a few thin clast bearing (5%, feldspar, quartz, to 1/2") beds - graywacke interbeds
-increasingly biotite rich from 510' to 512'(to 15%) increasingly coarser, clast rich (to 5 to 10%), grades into a graywacke by 512'
-no visible sulphides
-at 506.7', 1" graywacke interbedded to 40° to the core axis
-from 506.7 to 507.2', 6" black intensely carbonitized interbed

512' to 515' Graywacke - contact with overlying silt stone at 30° to the core axis
-predominently clast rich (70 to 80%) with small (1/16" to average 1/32") tightly packed sub angular to sub rounded white feldspar in quartz clasts in very fine grained light green weakly sericitized, siliceaus matrix
-5 to 10% fine grained disseminated biotite, weakly aligned at 40° to the core axis
-moderately to strongly fractured at prefered orientation of 40° to the core axis, with predominently chlorite-calcite fracture filling, minor quartz
-numerous small calcite blebs (less than 1/64") and stringers parallel to foliation
-from 514 to 514.5',soft strongly chloritized dark green schistose silt stone interbed at 20° to the core axis, very irregular with brecciated frags or clasts of graywacke to 1"
-a few 1/4" lithic dark green argillite/volcanic clasts
-contact with underlying unit at 30° to the core axis
-no visible sulphides

515' to 520' Silt Stone-very fine grained hard relatively siliceaus, granular silt stone
-unit is weakly fractured at random orientations with calcite, chlorite fracture filling
-from 515 to 516', numerous graywacke clasts - brecciated beds ? to 2" to 55° to the core axis
-from 515 to 517.5', predominently hard dark grayish green fresh siliceaus silt stone with 5% very fine grained disseminated biotite, bedding very poorly developed at 25° to the core axis

-from 517.5 to 520', well developed bedding at 25° to the core axis, beds 1 to 2" apart, moderately schistose parallel bedding, soft,weakly chlorite-sericite altered, a few thin (1/4")clast bearing graywacke beds (maybe grated bases of sequences)
-trace very fine disseminated pyrite

520'to 532.5' Interbedded Graywacke and Altered Silt Stone - from 520 to 523.5', interbedded, thinly bedded, at an average orientation of 25% to the core axis, (beds 1 to 2" apart, ofter irregular, with indistinct contacts) 50% graywacke (with 30 to 40% small to 1/16" quartz, feldspar clasts and very fine grained weakly chlorite-sericite altered silt stone type matrix) and 50% chlorite-sericite altered schistose, soft, silt stone.
-weakly to moderately fractured at random orientations with calcite and trace pyrite fracture filling
-from 523.5 to 525.5',predominently graywacke, bedding weakly developed at 25% to the core axis, gray, harder, relatively siliceaus matrix (very fine grained, granular) with an average of 30 to 40% small (less than 1/32") quartz, feldspar, white clasts, with 5 to 10% fine grained disseminated biotite, a few clast rich (60%) vrs. clast poor (5to 10%) beds, a few very carb rich(30% disseminated small calcite blebs) beds, no visible sulphides, weakly fractured at random orientations with calcite fracture filling
-from 525.5 to 526', soft chlorite-sericite altered thinly bedded very fine grained silt stone, with a few thin 1/16 to 1/4" graywacke seams-beds parallel to bedding
-from 526 to 532.5', predominently tightly packed graywacke, very fine grained light green sericitized matrix with 60 to 70% small (less than 1/32") white feldspar clasts, tightly packed, well developed bedding at 25° to the core axis, a few thin calcite stringers and blebs

-parallel to bedding, a few thin soft silt stone (altered, chlorite-sericite)beds, weakly fractured at random orientations with calcite fracture filling and occasional sericite and silica alteration halos
-at 527', 2" soft green chlorite altered silt stone bed at 528', 1" soft green chlorite altered silt stone bed at 20° to the core axis
-a few lithic frags to 1/4" of light green sericite altered argillite/volcanic
-from 530.2 to 530.8', light green sericitized silt stone interbed at 35° to the core axis
-from 531.7 to 532', soft sericitized silt stone interbed at 20° to the core axis,
-no visible sulphides

532.5' to 553.5' Siliceous- Silt Stone-Argillite -predominently a very very fine grained, granular, hard, siliceaus, light green (weakly sericitized) to gray silt stone
-appears redish brown in places with 5 to 15% very fine grained disseminated biotite (biotite present where rock is not sericitized)
-banded appearance with biotite rich vrs. biotite poor beds
-bedding very irregular, contorted, at an average orientation of 20 to 25° to the core axis
-moderately to strongly fractured, one set at prefered orientation of 40 to 50° to the core axis although others present, with calcite, quartz, occasionaly sericite-chlorite fracture filling, and strong bleached-silica and occasional sericite alteration halos to 1/4"

-a few slightly softer slightly coarser grained sand stone interbeds
-from 532.5 to 538', predominently silt stone as above from 536 to 537', numerous 1/16 to 1/8" crudely hexagonal calcite blebs (maybe altered garnets)
-from 538 to 547', becomes very cherty,gray, siliceaus, and argillaceous
-bedding at 20° to the core axis as exhibited by alignment of biotite rich beds
-from 538 to 541',strongly fractured at 40° to the core axis with bleached halos to 1/4", and a few calcite blebs (altered garnets), a few biotite rich silt stone clasts (boudinaged interbeds)
-gradationtly becomes slightly coarser, grading to a silt stone from 546 to 547'
-from 547 to 550', softer light grayish green, weakly sericitized silt stone with trace very fine grained disseminated pyrrhotite-pyrite
from 550 to 552', hard, very fine grained siliceaus biotite bearing(10%) silt stone
-from 552 to 553.5', light grayish green cherty argillite with a few thin silt stone interbeds
-overall sulphide content, trace, pyrite associated with calcite fracture filling, and trace very fine grained disseminated pyrite-pyrrhotite from 547 to 550'

553.5'to 574' Altered (Carbonitized, Sericitized) Silt Stone-rock consists of a fine grained to a very fine grained, granular light to a medium green, moderatly sericitized, weakly chloritized in places, moderate to strongly carbonitized (innumerable small less than 1/64" disseminated calcite to 25 to 40% rock) altered silt stone (appears very andesetic in places but granularity in weakly developed bedding indicates medisediment)

-very weakly developed bedding at average orientation of 20° to the core axis
-very weakly schistose, in places parallel to bedding, elsewhere cross cuts bedding at 60° to the core axis
-weakly fractured at random orientations with calcite fracture fillings
-a few thin siliceous zones and less altered "windows"
-occasional thin siliceous argillite interbeds to 1/4"
-trace of very fine grained disseminated pyrrhotite-pyrite
-at 558', 1/4" quartz vein at 40° to the core axis with 2" slightly harder light green alteration halo (bleached)
-from 561'to 571',weak schistosity cross cuts weak bedding 60° to the core axis, locally intensley carbonitized
-from 571 to 572', 1" thick quartz calcite hard brown acicular mineral (biotite?) vein at 10° to the core axis, quartz calcite core rim by hard brown mineral, trace very fine grained disseminated pyrrgotite-pyrite-calcopyrite in vein and in cherty 1" alteration halo around vein, locally surrounding silt stone strongly carbonitized.

574' to 577.5' Interbedded Siliceous Silt Stone and Cherty Siliceous Argillite - from 574 to 575', very fine grained, granular, light yellowish green, siliceous (silicified ?) silt stone with weakly developed bedding at 35° to the core axis, numerous small calcite blebs (less than 1/64") to 10% of rock, weakly fractured parallel to bedding at 35° to the core axis, with calcite and minor sericite-chlorite fracture filling

-from 575 to 577.5', becomes very very fine grained to argillaceous white cherty siliceaus argillite silt stone, very contorted bedding ranging from 0 to 90° to the core axis, average orientation 70° to the core axis, thinly bedded (1/4 to 1/2"), a few thin chlorite calcite seams parallel to bedding, numerous small disseminated calcite blebs, moderately fractured at random orientations with calcite, minor chlorite-sericite-pyrite fracture filling, minor movement along fractures to 1/4", very modelled appearing, overall sulphide content, trace, pyrite as fracture filling mineralization.

577.5' to 601' Altered (Carbonitized, Sericitized) Silt Stone - very fine grained to fine grained, light green, soft, very strongly sericitized (to weakly chloritized in places) and moderately carbonitized (innumerable very small less than 1/64" calcite blebs - altered grains) altered silt stone.
-appears very andesetic, but weakly granular with faintly developed bedding in places at average orientation of 30° to the core axis.
-weakly schistose-sheared appearing with schistosity predominently parallel sub parallel bedding, but in places appears to weakly cross cut bedding at 55° to the core axis.
-weakly to moderately fractured at random orientations with predominently calcite fracture filling, occasional sericite , chlorite, quartz, sulphides,
-a few small (to 1/16") disseminated fuchsite blebs.
-occasion thin (to 1/4") irregular contorted siliceaus argillite interbeds.
-at 580', 1/2" quartz carbonate vein at 15° to the core axis, predominently medium grained to coarse grained granular quartz with calcite "matrix", very fine grained disseminated Po-Py

-at 584.4', 1/2" quartz carbonate vein at 20° to the core axis, predominately quartz with a few gray calcite blebs, a few chlorite blebs, quartz is stained light brown in places, a few small disseminated Po blebs.
-from 585 to 589', numerous thin cherty siliceaus argillite interbeds to 1/4", very contorted, average orientation 40° to the core axis, to 10% of rock.
-593 to 594', spotted alterations with numerous small elongate chlorite clots to 1/16", clots aligned parallel to schistosity/bedding at 40° to the core axis.
-from 596 to 601', less altered, less sericite carbonate rich, become gradationaly more siliceaus.
-overall sulphide content, variable, from 577.5' to 581' sulphides to 0.5% as very fine grained disseminated pyrrhotite-pyrite - trace calcopyrite, as thin small blebs parallel to foliation.
-sulphides from 581 to 601', trace, with pyrite-pyrrhotite associated with calcite fracture filling, and very minor fine grained disseminated mineralization.

601' to 617' Siliceous Silt Stone- bedding moderately developed at an average orientation of 15° to the core axis.
-very fine grained, hard gray, siliceaus (to cherty in places) silt stone,
-bedding exhibited by alignment of thin biotite rich bands
-10% very fine grained disseminated biotite.
-occasional thin (to 1/4") dark gray to black, slightly softer chlorite carbonate rich silt stone interbeds.
-bedding often irregular, slumped,contorted,
-weakly fractured at random orientations with predominently calcite fracture filling, occasion biotite fracture filling

a few siliceaus-cherty alteration halos to 1/4", 1 set at prefered orientation at 50° to the core axis.
-occasional small disseminated subhedral calcite blebs to 1/16" (altered garnets)
-some movement along fractures up to 1/4"
-occasion dark carb rich bands often boudinaged, brecciated
-occasion thin calcite blebs-seams parallel to bedding associated with darker calcite rich interbeds.
-from 601to 603', numerous thin (to 1/2") dark gray to black softer weakly chloritic very carbonate rich interbeds at 10 to 15° to the core axis and 25% of rock.
-at 607', 1" white siliceaus cherty bed at 5° to the core axis.
-from 608 to 609', 1/2" siliceaus bed at 5° to the core axis, with 10 to 15% small thin cross cutting calcite stringers - blebs, no visible sulphides.
-from 611 to 613', black calcite rich beds-highly slumped boudinaged, to 1", or 40% of rock with thin 1/4" hard white magnesite bands.
-from 613 to 614', numerous irregular patches-bands to 2" of quartz magnesite at 45° to the core axis (cross cutting bedding)
-from 615 to 617', few small silicified blebs to 1/2"
-overall sulphide content, trace pyrite-pyrrhotite as mineralization associated with carbonate filled fracture.

617' to 625.5' Interbedded Altered Silt Stone and Argillite- well developed bedding varies from 0 to 20° to the core axis, average orientation 15° to the core axis, thinly bedded (1/4 tol")

-60% light green relatively soft, weakly chlorite - sericite altered silt stone
-40% darker gray to black, soft, weakly chloritized, carbonate rich, (10 to 15% disseminated calcite) argillite silt stone.
-bedding very contorted, slumped in places, off set by up to 1/4" by fractures in places.
-rock predominently weakly fractured at random orientations with calcite fracture fillings.
- light green soft silt stone with 10 to 15% very small (less than 1/64") calcite blebs disseminated throughout unit.
-from 622.5 to 623.5', 1/16" calcite filled fracture at 15° to the core axis with 5% fine grained disseminated pyrite.
-overall sulphide content, 1 to 2% as predominently very very fine grained pyrite-pyrrhotite-trace-calcopyrite blebs in disseminated thin bands parallel to bedding and associated with fracture filling.

625.5' to 647' <u>Weakly Altered Silt Stone-</u> bedding highly irregular, contorted, but predominently at 20 to 30° to the core axis (very 0 to 60°)
-rock predominently a very fine grained, granular, light grayish green, relatively hard, weakly sericitized silt stone.
-predominently weakly fractured at random orientations with calcite, occasionaly biotite, sericite, chlorite, trace pyrite fracture filling.
-a few thin graywacke beds - zones, were very small quartz, feldspar clast less than 5 % of rock (possibly a graded bed)

-a few zones of spotted silicification alteration, with small (to 1/2") bleached silicification blebs, possibly a brecciated interbed but very indistinct contacts with matrix.
-at 627', 1/2" graywacke clast
-at 625.5 to 633', relatively massive appearing, andesetic appearing with only very minor biotite, and very poorly developed bedding.
-from 633' becomes biotite rich (to15%) slightly harder, more siliceaus, with well developed bedding at 20 to 30° to the core axis.
-from 632 to 633', numerous bands parallel to bedding of white siliceaus spotted alteration blebs to 1/2" (maybe brecciated siliceaus argillite interbeds)
from 633' to 638', very modelled appearing, with contorted biotite rich beds often boudinaged, brecciated, in biotite poor lighter very siliceaus silt stone.
-from 638 to 647', a few thin dark grayish green siliceaus argillite interbeds to 1/4" often very contorted.
-from 646 to 647', numerous graywacke clasts to 2"
-overall sulphide content, trace, pyrite associated with calcite fracture filling.

647' to 659' Graywacke- rock comprised of a very fine grained, granular, light green, weakly sericitized, very hard siliceaus matrix clast to 30%, predominently small (to 1/16") angular to sub rounded white feldspar, quartz clasts with a few large lithic clast to 1/4" of green argillite/volcanic and cherty argillite.
-matrix appears weakly foliated, with alignment of elongate clasts and prefered orientation of disseminated biotite at average orientation of 60° to the core axis.

-biotite present to 5 to 10%, as very fine grained disseminated mineralization in small clots
-from 647 to 650', biotite reduced to 2%, more strongly sericite altered,a few chlorite clots.
-rock is predominently weakly fractured at a prefered low angle orientation of 10 to 30° to the core axis, with calcite fracture filling.
-from 657 to 659', increasingly clast poor grades into a siliceaus silt stone.
-overall sulphide content, trace,pyrite associated with fracture filling and very minor fine grained disseminated pyrite.

659' to 670.5' Interbedded Silt Stone and Graywacke- from 659 to 665', predominently silt stone, gray, very fine grained, granular siliceaus hard, poorly developed bedding at 25° to the core axis with 10% very fine grained disseminated biotite and occasional biotite rich bands, weakly fractured at prefered orientations of 10 to 20° and 50 to 60°, with predominently calcite fracture filling, occasion bleached to spotted alteration blebs, at 659.5', 2" clast poor (5% feldspar, quartz) graywacke bed at 25° to the core axis, from 659.5 to 660', numerous elongate (parallel to sub parallel to bedding) lighter to bleached, spotted alteration blebs to 1/4", very modelled appearing in places with highly contorted bedding, biotite rich blebs-brecciated frags, no visible sulphides.
-from 665 to 665.9', clast rich graywacke interbed at 25° to the core axis, with small (to 1/16") predominently feldspar quartz sub angular to sub rounded clast to 50 to 60% in very fine grained weakly sericitized light greenish gray siliceaus matrix, with 5 to 10% disseminated biotite.

-from 665.9 to 670.5', interbedded silt stone and graywacke bedding averages 10 to 25° to the core axis, predominently gradational contacts between silt stone and clast poor (10%) graywacke
-overall sulphide content, trace, pyrite associated with calcite fracture filling.

670.5' to 688' Graywacke- rock consists predominently of a light gray to green (weakly sericitized in places) hard, fine grained, granular, siliceaus matrix with 30 to 40% (average) small (to 1/16", average 1/32") sub angular to sub rounded white quartz, feldspar clasts, occasionaly gray cherty argillite clasts, occasional green weakly chlorite-sericite altered lithic argillite/volcanic clast to 1/2"
-5 to 10% fine grained disseminated biotite
-weakly foliated as exhibited by alignment of biotite and elongate clast at average orientation of 60° to the core axis, this foliation appears to cross cut bedding at 20° to the core axis.
-a few thin (1 to 2") clast poor (less than 5%) silt stone type interbeds with gradational contacts
-some graded bedding with clast rich (to 60%) vrs., clast poor (10 to 20%) zones
-from 671 to 671.5', 1" clast free silt stone interbed at 20° to the core axis with very indistinct contacts.
-at 674', 1" soft green argillaceous chloritized argillite/ volcanic clast.
-the rock weakly fractured at random orientations with predominently calcite, sericite, chlorite, biotite, pyrite fracture filling.

-from 677 to 677.5', very fine grained dark green clast free silt stone bed, contacts at 45° to the core axis, at 677.3', 1/2" beige tightly packed graywacke bed at 50°to the core axis.
-from 677.5, matrix becomes lighter green, moderately sericitized.
-at 678', 1" fine grained granular sugary quartz vein at 70° to the core axis.
at 680', 2" thin green chlorite-carbonate altered argillite, volcanic clast elongate at 0° to the core axis, locally numerous small lithic green chloritized clasts aligned parallel to foliation at 60° to the core axis.
-from 681 to 682.5', locally very clast poor (less than 5%)
-at 682', at 25° to the core axis, 2" gray clast free silt stone interbed
-at 683 to 683.5', 6" gray clast free silt stone interbed
-from 683.5 to 684.5', numerous thin calcite quartz seams to 1/16" at 80 to 90°to the core axis with 1/4" irregular beige alteration halos.
-overall sulphide content, trace, pyrite associated with calcite fracture filling.
-arbitrary contact with underlying more interbedded units

688' to 708' <u>Interbedded Silt Stone and Graywacke</u> - bedding moderately developed at an average orientation of 20° to the core axis, ranges from 0 to 40° to the core axis.
-rock comprised of interbedded - silt stone, hard, gray, siliceaus, very fine grained, granular, with 10 to 15% disseminated biotite, often thin biotite rich beds to 1/4", a few occasional small feldspar and quartz clasts, and - graywacke, very fine grained granular silt stone type matrix, occasionaly weakly sericitized,with 5 to 10%

disseminated biotite, and 20 to 60% quartz, feldspar clasts to 1/16"
-beds often gradational
-overall composition approximately 60% silt stone, 40% graywacke
-unit is weakly fractured at random orientations, with calcite, occasionaly chlorite, sericite, pyrite fracture filling.
-a few thin cross cutting hard carbonate (magnesite-calcite with minor quartz) seams at 80 to 90° to the core axis.
-overall sulphide content, trace, pyrite associated with carbonate fracture filling
-at 688.8', a few 1/4" bleached silica spotted alteration blebs around fractures
-at 691', 1" graywacke clast or brecciated bed
-from 688 to 700.5', predominently gray silt stone with a few thin 1 to 2" graywacke beds.
-from 695.5' to 696.5', 1/2" quartz vein at 20° to the core axis, with trace amounts of very fine grained disseminated pyrite along rims.
-at 700', 1" graywacke clast
-at 700.5 to 701', graywacke interbed
-at 701.5 to 703.5', graywacke interbed
-from 705 to 705.5', very modelled appearing
-from 705.5 to 706', numerous thin cross cutting carbonate biotite seams to 1/8" at 90° to the core axis

708' to 712' Siliceaus Metagraywacke- very fine grained gray to light green (weakly sericitized) siliceaus matrix with 10 to 15% fine grained disseminated biotite.
-clast rich, with 60 to 70% small (1/64") white feldspar quartz clast with a few larger (to 1") light green sericitized argillite-silt stone clast.
-weakly developed bedding at an average orientation of 45° to the core axis.
-weakly to moderately fractured at a prefered orientation of 55°, predominently calcite fracture filling, minor quartz, sericite,
-a few thin (to 1/4") sericite alteration halos around fractures, some minor movement along fractures,
-no visible sulphides
-at 709.2', 1" white tightly packed graywacke bed at 60° to the core axis.
-at 709 to 710', numerous 1" light green sericite altered argillite/silt stone clasts
-from 711 to 712', a few thin 1/4 to 1/2" siliceaus argillite - silt stone interbeds at 45° to the core axis.

712' to 713' Cherty Siliceaus Argillite- bedding averages 10° to the core axis, ranges from 0 to 25°, highly contorted, off set by numerous fractures at a prefered orientation of 80 to 90°, some minor movement along fractures to 1/4",
-light brownish gray thinly bedded cherty argillite-silt stone, thinly bedded (1/4" average) as exhibited by thin biotite bearing vrs. biotite free beds.
-fractures predominently magnesite filled, occasionally quartz filled, with occasional bleach silica and sericite alteration halos to 1/4"
-some spotted alteration with small white bleached silicification blebs to 1/16"
-no visible sulphides

713' to 738' Silt Stone - thinly bedded (average 1/2 to 1"), highly contorted bedding with slumping and soft sediment deformation features, at an average orientation of 25° to the core axis, varies from 20 to 35° to the core axis
-predominently a very fine grained, granular, dark gray to light green (weakly sericitized in places) relatively hard, siliceaus, silt stone with an average 15% very fine grained biotite.
-occasional thin clast bearing zones (less than 5%, small to 1/32" quartz, feldspar), more graded beds than distinct interbeds.
-moderately fractured at random orientations with calcite-sericite, occasionally quartz fracture filling with trace very fine grained disseminated pyrite.
-a few very thin argillite beds, a few thin softer chlorite sericite carbonate altered interbeds.
-weakly schistose in places, schistosity appears to cross cut bedding at 60° to the core axis.
-occasional thin (1/16") very biotite rich beds-bands
-occasional dark gray calcite rich beds
-from 714 to 715.5', slightly coarser with a few small (to 1/32") feldspar in quartz clast, weakly sericitized light green.
-from 715.5 to 716.5', softer, light green, moderately sericite-chlorite altered, moderately carbonitized.
-from 716.5 to 717', a few thin 1 to 2" graywacke interbeds
-at 723.5', 1" siliceaus cherty argillite interbeds at 25° to the core axis.
-from 723.5 to 724.5', numerous thin 1/4 to 1/2" cherty siliceaus argillite interbeds at 25° to the core axis, highly crenulated and contorted.

-from 729 to 730', numerous 1/2 to 1" dark gray to black very calcite rich interbeds at 25° to the core axis.
-at 733', 1" hard based carbonate (dolomite) vein at 55° to the core axis.
-at 733 to 735', very siliceaus thin dark carbonate rich beds - bands to 20% of rock.
-735 to 738', very siliceaus hard gray argillite interbed
-from 737 to 738', a few 1" coarse clastic graywacke interbeds at 25° to the core axis.
-overall sulphide content, trace, fine grained disseminated pyrite associated with calcite fracture filling.

738' to 744' Interbedded Silt Stone and Argillite - well developed bedding at an average orientation of 20° to the core axis thinly bedded(1/2 to 1 ")
-rock comprised of interbedded relatively hard, black weakly chloritic argillite, and softer light green slightly coarser weakly chlorite-sericite altered, weakly sheared-schistose (parallel to bedding) silt stone. Overall composition approximately 50/50
-bedding often crenulated, wavey (possible ripple marks) occasional off set by fractures.
-moderately fractured at random orientations, with calcite fracture filling, minor chlorite, pyrite.
-0.5% very fine grained disseminated pyrite, pyrrhotite, trace calcopyrite, with a prefered association in darker black argillite beds, a few Po blebs to 1/8" elongate parallel bedding (often mantled by calcopyrite)
-weakly carbonitized in places (very fine grained disseminated calcite to 15%)

744' to 756' Silt Stone- rock predominently of very fine grained granular, light gray, hard, siliceaus, silt stone
-very poorly developed bedding at 10 to 15° to the core axis as exhibited by occasional thin black (1/16") argillite interbeds.
-weakly fractured at random orientations with predominently calcite, minor pyrite fracture filling.
-5 to 10% very fine grained disseminated biotite
-weakly sericitized in places
-a few thin (1/16") clast bearing "beds" with small 1/32" to 1/16" white feldspar and quartz clasts.
-at 747.5',2" elongate cherty argillite clast (possibly a boudinaged interbed) at 80° to the core axis, with weak sericite biotite rich alteration halo.
-from 750 to 752', numerous thin dark gray siliceaus agrillite interbeds to 1/4" and 20% of rock at 10 to 20° to the core axis.
-at 754.5', 2" coarse clastic graywacke interbed at 55° to the core axis
-overall sulphide content, trace, predominently pyrite associated with fracture filling and minor very fine grained disseminated pyrite.

756' to 767' Altered (Sericitized) Silt Stone- rock predominently very fine grained, granular, relatively hard, siliceaus, light green weakly to moderately sericitized silt stone.
-minor (5 to 10%) very fine grained disseminated biotite were rock is not strongly sericitized.
-poorly developed bedding at 20 to 40° to the core axis, average orientation is 30°
-occasionally clast rich (5 to 10%, small, to 1/16" sub-angular to sub rounded feldspar and quartz clasts)

zones, with irregular contacts, graded as opposed to distinct interbeds
-spotted alteration in places with irregular biotite rich blebs to 1/2", spherical to elongate parallel to bedding
-overall sulphide content, trace very fine grained disseminated pyrite
-from 756 to 757', locally bedding highly contorted, average 45° to the core axis, numerous thin tightly packed graywacke interbeds to 1/4", beds often boudinaged, brecciated,
-at 758', 1/2" predominently quartz with minor calcite vein at 55° to the core axis, a few small biotite blebs to 1/8", strong sericite alteration at rims.
-at 761', 1/16" fuchsite clast
-from 761 to 762', numerous thin graywacke (clast to 30%) interbeds and clast to 1"
-from 766 to 767', a few thin (to 1") graywacke interbeds at 40° to the core axis.

767' to 774' Graywacke- very fine grained, light gray to green, weakly sericitized, siliceaus matrix, weakly schistose at 70° to the core axis, with 40 to 50% small (average 1/32"to 1/8") predominently white, sub angular to sub rounded, feldspar and quartz clasts, numerous thin elongate parallel to foliation dark green chlorite altered mafic clasts
-clast in places to 70 to 80%
-weakly to moderately fractured at prefered low angle orientation of 20 to 30° to the core axis, with predominently calcite, minor quartz, chlorite, sericite and fractur filling.

-bedding difficult to determine, poorly developed, appears to be approximately 25° to the core axis.
-a few weak sericite alteration halos to 1/4" around fractures.
-overall sulphide content, trace, very fine grained disseminated pyrite associated with calcite fracture filling and disseminated in sericite alteration halos.
-from 768.5 to 769', locally very clast rich, to 90%
-from 768.5 to 770', quartz chlorite filled fractured to 1/4" at 0 to 10° to the core axis.
-from 770', matrix becomes light green, moderately sericitized, very "dacite porphyry" appearing
-from 772 to 774', slightly softer, weakly carbonitized (10 to 15% very fine grained disseminated calcite and thin calcite stringers parallel to foliation)

774' to 781.5' Interbedded, Altered (Chlorite-Sericite) Silt Stone and Argillite - from 774 to 777', predominently soft, dark grayish green, altered silt stone, very fine grained, schistose sheared appearing, with weakly developed bedding at 20° to the core axis, moderately chlorite-sericite altered, moderately carbonitized, weak remnant granular texture in places, in places a few (5%) small white quartz feldspar clasts.
-from 777 to 779',numerous thin 1/4" white to gray cherty argillite interbeds and thin graywacke interbeds, wacke interbeds with up to 60% of small (1/16") quartz feldspar clasts bedding highly irregular at an average orientation of 10° to the core axis.
-from 779 to 781', light green, weakly to moderately sericitized silt stone, moderately fractured at random orientations with predominently calcite fracture filling.

-from 793 to 802', becomes softer, light green, moderately sericitized-carbonitized, weakly schistose silt stone with numerous thin (to 15%) cherty siliceaus argillite interbeds to 1/4", bedding locally at 25° to the core axis, schistosity locally at 25° to the core axis, more strongly fractured at weak prefered orientation of 30 to 50° to the core axis, with biotite-quartz-calcite fracture filling and trace very fine grained disseminated pyrite throughout rock, a few biotite rich bands parallel to bedding, occasional clast bearing (less than 5%) zones, a few weakly chloritic beds-bands.
-from 802 to 812', soft light green schistose sheared (parallel to weakly developed bedding at 25 to 40° to the core axis) chlorite sericite carbonate altered silt stone intensley fractured at prefered orientations of 30 to 50° to the core axis with calcite fracture filling, 0.25% disseminated pyrite and pyrite associated with calcite fracture filling, a few thin cherty siliceaus argillite interbeds, a few thin clast rich graywacke interbeds.
-from 812' to 821', harder, siliceau biotite bearing silt stone, with 0.25% pyrite as disseminated mineralizatio and associated with calcite fracture filling, unit is moderately carbonitized.

821' to 825' Silt Stone - very fined grained, hard, siliceaus, dark grayish green silt stone, with 10% very fine grained disseminated biotite, granular no apparent bedding.
-weakly fractured at prefered orientation of 20 to 30° to the core axis, with calcite and minor quartz, chlorite, sericite fracture filling, no visible sulphides.
-weakly carbonitized (very fine grained disseminated calcite)
-occasional clast bearing zones (less than 5%, small white quartz feldspar clast)

825' to 830' Altered Silt Stone-Graywacke- rock predominently a very fine grained to argillaceous dark brownish gray, very hard very siliceaus silt stone, highly contorted bedding at 0 to 90° to the core axis with an average orientation of 10° to the core axis, numerous boudinaged-brecciated beds-fragments to 1 to 2", a few thin graywacke zones-beds to 1", where silt stone gradiationaly becomes clast bearing (to 20% small 1/16" quartz, feldspar clast)
-very strongly fractured at random orientations with calcite quartz, and minor pyrite fracture filling, with strong sericite and bleached-silica alteration halos.
-occasional spotted alteration biotite rich blebs to 1/4"
-numerous thin hard white magnesite seams to 1/4" at 70 to 90° to the core axis.
-5% very fine grained disseminated biotite
-overall sulphide content, trace, pyrite associated with calcite fracture filling
-at 825.5', 1" hard white magnesite vein at 85° to the core axis, with minor quartz.

830' to 839' Sericitized Metagraywacke- very fine grained, light green weakly to moderately sericitized, relatively hard, siliceaus matrix,
-weakly developed foliation (poorly developed bedding and weak schistosity) at 40° to the core axis, although highly variable.
-50 to 60% small (average 1/16", to 1/4") sub angular to sub rounded predominently white feldspar, quartz clasts occasional lithic clasts of light green sericite altered argillite/volcanic elongate parallel to foliation.
-5 to 10% very fine grained disseminated biotite in places (where less strongly sericite altered) weakly aligned

-moderately fractured at random orientations with predominently calcite, occasionaly quartz chlorite pyrite fracture filling.
-occasional sericite alteration halos to 1" around fractures.
-occasional calcite veins to 1/4" at 80 to 90° to the core axis
-overall sulphide content, trace, pyrite associated with calcite fracture filling and very minor very fine grained disseminated pyrite.

839' to 1004' Silt Stone (with Graywacke Interbeds) - rock consists predominently of a very fine grained dark brownish gray, very hard, siliceaus silt stone with varying degrees and types of alteration predominently associated with fracturing.
-alteration predominently a weak sericitization as halos around fractures to 1", occasionaly pervasive sericite alteration
-occasional silicification bleaching alteration halos
-occasional zones of " spotted alteration " with spherical to slightly elongate bio rich alteration blebs to 1/4"
-majority of rock contains 10% very fine grained disseminated biotite (except were strongly sericite altered)
-rock predominently moderately fractured with sets at 20 to 30°, and 60 to 70°, although other orientations are present.
-some movement (up to 1/4") along fractures
-fractures predominently calcite occasionaly sericite, chlorite, quartz filled
-occasional clast rich (to 10 to 20%) graywacke interbeds contact usually indistinct, more of a graded sequence than a distinct interbed.
-some grains size variation throughout silt stone unit

in places coarsens to what could technically be a sand stone-quartzite
-weak to moderately foliated in places as exhibited by alignment of biotite, an occasional biotite rich beds, varies considerably throughout the unit, average orientation 55°, ranges from 30 to 70°
-bedding very weakly developed, highly contorted in places average orientation of 30° to the core axis.
-at 839.5', 1/2" hard white carbonate (magnesite) vein with minor quartz at 80° to the core axis, with small 1/32" Py blebs
-from 839 to 842', spotted alteration affects 50% of rock, spherical to elongate biotite rich blebs to 1/4", locally foliation at 55° to the core axis
-at 842', 1/4" hard white magnesite vein at 85° to the core axis with minor bright green epidotes ?
-bedding at 843', 30° to the core axis
-at 846', 1" graywacke bed at 25° to the core axis, very indistinct contacts, silt stone coarsens to a clast rich (70%) graywacke.
-from 848 to 852', graywacke zone, gradiational contacts, slightly coarser silt stone- sand stone siliceaus matrix with 20% small white feldspar, quartz clast to 1/16"
-at 850', 1/4" quartz vein at 50° to the core axis
-from 852 to 856', weakly clast bearing (5%) slightly coarser silt stone - sand stone type granular matrix.
-at 857', numerous strong sericite alteration halos to 1/2" along fractures at 30° to the core axis, locally a few 1/8" hard white magnesite seams at 90° to the core axis

-at 866', 2" graywacke bed at 20° to the core axis
-from 857 to 866', numerous thin clast bearing zones (less than 5%) and a few thin contorted siliceous argillite beds at 30° to the core axis
-at 867.5 to868', numerous thin 1/4" light brown contorted cherty argillite-siltstone beds at 40° to the core axis
-at 870 to 871.5',numerous thin (to 1/2") cherty argillite interbeds and boudinaged-brecciated argillite fragments at highly variable orientations ranging from 10 to 70° to the core axis.
-at 873 to 874', graywacke interbed with indistinct contacts at 30° to the core axis, with 20% small feldspar-quartz clast in slightly coarser granular siltstone-sand stone matrix.
-at 875', 1/4" hard white magnesite vein at 90° to the core axis with minor quartz, with 1" strong sericite-bleached-silica alteration halos
-from 875 to 876', numerous 1" gray siliceous argillite interbeds at 20° to the core axis.
-from 877 to 879.5', graywacke interbeds, small feldspar and quartz clast to 1/16" a few lithic light green argillite/volcanic clast to 1/4", clast to 30% in dark green to gray siltstone matrix.
-from 880 to 882', numerous thin gray siliceous (1/4") argillite interbeds at 55° to the core axis, highly contorted in places.
-from 882', locally bedding becomes well developed at 30° to the core axis with numerous thin 1/8" clast bearing graywacke beds.
-from 882 to 897', very modelled appearing with spotted alteration affecting 30 to 40% of rock, biotite rich blebs to 1/4 - 1/2".

-at 899.5', 1/2', 1/2" fine grained sugary recrystalized quartz and calcite vein at 55° to the core axis.
-from 903 to 904', graywacke interbed at 35° to the core axis with 5 to 10% (small 1/32") white feldspar and quartz clasts in slightly coarser sandstone matrix.
-at 904.2', 1/4" calcite fill fracture at 20° to the core box axis with a few 1/8" pyrite blebs.
-from 904.5 to 908', graywacke, with small white elongate clast feldspar to 1/16" and 50% of rock locally foliation at 65° to the core axis.
-at 907', locally carbonate rich zone around numerous sericite-calcite fill fractures
-at 907.5', 1" graywacke clast rimed by calcite
-at 910', 1/4" hard white magnesite and sericite-quartz vein at 90° to the core axis
-from 908 to 910', numerous slightly lighter yellowish green weakly carbonitized patches.
-at 916', 1" hard white magnesite vein at 90° to the core axis with numerous thin quartz-calcite seams parallel and perpendicular to vein orientation, no visible sulphides.
-from 919 to 921.5', graywacke, with 15% small (1/32") white feldspar quartz clasts in hard gray siliceous siltstone matrix.
-from 921.5 to 926', becomes very fine grained, with numerous small quartz-feldspar clasts and blebs to 1/4 to 1/2" with weakly developed highly contorted bedding - foliation at 30° to the core axis(weak schistosity locally at 70 to 80° to the core axis)
-at 931.5', 1/2" hard white magnesite vein at 90° to the core axis with a few thin quartz stringers, and a strong 1" sericite alteration halo.

-at 936',1" quartz vein at 50° to the core axis, medium grained, granular, sugary quartz with minor calcite at rims, no visible sulphides
-at 938.5', 3" sericite alteration zone, with sericite alteration halos to 1/2" around several calcite fill fractures at 30° to the core axis.
-at 944.8', 1/2" hard white magnesite vein at 90° to the core axis with minor calcite and quartz, no visible sulphides.
-at 946.5', at 55° to the core axis, 1/2" hard white magnesite vein with minor quartz and calcite seams.
-at 949.5', 1" hard white magnesite vein at 65° to the core axis.
-at 950', 1/4" hard white magnesite-quartz vein at 80° to the core axis.
-at 951', 1" hard white magnesite vein at 90° to the core axis with a few thin quartz stringers, and no visible sulphides.
-at 954', 1" hard gray siliceous argillite bed at 30° to the core axis.
-from 955 to 956', numerous thin 1/4 to 1/2" siliceous argillite interbeds at 30° to the core axis.
-at 960', 4" gray siliceous argillite bed at 20° to the core axis
-from 960 to 979', becomes fine grained siltstone with numerous thin siliceous argillite beds to 20% of rock
-from 970 to 971', numerous 1/4" hard white magnesite + quartz veins at 80 to 90° to the core axis and 30% of rock, no visible sulphides.

-from 972 to 975',spotted alteration affects 30% of rock, foliation at locally 50° to the core axis.
-from 979 to 990',gray siliceous argillite beds to 35% of rock, bedding at locally 0 to 20° to the core axis, highly contorted and slumped.
-at 985', 2" quartz magnesite vein at 60° to the core axis
-at 986.2', 1" hard white magnesite bleb with minor cherty quartz crudely oriented at 70° to the core axis.
-at 987.5', 1" hard white magnesite vein at 90° to the core axis, with minor cherty quartz and calcite and trace very fine grained disseminated pyrite.
-at 989.5', 1" magnesite with minor quartz vein at 30° to the core axis, highly contorted, trace fg disseminated pyrite
-overall sulphide content, trace, vfg disseminated pyrite associated with calcite fracture filling .

1004' to 1014' Interbedded Argillite-Siltstone- rock comprised predominently of a vfg to argillaceous light grayish green very hard very siliceous argillite to siltstone.
-predominently gradational context between argillite to a slightly coarser granular siltstone, occasional well defined interbeds.
-bedding very contorted slumped, at an average orientation of 10 to 20° to the core axis although highly varyable, as exhibited by numerous thin biotite rich beds to 1/4"
-minor to 10 to 15% vfg disseminated biotite
-moderately fractured at random orientations with calcite, sericite, chlorite,quartz, and occasionally biotite

fracture filling, with occasional sericite and bleached silica alteration halos to 1/4"
-some movement to 1/4" along fractures
-appears very cherty in places
-occasional thin (1/8 to 1/4") hard green argillite interbeds, often brecciated, boudinaged, very contorted, and very carbonate rich.
- a few calcite rich zones with numerous calcite stringers parallel to bedding
-a few zones with "spotted alteration" - small to 1/2" bleached silica biotite rich alteration blebs.
-from 1006 to 1007', a few 1/4" clastic appearing pyrrhotite blebs
-at 1009.5', a few small 1/8" pyrrhotite-calcopyrite clasts
-from 1008 to 1010', numerous brecciated - boudinaged thin dark green hard carbonate rich argillaceous beds to 1/4" often with minor disseminated pyrite-pyrrhotite-calcopyrite.
-from 1012.5 to 1013.5', strongly fractured at random orientations with locally talc, sericite, and calcite fracture filling, locally host rock is very bleached and silicified.
-at 1015.5',1" hard white magnesite with minor qts vn at 75° to the core axis.
from 1017.5 to 1018',numerous thin 1/4" magnesite with minor qtz vn at 70° to ca, with minor cherty alteration halos.
-bedding locally at 1025', at 35° to the ca.
-at 1070', 1/4" qts vn at 35° to ca with a few thin 1/16" pyrite blebs.

-at 1087.5', 1/2" hard white magnesite with minor quartz and sericite vn at 65° to the ca
-at 1088.2', 3" zone with numerous thin 1/4" hard white magnesite vn at 90° to ca, with strong thin cherty alteration halos.
-at 1090', 1/16" pyrite fracture filled with minor calcite at 5° to ca.
-at 1091.2', a few 1/16" hard white calcite seams at 80 to 90° to ca with trace fg disseminated pyrrhotite-pyrite.
-from 1092', argillite interbeds to 70%, locally bedding at 10 to 20°
-from 1105 to 1106', numerous thin hard white magnesite vn to 1/8" to 80 to 90° to ca
-at 1106', 1" hard white magnesite vn at 90° to ca with minor quartz and sericite.
-from 1108 to 1109', numerous thin 1/4" hard white magnesite vn at 90° to ca and 5% of rock.
-from 1113 to 1114', numerous small (1/16") disseminated calcite blebs
-overall sulphide content, trace, pyrite -pyrrhotite-calcopyrite predominently associated with calcite fracture filling, very minor fg disseminated mineralization.

1114' to 1124.5' <u>Sericitzed, Siliceous Metagraywacke-</u> rock comprised of a very fg granular light green weakly sericitized hard siliceous matrix with an average of 40% white angular to sub rounded small (to 1/8") feldspar and qtz clast.
-rock weakly fractured at random orientations with qtz, calcite, and minor sericite, chlorite fracture filling - occasionally with trace pyrite.

-no appearant bedding or foliation.
-minor (less than 5%) vfg disseminated biotite in places.
-from 1118.5 to 1119',1/2" coarse grained granular recrystallized qtz vn at 25° to ca with trace fg disseminated sphalerite .
at 1123 to 1123.5', 1/2" qtz vn with trace fg disseminated pyrite at 20° to the ca
-overall sulphide content, trace, pyrite associated with qtz vn and calcite fracture filling.

1124.5' to 1176' Interbedded Siliceous Argillite and Siltstone- rock comprised predominently of gray, very hard, (cherty in places) siliceous argillite to siltstone, thinly bedded (1/2to 1"), very contorted slumped, at average orientation of 20° to ca although highly varyable.
-a few thin light greenish gray slightly coarser,soft, weakly chlorite -sericite-calcite rich siltstone interbeds.
-moderately to strongly fractured at random orientations with calcite, qtz, sericite, chlorite fracture filling and strong sericite and bleached silica alteration halos to 1/4"
-siltstone interbeds contain minor(5 to 10%)disseminated biotite .
-occasional thin magnesite qtz vn at 65 to 75° to ca
-off setting of up to 1/2" of beds along fracture.
-argillite grades into hard siliceous siltstone in places
-spotted alteration in places with white bleached blebs to 1/2", usually proximal to fractures
-at 1127.8', 1/4" hard white magnesite vn at 65° to ca
-at 1124.5 to 1145', predominently (70%) argillite, with 20% hard siltstone and 10% softer sericitized siltstone.

from 1145', becomes predominently hard slightly coarser, granular, vfg, dark green, siltstone with a few argillite interbeds, and a few softer chlorite-sericite altered siltstone zones.
-from 1146 to 1149',softer weakly chlorite-sericite altered siltstone with 1% vfg disseminated pyrrhotite-pyrite
-overall sulphide content, trace, pyrite-pyrrhotite associated with calcite fracture filling and minor vfg disseminated mineralization in places.

HOLE NO. M-8

CASING COLLAR ELEV.: 4' above ground GROUND ELEV.:

COORDINATES: N. E.

INCLINATION: -55° BEARING: N35°W

PROJECT: JIM'S LAKE (ENSION)

DATE STARTED: APRIL 5. 83

DATE FINISHED: APRIL 16. 83

TOTAL DEPTH: 1596'

REF. TO CLAIM CORNER:

SCALE: 1": 10

LOGGED BY: D. McIVOR

COMMENTS: CASED c̄ PLASTIC PIPE TO 225'

- HOLE COLLARED 200' @ S35°E FROM JLE-83-08. & 231' @ 250° FROM L12E, 20+00S (MARATHON GRID)
- DIP TESTS: (CORRECTED) @ 300': 51°. @ 600: 51°. @ 900': 47°. @ 1200': 41°. @ 1350: 39°. @ 1500': 37°

AVE CORE REC'Y / HOLE: 100%

Columns: SECTION | ALTERATION (CHLORITE, SERICITE, SILICIFICATION, CARBONATE) | FRACTURING | MINERAL | GEOLOGY | DESCRIPTIVE GEOLOGY | % SULPHIDES | DRILLING INTERVAL | % CORE RECOVERED | CORE SIZE | SAMPLE INTERVAL | % REC'Y SAMP. INT. | ESTIMATED

Section marks: 180', 190', 200', 210', 220', 230', 240'

DESCRIPTIVE GEOLOGY

0'-222' OVERBURDEN

(Geology column: OVERBURDEN; Core size column: CASING)

- FROM 220'-222'. cored through the following boulders:
- 2" cg gabbro.
- 1" granite
- 1" qtz-bio gneiss
- 1" maf volc.
- 2" siliceous metagraywacke
- 6" qtz-pebble congl. (Lorrain equiv.) c̄ tr. Py ass. c̄ chl. frac fill.
- 4" qtz-bio gn bldr.
- 3" 'basal till' - clay-fg sand matrix c̄ pebbles to 1/2" & 30%, pred. gran., qtz. graywacke, afew small maf. volc.

N.B. - HOLE MADE WATER FROM 214'-222'.

222'-248.5' SILICEOUS META-GRAYWACKE

- pred. vfg-aph. dk gray to brownish gray hard, siliceous, granular matrix, v. wkly sericitized in places (light green).
- wkly foliated, (schistose & bedding). @ av. or. of 60° to the cba, as exhibited by alinement of elongate clasts & pref. or. of diss. bio. (varies 45°-65°)
- matrix c̄ av. of 15% vfg diss bio, in places to 30%
- clast content av. 35-40%, as v. small (1/32-1/16", occ. to 1/4"), sub rounded-subang. white feld, qtz clasts, occ. elongate ∥ fol. & 'tuffaceous appearing', occ. v. ang. - lath shaped & 'porphyry appearing' (i.e. dacite porphyry)
- rock is moderately fractured (every 1-2") √c̄ sets @ 60-70° cba (∥-sub∥ fol.) & 20-30° to the cba. other or. also present.
- fracs, pred. calcite, sericite filled. c̄ strong light green sericite alt halos of up to 1", av. 1/4", v. fuchsite appearing in places - in afew places matrix totally sericitized due to frac. frequency
- afew cherty clasts in places
- afew bio rich seams to 1/32" ∥ fol.
- majority of thin calcite-sericite filled fracs c̄ tr. Py, Cpy along frac. surfaces
- afew qtz filled fracs. usually sugary, recrystallized. matrix sugary in places

CONT.

Alteration (222'-240'): Chlorite: NIL; Sericite: WEAK PATCHY ALT.; Silicification: NIL; Carbonate: FRACTURE FILLING

Mineral column: Po, Py, Py, Cpy, Po, Py

Geology column annotations:
- 15% vfg diss bio
- 35-40% small feld, qtz clasts
- qtz-calc vn
- SILICEOUS METAGRAYWACKE
- wk fol. @ 60° to the c.a.
- fg granular siliceous matrix.
- brecciated by calcite seams
- chert clast

% SULPHIDES: TRACE

DRILLING INTERVAL	% CORE RECOVERED	CORE SIZE	SAMPLE INTERVAL	% REC'Y SAMP. INT.
222'-227'	100%	NQ	222'-227'	100%
227'-236'	100%	BQ	227'-229'	100%
			229'-232'	100%
			232'-234'	100%
236'-240'	100%		234'-240'	100%

HOLE NO. M-6[illegible] | PROJECT: TIM'S LAKE EXTENSION | PAGE NO: 1A OF 24

CASING COLLAR ELEV.: 4' above gr | GROUND ELEV.: | DATE STARTED: APRIL 5-83 | REF. TO CLAIM CORNER:

COORDINATES: N. E. | DATE FINISHED: APRIL 16-83 | SCALE: 1"=10'

INCLINATION: -55° | BEARING: N35°W | TOTAL DEPTH: 1596' | LOGGED BY: D. McIVOR

SECTION	ALTERATION	FRACTURING	MINERAL	GEOLOGY	COMMENTS:	AVE CORE REC'Y / HOLE	% SULPHIDES	DRILLING INTERVAL	% CORE RECOVERED	CORE SIZE	SAMPLE INTERVAL	% REC'Y. SAMP. INT.	ESTIMATED

DESCRIPTIVE GEOLOGY

222'-248.5' CONT.
- from 222'-227', wkly vuggy, with eroded clasts
- @ 222.5'; 1/2" sugary, fg qtz 'bleb' ± tr. Py @ rims.
- from 227'-228.5', ser. alt halos on fracs @ 60°, 25° to the cba affect 25% of rock, ± tr. Py, Po along fracs.
- from 228.5'-229', pervasive light green sericite alt. (v. fsch. appearing) of sil. matrix around 1/4" qtz-calc vn (@ 228.7'), @ 40° cba, pred. qtz, minor calc., ± 0.5% Py as small blebs to 1/8" @ vn rims & frac. fill in vn, sugary-recrystallized, tr. vfg diss Py in host rk around vn.
- from 232.5'-234', matrix totally sericitized, light green, v. intensely micro-fractured, ± calcite frac fill, sfew calc-ser filled macro-fracs @ 30° cba.
- @ 233.7', 2" breccia zone ± calcite seams & filled fracs to 1/4" strongly brecciating sericitized graywacke, sfew diss blebs to 1/32" Cpy, sph, ± calc. seams.
- @ 235', 8" ser. alt. zone ± tr. diss Cpy in sfew calcite filled fracs.
- @ 237', 1/2" white cherty qtz clast? elongate ⊥ to fol.
- from 235'-240', ser. alt. halos on fracs affect 30% of rock.
- @ 240.8', 1/2" fg sugary recryst. qtz vn @ 75° to the cba, tr. calc. @ rims, nvs.
- from 240'-245', ser. alt. halos affect 20% of rock, locally bio rich (to 25%)
- from 245'-248', ser. alt. affects 50% of rock
- OVERALL SULPHIDE CONTENT: trace. Py, v minor Cpy, Po, sph. ass. ± calcite frac fill & associated alt. halos.

248.5'-251' SERICITIZED, SILICEOUS META-GRAYWACKE
- vfg-v. hard, siliceous, bright light green, sericite rich, matrix, ± 40% small (to 1/32") white sub rnd-sub ang. feld. qtz clasts, sfew clasts elongate // wkly dev. foliation @ 55° cba (bd.?-wk sch.?)
- strongly fractured @ pref. or. 20-30° to the cba, ± calc-ser. tr. Py frac fill, & lighter green ser. alt. halos
- clasts also partially ser. alt. in places, ± v. faint clast-matrix contacts.
- appears very 'dacitic' in places (porphyry/felsitic appearing)
- sfew calcite blebs to 1/4" along fracs
- OVERALL SULPHIDE CONTENT: trace Py along sfew fracs
- @ 249.2', 1/8" calc vn @ 60° to the cba, ± tr. vfg diss. Py.

251'-262' META GRAYWACKE
- vfg light brownish gray to light green in places (wkly sericitized), hard, siliceous, granular matrix, ± 20% vfg diss bio throughout rock, wkly foliated (align bio-sch.?-bd.?), v. poorly developed @ 60° to the cba.
- clasts to 30% of rock, pred. v. small (< 1/16"-1/8") white feldspar, qtz, pred. sub rnd.
- sfew fold. clasts v. lath shaped, lending porphyritic appearance to rock.
- clasts occasionally v. elongate // to fol. (@ 60° cba)
- rock is mod. fractured, 4 sets @ 20-30° cba, 60-70° cba, ± calcite & tr. Py-Cpy frac fill, & ser. alt. halos to 3-4", av. 1/4" (v. fsch. appearing in places)
- v. wkly carbonatized in places, pred. around fracs. (vfg diss. calcite).
- occ. green carb. frac. fill (calcite ± vfg diss ser.)
- from 256'-257', bright green sericite alt. halos around calc-ser. Py filled fracs @ 20°-30° cba affect 70% of rock (appears v. 'dacite porphyry' here, ± 30-90% small, sub ang. feld. clasts - in ser. alt. matrix).
- @ 260.8', 1/4" qtz-calc. vn @ 55° cba, sugary, fg, recrystallized, tr vfg diss Cpy, 1/2" ser. alt. halo.
- @ 261', 4" sericite altered zone.
- OVERALL SULPHIDE CONTENT: trace. Py, Cpy ass. ± calcite frac. fill & alt. halos.

262'-269' SERICITIZED, SILICEOUS META-GRAYWACKE.
- vfg-to argillaceous, light green, wkly sericitized, siliceous, granular matrix ± 20-40% small subang.-sub rnd. white feld. qtz clasts, occ. elongate // v. weakly dev. fol. (bd.? sch.?) @ 55° cba
- sfew less alt. zones ± 5-10% vfg diss bio
- sfew softer, more strongly schistose zones (sch. @ 55-60° cba) proximal to qtz veins

CONT.

HOLE NO. M-83-1		PROJECT: JIM'S LAKE EXTENSION	PAGE NO: 2 OF 24
CASING COLLAR ELEV.: 4' above gr.	GROUND ELEV.:	DATE STARTED: APRIL 5.83	REF. TO CLAIM CORNER:
COORDINATES:	N. E.	DATE FINISHED: APRIL 16.83	SCALE: 1"=10'
INCLINATION: -55°	BEARING: N35°W	TOTAL DEPTH: 1596'	LOGGED BY: D. McIVOR

SECTION	Chlorite	Sericite	Silicification	Carbonate	FRACTURING	MINERAL	GEOLOGY	COMMENTS	% SULPHIDES	DRILLING INTERVAL	% CORE RECOVERED	CORE SIZE	SAMPLE INTERVAL	% REC'Y SAMP. INT.	ESTIMATED
240'	NIL	WEAK	NIL	FRAC. FILL		Py		qtz vn; SILICEOUS META-GRAYWACKE	TRACE	240'–246'	100%	BQ	240'–248.5'	100%	
										246'–247'	100%				
250'	NIL	MOD	NIL	FR. FILL		Py		lighter green, sericitized matrix; SERICITIZED, SILICEOUS METAGRAYWACKE	TR.	247'–254'	100%		248.5'–251'	100%	
	NIL	WEAK	NIL	WEAK, PATCHY		Py, Cpy		2% vfg diss bio; 30% small feld. qtz clasts; locally sericitized METAGRAYWACKE; qtz-calcite vn	TRACE	254'–262'	100%		251'–256'	100%	
260'						Py							256'–262'	100%	
	NIL	WK–MOD	NIL	FR. FILL		Py, Cpy		SERICITIZED, SILICEOUS METAGRAYWACKE; qtz-magnesite vning to 50% rock	1%	262'–271'	100%		262'–265'	100%	
													265'–267.5'	100%	
													267.5'–269'	100%	
270'	NIL	WEAK, PATCHY	NIL	FRAC. FILL		Py, Cpy		30% small feld. qtz clasts, wkly align. ∥ bd @ 55°; afew diss fuchsite clasts; SILICEOUS METAGRAYWACKE	TRACE	271'–279'	100%		269'–283'		
280'						Py				279'–284'	100%				
	MINOR FRAC. FILL	WK. PATCHY HALOS ON FR.	NIL	FRACTURE FILL		Py, Cpy		matrix locally strongly sericitized; 'spotted alt' bleached silica & carb. alt. blebs; SILICEOUS METAGRAYWACKE; strong ser. alt. halos on fracs.; qtz-magnesite vn; qtz-calcite seams	TRACE	284'–286'	100%		283'–288'	100%	
290'						Py				286'–290'	100%		288'–294'	100%	
										290'–295'	100%		294'–296'	100%	
										295'–300'	100%		296'–298'	100%	
300'						Py							298'–303'	100%	

DESCRIPTIVE GEOLOGY

262–269' CONT.

- @ 263.7', 1" qtz vn @ 60° cba c minor calc. @ rims. mg. gran., recrystallized, locally v. strong ser. alt. overprints clast-matrix contacts.
- @ 264', 1/4" qtz vn @ 85° to the cba.
- from 265'–267.5', qtz-carb veining to 50% of rock.
  - from 265'–265.4', pred. qtz vning @ 30° to the cba, mg. sugary, c afew light gray calcite seams & blebs, minor bio @ rims, surrounding host rock v. ser. alt. c 5% diss bio & 1% diss sulphides, pred. Po, tr. Py-Cpy-sph. (Cpy & Py as inclusions in Po blebs to 1/4", sph as small blebs @ edges of vn.). ser alt. @ vn rims is v. bright green, may be trace amounts fuchsite.
  - from 265.4'–265.8', 1" qtz-carb vn @ 30° to the cba, highly contorted, pred. cg hard white crystalline, fibrous appearing magnesite 'blades' to 1" intergrown c qtz 'matrix', vn rimmed by bio, ser., & sulphides to 1%. Cpy-Po blebs to 1/8" (Cpy rims Po blebs), tr. Py.
  - from 266'–266.4', qtz-calc vn @ crude or. of 60° to the cba, pred. milky to gray fg-mg sugary recryst. qtz, c lg blebs to 1/2" of hd. white crystalline carb. (calc-magnesite), often blades intergrown c qtz, numerous hard bright light green brecc. frags of host rock, sulphides in vn. & @ rims to 1%, pred. Po, tr. Cpy, Py, as blebs to 1/4" (Po rims Py, Cpy rims Po)
  - from 266.6'–267.3', highly contorted qc vn. @ av. or. 30° cba, pred. gray mg granular qtz c afew calcite seams, blebs, afew ser-chl alt. frags host rock, afew xlline magnesite blebs, tr. Po-Py-Cpy as small blebs @ rims.
- from 267.3'–268', matrix v. bright light green, sericitized, c 60% v. small qtz-feld clasts, vfg diss Po-Py-Cpy to 1%, afew blebs to 1/16", num. thin calcite-sulphide filled fracs. (Cpy rims Po blebs)
- @ 268', 1/2" qc vn @ 30° to the cba, pred. hd. white crystalline magnesite-calcite blades intergrown c qtz, c small diss Po-Cpy & Py blebs to 1/16" & 0.5%.
- from 268.2'–268.5', qtz vn @ 70° to the cba, fg granular, recryst., minor calc. ff, nvs.

OVERALL SULPHIDE CONTENT: 1%, (0.5% Po, 0.35% Py, 0.15% Cpy), min. ass. c qtz-carb vns.

269'–283' SILICEOUS META-GRAYWACKE

- vfg. siliceous granular light gray to green matrix, c 25–30% v. small (1/64"–1/16") sub-rnd pred. feld & qtz clasts, afew cherty clasts, afew elongate clasts ∥ wkly dev. fol. (bd.) @ 55–60° to the cba.
- 10–15% vfg diss bio, @ wk pref. or. (sch?) @ 55–60° to the cba, occ. to 30%
- matrix weakly sericitized in places
- wk-mod fractured @ pref. low angle orientation (20–30° to the cba) & ∥ to subtl fol. @ 50–60° cba, pred. calcite-sericite fracfill & tr. sulphides (Py, Cpy, Po), c distinct ser. alt. halos av 1/4", to 2–3". (v. fuch. appearing in places).
- minor vfg diss Po, Py, Cpy proximal to fracs (non-clastic).
- afew v. small diss. fuchsite clasts to 1/32".
- occ. thin qtz seams-filled fracs.
- @ 269', 1/4" fg sugary qtz vn @ 45° to the cba c ser. alt. @ rims
- @ 269.3', 1/4" qtz-calc vn @ 45°, tr. fg diss Py-Cpy
- @ 270.5', 1/4" shear zone @ 60° to the cba, v. bio rich
- @ 271.5', 1/32" calc-green carb filled frac @ 15° to the cba c 0.5% Py, 1/8" ser. alt. halo.
- from 276'–278', majority of matrix affected by ser. alt., light green, numerous thin calcite filled fracs, appears v. 'dacite porphyry', c ser. alt. overprinting granularity of matrix, occ. qtz filled fracs, afew 1/4" qtz-calc. blebs along fracs.
- from 278'–279', numerous 1/16"–1/8" calc. filled fracs @ 30° to the cba, c occ. scything stringers, afew 1/2" ser alt. halos, tr. Cpy, Py
- from 279'–283', becomes slightly coarser, & feld. qtz clasts av 1/8" (v. porphyry appearing.)

HOLE NO. M-83-1 | PROJECT: TIM'S LAKE EXTENSION | PAGE NO: 3 OF 24

CASING COLLAR ELEV.: 4' above ground | GROUND ELEV.: | DATE STARTED: APRIL 6, 83 | REF. TO CLAIM CORNER:

COORDINATES: N. E. | DATE FINISHED: APRIL 16, 83 | SCALE: 1" = 10'

INCLINATION: -55° | BEARING: N35°W | TOTAL DEPTH: 1596' | LOGGED BY: D. McIVOR

ALTERATION: CHLORITE | SERICITE | SILICIFICATION | CARBONATE | FRACTURING | MINERAL | GEOLOGY

COMMENTS:

AVE CORE REC'Y / HOLE

DESCRIPTIVE GEOLOGY

SECTION	DESCRIPTIVE GEOLOGY	% SULPHIDES	DRILLING INTERVAL	% CORE RECOVERED	CORE SIZE	SAMPLE INTERVAL	% REC'Y SAMP. INT.	ESTIMATED
300'	283'-364' SILICEOUS META-GRAYWACKE rock comprised of a fg.-vfg. dk gray to light green (wkly sericitized in places) hard, siliceous matrix, ± 30% small (to 1/16") sub rounded clasts of white, feld., qtz., wkly aligned @ av. or. 55-60° to the cba (bedding) - clasts in places to 40%. - av. 15% (varies 5-25%) fg diss light brown bio, wkly align. // fol (wk sch.) @ av. or. 55-60° to the cba, varies, 40°-70°. - moderately fractured, ± sets @ pref. or. of 20°-40°, & 60-70° to the cba, pred. calcite frac fill & strong ser alt. halos to 2-3 ax 1/4", tr. vfg Cpy, Py, Po ass. ± calcite frac fill - in places sericite alt. overprints clast-matrix contacts, lending 'porphyry' appearance to rock (i.e. dacite porphyry) - in places elongate clasts // fol. lend tuffaceous appearance to rock. - from 289-283', matrix light green, mod. sericitized, (strong alt halos around fracs), v. fuchsite appearing in places, minor chlorite frac fill locally - from 287-290' afew irreg pinkish brown faint alteration 'blebs' - wkly carb. bearing. - @ 291', 1/16" calcite-sericite filled frac. @ 25° to the cba, ± tr. vfg diss Py & 1/2" bright green sericite alt. halo. - minor movement along some fracs. (to 1/4") - from 293-294.6', num. fracs & ass. ser. alt. halos give matrix perv. ser. alt appearance, v. 'porphyry' appearing, minor diss Py in fracs & ass. alt. halos. - from 294.6-295.5', qtz-carb vn, upper contact @ 85°, lwr contact @ 60°, consists of 50% sugary qtz & 50% fd. white (magnesite) carb as long fibrous intergrowths into qtz. (to 1" long), minor calcite @ rims, nvs. - from 296.5-297', numerous thin (to 1/16") qtz-calc filled fracs @ av. or. 80° to the cba, ± trace fg diss Cpy, Py, & strong (to 1/2") bright light green v. ser rich alt. halos. - from 299-303', v. strongly fractured & thin pred. calc. filled fracs @ av. or. 60° to the cba (ranges 45-90°), ± thin light green ser. alt halos affecting 60% of rock, occ. thin seams of fg recrystallized qtz. v. 'porphyry' appearing ± bio gone, tr. Py along afew fracs. - from 304-306', foliation locally @ 40° - from 306.5-308', matrix locally sericitized, ± num. thin calcite & fg recrystallized qtz filled fracs @ 20-30° to the cba - from 308-312', 60% of matrix is sericitized - @ 312.8', 1/2" pred. qtz ± minor grey calcite vn @ 45° to the cba, ± afew small 1/32" Cpy blebs @ rims vn recuts local frac or. @ 65° cba. - from 314-315', strongly fractured, with cross-cutting sets @ 20-40° to the cba, pred. calc. ser. filled, ± tr. vfg Py & wk perv. ser. alt. of surrounding rock. - @ 317.3', 1" qtz vn @ 60° to the cba ± afew small calcite & bright green ser.-fuch. blebs, nvs - from 318.5-319.5' strongly ser. matrix around 1/4" qtz vn-filled frac @ 30° to the cba @ 319, pred. pink calc. & fg recryst. qtz, tr. vfg diss Py - from 325', gradationally becomes less clast rich, (20-30%) but av. size increases to 1/16" afew clasts to 1/4" numerous bright light green ser (fuch.) clasts, afew blue qtz clasts, well dev. fol. @ 55-60° cba, less fractured, less sericite alt. - @ 333', 1/2" qtz vn @ 55° to the cba, pred. fg recryst. qtz ± afew thin calc seams, afew small bio-ser. blebs, nvs. - OVERALL SULPHIDE CONTENT: trace vfg Py, Po, Cpy as fracture filling ± calc., ser., & v. minor diss num. ass. ± ser. alt. halos around fracs. 364'-383.5' ARKOSIC METAQUARTZITE (± GRAYWACKE INTERBEDS) - rock predominantly fg. grey to light purple to pink, wkly arkosic metaquartzite to siliceous metagraywacke, i.e., pred a feld-qtz matrix ± occasional clast rich zones, where small (1/32-1/16") white sub-rnd to sub-ang feld & qtz clasts to 20% of rock. - v. weakly dev. bedding as indicated by pref. or. of clasts & alignment of bio where present. @ ± av. or. of 55-60° to the cba - wk to mod. fractured, ± sets @ 20-30° & 60-70° to the cba, although other orientations are present, - pred. calc., ser., occ. qtz frac fill, ± thin ser. alt halos - some minor 'green carb' frac fill (calc ± vfg diss ser?) CONT.	TRACE TRACE TRACE TRACE	300' 304' 308' 312' 314' 317' 321' 325' 329' 334' 339' 343' 349' 357' Tr 365'	100% 100% 100% 100% 100% 100% 100% 100% 100% 100% 100% 100%	BQ	From 298' 303' 308' 313' 318' 319' 320' 330' 340' 350' 366'	100% 100% 100% 100% 100% 100%	MINOR AS FRACTURE FILLING ALTERATION HALOS AROUND FRACTURES FRACTURE FILLING

HOLE NO. M-83-1 | PROJECT: JIM'S LAKE EXTENSION | PAGE NO: 4 OF 24

CASING COLLAR ELEV.: 4' above gr. | GROUND ELEV.: | DATE STARTED: APRIL 5. 83 | REF. TO CLAIM CORNER:

COORDINATES: N. E. | DATE FINISHED: APRIL 16. 83 | SCALE: 1" = 10'

INCLINATION: -55° | BEARING: N35°W | TOTAL DEPTH: 1696' | LOGGED BY: D. McIVOR

SECTION: 360' – 420'

ALTERATION (CHLORITE / SERICITE / SILICIFICATION / CARBONATE) | FRACTURING | MINERAL | GEOLOGY | COMMENTS | AVE CORE REC'Y / HOLE

Interval	Chlorite	Sericite	Silicification	Carbonate	Mineral
360'–364'	FR FILL	WK	NIL	FR FILL	Py
364'–383.5'	NIL	HALOS AROUND FRACS	NIL	FRACTURE FILLING	Py
383.5'–392'	ALT. AFEW BDS	ALT. AFEW BDS	NIL	SEAMS TO 15%	Py
392'–418'	NIL	STRONG	NIL	THIN SEAMS TO 15%	Py
418'–420'	WK	WK	NIL	FR. FILL	Py

DESCRIPTIVE GEOLOGY

SILICEOUS METAGRAYWACKE

- qtz-ser-calc vn.
- locally wkly ser. alt.
- locally 10% small qtz & feld clasts - graywacke
- qtz vn

METAQUARTZITE

- magnesite vn
- fg granular sil. qtzite, grades into grwk in places
- qtz-calc vn. ē strong carb. alt. halo

INTERBEDDED ARGILLITES & GRWK

- infold soft black chl. arg. ser arg. hard sil. arg & graywacke.
- 1/2" qtz vn.
- mod. schistosity (ǁ bd) @ 45°
- thin calcite seams to 15% of rock.
- small feld & qtz clasts to 1/16". 30%

SERICITE-CARBONATE 'SCHIST' (ALTERED GRAYWACKE)

- qtz-calcite vn
- qtz vn ē 1% Py

INTERBEDDED ARGILLITES & GRAYWACKE

364'-383.5' CONT.

- numerous 'zones' where matrix is light green. wkly sericitized. v. 'dacite porphyry' appearing in places.
- afew 'carbonatized' zones ē small diss. calcite blebs to 5-10% of rock
- 10-15% vfg diss. bio
- notable loss of bio where rock is sericitized.
- SULPHIDE CONTENT: trace Py as thin 'flakes' along calcite filled fracs.
- @ 366', 1/4" qtz-ser-calcite vn @ 70° to the cba, locally numerous small diss. calc. blebs
- from 366'-367', light green. matrix is weakly sericitized.
- from 368'-369.5', light green. wkly sericitized matrix. v. 'porphyry' appearing ē clasts of qtz, feld to 10%, num. thin calc. stringers & filled fracs, @ 369.8', 1/4" calcite seam @ 80° cba
- @ 371', 1/2" qtz vn @ 60° to the cba. mg. recryst., minor calc. @ rims. afew bright green ser. blebs, nvs.
- from 371'-373.5', light green. wkly sericitized matrix, v. 'dacite porphyry' appearing.
- @ 373.5', 1/2" hard white carb (mag?) vn. @ 65° to the cba, ē afew thin sericite seams, qtz eyes, afew Py blebs to 1/32" along fracs in vn., 6" carbonatized halo around vn.
- from 374'-374.5', numerous 1/4" calcite seams @ 60-70° to the cba.
- @ 377', 1/4" qtz-calcite vn @ 85° to the cba ē 6" carb. alt halo, nvs.
- @ 378.2', 1/4" soft calcite filled frac @ 25° to the cba. ē num. small Py flakes to 1/16".
- from 378.5'-379', num. 1/4" calc-qtz-ser seams @ 60° to the cba. nvs.
- from 379.8'-380', locally v. strongly fractured. wkly sericitized. num. calcite seams
- from 380.5'-381', v. striped appearing. ē thin 1/4" ser alt halos on fracs @ 65° to the cba cutting purple-pink bio rich qtzite
- vfg in places, to a siltstone
- sharp contact ē underlying argillite

383.5'-392' INTERBEDDED ARGILLITES & GRAYWACKE

- v. thinly bd. (from < 1/16" to 1") (bd. v. well developed @ av. or. 45° to the cba, ranges 40-50°). interbedded, pred. dk gray, hard. siliceous arg., softer dk black chloritic argillite & softer light green sericitized argillite, ē afew thicker (to 1") graywacke interbeds (fg. granular. light green. sericitized siliceous matrix ē afew small qtz-feld clasts)
- numerous thin calcite seams to 1/64" & 5% of rock both ǁ & xcutting bedding.
- carb to 15% in afew thin wacke beds
- afew thin bio rich seams
- afew zones ē intense slumping. soft sed. deformation type features.
- unit is mod. fractured, pred. ǁ & sub ǁ bd. ē pred. calcite. minor qtz. sulphide frac fill. - rock wkly brecc. by calc filled fracs in places.
- OVERALL SULPHIDE CONTENT: 0.5%, pred. Po. & sph. Py. as thin blebs ǁ bd. throughout all lithologies. & as frac. fill min., occ. clastic appearing blebs to 1/16" in wacke beds.
- overall comp. ≈ 40% gray-black chl. arg. 20% hd sil. arg. 20% ser. arg. 20% wacke.
- from 383.5'-383.8', argillites v. cherty. gray. ē num. irreg. qtz-calc-magnesite seams to 1/16" ǁ-sub ǁ bd., often strongly contorted.
- from 385'-386', num calcite seams & filled fracs to 10% of rock. wkly brecc. rock in places, ē tr. fg diss Po. afew sph. blebs to 1/8".
- from 386'-388', v. sheared, sericite rich. ē num. randomly oriented qtz-calcite seams wkly brecciating rock. v. strong slickensides along bd/frac. surfaces. 1% vfg diss Py ē qc seams (core v. ground).
- from 389'-390', num. hard cherty beds to 1/2" & 40%.
- from 391'-392', v. sch. sericitized graywacke bed. ē num. small calcite blebs to 1/16" diss. throughout rock

SULPHIDES %	DRILLING INTERVAL	% CORE RECOVERED	CORE SIZE
TR.	From 357'–365'	100%	BQ
TRACE	365'–376'	100%	
	376'–386'	100%	
0.5%	386'–388'	100%	
	388'–391'	100%	
0.25%	391'–401'	100%	
0.25%	401'–411'	100%	
0.25%	411'–420'	100%	

SAMPLE INTERVAL	% REC'Y SAMP. INT.	ESTIMATED
360'–364'	100%	
364'–369'	100%	
369'–373'	100%	
373'–374'	100%	
374'–379'	100%	
379'–383.5'	100%	
383.5'–388'	100%	
388'–392'	100%	
392'–401'	100%	
401'–403'	100%	
403'–407'	100%	
407'–409'	100%	
409'–411'	100%	
411'–417'	100%	
417'–418'	100%	
418'–420'	100%	

HOLE NO. 83-1 | PROJECT: JIM'S LAKE EXTENSION | PAGE NO: 41 OF 84'

CASING COLLAR ELEV.: 4' above ground | GROUND ELEV.: | DATE STARTED: APRIL 5, 83 | REF. TO CLAIM CORNER:

COORDINATES: N. E. | DATE FINISHED: APRIL 16, 83 | SCALE: 1" = 10'

INCLINATION: -55° | BEARING: N35°W | TOTAL DEPTH: 1596' | LOGGED BY: D McEVOR

SECTION	ALTERATION	FRACTURING	MINERAL	GEOLOGY	COMMENTS: / DESCRIPTIVE GEOLOGY	AVE CORE REC'Y / HOLE	% SULPHIDES	DRILLING INTERVAL	% CORE RECOVERED	CORE SIZE	SAMPLE INTERVAL	% REC'Y. SAMP. INT.	ESTIMATED

392'-418' SERICITE-CARBONATE SCHIST (ALTERED VOLCANOCLASTIC? / GRAYWACKE)

- rock comprised of a relatively uniform, light green, v. strongly to sericitized, rel. hard siliceous, strongly schistose (& wkly dev. bedding, fol. @ 45° to the cba) vfg. granular matrix, & numerous (to 30% in places) small white clasts of feld. qtz. (often calc rimmed altered), sub rnd. to 1/16".
- numerous thin calcite stringers // bd/sch. occ. seams to 1/4", calcite to 15% of rock
- afew thin (1/16-1/4") qtz-calcite-Py seams to 1/4" // bd sch.
- softer, v. sheared appearing in places.
- mod. fractured (to strong in places) & sch @ 20-30° & 40-50°, & soft white calcite ± Py-qtz-ser. frac fill, Py often oxidized.
- @ 393.8', 1/2" qtz (fg. recryst)-calcite vn @ 55°, minor golden brown disc bio @ rims & diss. locally in host rock.
- from 401-403' v. strongly fractured @ 45° to the cba, sheared appearing, & calcite frac fill to 1/4", soft, & Py flakes, cubes to 1/16", often black, oxidized.
- @ 404', 1/4" qc vn @ 45°, qtz core & bd white carb (mag) rims, tr. vfg diss Py.
- from 407'-409', qtz-carb vning to 25% of rock, pred. fg suggry, recryst. qtz & sands & blebs to 1" @ variable orientations from 30-60° to the cba, & minor white calcite - Py frac fill, & thn seams @ rims to 0.5%, occ. brown bio seams @ rims, strong sericite alt. @ rims.
- from 409-411', v. intensely fractured, sheared, fracs every 1/4" @ pref. or. of 45° & 0° to the cba, & calcite infillings to 50% of rock, & 0.5% Py-oxidized Py flakes.
- from 411-418', gradationally less sch, less clast rich, less carb rich.
- @ 417.7', 3" qtz-carb vn @ 70° to the cba, pred by suggry recryst. qtz & afew thin seams, blebs of gray calcite, & afew thin stringers bd white mag, nvs.
- OVERALL SULPHIDE CONTENT: 0.25%, pred. by ass & calcite fracture filling.

HOLE NO. M[redacted]-1 PROJECT: JIM'S [redacted]E EXTENSION PAGE NO: 5 OF 24

CASING COLLAR ELEV.: 4' above ground GROUND ELEV.: DATE STARTED: APRIL 5, 83 REF. TO CLAIM CORNER:

COORDINATES: N. E. DATE FINISHED: APRIL 16, 83 SCALE: 1" = 10'

INCLINATION: -55° BEARING: N35°W TOTAL DEPTH: 1596' LOGGED BY: D. McIVOR

COMMENTS: SEE ATTACHED TYPED 'DESCRIPTIVE GEOLOGY' NOTES.

AVE CORE REC'Y / HOLE

DESCRIPTIVE GEOLOGY

SECTION	ALTERATION: CHLORITE	ALTERATION: SERICITE	ALTERATION: SILICIFICATION	ALTERATION: CARBONATE	FRACTURING	MINERAL	GEOLOGY	DESCRIPTIVE GEOLOGY	% SULPHIDES	DRILLING INTERVAL	% CORE RECOVERED	CORE SIZE	SAMPLE INTERVAL	% REC'Y. SAMP. INT.	ESTIMATED
420'										420'		BQ	420'		
	AFEW ALT. ARG. BEDS	AFEW ALT. ARG. BEDS	NIL	FRACTURE FILLING		Py		well developed bd @ 30-40° thinly bd. interbedded black wkly chlorite arg., soft green sericitic arg & gray sil. arg & abdw thin graywacke interbeds.	0.25%		100%			100%	
						Py				426.5'			426'		
430'								INTERBEDDED ARGILLITES & GRAYWACKE		429'	100%			100%	
						Py				431'	100%		431'		
						Py		from 431' graywacke interbeds to 60%, locally sulphides to 1%			100%				
						Py			1%	435'					
						Py		numerous thin graywacke beds v. carbonatized.						100%	
						Py							438'		
440'	WEAK	WEAK	HALOS	WEAK		Py		abdw thin siliceous arg. interbeds							
						Py		CONGLOMERATIC GRAYWACKE							
						Py		abdw large (to 8") gray chl-calcite rich arg. clasts.	0.26%		100%			100%	
						Py		small white feld & qtz clasts to 40% in fg. granular wkly ser. alt. sil. matrix.					443'		
	ALTERED BDS.	ALT. ABDW BDS	NIL	FRAC. FILL		Py		bio rich siltstone & graded clast bearing graywacke 'zones'							
						Py		siltstone-graywacke & boud/brecc. cherty siliceous argillite beds.	TRACE	445'			445'	100%	
						Py		INTERBEDDED GRAYWACKE & ARGILLITE					448'	100%	
450'						Py							450'	100%	
	MINOR FRAC. FILL	WEAK, PATCHY	ALT. HALOS ON FRACS	FRACTURE FILLING		Py		schistose wkly chloritic siltstone-graywacke							
						Py		prod. chert poor (15%), small white feld & qtz clasts in a fg granular siliceous matrix.			100%				
						Py				455'				100%	
						Py		abdw larger, lithic clasts of ser. arg. 'OFF'							
						Py		locally clasts to 50%			100%				
460'						Py				459'			459'		
						Py		CONGLOMERATIC METAGRAYWACKE							
						Py									
						Py					100%			100%	
						Py									
						Py		thin cherty siliceous argillite interbeds.		467'					
						Py							468.5'		
470'	MINOR FRAC. FILL	MODERATE	HALOS ON FRACS	WEAK, PATCHY		Py		av. 25-30% small qtz. feld clasts in light green mod. sericitized hard siliceous matrix (v 'dacite porphyry' appearing)			100%		471'	100%	
						Py				473'					
						Py		qtz vn	0.5%		100%			100%	
						Py		SERICITIZED, SILICEOUS META-GRAYWACKE					477'		
						Py		qtz vn		478'					
						Py		qtz vns		479'	100%		478.5' to 483'	100%	
480'															

HOLE NO. M[illegible]3-1		PROJECT: JIM'S [illegible]E EXTENSION	PAGE NO: 6 OF 24'
CASING COLLAR ELEV.: 4' above gr.	GROUND ELEV.:	DATE STARTED: APRIL 5.83	REF. TO CLAIM CORNER:
COORDINATES:	N. E.	DATE FINISHED: APRIL 16.83	SCALE: 1" = 10'
INCLINATION: -55°	BEARING: N35°W	TOTAL DEPTH: 1596'	LOGGED BY: D. McIVOR

SECTION	ALTERATION: CHLORITE	SERICITE	SILICIFICATION	CARBONATE	% SULPHIDES
480'–490'	MINOR FRAC FILL	MODERATE	HALOS ON FRACS	WEAK, PATCHY	0.5%
490'–494'	WEAK	WEAK	HALOS	FR. FILL	TRACE
494'–498'	NIL	WEAK	NIL	FR. FILL TO 20%	TR.
498'–508'	WEAK, A FEW BDS	WEAK, A FEW BDS	HALOS ON FRAGS	FRAC. FILL	0.5%
508'–512'	WK	MOD	WK	FR. FILL	TR.
512'–515'	WK	WK	HAS	FR. FILL	TR.
515'–519'	FR. FILL	WK	HAS	FR. FILL	TR.
519'–537'	MINOR FRAC FILL	A WEAK ↓ MOD	A FEW HALOS ON FRACS.	FRACTURE FILLING	TRACE
537'–540'	STRONG	STRONG	NIL	STRONG	0.25%

COMMENTS:

AVE CORE REC'Y / HOLE

DESCRIPTIVE GEOLOGY

- thin siliceous arg intbeds c 1% diss Po-Py

SERICITIZED, SILICEOUS METAGRAYWACKE

- graywacke txt overprinted by ser. & silica halos around fractures.
- interbedded black wkly chloritic argillite & graywacke

INTERBEDDED ARGILLITES & METAGRAYWACKE

- talc-calcite seams to 1/4" ∥ bd @ 45°
- graded bedding, coarsening downhole.

INTENSELY FRACTURED, CARBONATE RICH METAGRAYWACKE

- pred. gray siliceous argillite, c afew chl. arg interbeds, strong ssd features
- talc-calcite vn. filled frac.
- becomes gray sil. arg c afew thin graywacke interbeds, locally minor sph. frac fill

INTERBEDDED ARGILLITES & METAGRAYWACKE

- rock locally weakly brecciated by thin qtz-calcite seams c 1% vfg diss Po.
- thinly bd interbd gray sil. arg, black chloritic arg & graywacke.

ALTERED METAGRAYWACKE

- shear zone @ 80°, strong ser-carb, minor chl alt., strongly schistose
- thickly bd. cherty arg & softer chl-ser rich argillite matrix c num. 8" graywacke 'clasts'.

POLYMICT PARACONGLOMERATE

- thinly bd @ 40°; minor diss bio.

CHERTY SILICEOUS ARGILLITE

- bd. as exhibited by orient of big. clasts. @ 45°
- few thin cherty argillite interbeds
- siliceous argillite interbed

SILICEOUS METAGRAYWACKE

- qtz vn
- becomes increasing sericitized; becomes wkly sch. @ 70°; clasts to 1/2" qtz. feld, lithic arg. 'QFP'; locally calcite seams to 20%
- strongly sch. chl-ser-carb alt. rock, sch. @ 70°
- 30-40% small chloritized mafic frags/clasts

CHLORITE-CARBONATE-SERICITE SCHIST

- numerous calcite seams cut rock

DRILLING INTERVAL (FROM 479')	% CORE RECOVERED	CORE SIZE
489'	100%	BQ
492'	100%	
501'	100%	
507'	100%	
509'	100%	
519'	100%	
529'	100%	
540'	100%	

SAMPLE INTERVAL (FROM 479.5')	% REC'Y SAMP. INT	ESTIMATED
483'	100%	
484'	100%	
486'	100%	
489.5'	100%	
494.5'	100%	
498'	100%	
500'	100%	
504'	100%	
507'	100%	
511'	100%	
514'		
517.5'	100%	
531'		
535'	100%	
To 541'	100%	

HOLE NO. [illegible]83-1		PROJECT: JI[illegible] LAKE EXTENSION	PAGE NO: 7 OF 24
CASING COLLAR ELEV.: 4' above gr.	GROUND ELEV.:	DATE STARTED: APRIL 5. 83	REF. TO CLAIM CORNER:
COORDINATES:	N. E.	DATE FINISHED: APRIL 16. 83	SCALE: 1" = 10'
INCLINATION: -55°	BEARING: N35°W	TOTAL DEPTH: 1596'	LOGGED BY: D. McIVOR

COMMENTS:

AVE CORE REC'Y / HOLE

SECTION	ALTERATION: CHLORITE	SERICITE	SILICIFICATION	CARBONATE	FRACTURING	MINERAL	DESCRIPTIVE GEOLOGY	% SULPHIDES	DRILLING INTERVAL	% CORE RECOVERED	CORE SIZE	SAMPLE INTERVAL	% REC'Y SAMP. INT.	ESTIMATED
540'	STRONG	STRONG	NIL	STRONG		Py	CHLORITE-CARBONATE-SERICITE 'SCHIST'	0.25%	540'		BQ	FROM 535 – 541'	100%	
												541' – 546'	100%	
	V. MINOR	MODERATE	SPOTTED ALT.	FRAC. FILL		Py	- qtz vn - cherty arg. bed - 5% small qtz. feld clasts CONGLOMERATIC METAGRAYWACKE - a few larger lithic clasts of sericite rich arg. - spotted alt. c bleached-silicified blebs to 1/8"	0.25%	550'	100%		546' – 554'	100%	
550'														
	MIN.	MOD.	NIL	FR. FILL		Py	CONGLOMERATIC METAGRAYWACKE - large clasts (slumped fragments) of cherty siliceous argillite	TR.		100%		554' – 556.5'	100%	
560'	NIL	WEAK	SPOTTED ALT	FRAC FILL		Py	- cherty sil. arg. bd. @ 35° - siltstone-graywacke - cherty sil. arg. - siltst.-grwke INTERBEDDED SILTSTONE-GRAYWACKE & CHERTY SILICEOUS ARGILLITE - cherty siliceous argillite.	TRACE	560' 563'			556.5' – 562' 562' – 564'	100% 100%	
570' 580'	MINOR FRAC. FILL	PATCHY, WEAK	PATCHES & HALOS ON FRACS	FRACTURE FILLING		Py	- thinly bd. well dev. bd. @ 40° - 10-20% vfg diss bio - graywacke 'trough' - grades into a clast poor graywacke by 576'. SILTSTONE-GRAYWACKE - spotted alt blebs of silica, occ. ± carb.	TRACE TO 0.25%	574' 584'	100%		564' – 576' 576' – 586'	100%	
590'	NIL	WEAK, PATCHY	SPOTTED ALT BLEBS	FRACTURE FILL		Py	- poorly dev. bd. @ 50° - bleached, siliceous alteration blebs affect 30% of rock - qtz-carb vn ALTERED SILTSTONE-GRAYWACKE - chl-ser shear zone c 1% vfg diss Py - 10% small feld-qtz clasts from 594 - graywacke	TRACE	594'	100% 100%		586' – 596' 596' – 599'	100% 100%	
600'	NIL	WK	WK	F.F.		Py	GRAYWACKE	TR	To 605'					

HOLE NO. [redacted]3-1
CASING COLLAR ELEV.: 4' above ground GROUND ELEV.:
COORDINATES: N. E.
INCLINATION: -55° BEARING: N35°W

PROJECT: JIM [redacted]AKE EXTENSION
DATE STARTED: APRIL 5. 83
DATE FINISHED: APRIL 16. 83
TOTAL DEPTH: 1596'

REF. TO CLAIM CORNER:
SCALE: 1" = 10'
LOGGED BY: D. McIVOR

COMMENTS:

AVE CORE REC'Y / HOLE

DESCRIPTIVE GEOLOGY

SECTION	CHLORITE	SERICITE	SILICIFICATION	CARBONATE	MINERAL	DESCRIPTIVE GEOLOGY	% SULPHIDES
600'–618'	NIL	PATCHY, WEAK TO MOD.	SPOTTED ALT. HALOS ON FRACS	FRACTURE FILLING	Py, Po	vfg siltstone type matrix c 10% vfg diss bio. bd ≅ 50° - spotted alteration. bio rich · bleached blebs - 20% small feld. qtz clasts SILICEOUS GRAYWACKE - qtz vn - a few larger 2" chloritized arg. clasts	TRACE
618'–622'	WK	WK	WK	FR. FILL	Py	INTERBEDDED ARGILLITES & SILTSTONE-GRAYWACKE	TR
622'–625.5'	WK	NIL	WK	FR FILL	Py	CHLORITIZED 'GRAYWACKE'	TR.
625.5'–637'	WK ALT. A FEW BEDS	MINOR	ALT. A FEW BEDS	FR. FILL	Po, Py	black soft chloritic argillite, bd @ 30-35° gray siliceous argillite qtz vn c minor Po INTERBEDDED ARGILLITES & GRAYWACKE - thinly bd, interbedded black arg & chloritized graywacke	2%, 0.25%, TRACE
637'–642.5'	NIL	WEAK	HALOS	FR. FILL	Py	- frag' appearing Po-Cpy blebs to 1" c qtz. calcite - thin argillite interbeds GRAYWACKE	TRACE
642.5'–660'	WEAK ALT. A FEW BEDS	WEAK ALT. A FEW BEDS	SPOTTED ALT. & HALOS ON FR.	FRACTURE FILLING	Po, Cpy	- biotite rich siltstone-graywacke - cherty siliceous argillite - chloritic argillite interbed c 5% Po interbedded siltstone - argillites, bd @ 40° - qtz vn INTERBEDDED ARGILLITES & SILTSTONE & GRAYWACKE INTERBEDS - 'spotted alteration' silicified blebs to 1/2" & 30% locally - argillite to siltstone c a few thin graywacke interbeds (gradational contacts)	TRACE

DRILLING INTERVAL	% CORE RECOVERED	CORE SIZE
From 594'–605'	100%	BQ
605'–616'	100%	
616'–621'	100%	
621'–631'	100%	
631'–642'	100%	
642'–648'	100%	
648'–659'	100%	

SAMPLE INTERVAL	% REC'Y SAMP. INT.	ESTIMATED
606'–609'	100%	
609'–612'	100%	
618'–622'	100%	
622'–625.5'	100%	
625.5'–629'	100%	
629'–632'	100%	
632'–637'	100%	
637'–638'	100%	
642.5'–644'	100%	
644'–645.5'	100%	
645.5'–647'	100%	
647'–652'	100%	
652'–653'	100%	
653'–658'	100%	
658' To 663'	100%	

HOLE NO. 83-1 | PROJECT: TI... LAKE EXTENSION | PAGE NO: 9 OF 24'

CASING COLLAR ELEV.: 4' above ground | GROUND ELEV.: | DATE STARTED: APRIL 5. 83 | REF. TO CLAIM CORNER:

COORDINATES: N. E. | DATE FINISHED: APRIL 16. 83 | SCALE: 1" = 10'

INCLINATION: -55° | BEARING: N35°W | TOTAL DEPTH: 1596' | LOGGED BY: D. McIVOR

COMMENTS:

AVE CORE REC'Y / HOLE

DESCRIPTIVE GEOLOGY

SECTION	ALTERATION: CHLORITE	ALTERATION: SERICITE	ALTERATION: SILICIFICATION	ALTERATION: CARBONATE	FRACTURING	MINERAL	GEOLOGY	DESCRIPTIVE GEOLOGY	% SULPHIDES	DRILLING INTERVAL	% CORE RECOVERED	CORE SIZE	SAMPLE INTERVAL	% REC'Y. SAMP. INT.	ESTIMATED
660'	WEAK ALT. A FEW BEDS	WEAK ALT. A FEW BEDS	SPOTTED ALT. HALOS	FRACTURE FILLING		Py		- gray wacke interbed locally cherty siliceous argillite to 70%. very contorted.	TRACE	659'		BQ	658' 663	100%	
						Py		- graywacke interbed. INTERBEDDED ARGILLITES & SILTSTONE-GRAYWACKE INTERBEDS			100%		667.5	100%	
670'						Py		- qtz-calcite vn - silicified 'spotted alt.' blebs to 2" - softer, wkly chloritic argillite.	TRACE	669'				100%	
								- 25% vfg diss py exhibits bd. @ 80°			100%		676'		
	FRAC. FILL	FRAC FILL	SPOTTED ALT.	FRAC FILL				- graywacke - 2" siliceous arg. interbed SILTSTONE-GRAYWACKE	TRACE	678'					
680'						Py		- predominantly vfg granular siltstone ± 5% small feld & qtz clasts. graywacke. clasts to 30%			100%		684'		
	NIL	NIL	NIL	FR FILL		Py		- siliceous arg. to siltstone SILICEOUS SILTSTONE-ARGILLITE	TR.				687'	100%	
	FR FILL	FR. FILL	SPOT. ALT.	FR. FILL		Py		- spotted alteration - silicified patches to 30% rock. ALTERED SILTSTONE	TRACE	688'				100%	
690'								- grades into graywacke					692'		
	FR FILL	FR. FILL	NIL	FR. FILL		Py		GRAYWACKE graded, coarsens downhole	TR.		100%				
	MINOR AS FRAC. FILL	WEAK ALT. A FEW BEDS	ALT. HALOS AROUND FRAC.	FRACTURE FILLING				- thinly bd., interbedded black siliceous argillite & slightly coarser siltstone. bd. @ 45°. ± 20% vfg diss py. - graywacke 'rough'	TRACE	697'					
700'						Po		- thinly bd gray sil. arg & siltstone thin bedded graywacke interbed INTERBEDDED ARGILLITES & SILTSTONE-GRAYWACKE			100%		705'		
						Po		- contorted cherty siliceous argillite		706'			707'	100%	
710'								- becomes softer, wkly chl-ser alt. argillite-siltstone			100%		710'	100%	
								- 1" semi-massive Po-Cpy 'clast' frag. & inclusions of qtz. carbonate.					713'		
								- ½" Po-Cpy-calcite clast fragment		716'			715'	100%	
720'								- interbedded gray-black siliceous siltstone-argillite & thin chl-ser altered siltstone interbeds	TRACE	TD 726'	100%				

HOLE NO. [redacted]83-1 | PROJECT: JIM'S [redacted] EXTENSION | PAGE NO: 10 OF 24

CASING COLLAR ELEV.: 4' above gr | GROUND ELEV.: | DATE STARTED: APRIL 5, 83 | REF. TO CLAIM CORNER:

COORDINATES: | N. | E. | DATE FINISHED: APRIL 16, 83 | SCALE: 1" = 10'

INCLINATION: -55° | BEARING: N35°W | TOTAL DEPTH: 1596' | LOGGED BY: D McIVOR

ALTERATION: CHLORITE | SERICITE | SILICIFICATION | CARBONATE | FRACTURING | MINERAL | GEOLOGY

COMMENTS: | AVE CORE REC'Y / HOLE

DESCRIPTIVE GEOLOGY

SECTION	DESCRIPTIVE GEOLOGY	% SULPHIDES	DRILLING INTERVAL (Fract./ft.)	% CORE RECOVERED	CORE SIZE	SAMPLE INTERVAL	% REC'Y. SAMP. INT.	ESTIMATED
720'	- thinly bd interbedded (@ 40°) wkly chl-ser alt dk gray arg., & slightly coarser siltstone (60%), & thin graywacke interbeds (40%)	TRACE	726'	100%	BQ			
	from 725': becomes pred. lithic wacke & 20% thin siltstone - argillite interbeds							
	INTERBEDDED ARGILLITES & SILTSTONE - GRAYWACKE							
730'	soft chloritic & cherty argillite clasts to 2": 5%			100%		733'		
						735'	100%	
			736'			736.5'		
	- abv large (to 1") black argillite clasts					738'	100%	
	- spotted alteration - silicified patches overprint graywacke bd.							
740'	- abv large (to 1") sericitized argillite clasts.					740'	100%	
	- numerous thin qtz-calcite stringers			100%		743'	100%	
	- bd locally well dev. @ 35°							
	- matrix locally mod sericitized. v 'dacite porphyry' appearing.					745'	100%	
	- qtz magnesite vn.							
	- qtz vns							
	- cherty argillite interbed.		746'			747'	100%	
	- qtz vns							
750'	- qtz vn			100%		752'		
	- locally v. clast poor & 20% vfg diss bio					753'	100%	
	GRAYWACKE		756'					
760'	- matrix locally strongly sericitized			100%				
			766'					
770'	- qtz vn			100%		771'		
						773'	100%	
	- qtz vn		776'					
780'			T 786'	100%				

ALTERATION: MINOR AS FRAC. FILL — MINOR AS FRACTURE FILLING — WEAK ALT. AREN BEDS — WEAK TO MODERATE — ALT HALOS AROUND FRACS — WEAK, PATCHY, SPOTTED ALTERATION — FRACTURE FILLING

HOLE NO. M[redacted]-1 | PROJECT: JIM'S LAKE EXTENSION | PAGE NO: 11 OF 24

CASING COLLAR ELEV.: 4' above gr | GROUND ELEV.: | DATE STARTED: APRIL 5, 83 | REF. TO CLAIM CORNER:

COORDINATES: N. E. | DATE FINISHED: APRIL 16, 83 | SCALE: 1" = 10'

INCLINATION: -55° | BEARING: N35°W | TOTAL DEPTH: 1596' | LOGGED BY: D. McIVOR

SECTION	ALTERATION: CHLORITE	ALTERATION: SERICITE	ALTERATION: SILICIFICATION	ALTERATION: CARBONATE	FRACTURING	MINERAL	GEOLOGY	COMMENTS: / DESCRIPTIVE GEOLOGY	AVE CORE REC'Y / HOLE	% SULPHIDES	DRILLING INTERVAL FROM TO	% CORE RECOVERED	CORE SIZE	SAMPLE INTERVAL	% REC'Y. SAMP. INT.	ESTIMATED
780'	MINOR AS FRAC FILL	WEAK TO MOD ↓	WEAK, PATCHY ↓	FRACTURE FILL ↓		Po, Py		graded bd. coarsening downhole spotted alt. - silica patches		TRACE	786'	100%	Ba	785'		
								GRAYWACKE occasional v. clast rich 'troughs'						790'	100%	
790'								siliceous argillite interbed				100%		793.5'	100%	
	MINOR FRAC FILL	MODERATE ↓	ALT. BLEBS ↓	FRAC. FILL ↓		Py		coarse clast rich graywacke thinly bd cherty arg. (40%) & siltstone (60%) ± clast thin graywacke interbeds		TRACE	795'					
						Po		INTERBEDDED ALTERED SILTSTONE - GRAYWACKE & CHERTY SILICEOUS ARGILLITE magnesite vn						800'	100%	
800'												100%				
								locally v fg diss bio to 20% fg granular sericitized metased (altered siltstone - graywacke)						804'	100%	
	MINOR FR FILL	WEAK TO MOD. ↓	SPOTTED ALT ↓	FRAC. FILL ↓		Py		calc-bio filled frac ± strong cherty alt. halo ± diss. Py bleached - silicified alteration patches			806'			807'		
						Py		SERICITIZED SILICEOUS METASEDIMENT						809'	100%	
810'												100%				
						Py		cherty argillite interbed						814'		
											816'			817'	100%	
	NIL ↓	WEAK ↓	SPOTTED ALT.	DISS. TO 10% & FR FILL		Po		cherty silica alt. blebs			819'	100%		819'	100%	
820'								cherty siliceous arg. to 60%. bd @ 45°								
						Py		INTERBEDDED SERICITIZED SILICEOUS METASEDIMENT & CHERTY SILICEOUS ARGILLITE strong ssd.		0.25%				823'	100%	
						Py						100%		824'	100%	
														829.5'	100%	
	NIL ↓	WEAK ↓	SPOT. ALT.	DIS TO 10% & F.F.		Py		spotted alteration - silicified bleached patches small feld & qz clasts varg 5-25%. in granular fg 'gteite' matrix		TRACE	829'				100%	
830'						Po		ALTERED METAGRAYWACKE cherty argillite interbedded.						831'		
														832'	100%	
								cherty arg interbed				100%		835'	100%	
	FR FILL	MOD	SPALT.	FR. FILL		Py, Po		ALTERED SILICEOUS METAGRAYWACKE		TR.	837'			To 841'	100%	
840'																

HOLE NO. [redacted]3-1
CASING COLLAR ELEV.: 4' above gr GROUND ELEV.:
COORDINATES: N. E.
INCLINATION: -55° BEARING: N35°W

PROJECT: [redacted] LAKE EXTENSION
DATE STARTED: APRIL 5, 83
DATE FINISHED: APRIL 16, 83
TOTAL DEPTH: 1596'

PAGE NO: 12 OF 24
REF. TO CLAIM CORNER:
SCALE: 1" = 10'
LOGGED BY: D. McIVOR

SECTION	ALTERATION: CHLORITE	ALTERATION: SERICITE	ALTERATION: SILICIFICATION	ALTERATION: CARBONATE	% SULPHIDES
840'–893'	MINOR AS FRACTURE FILLING	MODERATE PERVASIVE ALTERATION	SPOTTED ALTERATION BLEBS PATCHES	FRACTURE FILLING & DISS. BLEBS TO 5%	TRACE
893'–900'	NIL	WEAK	ALT. HALO	FR FILL	TRACE

DESCRIPTIVE GEOLOGY

- 840' – cherty siliceous arg. interbed
- qz stringers wkly brecc rock
- silicified patches or clasts?
- locally 10% vfg diss Py
- 850' – qtz-calcite vn ẽ sericite-carb. alt. halo
- locally strongly silicified (halos around intensely fractured zone)

ALTERED SILICEOUS METAGRAYWACKE

- 860' – cherty siliceous arg. interbeds
- wkly sch. locally @ 50°
- thin pink cherty bands
- locally carbonatized, soft, sheared appearing
- 870' – qtz-calc-bio vn @ 25° ẽ
- calcite rich arg bed ẽ 1% vfg diss Po.
- light green chert interbed.
- clast poor (6%) locally
- 880' – silica alteration patches
- arg-siltstone interbed.
- slumped argillite fragments
- 893' – siltstone matrix ẽ 30% small feld. & qtz clasts.

GRAYWACKE

Mineral: Py, Po

DRILLING INTERVAL	% CORE RECOVERED	CORE SIZE
From 831' – 849'	100%	BQ
849' – 851'	100%	BQ
851' – 862'	100%	BQ
862' – 872'	100%	BQ
872' – 882'	100%	BQ
882' – 893'	100%	BQ
893' – To 902'	100%	BQ

SAMPLE INTERVAL	% REC'Y SAMP. INT.
From 835' – 841'	100%
841' – 842'	100%
842' – 847'	100%
847' – 851'	100%
851' – 852'	100%
852' – 859'	100%
859' – 862'	100%
862' – 866'	100%
866' – 868.5'	100%
868.5' – 870'	100%
870' – 872.5'	100%
872.5' – 878'	100%
878' – 884.5'	100%
884.5' – 887'	100%
887' – 893'	100%

AVE CORE REC'Y / HOLE:
ESTIMATED:
COMMENTS:

HOLE NO. M-83-1 PROJECT: JIMS LAKE EXTENSION PAGE NO: 13 OF 24

CASING COLLAR ELEV.: 4' above ground GROUND ELEV.: DATE STARTED: APRIL 6. 83 REF. TO CLAIM CORNER:

COORDINATES: N. E. DATE FINISHED: APRIL 16. 83 SCALE: 1" = 10'

INCLINATION: -55° BEARING: N35°W TOTAL DEPTH: 1596' LOGGED BY: D. McIVOR

COMMENTS:

AVE CORE REC'Y / HOLE

SECTION	CHLORITE	SERICITE	SILICIFICATION	CARBONATE	FRACTURING	MINERAL	GEOLOGY / DESCRIPTIVE GEOLOGY	% SULPHIDES	DRILLING INTERVAL	% CORE RECOVERED	CORE SIZE	SAMPLE INTERVAL	% REC'Y SAMP. INT.	ESTIMATED
900'	WK. ALT. INT-BEDS	WEAK	HALOS	FR. FILL		Py	- slow siltstone - arg interbeds. occ c small scattered garnets. GRAYWACKE	TR.	FROM 893' 902'	100%	BQ	902' – 904.5'	100%	
	WK	WK	NIL	STR.		Py Po	strong sch @ 55°. CARBONATIZED. SHEARED. SCHISTOSE METASEDIMENT	0.5%				904.5' – 908'	100%	
910'	NIL	WEAK TO MOD.	ALT. BLEBS	FRAC. FILL		Po Py	20% small white feld - qtz clasts in vfg granular siliceous matrix. locally strongly sch. carb-ser-chl alt. silicified bands - blebs. ALTERED METAGRAYWACKE. bio filled frac	TRACE				908' – 914'	100%	
												914' – 920'	100%	
920'	WK	WK	NIL	STR		Py Po	soft. thinly bd. chl-ser-carb alt. siltstone. SILTSTONE. - grades into graywacke.	TRACE				920' – 925'	100%	
	WK	WK	NIL	FR FILL		Py	qtz-chl vn. INTERBEDDED GRAYWACKE & SILICEOUS ARGILLITE	TR.				925' – 929'		
930'	NIL	ALT. HALOS	ALT. HALOS	FRAC. FILL		Py Po Py	bd. @ 35°. thinly bd gray-green-black cherty arg to siltstone. - highly contorted bd. brecciated appearing. SILICEOUS (CHERTY) ARGILLITE TO SILTSTONE	TRACE				929' – 932'	100%	
												932' – 934'	100%	
												934' – 940.5'	100%	
940'	NIL	NIL	NIL	FR FILL		Po Py	GRAYWACKE	TRACE				940.5' – 947'		
950'	WK	WK	NIL	FR FILL		Py	thinly bd @ 40°. INTERBEDDED ARGILLITE - SILTSTONE - GRAYWACKE	TRACE				947' – 953'	100%	
	WK	WK	NIL	F.F.		Py	METAGRAYWACKE	TR				953' – 954.5'		
960'	NIL	WK	NIL	FR FILL		Py	thinly bd interbedded hard black argillite & slightly coarser siltstone. graywacke 'clasts'. INTERBEDDED ARGILLITE - SILTSTONE. - semi-massive Po band	1%	956' To 966'	100%	BQ	954.5' – 960'	100%	

HOLE NO. M-83-1 | PROJECT: JIM'S LAKE EXTENSION | PAGE NO: 14 OF 24

CASING COLLAR ELEV.: 4' above gr. | GROUND ELEV.: | DATE STARTED: APRIL 5.83 | REF. TO CLAIM CORNER:

COORDINATES: N. E. | DATE FINISHED: APRIL 16.83 | SCALE: 1" = 10'

INCLINATION: -55° | BEARING: N35°W | TOTAL DEPTH: 1596' | LOGGED BY: D. McIVOR

COMMENTS:

AVE CORE REC'Y / HOLE

DESCRIPTIVE GEOLOGY

SECTION	Chlorite	Sericite	Silicification	Carbonate	Mineral	Descriptive Geology	% Sulphides
960'	NIL	WEAK	NIL	FR FILL	Po, Py	INTERBEDDED ARGILLITE - SILTSTONE	1%
	THIN SEAMS	WEAK	NIL	FR. FILL & SMS	Po, Py	calcite - chlorite seams; 30% small feld. qtz clasts. METAGRAYWACKE; fol. @ 65°; qtz vn	TRACE
970'	FRAC. FILL	WEAK	NIL	FRAC. FILL	Po, Py, Po	thinly bd (@ 45°) interbedded soft gray to black siltstone (60%), hard black cherty arg. (15%) & graywacke (25%). INTERBEDDED ARGILLITE - SILTSTONE - GRAYWACKE; qtz vn.	TRACE
980'	WEAK	WEAK	HALOS	FR FILL	Py, Po	interbedded (highly contorted, slumped) (@ [illegible] or. 65°) cherty arg & softer gray-green wkly chl-ser alt. siltstone. INTERBEDDED ARGILLITES - SILTSTONE	TRACE
	WK	WK	HALOS	SEAMS	Py	locally intensely brecciated by qtz. calcite-magnesite seams. BRECCIATED INTERBEDDED ARGILLITES & GRAYWACKE	1%
990'	MINOR FR FILL	WEAK, A FEW BDS	ALT. HALOS	A FEW BEDS & FR. FILL	Po	thinly bd (@ 60°) interbedded green siliceous argillite - & softer, gray, silty coarser siltstone, a few graywacke interbeds. INTERBEDDED ARGILLITES - SILTSTONE - GRAYWACKE; acicular calcite blebs; wkly brecciated by calcite-qtz seams.	TRACE
1000'	WK	WK	HALO	FR. FILL		GRAYWACKE	NVS
	WK. ALT. A FEW BDS	WK. ALT. A FEW BDS	HALOS, BOT. ALT.	FRAC. FILL	Po, Py	thinly bd., interbedded light green soft, schistose (// bd @ 50°) wkly chl-ser. alt. siltstone, gray-black cherty argillite & graywacke; gray cherty arg.; graywacke. INTERBD. ARG - SLTST - GRWK; interbedded siltstone - arg	TRACE
1010'						qtz - magnesite vn.; qtz - calcite vn	
	FR FILL	WEAK	PATCHES	FR FILL	Po, Py	SERICITIZED, SILICEOUS METAGRAYWACKE; 30% small qtz & feld clasts	TRACE
1020'	A FEW BEDS	A FEW BEDS	PATCHY	FR FILL	Py	highly contorted bio rich siltstone. BIOTITE RICH SILTSTONE - GRAYWACKE; graywacke - siltstone matrix & 30% small qtz-feld clasts.	TR.

Drilling Interval	% Core Recovered	Core Size
From 966' - 968'	100%	BQ
968' - 975'	100%	BQ
975' - 985'	100%	BQ
985' - 995'	100%	BQ
995' - 1002'	100%	BQ
1002' - 1012'	100%	BQ
1012' - To 1023'		BQ

Sample Interval	% Rec'y Samp. Int.	Estimated
960' - 964.5'	100%	
964.5' - 970'		
970' - 974'	100%	
974' - 975'	100%	
975' - 979'	100%	
979' - 985'	100%	
985' - 986'	100%	
986' - 987'	100%	
987' - 990'	100%	
990' - 995'	100%	
995' - 999'	100%	
999' - 1001'		
1001' - 1007'	100%	
1007' - 1010'	100%	
1010' - 1011'	100%	

HOLE NO. M-[illegible]-1

CASING COLLAR ELEV.: 4' above gr. GROUND ELEV.:

COORDINATES: N. E.

INCLINATION: -55° BEARING: N35°W

PROJECT: JIMS LAKE EXTENSION

DATE STARTED: APRIL 5.83

DATE FINISHED: APRIL 16.83

TOTAL DEPTH: 1596'

REF. TO CLAIM CORNER:

SCALE: 1" = 10'

LOGGED BY: D McIVOR

COMMENTS:

AVE CORE REC'Y / HOLE

SECTION	ALTERATION: CHLORITE	SERICITE	SILICIFICATION	CARBONATE	FRACTURING	MINERAL	GEOLOGY	DESCRIPTIVE GEOLOGY	% SULPHIDES	DRILLING INTERVAL	% CORE RECOVERED	CORE SIZE	SAMPLE INTERVAL	% REC'Y SAMP. INT.	ESTIMATED
1020'	WK	WK	WK	FR FILL		Py		BIO RICH SILTSTONE - GRAYWACKE	TR.	FROM 1012' – 1025'	100%	BQ	1022.5'		
	NIL	WEAK, BANDS	SPOTTED ALT	FR FILL & DISS TO 10%		Py		- poorly dev. bd. @ 50° - bands of silicified spotted alt. SILTSTONE - spherical to elongate silica alt. blebs comprise 10% of rock	TRACE		100%		1030.5'	100%	
1030'	MINOR	WEAK	NIL	BLEBS TO 10%		Py		- thin chl-carb shear zone SERICITIZED SILICEOUS GRAYWACKE - wkly dev. bd. @ 40° as exhibited by align. of clasts. - qtz vn	TRACE	1033'			1036'	100%	
1040'	NIL	MODERATE	SPOTTED ALT.	PATCHY, FR. FILL		Py, Po		- highly contorted siliceous siltstone c̄ a few thin argillite & graywacke interbeds. - becomes soft, schistose (@ 40°) sericitized & wkly carbonatized siltstone - graywacke. ALTERED, INTERBEDDED SILTSTONE - GRAYWACKE - siliceous siltstone c̄ spotted alt.	TRACE	1043'	100%		1040', 1045', 1049'	100%, 100%, 100%	
1050'	NIL	HALO	NIL	FR. FILL				GRAYWACKE 10% small feld-qtz clasts.	NVS		100%		1051'		
1060' / 1070'	WEAK ALT. OF ARG BEDS	WEAK ALT. OF A FEW BEDS	ALT. HALOS AROUND FRACS.	WK ALT. A FEW BEDS & FR. FILL		Po, Py, Po		shear zone, strong chl-carb alteration c̄ 2% vfg diss Po. tr. Cpy - chert interbeds INTERBEDDED CHERTY SILICEOUS ARGILLITE & SILTSTONE thinly bedded interbedded cherty arg & siliceous siltstone & softer wkly chl-ser (± carb) alt. siltstone - graywacke - bd. highly variable, av 45-60° to the c.a. pred. siliceous siltstone, bd. @ 45°.	TRACE	1054', 1064', 1075'	100%, 100%, 100%		1055.5', 1057', 1062', 1067', 1071', 1074.5'	100%, 100%, 100%, 100%, 100%, 100%	
1080'	WEAK	WEAK	HALOS	MOD		Py		INTERBEDDED SILTSTONE & ALTERED (CHL., SER., CARB) METASED pred. soft (chl-ser-carb) alt. metased (siltstone)	TRACE	To 1085'	100%		1078', To 1082'	100%, 100%	

HOLE NO. M... -1 | PROJECT: JIM'S LAKE EXTENSION | PAGE NO: 16 OF 24

CASING COLLAR ELEV.: 4' above gr. | GROUND ELEV.: | DATE STARTED: APRIL 5 · 83 | REF. TO CLAIM CORNER:

COORDINATES: N. E. | DATE FINISHED: APRIL 16 · 83 | SCALE: 1" = 10'

INCLINATION: -55° | BEARING: N35°W | TOTAL DEPTH: 1596' | LOGGED BY: D. McIVOR

COMMENTS:

AVE CORE REC'Y / HOLE

SECTION	CHLORITE	SERICITE	SILICIFICATION	CARBONATE	FRACTURING	MINERAL	DESCRIPTIVE GEOLOGY	% SULPHIDES	DRILLING INTERVAL	% CORE RECOVERED	CORE SIZE	SAMPLE INTERVAL	% REC'Y SAMP. INT.	ESTIMATED
1080'	WEAK	WEAK	HALOS	MOD.		Py	- chl-ser-carb alt. metased - siltstone INTERBEDDED SILTSTONE & ALTERED (CHL-SER-CARB) METASED - graywacke interbed	TRACE	From 1078' – 1085'	100%	BQ	From 1078' – 1082' – 1086'	100% 100%	
	NIL	MOD.	NIL	FR. FILL		Po	GRAYWACKE	TR				1089'	100%	
1090'	NIL	V. WEAK, PATCHY	HALOS ON FRACS	FR. FILL & AFEW DISS BLEBS		Po, Py	- graywacke interbeds poorly developed bd. @ 50° SILTSTONE & GRAYWACKE INTERBEDS	TRACE TO 0.25%	1095'	100%				
1100'	MOD.	WEAK	NIL	STRONG		Po, Py	- qtz-calcite-talc vn wkly sch. sheared, @ 70-90° to the c.a., composed of ≈ 50% bio (often alt. to chl.), 30% calcite, minor qtz, ser -wkly xlline appearing. may be intrusive → lamprophyre. BIOTITE-CHLORITE-CALCITE 'SCHIST'	3%	1106'	100%		1100' – 1106'	100%	
1110'	AFEW CLOTS	MODERATE	SPOTTED ALT.	FRAC FILL		Py	- qtz vn 30% small qtz-fsld clasts in vfg siliceous matrix. spotted alt. blebs. SERICITIZED, SILICEOUS METAGRAYWACKE - cherty argillite interbeds	TRACE	1116'	100%		1114.5'		
1120'	NIL	WEAK	HALOS ON FRACS	FRAC FILL		Py, Po	- cherty arg - qtz-calcite vns INTERBEDDED CHERTY SILICEOUS ARGILLITE & SILTSTONE - graywacke interbed - thinly bd. interbedded siltstone (60%) & cherty argillite (35%)	TRACE	1126'	100%		1120' 1125.5'	100% 100%	
1130'	NIL	WEAK	NIL	FRACTURE FILL		Po, Py	- num small qtz vns - cherty arg interbeds - qtz vn & strong ser. alt @ rims GRAYWACKE - qtz vn - qtz vn	TRACE	1136' To 1146'	100% 100%	↓	1128' 1130' 1133'	100% 100%	
1140'														

HOLE NO. M-85-1 | PROJECT: JIM'S LAKE EXTENSION | PAGE NO: 17 OF 24

CASING COLLAR ELEV.: 4' above gr. | GROUND ELEV.: | DATE STARTED: APRIL 5. 83 | REF. TO CLAIM CORNER:

COORDINATES: | N. | E. | DATE FINISHED: APRIL 16. 83 | SCALE: 1" = 10'

INCLINATION: −55° | BEARING: N85°W | TOTAL DEPTH: 1596' | LOGGED BY: D. McIVOR

SECTION	ALTERATION: CHLORITE	ALTERATION: SERICITE	ALTERATION: SILICIFICATION	ALTERATION: CARBONATE	FRACTURING	MINERAL	GEOLOGY	COMMENTS: / DESCRIPTIVE GEOLOGY	AVE CORE REC'Y / HOLE	% SULPHIDES	DRILLING INTERVAL	% CORE RECOVERED	CORE SIZE	SAMPLE INTERVAL	% REC'Y. SAMP. INT.	ESTIMATED
1140'	NIL	WEAK	NIL	FR FILL		Py		grn GRAYWACKE		TRACE	From 1134'	100%	BQ	1141.5'		
	ALT. AREN BEDS	ALT. AREN BEDS	HALOS ON FRAC	ALT. AREN BEDS		Py		thinly bd. (@ 65° or 15°) interbedded cherty arg & softer, silty coarser wkly chl-ser-carb rich-alt. schistose siltstone		TR.	1146'			1146'	100%	
						Py		INTERBEDDED SILTSTONE & CHERTY SILICEOUS ARGILLITE						1148'	100%	
1150'						Py				1%		100%		1152.5'	100%	
	NIL	F.F.	NIL	F.F.				GRAYWACKE		NVS						
	NIL	WK	HALO	F.F.		Py		ARG-SLTST		TR.	1156'					
	NIL	WK	NIL	F.F.		Py		GRAYWACKE		TR.				1160.5'		
1160'	FRAC FILL	HALOS ON FR.	SPOTTED ALT.	FRAC FILL		Py, Cpy		grn-chl-carb vn - also thin graywacke 'zones' SILTSTONE		TRACE		100%		1161'	100%	
						Py		'spotted alt' silicification blebs			1166'			1162'	100%	
															100%	
														1168'		
1170'	INIL	MODERATE	INIL	FRAC. FILL				chloritized zone ± aciculer bio? clasts		TRACE		100%				
								grn GRAYWACKE								
						Py		50-60% small grn & feld clasts in wkly siliceous matrix			1176'					
								clasts to 90%						1180'		
1180'	WEAK ALT. AREN BEDS	WEAK ALT. A FEW BEDS	INIL	PATCHY WEAK ALT. A FEW BEDS				prod. light gray cherty arg				100%			100%	
								siltstone						1186'		
								soft wkly sch. arg-siltstone			1186'					
						Py		graywacke 'clasts' to 2"						1190'	100%	
1190'						Py		INTERBEDDED ALTERED ARGILLITES & SILTSTONE & GRAYWACKE		TRACE TO 0.25%		100%		1194'	100%	
								soft wkly chl-ser alt. mod. sch siltstone to arg. & numerous thin wacke beds			1196'				100%	
											To 1206'	100%		1199'		
1200'																

HOLE NO. [redacted]83-1 | PROJECT: JIM'S LAKE EXTENSION | PAGE NO: 18 OF 24

CASING COLLAR ELEV.: 4' above gr. | GROUND ELEV.: | DATE STARTED: APRIL 5. 83 | REF. TO CLAIM CORNER:

COORDINATES: N. E. | DATE FINISHED: APRIL 16. 83 | SCALE: 1" = 10'

INCLINATION: -55° | BEARING: N35°W | TOTAL DEPTH: 1596' | LOGGED BY: D. McIVOR

SECTION	ALTERATION: CHLORITE	ALTERATION: SERICITE	ALTERATION: SILICIFICATION	ALTERATION: CARBONATE	FRACTURING	MINERAL	GEOLOGY	DESCRIPTIVE GEOLOGY	% SULPHIDES	DRILLING INTERVAL	% CORE RECOVERED	CORE SIZE	SAMPLE INTERVAL	% REC'Y. SAMP. INT.	ESTIMATED
1200'	WEAK ALT. OF AFEW BEDS	WEAK ALT. OF AFEW BEDS	NIL	WEAK ALT. OF AFEW BEDS		Py		soft. green to gray, mod. sch. siltstone - arg.	TRACE To 0.25%	1196'		BQ	From 1199'		
								graywacke, ± 80% small qtz & feld clasts.		1206'	100%		1204'	100%	
								siltstone - graywacke interbed.					1209'	100%	
1210'						Py		soft. schistose (⊥ to bd @ 30°) strongly sericitized arg to slst.					1210'	100%	
								INTERBEDDED ALTERED ARGILLITES & SILTSTONE & GRAYWACKE							
								graywacke, ± 60-70% small feld & qtz clasts		1216'	100%		1214'	100%	
													1217'	100%	
1220'						Py		becomes hard bio rich siliceous siltstone ± numerous thin cherty argillite, soft ser rich arg - siltstone and graywacke interbeds.			100%		1222'	100%	
										1226'			1227'	100%	
1230'											100%		1232'	100%	
	NIL	HALOSI	HALOSI	FR FILL & ALT. BEDS	/	Py		bio rich beds exhibit bd @ 40° to the ca							
						Py		alter dk gray v. calcite rich beds							
								qc vn							
					/	Py		SILTSTONE calcite rich beds to 40% rock	0.25%	1236'			1236'		
					/	Py		cherty arg interbed					1239'	100%	
1240'	NOD	STR	NIL	STR	/	Py		thinly bd (@ 40°) interbedded dk gray, wkly chloritic, v. carb rich sch., sheared arg & soft. green, sheared sericitized argillite.	TR.		100%		1240'		
					/	Py		INTERBEDDED ALTERED ARGILLITES					1241.5'	100%	
	WEAK	V. WEAK	NIL	FRAC FILL	/	Py		hard, siliceous bio rich siltstone	TRACE	1246'					
					/	Py		SILTSTONE occasional wkly chloritic beds			100%		1251.5'		
	NIL	WEAK	HALOSON FR.	FR FILL & WEAK	/	Py		clast free, sheared, chl-calc-ser rich zone	TRACE					100%	
					/	Py		GRAYWACKE fuchsite clast matrix becomes wkly carbonatized		1256'	100%		1256'		
1260'										To 1261			To 1261'	100%	

HOLE NO. 83-1 | PROJECT: TIM'S LAKE EXTENSION | PAGE NO: 19 OF 24

CASING COLLAR ELEV.: 4' above gr. | GROUND ELEV.: | DATE STARTED: APRIL 5, 83 | REF. TO CLAIM CORNER:

COORDINATES: N. E. | DATE FINISHED: APRIL 16, 83 | SCALE: 1" = 10'

INCLINATION: -55° | BEARING: N35°W | TOTAL DEPTH: 1596' | LOGGED BY: D. McIVOR

COMMENTS:

AVE CORE REC'Y / HOLE

DESCRIPTIVE GEOLOGY

SECTION	ALTERATION: CHLORITE	ALTERATION: SERICITE	ALTERATION: SILICIFICATION	ALTERATION: CARBONATE	FRACTURING	MINERAL	GEOLOGY	DESCRIPTIVE GEOLOGY	% SULPHIDES	DRILLING INTERVAL (FROM 1256')	% CORE RECOVERED	CORE SIZE	SAMPLE INTERVAL (FROM 1256')	% REC'Y SAMP. INT.	ESTIMATED
1260'	NIL	WK	NIL	VR	f	Py									
	WEAK	MOD TO STRONG	PATCHY, WEAK	MOD TO STRONG	fc	Py		soft, sheared, intensely carbonatized, sericitized siltstone	TR			BQ	1261'	100%	
								qtz-calcite vn	3%				1263'	100%	
						Py		soft, carbonatized, sericitized, sheared siltstone	0.5%		100%		1264'	100%	
									2%	1266'			1266.5'	100%	
						Py		ALTERED SILTSTONE - GRAYWACKE							
						Py		graywacke, carbonatized, sericitized matrix c 10% small qtz & feld clasts	2%				1268'	100%	
1270'								sheared, carb-ser alt. siltstone	0.5%				1270'	100%	
								qtz-cak-bio vn							
						Py		harder, more siliceous siltstone	TR		100%		1273'	100%	
	PATCHY, WEAK	PATCHY, MOD.	HALOS ON FRACS	PATCHY, WEAK		Py		thinly bd., interbedded cherty siliceous arg. & softer, sericitized siltstone							
						Py		vfg, granular, siliceous, wkly sericitized siltstone	TRACE	1276'			1278'	100%	
								INTERBEDDED ARGILLITES - SILTSTONE							
1280'						Py		interbedded cherty arg & sericitized siltstone.			100%		1282'	100%	
						Py		clt carb-ser alt. sch. sheared siltstone							
						Py		thinly bd interbedded cherty argillite & siltstone					1286.5'	100%	
										1286'					
								graywacke clast							
	NIL	WEAK	NIL	FRAC FILL				small qtz & feld clasts to 40% in vfg hard siliceous matrix.	TRACE						
1290'								cherty arg interbed			100%				
								GRAYWACKE							
						Py		siltstone interbed.		1296'					
													1302'		
1300'	WEAK, PATCHY	WEAK, PATCHY	HALOS ON FRACS	FRAC FILL				bedding @ 50° as exhibited by bio rich beds & graded beds coarsening to a graywacke	TRACE		100%		1304'	100%	
								qtz-magnesite vn							
								qtz vn							
						Py		SILTSTONE - GRAYWACKE		1306'					
						Py		'spotted alt.' silica patches affects 40% of rock locally					1309'		
1310'													1311'	100%	
								graywacke			100%				
	WEAK, PATCHY	WEAK, PATCHY	HALOS ON FRAC	FRAC FILL		Py		pred. siltstone & thin graywacke & arg interbeds.	TRACE				1313'		
						Py		INTERBEDDED GRAYWACKE - SILTSTONE - ARGILLITE		1316'					
														100%	
1320'								graywacke		To 1326'	100%		1319'		

HOLE NO.	M-83-1	PROJECT:	JIM'S LAKE EXTENSION	PAGE NO:	20 OF 24
CASING COLLAR ELEV.:	4' above gr. GROUND ELEV.:	DATE STARTED:	APRIL 5, 83	REF. TO CLAIM CORNER:	
COORDINATES:	N. E	DATE FINISHED:	APRIL 16, 83	SCALE:	1" = 10'
INCLINATION:	-55° BEARING: N35°W	TOTAL DEPTH:	1596'	LOGGED BY:	D. McIVOR

COMMENTS:

AVE CORE REC'Y / HOLE

DESCRIPTIVE GEOLOGY

Section	Chlorite	Sericite	Silicification	Carbonate	Mineral	% Sulphides
1320'–1356'	WEAK, PATCHY ALTERATION	WEAK, PATCHY ALTERATION	HALOS AROUND A FEW FRACTURES	FRACTURE FILLING	Py	TRACE
1356'–1366'	WEAK, PATCHY	WEAK, PATCHY	SPOTTED ALT.	FRAC FILL	Py	TRACE
1366'–1379'	PATCHY, WEAK	PATCHY, WK TO MOD	STRONG HALOS & SPOTS	FRAC FILL & BLEBS	Py	TRACE
1380'	NIL	WK	NIL	F.F	Py	TR

1320' – graywacke c 50% small qtz & feld clasts
– qtz vn
– siliceous argillite
– siltstone, soft, wkly chl-ser alt.
1330' – graywacke, c 30% small feld & qtz clasts.

INTERBEDDED GRAYWACKE - SILTSTONE - ARGILLITE

– interbedded siltstone & siliceous argillite.
– graywacke
1340' – bio rich siliceous siltstone
– qtz-calcite vn
1350' – prpd graywacke.
– qtz vn
– magnesite vn.
– bio rich beds exhibit bd @ 20 or 40°
– cherty arg interbeds
1360' – locally softer, wkly chl-ser alt.

SILTSTONE (c ARGILLITE INTERBEDS)

– num. thin argillite interbeds.
– strongly sch. chl-ser-carb alt. siltstone
– qtz vn
– cherty argillite interbed
– siliceous siltstone
1370' – sericitized, hard siliceous light green siltstone

ALTERED SILTSTONE - GRAYWACKE

– graywacke
– siltstone, spotted silica alt. affects 80% of rock
– carb vn
1380' SILTSTONE

Drilling Interval	% Core Recovered	Core Size
From 1316' – 1326'	100%	BQ
1326' – 1336'	100%	BQ
1336' – 1346'	100%	BQ
1346' – 1356'	100%	BQ
1356' – 1366'	100%	BQ
1366' – 1376'	100%	BQ
1376' to 1386'	100%	BQ

Sample Interval	% Rec'y Samp. Int.	Estimated
1326' – 1329'	100%	
1335' – 1337.5'	100%	
1339' – 1346'	100%	
1350' – 1353'	100%	
1355' – 1360'	100%	
1360' – 1366'	100%	
1366' – 1370'	100%	
1370' – 1374'	100%	
1374' – 1378'	100%	
1378' – 1379'	100%	
1379'	100%	

HOLE NO. M-83-1 | PROJECT: JIM'S LAKE EXTENSION | PAGE NO: 21 OF 24

CASING COLLAR ELEV.: 4' above gr. | GROUND ELEV.: | DATE STARTED: APRIL 5. 83 | REF. TO CLAIM CORNER:

COORDINATES: N. E. | DATE FINISHED: APRIL 6. 83 | SCALE: 1": 10'

INCLINATION: -55° | BEARING: N35°W | TOTAL DEPTH: 1596' | LOGGED BY: D McIvor

SECTION	ALTERATION: CHLORITE	ALTERATION: SERICITE	ALTERATION: SILICIFICATION	ALTERATION: CARBONATE	FRACTURING	MINERAL	GEOLOGY	COMMENTS: / DESCRIPTIVE GEOLOGY	AVE CORE REC'Y / HOLE	% SULPHIDES	DRILLING INTERVAL	% CORE RECOVERED	CORE SIZE	SAMPLE INTERVAL	% REC'Y SAMP. INT.	ESTIMATED
1380'	NIL	NIL	NIL	FR. FILL	//	Py		SILTSTONE (± GRAYWACKE INTERBEDS)		TR.	FROM 13%'		BQ	1382		
	NIL	HALOS-I	SR. HALOS	FRAC FILL		Py Po		strong ser & silica halos on fracs. affect most of rk. INTERBEDDED, ALT. SILTSTONE & SILICEOUS ARGILLITE		TRACE	1384'	100%		1386	100%	
1390'	NIL PATCHY	HALOS-I	SR. ALT.	FRAC. FILL	/ \	Py		chl rich bed SILTSTONE		TRACE	1394'	100%		1397	100%	
1400'	V. WEAK, PATCHY ALTERATION	WEAK TO MODERATE ALTERATION OF BEDS	MINOR SPOTTED ALTERATION	STRONG ALTERATION OF SEVERAL BEDS		Py Po		locally cherty argillite beds to 60% wkly alt. (carb-ser.) siltstone. bd. v. contorted, av. 60° thin cherty arg interbed. black cherty argillite interbed wkly sch. sheared, mod. ser-carb alt. siltstone-arg. bd/sch locally @ 40° afew lithic arg. clasts to 1"		TRACE	1406'	100%		1406	100%	
1410'						Po				0.25%	1411'	100%		1410'	100%	
						Py		thinly bd interbedded soft gray to black wkly carb^{a} arg & soft gray ser-carb alt. siltstone. INTERBEDDED, ALTERED SILTSTONE & ARGILLITE (CARBONATIZED)		TR	1416'	100%		1414'	100%	
1420'						Py Po		strongly sch. intensely carbonatized. sericitized arg. to siltstone ± 1% Po as vfg diss mm & blebs // bd @ 30°		1%				1417'	100%	
						Po		carbonatized. soft. sch. dark grayish green siltstone to argillite. bd @ 35-40°		TRACE To 0.25%	1426'	100%		1420-5	100%	
1430'						Py Po					1436'	100%		1430'	100%	
1440'											To 1446'	100%		1435'	100%	

HOLE NO. M-83-1 | CASING COLLAR ELEV.: 4' above gr. | GROUND ELEV.: | COORDINATES: N. E. | INCLINATION: -55° | BEARING: N35°W

PROJECT: JIM'S LAKE EXTENSION | DATE STARTED: APRIL 5, 83 | DATE FINISHED: APRIL 16, 83 | TOTAL DEPTH: 1596'

REF. TO CLAIM CORNER: | SCALE: 1" = 10' | LOGGED BY: D. MAYOR

COMMENTS:

AVE CORE REC'Y / HOLE

DESCRIPTIVE GEOLOGY

SECTION	CHLORITE	SERICITE	SILICIFICATION	CARBONATE	MINERAL	DESCRIPTIVE GEOLOGY
1440'	WEAK, PATCHY	WEAK TO MOD	MINOR SPOTTEDLY	STRONG	Po, Py	- soft dark grayish green strongly carbonatized arg to siltstone
						INTERBEDDED, ALTERED SILTSTONE & ARGILLITE (CARBONATIZED)
						- thin siliceous argillite interbeds to 30% of rock
1450'					Po, Py	
	WEAK, PATCHY / STR	WEAK, PATCHY	NIL	STRONG PATCHY	Po	- thinly bd. interbedded gray-black cherty siliceous argillite (40%) & soft, wkly chl-ser-carb alt. siltstone (60%)
						- calcite vn
1460'					Po, Py	- calcite-qtz stringers.
						INTERBEDDED ARGILLITE & ALTERED SILTSTONE
					Po	} becomes strongly sch (@ 40°), chloritized
1470'	NIL	FRAC FILL	NIL	FRAC FILL	Po	- bd. dark gray, bio rich siliceous siltstone
						SILTSTONE
					Py	- cherty argillite interbeds to 30% of rock.
						- qtz-magnesite vn
1480'	OCC. ALTERED BED	WEAK, PATCHY	NIL	FRACTURE FILLING	Py, Po	- qtz-magnesite vn
						- soft, strongly sericitized siltstone bed @ 30°.
						- qtz-dol-mag vein
					Py	- qtz-mag-calc vn.
						- qtz-mag vn
						SILTSTONE - GRAYWACKE
					Py, Po	- soft, chloritized bed c 1% vfg Py-Po
1490'						- qtz-mag-calc-ser vn
						- qtz vn
1500'					Py	- grades into a graywacke

% SULPHIDES	DRILLING INTERVAL (FROM 1436')	% CORE RECOVERED	CORE SIZE
TRACE TO 0.25%	to 1446'	100%	BQ
	to 1456'	100%	
0.5%	to 1466'	100%	
TRACE	to 1476'	100%	
TRACE	to 1486'	100%	
	to 1496'	100%	
	TO 1506'	100%	

SAMPLE INTERVAL	% REC'Y SAMP. INT	ESTIMATED
1440'–1445'	100%	
1445'–1450'	100%	
1450'–1454'	100%	
1454'–1459'	100%	
1459'–1465'	100%	
1465'–1468'	100%	
1468'–1478'	100%	
1478'–1479'	100%	
1481'–1483'	100%	
1483'–1485'	100%	
1485'–1490'	100%	
1490'–1496'	100%	
1496'–1497'	100%	
1499'–1500.5'	100%	

HOLE NO. M-83-1 | PROJECT: M-83-1 | PAGE NO: 23 OF 24

CASING COLLAR ELEV.: 4' above gr. | GROUND ELEV.: | DATE STARTED: APRIL 5 · 83 | REF. TO CLAIM CORNER:

COORDINATES: N. E. | DATE FINISHED: APRIL 16 · 83 | SCALE: 1" = 10'

INCLINATION: -55° | BEARING: N35°W | TOTAL DEPTH: 1596' | LOGGED BY: D. McIVOR

SECTION	ALTERATION: CHLORITE	ALTERATION: SERICITE	ALTERATION: SILICIFICATION	ALTERATION: CARBONATE	FRACTURING	MINERAL	GEOLOGY	COMMENTS: / DESCRIPTIVE GEOLOGY	AVE CORE REC'Y / HOLE	% SULPHIDES	DRILLING INTERVAL FROM 1496'	% CORE RECOVERED	CORE SIZE	SAMPLE INTERVAL	% REC'Y SAMP. INT.	ESTIMATED
1500'	NIL	WEAK TO MODERATE ALTERATION OF MATRIX	ALTERATION HALOS AROUND A FEW FRACTURES	FRACTURE FILLING	/	Pb		thin argillite interbed calcite vn light green wk-mod sericitized siliceous matrix ± 40% small qtz, feld clasts, ± alter larger clasts of ser-chl alt. arg/volc. QFP.				100%	80	1500.5'	100%	
						Py		diss. calcite blebs to 1/4" & 15% qtz-magnesite vn sil. arg clast			1504'			1504' 1507'	100%	
1510'					\	Py		contorted calcite vn		0.25%		100%		1510'		
											1512'				100%	
								qtz-calc vns			1516'			1517'		
1520'					/			qtz vn							100%	
						Pb		locally lithic clasts of ser. arg & chl. arg to 1/2" & 40% GRAYWACKE - LITHIC WACKE				100%		1521'		
					\						1526'					
						Pb										
1530'	NIL				/	Py		weak foliation @ 60° exhibited by align. of clasts & bio in matrix		0.25%		100%		1530'	100%	
											1534'			1536'		
1540'					/	Pb						100%				
											1546'			1546'		
					/	Py									100%	
1550'	NIL					Pb		1/4" Pb clast		0.25%		100%		1551'		
					/	Py					1556'			1556'		
1560'					/						TD 1566'	100%		1561'	100%	

HOLE NO. M-[illegible]-1
CASING COLLAR ELEV.: 4' above gr. GROUND ELEV.:
COORDINATES: N. E.
INCLINATION: -55° BEARING: N35°W

PROJECT: JIM'S LAKE EXTENSION
DATE STARTED: APRIL 5. 83
DATE FINISHED: APRIL 16. 83
TOTAL DEPTH: 1596'

REF. TO CLAIM CORNER:
SCALE: 1" = 10'
LOGGED BY: D. McIVOR

COMMENTS:

AVE CORE REC'Y / HOLE

SECTION	CHLORITE	SERICITE	SILICIFICATION	CARBONATE	FRACTURING	MINERAL	DESCRIPTIVE GEOLOGY	% SULPHIDES	DRILLING INTERVAL (FROM 1556')	% CORE RECOVERED	CORE SIZE	SAMPLE INTERVAL (FROM 1556')	% REC'Y SAMP. INT.	ESTIMATED
1560'	NIL	WEAK	HALOS	FRAC FILL		Po, Py	GRAYWACKE - LITHIC WACKE	0.25%	1566'	100%	BQ	1561'	100%	
1570'	WEAK PATCHY ALT. A FEW BEDS	WEAK PATCHY ALT. A FEW BEDS	HALOS AROUND A FEW FRACS	FRACTURE FILLING			pred. siltstone c̄ num. thin graywacke interbeds. bd. highly contorted. av. or. @ 35°. graywacke c̄ 80% small fld & qtz clasts. pred. hard siliceous siltstone. c̄ a few softer wkly chl-ser alt interbeds. a few thin graywacke interbeds			100%		1573'		
							gray cherty argillite interbed	TRACE	1576'			1575'	100%	
							qtz-magnesite seams							
1580'						Po, Po	INTERBEDDED ARGILLITE - SILTSTONE - GRAYWACKE. thinly bd. interbedded cherty argillite (40%) & siliceous siltstone (60%). qtz-mag vn			100%		1580'	100%	
						Py	coarse clast rich graywacke bed		1586'			1587.5'	100%	
1590'							thinly bd. cherty argillite			100%		1590'	100%	
						Py	siltstone					1593.5'	100%	
1596'									1596'		↓	1596'	100%	

257 SAMPLES SPLIT FOR ASSAY

D. McIvor
JUNE 10. 83

DDH M - 83 - 1

Descriptive Geology Notes

continued from handwritten notes; picked up at 418'

418' to 438' Interbedded Argillites and Graywacke- very well developed bedding and associated weak schistosity in places at an average orientation of 35° to ca (varies 30 to 40°)
-rock consists predominently of very thinly bedded argillites, predominently hard black weakly chloritic argillite, minor gray hard siliceous-cherty argillite, and softer light green to gray sericitized to chloritized argillite, and thin alternating interbeds.
-numerous thin calcite seams parallel to bedding and very minor disseminated elongate calcite blebs parallel to bedding, to 10% of rock.
-moderately fractured at orientations both parallel to and cross cutting bedding, with calcite and minor sulphides (Po, tr Py) fracture filling.
-a few thin cross cutting qtz calcite and calcite vn-seams throughout unit.
-some slumping, soft sediment deformation features, very contorted, crenulated in places (possible ripple marks) some boudinaged interbeds.
-sulphides to 0.25% (Po,Py)as very thin blebs along bedding planes and fracture filling,
-a few silicified appearing beds and blebs
-calcite blebs appear to be fragments in places, very thin, elongate to parallel to bedding, and occasionally with disseminated sulphides.
-a few thin argillite interbeds are very calcite rich (to 40%)
-numerous thin (less than 1/8") graywacke interbeds, with a light green to black argillaceous matrix and small

qtz feldspar clast to 5 to 10%
-from 418.5 to 419', numerous thin(1/4") very hard white to gray siliceous argillite beds.
-at 418.9', 1/2" qtz vn cross cuts bedding at 60° to ca with minor calcite, and pyrite to 1% as fracture filling in vn
-at 418.8', a few 1/4" fragmental appearing calcite-pyrrhotite blebs and thin black argillite bed.
-from 424 to 424.5', light green, soft, sericitized, fine grained dacitic appearing interbed (possibly an altered sericite rich argillite)
-from 425 to 426.5', becomes thinly bedded, interbedded at 50° to the ca, fine grained light green relatively hard sericitized fragment poor graywacke (5% small qtz-carbonate, feldspar clasts) and gray soft chloritized argillite with numerous calcite seams, slumped boudinaged interbeds of sericite rich rock give lapilli tuff appearance to rock
-from 426.5 to 427.5',thinly bedded(at45° ca) relatively hard greenish white sericite rich argillite and dark green chloritic (weakly) argillite, boudinaged, slumped, with strong ssd features, numerous parallel on cross cutting calcite fill fractures with trace pyrite-pyrrhotite, a few thin graywacke interbeds (light green sericitized matrix with 5 to 10% small (less than 1/32") sub rounded feldspar and qtz clast)
-at 428', a few 1/4" siliceous argillite beds, locally bedding at 35°, locally a few pyrite-pyrrhotite filled fractures.
-from 428 to 431', very thinly bedded relatively hard black weakly chloritic argillite, with thin calcite seams and fragmental appearing elongate blebs parallel to bedding,

with minor pyrrhotite-pyrite, strong slumping, and what appears to be foreset bedding.
-at 429.8', 1" clast rich graywacke interbed with small sub rounded qtz, feldspar, and calcite clast to 1/32" and a few small pyrite-pyrrhotite clasts.
-from 431 to 438', bedding averages 40 to 45° to ca, becomes 50% graywacke interbeds, and 50% gray to black weakly chloritic argillite, bedding averages 1 to 2". associated moderate to strong schistosity parallel to bedding.
-graywacke consists of a light green argillaceous sericitized, schistose matrix with 20% small white feldspar and qtz clasts, numerous thin calcite seams, parallel to bedding, cross cutting calcite filled fractures and some slumping, boudinaged, calcite seams to 15% very kinked, crenulated in places (possible ripple marks) a few thin white siliceous argillite interbeds, sulphides locally to 1%, 0.75% pyrite, 0.25% pyrrhotite, as thin seams associated with calcite along bedding plains and associated with cross cutting calcite fill fractures.

438' to 443' <u>Conglomeratic Graywacke(Polymictic Paraconglomeratic)</u>
-moderately developed bedding at 45 to 50° to ca,
-rock consists of predominently vfg to argillaceous light gray to green weakly sericitized relatively hard siliceous matrix, thickly bedded, poorly developed bedding with weak schistosity parallel to bedding, and 20 to 40% (highly variable) small (from less than 1/64") (to 1/16") predominently white sub rounded to sub angular quartz, feldspar clasts, weakly aligned parallel to foliation-bedding.

-some poorly developed graded sequences coarsening down hole.
-a few large gray chlorite-calcite rich argillaceous clast, usually very elongate parallel to bedding, to 2", appear fragmental, ie., aglomeratic, to 5% of rock.
-a few thin gray relatively soft chlorite-calcite rich argillaceous seams-interbeds (maybe very large clast)
-strongly fractured, predominently parallel sub parallel to bedding, with calcite and minor pyrite-pyrrhotite fracture filling, occasional with qtz, sericite, or chlorite alteration halos, occasional biotite rich around fractures.
-numerous thin calcite stringers 10% lend carbonitized appearance rock.
-438.5', 1/2" white amorphous appearing siliceous or silicified argillite bed at 35° to ca, with thin calcite fill fractures perpendicular to bedding, trace very fine grained disseminated pyrite-pyrrhotite.
-overall sulphide content, 0.25%, pyrite-pyrrhotite associated with fracture filling and vfg disseminated mineralization proximal to fractures.
-appears very "dacite porphyry" in places
-arbitrary contact with underlying more biotite rich unit.

443' to 450' <u>Interbedded Siliceous, Biotite Rich Metagraywacke and Siliceous Meta-argillite</u>- bedding varys from 35 to 50° to ca, average orientation 45°, very irregular in places, slumped, ssd features, some foreset bedding rock consists of interbedded-graywacke-siltstone, vfg, granular, light grayish green brown relatively siliceous siltstone with 10 to 30% (highly variable) vfg disseminated light brown biotite, at a weak prefered orientation parallel to bedding and weak schistosity at 35 to 50° to ca,

predominently clast poor, but grades into sections with 10 to 20% small (less than 1/32") white feldspar and qtz clasts.
-strongly fractured predominently parallel to foliation with predominently calcite, occasionally qtz, chlorite fracture filling and trace pyrite-pyrrhotite, and strong light green sericite alteration halos around fractures occasionally carbonate, silica alteration halos.
- a few thin chlorite - biotite rich seams
- a few calcite rich zones-beds poorly defined and
-argillites, predominently dark gray to black chloritic occasionally schistose argillite with numerous thin calcite seams parallel to bedding, minor lighter green sericite rich, schistose argillite and gray to pinkish gray hard cherty argillite.
-from 443 to 445', predominently biotite rich siltstone graywacke.
-from 445 to 448', predominently light greenish gray to brownish gray sericite rich to biotite rich siltstone graywacke with irregular bands and clasts or boudinaged interbeds of gray to white siliceous to cherty argillite with 25% disseminated biotite.
-maybe conglomeratic with a graywacke matrix and silicious argillite clast to 2 to 3"
-in places these silicious zones appear to be an alteration product occuring as diffused blebs with no distinct contacts and occuring approximal to fractures, elsewhere distinct interbeds or clasts
-very slumped in places with irregular ssd features

-strongly fractured parallel to sub parallel bedding with biotite, calcite, qtz, fracture filling and occasional strong sericite-silica-biotite alteration halos.
-from 448 to 450', predominently dark grayish green weakly chloritic siltstone, schistose -bedding at 40° to the ca, with thin gray chlorite rich argillaceous interbeds to 10%, numerous thin calcite seams, irregular - slumped bedding.
-overall sulphide content, trace, pyrite-pyrrhotite associated with carbonates seams parallel to bedding and associated with carbonate filled fractures.

450' to 468.5' <u>Conglomeratic, Siliceous Metagraywacke (biotite rich)</u>
-rock consists predominently of a thickly bedded (6 to 8"), relatively poorly defined bedding, at variable orientations from 40 to 50° to the ca.
-graywacke predominently a light pinkish brown a vfg granular, to argillaceous, relatively hard, siliceous matrix with 5 to 30% vfg disseminated light brown biotite exhibiting a weak prefered orientation parallel to bedding and weak schistosity and clast predominently small (1/32 to 1/16") sub rounded to sub angular white qtz and feldspar highly variable content, with grading sequences from clast poor (5% to clast rich) 30% zones, occasionally distinct clast rich interbeds.
-predominently clast poor, with an average content of 15%, numerous clast are altered to calcite.
-a few conglomeratic zones with elongate clast (parallel to bedding) of gray to green argillite, siliceous argillite, and qtz-feldspar porphyry ? to 1/2" , very fragmental appearing in places, to 5% of rock.

-moderately to strongly fractured, with sets parallel to bedding and randomly oriented sets with predominently calcite, minor qtz, biotite, chlorite fracture filling and trace amounts of pyrite-pyrrhotite.
-strong sericite and occasional silica, biotite, carbonate alteration halos to 2 to 3" around fractures.
-very banded appearing in places with argillaceous seams cutting granular seams (appears to be alteration product as opposed to distinct interbed)
-from 454.3 to 455', matrix is light green, weakly sericitized, biotite free.
-from 455.2 to 456',matrix is light green sericitized
-from 456 to 458', locally very clast rich, to 50% predominently small qtz and feldspar angular to sub rounded clasts with a few large conglomeratic clast to 1/2" of predominently qtz, and sericitized qtz-feldspar-porphyry ? , a few softer sericitized argillite clasts and coarse grained crystallined grenetic-qfp clasts, very biotite rich locally to 20%, only very weakly fractured.
-at 460', 3" sericite alteration halo around calcite fill fracture at 50°
-from 463.5 to 464.5',fine grained siliceous ground mass becomes light green, weakly to moderately sericitized, with numerous randomly oriented calcite fill fractures, and few remnant patches of biotite, very porphyritic appearing,("dacite porphyry")
-from 464.5 to 465.5', locally very clast rich, to 50% predominently quartz and feldspar, with a few large qfp clasts, locally very biotite rich (to 25%)
-from 465.5 to 468.5', numerous thin cherty argillite interbeds, very irregular, maybe an alteration product or highly deformed slumped/boudinaged interbeds.

468' to 489.5' Sericitized, Siliceous, Metagraywacke- rock consists predominently of a siliceous medagraywacke with varying types and intensities of alteration.

-predominently vfg to argillaceous light green moderately sericitized hard siliceous matrix, with clast of predominently angular to lath shaped to sub rounded feldspar and qtz from 1/64 to 1/16", varying from 20 to 50% of rock, appears very porphyritic, weakly carbonitized in places, a few light green argillaceous clast,

-exhibits weak foliation - bedding at an average orientation of 40° to the ca.

-a few irregular patches, zones, with disseminated reddish brown biotite to 30% of rock.

-a few clast rich beds with 50 to 60% qtz feldspar clasts

-strongly fractured at random orientations with predominently calcite, occasionaly qtz fracture filling with strong silica, and sericite alteration halos to 2".

-very banded appearing in places with clast rich rock cut by alterations seams-halos with clastic texture totally over printed and biotite altered to sericite.

-a few irregular white silicification "patches" to 1", usually with associated vfg disseminated biotite.

-at 468.6', 1/4" calcite filled fracture at 25° to the ca.

-from 469 to 471', locally very intensely fractured with a few larger clast to 1/2" of predominently qtz and feldspar, elongate parallel to bedding

-at 473', 1/2" qtz vn at 90° to ca, locally abundant pyrite fracture filling associated with calcite, a few large cherty clast, a few qfp clast, with very faint contacts with matrix.

-from 473', becomes very clast rich, to 50%

-numerous thin calcite fill fractures often have 1/16 to 1/8" pyrite crystalline "flakes"
-at 477', 1" qtz vn at 30° to ca with 2% pyrite as thin seams and flakes filling fractures, vn is fine grained sugary, rectystallized.
-from 477 to 478.5', numerous thin qtz seams to 1/2" cut rock at prefered orientation at 90° to ca, with minor associated calcite and locally 1% pyrite as cubic mineralization along calcite filled fractures, locally strong silicification over prints graywacke appearance.
-locally a few thin elongate light green weakly sericitized siliceous argillite interbeds and boudinaged fragments (may be an alteration product as opposed to distinct interbeds)
-from 483 to 484', numerous silicified seams or alteration bands to 1/2" with 1% vfg disseminated pyrrhotite, minor pyrite, locally numerous filled calcite fractures with pyrite-pyrrhotite and numerous biotite rich light purpleish white silicified alteration blebs.
from 486 to 489.5', becomes intensely fractured with original texture completely over printed by silicification and sericitized alteration halos, patches around fractures, calcite-silica filled fractures brecciated rock in places,
from 487 to 489.5', one prominent fracture at 0° to ca, exhibits movement of up to 6" down hole.
-overall sulphide content throughout unit, 0.5%, predominenetly pyrite, trace pyrrhotite, strickly associated with carbonate-silica filled fractures and associated alteration halos.

489.5' to 494.5' Interbedded Argillites and Altered Metagraywacke- bedding highly irregular, slumped, with soft sediment deformation features in places, ranging from 35 to 50° to ca, predominently orientation of 45° to ca,

-rock consists predominently of interbedded l-grayish black, thinly bedded argillite, relatively soft, weakly chloritic, very strongly fractured parallel to sub parallel to foliation, with calcite fracture filling and a few clast rich beds to 1/4" where small white feldspar and qtz sub rounded clast to 1/32" and 5% of rock and 2 graywacke, with a light greenish gray sericitized argillaceous relatively hard siliceous ground mass and 20 to 30% small (1/32 to 1/16") qtz and feldspar clasts some grading evident, coarsening downhole, moderately fractured sub parallel parallel to bedding with calcite fracture filling.

-overall composition approximately 60% argillite, 40% graywacke

-graywacke beds in places are biotite rich, with 15 to 20% fine grained disseminated reddish biotite, weakly aligned parallel to foliation - weak schistosity, occasionally very strongly fractured with silicified and sericitized alteration halos and clast-matrix boundary over printed by alteration.

-a few thin argillite interbeds

-at 490.7', 3" graywacke bed, grading down hole with predominently qtz and feldspar clast to 1/16"

-a few thin boudinaged beds give fragmental-aglomeratic appearance in places

-from 491.5 to 492', graywacke, completely altered, very intensley fractured at random orientations, with qtz, calcite, sericite fracture filling and strong silicification and sericite alteration of surrounding rock.
-a few thin 1/4" qtz feldspar seams cut all units at random orientations
-at 492.7', 2" black argillite interbeds with numerous 1/4" calcite and talc seams parallel to bedding.
from 494 to 494.5', graywacke bed with numerous light green to white calcite and talc seams - vn to 1/4" and 25% of rock with a few small 1/16" pyrrhotite blebs.
-overall sulphide content, trace, pyrite, pyrrhotite associated with calcite fracture filling and qtz calcite vn.

494.5' to 498' <u>Intensley Fractured,Carbonate Rich Graywacke</u>- weakly bedded foliation at 40° to ca
-vfg to argillaceous light grayish green relatively hard siliceous, weakly sericitized matrix with clast increasing in size and frequency from 494.5 ', (5%) to 498', (40%) in well developed graded sequence coarsening down hole clast predominently qtz and feldspar,to 1/16"
-rock intensely fractured at random orientations, to weakly breeciated in places, with predominently calcite and talc fracture filling, and associated pyrite-pyrrhotite blebs to 1/16" to .25%
-a few biotite rich beds - seams
-carbonate content approximately 20%
-movement up to 1" along several fractures.

498' to 507' Interbedded Argillites and Metagraywacke- bedding-foliation average orientation 40° to ca,
-rock consists of thinly bedded (from 1/4 to 2 to 3") interbedded gray cherty siliceous argillite, black softer weakly chloritic agrillite and graywacke (matrix very fg argillaceous, light green weakly sericitized to gray, siliceous with low class content, 5 to 10%, small white feldspar-qtz clasts.) intensely fractured by calcite and talc filled fractures to 1/4" in places, at random orientations, weakly brecciated in places, minor pyrite-pyrrhotite associated with calcite-talc fracture filling.
-slumped-brecciated in places
-strong movement along fractures of up to 1/4"
-a few fractures have strong silicification halos to 1/2" and patchie irregular silicification blebs to 1" around fractured zones.
-from 498 to 500', predominently cherty gray siliceous argillite with a few thin black softer weakly chloritic argillite interbeds, strongly brecciated, slumped, with calcite seams and fracture filling to 10% of rock, and 1% associated pyrite-pyrrhotite,
-at 499.3', 1/4" talc-calcite filled vn fill fracture-vn at 5° to ca with a few small 1/16" disseminated sphalerite blebs and numerous thin pyrite seams
-from 500 to 502.5', becomes very fg to argillaceous, siliceous argillite-siltstone, with a few thin graywacke interbeds, and chlorite rich argillite interbeds, with strong silicified alteration halos around numerous fractures and fg disseminated reddish brown biotite associated with halos around fractures to 15% of rock, trace pyrite sphalerite associated with calcite and qtz fracture filling.

-from 502.5 to 504', predominently gray siliceous argillite and black chloritized argillite interbeds to 1" with a few thin graywacke beds, numerous zones with strong patchie alteration blebs of silica
-at 503.5', 3" silicified-bleached bed
-from 503.5 to 504', rock is weakly brecciated by numerous thin calcite-qtz vn/filled fractures with 1% vfg disseminated pyrrhotite.
-from 504', becomes interbedded soft gray to black chloritized argillite and gray cherty siliceous argillite with a few thin graywacke interbeds, very intensely fractured with talc-calcite fracture filling, weakly brecciated in places by calcite-talc seams, a few patches of silicification
-at 504.5', 1" pyrite seam in calcite filled fracture at 0° to ca,
-from 506.5 to 507', numerous 1/4" talc-calcite vn/filled fractures at 90° to the ca, with occasional small sphalerite blebs to 1/16"
-overall sulphide content, 0.5%, predominently pyrite, trace pyrrhotite, sphalerite, as mineralization is associated with calcite fracture filling.

507' to 511' Altered Metagraywacke-from 507 to 508', very"dacite porphyry" appearing, with light green moderately to strongly sericitized relatively soft vfg to argillaceous matrix and 40% small (1/32 to 1/16") angular to sub rounded to white feldspar and qtz clasts, no apparent bedding, strongly fractured at prefered orientations of 45 to 50° to ca, with predominently calcite and minor talc sericite fracture filling, a few thin sericite alteration halos, trace vfg disseminated pyrite.

-at 507.5', 1" silicified bleb
-becomes increasingly siliceous and silicified to 508',
-from 508 to 511', becomes increasingly silicified, silicification appears more as an alteration product associated with fractures that a distinct sedimental-logical change, gray to white to pink, very hard, siliceous matrix, intensely fractured at random orient-ations, with silica, calcite fracture filling, weakly foliated at 45° to the ca, occasional unaltered clasts occasional unaltered patches where clasts still visible a few reddish brown biotite rich patches, trace pyrite associated with calcite and talc fracture filling.
-from 509.5 to 510', shear zone, intensely schistose at 80° to the ca, very intensely fractured, brecciated, with rock altered totally to sericite and calcite with minor chlorite, trace fg disseminated pyrite.

511' to 514' Polymictic Paraconglomerate- rock consists predominently of thickly bedded (4 to 5") light gray, siliceous cherty argillite and softer weakly chlorite-sericite rich argillit bedding well developed at 50° to ca, with 5% clasts of graywacke-graywacke clasts consists of a vfg siliceous argillite matrix and 50% small (to 1/16") white feldspar and qtz clasts, clast to 3",
-a few elongate soft gray argillite clast-slumped frag-ments parallel to bedding .
-a few irregular zones of patchie silicification and bleaching.
-strongly fractured predominently parallel sub parallel to foliation, with calcite and minor talc, qtz fracture filling, with strong sericite and silica alteration halos.
-trace fg disseminated pyrite associated with calcite

fracture filling.
-at 512, 4" clast rich graywacke interbed at 55° to the ca.

514' to 517.5' Cherty Siliceous Argillite- thinly bedded (1/4 to 1") cherty argillite, bedding at 40° to the ca, with beds of dark gray to black and light brown argillite, some irregular slumping, and soft sediment deformation features.
-very intensely fractured at prefered orientation of 40° to the ca, with calcite,quartz fracture filling and strong sericite alteration halos around fractures.
-rock appears weakly brecciated in places with patches of light brown biotite rich cherty argillite in a lighter cherty argilleous matrix.
-overall sulphide content, trace, pyrite and minor sphalerite associated with carbonate fracture filling and very minor fg disseminated Py throughout rock.
-irregular slumped contact at 517.5', at 40°to ca, with cherty argillite frags slumping into underlying graywacke.
-at 514.5', 1/4" calcite seam at 5° to ca, with trace disseminated Po and sphalerite.

517' to 535' Siliceous Metagraywacke- rock comprised predominently of a light green, weakly sericitized, siliceous, fg to vfg granular matrix with varying amounts of vfg disseminated biotite, average 5% weakly aligned parallel to poorly developed bedding at 45° to ca,
-clast to 35%, varies from 20 to 50%, predominently (small 1/32 to 1/16") white sub rounded to sub angular feldspar and qtz, weakly aligned parallel to bedding, a few elongate clast parallel to bedding lend to tuffaceaus to rock, elsewhere lath shaped feldspar clasts lend porphyritic appearance to rock (dacite porphyry)

-predominently weak to moderately fractured, with a prefered orientation parallel to sub parallel bedding, with calcite and minor talc, chlorite, sericite, qtz fracture filling and a few sericite and bleached alteration halos.
-a few chert clasts, a few larger 1/4" coarse grained qtz feldspar porphyry appearing clast
-a few light green sericitized to chlorite altered mafic mineral clasts
-matrix appears weakly schistose parallel to bedding.
-at 517.5', thin(1/32") talc filled fracture at 90° to ca,
-from 518 to 519', a few thin cherty argillite beds at 35° to ca,
-from 517', rock is biotite rich, with pale reddish brown vfg disseminated biotite to 20% of rock, more strongly fractured,
-at 524', 1/2" siliceous argillite interbed at 55° to ca,
-at 528', 1/2" qtz vn at 90° to ca,
-from 517 to 528', clast become increasingly larger, graded sequence, coarsening, downhole, by 528', clasts to 1/2" and elongate parallel to bedding.
-from 528 to 535', matrix becomes softer, more strongly sericitized, schistose, with foliation at 70° to ca,
-numerous thin calcite stringers and blebs parallel to foliation to 10% of rock, clast reduced to 25% of rock but average 1/4 to 1/2" in size, predominently qtz, feldspar, qtz feldspar porphyry, and sericite altered altered argillite/volcanic- very lapilli tuff to alglomeratic appearing.
at 531.2', 1/8" qtz calcite seam at 40° to ca, with a few Py-calcopyrite blebs to 1/32" (calcopyrite mantals Po)

-from 531 to 535', clast-matrix contacts become over printed by schistosity and associated aleration, numerous thin calcite seams become 20% of rock, vfg disseminated Py becomes .1%
-overall sulphide content, trace, a few small Py-Po-calco-pyrite blebs throughout unit, predominently associated with calcite fracture filling.

535' to 546' Chlorite-Carbonate-Sericite "Schist" (severely altered lithic wacke)- rock consists predominently of a vfg to apthanitic, very stongly schistose, light to dark green chlorite - calcite - sericite rich matrix with 30 to 40% thin, elongate (to 1/2") totally chloritized fragments/ clasts parallel to foliation, very aglomeratic appearing
-very soft, sheared appearing, bedding and schistosity at well developed orientation of 70° to ca,
-matrix composition variable, averages approx., 25% calcite 40 to 50% sericite, and 30% chlorite, clast are totally chlorite, and occasionally talc altered.
-a few biotite rich bands-beds, with vfg disseminated reddish brown biotite to 30 to 40% of rock in places, average 5% throughout unit.
-in places small disseminated calcite blebs to 25% of rock
-moderately fractured at random orientations with predominently calcite fracture filling.
-in places matrix appears to exhibit a remnant coarse grained crystalline texture or possibly a very small clast rich-granular texture with altered mineralization (chlorite-sericite-carbonate forming an interstitial matrix.
-from 537 to 537.5', fg disseminated reddish brown biotite to 50% of rock, strongly schistose at 70° to ca, with a few small qtz clast.

-from 538 to 540', matrix appears weakly crystalline (remnant)
-from 540.5 to 541', intensely sheared, schistose, at 70° to ca, with total alteration of rock to chlorite-sericite-carbonate, and a few thin qtz calcite seams parallel to bedding - schistosity, minor disseminated blebs of light golden brown sub metallic mineral (possibly sphalerite)
-from 541 to 541.5', biotite rich, to 30%
-from 542.5 to 543', biotite rich, (30%)
-from 544 to 544.3', 4" light greenish brown biotite rich siliceous graywacke interbed
-numerous small disseminated calcite blebs hexagonal, possibly altered garnets.
-overall sulphide content, 0.25%, as vfg disseminated Po-Py- calcopyrite with minor sphalerite, and Py associated with calcite fracture filling
-very sharp distinct lower contact at 546' at 70° to ca,

546' to 554' <u>Conglomeratic Metagraywacke-</u>(sericitized,clast poor)
-predominently a fg, light green, moderately sericitized, relatively soft, granular matrix, with weakly developed bedding at 70° to the ca, as exhibited by alignment of a few clasts,
-numerous small white calcite blebs/clasts to 5% throughout rock.
-numerous zones of very irregular silicia patches (pink to green to white), maybe slumped brecciated interbeds or an alteration product.

-weakly to moderately fractured at random orientations with predominently calcite fracture filling
-a few (to 5%) conglomeratic appearing clast to 1/2" of light green soft argillite, usually elongate parallel to bedding weakly developed, usually well rounded to sub rounded.
-at 546.5', 1/4" qtz vn at 90° to the ca, with large black chlorite clots at rims.
-at 547', 1/2" light brownish pink cherty bed at 45° to ca,
-from 546 to 548', numerous thin calcite stringers and small disseminated blebs to 15% of rock
-becomes increasingly harder, siliceous from 552 to 554', with an increasingly clast content to 10%.
-overall sulphide content 0.25%, as vfg disseminated Po-Py, with minor calcopyrite, and a few small blebs associated with calcite fracture filling.
-(maybe an alteration halo from overlying severely altered and possibly intrusive unit)

554' to 556.5' <u>Conglomeratic Metagraywacke</u> - matrix consists of a fg light green weakly to moderately sericitized hard, relatively siliceous, granular rock, weakly bedded to 55° to ca, with 30% large (to 2") angular elongate clast or slumped fragments of light green (sericitized) to light pinkish brown (with disseminated biotite) cherty siliceous argillite.
-a few small (1/16") white qtz and feldspar clast.
-matrix weakly biotite bearing in places (5%)
-clast-matrix boundaries often obscure.

weakly to moderately fractured at low angles (0 to 45°) with calcite and trace PY fracture filling.

556.5' to 564' Interbedded Siltstone - Graywacke and Cherty Siliceous Argillite- from 556.5 to 557', predominently siliceous argillite, cherty, light green, weakly sericitized, to light reddish brown (with 5 to 10% vfg disseminated biotite), irregular contorted bedding at an average orientation of 35° to ca,strongly fractured with qtz, calcite fracture filling and strong silica alteration halos to 1/4", fractures exhibit weak prefered orientations parallel bedding, spotted appearance in places with irregular small(1/4") difuse appearing silicification patches (possibly very altered clasts) contact with underlying siltstone unit at 20° to ca, maybe and alteration zone as opposed to distinct siliceous argillite interbed nvs.

-from 557 to 558.5', siltstone-graywacke, vfg light brown relatively hard siliceous biotite rich siltstone, with 10 to 20% vfg disseminated biotite,reddish brown-purple color due to biotite, thinly bedded as exhibited by thin (1/16") very biotite rich seams-beds at 25° to the ca, although extremely variable, numerous blebs to 1/2" of hard siliceous rock, maybe clast but appear more to be silicification patches, occuring close association with fractures, and strong bleached - silica - sericite alteration halos to 1/4" around fractures at a prefered orientation of 40 to 50° to ca.

-from 558.5 to 559', cherty siliceous argillite, with 10% fg disseminated biotite, and silicification patches-blebs affecting 50% of rock, poorly developed bedding at 30° to the ca,
-from 559 to 560',thinly bedded 1/2" interbedded biotite rich siliceous siltstone and cherty hard gray argillite, well developed bedding at 40° to the ca, weakly fractured parallel bedding with calcite fracture filling.
-from 560 to 562', predominently siltstone graywacke, vfg hard gray to reddish brown siliceous siltstone matrix with a few small (1/32") white feldspar and qtz clasts and 10 to 15% vfg disseminated biotite, weakly fractured with calcite fracture filling a few sericite and bleached silica alteration halos, with minor Py, bedding well developed at 50° to ca, at 560.6', 3" bed of very clast rich graywacke with clast of predominently qtz and feldspar to 30% of rock, a few thin siliceous argillite interbeds
-from 562 to 564', thinly bedded (highly irregular, contorted,slumped,) at an average orientation of 45° to ca, varies 20 to 60°, predominently hard light green to pinkish brown relatively cherty siliceous argillite, very intensely fractured predominently parallel to bedding with calcite sericite, chlorite and minor Py fracture filling, with strong bleached and sericite alteration halos.
-occasional spherical-elongate silicification blebs to 1/4", a few biotite rich beds with small disseminated clots to 20%, a few thin coarser siltstone beds.
-overall sulphide content trace Py as fracture filling.

564' to 586' Siltstone-Graywacke- from 564 to 576', predominently light grayish brown siltstone, well developed bedding at 40° to the ca, thinly bedded (1/4 to 1") vfg, granular, relatively hard, siliceous siltstone with 10 to 20% fg disseminated biotite weakly aligned parallel to bedding a few thin biotite rich vrs. biotite poor beds, exhibits bedding.

-a few zones of silicification patches or very contorted, slumped,brecciated siliceous argillite interbeds, predominently well sorted with a few zones-beds with small white qtz feldspar clast to 1/32" (graywacke)

-weakly to moderately fractured with sets at 20 to 30°, and 40 to 60°, with predominently calcite fracture filling occasionally minor sericite, chlorite, with occasional bleached and sericite and biotite rich alteration halos around fractures.

-light green, weakly sericitized in places

-from 570 to 576', gradationally becomes coarser (a sandstone) with biotite forming clast like clots to 1/16" parallel to bedding, more frequent qtz and feldspar clasts grades into a graywacke by 576'

-sulphides to 576', trace Py-Po-calcopyrite associated with thin calcite fill fractures and minor fg disseminated mineralization.

at 565', at 0° to the ca, 6" trough filled graywacke bed coarse clast rich wacke zone and vfg siltstone, locally with trace disseminated Py-calcopyrite associated with a few thin calcite stringers.

-from 566.2' to 566.7', silicified zone for siliceous argillite siltstone interbed light pinkish brown, hard, irregular patchie appearance with siliceous blebs to 1/2"

-576', graywacke, gray to light green,fine grained, weakly sericitized, relatively hard, siliceous siltstone matrix with 10 to 15% disseminated reddish brown biotite and 25 to 30% small clasts to 1/16" white qtz and feldspar weakly aligned parallel to bedding at 50° to the ca,
-clast rich to 50% and clast poor zones, some graded bedding
-weakly to moderately fractured at random orientation with calcite, occasionally qtz fracture filling and strong sericite and bleached - silica alteration halos to 1/4"
-a few zone of spotted alteration, pinkish white bleached silicification blebs (possibly very altered clasts)
-from 578 to 579.5', spotted alteration, with numerous elongate pinkish calcite-silica rich alteration blebs
-sulphides from 576 to 586', trace to 0.25%, Py with minor Po associated with calcite filled fractures.

586' to 599' <u>Altered Siltstone - Graywacke</u> - rock consists predominently of a vfg, granular, siliceous, hard siltstone with 10% fg disseminated biotite, weakly developed bedding at 50° to the ca,
-spotted alteration affects 30% of rock with elongate parallel to bedding spherical two spherical blebs to 1/2" of light pink light green weakly carbonitized to weakly sericitized siliceous alteration blebs (maybe very altered clasts) lending an aglomeratic appearance to the rock.
-matrix occasionally sericitized, bright green
-moderately fractured at random orientations with calcite sericite, qtz, fracture filling, and strong bleached and sericite alteration halos to 1/2", trace Po-Py associated with calcite filled fractures

-a few small qtz and feldspar (1/32") clasts where less altered occasionally to calcite.
-a few slumping and soft sediment deformation features
-from 594', becomes increasingly clast rich (to 10%)
-at 588.3', 1/4" calcite qtz vn at 40° to the ca, with minor disseminated Po at rims.
-from 595.5 to 596', soft shear zone, with strong chlorite-sericite alteration around 1" calcite vn at 595.8', with 1% fg disseminated Py.
-from 596 to 597', irregular silicification blebs to 1"
-from 597 to 599', matrix becomes soft weakly chlorite-sericite altered with blebs of silicifation alteration, numerous calcite seams with Py , movement along fractures of up to 2",
-overall sulphide content, trace, Py, minor Po, associated with calcite filled fractures.

599' to 618' Siliceous Graywacke- bedding exhibited by alignment of clast and biotite at an average orientation of 50° to the ca.
-predominently a fg granular gray siltstone type matrix siliceous, with 5 to 10% disseminated biotite weakly aligned parallel to bedding, a few biotite rich vrs, biotite poor beds, matrix is weakly to moderately sericitized in places,
-clast average approx., 20%, vary from 10 to 30%, predominently small sub angular to sub rounded (1/16 to 1/8") white feldspar and qtz clasts, a few graded beds with clasts to 40%
-rock predominently weakly to moderately fractured at prefered orientation of 40 to 60° to the ca, predominently calcite fracture filling, occasional qtz, Py, Po, and occasionally strong sericite alteration or bleached

silica alteration halos to 1/4".
-from 603 to 604', spotted alteration with blebs to 1/2" of pinkish brown biotite rich silicification blebs.
-at 606', 2" clasts rich bed at 55° to the ca,
-from 606.5 to 608', matrix very sericitized, very dacite porphyry appearing, numerous thin calcite seams to 1/8" cut rock at 70 to 90° to the ca,
-at 610.2', 2" qtz vn at 50° to the ca, qtz is med. grained granular, sugary, recrystallized, highly fractured with calcite fracture filling and a few biotite clasts to 1/8" at rims.
-from 610 to 612', numerous patchie spotted appearing alteration zones.
-from 613.5 to 614', a few large (1") dark grayish green weakly chloritized argillite clasts
-unit coarsens down hole towards 618',
-overall sulphide content, trace, Py with minor Po associated with calcite - sericite filled fractures and associated alteration halos.

618' to 622' <u>Interbedded Argillites and Siltstone and Graywacke</u> -from 618 to 619', thinly bedded, at 35° to the ca, interbedded relatively soft dark greenish gray to black weakly chloritic argillite and harder, gray to light purplish brown (with minor disseminated biotite) siliceous argillite strongly fractured, fractures both parallel and cross cut bedding, predominently calcite with minor sericite chlorite, Py fracture filling, strong bleached and sericite alteration halos around fractures.
-from 619 to 620', graywacke, vfg, granular, siliceous dark gray to reddish brown siltsone matrix with 10 to 15% disseminated biotite, and 30% small white feldspar and qtz clasts to 1/16"

-strongly fractured at random orientations with calcite and trace Py, chlorite, sericite fracture filling,
-poorly developed bedding as exhibited by alignment of biotite and clast at 50° to the ca,
-from 620 to 622', thinly bedded (very irregular, kinked, contorted, at 30° to the ca,) black relatively soft chloritic argillite and fine grained soft chloritized graywacke with a few small carbonate, qtz, and feldspar clasts.
-a few silicification blebs
-overall sulphide content, trace, Py associated with fracture filling.

622' to 625.5' Chloritized Graywacke- fg, light green, weakly chloritized, thickly bedded, poorly developed bedding, graywacke, clast poor, only a few small white feldspar clasts, a few irregular biotite rich patches and silicification patches moderately fractured at random orientations with calcite fracture filling,
-from 624.5 to 625.5', 1/4" calcite seam at 10° to ca, with a few 1/8" Py blebs.

625.5' to 637' Interbedded Argillites and Graywacke- rock consists predominently of thinly bedded (1 to 2")(bedding at average orientation of 30 to 3%° to the ca)
-a black,relatively soft, weakly chloritic argillite, with numerous thin calcite seams and blebs parallel to bedding usually with 1.5 to 2% vfg disseminated Po, trace, Py, as thin slips and seams parallel to bedding often associated with calcite, and occasional fragmental appearing sulphide blebs, calcite to 10% of rock and b slightly coarser, dark green, chloritic graywacke, weakly schistose parallel to bedding at 35° to the ca, some boudinaged beds, slumping and flame type structures, and c gray cherty siliceous

argillite.
-rock predominently weakly fractured at random orientations with calcite, chlorite, and minor Py fracture filling.
-at 626.3', 1/4" band of disseminated Po blebs to 1/8"
-from 625.5 to 629', predominently black soft argillite with a few thin slightly coarser grayish green graywacke interbeds and boudinaged, slumped, fragments, locally 2% sulphides, Po and trace Py,
-from 629 to 632', predominently cherty gray siliceous argillite, brecciated, boudinaged in places with large fragments of cherty argillite in black chloritic argillaceous matrix, more intensely fractured, at orientations parallel to bedding (35°) with bleached silica alteration halos, a few thin black and dark green chloritized argillite interbeds
-at 630', 1" qtz vn at 65° to the ca, with minor calcite at rims, large chlorite blebs at rims, and a few disseminated Po blebs.
-sulphides to 0.25%, primarily disseminated Po, usually associated with thin black chloritic argillite interbeds.
-form 632 to 636', thinly bedded interbedded dark slightly harder black argillite and grayish green graywacke, trace Py - Po associated with calcite filled fractures, minor disseminated Po in black argillite beds, a few irregular semi-spherical disseminated calcite rich blebs, nodular appearing,
-at 636 to 637', interbedded clast rich graywacke and light green vfg weakly chloritic argillite, trace Po, as a few thin seams associated with calcite thin black argillite interbeds.

637' to 642.5' Graywacke-rock comprised of light grayish green, weakly sericitized vfg granular relatively siliceous matrix with 30 to 50% small (1/16") white feldspar, qtz, and black to gray argillite clasts weakly aligned, exhibiting bedding at 35 to 40° to the ca.

-a few graded beds, coarsening down hole to 642.5'

-minor disseminated vfg biotite (5%)

-weakly to moderately fractured at random orientations with predominently calcite, minor chlorite, sericite, Py fracture filling, sericite and bleached-silica alteration halos to 1/8"

-occasional thin biotite rich vfg clast free interbeds

-from 641 to 642.5', matrix becomes softer, strongly sericitized, weakly schistose parallel to bedding,

-overall sulphide content, trace, Py and minor Po associated with fracture filling, a few Cpy blebs manteling Po blebs at 637.3'

-from 637 to 638', thin argillite interbeds to 10% of rock.

-from 640 to 641', locally biotite rich (20%)

642.5' to 676' <u>Interbedded Argillites-Siltstone with Graywacke Interbeds</u>

- rock consists predominently of thinly bedded (1/4 to 1") predominently gray to black relatively cherty siliceous argillite and slightly softer, coarser, biotite rich dark gray argillite-siltstone (composition approx. 70% siltstone, 30% argillite)

-bedding variable, from 30 to 45° to the ca, average approx 40°.

-argillite varies in places from light brown (vfg biotite rich) to light green (weakly sericitized) lending banded appearance to rock

-abundant soft sediment deformation features,slumping, flames, boudinage, some foreset bedding.

-a few graded beds with argillite coarsening to siltstone with no appearant contacts.

-a few siltstone interbeds contain a few small qtz and feldspar clast (less than 5%)

-moderate to strongly fractured, with sets at 40° to the ca, both parallel and cross cutting the bedding, with predominently calcite and minor qtz, chlorite, sericite, Py and Po fracture filling, with occasional bleached and sericite alteration halos to 1/4"

-occasional very cherty white to beige argillaceous interbeds.

-a few small scattered garnets often altered to carbonate,

-weak crenulation, wavey bedding in places (possible ripple marks)

-all lithologies contain approx., 5% calcite as small blebs as thin stringers parallel to bedding.

-siltstone units predominently biotite rich (20 to 30%) and occasional thin biotite rich vrs. biotite poor beds illustrate beddding.

-some off setting of bedding along fractures up to 1/4"
-appears weakly brecciated in places with small spherical to elongate blebs of light green sericite-silica altered or brecciated argillite fragments, poorly defined boundaries maybe a spotted alteration.
-from 642.5 to 644', locally very biotite rich, to 30% vfg siliceous graywacke, siltstone type matrix with 5% small qtz feldspar clasts.
-from 644 to 645.5', very cherty siliceous argillite, bedding very contorted at 35° to the ca, with light gray to yellow to green chert and numerous irregular brown patches (biotite, calcite rich), very intensely fractured at 35° to the ca, with calcite magnesite, chlorite, sericite fracture filling, strongly bleached appearing with halos to 2 to 3" around fractures, weakly sericitized in places, trace Py as fracture filling.
-at 646.4', 3" soft chloritic argillite bed with 5% Po as vfg disseminated mineralization parallel to bedding with numerous thin calcite blebs in seam parallel to bedding.
-at 649', 1/4" fg sugary, recrystallized qtz vn at 60° to ca, with 0.5% fg disseminated Po, minor Py
-from 652 to 652.5', locally sulphide rich, Po with trace calcopyrite to 1% as small elongate blebs in thin seams parallel to bedding at 45° to the ca, in close association with calcite seams.
-from 653', spotted patchie sericite - silica alteration blebs effect up to 30% of rock.
-at 659.6', 1/2" qtz calcite - Po-calcopyrite rimed, brecciated host rock fragment.
-at 663', 4" clast rich graywacke bed at 60° to the ca, clast to 40% of qtz, feldspar, cherty argillite, to 1/4"

-from 663 to 667.5', locally very cherty siliceous, argillite becomes 70% of rock, highly contorted bedding, with slumping, boudinaged, appears almost brecciated, indistinct contacts between brecciated fragments and matrix.
-at 667.4', 1/4" qtz magnesite vn at 45° to the ca,
-from 667.5 to 669', graywacke interbed, fg biotite rich matrix with 20 to 30% small (1/16") qtz feldspar clast and a few zones of numerous elongate cherty siliceous argillite clasts (possibly boudinaged beds) to 1/2"
-at 668', 1/2" med grained sugary recrystallized qtz vn
-at 668.5', 1/2" med grained sugary recrystallized qtz vn at 35° to ca.
-at 671.5', 1/2" qtz calcite vn at 35° to ca, very contorted with a few small Po blebs to 1/32".
-from 669 to 676', predominently dark green softer siltstone, weakly brecciated appearing with patches of more siliceous rock to 2", (possibly spotted alteration)
-overall sulphide content, trace, Po with minor calcopyrite and Py as thin blebs in seams in a few locallized zones and fracture filling associated with calcite.

676' to 684' <u>Siltstone and Graywacke-</u> rock composed predominently of vfg granular, dark drownish gray, biotite rich siliceous siltstone, with vfg disseminated reddish brown biotite to 25%.
-irregular small (1/8 to 1/2") light green to pinkish-green elongate spherical siliceous alteration blebs throughout rock (affecting approx. 30% of rock)
-occasional graded beds(coarsening down hole) to clast bearing graywacke, with up to 30% small (1/32 to 1/16")

sub rounded to sub angular qtz and feldspar clast.
-bedding as exhibited by alignment of siliceous blebs and biotite at an average orientation of 50° to ca, poorly developed.
-average clast content approx., 5%
-moderately fractured in distinct sets at 40 to 60°, and 20 to 30° to the ca, with predominently calcite minor chlorite, sericite, qtz, fracture filling and a few thin sericite, bleached - silica alteration halos.
-from 678 to 678.3', intensely fractured, locally strongly silicified.
-from 678.3 to 679', graywacke interbed, locally small qtz and feldspar clast to 20%, a few larger black argillite clast to 1/4", bedding at 50°
-at 680', 2" light pink vfg siliceous argillite interbed at 55° to the ca, very intensely fractured, brecciated, with calcite fracture filling in seams.
-from 682 to 684', graywacke, clast to 30% of qtz, feldspar and a few black argillite and cherty argillite clasts to 1/4",coarsens down hole to 684',
-strongly fractured locally with calcite fracture filling
-overall sulphide content, trace, Py associated strickly with calcite fracture filling.

684' to 687' <u>Siliceous Siltstone - Argillite</u> - rock consists predominently of a vfg to argillaceous dark gray to granular siltstone-argillite, very siliceous, hard, poorly developed bedding at 45° to ca
-a few thin cherty silica beds, a few small graywacke type qtz feldspar clast bearing interbeds.
-moderately fractured at random orientations with calcite and trace Py fracture filling.

-5% vfg disseminated black biotite.
-at 684.5', 1/2" cherty silica bed, very contorted, slumped, at 50° to the ca,

687' to 692' Altered Siltstone- rock comprized of a vfg granular siliceous matrix with 15 to 20% disseminated biotite, weakly developed bedding at 45° to the ca,
-30% elongate parallel to bedding light green cherty silica alteration blebs to 1/2" (possibly clasts with very indistinct contacts), close association with fractures in places appears to be boudianged interbeds, but appears more an alteration product
-from 687 to 688', alteration blebs to 60% of rock
-weakly to moderately fractured at random orientations with predominently calcite, minor biotite, sericite, chlorite, qtz, Py fracture filling and a few thin sericite and bleached-silica alteration halos
-a few light pink zones with numerous small disseminated calcite blebs.
-grades into an graywacke at 692',
-overall sulphide content, trace, Py associated with calcite fracture filling.

692' to 696' Graywacke- light gray vfg siliceous matrix with graded beds towards 696', becomes coarse, clast rich with clast of qtz and feldspar to 1/16" and 40% of rock, a few larger lithic cherty siliceous argillite and black argillite clast to 1"
-bedding well developed at 30° to the ca,
-10% fg disseminated biotite
-appears weakly schistose in places at 55° to the ca,
-weakly fractured at random orientations with chlorite, calcite, sericite and trace Py fracture filling.

696' to 736.5' Interbedded Argillites and Siltstones - Graywacke- predominently thinly bedded, interbedded - 1 hard black relatively siliceous argillite with vfg disseminated biotite, - 2 slightly coarser, siliceous siltstone, with minor disseminated biotite, and occasionally a few clasts of feldspar and qtz (less than 1 to 2%) and - 3 graywacke , fg black to light green sericitized siliceous matrix with 20 to 50% small predominently feldspar and qtz clasts to 1/16", with minor biotite occasionally lithic clasts to 1" of black argillite and cherty siliceous argillite.

-a few gray cherty siliceous argillite interbeds

-bedding highly variable ranging from 30 to 55° to ca, average 45°, some foreset type bedding, abundant ssd features in places, slumping, boudinaged beds.

-predominently moderately fractured at random orientations with calcite, minor chlorite, qtz, sericite, biotite, Py fracture filling, a few sericite and bleached - silica alteration halos.

-thinly bedded (1/4 to 2 to 3")

-biotite present throughout most units from 10 to 15%

-from 696 to 696.5', a few thin cherty beige siliceous argillite beds to 1/2" at 35° to the ca,

-from 696 to 700.5', predominently thinly bedded black siliceous argillite and slightly coarser siltstone both biotite rich (20%)

-from 700.5 to 701', siltstone - graywacke bed at 30 to 50° to ca, (trough filled appearance) with light green weakly sericitized siliceous siltstone matrix and 5 to 10% small qtz-feldspar clasts biotite clots.

-from 701 to 701.5', a few 1" cherty siliceous argillite beds at 35° to the ca,

-at 702.3', 1" fg sugary recrystallized qtz vn at 35° to the ca, with a few thin biotite and sericite seams.
-from 701.5 to 708', predominently gray thinly bedded siliceous argillite and siltstone, at 705', a few small Po blebs to 1/16" along thin calcite seam.
-from 705 to 706', locally strongly fractured at random orientations with calcite filled fractures, weakly brecciate rock.
-at 705.5', 1" boudinaged - slumped graywacke bed at 45° to ca, a few thin siliceous cherty argillite beds locally very slumped, deformed, minor vfg disseminated Po.
-from 707 to709.5', cherty siliceous argillite beds to 30%, very contorted, bedding 35 to 40°, intensely fractured with strong bleached - silica alteration halos on qtz filled fractures.
-from 709.5 to 716', becomes relatively soft, weakly schistose, chloritized-sericitized, dark gray argillite-siltstone, with a few thin siliceous argillite and gray-wacke interbeds, numerous thin calcite seams and blebs parallel to bedding at 30° to the ca,
-at 714', 1' semi massive Po clast - fragment, Po with minor calcopyrite at rims and several small inclusions of carbonate, qtz, and chlorite.
-at 715.8', 1/4" Po-calcopyrite bleb
-at 716 to 719', interbedded gray to black relatively hard siliceous argillite - siltstone and lighter green softer weakly chlorite - sericite altered siltstone, bedding at 35°
-at 717', 1/2" narrow Po-calcopyrite - calcite clast or fragment
-from 719 to 725.5', bedding well developed at 40°, becomes softer weakly chlorite - sericite altered dark gray

chlorite, sericite fracture filling and strong silicification of graywacke at rims over prints clast matrix, contacts nvs.
-from 753 to 757', becomes very clast poor (1 to 2%) predominently a light gray to green fg granular weakly sericitized siltstone with 25 to 30% disseminated biotite a few thin qtz seams, strong sericite and bleached silica alteration halos on fractures.
-gradiationally becomes increasingly clast rich from 757 to 758',
-from 758 to 761.5', graywacke, light grayish green sericitized fg granular siliceous ground mass, poorly developed bedding at 50°, with 20% fg disseminated biotite, and 30 to 40% small qtz and feldspar clasts, a few larger 1/4" lithic clasts of qfp, cherty argillite, and light green sericitized argillite.
-from 761.5 to 764', matrix becomes light green, moderately sericitized, biotite free, clast reduced to 25% , no apparent bedding, very "dacite porphyry", appearing
-from 764', becomes very biotite rich (20%) and clast rich (30%) weakly developed bedding at 45° to ca,
-from 771.7 to 772.2', 6" qtz vn, slightly recrystallized at rims, strongly fractured with calcite fracture filling
-from 772.2 to 776', light green sericitized siliceous ground mass with 20% clasts to 1/4" of qtz, feldspar and light green sericitized argillite.
-at 777', 1/4" coarse vn at 30° to ca, with 1/2" bright green sericitized (very fuchsitic appearing) alteration halo.
-from 780 to 781', graded clast rich bed coarsening down hole with increasing clast size and content to 60%

by 781', with clast to 1/2" of angular to sub rounded qtz, feldspar, qtz, feldspar porphyry, sericite rich light green siliceous argillite, well developed bedding at 50° to ca, biotite rich (15%)
-from 781 to 781.8', graded bed coarsening down hole from a fg clast free biotite rich siltstone to a clast rich graywacke (30%) at 782', 2" bed - zone with spherical to elongate light green to pink cherty siliceous alteration blebs affecting 50% of rock.
-from 782.5 to 783.5', siliceous matrix becomes strongly sericitized, very "dacite porphyry", appearing with numerous thin calcite filled fractures at 25° to ca, and strong sericite alteration halos.
-from 784.5 to 793.5', becomes predominently clast poor graywacke (5%) clasts, very biotite rich (25%) with numerous zones of irregular spotted alteration (siliceous-bleached - alteration blebs) and a few graded zones of coarse clast rich wacke.
-at 787.5', 3" trough of coarser (25% clasts) graywacke
-from 788 to 789', slightly coarser, 10% clasts
-at 791.2', 1/2" light brown siliceous argillite bed at 40 ° to the ca,
-from 791 to 792.5', numerous thin siliceous argillite seams at 45° to the ca, and 40% of rock.
-from 792.5 to 793.5', clast rich (30%)
-overall sulphide content, trace, minor Py and Po associated strickly with calcite fracture filling.

-at 887 to 888', a few 1" elongate cherty siltstone-argillite frags (maybe slumped)
-from 890 to 890.5', softer, sheared, very carbonate rich,
-overall sulphide content, trace to 0.25%, as vfg disseminated Po-Py and PoPy associated with calcite fracture filling
-arbitrary contact with underlying less altered graywacke unit

893' to 904.5' Graywacke - vfg, granular, light gray to light green (weakly sericitized) siliceous siltstone matrix, weakly foliated (poorly developed bedding) at 60° to the ca, although highly variable, with 25 to 30% small (to 1/16") predominently white sub rounded to sub angular qtz and feldspar clasts, occasionally elongate parallel to bedding lending a tuffaceaus appearance to rock, and 10% vfg disseminated biotite, weakly aligned parallel to bedding
-weakly to moderately fractured with sets at 40 to 50°, and 10 to 30° to the ca, with predominently calcite, minor qtz, Py-Po, sericite, biotite fracture filling and weak sericite and bleached - silica alteration halos to 1/4"
-a few larger 1/4" rounded qtz and feldspar clasts (qfp appearing in places)
-some movement along fractures of up to 1/2"
-at 895 to 895.5', matrix is light green,weakly sericitized
-from 897 to 898', matrix is light green, moderately sericitized
-from 900 to 901', a few 1/2" fg siltstone-argillite light brown interbeds, very contorted, slumped, at an average orientation of 50° to the ca, locally a few small scattered garnets.

-overall sulphide content, trace Py, very minor Po associated with calcite-sericite filled fractures
-from 902.5 to 904.5', becomes less clast rich(10%) vfg, slightly sheared appearing with a weak schistosity at 45° to the ca, increased carbonate content as small disseminated blebs to 10%, and a few thin siliceous argillite interbeds at 45° to the ca, weakly chloritic

904.5' to 908' Carbonitized, Sheared, Schistose Metasediment -rock comprised of a vfg, dark gray, very strongly carbonitized, weakly chlorite - sericite altered, strongly schistose (at 55° to the ca) altered medasediment (possibly a graywacke, weak remnant granular texture and a few small carbonate altered clast appearing blebs)
-numerous thin calcite seams parallel sub parallel to schistosity, to 1/4", weakly brecciate rock in places
-strongly fractured at random orientations with calcite and chlorite fracture filling
-0.5% vfg disseminated Po-Py as thin seams and blebs parallel to foliation and associated with calcite fracture filling
-becomes less strongly altered and schistose towards 908', grading into underlying less altered graywacke

908' to 920' Altered (Sericite) Metagraywacke - vfg, light green, granular, siliceous, weakly sericitized matrix with 20% small white sub angular to sub rounded feldspar and qtz clasts, a few larger(to 1/4") siliceous argillite clasts, poorly developed bedding at 55° to ca, weakly schistose in a few places at 55° to ca,

-a few vfg to argillaceous siltstone interbeds
-weakly fractured at random orientations with calcite fracture filling
-numerous small disseminated calcite blebs and stringers throughout rock (lends a weak pervasive carbonitized appearance to rock)
-a few thin (to 1") silicified appearing bands - interbeds (maybe alteration zones as opposed to distinct interbeds)
-from 910 to 911', becomes increasingly schistose and thinly bedded at 55° to the ca, locally very soft, chlorite altered, and strongly carbonitized, with trace, Po as thin slips parallel to schistosity
-from 911 to 912', numerous silicified bands-blebs to 2" parallel to beddding
-at 913', 2" irregular cherty silica band
-at 913.6', 2" cherty siliceous band at 45° to ca,
-from 913 to 917', softer, weakly schistose at 50° to ca, very dacitic appearing
-at 917', 1/4" brown hard biotite - calcite filled fracture /vn at 15° to ca, with trace disseminated Py-Po and strong cherty 1/2" alteration halo
-overall sulphide content, trace, Py-Po associated with calcite filled fractures and alteration halos around fractures.

920' to 925' <u>Altered Siltstone</u> - well developed bedding at 40 to 45° to ca,
-vfg dark greenish gray, thinly bedded, moderately soft, carbonate rich (to 25%) siltstone weakly chloritized, weakly schistose parallel to bedding

-moderately fractured at prefered orientations of 0 to 20° to ca, with calcite and minor Py-Po fracture filling
-from 924 to 925', grades into a graywacke, becomes slightly more siliceous, with 20% small qtz and feldspar clasts by 925'

925' to 929' Interbedded Graywacke and Siliceous Argillite - from 925 to 927', vfg to argillaceous light green, hard, siliceous siltstone-argillite thinly bedded at 45° to ca, a few thin 1 to 2" soft weakly chloritic argillite interbeds, moderately fractured at random orientations with calcite and trace Py fracture filling, numerous small disseminated calcite blebs,
-at 926.4', 2" cherty band with indistinct contacts at 45° to ca,
-at 926.6', 1/4" qtz chlorite vn at 20° to ca,
-from 927 to 929', graywacke, vfg gray siliceous granular matrix with occasional light green weakly sericitized zones, 10% fg disseminated biotite, 15 to 20% small (1/32") qtz feldspar clasts, weakly fractured,
-at 927.9 to 928.3', hard dark green argillite interbed with a few small pale pink garnets to 1/32"
-overall sulphide content, minor Py associated with calcite fracture filling .

929' to 940.5' Siliceous (Cherty) Argillite - Siltstone - foliation (bedding) at average orientation of 35° to ca,
-rock consists predominently of vfg to argillaceous dark gray to black siltstone-argillite, very siliceous, cherty in places
-thinly bedded, some slumped, contorted zones

-contains 10 to 15% fg disseminated black to reddish brown biotite
-contains a few (1 to 2") very small white to pale pink euhedral to subhedral garnets.
-predominently siltstone with rapid grain size changes to argillite with no distinct contacts, occasional distinct argillite interbeds
-moderate to strongly fractured at random orientations with predominently calcite fracture filling, occasional strong silica - bleached and sericite alteration halos
-movement along fractures of up 1"
-a few thin beds contain a few small qtz-feldspar clasts to 1/32"
-from 929 to 932', predominently gray to dark green black siltstone - argillite with a few cherty zones and distinct chert interbeds, with trace Py-Po associated with calcite fracture filling.
-from 932 to 934', predominently cherty argillite, highly contorted, slumped, brecciated appearing, highly fractured at random orientations with qtz and minor calcite chlorite fracture filling, strong bleached alteration halos
-from 934 to 940.5', thinly bedded dark grayish black hard siliceous argillite and slightly softer argillite-siltstone with 10 to 15% vfg disseminated biotite, a few small scattered garnets, numerous small disseminated calcite blebs, and 1% sulphides as vfg blebs elongate parallel to bedding to 1/4" in places, predominently Po with trace, Py, calcoPy, and sphalerite, moderately fractured at random orientations with calcite, chlorite, and Py fracture filling.

-from 938 to 940', a few small 1/4" siliceous blebs (spotted alteration)
-at 939', 2" highly contorted chert interbed
-from 939.5 to 940.5', irregular contact with underlying graywacke, with cherty siliceous argillite seams and beds brecciating (slumped into) graywacke

940.5' to 947' Graywacke-vfg granular gray siliceous matrix with 40 to 50% small (1/32") white sub angular to sub rounded qtz feldspar clasts
-10% vfg disseminated biotite
-weakly developed bedding as indicated by alignment of clasts and biotite at 35° to the ca,
-a few small scattered calcite blebs
-from 941 to 941.5', thin clast free dark gray siliceous siltstone - argillite interbed at 35° to the ca,
-a few graded sequences coarsening down hole
-weakly fractured with only a few thin calcite fill fractures throughout unit at random orientations
-overall sulphide content, trace, minor Py - Po associated with calcite fill fractures and a few small disseminated clastic appearing blebs.

947' to 953' Interbedded Argillite-Siltstone-Graywacke-rock comprised of thinly bedded (average 1", to 2 to 3") (bedding well developed at an average orientation of 40° to ca, although varies slightly throughout unit), interbedded
-black to grayish black argillite, ranging from hard cherty to relatively soft weakly chloritic with numerous small disseminated calcite blebs (10%) a few small scattered garnets, and usually trace fg disseminated Py-Po as thin seams and blebs parallel to bedding and - slightly

coarser, granular appearing hard gray to green siltstone, occasionally clast rich, with contacts gradational
-argillites predominently 90% of rock with 10% siltstone-graywacke
-appears weakly schistose in places parallel to bedding
-weakly fractured at random orientations with predominently calcite fracture filling
-5 to 10% disseminated biotite in all units
-overall sulphide content, trace, Py-Po as vfg disseminated mineralization associated with black argillite beds and with calcite filled fractures
-from 949 to 949.6', siliceous graywacke interbed, very contorted, grades down hole
-from 949.6 to 951', soft, chlorite rich schistose argillite (schistosity in bedding locally at 35° to ca,) with a few thin chert - qtz interbeds
-from 951 to 953', soft, gray to black weakly schistose weakly chloritized argillite and slightly coarser light green soft weakly sericitized altered siltstone, often boudinaged, very fragmental appearing

953' to 954.5' Metagraywacke- vfg granular dark grayish green siliceous matrix with 30% small white feldspar in qtz clasts, 10% small chloritized mafic clots (altered biotite?) and minor disseminated brown biotite
-well developed bedding and apparent weak schistosity at 65° to ca,
-weakly fractured at random orientations with calcite and trace Py fracture filling.

954.5' to 964.5' Interbedded Argillite and Siltstone- bedding well developed at 45° to ca, contorted and slumped in places
-consists predominently of thinly bedded (1 to 2") hard siliceous dark black argillite and slightly coarser dark gray granular siliceous siltstone with a few thin clast rich graywacke interbeds.
-gradationally contacts in places with argillite coarsening to siltstone coarsening to graywacke down hole, elsewhere distinct sharply defined interbeds.
-a few conglomeratic zones with large clasts to 1" of graywacke siliceous argillite in a siltstone - argillite matrix (maybe slumped or brecciated fragments)
-numerous thin calcite fill fractures and thin calcite seams at random orientations
-minor fg disseminated biotite
-a few small disseminated calcite blebs
-overall sulphide content, 1%, predominently Po with trace Py and calcoPy as thin slips and seams parallel to bedding predominently associated with black chloritic argillite and blebs to 1/8" associated with calcite filled fractures and seams
-from 956 to 957', numerous thin graywacke seams and graywacke clasts to 1", a few black siliceous argillite clasts to 1"
-at 957', 1/2" contorted graywacke at 10° to the ca,
-from 956 to 957', locally Po and Py to 2% as blebs to 1/8" associated with calcite filled fractures and calcite seams.
-from 957.5 to 958', locally Po and calcoPy as thin seams and blebs to 1/4" to 2%,
-at 958.5 to 959', slumped contorted graywacke interbed

793.5' to 804' Interbedded Altered(Sericitized, Silicified) Siltstone-Graywacke and Cherty Siliceous Argillite - from 793.5 to 794.5', highly contorted, slumped, light brown to white thinly bedded interbedded biotite rich siliceous siltstone and cherty siliceous argillite

-from 794.5 to 795.5', coarse clast rich graywacke bed vfg sericitized soft granular siliceous matrix, with 40% small (to 1/16") sub rounded to sub angular feldspar and qtz clasts, bedding locally at 35° to the ca, very "dacite porphyry" appearing, trace, vfg disseminated Py.

-from 795.5 to 804', rock predominently vfg to argillaceous light green to strongly sericitized siliceous siltstone-graywacke, clast poor, with only a few zones (unaltered windows) where small qtz and feldspar clasts are present.

-numeorus irregular blebs - bands - beds of biotite rich vrs. sericite rich rock often with very irregular (slumped contorted,) contacts.

-numerous thin cherty siliceous argillite beds from 1 to 2" and silicified cherty blebs - zones (appears to be more of an alteration than a distinct interbed) bedding highly irregular, average orientation of 35° to the ca,

-strongly fractured at random orientations with calcite minor sericite, biotite, qtz, chlorite, fracture filling and occasionally strong sericite and bleached - silica alteration halos.

-overall composition of unit, 40% cherty siliceous argillite 60% siltstone graywacke

-at 799.4', 1/4" hard beige dolomite vn at 80° to ca,

-at 799.8', 1/4" qtz calcite vn at 60° to ca,

-overall sulphide content, trace, Po and Py associated with calcite fracture filling.

804' to 817' Sericitized Siliceous Metasediment -rock consists predominently of a vfg, granular, siliceous light green, weakly to moderately sericitized altered siltstone to graywacke.
-contains 5% disseminated biotite.
-contains a few small qtz and feldspar clasts to 1/32" and 5 to 10% in places, predominently elongate parallel to weakly developed bedding and schistosity at 50° to the ca,
-moderate to strongly fractured at 40 to 50° to the ca, with calcite, minor chlorite, sericite, biotite and Py fracture filling.
-some minor movement to 1/4" along fractures
-a few zones with strong spotted alteration, spherical to elongate bleached-silica alteration blebs to 1/2"
-from 805 to 805.5', locally biotite to 20%
-at 808', 1/4" calcite biotite filled fracture at 25° to ca, with 1" strong bleached alteration halo and numerous disseminated cubic Py blebs to 1%, locally host rock is strongly silicified (spotted alteration blebs to 1/2")
-from 812', increasingly siliceous, increasingly altered with bleached - silica alteration blebs affecting 30 to 40% of rock.
-at 814.4', 2" cherty siliceous argillite interbed at 45° to the ca,
-at 815', 2" bleached-silica altered "zone"
-from 814 to 817', becomes strongly fractured at 20° to ca, with calcite fracture filling and trace Py.
-overall sulphide content, trace, Py associated with calcite fracture filling.

817' to 826.5' Interbedded Light Green Sericitzed Siliceous Metasediment And Cherty Argillite - from 817 to 819', predominently vfg granular siliceous light green weakly sericitized rock poorly developed bedding at 40° to ca, numerous irregualr blebs of bleached - cherty silica alteration to 1", calcite to 10% as vfg disseminated mineralization throughout rock, moderate to strongly fractured with predominently calcite fracture filling, trace Py,
-from 819 to 821.5', becomes thinly bedded (1/4 to 1/2" light green weakly sericitized medasediment with numerous thin cherty siliceous argillite interbeds to 60% of rock, often very irregular contorted beds and boudinaged/ brecciated fragments of siliceous argillite, average bedding orientation at 45°, beds often very diffuse, with indistinct contacts, and often appear more an alteration (silicification)
-from 821.5 to 823', as above, with cherty argillite interbeds to 10%
-from 823 to 824', predominently cherty argillite, very slumped deformed bedding at an average orientation of 45°, with numerous thin calcite and hard brown biotite veins/filled fractures at 15 to 20° to the ca, with trace fg disseminated Py-Po and strong cherty alteration halos to 1",
-from 824.5 to 826.5', green cherty siliceous medasediment fg, granular
-at 825.3', 1/4" hard brown biotite and calcite vn/filled fractures at 20° to ca, with minor disseminated Py and a strong 1/2" cherty alteration halo.
-at 817', at 15° to ca, 1/4" calcite and green mafic filled mineral fracture with trace disseminated Py.

-from 817 to 817.5', numerous bleached cherty appearing alteration blebs to 1"
-at 823.5', 1/4" calcite and black unknown mafic mineral filled fracture at 10° to the ca, with trace disseminated Py-Po
-at 825.5', 1" band of disseminated hard brown biotite ? blebs to 1/16" at 45° to the ca, locally disseminated calcite to 20% with minor vfg disseminated Po and calco Py.
-at 826', 1/4" band of disseminated hard brown biotite ? at 45° to the ca, with minor disseminated Po, locally very carbonate rich
-entire unit appears weakly carbonitized
-overall sulphide content, 0.25%, vfg disseminated Po with trace Py and calco Py and minor mineralization associated with calcite fracture filling.

826.5' to 835' Altered (sericitized, silicified) Metagraywacke - fg to light gray to green siliceous weakly sericitized qtz type ground mass with a few small predominently feldspar occasionally qtz clasts to an average 5%, in places to 25%
-clast occasionally elongate parallel to weakly developed bedding at 65° to the ca, lending it to tuffaceous appearance to rock
-numerous bleached-silicified "spotted alteration" blebs to 1/2",
-numerous small calcite blebs to 10% of rock lend weak pervasive carbonitized appearance to rock.
-moderate to strongly fractured with predominently calcite, minor Py-Po fracture filling, fractures randomly oriented
-from 831 to 831.5', cherty siliceous argillite interbed at 40° to the ca, thinly bedded contorted, light green to light purple, weakly sericitized, surrounding graywacke

intensely silicified.
-from 833 to 835', clasts to 25% and 1/2", predominently qtz, feldspar, a few lithic qtz feldspar porphyry clasts.
-overall sulphide content, trace, Py-Po associated with calcite fracture filling.

835' to 893' Altered (sericite, silica) Siliceous Metagraywacke - rock predominently siliceous graywacke with varying intensities and types of alteration (the term graywacke is used to describe the unit, although intensely altered and very dacitic appearing, a few unaltered windows illustrate well developed clastic/granular texture)
rock comprised predominently of a fg to vfg granular, siliceous, light green, weakly sericitized matrix, with a varying clast content, average 10%, to 40% in places clast predominently small (to 1/16") qtz, feldspar, occasionally large lithic clasts to 1/4" of sericitized argillite, and qtz, feldspar.
-foliation variable, poorly developed bedding and weak schistosity at an average orientation of 65° to the ca, ranges from 40 to 70°
-contains numerous irregular white to light pink to light green siliceous alteration blebs to 1", semi spherical to elongate parallel to foliation, in places appear almost clastic, but with very indistinct contacts with matrix, affects approx, 20% of rock,
-numerous small disseminated calcite blebs throughout unit to 5% of rock.
-rock is moderately fractured at random orientations with predominently calcite fracture filling, minor qtz, sericite, chlorite, biotite, Py , in places with strong sericite and bleached - silica alteration halos

-a few biotite rich and siliceous alteration patches throughout unit and minor disseminated biotite in matrix in places.
-at 835.5', 2" cherty band at 45° to the ca,
-at 838', numerous calcite filled fractures with cubic Py blebs to 1/32"
-at 841',2" cherty siliceous argillite interbed at 40° to the ca,
-from 841 to 841.5', very bleached, silicified, with numerous thin qtz calcite stringers weakly brecciating rock
-at 841.5', calcite fill fractures at 35° to the ca, with numerous small 1/16" Py cubes.
-from 841.5 to 846.5', locally spotted alteration - silica blebs to 60% of rock, parallel to weakly developed bedding locally at 70° to the ca,
-from 844 to 846.5', locally biotite rich, with 10% fg disseminated reddish brown biotite.
-from 846.5 to 850', less altered, well developed graywacke texture with 30 to 40% small qtz and feldspar clast, a few larger rounded qtz clasts to 1/4", a few elongate clasts parallel to weakly developed bedding at 65° to the ca, a few patches of spotted silica alteration in close spacial association with major calcite filled fractures
-at 847.5', 6" zone with spotted alteration blebs affecting 30% of rock
-at 851.3', 1/4" calcite qtz vn at 40° to the ca, with a few small disseminated Py blebs and a strong 2" soft brownish gray sericite-carbonate alteration halo.
-from 850 to 859', remnant graywacke texture well developed with 20% small qtz feldspar clasts, less strongly altered, (spotted alteration blebs restricted to zones proximal to major fractures)

-859 to 860.5', intensely fractured at random orientations with calcite fracture filling and very strong silicification as blebs and bands to 2", locally 0.25% vfg disseminated Py associated with calcite filled fractures.
-from 860.5 to 861.5', appears carbonitized, with numerous small calcite blebs to 20% of rock, softer, sheared appearance.
-at 861.5', a few thin 1/4" cherty siliceous argillite beds at 55° to the ca,
-from 862', less silica altered,
-at 862.3', thin qtz filled fracture with numerous small calcoPy blebs to 1/16", fg to vfg light green sericitized siliceous matrix with 10 to 20% small qtz and feldspar clasts, spotted alteration blebs only 5% of rock and restricted to zones proximal to fractures, numeorus disseminated calcite blebs to 10 to 15% of rock, strongly fractured with a few calcite and sericite alteration halos, unit weakly schistose at 50° to the ca,
-at 865.5', a few 1/16" calcite filled fractures at 45° to the ca, with thin carbonate alteration halos and minor fg disseminated Py-Po,
-at 866', 1/8" qtz calcite biotite filled fracture with 1/2" sericite carbonate alteration halo and 0.5% fg disseminated Py-Po
-from 866.5 to 868.5', numerous light green to pale reddish pink vfg cherty bands-seams at irregular orientations averaging 50° to the ca, to 60% of rock, surrounding graywacke intensely silicified,
-from 868.5 to 870', softer, sheared appearing with small disseminated calcite blebs to 20% of rock and locally minor vfg disseminated Po-Py.

-at 870', 1/4" qtz calcite and hard brown biotite vn at 25° to the ca, with minor disseminated Po-Py and strong 1" cherty alteration halo with 1% vfg disseminated Py-Po
-at 870.2', 1" calcite rich siliceous cherty alteration zone at 50° to the ca, with 1% vfg disseminated Po
-from 870 to 872.5', predominently light green chert, no apparent beddding, a few pink highly fractured zones at weak prefered orientation of 40 to 50° to the ca, with calcite, qtz, minor sericite,biotite, Po-Py fracture filling and trace vfg disseminated Po-Py, a few chlorite sericite altered graywacke bands to 1", at 50° to the ca,
-from 872.5 to 884.5', becomes slightly darker green, softer, fine grained relatively siliceous, moderately sericitized altered matrix with 5 to 10% small qtz feldspar clasts and a few larger qtz/silica clasts ? alteration blebs to 1/2", weakly foliated, with bedding and weak schistosity at 65° to the ca, appears weakly carbonitized with 10% vfg disseminated calcite blebs, moderately to strongly fractured at random orientations with calcite fracture filling, disseminated cubic Py and minor Po to .25%, and minor Py-Po fracture filling associated with calcite.
-from 884.5 to 887', siltstone-argillite interbed, cherty light green to pale reddish brown siliceous siltstone-argillite, poorly developed bedding at 45° to the ca, very contorted, slumped in places with a few thin calcite filled fractures and sericite alteration halos with trace vfg disseminated Py
-from 887 to 893', light green strongly sericitized siliceous granular matrix with 10% small qtz feldspar clasts and 10% small silicification blebs, a few unaltered windows of biotite rich siltstone matrix with 20 to 30% qtz feldspar clasts.

-at 959.3', 1/4" semi massive Po band at 45° to the ca,

964.5' to 970' Metagraywacke - predominently a vfg gray to light green siliceous matrix, well foliated - bedded at 65° to the ca, weakly schistose, weakly sericitized in places
-30 to 40% small(to 1/16") predominently feldspar, minor qtz, clasts and a few larger lithic clasts to 1/4" of black siliceous argillite
-numerous small elongate mafic clots parallel to foliation (chlorite altered biotite)
-a few thin boudinaged gray argillite interbeds to 1/4"
-from 965.5 to 966', a few thin calcite - chlorite seams at 0 to 10° to ca, with trace fg disseminated Po-Py
-moderatly fractured at random orientations with calcite and trace Py-Po fracture filling
-overall sulphide content, trace, as above.

970' to 979' Interbedded Argillite-Siltstone-Graywacke - rock comprised of interbedded thinly bedded (1/2 to 2") black siliceous cherty argillite, softer gray to black argillite - siltstone and graywacke.
-well developed at 45 to 50° to ca, varies slightly throughout unit with minor slumping.
-predominently siltstone with argillite and graywacke interbeds, sharp contacts as well as graded contacts.
-moderately fractured at random orientations with calcite and chlorite fracture filling
-some movement along fractures
-overall sulphide content, trace, Po and Py as thin seams in argillite interbeds and Py associated with calcite filled fractures.

-970', 2" qtz vn at 65° to the ca, medium grained granular recrystallized.
-at 971', 4" clast rich graywacke interbed at 45° to the ca,
-at 974.2', 4" smokey gray medium granular qtz vn at 65° to the ca, with a few thin sericite seams
-at 975.3 to 976.5', graywacke interbed.

979' to 985' Interbedded Argillite - Siltstone- bedding at an average orientation 65° to the ca, although highly deformed, contorted in places with strong ssd features and slumping
-rock consists of thinly bedded (1/16 to 1 ")light gray siliceous hard cherty argillite, dark grayish green softer weakly chloritic argillite, and slightly coarser gray granular siltstone.
-siltstone beds, in places contain a few lithic frags of argillite to 1",
-moderatly fractured at random orientations with calcite minor qtz, sericite, chlorite fracture filling with trace Py-Po and a few strong bleached and sericite alteration halos
-overall sulphide content, trace, Po-Py associated with calcite filled fractures.
-from 983 to 984', locally very cherty
-overall composition approx., 80% soft, argillite and siltstone, and 20% cherty argillite.

985' to 990' Brecciated Interbedded Argillites and Graywacke- from 985 to 986', dark gray to vfg to argillaceous moderately hard relatively siliceous argillite, weakly brecciated by numerous thin calcite seams to 1/4" at random orientations with minor qtz, chlorite, and 1% Po as small disseminated blebs to 1/8" in calcite seams, locally bedding

approx., 45° to the ca, fragment matrix ration approx., 98/2
-from 986 to 987', very intensely brecciated with a fragment/matrix ratio of 60/40, with 40% angular fragments from 1/16 to 1" of siliceous light green to gray cherty argillite in a white qtz-carbonate (qtz,chert, and hard white magnesite) matrix, weak foliation at 60° to the ca, although highly variable, major qtz carbonate vn at 0° to the ca, appears to off set bedding and control brecciation, with movement along vn to 6", locally 1% Po trace Py as fg disseminated blebs in both breccia matrix and fragments, minor sericite and chlorite with qtz carbonate breccia seams.
-from 987 to 990', thinly bedded (1 to 3") interbedded graywacke, gray siliceous fg granular matrix with 30% small feldspar and qtz clasts, and dark gray siliceous cherty argillite, and light green softer weakly chloritic argillite, all units are weakly brecciated around a major 1/2" qtz calcite chlorite talc sericite vn at 0° to the ca, with major off setting of units by as much as 6", locally Po and Py to 1% as blebs to 1/8" along vn
-unit is very intensely fractured around major vn (latter type fractures) with calcite and sulphide fracture filling.
-overall sulphide content throughout unit, 1%, predominently Po,trace Py and sphalerite.

990' to 999' <u>Interbedded Argillites - Siltstones - Graywacke</u> - thinly bedded (average 1 to 2", an average orientation of 50° to the ca,) interbedded.
-gray to green vfg siliceous hard cherty argillite and
-softer gray to green slightly coarser more granular appearing siltstone and - siliceous graywacke, gray to

light green weakly sericitized matrix with 30 to 40% small (1/16") white sub angular to sub rounded qtz and feldspar clasts.
-bedding often very contorted, deformed
-often gradational as opposed to distinct bedding contacts.
-minor disseminated biotite in a few beds and irregular patches, to 10% in places
-moderate to strongly fractured at random orientations with calcite minor qtz and chlorite fracture filling and strong sericite and bleached - silica alteration halo to 1/2"
-minor vfg disseminated Po in a few argillite beds
-a few small calcite blebs in a few siltstone argillite beds
-many of these siliceous argillite interbeds maybe altered patches, indistinct contacts
-numerous thin white fine granined granular recrystallized qtz stringers throughout unit
-from 997.5 to 998', locally reddish brown vfg biotite rich siliceous argillite - siltstone with 10% small elongate acicular appearing calcite blebs to 1/8"
-a few thin siltstone beds, usually very carbonate rich (disseminated calcite to 20%)
-from 998 to 999', weakly brecciated in places by hard white silica and minor calcite seams parallel bedding at 45° to the ca, locally black siltstone is very carbonate rich
-overall sulphide content, trace, vfg disseminated Po in a few argillite beds and minor Po - Py associated with calcite fracture filling

999' to 1001' Graywacke-vfg to argillaceous light gray siliceous matrix with 15% fg disseminated biotite and 25 to 30% small feldspar and qtz clast to 1/16", a few chloritized mafic clasts, weakly fractured at random orientations with calcite fracture filling and weak sericite (1/4") alteration halos, no apparent bedding, nvs

1001' to 1011' Interbedded Argillite - Siltstone - Graywacke- bedding averages 50° to the ca, thinly bedded (1 to 2") interbedded -light gray to green, soft, schistose (parallel to bedding at 50°) weakly chlorite - sericite altered argillite-siltstone, vfg, a few small qtz and feldspar clasts (less than 1%) minor disseminated biotite, trace, fg disseminated Po and calco Py, and - gray to black cherty argillite and - graywacke

-occasional bands - beds of irregular spherical to slightly elongate silicificed blebs to 1/4"

-very irregular slumped contacts, often well defined, often gradational

-all units are moderate to strongly fractured at random orientations with predominently calcite fracture filling, and occasional bleached - silica and sericite alteration halos

-from 1001 to 1002.5', predominently soft schistose argillite - siltstone

-from 1002.5 to 1004', predominently gray cherty argillite with a few coarse clastic graywacke beds to 1"

-from 1004 to 1004.5', thinly bedded siltstone and gray siliceous argillite, locally biotite rich to 20%, and a few bands of pinkish white silicification blebs to 1/4"

-from 1004.5 to 1007', graywacke, light green moderately sericitized siliceous matrix with 10 to 50% small(to 1/16") feldspar and qtz clasts, very "dacite porphyry" appearing

where clast poor, some graded beds coarsening down hole
-from 1007 to 1010', predominently thinly bedded, contorted, deformed, light green to light brown cherty argillite with numerous thin fg disseminated biotite rich beds, very strongly fractured with calcite fracture filling and trace fg disseminated Py in a few cherty argillite beds, a few softer strongly sericitized interbeds
-from 1010 to 1011', qtz carbonate vn, predominently milk white to translucent gray qtz with 10% carbonate as hard fibres acicular (magnesite) inter growths and gray calcite seams along fractures, a few blebs of bright light green epidote, trace fg disseminated Py along a few carbonate filled fractures
-overall sulphide content, trace, fg disseminated Po-Py and Po-Py associated with calcite filled fractures.

1011' to 1016' Sericitzed, Siliceous Metagraywacke- light green to moderately sericitized, vfg to argillaceous siliceous matrix, weakly schistose at 40° to ca, very "dacite porphyry" appearing, with 30% small (to 1/16") sub angular to sub rounded white qtz and feldspar clasts.
-weakly to moderately fractured at prefered low angle orientation of 0 to 30° to the ca, with calcite, sricite, fracture filling, and occasional minor sericite chlorite, biotite rich alteration halos, a few qtz filled fractures, trace, Py-Po along fractures.
-no apparent bedding
-a few silicified zones with irregular brownish pink silica patches to 1/4", usually proximal to fractures
-at 1012', 2" irregular qtz - gray calcite vn

1016' to 1022.5' Biotite Rich Siltstone-Graywacke - from 1016 to 1018', thinly bedded contorted dark brown biotite rich (25%) vfg hard siliceous siltstone with numerous thin irregular siliceous white to gray to green cherty siliceous argillite interbeds or alteration bands - blebs, a few thin softer chlorite - sericite argillite seams - beds
-from 1018 to 1022.5', dark brown vfg biotite rich siltstone matrix with qtz and feldspar clasts to 30%, 1/16", a few larger (to 1/4") cherty siliceous argillite clasts, in places small (1/2") spherical to elongate parallel to poorly developed bedding at 45° to the ca, light green weakly sericitized and silicified alteration blebs affect 30% of rock .
-from 1019.5 to 1020.5', numerous 1 to 2" clast free bright green siliceous bands at 35° to the ca,
-at 1020', 1/2" light green weakly sericitized chert band at 35° to the ca,
-from 1020.5 to 1022.5', 30 to 40% small qtz feldspar clast -unit is weakly fractured at random orientations with calcite, sericite, qtz fracture filling with trace Py, and sericite alteration rims to 1"

1022.5' to 1030.5' Altered Siltstone- rock consists predominently of a vfg granular dark brownish gray biotite rich (25%) hard siliceous siltstone
-poorly developed bedding at 50° to the ca,
-numerous thin bands-beds and zones of irregular spotted alteration with small (1/8 to 1/4") spherical to elongate parallel to bedding blebs of light green weakly sericitized silicified rock and dark biotite rich spots, maybe altered clasts but very indistinct contacts with matrix,

calcite, biotite fracture filling and trace, Py-Po
-numerous small disseminated calcite blebs and stringers to 10% in places, lends a weak pervasive carbonitized appearance to rock
-from 1032 to 1034', vfg, clast poor (10%, very carb rich, 20%)
-from 1033.5 to 1033.8', very strongly sheared, schistose appearing at 70° to the ca, soft, chlorite-carbonate rich
-at 1035.5', 1/2" qtz vn at 55° to the ca, fg,sugary, recrystallized, with trace fg disseminated Po
-overall sulphide content, trace, Po-Py associated with carbonate fracture filling and minor vfg disseminated mineralization.
-from 1036 to 1049', altered (sericitized, silicified) interbedded siltstone and graywacke.
-from 1036 to 1040', predominently vfg granular hard siliceous light brown siltstone with minor disseminated biotite (5 to 10%), and numerous thin contorted light white to green weakly sericitized cherty argillite beds, and a few coarse clast rich (30%) graywacke beds, bedding varies from 45 to 90° to the ca, spotted alteration in places with small brown biotite - chlorite - silica rich blebs to 1/4", weakly schistose in places at highly variable orientations predominently parallel to bedding weakly fractured at a prefered orientation of 30 to 50° to the ca, with calcite and trace fg disseminated Py fracture filling and strong sericite and bleached-silica alteration halos to 1/4"
-from 1040 to 1045', becomes predominently a soft weakly schistose, thinly bedded (at 40°) strongly sericitized light green weakly carbonitized siltstone, with numerous small calcite blebs to 1/16" (altered clasts ?) and

numerous thin diffuse reddish brown to white granular siliceous interbeds - bands, trace, fg disseminated Po - Py, very sheared appearing
-from 1045 to 1046.5', becomes vfg granular light green siliceous rock with bands of hard pale reddish brown biotite rich argillite and blebs of spotted alteration silica patches affecting 30% of rock, locally schistosity at 70° to the ca, nvs.
-from 1046.5 to 1049', becomes vfg brown siltstone, biotite rich to 30%, very hard, siliceous, with numerous spotted alteration silicification blebs affecting 20% of rock.
-at 1048', 1/4" calcite-sericite-chlorite filled fracture at 30° to the ca, with a few Po blebs and 1" strong zone chert-sericite alteration halo
-overall sulphide content, trace, Po-Py as vfg disseminated mineralization in altered zones and associated with calcite filled fractures

1049' to 1051' Graywacke- weakly developed bedding at 50° to the ca, vfg light grayish green weakly sericitized matrix with 70% small qtz and feldspar clasts, grades, coarsens down hole with clasts to 1/16" of minor 5% vfg disseminated biotite, weakly fractured at random orientations with calcite fracture filling and weak sericite alteration halos nvs.

1051' to 1074.5' Interbedded Cherty Siliceous Argillite and Siltstone- thinly bedded (1 to 3") predominently - argillite, gray, cherty, hard, occasionally light green weakly sericitized or pale reddish brown (with minor disseminated biotite, and minor - argillite - siltstone, hard siliceous gray argillite similar to above unit but slightly coarser, more granular appearing, with 10 to 20% vfg disseminated biotite and - siltstone- graywacke, a softer light to

dark green biotite rich siltstone often weakly schistose sheared appearing, weakly chlorite - sericite altered, with small qtz and feldspar clasts to 5%
-overall composition approx 60% cherty argillite, 35% biotite rich argillite - siltstone, and 5% graywacke.
-bedding variable from 35 to 60°, average 45 to 50° to the ca,
-contacts often deformed, contorted, slumped, particularly in cherty beds, contact often gradational
-coarser siltstone beds often very calcite rich with 10 to 15% disseminated calcite
-rock is moderately fractured at random orientations with predominently calcite, minor qtz, chlorite, sericite fracture filling and occasional trace Py - Po, occasional cherty and sericite alteration halos to 1/4"
-a few thin cherty beds are often carbonate rich with thin calcite - sericite seams parallel to bedding and fg disseminated calcite
-overall sulphides, trace, predominently Po, minor calcoPy Py associated with soft shear zones and carbonate fracture filling
-from 1055 to 1055.5', locally chert is bleached, white, to pale reddish brown where biotite is present
-from 1055.5 to 1057', very soft, sheared, (schistosity at 50° to ca,) chlorite-carbonate schist, chlorite altered carbonitized siltstone with 2% sulphides as vfg disseminated blebs and slips parallel to schistosity of Po with trace calcoPy.(calcoPy mantles Po)
-from 1058 to 1060', numerous 1 to 2" milky chert bands at 50° to the ca,
-from 1060.5 to 1061', soft gray weakly chloritic carbonitized weakly schistose altered siltstone with trace vfg

-moderately fractured at random orientations with strong bleached and sericite alteration halos to 1/2", predominently calcite minor qtz fracture filling.
-occasionally very calcite rich with 5 to 10% disseminated calcite in places
-occasional bands of light green sericite altered rock to 2 to 3"
-appears brecciated in places by thin indistinct bleached seams, occasionally by thin calcite seams
-a few thin clast bearing "graywacke" zones
-from 1023 to 1024.8', spotted alteration blebs affect 70% of rock
-from 1024.8 to 1026.5', light green soft sericite rich and hard cherty alteration bands and blebs to 3" affect 90% of rock, weakly brecciated by numerous thin vfg calcite seams with trace fg disseminated Po
-from 1028 to 1030.5', rock completely affected by alteration blebs, very siliceous, cherty
-overall sulphide content, trace, Po - Py associated with fractures and minor vfg disseminated mineralization.

1030.5' to 1036' <u>Sericitized Siliceous Metagraywacke-</u> weakly developed bedding at 40° to the ca, as exhibited by alignment of clasts
-rock composed of a vfg granular light green weakly sericitized hard siliceous matrix with minor disseminated biotite (5 to 10%), and 10 to 40% (highly variable) small (1/16") sub rounded to sub angular qtz and feldspar clasts, a few dark green weakly chlorite - sericite altered mafic clasts, a few clast elongate parallel to foliation lending to tuffaceous appearance to rock,
-rock is weakly fractured at random orientations with

disseminated Po.
-from 1061 to 1061.5', vfg light green cherty argillite bed with 30% fg disseminated

1074.5' to 1086' Interbedded Siltstone and Altered (chlorite, sericite, carbonate) Metasediment - rock composed of interbedded - 1. predominently vfg gray to light brown granular siliceous thinly bedded biotite rich siltstone, biotite rich siltstone, biotite approx 20%, bedding averages 45° to the ca, weakly aligned biotite parallel to bedding, occasionally a few qtz feldspar clasts to less than 1%, occasionally very calcite rich, weakly to moderately fractured at random orientations with chlorite, calcite sericite, qtz fracture filling and occasional bleached-silica and sericite alteration halos
-to dark greenish gray soft moderately carbonitized weakly chloritized-sericitized in places vfg weakly granular altered medasediment (siltstone ?) poorly developed bedding at 45° to the ca, weakly schistose parallel to bedding, a few zones with small qtz feldspar clasts to less than 1 to 2%, strongly fractured with calcite chlorite fracture filling and minor vfg disseminated Po.
-from 1074.5 to 1078', predominently siltstone
-from 1078 to 1082', predominently soft altered medasediment appears conglomeratic in places with 1 to 2" cherty argillite and soft altered siltstone rounded clasts.
-from 1082 to 1085', predominently siltstone
-from 1085 to 1086', predominently altered medasediment at 1085.9', 2" graywacke bed at 65° to the ca,
-overall sulphide content, trace, fg disseminated Po in altered zones and trace Py - Po associated with calcite fill fractures.

1086' to 1089' Graywacke - vfg weakly to moderately sericitized matrix light green, with 10 to 20% small disseminated carbonate blebs and seams lending weak pervasive carbonitization appearance to rock with 40% small (to 1/16") sub angular to sub rounded white feldspar and qtz clasts (appears very much like a dacite porphyry)
-weakly fractured at random orientations with calcite fracture filling.
-overall sulphide content, trace, vfg disseminated Po associated with calcite fill fractures.

1089' to 1100' Siltstone with Graywacke Interbeds- rock comprised of predominently of light brown to gray vfg granular siltstone, poorly developed bedding at 50° to the ca, although highly variable, as indicated by thin biotite rich (1/16") seams-beds overall vfg disseminated biotite to 10% of rock, rock is relatively soft, weakly schistose parallel to bedding in places, with weak associated sericite alteration
- a few indistinct frag-clast rich graywacke zones (graded beds) and a few small (5 to 10%) qtz, feldspar clasts.
-weakly fractured at prefered low angle orientation of 10 to 30° to the ca, with predominently calcite fracture filling and a few sericite and bleached - silica alteration halos to 1/4", minor Po - Py associated with calcite fracture filling
-a few small disseminated calcite blebs throughout rock
-a few thin (1/4") cherty argillite interbeds, often highly contorted
-a few spotted alteration blebs of bleached silica, (possibly very altered clasts)
-from 1089 to 1090', a few thin 1 to 2" graywacke interbeds at 50° to the ca, locally siltstone is vfg, soft, sericitized, with minor fine grained disseminated Py.

-from 1095.5 to 1098', rock becomes lighter green, softer, moderately sericitized (biotite is gone) with numerous thin 2 to 3" graywacke beds, (graywacke is clast rich with 30% small qtz feldspar clasts)
-from 1098 to 1100', graywacke interbed, light green sericitized to light brown biotite rich siltstone type matrix with 15% feldspar and qtz clasts to 1/16", strongly fractured with sericite and silica bleached alteration halos
-overall sulphide content, trace to 0.25%, as vfg disseminated Po and Py in siltstone and Py-Po associated with calcite filled fractures.

1100' to 1106' Biotite-Chlorite-Calcite "Schist" - rock comprised of a soft, fg, granular to weakly crystalline ? appearing weakly schistose (at 70 to 90° to the ca, sheared appearing) biotite - chlorite - carbonate rich rock (composition approx 50% biotite, 30% calcite, 20% chlorite)
-numeorus thin qtz (1/8") blebs and irregular seams at random orientations to 5% of rock
-a few thin cross cutting and parallel calcite seams
-moderately fractured at random orientations with calcite fracture filling and trace Po
-overall sulphide content, 3%, predominently vfg disseminated non magnetic Po blebs parallel to weak schistosity to 1/32" with minor calcoPy as cores of a few Po blebs, and minor Py as fracture filling
-very altered, intrusive appearing, appears almost lamprophyric
-numerous small disseminated sericite clots throughout rock
-at 1100', 1/4" qtz calcite talc vn at 20° to the ca, with a few small 1/8" Po blebs.

1106' to 1114.5' Sericitized Siliceous Metagraywacke- predominently a vfg to argillaceous light green moderately sericitized siliceous hard matrix with minor disseminated (5%)biotite in places, a few small disseminated calcite blebs and stringers, weakly foliated (poorly developed bedding and weak schistosity) at 50° to the ca,
-25 to 30% small (to 1/16") sub rounded to sub angular white feldspar, qtz clasts, occasionally dark qtz "eyes" and occasional small chloritized mafic clasts, weakly aligned in places parallel to crudely developed bedding a few clast rich vrs clast poor graded beds, in places appears very (dacite porphyry)
-weakly fractured at random orientations with predominently calcite fracture filling, and a few thin sericite alteration halos
-overall sulphide content, trace Py associated with calcite fracture filling
-at 1106', 1/2" med. grained granular recrystallized qtz vn at 70° to the ca,
-from 1106 to 1107', very siliceous, with numerous elongate blebs to 1/2" of spotted alteration, pinkish brown to light gray silicified - bleached blebs at 65° to the ca,
-from 1110 to 1111', vfg cherty siliceous argillite-siltstone seams at 65° to the ca,
-from 1112 to 1113', numerous thin vfg clast free beds at 60° to the ca, some with associated weak chlorite alteration, some with silicified patches and blebs.

1114.5' to 1125.5' Interbedded Cherty Siliceous Argillite and Siltstone -
--thinly bedded (bedding averages 1 to 2") (average orientation 55°, but very contorted, ranges from 40 to 70°) interbedded- 1. siltstone, very siliceous, vfg, granular, dark gray to brown biotite rich (10 to 15%) siltstone, bedding exhibited by thin bands of biotite rich vrs. biotite poorl siltstone, cherty in places, and - 2. light green weakly sericitized to dark gray cherty siliceous argillite, often with thin biotite seams parallel to bedding
-occasional thin softer sericitized light green argillite interbeds
-composition approx., 60% siltstone, 35% cherty argillite,
-moderately fractured at random orientations with predominently calcite, minor qtz fracture filling, with occasional sericite and bleached - silica alteration halos (bleaching halos prominent in cherty sections with light green sericite halos prominent in siltstone)
-numerous thin chlorite-calcite seams (1/16") parallel to bedding, particularly in cherty zones
-overall sulphide content, trace, minor vfg disseminated Py and cherty argillite beds and trace Py-Po associated with calcite filled fractures.
-at 1116', 2" bleached cherty argillite zone
-at 1118', a few 1/4" qtz magnesite vn at 90° to the ca,
-from 1120.8 to 1121.3', 6" coarse clastic graywacke interbed at 60° to the ca, vfg siliceous matrix with 80% small white feldspar and qtz clasts, 5% small biotite clots.
-at 1122.2', 2" clast rich graywacke interbed, indistinct graded contacts.

1122.5' to 1144.5' Graywacke - predominently a coarse clast rich graywacke with a vfg to argillaceous light green, weakly sericitized matrix and 50 to 60% clasts to 1/8" of sub angular to sub rounded white predominently feldspar, minor qtz
-a few lath shaped clasts give very "dacite porphyry" appearance to rock
-a few less clast rich sections, some crude graded bedding in places
-5 to 10% disseminated biotite throughout rock, at weak prefered orientation of 60 to 70° to the ca, (schistosity) very poorly developed bedding at 70° to the ca, as exhibited prefered orientation of larger elongate clasts.
-weakly fractured at random orientations with calcite minor qtz chlorite and Py fracture filling.
-a few small calcite blebs in stringers in rock, predominently parallel to foliation
-1125.5 to 1127', numerous thin 1/4" qtz with minor calcite vn at 60° to the ca, with a few small (1/32") Po blebs
-from 1127 to 1127.5', tightly packed feldspar, qtz clasts to 95% of rock with minor light green sericitized siliceous matrix, and numerous thin qtz seams to 1/4" at 60° to the ca,
-from 1129 to 1130', numerous thin bands to 1" at 60 to 65° to the ca, of strong sericite alteration occasional with thin cherty argillite beds/vn ?
-from 1130.8 to 1131.4', 3" qtz vn at 20° to the ca, coarse grained granular recrystallized qtz, highly fractured with minor gray calcite fracture filling and trace disseminated Po, very strong sericite alteration at rims.
-at 1132.5', 2" qtz vn at 70° to the ca,coarse grained recrystallized qtz with a few gray calcite blebs and locally a few thin thiner qtz calcite seams at 70° to the ca,

-from 1132 to 1134', finer grained, less clast rich (10 to 15%) with a few coarse graded interbeds.
-from 1136 to 1138', numerous 1 to 2" strongly sericitzed light green bands to 60° to the ca, locally a few very clast rich (90%) graywacke beds in sericite carbonate rich matrix
-at 1138', 1/4" qtz vn at 70° to the ca,
-at 1138.7', 1/4" coarse grained granular recrystallized qtz vn at 70° to the ca,
-at 1139 to 1141', fg clast poor (5 to 10%), clast very small(less than 1/32")
-1142.5', 1/4" qtz vn at 85° to the ca, with a light green clast rich (95%) zone rimming the vn
-locally from 1144 to 1144.5', clast to 90% (graded bedding coarsening down hole)
-overall sulphide content, trace, a few Po - Py blebs associated with qtz vn and calcite filled fractures.

1144.5' to 1152.5' <u>Interbedded Siltstone and Cherty Siliceous Argillite</u>
-rock consists of thinly bedded (1 to 2", at an average orientation of 50° to the ca,) interbedded
-predominently, pale reddish brown cherty argillite
-gray hard cherty argillite
-and softer, slightly coarser gray to green weakly schistose biotite rich (20%) weakly chlorite to sericite altered to very calcite rich to (20%) siltstone, usually with 1 to 2% vfg disseminated Po with minor calco-Py and Py
-bedding highly variable throughout unit ranging from 0 to 90° to the ca,
-moderate to strongly fractured in places at random orientations with calcite, minor qtz, sericite, chlorite, Py-Po fracture filling and an occasional sericite and bleached-silica alteration halos to 1/2".

-from 1144.5 to 1146', cherty argillite predominent, somewhat contorted with weakly developed bedding at 50° to the ca, numerous thin 1/16" cross cutting calcite seams at 90° to the ca, locally 10 to 15% very small thin acicular light green mafic mineral crystals (unknown mineral), with trace, vfg disseminated Po throughout rock.
-from 1146 to 1148', predominently gray cherty argillite with numerous biotite seams to 10%
-from 1148 to 1152.5', becomes thinly bedded interbedded cherty argillite and siltstone as above, with siltstone to 60% and locally 1% disseminated Po with trace calco-Py
-overall sulphide content, 1%, predominently Po, minor Py calco-Py as vfg disseminated mineralization associated with siltstone and minor mineralization associated with calcite filled fractures.

1152.5' to 1154' Graywacke - weakly foliated (poorly developed bedding and weak schistosity) at 50° to the ca, as exhibited by alignment of clasts and biotite
-light gray to green weakly sericitized vfg siliceous matrix with 5 to 10% disseminated biotite and 60 to 70% small to (1/16") white sub rounded to sub angular predominently feldspar and qtz clasts, a few larger elongate 1/2" gray argillite clasts
-weakly fractured parallel to foliation with calcite and sericite fracture filling and a few thin sericite alteration halos
-nvs

1154' to 1156' Argillite - Siltstone- rock comprised of light gray to green weakly sericitized vfg to argillaceous hard siliceous argillite to siltstone with 25% biotite as small elongate clots to 1/16" parallel to weakly developed bedding at 65° to the ca,

-a few zones with spherical to elongate light pink silicification blebs or very altered clasts, to 1/4", very indistinct contacts with matrix.

-moderately to strongly fractured at prefered orientations of 30 to 50° to the ca, with calcite fracture filling and sericite and bleached - silica alteration halos to 1/2"

-at 1155', 2" graywacke clast

-overall sulphide content, trace, vfg disseminated Py and Py associated with fractures.

1156' to 1158.5' Graywacke - coarse clast rich graywacke, with 60 to 70% small (1/16") feldspar and qtz clasts, weakly foliated at 45° to the ca, as exhibited by alignment of 5 to 10% small biotite clots and clasts,

-matrix is light green to gray, siliceous, weakly sericitized in places.

-very weakly fractured at random orientations with calcite fracture filling and 1/4" sericite alteration halos, trace fg Py associated with calcite filled fractures

-a few small disseminated calcite blebs and stringers throughout unit

1158.5' to 1168' Siltstone - rock comprised of predominently of dark grayish brown vfg granular hard siliceous siltstone, biotite rich with 25% disseminated biotite

-occasional small qtz and feldspar clast to 1/16" and less than 5% scattered throughout the unit or in very thin interbeds.

-occasional small calcite blebs disseminated throughout rock

-a few zones with small light pink to white bleached semi spherical to elongate spotted alteration blebs.

-weakly fractured at a prefered orientation of 30° to the ca, with calcite fracture filling and strong sericite alteration halos

-weakly developed foliation at 65° to the ca, as exhibited by alignment of clasts and biotite (bedding)

-from 1158.5 to 1160', matrix is light green, weakly sericitized

-from 1161 to 1161.4', 2" qtz-carbonate- chlorite vn at 35° to the ca, predominently milky qtz with blebs to 1" of gray calcite and hard magnesite with large chlorite-sericite blebs to 1/2", trace, Py-calcoPy as small scattered blebs to 1/16", (calcoPy cores Po), intense sericite alteration at vn rims.

-from 1161.4 to 1162', a few (5 to 10%) small qtz feldspar clasts, a graded graywacke zone

-from 1164 to 1168', becomes very strongly fractured with numerous sericite alteration halos to 1", and strong spotted alteration with silica blebs to 1/2" affecting approx., 70% of rock.

-overall sulphide content, trace, predominently Py with minor Po and minor calcoPy in qtz vn and associated with calcite filled fractures.

1168' to 1180' Graywacke- vfg to argillaceous light green moderately sericitized siliceous matrix, weakly foliated (poorly developed bedding and weak schistosity) at 55° to the ca, 10% disseminated biotite as vfg clots to 1/16" aligned parallel to foliation.
-50 to 60% small (to 1/16") qtz and feldspar clasts, a few clast rich vrs clast poor graded beds
-clast weakly aligned parallel to foliation
-predominently weakly fractured at random orientations with calcite fracture filling and sericite alteration halos
-overall sulphide content, trace, Py associated with calcite fracture filling
-from 1168 to 1168.5', a few 1/8" calcite filled fractures at 30° to the ca, with 1/2" sericite alteration halos
-from 1169.5 to 1170.5', locally clast poor (30%)
-at 1170.6', 2" soft chlorite rich zone with calcite blebs to 1/4" and 30% elongate acicular biotite clots
-at 1173', locally bedding at 35° to the ca,
-from 1173 to 1177', locally clast poor (15 to 20%) numerous small calcite blebs and stringer to 5% of rock
-at 1174.8, 1/4" qtz vn with minor calcite at 40° to the ca,
-from 1177 to 1180', locally clast rich (85 to 90%) locally calcite as thin blebs in matrix to 10% of rock.

1180' to 1232' Altered, Interbedded Argillites - Siltstone- Graywacke-
-bedding highly irregular, varies from 30 to 50°, average orientation 35° to the ca,
-rock comprised of interbedded sequences of
-1. argillites, gray to light green (weakly sericitized in places) cherty argillite and
-2. siltstone, slightly coarser, granular, vfg, hard, siliceous siltstone, thinly bedded with numerous thin biotite rich beds-seams to 1/16" exhibiting, occasionally with a

few small feldspar and qtz clasts, moderate to strongly foliated as exhibited by alignment of biotite, cross cuts bedding at 70° to the ca, biotite to 20%, and

-3. light green, very soft, strongly chlorite- sericite altered argillite to siltstone, vfg to argillaceous, weakly schistose, sheared appearing, with minor vfg disseminated biotite, weakly carbonitized, schistosity cross cuts bedding at 70° to the ca, and

-4. graywacke - qtz, white, fg to granular rock composed of 60 to 80% small (1/16" very tightly packed, clast supported feldspar and qtz grains in an argillaceous white siliceous sericitized matrix, predominently well sorted, with 5 to 10% disseminated biotite.

-numerous deformation and soft sediment deformation features slumping, occasionally boudinaged beds

-entire unit moderately fractured at random orientations with calcite, chlorite, sericite fracture filling, occasionally with trace Po-Py

-from 1181 to 1183', predominently light gray cherty argillite, dirty in places with thin biotite rich seams and biotite rich beds, highly contorted bedding ranging from 0 to 50° to the ca, average 35°

-from 1183 to 1185', predominently fg granular thinly bedded siltstone, biotite rich (20%), foliation at 70° to the ca, cross cuts bedding at 35° to the ca, trace fg disseminated Po-Py

-from 1185 to 1194', predominently soft moderate to strongly chloritized - sericitized vfg light yellowish green weakly schistose argillite - siltstone, with 5 to 10% vfg disseminated biotite elongate parallel to bedding, locally 0.25% disseminated Py-Po as small blebs to 1/32" parallel bedding-schistosity, numerous hard white siltstone to graywacke-qtz interbeds, locally at 1190' appears conglomeratic

interbeds to 1/4" weakly brecciate rock, weak bedding at 35° to the ca,
-from 1217 to 1232', becomes predominently siliceous, hard, biotite rich (10%) siltstone and cherty argillite with a few soft sericite rich argillite - siltstone interbeds and graywacke interbeds, trace, fg disseminated Py and a few soft sericite altered zones.
-overall sulphide content, trace to .25%, as vfg disseminated Py and Py-Po associated with calcite filled fractures

1232' to 1240' Siltstone - bedding varies from 35 to 45° to the ca,
-vfg dark gray granular siliceous siltstone, with 15% vfg disseminated biotite, occasionally in thin biotite rich vrs biotite poor beds.
-weakly fractured predominently parallel sub parallel to bedding with calcite fracture filling and occasional thin sericite and bleached - silica alteration halos to 1/4"
-cherty in places, a few thin argillite interbeds
-numerous thin (to 10% of rock) slightly darker gray slightly softer bands/beds of carbonate rich siltstone, often boudinaged, slumped, off set by fractures
-a few small (1/32") carbonate blebs scattered throughout rock.
-at 1235', a few thin elongate (to 1/2") gray calcite blebs clasts parallel to bedding.
-at 1235.8', 1/4" qtz calcite vn cross cuts bedding at 60° to the ca,
-from 1236 to 1239', black calcite rich (40%) beds to 40% of rock, to 1/2", very strongly deformed, brecciated, at 1237', 1/8" black mineralized calcite-Py filled fracture at 10° to the ca, locally a few cherty seams and numerous

thin 1/8" gray calcite seams parallel to bedding
-at 1238.8', 1/4" cherty siliceous boudinaged bed with numerous cross cutting calcite seams.
-at 1239 to 1240', numerous small (to 1/2") white silicified bleached alteration blebs parallel to foliation and associated with calcite filled fractures
-overall sulphide content, 0.25%, vfg disseminated Py with trace Po as blebs to 1/32" elongate parallel to bedding and disseminated throughout rock, and Py with trace Po fracture filling associated with calcite.

1240' to 1244.5' Interbedded Altered Argillites - bedding well developed at 40° to the ca,
-rock comprised of thinly bedded (1/16 to 1") interbedded dark gray to black soft weakly chloritic carbonate rich slightly schistose argillite and lighter green soft strongly sericitized schistose carbonate rich argillite (approx., 50/50)
-weakly to moderately fractured at random orientations with predominently calcite and sulphide (Pyn) fracture filling
-some ssd and slumped bedding features.
-overall sulphide content, trace 0.5% as vfg disseminated Py trace Po and calco Py disseminated throughout rock often elongate parallel to schistosity-bedding, and occasional larger blebs and seams along fractures and carbonate seams to 1/8"
-sulphide show weak preference for dark green to black chloritic beds.

1244.5' to 1251.5' Siltstone- predominently a fg granular dark gray to light green relatively hard siliceous siltstone, occasionally weakly chloritic and slightly softer, occasionally with a few small qtz and feldspar clasts (less than 5%)

-bedding very irregular, contorted in places, average 40° to the ca, as exhibited by thin (1/16") biotite rich bands parallel to bedding, vfg disseminated biotite throughout rock to 10%
-weakly to moderately fractured at random orientations with calcite fracture filling
-1247.5 to 1248.5', locally cherty, very siliceous
- at 1247.5', 1" zone with small silicification patches- clasts to 1/8"
-overall sulphide content, trace, vfg disseminated Py-Po and small disseminated blebs associated with calcite filled fractures.

1251.5' to 1261' Graywacke- weakly developed bedding at 40° to the ca, as exhibited by occasional clast rich vrs. clast poor beds, in places weakly graded bedding, coarsening down hole.
-vfg granular to argillaceous light grayish green weakly sericitized matrix, relatively hard and siliceous to softer sericitized in places.
-from 5 to 10% vfg disseminated biotite
-clast content highly variable, averages 10 to 15%, to 40% in places, predominently sub angular to sub rounded, white feldspar and qtz clasts to 1/16" and a few large chlorite sericite altered argillite/volcanic clasts to 1/4" elongate parallel to bedding.
-a few small calcite blebs to 1/64" scattered throughout rock
-rock is weakly fractured at random orientations with calcite fracture filling and a few faint sericite and bleached - silica alteration halos to 1/4"
-from 1251.5 to 1254', relatively clast rich (30%)
-from 1254 to 1255', clast free, dark green weakly chlorite sericite altered sheared appearing strongly carbonitized siltstone-argillite interbed.

-at 1255', 1/16" fuchsite clast
-from 1255 to 1261', matrix becomes softer, moderately sericitized and carbonitized, with 25 to 30% vfg disseminated calcite blebs, seams, and stringers, very tuffaceaus appearing with numerous small (1/4") elongate black to gray cherty qtz clasts, matrix weakly schistose-sheared appearing at 40 to 70° to the ca,
-overall sulphide content, trace, fg disseminated Py-Po and Py-Po associated with calcite fracture filling.

1261' to 1273' Altered Siltstone - Graywacke- from 1261 to 1263', predominently a vfg weakly granular light green to gray soft intensely carbonitized moderately sericitzed to chloritized in places sheared appearing siltstone, very soft
-a few bands of more siliceous siltstone, minor 1 to 2% vfg disseminated biotite, no apparent bedding, moderate to strongly fractured with predominently calcite fracture filling, 2 to 3% vfg disseminated Po with minor Py and calcoPy
-from 1263 to 1264', qtz carbonate vn,contacts at 55° to the ca, predominently white fg sugary recrystallized qtz (70%) with 25% calcite (often very light green, sericite rich) blebs and seams and fracture filling and fibres intergrowths numerous sericite blebs in seams, 0.5% vfg disseminated Po and trace Py as blebs in carbonate and sericite seams, strong sericite alteration at rims with vfg Po-Py blebs in host rock to 1% around vn
-from 1264 to 1266.5', soft, weakly bedded at 45° to the ca, intensely carbonitized, sericitized, sheared light green siltstone with a few thin biotite rich seams, 2% vfg disseminated Py-Po with trace calcoPy, a few small qtz and feldspar clasts (1 to 2%), a few cherty siliceous zones (alteration)

-from 1266.5 to 1268', graywacke, fg light green sericitized carbonitized matrix with 10 to 15% small (to 1/32") qtz and feldspar clasts, strongly fractured at a prefered orientation of 0 to 10° to the ca, with qtz, calcite, biotite filled fractures to 1/4" and strong cherty silica alteration halos around fractures to 1", at 1266.5', 3" dark brown biotite - calcite bleb, sulphides to 2" as disseminated Po-Py with trace calcoPy to 1/32" and fracture filling associated with calcite.
-from 1268 to 1269', strongly sericitized carbonitized siltstone, schistose, with 0.5% disseminated Po-Py.
-from 1269 to 1270', 4" qtz calcite biotite vn at 15° to the ca, with strong 1 to 2" cherty alteration halos and 0.5% disseminated Py with trace Po in vn and altered wall rock
-from 1270 to 1273', becomes harder, light green, moderately sericitized - siliceous, moderately carbonitized siltstone with numerous small calcite blebs and stringers to 30% of rock, a few small qtz and feldspar clasts, trace fg disseminated Po-Py.

1273' to 1286.5', <u>Interbedded Argillites and Siltstone</u> - from 1273 to 1275' thinly bedded (1/4 to 1/2") interbedded light green to white hard cherty siliceous argillite and slightly softer, sericitized, light green siltstone.
-bedding highly contorted, irregular, at an average orientation of 35° to the ca,
-rock weakly fractured at random orientations with calcite and trace Py fracture filling.
-minor vfg disseminated biotite in a few siltstone interbeds
-cherty argillite beds often boudinaged, brecciated, and off set by fracturing.

-from 1275 to 1278', predominently a fg hard granular siliceous light green weakly sericitized siltstone with 30% small disseminated calcite blebs lending carbonitized appearance to rock, moderately fractured at prefered low angle orientation of 10 to 30° to the ca, with calcite and trace Po-Py fracture filling with gray carbonate rich alteration halos to 1", trace, fg disseminated Po-Py throughout rock, no apparent bedding.
-from 1278 to 1281', bedding poorly developed at 40° to the ca, thinly bedded (2 to 3") interbedded light green weakly sericitized to light brown (with minor fg disseminated biotite) to gray cherty argillite (30%) and light green hard siliceous fg granular siltstone (to 70%), occasionally with minor (5 to 10%) fg disseminated biotite, a few thin hard white carbonate - magnesite - qtz seams at 80 to 90° to the ca, and to 1", weakly to moderately fractured at low angle orientation of 0 to 20° with calcite and trace Po-Py fracture filling and silicification halos to 1/2", a few zone with 5% small disseminated calcite blebs, a few thin cherty silica beds strongly contorted.
-from 1281 to 1282', soft dark green very sericite - chlorite carbonate altered schistose (parallel to bedding at 40° to the ca,) altered siltstone with 1% vfg disseminated Po-Py
-from 1282 to 1286.5', moderate developed bedding at 50 to 55° to the ca, although contorted in places thinly bedded (1/2 to 1") interbedded gray cherty siliceous argillite (50% and modelled siltstone 50%)
-siltstone contains numerous spotted alteration patches of silica and biotite, occasionally with indistinct small qtz and feldspar clasts, trace, fg Py-Po associated with calcite fracture filling.

1286.5' to 1298' Graywacke- vfg granular relatively hard gray to light green weakly sericitized matrix with 10% fg disseminated biotite and 40% small (1/32 to 1/16") sub angular to sub rounded, predominently qtz and feldspar clast.
-weakly fractured at prefered low angle orientation 0 to 20° with calcite and trace Py fracture filling and weak sericite alteration halos.
-at 1287', 1" coarse clast rich wacke clast
-from 1286 to 1288.5', locally clast poor (5 to 10%)
-from 1288.5 to 1289.5', siliceous biotite rich vfg granular siltstone interbed highly contorted with bedding averaging 40° to the ca, numerous spotted alteration blebs to 1/2" (silica)
-at 1289.5', 1" qtz vn at 45° to the ca,
-from 1291 to 1292', siltstone with numerous thin cherty argillite interbeds
-overall sulphide content, trace, Py associated with fracture filling

1298' to 1311' Siltstone - Graywacke - predominently vfg dark gray to green relatively hard siliceous siltstone with 10 to 15% fg disseminated biotite,
-numerous zones where siltstone matrix contains 5 to 15% small (1/32") white sub rounded to sub angular reldspar and qtz clasts (graded sequences as opposed to distinct interbeds, coarsening down hole)
-weakly sericite - chlorite altered in places
-very poorly developed beddding - foliation as exhibited by weak alignment of biotite rich seams and graded beds at an average orientation of 50° to the ca,
-predominently a weakly fractured at random orientations with calcite and sericite fracture filling occasionally with trace, Py, occasional sericite and bleached-silica alteration halos to 1/2"

-occasional zones of weak spotted alteration with small spherical to elongate blebs to 1/4" of bleached - silica and biotite rich rock (maybe very altered clasts but occur in close association with fracturing)
-at 1302.5', 1/4" magnesite with minor qtz vn at 90° to the ca, with 1" strong sericite and bleached alteration halo
-at 1303', 1" qtz with minor magnesite fibres intergrowths vn at 90° to the ca,
-from 1306 to 1311', becomes moderate to strongly fractured at a prefered orientation of 55° to the ca, with strong silica - bleached and sericite alteration halos to 1/2" affecting 20% of rock, locally becomes harder, more siliceous slightly coarser with 5 to 10% small scattered qtz and feldspar clasts.
-from 1308 to 1309', spotted alteration affects 40% of rock
-at 1311', 1" narrow calcite bleb-boudinaged bed at 90° to the ca,
-overall sulphide content, trace, Py-Po associated with calcite filled fractures and alteration halos.

1311' to 1355' Interbedded Graywacke - Siltstone- Argillite- rock comprised predominently of graywacke-siltstone with a few thin argillite interbeds
-graywacke siltstone occurs as gradational beds predominently hard, biotite rich (10 to 20%) light gray to green (weakly sericitzed), weakly chloritized in places, siliceous siltstone with up to 50% small (to 1/16") clasts of white sub angular to sub rounded qtz, feldspar, occasionally lithic clasts to 1/2" of green chloritized to sericitized argillite, and hard black siliceous argillite.

-rock is moderately fractured at random orientations, prefered sets at 20 to 30° to the ca, and 70 to 90° to the ca, with predominently calcite, occasionally qtz and sericite fracture filling, with strong sericite and bleached-silica alteration halos to 1/2", occasional with trace, Po-Py
-numerous zones of spotted alteration, small silicification blebs.
-bedding poorly developed at an average orientation of 45° to the ca,
-from 1311 to 1313', predominently graywacke, vfg ,granular, light green weakly sericitized hard siliceous matrix with 35% small qtz, feldspar and occasional chlorite altered argillite clasts.
-from 1313 to 1319', predominently siltstone, with numerous coarser graded (down hole) graywacke beds and a few thin irregular contorted, boudinaged light gray siliceous argillite beds/fragments, strong sericite-silica alteration halos around fractures affect 25% of rock, from 1315 to 1316', numerous thin 1/2" contorted gray cherty siliceous argillite beds at 50° to the ca, spotted alteration in siltstone affects approx., 30% of rock,
-from 1318 to 1318.5', thinly bedded interbedded cherty siliceous argillite and hard biotite rich siliceous siltstone at 40° to the ca,
-from 1319 to 1323', predominently graywacke, clast rich to 50%, at 1319.5', 2" cherty gray argillite bed at 50° to the ca,
-from 1320.5 to 1321.5', hard gray black siliceous biotite rich siltstone with numerous silicified spotted alteration blebs, bedding locally at 40°, numerous strong silica-bleached and sericite alteration halos on fractures with

trace Py and qtz calcite fracture filling, from 1322 to 1323', numerous 1/2" green sericite - silica altered argillite clast to 1/2",
-from 1323 to 1326', predominently a vfg gray siliceous siltstone, at 1323.5', 1/4" qtz vn cross cuts bedding at 50°, from 1323.5 to 1324', numerous thin cherty argillite siliceous argillite beds (1/4" very contorted, average orientation 60°), numerous elongate light green cherty silica alteration blebs to 1/2", numerous thin 1/4 to 1/2" graywacke beds,
-from 1326 to 1329', siltstone, slightly softer, dark grayis green, vfg, weakly sericite-chlorite altered, with numerous thin graywacke beds and clasts to 1/2", a few thin green sericitized argillite beds, minor biotite (5%) , from 1329 to 1335', graywacke, dark grayish green weakly sericitized siliceous matrix with 30% small feldspar and qtz clasts to 1/16", 15% disseminated biotite, occasionaly bands of strong sericite alteration, at 1329.5', 2" gray hard siliceous argillite bed at 40°, at 1329.7', 3" siltstone bed at 40°, at 1330.2', 1" gray cherty gray argillite bed at 40°, from 1330 to 1331', very clast poor, from 1331 to 1331.5', irregular bands-fragments-slumped-brecciated light green sericite altered argillite clasts to 10% of rock, from 1331.6 to 1332', matrix becomes light green moderately sericitized, from 1332 to 1332.5', numerous 1" green sericitized argillite clasts or brecciated fragments
-from 1335 to 1337.5', thinly bedded interbedded siltstone and gray cherty argillite, bedding highly contorted at 40° to the ca, at 1335.5', 1/2" white carbonate and bleached silica zone in highly fractured and strongly sericitized bleached zone, at 1336.5', 1/4" calcite vn at 90° to the ca, locally some spotted silica alteration blebs.

-from 1337.5 to 1339', graywacke, vfg granular, light gray to green relatively hard siliceous matrix with 10 to 15% disseminated biotite, weakly foliated at 40° to 60°, 20% small qtz feldspar clasts, a few large 1" siltstone clasts or brecciated frags.
-from 1339 to 1346', predominently siltstone, vfg gray hard siliceous biotite rich(25%), poorly developed bedding at 40°, weakly fractured, a few thin graywacke zones (gradationally coarser) and a few distinct graywacke, argillite interbeds, from 1340.3 to 1340.8', numerous thin 2" graywacke beds and brecciated appearing frags/clasts to 1", from 1341.8 to 1342.3', graywacke interbed at 40°, from 1342.3 to 1342.5', very contorted, thinly bedded siliceous cherty argillite (thinly bedded, 1/4", at 0 to 90° highly contorted), from 1343.3 to 1343.9', numerous thin 1/2" cherty siliceous argillite beds at 25° to the ca, from 1345 to 1346', a few 1" siliceous argillite cherty beds at 35° to the ca, and locally numerous elongate 1/4" spotted alteration silicified blebs
-from 1346 to 1355', predominently graywacke, from 1346.5 to 1347.3', siltstone interbed vfg hard siliceous with numerous spotted alteration blebs and thin siliceous argillite beds at 30° to the ca, at 1350', 2" qtz carbonate vn at 60° to the ca, predominently qtz with thin white calcite seams a few sericite seams very contorted, folded, with trace fg disseminated Py, at 1351', 1" qtz vn at 90° to the ca, with strong 2" sericite alteration halo in surrounding graywacke, from 1351.5 to 1353', strongly fractured with associated silica - bleached and sericite alteration halos affecting 100% of rock, a few thin highly contorted siliceous argillite interbeds, at 1353.5', at 45° to the ca, 1/2" magnesite vn at 45° to ca,

-overall sulphide content, trace, Py-Po associated with fracture filling and alteration halos on fractures.

1355' to 1366' Siltstone (with thin argillite interbeds) - predominently vfg granular light grayish green siltstone with 5 to 10% disseminated biotite, occasional biotite rich beds to 1/32" bedding highly irregular, slumped, contorted at an average orientation of 40° to the ca,
-occasional zones with white 1/4 to 1/2" spotted alteration blebs parallel sub parallel to bedding, silica-bleaching
-moderate to strongly fractured at prefered sets of 80 to 90° and 20 to 30° to the ca, with strong 1/2 to 1" sericite alteration halos, occasionally bleached silica halos, affecting 40 to 50% of rock.
-occasional graywacke zones-beds, indistinct contacts, more of a graded zone than a distinct interbed, with 5 to 10% small feldspar and qtz clasts.
-occasionally softer weakly chlorite - sericite altered dark green argillite - siltstone beds usually with numerous small calcite blebs to 1/16"
-overall sulphide content, trace, vfg Po-Py disseminated in alteration halos and Py associated with calcite fracture filling.
-from 1356.8 to 1357.3', numerous thin (to 1/2") light gray to green weakly sericitized siliceous to cherty argillite beds, contorted, occasionally boudinaged or brecciated at an average orientation of 60° to the ca, at 1357', 1" white calcite rich argillite bed, locally trace, vfg disseminated Py in strong silicification halos on fractures
-from 1359 to 1361', softer darker green weakly chlorite-sericite altered siltstone, at 1360', 1" qtz vn at 60° to the ca, with a few small gray calcite blebs, locally numerous highly contorted thin (1/4")graywacke beds.

-at 1361.5', 3" graywacke bed at 35° to the ca, siltstone matrix with 20% feldspar and qtz clasts to 1/8"
-from 1362', numerous thin gray cherty argillite beds to 1" and brecciated - boudinaged fragments, to 25% of rock.

1366' to 1379' Altered (silicified, sericitized) Siltstone-Graywacke
-from 1366 to 1367', vfg dark to light green, strongly sericite-chlorite altered weakly schistose (at 65° to the ca), siltstone with 30% small disseminated calcite blebs in seams to 1/16" parallel to foliation, a few small unaltered windows of biotite rich siltstone to graywacke with 5 to 10% small qtz feldspar clasts in places, 0.5% vfg disseminated Po-Py .
-from 1367 to 1368.3', qtz vn at 30° to the ca, predominently med grain granular sugary recrystallized qtz, strongly fractured with calcite fracture filling, a few gray calcite blebs in seams to 1", trace disseminated Py-Po as blebs to 1/16"
-at 1368.5', 4" highly contorted thinly bedded cherty argillite bed (bedding less than 1/16") with a 2" hard white magnesite vn at 85° to the ca, a few cross cutting thin qtz calcite stringers with trace fg disseminated Py-Po
-from 1368.3 to 1370', thinly bedded at (50° to the ca) dark brown cherty fg granular siltstone to argillite, intensely fractured at random orientations with strong sericite and bleached - silica alteration halos affecting 60% of rock, fractures predominently calcite, minor qtz sericite filled, at 1370', a few 1/4" qtz carbonate (magnesite)vn at 90° to the ca, with minor disseminated Py-Po

-from 1370 to 1374', rock predominently fg light green strongly sericitized altered siltstone with a few windows of brown biotite rich less altered siltstone, alteration associated with fractures, intensely fractured at random orientations with halos to 2" affecting 95% of rock, fractures predominently calcite and qtz filled.
-from 1372.5 to 1374', rock becomes weakly brecciated by thin calcite seams and fill fractures at random orientations with trace disseminated Py and Py associated with calcite fracture filling.
-from 1374 to 1375', altered graywacke, small qtz and feldspar clasts to 45% set in a very fine grained siliceous matrix, strongly fractured at a prefered orientation 0 to 10° to the ca, with strong sericite alteration halos affecting 50% of rock.
-1375 to 1379', altered siltstone, strongly fractured with sets at 0 to 10° and 45 to 60°, strong sericite and silica alteration halos affect 80° of rock with spotted alteration silica blebs in places, fractures predominently calcite, qtz, sericite filled with trace Py.
-at 1377', 2" soft chlorite-sericite - calcite altered seams with 10% vfg disseminated Py
-at 1378.5', 3" calcite qtz vn at 65° to the ca,
-overall sulphide content, trace fg disseminated Py-Po and Py-Po associated with calcite filled fractures.

1379' to 1382' Siltstone (with graywacke interbeds)- predominently a vfg granular light brownish gray biotite rich (15%) siltstone, hard, siliceous.
-poorly developed bedding at 40° to the ca, as exhibited by a few thin graywacke and argillite interbeds.
-moderately fractured with sets at 0 to 10° and 40 to 60° to the ca, predominently calcite fracture filled with sericite alteration halos to 1/4"
-a few graywacke zones, gradationally coarsens from siltstone to clast bearing (to 40%) graywacke, predominently small white qtz and feldspar clasts to 1/32" a few large (to 3") graywacke clasts
-at 1379.5', 1/4" cherty argillite interbed at 40° to the ca,
-at 1381', 3" graywacke clast
-trace vfg disseminated Py and Py associated with calcite fracture filling.

1382' to 1390' Interbedded Altered Siltstone and Siliceous Argillite
-rock comprised predominently of a dark brown biotite rich (to 15%) vfg granular hard siliceous siltstone, intensely fractured with sets at 0 to 20° and 80 to 90° with strong bleached -silica and sericite alteration halos to 1/2" affecting 30 to 40% of rock, fractures predominently calcite occasionally qtz and sericite filled fractures appear to brecciate rock in places.
-numerous thin cherty siliceous argillite interbeds
-some movement along fractures of up to 1"
-overall sulphide content, trace, Py and Po associated with calcite filled fractures and disseminated in alteration halos.

-at 1382', 1" cherty gray argillite bed at 65° to the ca,
-from 1382.3 to 1383', cherty dark gray argillite bed at 65° to the ca,
-at 1382.5', 1/2" hard white magnesite and qtz vn at 90° to the ca,
-from 1384 to 1386', cherty argillaceous rock to 50% as thin interbeds and alteration blebs
-at 1384.4', 2" sericitized halo at 40° to the ca with 1% fg disseminated Py
-at 1385', 1/4" hard white magnesite vn at 90° to the ca, with a 1/4" chert halo
-at 1386.6', 1/2" qtz calcite vn at 90° to the ca, with large sericite and chert brecciated fragments
-at 1386.8', 1"cherty argillite bed at 40° to the ca,

1390' to 1399' Siltstone - vfg granular dark gray to green hard siliceous siltstone with 10 to 15% fg disseminated biotite.
-5% small (1/32") carbonate blebs disseminated throughout rock
-weakly fractured at random orientations with calcite, minor qtz, biotite, sericite fracture filling with a few sericite alteration halos.
-in places a few small (to 1/4") cherty argillite clasts and small qtz feldspar clasts to less than 1%
-in places spotted alteration with light green weakly sericitized siliceous blebs to 1/2" parallel to foliation affect 30 to 40% of rock.
-weakly foliated as exhibited by alignment of clasts and biotite varies from 35 to 50° to the ca, average orientation 40°.
-a few thin dark green soft weakly chloritized beds.

-at 1392.8', 2" chlorite rich soft bed at 35° to the ca,
-from 1392.5 to 1393.4', predominently soft chlorite rich, with 10% calcite blebs to 1/4", bedding at 40°
-from 1397 to 1399', becomes slightly coarser, granular,
-overall sulphide content, trace, with a few small disseminated Py blebs and Py associated with fracture filling.

1399' to 1454' Interbedded, Altered (carbonitized, sericitized) Siltstone And Argillite - rock consists predominently of a vfg to argillaceous light green to gray thinly bedded (1 to 2") schistose relatively soft strongly carbonitized moderately sericitized siltstone to argillite with numerous thin cherty argillite interbeds.
-alteration intensities and bedding orientation highly variable
-rock is predominently moderately fractured and random orientations with calcite minor qtz sericite fracture filling.
-occasional graded zones coarsening to a clast bearing graywacke (a few small qtz, feldspar, and carbonate clasts in thin beds)
-from 1399 to 1406', predominently only weakly altered (sericite, carbonate) siltstone with numerous (15%) small disseminated carbonate blebs, 10% small disseminated biotite clots, weakly developed bedding at highly variable orientations from 30 to 70° to the ca, average 60 to 65° numerous thin calcite seams at random orientations, strongly fractured with calcite fracture filling,
-from 1399 to 1400', thinly bedded,(1/4 to 1/2") cherty dark gray siliceous argillite interbeds to 60% of rock, bedding locally at 30° to the ca,

-from 1401 to 1401.5', thinly bedded cherty argillites, bedding locally at 35° to the ca, surrounding siltstone weakly carbonitized, relatively hard, siliceous,
-from 1403.5 to 1404', softer, strongly altered, schistose zone at 65° to the ca, with calcite seams and blebs to 30% and trace fg disseminated Po-Py as thin seams parallel to schistosity.
-at 1404', 1/2" cherty argillite bed at 65° to the ca,
-from 1404 to 1406', gradationally becomes softer, more sheared - schistose appearing with stronger sericite and carbonate alteration, appears brecciated in places with zones of soft sericite carbonate altered rock rimed by harder fresh siltstone.
-overall sulphides from 1399 to 1406', trace, fg disseminated Po-Py and Py associate with fracture filling.
-from 1406 to 1414', becomes soft dark grayish green moderately sericitized, carbonitized, schistose - sheared appearing altered siltstone to argillite.
-numerous small (to 1/4") gray calcite and minor biotite clots disseminated throughout rock, bedding locally at 40° to the ca,
-at 1408', 1" cherty black argillite bed at 30° to the ca, very irregular undulated contact with altered siltstone
-at 1408.6', 1/2" gray siliceous argillite bed at 50° to the ca,
-at 1412', 1/2" gray cherty argillite bed, kinked, contorted at 45° to the ca,
-from 1411 to 1412', a few small qtz and lithic argillite clasts to 1/4"
-from 1412.5 to 1414', gradationally coarsens into a graywacke, with a fg soft sericitized carbonitized matrix and 25% small white and qtz clasts (many of which are altered to calcite) and a few larger chert and black argillite

lithic clasts to 1/2", bedding well developed at 35° to the ca,
-overall sulphides from 1406 to 1414', 0.25% as fg disseminated Py and Py associated with calcite fracture filling
-from 1414 to 1417', thinly bedded (1/16") interbedded soft gray to black weakly carbonitized argillite and slightly coarser soft gray calcite rich siltstone, bedding irregular in places but average 30° to the ca.
- a few Po blebs to 1/4" parallel to bedding (very fragmental appearing)
- a few thin biotite seams parallel to weakly developed bedding
-weakly fractured at random orientations with calcite fracture filling.
-from 1417 to 1420.5', light gray relatively soft vfg argillaceous weakly schistose poorly bedded intensely carbonitized siltstone - argillite, modelled appearing with faint blebs to 1/2" of auto brecciated ? siltstone.
-sulphides to 1% as predominently Po minor Py, thin seams and blebs parallel to weak schistosity at 30° to the ca, and vfg disseminated mineralization throughout rock.
-at 1419', 1/2" qtz calcite vn at 30° to the ca, with numerous small Po-Py blebs at rims.
-gradationally becomes coarser from 1419 to 1420.5',
-from 1420.5 to 1454', predominently vfg soft dark grayish green strongly carbonitized weakly sericitized to chloritized in places sheared schistose appearing siltstone argillite, moderately developed bedding at 35 to 40° to the ca, highly irregular in places,
-numerous thin cherty argillite interbeds.
-spotted appearing in places with faint lighter carbonate rich blebs to 1/2" parallel to bedding.

-trace to 0.25% fg disseminated Py-Po
-weakly fractured at random orientations with calcite fracture filling
-minor disseminated biotite in places
-from 1424.5 to 1425.5', a few 1 to 2" gray siliceous argillite clasts/frags (maybe brecciated interbeds)
-from 1426.5 to 1427.5', gray siliceous argillite bed, weakly brecciated, highly irregular orientations from 10 to 50° to the ca, a few small qtz and calcite clasts/ frags to 1/4", trace, fg disseminated Py-Po
-from 1428 to 1429', very modelled appearing with spotted alteration affecting 60 to 70% of rock.
-from 1429 to 1429.5', a dark gray siliceous argillite interbed at 75° to the ca,
-from 1429.5 to 1430', numerous small 1/8" fragmental appearing carbonate blebs
-at 1430.7', 2" gray siliceous argillite interbed at 50° to the ca,
-from 1431 to 1432.5', thin (1/16 to 1/4") highly cont-orted siliceous argillite beds to 30% of rock
-from 1436 to 1437', gradationally becomes coarser, grades into a fine graywacke.
-from 1437 to 1438', numerous thin cherty argillite seams and fragments/clasts to 40% of rock
-at 1440', 2" siliceous argillite bed at 30° to the ca, locally siltstone is intensely carbonitized.
-from 1440 to 1454', numerous thin (to 1") siliceous argillite interbeds to 30% of rock, a few thin graywacke beds.

1454' to 1468' Interbedded Argillite and Altered Siltstone - bedding variable from 35 to 40° to the ca, thinly bedded (average 1 to 2") interbedded gray to black cherty siliceous argillite and soft gray to green, weakly sericite-chlorite altered, occasionally strongly carbonitized, altered siltstone.

-approx., 40% argillite, 60% siltstone

-moderately fractured at prefered orientation of 80 to 90° to the ca, with calcite fracture filling, some movement to 1" along fractures.

-sulphides to 0.5% as vfg disseminated Po-Py in altered siltstone beds

-from 1459.5 to 1460.5', 1/2" calcite vn with minor sericite at 30° to the ca,

-at 1461', 1/4" non magnetic Po band parallel to bedding at 30° to the ca,

-a few thin qtz calcite vn - stringers at 80 to 90° to the ca, to 1/4"

-minor disseminated biotite in a few siltstone beds

-from 1465 to 1468', very schistose, chloritized, soft with numerous calcite blebs in seams to 1/8"

1468' to 1479' Interbedded Argillite and Siltstone- bedding well developed at 30 to 35° to the ca,

-predominently hard dark gray biotite rich (10 to 15%) siliceous siltstone, vfg, granular, cherty in places, with thin cherty argillite interbeds to 30% of rock.

-rock is weakly fractured at low angle orientations of 10 to 30°, with calcite and trace Po-Py fracture filling.

-trace fg disseminated Py-Po throughout unit

-occasional biotite rich vrs biotite poor beds

-occasionally slightly coarser clast rich thin graywacke interbeds (with 5 to 10% small qtz and feldspar clasts)

-at 1478.5', 2" qtz magnesite vn at 90° to the ca,

1479' to 1500.5' Siltstone-Graywacke - vfg to fg light greenish gray to dark gray biotite rich siltstone relatively hard, siliceous with 10 to 15% fg disseminated biotite, occasional biotite rich vrs biotite poor beds,
-moderately fractured at prefered orientation of 45 to 65° and 0 to 20° to the ca, with predominently calcite minor qtz, sericite, biotite, fracture filling.
-a few thin (1/4") sericite alteration halos on fractures
-poorly developed bedding at an average orientation of 30 to 35° to the ca,
-at 1481.7', 1/2" qtz carbonate vn (qtz with hard white magnesite) at 90° to the ca, with a few 1 to 2" qtz carbonate blebs at 45° to the ca, trace fine grained disseminated Py.
-from 1482 to 1482.9', bright light green soft sericitized siltstone bed at 25° to the ca, with 0.25% vfg disseminated Py-Po
-at 1483.2 to 1484.5', qtz carbonate vn, predominently milky sugary recrystallized qtz, strongly fractured with a few thin sericite and calcite filled fractures, from 1484 to 1484.5', hard fibrous beige (dolomite-magnesite intergrowths to 30% with a few small disseminated Py blebs)
-at 1486', 1" qtz magnesite vn at 60° to the ca, with strong sericite alteration at rims.
-at 1487.2', 1" hard white magnesite with minor qtz vn at 65° to the ca, strong sericite alteration at rims.
-at 1488', 2" soft dark green chloritized bed with 1% fg disseminated Py-Po.
-at 1488.5', 1/2" hard white magnesite and calcite vn at 50° to the ca,

-at 1489.5', 1/4" magnesite with minor qtz, calcite, sericite vn at 90° to the ca,
-at 1491.2', 2" hard white magnesite with minor qtz, calcite and sericite vn at 90° to the ca, with a strong 1 to 2" sericite alteration halo
-from 1491.2', unit becomes slightly coarser, occasional small qtz and feldspar clast bearing zones to 5% (graywacke)
-from 1493 to 1493.5', locally bright light green, moderaetly sericitized.
-from 1496 to 1497', qtz vn, contacts at 50° to the ca, predominently strongly fractured milky white qtz, sugary at rims with minor black unidentified mineral and no carbonate.
-from 1497 to 1500.5', small qtz and feldspar clasts to 10% (a graywacke)
-from 1498 to 1499', 1/2" sericite alteration halo around major calcite filled fractured at 10° to the ca,
-from 1500 to 1500.5', numerous thin qtz vn at a prefered orientation of 80 to 90° to the ca, to 70% of rock, a few thin associated calcite seams and blebs, locally strong sericite alteration halos.
-overall sulphide content, trace, fine grained disseminated Py-Po and Py-Po associated with qtz carbonate vn and calcite fracture filling.

1500.5' to 1568' <u>Graywacke - Lithicwacke</u> - rock predominently a vfg dark green to gray weakly to moderately sericitized relatively hard siliceous granular matrix with 5 to 10% fg disseminated biotite and biotite clots to 1/16" exhibiting weak foliation (schistosity) at 60° to the ca,
-clast content variable ranges from 30 to 40%
-predominently small (to 1/8", average 1/32") white sub angular to sub rounded feldspar and qtz clasts occasional

small blue qtz clasts, occasional larger (to 1/2") cherty to sericitized argillite clasts elongate parallel to foliation and to 10% of rock, a few chloritized argillite clasts, a few qfp appearing clasts.
-numerous thin small calcite blebs in stringers parallel to foliation to 5% of rock.
-rock predominently weakly fractured at random orientations with calcite, minor sericite, qtz, fracture filling and sericite alteration halos to 1/4", a few bleached-silica alteration halos.
-overall sulphide content, 0.25% vfg disseminated Py-Po-cal coPy as small clastic appearing blebs and minor mineralization associated with fracture filling.
-at 1501', 1/2" light green frag free argillite seams at 55° to the ca,
-at 1501.7', 1/4" calcite vn at 50° to the ca,
-at 1502.2', 1/4" qtz vn at 45° to the ca,
-from 1504.5 to 1506', locally calcite blebs to 1/4" and 15% of rock
-at 1506.7', 2" qtz carbonate vn at 70° to the ca, predominently hard white magnesite with a few thin qtz seams and brown biotite rich dolomite ? seams, strong sericite - calcite alteration at rims.
-at 1507', 1/2" silicified gray argillite clast at 35° to the ca,
-at 1512', 1/2" calcite with a few qtz blebs-vn at 55° to the ca,
-at 1513', a few 1/4" calcite seams at 60° to the ca, with strong (1") sericite alteration halos.
-at 1517 to 1517.5', a few 1/4" qtz vn at 70° to the ca, with minor calcite and strong sericite alteration halos.
-at 1520', 2" med grained sugary qtz vn at 50° to ca, with numerous thin calcite stringers and blebs and light brown fg disseminated biotite.

-at 1526.5', 1/8" calcite filled fracture with trace Py-Po and 1/4" dark brown fg biotite alteration halo at 25° to ca,
-from 1520 to 1526', very coarse, with lithic frags of qtz, cherty argillite, sericitized argillite, and chloritized argillite to 1/2" and 40% of rock
-at 1550', 1/4" argillite and Po clast
-from 1546 to 1556', matrix becomes very siliceous
-from 1556 to 1568', weak foliation over prints matrix-clast contacts at 15° to the ca,

1568' to 1596' Interbedded Argillite - Siltstone - Graywacke - rock comprised predominently of vfg granular dark gray to green siliceous hard biotite rich (15 to 20%) siltstone with numerous thin interbeds of coarse graywacke and cherty siliceous argillite.
-bedding well developed predominently thickly bedded at highly variable orientations, average 30° to ca,
-from 1568 to 1570', predominently siltstone with a few thin coarse clast rich graywacke beds, with qtz feldspar clasts to 1/16" and 70%
-a few thin brecciated - boudinaged cherty siliceous argillite beds-fragments, bedding locally at 35° to ca, weakly fractured at random orientations with calcite fracture filling
-from 1570 to 1571', coarsé clastic graywacke interbed at 35° to the ca, vfg light green weakly sericitized siliceous ground mass with 15% small biotite clots exhibiting a weak prefered orientation parallel to bedding and 70 to 80% small tightly packed feldspar and qtz clasts, nvs

-from 1571 to 1574', predominently hard siliceous siltstone
-from 1571 to 1571.3', softer weakly chlorite-sericite altered siltstone bed with 10% small disseminated white calcite blebs
-from 1571.6 to 1572.2', softer weakly chlorite-sericite altered green siltstone bed at 40° to ca, with 10 to 15% small disseminated calcite blebs.
-from 1572.3 to 1573', numerous thin coarse clastic graywacke interbeds to 40% of rock, at 30° to ca,
-from 1573.2 to 1573.4', a few 1" graywacke beds at 40° to ca, very coarse, clast rich, nvs.
-from 1574 to 1575', gray cherty argillite, thinly bedded at 40° to ca, a few thin biotite rich siltstone seams, weakly sericitized in places.
-at 1574.2', 2" spherical coarse graywacke clast
-at 1574.3', 1/4" qtz magnesite vn at 90° to ca,
-locally strongly fractured at random orientations with calcite fracture filling and numerous small disseminated calcite blebs and stringers.
-sulphides from 1574', to 1575' nvs.
-from 1575 to 1587.5', thinly bedded (1/4 to 1") gray cherty argillite (60%) and gray to light brown siliceous slightly coarser biotite rich siltstone (40%), bedding at 30° to ca, but irregular, contorted in places.
-strongly fractured at random orientations with calcite and sericite fracture filling
-at 1577.5', a few 1/4" qtz magnesite seams at 90° to ca, with cherty alteration halos.
-a few thin softer light green weakly chlorite-sericite altered siltstone beds
-a few thin graywacke beds
-at 1581', 1" qtz magnesite-sericite vn at 60° to ca, with

a few small Po blebs at rims
-numerous thin 1/4" qtz magnesite vn at weak prefered orientations of 80 to 90° to ca, throughout unit, sulphides, trace, a few small Po blebs associated with qtz carbonate.
-from 1587.5 to 1588.5', coarse clastic graywacke, composed of approx 60% small white tightly packed feldspar and qtz clasts in a light gray to green weakly sericitized schistose matrix with 10 to 15% fg disseminated biotite, bedding - foliation at 60° to ca, 0.25% fg disseminated clastic Po blebs.
-from 1588.5 to 1593.5', predominently light grayish green to milk white thinly bedded cherty argillite (80%) with 15% thin biotite rich siltstone interbeds and 5% thin biotite rich siltstone interbeds and 5% thin graywacke interbeds, bedding at 25° to ca, strongly fractured at prefered orientation 80 to 90°, movement up to 1" along fractures, numerous thin black bands in chert with 1 to 2% small disseminated subhedral garnets.
-numerous qtz magnesite seams to 1/4" at 80 to 90° to ca, throughout unit, trace, fg disseminated Po-Py associated with qtz carbonate vn and calcite fracture filling.
-from 1593.5 to 1596', siltstone, with a few clastic coarse graywacke interbeds to 3", bedding at 30 to 35° to ca, nvs.
-overall sulphide content throughout unit, trace, fg disseminated Py-Po associated with predominently with qtz carbonate vn and calcite fracture filling