



OPEN FILE 354

ANALYSES OF ROCK SPECIMENS FROM THE MIDDLE ORDOVICIAN TO LOWER DEVONIAN  
DEEP-WATER SUCCESSION EAST OF CAÑON FIORD, ELLESMERE ISLAND

by H. P. Trettin

This document was produced  
by scanning the original publication.

Ce document est le produit d'une  
numérisation par balayage  
de la publication originale.

## CONTENTS

	Page
Introduction .....	1
Analytical methods .....	1
X-ray analysis .....	1
Carbon analysis .....	4
Thin section analysis .....	5
Composition .....	5
Size and sorting .....	6
References cited .....	7
Abbreviations in Tables 1 to 3 .....	8
Table 1: Carbonate rocks and associated minor claystones and siltstones .....	15
Table 2: Siltstone, slate, and chert .....	25
Table 3: Sandstone .....	44
Table 4: Hazen Formation, section 1-1; variations in: dolomite/dolomite + calcite (in %) (based on X-ray diffraction peak height ratios) .....	65
Table 5: Statistical summary of X-ray diffraction, carbon, and point count analyses .....	66
Table 6: Vertical variations in plagioclase/plagioclase + K-feldspar (based on peak heights in whole- rock X-ray diffractograms) .....	71
Table 7: Notes on stratigraphic sections .....	72
Figure 1: Location of sections .....	to follow page 1
Figure 2: Typical X-ray diffractogram .....	to follow page 2

## INTRODUCTION

This report tabulates the results of analyses made on a total of 238 rock specimens from a Middle Ordovician to Lower Devonian succession east of Cañon Fiord, Ellesmere Island. The specimens are mainly from deep-water sediments of Hazen, Cape Phillips, Imina, and Eids Formations but some are from carbonate buildups of the undivided Allen Bay and Read Bay Formations. The location of the sampled sections is shown in Figure 1 and age and thickness of the sections are given in Table 7. The analytical work consisted of quantitative and non-quantitative petrographic observations, semiquantitative determinations of mineral content by the whole-rock X-ray diffraction technique, and some determinations of carbon content by induction furnace. Analytical results on individual specimens are listed in Tables 1 to 4, and statistical summaries are given in Tables 5 and 6. The present report supplements a stratigraphic report (Trettin, in press) in which the observations are interpreted geologically. Tables 1 to 4 of the present report are not included *in* Trettin, in press. The rock specimens can be inspected at the Geological Survey of Canada, Institute of Sedimentary and Petroleum Geology, 3303-33rd Street, N.W., Calgary, Alberta, where they are curated.

### Analytical methods

#### X-ray analysis

Whole-rock X-ray diffractograms (for values of 2 theta in the range 0 to approximately 42 degrees) were prepared for all specimens listed. These diffractograms were analyzed as obtained, without any additional X-ray work. It was found (Fig. 2) that six minerals or mineral groups can be recognized, not only in the present suite but also in a much larger suite of analyses on Devonian clastic sediments from

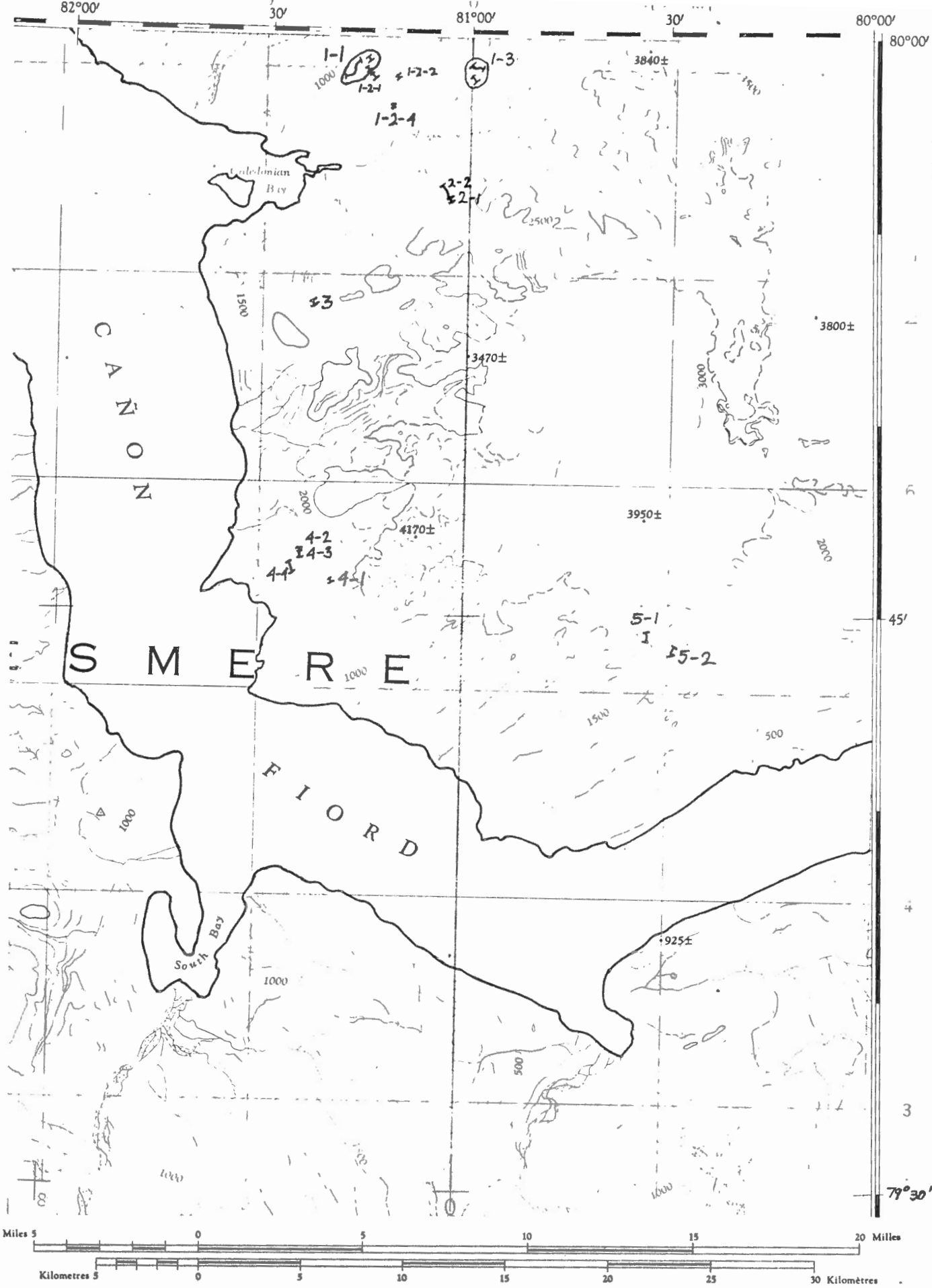


Figure 1: Location of sections

⊞ = stratigraphic sections

west-central Ellesmere Island (Trettin, in prep.). These minerals (or groups of minerals) are characterized by the following values of 2 theta using Cu radiation:

quartz .....	26.6°
Plagioclase .....	28.0° <sup>±</sup>
K-feldspar .....	26.9° to predominantly 27.5°
mica, illite:.....	8.8° <sup>±</sup>
chlorite, kaolinite ..	12.3° to 12.8°
calcite .....	29.4°
dolomite .....	31.0°

Comments on some of the minerals will be followed by an explanation of the methods used for calculating relative abundances.

Feldspar. Not many plagioclase crystals in the thin sections examined were identifiable, but those that could be identified were all albite. The calculated peak of low-temperature albite is at 27.96° (Smith, 1974) and the observed peaks are close to that value; precise identification of plagioclase composition, however, could not be made on the present diffractograms as the various peaks of the albite-anorthite series are close to each other.

The theoretical range for the principal peaks of low-temperature K-feldspar is 27.46° (low microcline) to 26.92° (low sanidine; Smith, 1974). In the present diffractograms, the K-feldspar peak generally is close to 27.5° (low microcline).

Mica and illite. Mica and illite have approximately the same principal peak in the vicinity of 8.8°. Thin section study indicates that most of this material is muscovite with variable amounts of biotite

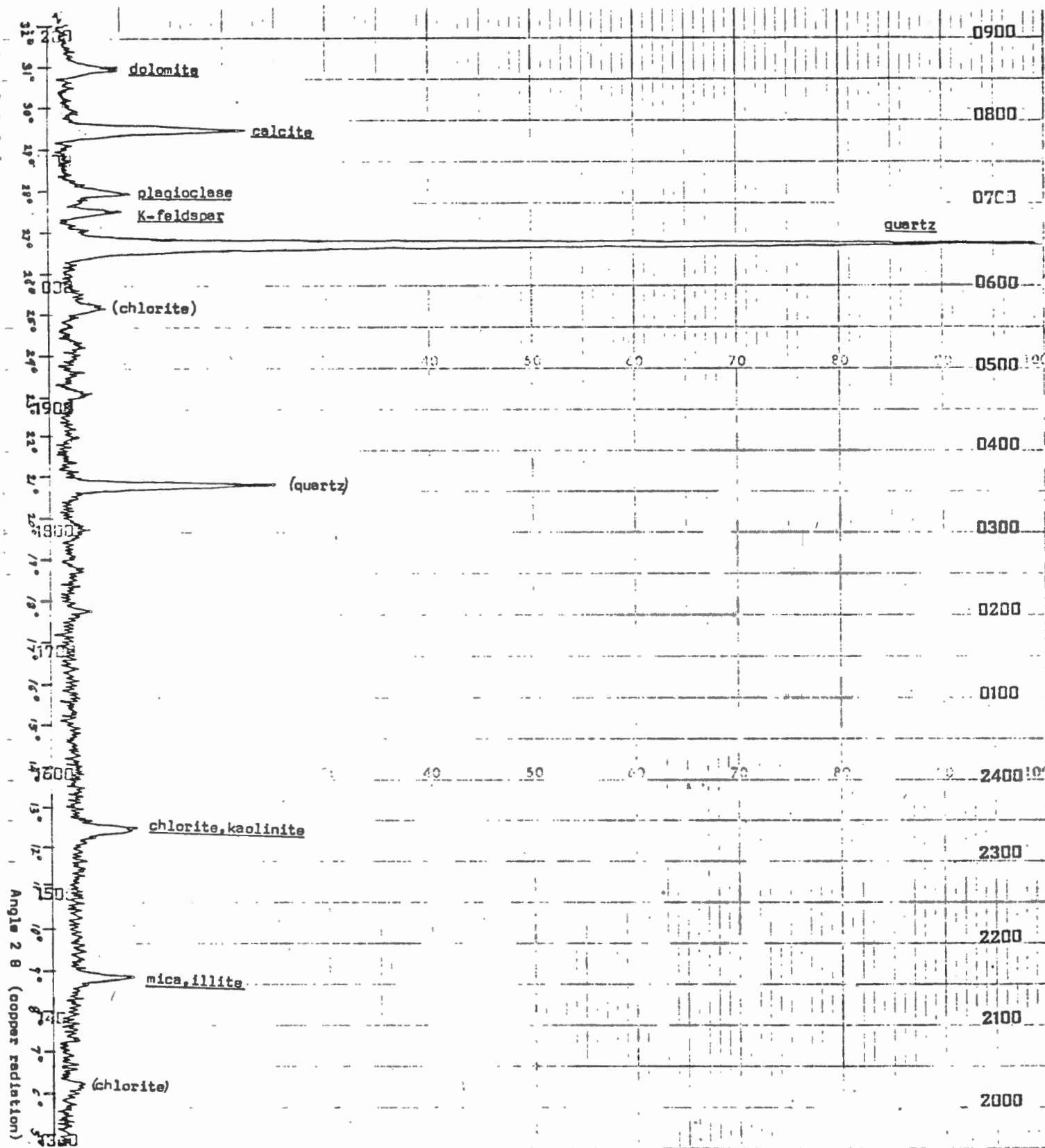


Figure 2: Typical whole-rock X-ray diffractogram (sandstone in upper upper Imina Formation, see Table 3E, # 1). Peaks used in compositional analysis are underlined, other peaks in brackets.

in some specimens. The presence of illite, however, which is optically not identifiable, cannot be excluded.

Chlorite and kaolinite. The principal peaks of chlorite occur in the ranges approximately  $6.0$  to  $6.5^\circ$  and  $12.3$  to  $12.8^\circ$ , and the principal peak of kaolinite is close to  $12.4^\circ$ . Because of this overlap it is impossible to distinguish kaolinite from chlorite without applying other techniques. In the present case, it can only be stated that much of the material producing the  $12.3^\circ$  to  $12.8^\circ$  peak is chlorite because the characteristic  $6.0$  to  $6.5^\circ$  peak has invariably been observed where the (much higher)  $12.3$  to  $12.8^\circ$  peak is developed. The chlorite also is identifiable in thin section although it is masked, to some extent, by calcite and dolomite because of the higher birefringence of these minerals.

Calculation of percentages. The values listed for individual minerals or groups of minerals express the height of the principal peak of that mineral (or group of minerals) as percentage of the sum of the principal peak heights of all minerals listed. This value is related to the relative abundance of the mineral but not equal to it.

Where the peaks were truncated by the margin of the recording paper, they were projected graphically onto an additional sheet. Analyses containing an extrapolated value have been incorporated in the present report (the extrapolated mineral there is marked by an "X") but have not been used in the statistical summaries presented in Trettin, in press, except for ratios of mineral pairs that were

not invalidated by the extrapolation. If a quartz peak has been projected, for example, all other mineral percentages have been discarded because they are affected by the quartz value, but the two ratios: plagioclase/plagioclase + K-feldspar and dolomite/dolomite + calcite have been retained.

The mineral ratios given are based on the original peak height measurements and not on the rounded-off percentages for the minerals involved listed in the Open File report. The difference between the two types of calculation is considerable where the absolute values are small. These ratios are stated as per cent with two significant figures, but the precision is only in the order of one significant figure where the absolute values are small (i.e. in the order of a few per cent). In the case of the feldspar and carbonate minerals, the ratios obtained from the X-ray diffractograms are probably close to the true values; in the case of the feldspar/feldspar + quartz ratio, however, the calculated value is significantly greater than the true value. Bayliss *et al.* (1970), for example, used a conversion factor of 2:1 for quartz:feldspar; that factor, however, is not applicable here because they used only one feldspar peak (instead of two).

#### Carbon analysis

Percentages of mineralic carbon, and, where present in significant amounts, of organic carbon, were established by the Leco induction furnace method. Percentages of calcite and dolomite were then calculated assuming (a) that all mineralic carbon is contained in these two



minerals, and (b) that their ratio is given by the X-ray peak height ratio with a small correction established by Royse *et al.* (1971) added.

### Thin section analysis

#### Composition

Compositional analysis was carried out either by visual estimate, in conjunction with the X-ray data, or by point counting. In the visual estimates only major groups of percentages are indicated (i.e. less than 1%, 1-5%, 6-20%, 21-50%, 51-100%). Wherever point count analyses subsequently were made of the same thin sections the estimates were found to be reliable within the limits stated.

Point counts were limited to identifiable grains, all the highly altered materials that constitute the "pseudomatrix" being excluded (see Imina Formation, Lithology, *in* Trettin, *in press*). These results, therefore, give greater percentages of unaltered materials such as quartz and chert, and lesser percentages of altered or crushed materials such as unstable feldspar and rock fragments than actually present in the rock. Statistical considerations (e.g. van der Plaas and Tobi, 1965) indicate that the precision of point counts depends on (1) the percentage of the mineral and (2) the number of points counted. For 300 points, the precision (at the 95% confidence level) ranges from  $\pm 1.6\%$  for a mineral making up 2 or 98% of the rock volume to  $\pm 5.8\%$  for a mineral making up 50% of the rock - provided that the identifications are correct and that the point distance is greater than the largest grain diameter. These statistical considerations, however, are not applicable here because the distinction between identifiable grains and pseudomatrix is subjective.

Size and sorting

The size distribution of quartz grains of coarse silt and sand grade was established for given intervals of two thin sections, using Friedman's (1958) point count method, and the statistical moments were calculated from these data; they are shown in Figures 40 and 48 of Trettin, in press. The average grain size of the analyzed intervals can be derived from the phi mean (using the Wentworth scale), and the sorting from the standard deviation, as follows:

poor sorting -- standard deviations greater than 1.3

moderate sorting -- standard deviations between 0.8 and 1.3

good sorting -- standard deviations less than 0.8

(Friedman, 1962). The true sorting, however, probably is much poorer because the fine silt fraction and the clay fraction were ignored. Grain size and sorting of the sandstones were estimated by visual comparison with the analyzed thin sections.

References cited

Bayliss, P., Levinson, A. A., and Klovan, J. E.

- 1970: Mineralogy of bottom sediments, Hudson Bay, Canada;  
Bull. Can. Petrol. Geol., v. 18, p. 469-473.

Friedman, G. M.

- 1958: Determination of sieve-size distribution from thin-  
section data for sedimentary petrological studies;  
J. Geol., v. 66, p. 394-416.

- 1962: Comparison of moment measures for sieving and thin-  
section data in sedimentary petrological studies;  
J. Sediment. Petrol., v. 32, p. 15-25.

Royse, C. F., Jr., Wadell, J. S., and Petersen, L. E.

- 1971: X-ray determination of calcite-dolomite: an evaluation;  
J. Sediment. Petrol., v. 41, p. 483-488.

Smith, J. V.

- 1974: Feldspar Minerals. Vol. 1. Crystal structure and  
physical properties; Springer Verlag, New York,  
Heidelberg, Berlin, 627 p.

Trettin, H. P.

- in press: Middle Ordovician to Lower Devonian deep-water succession  
at southeastern margin of Hazen Trough, Cañon Fiord,  
Ellesmere Island; Geol. Surv. Can., Bull. 272.

- in prep: Investigations of Devonian stratigraphy, west-central  
Ellesmere Island; Geol. Surv. Can., Bull.

van der Plaas, L. and Tobi, A. C.

- 1965: A chart for judging the reliability of point counting  
results; Am. J. Sci., v. 263, p. 87-90.

ABBREVIATIONS

GENERAL INFORMATION

UNIT

A.B.-R.B. = undivided Allen Bay and Read Bay Formations

C.PH = Cape Phillips Formation

IMINA A = lower Imina Formation

IMINA B = Imina Formation, Caledonian Bay Conglomerate Member

IMINA C = upper Imina Formation

FIELD NO.

Note that all field numbers have prefix TM

HEIGHT

AT/FROM = precise position of specimen or base of interval

TO = top of interval; precise position of specimen within  
interval unknown

X-RAY DIFF. = X-ray diffraction analysis

MICA-ILL. = mica and (?) illite

CHLO.-KAOL. = chlorite and (?) kaolinite

FS/FS+QU = total feldspar/total feldspar + quartz

PL/PL+KF = plagioclase/plagioclase+K-feldspar

DL/DL+CA = dolomite/dolomite+calcite

CARBON AN. = Carbon analysis

ORGANIC C = organic carbon

MINER. C = mineralic carbon

OPTICAL AN. = optical analysis

AN: TYPE = type of analysis

HSP = hand specimen examined under binocular microscope

THS' = thin section examined for texture and composition;  
estimates of abundance, if made at all, are restricted  
to a few minerals or grain types.

THS EST = thin section estimate; complete estimate of abundances  
based on inspection.

300 PT = point count analysis (300 points); results expressed  
in per cent.

\* = specimen is intensely altered and analysis rather unreliable.

Expression of estimates:

P = present

A = abundant

or: TR = trace amounts

X = 1-5%

XX = 6-20%

XXX = 21-50%

XXXX = 51-100%

GRAIN TYPE

PEL = peloids

LWST = lime wackestone

DOLST = dolostone

CTD. GNS. = coated grains

CHT. CL. = chert clasts

MEMS. = metamorphic rock fragments

VOLCS = volcanic rock fragments

CARB. CL. = carbonate rock fragments

OPQ = opaque

TML = tourmaline

ZRC = zircon

#### FOSSILS

ECH = echinoderms

BRACH = brachiopods

BRYO = bryozoans

TRIL = trilobites

GASTR = gastropods

STRMP = stromatoporoids

COR = corals

MOLL = molluscs

PEL = pelecypods

SPG = sponges

OSTR = ostracodes

STYLN = Styliolina-type cricoconarids

RAD = radiolarians

FOR = Foraminifera

ALG = algae

GIRVN = *Girvanella*-type algae

UNID = unidentified fossils

TRACE FOSS. = trace fossils

BRW = burrows

HOR BRW = horizontal borrows

GRAIN SIZE

PRED. = predominant grain size

MAX. = maximum grain size

ST = silt

VFSD = very fine grained sand

FSD = fine grained sand

MSD = medium grained sand

CSD coarse grained sand

VCSD = very coarse grained sand

GL = granules

PB = pebbles

CRYST. GRADE = crystal grade

CR = cryptocrystalline (less than 4 microns)

MIC = microcrystalline (4 to 60 microns)

FMIC. = finely microcrystalline (4 to 30 microns)

CAL. MATR. = calcite matrix

SORTING

P = poor

M = moderate

G = good

ROUNDING

SBANG = subangular

SBRD = subrounded

PHENOCLASTS

CHT = chert

FOSS = fossils

RIP-UP CLASTS = rip-up clasts (mostly of siltstone)

REPLACEMENT

CHT/QU REPL = replacement by chert or quartz

STRUCTURE

HOR. LAM. = horizontal lamination

X-LAM. = cross-lamination

CONVOL. = convolute lamination

DIST. BDG. = disturbed bedding

GRAD. BDG. = graded bedding

BRECC. = brecciation

SOLE MKS = sole marks

FLUTES = flute marks

FLAME = flame structure

CALC. VEINS = calcite veins

QZ-CALC VEINS = quartz and calcite veins

PRESS. SOLN. = pressure solution

MSM QTZ = metasomatic quartz

STYL = stylolites

COLOUR

LGY = light grey

MLGY = medium light grey

MDKGY = medium dark grey



DKGY = dark grey

BN = brown

DSKYBN = dusky brown

RD = red

#### ROCK TYPES

CLST = claystone

ST = siltstone

ST, F = fine grained siltstone

ST, C = coarse grained siltstone

SS = sandstone

SS, VF-F = sandstone, very fine to fine grained

GLCG W SDY MATR = granul conglomerate with sandy matrix

PBCG W SDY MATR = pebble conglomerate with sandy matrix

CG = conglomerate

CHT = chert

LMDST = lime mudstone

LWST = lime wackestone

LPST = lime packstone

LGST = lime grainstone

LWST-LGST, PW = transitional between lime wackestone and poorly  
washed grainstone

DOLST = dolostone

DOLST (PST) = dolostone, texture suggests original lime packstone

ARG= argillaceous

STY = silty

VFSDY = very fine grained sandy

FSDY = fine grained sandy

W GLS = with granules

PBLY = pebbly

MATR. REPLD. = classification uncertain because matrix replaced  
by silica

SLIDE DEP? = probably submarine slide deposit

Table 1: Carbonate rocks and associated minor claystones and siltstones

TABLE NO.	1A				1A				1A				1A				1A																		
CURRENT NO.	1				2				3				4				5				6														
UNIT	H	A	Z	E	N	H	A	Z	E	N	H	A	Z	E	N	H	A	Z	E	N	H	A	Z	E	N	H	A	Z	E	N	H	A	Z	E	N
SECTION NO.	1-1				1-1				1-1				1-1				1-1				1-1														
FIELD NO.	7203				72025				720115				720118				720119				720160														
GSC NO.	C035913				C035914				C035918				C035919				C035920				C035921														
HEIGHT (FT)																																			
- AT/FROM					3.				25.				115.				118.				119.				160.										
- TO																																			
X-RAY DIFF.																																			
QUARTZ					29				55				11				28				6				17										
K-FELDSPAR					3				4				2				5				2				3										
PLAGIOCLASE					0				1				1				0				1				0										
MICA-ILL.					0				0				0				0				0				1										
CHLD. - HAOL.					1				2				0				1				0				0										
CALCITE					65				29				*85				63				*89				62										
DOLOMITE					2				9				1				3				1				17										
SIDERITE																																			
FS/FS+QU					8				8				15				15				28				16										
PL/PL+KF					0				21				26				0				21				0										
DL/DL+CA					3				24								4								22										
CARBON AN.																																			
ORGANIC C																																			
MINER. C																																			
CALCITE																																			
DOLOMITE																																			
OPTICAL AN.																																			
AN. TYPE	THS				THS				THS				THS				THS				THS														
GRAIN TYPE																																			
- PEL																																			
- LWST																																			
- DOLST																																			
- PELLETS																																			
- COATD. GNS.																																			
- OOIDS																																			
- FOSSILS																																			
TRACE FOSS.																																			
GRAIN SIZE																																			
- PRED.																																			
- MAX.																																			
CRYST. GR.																																			
- CAL. MATR.	CR-FHIC				CR-FNIC				CR				CR				CR				CR														
- DOLOMITE	NIC				NIC								NIC								NIC														
MUSCOVITE																																			
BIOTITE																																			
FE-SULFIDES	TR				TR				TR				TR				TR				TR														
CHT/QU RPL.																																			
STRUCTURE																																			
- HOR. LAM.					X								X				X				X														
- GRAD. BDG.													X								X														
- OTHER																																			
COLOR	M G Y +				M G Y +				M G Y +				M G Y +				M G Y +				M G Y +														
	M D K G Y				M D K G Y				M D K G Y				M D K G Y				M D K G Y				M D K G Y														
ROCK TYPE (S)	L M P S T L Y				L M P S T L Y				L P S T L				L M P S T L Y				L P S T L				L M P S T L Y														

TABLE NO.	1A	1A	1A
CURRENT NO.	7	8	9
UNIT	HAZEN	HAZEN	HAZEN
SECTION NO.	1-1	1-1	1-1
FIELD NO.	Z2J183	Z2K1	Z2K276
GSC NO.	C035923	C035939	C035944
HEIGHT (FT)			
-AT/FROM	1183.	417.	6192.
-TO			
X-RAY DIFF.			
QUARTZ		22	26
K-FELDSPAR		1	0
PLAGIOCLASE		0	0
MICA-ILL.		0	0
CHLO. -KAOL.		0	0
CALCITE		76	71
DOLOMITE		1	3
SIDERITE			
FS/FS+QU		4	0
PL/PL+KF		0	0
DL/DL+CA		2	4
CARBON AN.			
ORGANIC C			
MINER. C			
CALCITE			
DOLOMITE			
OPTICAL AN.			
AN. TYPE	T#S	T#S	T#S
GRAIN TYPE			
-PEL		P	P
-LWST		P	P
-DOLST			
-PELLETS			
-COATD GNS.			
-OOIDS			
-FOSSILS	ECH TRIL BRACH	A ECH POSTR P	A ECH P
TRACE FOSS.			
GRAIN SIZE			
-PRED.			
-MAX	PB	6MM	6L
CRYST. GR.			
-CAL. MATR.	CR	CR <sup>2</sup>	CR
-DOLOMITE			
MUSCOVITE			
BIOTITE			
FE-SULFIDES		TR	TR
CHT/QU RPL.	XXX	XXX	XXX
STRUCTURE			
-HOR. LAM.			X
-GRAD. BDG.		X	X
-OTHER			
COLOR	M D K G Y - M G Y -	M G Y - M D K G Y - D K G Y -	M G Y - M D K G Y -
ROCK TYPE (S)	L P S I	L P S I	L P S I

TABLE NO.	1B	
CURRENT NO.	1	
UNIT	AB	RB
SECTION NO.	3	
FIELD NO.	2060	
GSC NO.	C035417	
HEIGHT (FT)		
- AT / FROM	TOP.	
- TO		
X-RAY DIFF.		
QUARTZ		5
K-FELDSPAR		0
PLAGIOCLASE		0
MICA-ILL.		0
CHLD. - KAOL.		0
CALCITE		92
DOLOMITE		3
SIDERITE		
FS/FS+QU		
PL/PL+KF		
DL/DL+CA		3
CARBON AN.		
ORGANIC C		
MINER. C		
CALCITE		
DOLOMITE		
OPTICAL AN.		
AN. TYPE	THS	
GRAIN TYPE		
- PEL		2
- LWST		
- DOLST		
- PELLETS		2
- COATD. GNS.		
- OIDS		
- FOSSILS		
TRACE FOSS.		
GRAIN SIZE		
- PRED.		
- MAX.		
CRYST. GR.		
- CAL. MATR.	CR-MIC	
- DOLOMITE		
MUSCOVITE		TR
BIOTITE		
FE-SULFIDES		TR
CHT/QU RPL.		
STRUCTURE		
- HOR. LAM.		X
- GRAD. BDG.		
- OTHER		
COLOR	MDKGY	
ROCK TYPE (S)	LMS	TAR
	STY	ARG

TABLE NO.	1C	1C	1C	1C	1C	1C
CURRENT NO.	1	2	3	4	5	6
UNIT	AB-RB	AB-RB	AB-RB	AB-RB	AB-RB	AB-RB
SECTION NO.	A-1	A-1	A-1	A-1	A-1	A-1
FIELD NO.	72C1-0	72C3T2P	72C4-0	72C5-L	72C5-2	72C6-0
GSC NO.	C035619	C035620	C035621	C035623	C035624	C035625
HEIGHT (FT)						
-AT/FROM						
-TO	0.0	5.8	5.9	6.9	6.9	12.4
X-RAY DIFF.						
QUARTZ						12
K-FELDSPAR						1
PLAGIOCLASE						3
MICA-ILL.						3
CHLD.-KAOL.						1
CALCITE					X	77
DOLOMITE						3
SIDERITE						
FS/FS+QU						27
PL/PL+KF						67
DL/DL+CA						
CARBON AN.						
ORGANIC C						
MINER. C						
CALCITE						
DOLOMITE						
OPTICAL AN.						
AN. TYPE	THS	THS	THS	THS	THS	THS
GRAIN TYPE						
-PEL		A	A	A	A	A
-LWST		P		P	P	P
-DOLST						
-PELLETS			?			?
-COATD. GNS.		P	P	P	P	P
-OIDS						A
-FOSSILS	BRACH	ABRACH	PBRACH	PBRACH	PBRACH	PBRACH
	ECH	PECH	PECH	PECH	PECH	PECH
	OSTR	POSTR	POSTR	POSTR	POSTR	POSTR
	ALG	?	TRIL	P:GASTR	?GASTR	P:GASTR
			GASTR	P	TRIL	P:ALG
			GIRVIN	P	ALG	?
TRACE FOSS.	BRW					BRW?
GRAIN SIZE						
-PRD.	M-VCISD	F-CISD	F-CISD	VF-HMSD	F-VCISD	F-HSD
-MAX.	PB	VCSD	PB	VCSD	PB	GL
CRYST. GR.						
-CAL. MATR.						
-DOLOMITE						
MUSCOVITE			TR		X	X
BIOTITE						
FE-SULFIDES					TR	
CHT/QU RPL.		X		TR	X	
STRUCTURE						
-HOR. LAM.						
-GRAD. BDG.						
-OTHER	STYL					
COLOR	HDKGY	HDKGY	HDKGY	HDKGY	HDKGY	HDKGY
ROCK TYPE (S)	LGSIT	LGSIT	LGSIT	LSSIT+STY	LGSIT+STY	LGSIT+STY

TABLE NO.	1C	1C	1C	1C	1C	1C
CURRENT NO.	7	8	9	10	11	12
UNIT	AB-RB	AB-RB	AB-RB	AB-RB	AB-RB	AB-RB
SECTION NO.	4-1	4-1	4-1	4-1	4-1	4-1
FIELD NO.	72C10	72C11	72C14	72C15	72C15-2	72C15-3
GSC NO.	C035626	C035627	C035628	C035629	C035630	C035631
HEIGHT (FT)						
-AT/FROM	27.0	27.1	34.1	35.3	35.3	35.3
-TO		30.1	35.3	39.2	39.2	39.2
X-RAY DIFF.						
QUARTZ					*53	*54
K-FELDSPAR					2	2
PLAGIOCLASE					8	7
MICA-ILL.					12	12
CHLO.-KAOL.					6	7
CALCITE					13	11
DOLOMITE					6	7
SIDERITE						
FS/FS+QU						
PL/PL+KF					80	75
DL/DL+CA					32	39
CARBON AN.						
ORGANIC C						
MINER. C						
CALCITE						
DOLOMITE						
OPTICAL AN.						
AN. TYPE	THS	THS	THS	THS	HSP	THS
GRAIN TYPE						
-PEL		A	A	A	P	A
-LWST		P		P		
-DOLST						
-PELLETS			?	?		?
-COATD. GNS.		A	P	A		
-OOIDS				P		P
-FOSSILS	BRACH ECH OSTR ALG	PECH POSTR P ?	PBRACH P COR	PBRACH PEICH POSTR TRIL	P P P ?	BRACH ECH OSTR TRIL
TRACE FOSS.						
GRAIN SIZE						
-PRED.	F VC SD	F F SD	F C SD	F F SD		F C SD
-MAX.	PB	PB	GL	VC SD		VC SD
CRYST. GR.						
-CAL. MATR.						
-DOLOMITE			X	X	X Y	X
MUSCOVITE					TR	TR
BIOTITE						TR
FE-SULFIDES			TR			
CHT/QU RPL.		X			X	
STRUCTURE						
-HOR. LAM.			X		X	X
-GRAD. BDG.						
-OTHER				X-LAM	X-LAM	STYL.
COLOR	HDKGY	MDKGY	MDKGY	MDKGY	MDKGY	MDKGY
ROCK TYPE (S)	LST STY	LST STY	LST STY	ST	ST	LST STY





TABLE NO.	1D	1D	1D	1D	1D	1D
CURRENT NO.	7	8	9	10	11	12
UNIT	C. PHIL.	C. PHIL.	C. PHIL.	C. PHIL.	C. PHIL.	C. PHIL.
SECTION NO.	3	3	3	3	3	3
FIELD NO.	7062	7062	7067	7067	7068	7065
GSC NO.	C035424	C035425	C035426	C035427	C035429	C035432
HEIGHT (FT)						
-AT/FROM	222.	258.	329.	330.	379.	538.5
-TO						
X-RAY DIFF.						
QUARTZ			x73			27
K-FELDSPAR			0			1
PLAGIOCLASE			0		3	4
MICA-ILL.			0	TR		5
CHLD. - KAOL.			0	0	1	3
CALCITE			24	89		0
DOLOMITE			3	4	57	60
SIDERITE						
FS/FS+QU			0	10		16
PL/PL+KF				100		82
DL/DL+CA			11	4		100
CARBON AN.						
ORGANIC C						
MINER. C						
CALCITE						
DOLOMITE						
OPTICAL AN.						
AN. TYPE	THS	THS	THS	THS	THS	THS
GRAIN TYPE						
-PEL		A	?		P	
-LWST						
-DOLST						A
-PELLETS		?	?		P	2
-COATD. GNS.					P	
-OOIDS						
-FOSSILS	O STR FOR	P O STR P FOR ECH	P P P	O STR FOR ECH TRIL BRACH STRMP ALG	P P P P P P ?	
TRACE FOSS.						
GRAIN SIZE						
-PRED.	ST-VFS	D F-M	S D		F-C	S D
-MAX	MSD	GL			PB	
CRYST. GR.						
-CAL. MATR.						
-DOLOMITE					HIC	HIC
MUSCOVITE		TR		TR		X
BIOTITE			TR			X
FE-SULFIDES		X		TR	TR	TR
CHT/QU RPL.		X	XXXX			
STRUCTURE						
-HOR. LAM.		X		X		
-GRAD. BDG.						
-OTHER					BRECC.	
COLOR	MGY MDKGY	MGY MDKGY	MGY MDKGY	M2KGY	MDKGY DSKGYBN	MDKGY
ROCK TYPE (S)	LPSI STY + ARG	LPSI LGMATL REPL	OR LSTY LID	SL LID	LSTI STLID	DOLY STL

TABLE NO.	1E	1E	1E	1E
CURRENT NO.	1	2	3	4
UNIT	C. PHIL.	C. PHIL.	C. PHIL.	C. PHIL.
SECTION NO.	4-2	4-2	4-2	4-2
FIELD NO.	72A26.5	72A45.1	72A5.3	72A5.5
GSC NO.	C035569	C035570	C035575	C035575
HEIGHT (FT)				
-AT/FROM	26.5	45.1	215.3	468.5
-TO				
X-RAY DIFF.				
QUARTZ	18	35	34	17
K-FELDSPAR	1	1	2	2
PLAGIOCLASE	4	3	4	4
MICA-ILL.	3	3	3	4
CHLO.-KAOL.	1	3	3	2
CALCITE	29	0	2	20
DOLOMITE	44	55	52	51
SIDERITE				
FS/FS+QU	22	11	15	24
PL/PL+KF	75	69	72	69
DL/DL+CA	60	100	96	72
CARBON AN.				
ORGANIC C				
HINER. C				
CALCITE				
DOLOMITE				
OPTICAL AN.				
AN. TYPE	THS	THS	THS	THS
GRAIN TYPE				
-PEL				
-LWST				
-DOLST				
-PELLETS				
-COATD. GNS.				
-OOIDS				
-FOSSILS	SPG	PSPG	PSPG	A
TRACE FOSS.				
GRAIN SIZE				
-PRED.				
-MAX.				
CRYST. G.P.				
-CAL. MATR.				
-DOLOMITE	FMIC	HIC	CR-FHIC	FHIC
MUSCOVITE		X	X	X
BIOTITE				
FE-SULFIDES	TR	TR		TR
CHT/QU RPL.				
STRUCTURE				
-HOR. LAM.		X	X	
-GRAD. BDG.				
-OTHER				
COLOR	NDKGY	NDKGY	NDKGY	NDKGY
ROCK TYPE(S)	DOLST + VFS + ARG	DOLST + VFS + ARG	DOLST + VFS + ARG	DOLST + VFS + ARG

TABLE NO.	1F	1G	1H
CURRENT NO.	1	1	1
UNIT	C PHIL.	MINA C	MINA
SECTION NO.	5-1	1-2	2-2
FIELD NO.	72H36	70-245D6	7022I-
GSC NO.	C035904	C035555	C035756
HEIGHT (FT)			
-AT/FROM	36.	1000.±	234.45
-TO			
X-RAY DIFF.			
QUARTZ	16		
K-FELDSPAR	0		
PLAGIOCLASE	2		
MICA-ILL.	2		
CHLD.-KAOL.	2		
CALCITE	76		
DOLOMITE	2		
SIDERITE			
FS/FS+QU	9		
PL/PL+KF	100		
DL/DL+CA	2		
CARBON AN.			
ORGANIC C			
MINER. C			
CALCITE			
DOLOMITE			
OPTICAL AN.			
AN. TYPE	THS	THS	THS
GRAIN TYPE			
-PEL	A	P	
-LWST		P	
-DOLST		P	
-PELLETS	?		
-COATD. GNS.		P	
-OOIDS			
-FOSSILS	STYLA P	ECH P BRACH P BAND P STRMP P FOR P	ECH P BRACH P OSTIR P FOR P ALG P GLASTR P
TRACE FOSS.			
GRAIN SIZE			
-PRED.	ST-VFS D	S/D-G/L	FSD
-MAX.	FSD	G/L	C-VCS D
CRYST. GR.			
-CAL. MATR.			
-DOLOMITE			
MUSCOVITE	X	TR	
BIOTITE			
FE-SULFIDES	TR		
CHT/QU RPL.		TR	
STRUCTURE			
-HOR. LAM.	X		
-GRAD. BDG.	X		
-OTHER			
COLOR	MRKGY	BN	
ROCK TYPE (S)	LPST+ STYS VFS D	LPST+ LGS VFS STY+ SE	LWST+ LWST LWST LWST LWST LWST



Table 2: Siltstone, slate, and chert

TABLE NO.	2A					2A				
CURRENT NO.	1									
UNIT	H	A	Z	E	N	H	A	Z	E	N
SECTION NO.	1	-	1			1	-	1		
FIELD NO.	72	7	13	.	5	72	7	30	2	
GSC NO.	C035915					C035925				
HEIGHT (FT)										
- AT / FROM			43	.	5			30	2	
- TO										
X-RAY DIFF.										
QUARTZ				7	4			X	9	6
K-FELDSPAR					8				2	
PLAGIOCLASE				?	TR				0	
MICA-ILL.				4					1	
CHLO.-KAOL.				4					0	
CALCITE					6				1	
DOLOMITE				4						
SIDERITE										
FS / FS+QV					10					
PL / PL+KF				?	TR					
DL / DL+CA					40					
CARBON AN.										
ORGANIC C										
MINER. C										
CALCITE										
DOLOMITE										
OPTICAL AN.										
AN. TYPE	T	H	S			T	H	S		
MUSCOVITE				?	X					
BIOTITE										
FE-SULFIDES					TR			TR		
FOSSILS						RAD		A		
TRACE FOSS										
STRUCTURE										
- HOR. LAM.					X			X		
- X-LAM.										
- CONVOL.										
- DIST. BDG.										
- GRAD. BDG.										
- OTHER										
COLOR					DKGY					DKGY
ROCK TYPE(S)					SLATE					CHT





TABLE NO.	2C				2C				2C				2C				2C			
CURRENT NO.	1				2				3				4				5			
UNIT	L. PHIL.				C. PHIL.				C. PHIL.				C. PHIL.				C. PHIL.			
SECTION NO.	3				3				3				3				3			
FIELD NO.	7068 - - -				7068 - - -				7068 - - -				7068 - - -				7068 - - -			
GSC NO.	C035428				C035430				C035431				C035433				C035434			
HEIGHT (FT)	372				511				512				539				670			
- AT / FROM																				
- TO																				
X-RAY DIFF.																				
QUARTZ	x71				x54				40				x56				*44			
K-FELDSPAR	21				3				1				3				2			
PLAGIOCLASE	6				8				3				7				8			
MICA-ILL.	9				13				5				13				13			
CHLO.-KAOL.	4				8				2				8				10			
CALCITE	4				2				0				2				12			
DOLOMITE	5				12				49				11				11			
SIDERITE																				
FS/FS+QU																				
PL/PL+KF	80				73				80				69				81			
DL/DL+CA	51				85				100				82				46			
CARBON AN.																				
ORGANIC C																				
MIVER. C																				
CALCITE																				
DOLOMITE																				
OPTICAL AN.																				
AN. TYPE	T#S				T#S				T#S				T#S				T#S			
MUSCOVITE	x				xx				xx				xx				xx			
BIOTITE																				
FE-SULFIDES	TR																TR			
FOSSILS																				
TRACE FOSS.																				
STRUCTURE																				
- HOR. LAM.	x				x				x				x				x			
- X-LAM.																				
- CONVOL.																				
- DIST. BDG.																				
- GRAD. BDG.																				
- OTHER																				
COLOR	MDKGY				MDKGY				MDKGY				MDKGY				MDKGY			
ROCK TYPE(S)	S T F				S T F				S T F				S T F				S T F			





TABLE NO.	2E				2E				2E				2E			
CURRENT NO.	1				2				3				4			
UNIT	C. PHIL.				C. PHIL.				C. PHIL.				C. PHIL.			
SECTION NO.	5-11				5-1				5-1				5-1			
FIELD NO.	72456				72458				72480				724165			
GSC NO.	C035905				C035906				C035907				C035908			
HEIGHT (FT)	56.				58.				80.				165.			
- AT / FROM																
- TO																
X-RAY DIFF.																
QUARTZ	57				65				43				75			
K-FELDSPAR	2				2				1				2			
PLAGIOCLASE	0				0				0				3			
MICA-ILL.	1				1				0				2			
CHLO. - KAOL.	0				0				1				0			
CALCITE	37				30				51				6			
DOLOMITE	3				2				4				12			
SIDERITE																
FS / FS+QU	3				3				3				6			
PLIPL+KF	0				0				0				57			
DL / DL+CA	7				6				8				66			
CARBON AN.																
ORGANIC C																
MINER. C																
CALCITE																
DOLOMITE																
OPTICAL AN.																
AN. TYPE	H S P				T H S				T H S				H S P			
MUSCOVITE									X				X			
BIOTITE																
FE-SULFIDES					?TR											
FOSSILS																
TRACE FOSS.																
STRUCTURE																
- HOR. LAM.	X				X				X				?			
- X-LAM.																
- CONVOL.																
- DIST. BDG.																
- GRAD. BDG.																
- OTHER																
COLOR	M D K G Y -				M D K G Y -				M D K G Y -				M D K G Y -			
	M G Y - - -				M G Y - - -				M G Y - - -				M G Y - - -			
ROCK TYPE(S)	S I A R G F T C + V E S D Y				S I A R G F T C + V E S D Y				S I A R G F T C + V E S D Y				S I A R G F T C + V E S D Y			

TABLE NO.	2E	2E	2E	2E
CURRENT NO.	5	6	7	8
UNIT	C. PH.	C. PHIL.	C. PHIL.	C. PHIL.
SECTION NO.	5-1	5-1	5-1	5-1
FIELD NO.	72H217	72H408	72H560	72H689
GSC NO.	C035909	C035910	C035911	C035912
HEIGHT (FT)				
- AT / FROM	217.	408.	560.	684.
- TO				
X-RAY DIFF.				
QUARTZ	*191	77	82	74
K-FELDSPAR	1	2	1	2
PLAGIOCLASE	2	7	7	8
MICA-ILL.	2	5	5	10
CHLO.-KAOL.	0	4	3	6
CALCITE	1	?TR	0	0
DOLOMITE	3	5	2	0
SIDERITE				
FS / FS+QV		11	10	12
PLIPL+KF	63	76	84	83
DL / DL+CA	65	≈ 100	100	
CARBON AN.				
ORGANIC C				
MINER. C				
CALCITE				
DOLOMITE				
OPTICAL AN.				
AN. TYPE	T#S	T#S	T#S	H#P
MUSCOVITE			XX	XX
BIOTITE			TR	X
FE-SULFIDES	X		TR	TR
FOSSILS	RAD	A		
TRACE FOSS.				
STRUCTURE				
- HOR. LAM.	X		X	X
- X-LAM.			?	
- CONVOL.				
- DIST. BDG.			?	
- GRAD. BDG.				
- OTHER				
COLOR	D K G Y	H D K G Y	H D K G Y	M D K G Y
ROCK TYPE(S)	CHI	ST AR G V F S I + V F S D Y	ST V F S D Y	ST



TABLE NO.	26				26				26				26															
CURRENT NO.	1				2				3				4															
UNIT	I	M	NA	C	I	M	NA	C	I	M	NA	C	I	M	NA	C												
SECTION NO.	1	2	1		1	2	1		1	2	1		1	2	1													
FIELD NO.	72	P	1	2	72	P	4	05	72	P	9	95	72	P	12	87												
GSC NO.	C	0	3	5	9	6	2	C	0	3	5	9	6	8	C	0	3	5	9	7	6	C	0	3	5	9	8	1
HEIGHT (FT)																												
- AT / FROM					4.05				9.95				12.87															
- TO																												
X-RAY DIFF.																												
QUARTZ					X67				70				57				56											
K-FELDSPAR					2				1				2				3											
PLAGIOCLASE					7				5				6				7											
MICA-ILL.					5				8				14				13											
CHLO.-KAOL.					6				9				13				11											
CALCITE					7				2				2				2											
DOLOMITE					6				5				6				6											
SIDERITE																												
FS / FS+QV									9				13				15											
PL / PL+KF					80				78				75				68											
DL / DL+CA					46				69				79				71											
CARBON AN.																												
ORGANIC C																												
MINER. C																												
CALCITE																												
DOLOMITE																												
OPTICAL AN.																												
AN. TYPE	H S P				T H S				T H S				T H S															
MUSCOVITE									XX				XX				XX											
BIOTITE									X				XX				TR											
FE-SULFIDES													TR															
FOSSILS																												
TRACE FOSS.																												
STRUCTURE																												
-HOR. LAM.									X				X				X											
-X-LAM.					X				X				X															
-CONVOL.					X																							
-DIST. BDG.													X															
-GRAD. BDG.																												
-OTHER																												
COLOR	MGY				MGY				MGY				MGY															
ROCK TYPE(S)	SIFSDY				SIFSDY				SIFSDY				SIFSDY															

TABLE NO.	2H				2H				2H				2H				2H							
CURRENT NO.	1				2				3				4				5							
UNIT	M	I	N	A	M	I	N	A	M	I	N	A	M	I	N	A	M	I	N	A	M	I	N	A
SECTION NO.	2-2				2-2				2-2				2-2				2-2							
FIELD NO.	7071B				7071R				7072D				7072E				7074A				7074S			
GSC NO.	C035444				C035448				C035453				C035454				C035464				C035465			
HEIGHT (FT)	2.1				17.45				229.0				230.5				734.1				735.05			
-AT/FROM																								
-TO																								
X-RAY DIFF.																								
QUARTZ	*38				*60				*64				*64				*33				*58			
K-FELDSPAR	1				TR				1				1				1				1			
PLAGIOCLASE	7				5				6				6				6				8			
MICA-ILL.	15				8				5				7				15				4			
CHLO.-KAOL.	12				5				6				6				17				5			
CALCITE	17				1				11				11				17				18			
DOLOMITE	10				21				7				5				11				6			
SIDERITE																								
FS/FS+QV																								
PL/PL+KF	89				94				87				88				85				92			
DL/DL+CA	37				95				41				33				39				25			
CARBON AN.																								
ORGANIC C																								
MINER. C																	2.25							
CALCITE																	11							
DOLOMITE																	8							
OPTICAL AN.																								
AN. TYPE	THS				THS				THS				THS				THS				THS			
MUSCOVITE	XX				XX				X				X				XX				X			
BIOTITE	X								X				X				X				X			
FE-SULFIDES	TR				TR								TR				TR				TR			
FOSSILS																								
TRACE FOSS.																								
STRUCTURE																								
-HOR. LAM.	X				X				X				X				X				X			
-X-LAM.	X								X								X				X			
-CONVOL.																								
-DIST. BDG.																					X			
-GRAD. BDG.					X																			
-OTHER																					FLAME			
COLOR	MDKGY				MGY				MGY				MDKGY				MDKGY				MDKGY			
ROCK TYPE(S)	SI				SIFSDY				SIFSDY				SI				SIFSDY				SIFSDY			

TABLE NO.	2H				2H				2H				2H				2H							
CURRENT NO.	7				8				9				10				11				12			
UNIT	1H	1NA			1H	1NA			1H	1NA			1H	1NA			1H	1NA			1H	1NA		
SECTION NO.	2-2				2-2				2-2				2-2				2-2				2-2			
FIELD NO.	7074C				7074C				7074D				7075A				7075B				7076A			
GSC NO.	C035466				C035467				C035468				C035469				C035470				C035475			
HEIGHT (FT)																								
- AT / FROM	7391.8				7411.5				7491.8				8671.2				8671.9				193191.0			
- TO																								
X-RAY DIFF.																								
QUARTZ	55				49				47				42								46			
K-FELDSPAR	2				1				1				1								1			
PLAGIOCLASE	4				5				7				4								6			
MICA-ILL.	8				7				6				4								7			
CHLO.-KAOL.	1				7				6				4								6			
CALCITE	22				23				24				35								26			
DOLOMITE	8				8				9				10								8			
SIDERITE																								
FS / FS+QU	9				11				15				10								13			
PLIPL+KF	75				86				81				89								86			
DL / DL+CA	27				26				27				22								23			
CARBON AN.																								
ORGANIC C																								
MINER. C																								
CALCITE																								
DOLOMITE																								
OPTICAL AN.																								
AN. TYPE	T#S				T#S				T#S				T#S				T#S				T#S			
MUSCOVITE					XX				XX				XX				XX				XX			
BIOTITE					TR				TR				TR				TR				TR			
FE-SULFIDES																								
FOSSILS																								
TRACE FOSS.																								
STRUCTURE																								
-HOR. LAM.					X				X				X				X				X			
-X-LAM.									X				X				X							
-CONVOL.																								
-DIST. BDG.									X												X			
-GRAD. BDG.					?				X				X											
-OTHER																								
COLOR	NGY				NGY				NGY				NGY				NGY				NGY			
ROCK TYPE(S)	SI				SI				SI				SIFSLC				SIFSLD				SI			

TABLE NO.	2H	2H	2H	2H	2H	2H
CURRENT NO.	13	14	15	16	17	18
UNIT	1M1NA	1M1NA	1M1NA	1M1NA	1M1NA	1M1NA
SECTION NO.	2-2	2-2	2-2	2-2	2-2	2-2
FIELD NO.	7076B	7077B	7077E	7077F	7077K	7078-2
GSC NO.	C035476	C035479	C035482	C035483	C035487	C035488
HEIGHT (FT)						
-AT/ FROM	969.6	1305.6	1306.03	1306.1	1307.75	1311.95
-TO						
X-RAY DIFF.						
QUARTZ	*6	6	1	5	7	8
K-FELDSPAR	1	2	1	0	1	1
PLAGIOCLASE	5	7	7	5	8	6
MICA-ILL.	2	12	5	12	3	8
CHLO.-KAOL.	3	9	4	4	2	7
CALCITE	16	4	17	12	25	14
DOLOMITE	7	9	5	9	4	6
SIDERITE						
FS/FS+QV		13		8		
PL/PL+KF	83	74	89	100	92	90
DL/DL+CA	31	69	21	42	15	30
CARBON AN.						
ORGANIC C						
MINER. C						
CALCITE						
DOLOMITE						
OPTICAL AN.						
AN. TYPE	H S P	T H S	T H S	T H S	T H S	T H S
MUSCOVITE		X X		X X	X X	X X
BIOTITE		X		X	TR	TR
FE-SULFIDES			TR	TR	TR	TR
FOSSILS						
TRACE FOSS.						
STRUCTURE						
-HOR. LAM.	X	X		X	X	X
-X-LAM.	X			X		
-CONVOL.						
-DIST. BDG.						
-GRAD. BDG.						X
-OTHER						
COLOR.	MGY	MGY	MGY	MGY	MGY	MGY
ROCK TYPE(S)	S V F S D Y	S V F S D Y	S I	S V F S L E N S	S V F S D Y T	S V F S D Y



TABLE NO	24	24	24	24	24
CURRENT NO.	19	20	21	22	23
UNIT	1M1MA	1M1MA	1M1MA	1M1MA	1M1MA
SECTION NO	2-2	2-2	2-2	2-2	2-2
FIELD NO.	70J15A	70J15Q	70J15R	70J15S	70J15T
GSC NO.	035501	035506	035507	035508	035509
HEIGHT (FT)					
-AT/FROM	1986.5	2002.6	2009.65	2012.05	2015.7
-TO					
X-RAY DIFF.					
QUARTZ	*75	*60	*58	*57	*59
K-FELDSPAR	2	2	1	1	2
PLAGIOCLASE	3	0	5	7	7
MICA-ILL	4	6	8	5	6
CHLO.-KAOL.	4	7	8	4	6
CALCITE	4	20	13	19	12
DOLOMITE	8	7	7	7	8
SIDERITE					
FS/FS+QV					
PL/PL+KF	67		89	93	79
DL/DL+CA	64	26	35	26	39
CARBON AN.					
ORGANIC C					
MINER. C					
CALCITE					
DOLOMITE					
OPTICAL AN.					
AN. TYPE	T#S	T#S	T#S	T#S	T#S
MUSCOVITE		X	X	X	X
BIOTITE	X	TR	TR	TR	TR
FE-SULFIDES					
FOSSILS					
TRACE FOSS.					
STRUCTURE					
-HOR. LAM.	X	X	X	X	X
-X-LAM.	X	X			
-CONVOL.					
-DIST. BDG.					
-GRAD. BDG.					
-OTHER					
COLOR	NGY	MGY	MGY	MGY	MGY
ROCK TYPE(S)	STVFSDY	STVFSDY	STVATV	STVFSDY	STVFSDY

TABLE NO.	21	21	22	21	21	21
CURRENT NO.	1	2	3	4	5	6
UNIT	1M1NA	1M1NA	1M1NA	1M1NA	1M1NA	1M1NA
SECTION NO.	5-2	5-2	5-2	5-2	5-2	5-2
FIELD NO.	72630	72633	726439C	726508A	726511B	726513D
GSC NO.	C035889	C035891	C035894	C035896	C035898	C035900
HEIGHT (FT)						
- AT / FROM	30.	33.	439.85	508.45	511.6	513.65
- TO						
X-RAY DIFF.						
QUARTZ	47	63	59	60	64	55
K-FELDSPAR	2	0	0	1	TR	TR
PLAGIOCLASE	4	5	5	4	4	5
MICA-ILL.	5	3	2	5	3	5
CHLO.-KAOL.	6	4	2	6	4	8
CALCITE	28	20	25	16	17	21
DOLOMITE	8	5	7	8	8	6
SIDERITE						
FS/FS+QU	12	7	8	8	7	8
PL/PL+KF	71	≈100	≈100	84	90	91
DL/DL+CA	21	19	23	34	31	22
CARBON AN.						
ORGANIC C						
MINER. C						
CALCITE						
DOLOMITE						
OPTICAL AN.						
AN. TYPE	HSP	#SP	T#S	T#S	T#S	T#S
MUSCOVITE				X	X	X
BIOTITE				TR	TR	TR
FE-SULFIDES				TR	TR	
FOSSILS						
TRACE FOSS.						
STRUCTURE						
-HOR. LAM.			X	X	X	X
-X-LAM.			X	X		
-CONVOL.						
-DIST. BDG.					X	
-GRAD. BDG.						X
-OTHER					SS	DYKE
COLOR	MDKGY	MGY	MGY	MGY	MGY	MGY
ROCK TYPE(S)	ST	STVFSDY	STVFSDY	STVFSDY	STVFSDY	STVFSDY



TABLE NO	20	20	20	20	20	20
CURRENT NO.	1	2	3	4	5	6
UNIT	EIDS	EIDS	EIDS	EIDS	EIDS	EIDS
SECTION NO.	1-3	1-3	1-3	1-3	1-3	1-3
FIELD NO.	Z0LB48	Z0LCX	Z0LIA	Z0LD40	Z0LD42	Z0L250
GSC NO.	C035528	C035529	C035532	C035538	C035539	C035542
HEIGHT (FT)						
-AT/FROM	634.	716.	1755.8	1794.	1796.	1870.
-TO		1754.				
X-RAY DIFF.						
QUARTZ	*33	36	*36	*40	*43	
K-FELDSPAR	21	1	1	1	1	
PLAGIOCLASE	5	5	7	6	8	
MICA-ILL.	17	12	17	10	8	
CHLO.-KAOL.	18	12	18	13	8	
CALCITE	16	24	7	23	26	
DOLOMITE	10	10	14	7	7	
SIDERITE						
FS/FS+QU		15				
PL/PL+K	2	2	84	91	100	
DL/DL+CA	38	30	66	23	21	
CARBON AN.						
ORGANIC C						
MINER. C	2.73	4.22	1.81		4.34	
CALCITE	13	23	4		27	
DOLOMITE	9	11	10		8	
OPTICAL AN.						
AN. TYPE	THS	THS	THS	THS	THS	THS
MUSCOVITE	XX	XX	XX	XX	XX	XX
BIOTITE		TR	X	X	X	X
FE-SULFIDES		TR	TR	TR	TR	TR
FOSSILS						
TRACE FOSS.	HOR BRV					
STRUCTURE						
-HOR. LAM.	X	X	X	X		X
-X-LAM.					X	
-CONVOL.						X
-DIST. BDG.					X	X
-GRAD. BDG.		X				
-OTHER					FLUTES	
					FLAME	
COLOR	MGY-LGY	MGY-LGY	MGY-LGY	MGY-LGY	MGY-LGY	MGY-LGY
ROCK TYPE(S)	S	S	S	S	S	S
	VFS	VFS	VFS	VFS	VFS	VFS
	DI	DI	DI	DI	DI	DI
	SL	SL	SL	SL	SL	SL
	TY	TY	TY	TY	TY	TY

TAB. NO.	27	27
CURRENT NO.	7	8
UNIT	E I D S	E I D S
SECTION NO.	1-3	1-3
FIELD NO.	70 LE 20	70 L 62
G.S.C. NO.	C 035547	C 035547
HEIGHT (FT)	2075.1	2800.4
- AT FROM		
- TO		
X-RAY DIFF.		
QUARTZ	36	
K-FELDSPAR	1	
PLAGIOCLASE	4	
MICA-ILL	11	
CHLO.-KAOL.	15	
CALCITE	24	
DOLOMITE	9	
SIDERITE		
FSIFSTQU	112	
PLIPLIKF	77	
DL/DI+CA	14	
CARBON AM.		
ORGANIC C		
MINER. C		
CALCITE		
DOLOMITE		
OPTICAL AN.		
AN. TYPE	T#S	T#S
MUSCOVITE		XX
BIOTITE		TR
FE-SULFIDES		TR
FOSSILS	BRyo P EICH P	
TRALE FOSS.		
STRUCTURE		
- HOR. LAM.		X
- X-LAM.		
- CONVOL.		
- DIST. BDG.		
- GRAD. BPA.		X
- OTHER		
COLOR	H G Y - - -	H G Y - L G Y
ROCK TYPE(S)	S I F S D Y V F S D Y A E L A T Y	S I F S D Y V F S D Y A E L A T Y



TABLE NO.	2L	2L	2L	2L
CURRENT NO.	1	2	3	4
UNIT	E I D S	E I D S	E I D S	E I D S
SECTION NO.	4-4	4-4	4-4	4-4
FIELD NO.	72825	72-22A	72-22A	72-22A3
GSC NO.	C035618	C035985	C035986	C035987
HEIGHT (FT)				
- AT / FROM	1.	350.±	350.±	350.±
- TO				
X-RAY DIFF.				
QUARTZ	*56	45	43	40
K-FELDSPAR	1	? TR	? TR	? TR
PLAGIOCLASE	6	5	5	5
MICA-ILL.	5	6	3	7
CHLO.-KAOL.	5	5	4	5
CALCITE	20	31	39	34
DOLOMITE	7	8	6	9
SIDERITE				
FS / FS+QU		110	111	111
PL / PL+KF	81	≈ 100	≈ 100	100
DL / DL+CA	25	20	14	21
CARBON AN.				
ORGANIC C				
MIVER. C				
CALCITE				
DOLOMITE				
OPTICAL AN.				
AN. TYPE	THS	THS	THS	THS
MUSCOVITE	X	X X	X	X X
BIOTITE	X	TR		TR
FE-SULFIDES	TR			
FOSSILS		STYLN	P STYLN BRACH	A STYLN P
TRACE FOSS.				
STRUCTURE				
- HOR. LAM.	X	X	X	X
- X-LAM.	X			
- CONVOL.				
- DIST. BDG.				
- GRAD. BDG.				
- OTHER				
COLOR	MGY	MGY MDKY	MDKY	MGY MDKY
ROCK TYPE(S)	ST VFSDY	ST VFSDY	ST VFSDY	ST VFSDY

Table 3: Sandstone

TABLE NO.	3A	3A	3A	3A	3	3
CURRENT NO.	1	2	3	4		
UNIT	C. PHIL.	C. PHIL.	C. PHIL.	C. PHIL.		
SECTION NO.	J-2	J-2	J-2	J-2		
FIELD NO.	72A263	72A273	72A32L	72A433		
GSC NO.	C035580	C035581	C035582	C035572		
HEIGHT (FT)						
-AT/FROM	263	273	321	438		
-TO						
X-RAY DIFF						
QUARTZ	*57	*52				
K-FELDSPAR	1	2				
PLAGIOCLASE	8	5				
MICA-ILL.	3	3				
CHLO.-KAOL.	2	4				
CALCITE	7	23				
DOLOMITE	22	11				
FS/FS+QU						
PL/PL+KF	84	72				
DL/DL+CA	75	33				
CARBON AN.						
MINER. C						
CALCITE						
DOLOMITE						
OPTICAL AN.						
AN. TYPE	THIS	THIS	THIS	THIS		
GRAIN TYPE						
-QUARTZ	XIXIX	YIXIX	XIXIX	XIXIX		
-CHT. CL.	X	X	TR	TR		
-FELDSPAR	XX	X	X	X		
-MUSCOVITE	X	X	X	X		
-BIOTITE	TR	TR	TR	TR		
-CHLORITE	X	X	X	X		
-HEMS.	TR	TR	TR	TR		
-VOLCS.						
-CARB. CL.	XXX	XXX	XXX	XXX		
-OTHER	TL	TR	TL	TR		
-OTHER						
-OTHER						
-OTHER						
GRAIN SIZE						
-PRED.	VFS D	VFS D	ST VFS D	ST VFS D		
-MAX.	FSD	MSD	FSD	FSD		
SORTING	M-G	M	M-G	M-G		
ROUNDING	SBAVG	SBAVG	SBAVG	SBAVG		
	SBRD	SBRD				
PHENOCLASTS						
-TYPE						
-MAX. SIZE						
RIP-UP CL.						
FOSSILS		OSTR P				
		B'RACH P				
TRACE FOSS.						
FE-SULFIDES		TR	TR	X	X	
STRUCTURE						
-HOR. LAM.	X	X	X	X	X	
-X-LAM.	X	X	X	X	X	
-CONVOL.						
-DIST. BDG.	X					
-GRAD. BDG.	X					
-OTHER						
		CALC. VEINS	CALC. VEINS	CALC. VEINS		
COLOR	MGY	MGY	MNYKY	MGY		
	MDKGY	MDKGY	MNYKY	MNYKY		
ROCK TYPE(S)	SLS	SLS	SLS	SLS		





TABLE NO.	3C	3C	3C	3C
CURRENT NO	1	2	3	4
UNIT	I	B	I	B
SECTION NO.	1-2-2	1-2-2	1-2-2	1-2-2
FIELD NO.	704E50	704M60	70215D3	70215D4
BSC NO.	C035548	C035549	C035552	C035553
HEIGHT (FT)				
-AT/FROM				
-TO				
X-RAY DIFF.				
QUARTZ		75		85
K-FELDSPAR		7		9
PLAGIOCLASE		3		3
MICA-ILL.		2		2
CHLO.-KAOL.		2		1
CALCITE		8		2
DOLOMITE		3		3
FS/FS+QU		11		8
PL/PL+KF		29		39
DL/DL+CA		30		67
CARBON AN.				
MINER. C				
CALCITE				
DOLOMITE				
OPTICAL AN.				
AN. TYPE	3000 IPT	3000 IPT	1100 IPT	302 IPT
GRAIN TYPE				
-QUARTZ		73		1100
-CHT. CL.		1		TR
-FELDSPAR		6		19
-MUSCOVITE		TR		3
-BIOTITE		1		1
-CHLORITE		TR		1
-MENS.		2		2
-VOLCS.		71		1
-CARB. CL.		14		11
-OTHER	OP	1		ZRC
-OTHER	FOSS	1		TR ERIC
-OTHER				TR
-OTHER				
GRAIN SIZE				
-PRED.	VF-FSD	VF-FSD	MSD	F-MSD
-MAX.		M-CSD	CSD	CSD
SORTING	P	M	M-G	G
ROUNDING	SBRD - SBRD	SBRD - SBRD	SBRD - RD	SBRD - RD
PHENOCLASTS	CHT	P		
-TYPE	FOSS	P		
-MAX. SIZE	8MM			
RIP-UP CL.				
FOSSILS	BRACH	P		
TRACE FOSS.				
FE-SULFIDES		TR		
STRUCTURE				
-HOR. LAM.				
-X-LAM.				
-CONVOL.				
-DIST. BDG.				
-GRAD. BDG.				
-OTHER			PRESS. SOLN. + MSY. QTZ	PRESS. SOLN
COLOR	MGY	MGY	LMY	RD
ROCK TYPE (S)	SP+LY	SP+LY	SP+LY	SP+LY

3D	3D
CURRENT NO	1
UNIT	I
SECTION NO.	1-2-2
FIELD NO.	70215D6
BSC NO.	C035555
HEIGHT (FT)	
-AT/FROM	
-TO	1000. +
X-RAY DIFF.	
QUARTZ	
K-FELDSPAR	
PLAGIOCLASE	
MICA-ILL.	
CHLO.-KAOL.	
CALCITE	
DOLOMITE	
FS/FS+QU	
PL/PL+KF	
DL/DL+CA	
CARBON AN.	
MINER. C	
CALCITE	
DOLOMITE	
OPTICAL AN.	
AN. TYPE	THIS ECT
GRAIN TYPE	
-QUARTZ	
-CHT. CL.	
-FELDSPAR	
-MUSCOVITE	
-BIOTITE	
-CHLORITE	
-MENS.	
-VOLCS.	
-CARB. CL.	
-OTHER	
-OTHER	
-OTHER	
-OTHER	
GRAIN SIZE	
-PRED.	S.D - GL
-MAX.	
SORTING	M
ROUNDING	SBRD - SBRD
PHENOCLASTS	FOSS P
-TYPE	
-MAX. SIZE	
RIP-UP CL.	
FOSSILS	GL
TRACE FOSS.	
FE-SULFIDES	
STRUCTURE	
-HOR. LAM.	
-X-LAM.	
-CONVOL.	
-DIST. BDG.	
-GRAD. BDG.	
-OTHER	
COLOR	BN
ROCK TYPE (S)	LS + ST + V + GL

TABLE NO	3E				3E				3E				3E				3E													
CURRENT NO.	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4										
UNIT	M	I	N	A	M	I	N	A	M	I	N	A	M	I	N	A	M	I	N	A										
SECTION NO.	1	2	4	1	2	4	1	2	4	1	2	4	1	2	4	1	2	4												
FIELD NO.	72	P	0	72	P	0	72	P	1	72	P	1	72	P	2	72	P	2												
GSC NO.	C035959	C035960	C035961	C035963	C035964	C035965																								
HEIGHT (FT)	0.0				0.6				1.1				1.3				2.0				2.3									
-AT/FROM																														
-TO																														
X-RAY DIFF																														
QUARTZ			67				78				72				68				68				67							
K-FELDSPAR			4				2				2				3				1				2							
PLAGIOCLASE			5				3				3				5				9				5							
MICA-ILL.			1				3				6				7				7				7							
CHLO.-KAOL.			1				1				6				7				6				7							
CALCITE			1	2			6				4				5				4				5							
DOLOMITE			4				4				7				5				5				7							
FS/FS+QU			12								6				10								10							
PL/PL+KF			53				62				56				62				89				68							
DL/DL+CA			23				35				62				52				60				58							
CARBON AN.																														
MINER. C																														
CALCITE																														
DOLOMITE																														
OPTICAL AN.																														
AN. TYPE	H	S	P		H	S	P		H	S	P		H	S	P		T	H	S	E	S	T	3	1	0					
GRAIN TYPE																														
-QUARTZ																			X	X	X	X			7	0				
-CHT. CL.																									TR					
-FELDSPAR																			X	X					7					
-MUSCOVITE																				X					5					
-BIOTITE																				X					6					
-CHLORITE																				X					3					
-HEMS.																					TR				1					
-VOLCS.																														
-CARB. CL.																				X	X				7					
-OTHER																				TR	OP	TR			1					
-OTHER																						TR			TR					
-OTHER																														
-OTHER																														
GRAIN SIZE																														
-PRED.	V	F	S	D	V	F	S	D	V	F	S	D	V	F	S	D	V	F	S	D	V	F	S	D						
-MAX.	Y	C	S	D	M	S	D	M	S	D	M	S	D	C	V	C	S	D	C	S	D									
SORTING	M	-	P		M				M				M				M													
ROUNDING																	S	B	A	N	G	S	B	A	N	G				
																	S	F	A	N		S	B	R	D					
PHEOCLASTS																														
-TYPE																														
-MAX SIZE																														
RIP-UP CL.																														
FOSSILS	E	C	H		A	E	C	H					U	N	I	D	P													
	T	R	I	L	P																									
TRACE FOSS.																														
FE-SULFIDES																														
STRUCTURE																														
-HOR. LAM.																														
-X-LAM.																														
-CONVOL.																														
-DIST. BDG.																														
-GRAD. BDG.																														
-OTHER																														
COLOR	M	G	Y		M	G	Y		M	G	Y		M	G	Y		M	G	Y		M	G	Y							
ROCK TYPE(S)	S	S	L	S	T	Y	S	S	L	S	T	Y	S	S	L	S	T	Y	S	S	L	S	T	Y	S	S	L	S	T	Y

TABLE NO.	3E				5E				7E				10E				11E				12E																																												
CURRENT NO.	7				8				9				10				11				12																																												
UNIT	M	I	N	A	C	M	I	N	A	C	M	I	N	A	C	M	I	N	A	C	M	I	N	A	C	M	I	N	A	C																																			
SECTION NO.	1	-2	-3		1	-2	-3		1	-2	-3		1	-2	-3		1	-2	-3		1	-2	-3		1	-2	-3																																						
FIELD NO.	72	P	2	7	72	P	3	52	72	P	1	17	72	P	4	8	72	P	6	27	72	P	7	87																																									
BSC NO.	C035966				C035967				C035969				C035970				C035971				C035972																																												
HEIGHT (FT)																																																																	
-AT/FROM					2.9				3.52				1.17				1.8				6.27				7.87																																								
-TO																																																																	
X-RAY DIFF																																																																	
QUARTZ					58				58				61				*75				*78				*76																																								
K-FELDSPAR					2				2				6				3				2				3																																								
PLAGIOCLASE					6				5				4				5				4				8																																								
MICA-ILL.					6				7				5				5				4				3																																								
CHLO.-KAOL.					5				6				4				5				5				4																																								
CALCITE					15				16				16				2				4				2																																								
DOLOMITE					8				6				2				5				3				4																																								
FS/FS+QU					112				110				113																																																				
PL/PL+KF					77				76				39				64				68				71																																								
DL/DL+CA					34				26				18				66				46				70																																								
CARBON AN.																																																																	
MINER. C																																																																	
CALCITE																																																																	
DOLOMITE																																																																	
OPTICAL AN.																																																																	
AN. TYPE	T	H	S		E	S	T		T	H	S		E	S	T		3	0	0		I	P	T	S		3	0	3		I	P	T		T	H	S		E	S	T																									
GRAIN TYPE																																																																	
-QUARTZ					X				X	X	X					X				X	X	X					17				7					8				0					X				X	X	X														
-CHT. CL.									TR								TR																												TR																				
-FELDSPAR					X				X					X				X					2																				3								X				X										
-MUSCOVITE					X								X								3																								3								X												
-BIOTITE					X								X								TR																				TR								X																
-CHLORITE					X								X								2																				1								X																
-HEMS.					TR								TR								*2																				TR								TR																
-VOLCS.																																																																	
-CARB. CL.					X				X					X				X					1				1																	1				1					X												
-OTHER					T				M	L					TR								O				P	Q					I				O	P	Q					I				1																	
-OTHER																																																																	
-OTHER																																																																	
-OTHER																																																																	
GRAIN SIZE																																																																	
-PRED.					V				F	S	D					V				F	S	D					V				F	S	D					V				F	S	D					V				F	S	D										
-MAX.					C				S	D					C				S	D					C				S	D					C				S	D					C				S	D					C				S	D					
-SORTING					M								M								M								M								M								M								M												
-ROUNDING					S				B	A	N	G					S				B	A	N	G					S				B	A	N	G					S				B	A	N	G					S				B	A	N	G					
PHENOCLASTS																																																																	
-TYPE																																																																	
-MAX. SIZE																																																																	
RIP-UP CL.																																																																	
FOSSILS																																																																	
TRACE FOSS.																																																																	
FE-SULFIDES																																																																	
STRUCTURE																																																																	
-HOR. LAM.																																																																	
-X-LAM.									V				A	G	V					X																																													
-CONVOL.																																																																	
-DIST. BDG.																																																																	
-GRAD. BDG.																																																																	
-OTHER																																																																	
COLOR					M				G	Y					M				G	Y					M				G	Y					M				G	Y					M				G	Y															
ROCK TYPE(S)					S				B	L	S	I	Y					S				B	L	S	I	Y					S				B	L	S	I	Y					S				B	L	S	I	Y					S				B	L	S	I	Y



TABLE NO.	3E	3E	3E
CURRENT NO.	14	20	21
UNIT	MINA C	MINA C	MINA C
SECTION NO.	1-2-4	1-2-4	1-2-4
FIELD NO.	72P	72P	72P
ASC NO.	12.86	13.02	15.12
HEIGHT (FT)			
-AT/FROM			
-TO			
X-RAY DIFF			
QUARTZ	*71	70	55
K-FELDSPAR		1	1
PLAGIOCLASE	6	4	6
MICA-ILL.	6	6	2
CHLO.-KAOL.	7	6	2
CALCITE	3	7	30
DOLOMITE	6	6	4
FS/FS+QU		7	11
PL/PL+KF	81	79	82
DL/DL+CA	65	49	111
CARBON AN.			
MINER. C			
CALCITE			
DOLOMITE			
OPTICAL AN.			
AN. TYPE	THIS	THIS	THIS
GRAIN TYPE			
-QUARTZ	XXXX	XXXX	XXXX
-CHT. CL.	X	TR	TR
-FELDSPAR	X	X	X
-MUSCOVITE	X	X	X
-BIOTITE	X	X	X
-CHLORITE	X	X	X
-HEMS.	TR	TR	TR
-VOLCS.			
-CARB. CL.	XIX	XX	XXX
-OTHER			
-OTHER			
-OTHER			
-OTHER			
GRAIN SIZE			
-PRED.	V F S D	V F S D	V F S D
-MAX.	M S D	M S D	V C S D
SORTING	M	M	M-P
ROUNDING	S B A N G -	S B A N G -	S B A N G -
	S B R D	S B R D	S B R D
PHENOCLASTS			
-TYPE			
-MAX. SIZE			
RIP-UP CL.	ST	PST	P
FOSSILS			
TRACE FOSS.			
FE-SULFIDES	TR	TR	TR
STRUCTURE			
-HOR. LAM.			
-X-LAM.			
-CONVOL.			
-DIST. BDG.			
-GRAD. BDG.			
-OTHER			
COLOR	MGY	MGY	MGY
ROCK TYPE(S)	S2+STX	SS+STX	S2+STX

TABLE NO.	3F	5F	8F	3F	5F	3F	6
CURRENT NO	1	2	3	4	5	6	
UNIT	1H1MA	1H1MA	1M1NA	1H1MA	1M1NA	1M1NA	1M1NA
SECTION NO.	2-2	2-2	2-2	2-2	2-2	2-2	2-2
FIELD NO.	70J1A	70J1L	70J1-0	70J1P0	70J1U	70J2A	
BSC NO.	C035A43	C035A45	C035A46	C035A47	C035A49	C035A50	
HEIGHT (FT)							
-AT/FROM		0.2	9.15	12.7	12.8	18.05	22.13
-TO							
X-RAY DIFF							
QUARTZ	*39	*72	*64	*53			*80
K-FELDSPAR	1		1	1			1
PLAGIOCLASE	13	5	11	4			2
MICA-ILL.	7	5	3	4			1
CHLO.-KAOL.	10	5	3	2			1
CALCITE	20	9	1	1			14
DOLOMITE	10	4	17	35			1
ES/FS+QU							
PL/PL+KF	796	100	92	81			71
DL/DL+CA	34	33	95	97			6
CARBON AN.							
MINER. C	2.48						
CALCITE	13						
DOLOMITE	7						
OPTICAL AN.							
AN. TYPE	THS	EST	300	PIT	THS	EST	THS
GRAIN TYPE							
-QUARTZ	XIXX		60	XIXIX	XIXIX	XIXIX	XIXIX
-CHT. CL.	X		1	TR	TR	TR	TR
-FELDSPAR	XX		4	XX	X	X	X
-MUSCOVITE	XX		2	X	X	X	X
-BIOTITE	TR		1	X	X	X	TR
-CHLORITE	X		1	X	X	X	TR
-HEMS.	X		3	X	X	X	X
-VOLCS.							TR
-CARB. CL.	XIXX		28	XIX	XXX	XX	XX
-OTHER		TML	TR			TML	TR
-OTHER						ZRC	TR
-OTHER							TR
-OTHER							TR
GRAIN SIZE							
-PRE.	MFSID	MFSID	MFSID	MFSID	MFSID	MFSID	MFSID
-MAX.	MSD	M-CSD	MSD	MSD	MSD	MSD	CSD
SORTING	M	M	M	M	M	M	S
ROUNDING	S BANG	S BANG	S BANG	S BANG	S BANG	S BANG	S BRD
PHENOCLASTS							
-TYPE							
-MAX. SIZE							
RIP-UP CL.		ST	PST	PST	P		
FOSSILS		ECH?	F				
TRACE FOSS.							
FE-SULFIDES		TR		TR		TR	TR
STRUCTURE							
-HOR. LAM.		X					VAGUE X
-X-LAM.							
-CONVOL.							
-DIST. BDG.							
-GRAD. BDG.							
-OTHER							
COLOR	MAY	BY	LY	LY	MY	LY	
ROCK TYPE(S)	SEASTY	SEASTY	SEASTY	SEASTY	SEASTY	SEASTY	SEASTY

TABLE NO.	3F	3F	3F	3F	3F
CURRENT NO.	1	1	1	1	1
UNIT	1 M 1 MA	1 M 1 NA	1 M 1 NA	1 M 1 NA	1 M 1 MA
SECTION NO.	2-2	2-2	2-2	2-2	2-2
FIELD NO.	70 J 2 B	70 J 2 C	70 J 2 H	70 J 2 I	70 J 2 J
GSC NO.	C035451	C035452	C035455	C035456	C035457
HEIGHT (FT)					
- AT / FROM	225.5	228.	233.	234.45	238.55
- TO					
X-RAY DIFF					
QUARTZ	*73	*82	*68	48	*51
K-FELDSPAR	1	TR		1	1
PLAGIOCLASE	5	5	9	4	3
MICA-ILL.	4	3	4	5	1
CHLO.-KAOL.	6	4	5	6	2
CALCITE	6	3	8	28	32
DOLOMITE	5	3	5	8	4
FS / FS + QU				8	
PL / PL + KF	79	96	91	79	85
DL / DL + CA	48	50	37	22	10
CARBON AN.					
MINER. C					
CALCITE					
DOLOMITE					
OPTICAL AN.					
AN. TYPE	3   0   0   1   P   T	T   H   S	E   S   T	T   H   S	E   S   T
GRAIN TYPE					
- QUARTZ	6   9	X   X   X   X	X   X   X   X	X   Y   X   X	X   X   X   X
- CHT. CL.	1	X	TR	X	TR
- FELDSPAR	3	X	X	X	X
- MUSCOVITE	1	X	X	X	X
- BIOTITE	TR	TR	TR	X	X
- CHLORITE	1	X	X	X	TR
- HEMS.	2	X	X	X	X
- VOLCS.	? TR				
- CARB. CL.	2   1	X	X   X	X   X   X	X   X   X   X
- OTHER	O   P   Q	2			
- OTHER	T   M   L	TR	T   H   L	T   R	T   R
- OTHER	Z   R   C	TR			
- OTHER					
GRAIN SIZE					
- PRED.	1   F - F   S   D	1   F - F   S   D	1   F   S   D		
- MAX.					
ROUTING	S   B   A   N   S	S   B   A   N   S	S   B   A   N   S	S   B   A   N   S	S   B   A   N   S
ROUNDING	S   B   R   D	S   B   R   D	S   B   R   D	S   B   R   D	S   B   R   D
PHENOCLASTS	F   O   S   S	P		L   G   S   T	F   O   S   S
- TYPE				P   W	A
- MAX. SIZE	P   B			A . 2   C   M	T   H   M
RIP-UP CL.	P   B	P   S   T	P   S   T	P	P   S   T
FOSSILS	E   C   H	P   E   C   H	P   E   C   H	P   E   C   H	P   E   C   H
	B   R   A   C   H	P   B   R   A   C   H	P   B   R   A   C   H	P   B   R   A   C   H	P   B   R   A   C   H
	B   R   Y   O	P   B   R   A   C   H	P   B   R   Y   O	P   B   R   Y   O	P   B   R   Y   O
	C   S   T   R	P			
TRACE FOSS.					
FE-SULFIDES		TR			TR
STRUCTURE					
- HOR. LAH.					
- X-LAM.					
- CONVOL.					
- DIST. BDG.					
- GRAD. BDG.					
- OTHER					
COLOR	M   G   Y	M   G   Y	M   G   Y	M   G   Y	M   G   Y
ROCK	S   S   L   S   I   Y	S   S   L   S   I   Y	S   S   L   S   I   Y	P   H   Y   G   W	G   L   C   G   W
TYPE (S)	N   G   L   S			S   H   A   T   R	S   S   Y   R
				T   H   L	S   S   Y   R
					S   S   Y   R



TABLE NO.	3F	3F	3F	3F	3F	3F
CURRENT NO.	13	14	15	16	17	18
UNIT	1M1NA	1M1NA	1M1NA	1M1NA	1M1NA	1M1NA
SECTION NO.	2-2	2-2	2-2	2-2	2-2	2-2
FIELD NO.	70JCA	70J3A	70J5B	70J3D	70J5C	70J5M
BEL.	3A	1.7	1.5	3.5	D.35	0.1
BSC NO.	C035959	C035460	C035461	C035462	C035471	C035472
HEIGHT (FT)						
-AT/FROM	401.3	403.7	405.3	412.4	868.35	872.45
-TO						
X-RAY DIFF						
QUARTZ	58	42	46	44	40	70
K-FELDSPAR	1	0	2	1	1	1
PLAGIOCLASE	3	3	9	4	9	6
MICA-ILL.	8	3	8	2	8	3
CHLO.-KAOL.	9	2	9	2	12	3
CALCITE	13	47	18	44	22	10
DOLOMITE	8	3	9	3	8	7
FSIFS+QU		18		10		
PL/PL+KF	81	100	93	83	93	90
DL/DL+CA	39	6	34	7	25	40
CARBON AN.						
MINER. C			2.17			
CALCITE			11			
DOLOMITE			6			
OPTICAL AN.						
AN. TYPE	THIS	EST	THIS	EST	THIS	EST
GRAIN TYPE					300	PT
-QUARTZ	XIXIX		XIXIX		XIXIX	
-CHT. CL.	TR		TR		TR	
-FELDSPAR	X		X		X	
-MUSCOVITE	X		X		X	
-BIOTITE	TR		TR		TR	
-CHLORITE	X		X		X	
-HEMS.	TR		TR		TR	
-VOLCS.						
-CARB. CL.	XX		XX		XX	
-OTHER	TML		TR		TML	
-OTHER						
-OTHER						
-OTHER						
GRAIN SIZE						
-PRED.	VFSID		VFSID		VFSID	
-MAX.	VCSID		MSID		MSID	
SORTING	H-P		M		M	
ROUNDING	SBRD		SBRD		SBRD	
PHENOCLASTS						
-TYPE						
-MAX. SIZE		2CM		4MM		
RIP-UP CL.		ST	P	ST	P	ST
FOSSILS	ECH	P	ECH	P	ECH	P
		BRACH	P	BRACH	P	
		BRYC	P	BRYC	P	
TRACE FOSS.						
FE-SULFIDES			TR		TR	
STRUCTURE						
-HOR. LAM.						X
-X-LAM.						X
-CONVOL						
-DIST. BDG.						
-GRAD. BDG.					X	
-OTHER						
COLOR	MGY		MGY		MGY	
ROCK TYPE(S)	SST		SST		SST	
	SDY		SDY		SDY	
	MATR		MATR		MATR	



TABLE NO.	3F	3F	3F	3F	3F	3F
CURRENT NO.	25	26	27	28	29	30
UNIT	1M1NA	1M1NA	1M1NA	1M1NA	1M1NA	1M1NA
SECTION NO.	2-2	2-2	2-2	2-2	2-2	2-2
FIELD NO.	7077I3	7077J0	7077J0	7078-1	70711B0	70711D-
BSC NO.	C035484	C035485	C035486	C035488	C035491	C035492
HEIGHT (FT)						
-AT/FROM	1307.05	1307.2	1307.7	1311.75	1647.25	1648.11
-TO						
X-RAY DIFF.						
QUARTZ	X57	*72	*61	*62	*61	*78
K-FELDSPAR	2	1	1	TR	6	1
PLAGIOCLASE	6	5	6	5	5	3
MICA-ILL.	11	3	7	4	2	1
CHLO.-KAOL.	10	3	6	4	3	2
CALCITE	8	10	12	19	22	13
DOLOMITE	6	6	7	6	7	2
FS/FS+QU						
PL/PL+KF	80	88	91	92	100	78
DL/DL+CA	43	35	37	23	24	14
CARBON AN.						
MINER. C						
CALCITE						
DOLOMITE						
OPTICAL AN.						
AN. TYPE	THIS	EST	3011	PIT	THIS	EST
GRAIN TYPE						
-QUARTZ	XIXIX	62	XIXIX	XIXIX	XIXIX	171
-CHT. CL.	TR	TR	TR		TR	1
-FELDSPAR	X	4	X	X	X	4
-MUSCOVITE	XX	2	X	X	X	TR
-BIOTITE	X	2	X	X	X	1
-CHLORITE	XX	2	X	X	X	1
-HEMS.	X	3	X	X	TR	TR
-VOLCS.						
-CARB. CL.	XIX	22	XIX	XIXX	XXX	22
-OTHER		OPR	1		TML	TR
-OTHER						
-OTHER						
-OTHER						
GRAIN SIZE						
-PRD.	ST	VFS	D	MFS	D	ST
-MAX.	F-MSD	H-CSD	F-MSD	MSD	FSD	CSD
SORTING	M	M	M	M	M-G	M
ROUNDING	SBRNG	SBRNG	SBRNG	SBRNG	SBRNG	SBRNG
PHENOCLASTS						
-TYPE						
-MAX. SIZE						
RIP-UP CL.	ST	P				
FOSSILS						ECH
TRACE FOSS.						
FE-SULFIDES						TR
STRUCTURE						
-HOR. LAM.		X		X	X	X
-X-LAM.					X	X
-CONVOL.						
-DIST. BDG.						
-GRAD. BDG.		X		X	X	
-OTHER						
COLOR	MGY	MGY	MGY	MGY	MGY	MGY
ROCK TYPE(S)	SIL	SIL	SIL	SIL	SIL	SIL

TABLE NO.	3F	3F	3F	3F	3F	3F
CURRENT NO.	31	32	33	34	35	36
UNIT	1M1NA	1M1NA	1M1NA	1M1NA	1M1NA	1M1NA
SECTION NO.	2-2	2-2	2-2	2-2	2-2	2-2
FIELD NO.	70211G	70211M	70211L-0	70212B	70212B	70219F
ASC NO.	8.2	7	0	0.07	70P	0.7
HEIGHT (FT)						
-AT/FROM	1663.4	1663.65	1677.65	1733.05	1733.7	1901.39
-TO						
X-RAY DIFF.						
QUARTZ	*74	*70	*74	49	*68	*68
K-FELDSPAR	TR	TR	2	1	1	TR
PLAGIOCLASE	3	5	3	2	6	7
MICA-ILL.	1	1	2	2	2	3
CHLO.-KAOL.	2	1	3	2	3	3
CALCITE	18	21	13	42	17	16
DOLOMITE	2	2	3	2	3	3
FS/FS+QU				5		
PL/PL+KF	90	92	67	80	86	93
DL/DL+CA	11	10	17	6	13	18
CARBON AN.						
MIXER. C						
CALCITE						
DOLOMITE						
OPTICAL AN.						
AN. TYPE	THIS	THIS	THIS	THIS	THIS	THIS
GRAIN TYPE						
-QUARTZ	XIXIX	67	XIXIX	XIXIX	XIXIX	62
-CHT. CL.	TR	TR	TR	TR	TR	TR
-FELDSPAR	X	6	X	X	X	7
-MUSCOVITE	X	1	X	X	X	2
-BIOTITE	X	TR	TR	X	X	1
-CHLORITE	X	TR	X	X	X	1
-HEMS.	TR	1	TR	TR	X	4
-VOLCS.						
-CARB. CL.	XX	24	XX	XXX	XX	23
-OTHER	TML	TR OPIR	TML	TR	TML	TR
-OTHER						
-OTHER						
-OTHER						
GRAIN SIZE.						
-PRED.	VFSID	VFSID	VFSID		VFSID	VIF-FSID
-MAX.	F-HSD	F-HSD	F-HSD		HSD	MSD
SORTING	H	M	M	P	M	M
ROUNDING	SBANG- SBRD	SBANG- SBRD	SBANG- SBRD	SBANG- RD	SBANG- SBRD	SBANG- SBRD
PHENOCLASTS				FOSIS	A	
-TYPE						
-MAX. SIZE				PB	9MM	
RIP-UP CL.						
FOSSILS				BRYO	A	
				ECH	P	
				BRACH	P	
				FOR	P	
				OSTR	P	
TRACE FOSS.						
FE-SULFIDES			TR		TR	
STRUCTURE						
-HOR. LAH.						X
-X-LAM.						X
-CONVOL.						
-DIST. BDG.						
-GRAD. BDG.						
-OTHER			CALC			
			VEIN			
COLOR	MGY	MGY	MGY	MGY	MGY	MGY
ROCK TYPE(S)	SS+STY	SS+STY	SS+STY	GLCSDY MATRY	SS+STY	SS+STY

TABLE NO.	3F	5F	8F	3F	5F	8F
CURRENT NO.	37	38	39	40	41	42
UNIT	1H1NA	1H1NA	1H1NA	1H1NA	1H1NA	1H1NA
SECTION NO.	2-2	2-2	2-2	2-2	2-2	2-2
FIELD NO.	7021A	7021A	7021A	7021A	7021A	7021A
GSC NO.	C035499C	C035500C	C035501C	C035502C	C035503C	C035505C
HEIGHT (FT)						
- AT / FROM	1901.714	1902.144	1988.112	1991.63	1994.415	2028.71
- TO						
X-RAY DIFF.						
QUARTZ	X63	*62	*75			*68
K-FELDSPAR	1	1	1			TR
PLAGIOCLASE	9	5	5			6
MICA-ILL.	6	3	3			4
CHLO.-KAOL.	6	3	4			5
CALCITE	8	20	9			11
DOLOMITE	7	4	3			6
FS/FS+QU						
PL/PL+KF	91	85	84			96
DL/DL+CA	45	13	27			33
CARBON AM.						
MINER. C						
CALCITE						
DOLOMITE						
OPTICAL AM.						
AM. TYPE	THIS	THIS	THIS	THIS	THIS	THIS
GRAIN TYPE						
- QUARTZ	XIXIX	5A	XIXIX	XIXIX	XIXIX	XIXIX
- CHL. CL.	TR	TR		TR	TR	TR
- FELDSPAR	XX		X	X	X	X
- MUSCOVITE	X	3	X	X	X	X
- BIOTITE	X	1	X	X	X	X
- CHLORITE	X	3	X	X	X	X
- MEHS.	X	3	X	X	X	X
- VOLCS.						
- CARB. CL.	XIX	B	XIX	XIX	XIX	XIX
- OTHER	THL	TR	THL	TR	TR	TR
- OTHER		TR				
- OTHER						
- OTHER						
GRAIN SIZE						
- PRED.	VF-FSD	VFSD	VFSD	VFSD	VF-FSD	VFSD
- MAX.	MSD	MSD	VCSID	MSD	F-MSD	MSD
SORTING	M	M	M-P	M	M	M
ROUNDING	SBAW6	SBAW6	SBAW6	SBAW6	SBAW6	SBAW6
	SBRD	SBRD	SBRD	SBRD	SBRD	SBRD
PHENOCLASTS						
- TYPE						
- MAX. SIZE						
RIP-UP CL.			IST	P		
FOSSILS			EICH	P		
			BRV0	P		
TRACE FOSS.						
FE-SULFIDES		TR			TR	TR
STRUCTURE						
- HOR. LAM.	X	X		X	X	X
- X-LAM.	X	X			X	
- CONVOL.						
- DIST. BDG.						
- GRAD. BDG.						X
- OTHER	FLAME				SOLE	WLC.
					NKS	VEIMS
COLOR	HGY	MGY	LGY	LGY	HGY	MGY
ROCK TYPE(S)	SI+STY	SI+STY	SELEIY	SI+STY	SI+STY	SELEIY
	SI	SI		SI	SI	SI

TABLE NO.	36	36	36	36	36	36
CURRENT NO.	1	2	3	4	5	6
UNIT	MINA	MINA	MINA	MINA	MINA	MINA
SECTION NO.	4-3	4-3	4-3	4-3	4-3	4-3
FIELD NO.	72B3-8-1	72B3-8-2	72B3-8-3	72B3-8-4	72B6-7-2	72B6-7-3
BSC NO.	C035600	C035600	C035600	C036027	C036027	C036027
HEIGHT (FT)						
-AT/FROM	3.8	3.8	3.8	67.	67.	67.
-TO						
X-RAY DIFF						
QUARTZ	55	57	50	61	56	59
K-FELDSPAR	2	1	2	3	2	1
PLAGIOCLASE	11	6	10	4	7	7
MICA-ILL.	5	3	3	3	3	3
CHLO.-KAOL.	3	3	3	3	3	4
CALCITE	14	13	9	20	23	17
DOLOMITE	10	17	23	6	6	9
FSIFS+QU						
PLIPL+KF	88	90	81	59	76	88
DLIDL+CA	42	42	73	21	21	33
CARBON AM.						
MINER. C						
CALCITE						
DOLOMITE						
OPTICAL AM.						
AN. TYPE	THIS	THIS	THIS	3100	PT	THIS
GRAIN TYPE						
-QUARTZ	XIXIX	XIXIX	XIXIX	159		XIXIX
-CHT. CL.	TR	TR	TR	1		TR
-FELDSPAR	XX	X	XX	8		XX
-MUSCOVITE	X	X	X	3		X
-BIOTITE	TR	TR	X	1		X
-CHLORITE	X	X	X	1		X
-HEMS.	X	X	X	4		X
-VOLCS.						
-CARB. CL.	XX	XXX	XXIX	28		XIXX
-OTHER			ZRC	TR-ZRC	TR	TR
-OTHER						
-OTHER						
-OTHER						
GRAIN SIZE.						
-PRED.	VFSID	VFSID	VFSID	VFSID	VFSID	VFSID
-MAX.	FSD	F-HSD	MSD	FMSD	FMSD	FSD
SORTING	M-G	M	M	M	M	M-G
ROUNDING	SBANS	SBANS	SBANS	SBANS	SBANS	SBANS
PHECLOCLASTS						
-TYPE						
-MAX. SIZE						
RIP-UP CL.						
FOSSILS						
TRACE FOSS.						
FE-SULFIDES			TR	TR	TR	TR
STRUCTURE						
-HOR. LAM.	X	X	X	X	X	X
-X-LAM.	X	X	X	X	X	X
-CONVOL.						
-DIST. BDG.						
-GRAD. BDG.						
-OTHER						
COLOR	MGY	MGY	MGY	MGY	MGY	MGY
ROCK TYPE(S)	SI	SI	SI	SI	SI	SI









TABLE NO.	3H
CURRENT NO.	7
UNIT	1 M 1 NA
SECTION NO.	5-2
FIELD NO.	72 G 575
BSC NO.	C 035902
HEIGHT (FT)	
- AT / FROM	575
- TO	
X-RAY DIFF.	
QUARTZ	X 810
K-FELDSPAR	TR
PLAGIOCLASE	2
MICA-ILL.	1
CHLO. - KAOL.	2
CALCITE	11
DOLOMITE	4
FS / FS + QU	
PL / PL + KF	79
DL / DL + CA	26
CARBON AN.	
MINER. C	
CALCITE	
DOLOMITE	
OPTICAL AN.	
AN. TYPE	3   0   0   P   T   X
GRAIN TYPE	
- QUARTZ	155
- CHT. CL.	1
- FELDSPAR	25
- MUSCOVITE	TR
- BIOTITE	TR
- CHLORITE	1
- HEMS.	3
- VOLCS.	
- CARB. CL.	234
- OTHER	OPR 1
- OTHER	
- OTHER	
- OTHER	
GRAIN SIZE.	
- PRED.	VFSID
- MAX.	MSD
SORTING	M
ROUNDING	S BANS = SRD
PHECLOASTS	
- TYPE	
- MAX. SIZE	
RIP-UP CL.	
FOSSILS	
TRACE FOSS.	
FE-SULFIDES	TR
STRUCTURE	
- HOR. LAM.	
- X-LAM.	
- CONVOL.	
- DIST. BDG.	
- GRAD. BDG.	
- OTHER	
COLOR	MGY
ROCK TYPE (S)	S S L E I Y

TABLE NO.	3I	5I	5I	3I	5I	5I
CURRENT NO.	1	2	3	4	5	6
UNIT	E1DS	E1DS	E1DS	E1DS	E1DS	E1DS
SECTION NO.	1-3	1-3	1-3	1-3	1-3	1-3
FIELD NO.	70LB1	70LB2	70LB2Z	70LCY	70LDA	70L15
GSC NO.	C035524	C035526	C035527	C035530	C035534	C035531
HEIGHT (FT)						
-AT/ FROM	587.	607.	613.	716.	754.	754.5
-TO				754.	790.	
X-RAY DIFF.						
QUARTZ	X39	X45	X38			X46
K-FELDSPAR		2TR	2			2
PLAGIOCLASE	13	4	8			11
MICA-ILL.	7	11	7			7
CHLO.-KAOL.	15	14	13			8
CALCITE	21	6	22			16
DOLOMITE	5		10			10
FS/FS+QU						
PL/PL+KF	100	≈ 100	83			85
DL/DL+CA	20	0	34			36
CARBON AN.						
MINER. C	2.82	1.11	3.29	2.44	2.72	
CALCITE	18	9	18			
DOLOMITE	5	0	9			
OPTICAL AN.						
AN. TYPE	THS	EST	300	PT	THS	EST
GRAIN TYPE						
-QUARTZ	XIXIX		174	XIXIX		63
-CHT. CL.	TR		3			2
-FELDSPAR	XX		7	XX		5
-MUSCOVITE	X		3	X		1
-BIOTITE	X		TR	X		TR
-CHLORITE	XX		1	XX		1
-HEMS.	TR		4			5
-VOLCS.						
-CARB. CL.	XXX		8	XXX		24
-OTHER				OPQ		TR
-OTHER						
-OTHER						
-OTHER						
GRAIN SIZE						
-PRED.	ST, VFS, D, VF, FSD	ST, VFS, D, VF, FSD	ST, VFS, D, VF, FSD	ST, VFS, D, VF, FSD	ST, VFS, D, VF, FSD	ST, VFS, D, VF, FSD
-MAX.	FSD	MSD	FSD	FSD	MSD	MSD
SORTING	M-G	M	M-S	M-G	M	M
ROUNDING	SBANS	SBANS	SBANS	SBANS	SBANS	SBANS
PHENOCLASTS						
-TYPE						
-MAX. SIZE						
RIP-UP CL.						
FOSSILS						
TRACE FOSS.						
FE-SULFIDES			TR	TR	TR	TR
STRUCTURE						
-HOR. LAH.	X	X	X	X	X	X
-X-LAM.			X			
-CONVOL.						
-DIST. BDG.						
-GRAD. BDG.						
-OTHER						
COLOR	MGY	MGY	MGY	MGY	MGY-LGY	MGY-LSY
ROCK TYPE(S)	SS+STY	SS+STY	SS+STY	SS+STY	SS+STY	SS+STY
			VE			

TABLE NO.	3I	3I	3I	3I
CURRENT NO.	7	8	9	10
UNIT	E1DC	E1DS	E1DS	E1DS
SECTION NO.	1-3	1-3	1-3	1-3
FIELD NO.	70L1E	70L1J	70L2D0	70LF
BSC NO.	C035536	C035537	C035543	C035545
HEIGHT (FT)				
-AT/FROM	1757.3	1758.15	18711.25	2050.
-TO				2806.
X-RAY DIFF.				
QUARTZ	X39	X37	X53	
K-FELDSPAR	2	2	2	
PLAGIOCLASE	10	12	7	
MICA-ILL.	8	7	3	
CHLO.-KAOL.	12	10	6	
CALCITE	18	24	18	
DOLOMITE	11	9	11	
FS/FS+QU				
PL/PL+KF				
DL/DL+CA	38	28	37	
CARBON AN.				
MINER. C	2.9	2		2.6
CALCITE	14	13		
DOLOMITE	9	5		
OPTICAL AN.				
AN. TYPE	THIS	EST	THIS	EST
GRAIN TYPE				
-QUARTZ	XIXX	XIXX	XIXX	XIXX
-CHT. CL.	ZTR		TR	TR
-FELDSPAR	XX	XX	X	X
-MUSCOVITE	X	X	X	X
-BIOTITE	X	X	X	X
-CHLORITE	X	X	X	X
-HEMS.	TR	TR	TR	TR
-VOLCS.	X			
-CARB. CL.	XXX	XXX	XXX	XXX
-OTHER				
-OTHER				
-OTHER				
-OTHER				
GRAIN SIZE.				
-PRED.	ST, VFS D	VFS D	VFS D	ST, VFS D
-MAX.	FS D	FS D	FS D	FS D
SORTING	M-G	M-G	M-P	M-G
ROUNDING	SBANG	SBANG	SBANG	SBANG
PHECLOCLASTS				
-TYPE				
-MAX. SIZE				
RIP-UP CL.			ST	P
FOSSILS			BRACH	P
			BRYO	P
TRACE FOSS.				
FE-SULFIDES				TR
STRUCTURE				
-HOR. LAH.		X		X
-X-LAH.		X		X
-CONVOL.				
-DIST. BDG.				
-GRAD. BDG.		X	X	
-OTHER	SOLE	FLUTES		
	MKS			
COLOR	MGY = LGY	MGY = LGY	MGY	MGY
ROCK TYPE (S)	SLSTY	SLSTY	SLSTY	SLSTY
	VFSDY	VFSDY		

dolomite x 100  
dolomite+calcite

Current No	Field No.	GSC No.	Height			Lithology
			(ft.)	(m)		
1	72 J 3	C 0 3 5 9 1 3	3	0.9	3	lime mudstone + claystone
2	72 J 2 5	C 0 3 5 9 1 4	25	7.6	24	lime mudstone + claystone
3	72 J 1 1 4	C 0 3 5 9 1 7	114	34.7	2	lime mudstone, cherty
4	72 J 1 1 8	C 0 3 5 9 1 9	118	36.0	4	lime mudstone + claystone
5	72 J 1 6 0	C 0 3 5 9 2 1	160	48.8	22	lime mudstone, silty
6	72 J 1 8 3	C 0 3 5 9 2 3	183	55.8	2	lime packstone, silty
7	72 J 2 0 5	C 0 3 5 9 2 4	205	62.5	0	limestone breccia (tectonic)
8	72 K 1	C 0 3 5 9 3 9	417	127.1	4	lime packstone, cherty
9	72 K 3	C 0 3 5 9 4 0	419	127.7	11	lime mudstone + chert
10	72 K 5 0	C 0 3 5 9 4 1	466	142.0	3	lime wackestone + packst., cherty
11	72 K 4 8 2	C 0 3 5 9 2 8	482	146.9	0	lime wackestone
12	72 K 2 3 3	C 0 3 5 9 4 2	649	197.8	0	lime mudstone
13	72 K 2 7 5	C 0 3 5 9 4 3	691	210.6	9	lime wackestone + chert
14	72 K 2 7 6	C 0 3 5 9 4 4	692	210.9	0	lime packstone, cherty
15	72 M 2 2 7.5	C 0 3 5 9 5 0	1078.5	328.7	0	lime wackestone, cherty

Table 4: Hazen Formation, section 1-1; variations in:  
dolomite/dolomite+calcite (in %)  
(based on x-ray diffraction peak height ratios)  
(Nine of the specimens also are listed in Table 1)

-65-

Table 5 Statistical summary of x-ray diffraction, carbon, and point count analyses

Stratigraphic unit	ALLEN B. - READ B	ALLEN B. - READ B	ALLEN B. - READ B	HARVEY	CAPE PHILLIPS	CAPE PHILLIPS															
Station #	3	4-1	4-1	1-1	2-1	3															
Interval (-)	TOP OF UNIT			0.9 - 210.9		25.9 - 78.6															
" (ft)				3 - 692		25 - 252															
Age	LATE LLANDOVERIAN OR	LUDLOVIAN	LUDLOVIAN	LATE MIDDLE CROCK.	PRINCETONIAN	WENLOCKIAN AND (?)															
"	EARLY WENLOCKIAN			TO MIDDLE (?) LLANDOVER		LUDLOVIAN															
Lithology	LIMESTONE	LIMESTONE	SILTSTONE	LIMESTONE, MINOR INTER-	SILTSTONE	LIMESTONE, MINOR INTER-															
"				LAMINATED CLAYSTONE		TERMINATED SILTSTONE															
X-RAY DIFFRACTION																					
PEAK HEIGHTS	N	$\bar{X}$	Range	RMS	N	$\bar{X}$	Range	RMS	N	$\bar{X}$	Range	RMS	N	$\bar{X}$	Range	RMS	N	$\bar{X}$	Range	RMS	
Quartz %	1	5							7	30.1	17-55			6	54.0	31-72			5	25.6	11-42
K-feldspar %	1	0							7	2.3	0-5			6	1.3	0-3			5	1.8	TR-5
Plagioclase %	1	0							7	TR	0-1			6	5.3	1-7			5		0-1?
Mica, illite %	1	0							7	TR	0-1			6	4.8	3-6			5	1.6	0-2
Chlorite, kaolinite %	1	0							7	0.6	0-2			6	5.0	2-15			5	0	0-0
Calcite %	1	92							7	61.7	29-76			6	21.3	5-51			5	55.0	27-86
Dolomite %	1	3							7	5.0	1-17			6	3.2	1-12			5	15.8	TR-39
PEAK HEIGHT RATIOS																					
fsp/fsp+qz %					1	27								9	10.4	0-28			6	11.2	2-13
plag/calc+K-fsp %					1	67			2	77.5	75-80			7	47	0-26			7	81.6	65-100
dol/dol+plag %	1	3							2	55.5	32-39			15	5.6	0-24	7.5		7	12.1	12-71
CARBON ANALYSIS																					
Sample C %									1	0.59											
Mineral C %									1	9.21											
Calcite (calcu.) %																					
Dolomite (calcu.) %																					
POINT COUNT																					
Quartz %																					
Frank elasta %																					
Feldspar %																					
Muscovite %																					
Plattite %																					
Chlorite %																					
Metamorphics %																					
Volcanics %																					
Carbonate clasts %																					

N = number of data  $\bar{X}$  = arithmetic mean RMS = root mean square (standard deviation)

SHEET 1

-69-

Stratigraphic unit	CAPE PHILLIPS				CAPE PHILLIPS				CAPE PHILLIPS				CAPE PHILLIPS				CAPE PHILLIPS								
Section #	3				3				4-2				A-2				A-2				5-1				
Interval (m)	100.3-164.1				113.4-204.2																				
" (ft)	329-538.5				372-670																				
Age	LUDLOWIAN AND (?)				LUDLOWIAN AND (?)				PRIDOLIAN				PRIDOLIAN				PRIDOLIAN				LLANDOVERIAN AND YOUNGER				
"	PRIDOLIAN				PRIDOLIAN																				
Lithology	LIMESTONE,				SILTSTONE				DOLOSTONE				SILTSTONE				SANDSTONE				SILTSTONE				
"	DOLOSTONE																								
X-RAY DIFFRACTION																									
PEAK HEIGHTS	N	$\bar{X}$	Range	RMS	N	$\bar{X}$	Range	RMS	N	$\bar{X}$	Range	RMS	N	$\bar{X}$	Range	RMS	N	$\bar{X}$	Range	RMS	N	$\bar{X}$	Range	RMS	
Quartz %	2	25.7	4-31		1	4.0			4	26.0	17-35		1	4.1				7	6.76	4.3-8.2					
K-feldspar %	3	TR	0-1		1	1			1	1.5	1-2							7	1.7	1-2					
Plagioclase %	3	3.3	3-4		1	3			4	3.8	3-4							7	3.6	0-8					
Mica, illite %	3	2.3	TR-5		1	5			1	3.3	3-4							7	3.4	1-10					
Chlorite, kaolinite %	3	1.3	0-3		1	2			4	2.3	1-3							7	2.0	0-6					
Calcite %	3		0-8.9		1	0			4	12.8	0-29							7	17.7	0-51					
Dolomite %	3		4-6.0		1	4.9			4	50.5	44-55							7	4.4	0-12					
PEAK HEIGHT RATIOS																									
fsp/fquartz %	3	22.0	10-40		1	8			4	13.0	11-24							7	6.9	3-12					
pln/total fsp %	3	57.3	30-100		5	76.6	69-81		4	71.3	69-75			3	70.7	67-77		2	78.0	72-84			3	78.0	72-84
dol/dol+calc %	3		4-100		5	77.8	46-100		4	82.0	60-100			3	54.3	32-59		2		33-75			7		6-100
CARBON ANALYSIS																									
Organic C %					2		0.78-1.66																		
Mineral C %					2		1.03-6.35																		
Calcite (calcu.) %					2		0-1																		
Dolomite (calcu.) %					2		7-17																		
POINT COUNT																									
Quartz %																									
Chert clasts %																									
Feldspar %																									
Muscovite %																									
Illite %																									
Chlorite %																									
Metamorphic %																									
Volcanics %																									
Carbonate clasts %																									

N = number of data  $\bar{X}$  = arithmetic mean RMS = root mean square (standard deviation)

SHEET 2

-67-

Stratigraphic unit	LOWER ITHINA				LOWER ITHINA				CALEDONIAN BAY MBR.				UPPER ITHINA				UPPER ITHINA				ITHINA			
Section #	1-2-1				1-2-1				1-2-2				1-2-4				1-2-4				2-2			
Interval (m)																								
" (ft)																								
Age	LATE LLANDOVERIAN				LATE LLANDOVERIAN				LUDLOVIAN				EARLY				EARLY				EARLY			
"	AND/OR VEULOCKIAN				AND/OR VEULOCKIAN								GEDINNIAN ?				GEDINNIAN ?				GEDINNIAN			
Lithology	SILTSTONE				SANDSTONE				SANDSTONE				SILTSTONE				SANDSTONE				SILTSTONE			
"																								
X-RAY DIFFRACTION																								
PEAK HEIGHTS	N	$\bar{X}$	Range	RMS	N	$\bar{X}$	Range	RMS	N	$\bar{X}$	Range	RMS	N	$\bar{X}$	Range	RMS	N	$\bar{X}$	Range	RMS	N	$\bar{X}$	Range	RMS
Quartz %	2	53.0	46-54		6	55.5	48-60		2	80.0	75-85		3	61.7	57-70		10	64.8	55-72		7	50.6	42-58	
K-feldspar %	2	2.5	2-3		6	3.0	3-3		2	5.5	4-7		3	2.0	1-3		10	2.5	1-6		7	1.1	1-2	
Plagioclase %	2	3.0	3-3		6	3.7	2-8		2	3.0	3-3		3	6.0	5-7		10	4.9	3-6		7	5.4	4-7	
Mica, illite %	2	4.0	3-5		6	3.5	2-6		2	2.0	2-2		3	11.7	8-14		10	5.5	2-7		7	8.0	4-12	
Chlorite, kaolinite %	2	4.0	3-5		6	3.7	3-6		2	1.5	1-2		3	11.0	9-13		10	5.2	2-7		7	5.3	1-9	
Calcite %	2	23.0	21-25		6	20.2	17-23		2	5.0	2-8		3	2.0	2-2		10	11.5	4-30		7	20.9	4-35	
Dolomite %	2	13.5	9-18		6	10.5	9-12		2	3.0	3-3		3	5.7	5-6		10	5.6	4-8		7	8.7	8-10	
PEAK HEIGHT RATIOS																								
Quartz/feldspar %	2	9.5	9-10		6	10.8	8-19		2	9.5	8-11		3	12.5	9-15		10	10.0	6-13		7	11.3	8-15	
plag/feldspar %	2	52.5	47-58		6	50.5	36-73		2	34.0	29-39		4	75.3	68-80		21	68.4	28-89	15	21	86.1	67-106	7.6
dol/dolomite %	2	31.5	31-52		6	34.5	32-41		2	48.5	36-67		4	66.3	46-79		21	46.5	11-74	18	4	36.1	21-45	18.4
CARBON ANALYSIS																								
Organic C %																								
Mineral C %																								
Calcite (calcul.) %																								
Dolomite (calcul.) %																								
POINT COUNT																								
Quartz %					4	52.0	49-56			2	67.5	62-73												
Sheet silicate %					3	1.3	1-2			2	TR	TR-1												
Feldspar %					3	2.0	1-4			2	12.5	6-14												
Muscovite %					3	1.0	1-1			2	1.5	TR-3												
Albite %					3	TR	TR-TR			2	1.0	1-1												
Chlorite %					3	1.0	1-1			2	TR	TR-1												
Interstratified %					3	10.3	9-12			2	2.0	2-2												
Vegetable %					3	TR	TR-TR			2	1.0	1-1												
Carbonate clasts %					3	32.3	24-37			2	12.5	11-14												

N = number of data  $\bar{X}$  = arithmetic mean RMS = root mean square (standard deviation)

158



Stratigraphic unit	I.M.I.V.A				I.M.I.V.A				I.M.I.V.A				I.M.I.V.A				E.I.D.S.				E.I.D.S.											
Section #	2-2				1-3				5-2				5-2				1-3				1-3											
Interval (m)																																
" (ft)																																
Age	EARLY				EARLY				EARLY				EARLY				EARLY TO MIDDLE (2)				EARLY TO MIDDLE (2)											
"	GEDINNIAN				GEDINNIAN				GEDINNIAN				GEDINNIAN				GEDINNIAN				GEDINNIAN											
Lithology	SANDSTONE				SANDSTONE				SILTSTONE				SANDSTONE				SILTSTONE				SANDSTONE											
"																																
X-RAY DIFFRACTION																																
PEAK HEIGHTS																																
Quartz %	N	$\bar{X}$	Range	RMS	N	$\bar{X}$	Range	RMS	N	$\bar{X}$	Range	RMS	N	$\bar{X}$	Range	RMS	N	$\bar{X}$	Range	RMS	N	$\bar{X}$	Range	RMS	N	$\bar{X}$	Range	RMS				
	4	45.5	41-49		1	3.3			7	57.6	47-69		5	6.6	5.8-7.5		2	36.0	36-36													
K-feldspar %	4	1.3	1-2		1	2			7	0.6	0-2		5	0.6	TR-1		2	1.0	1-1													
Plagioclase %	4	3.3	2-4		1	4			7	4.6	4-5		5	3.8	3-6		2	4.5	4-5													
Mica, illite %	4	3.3	2-6		1	6			7	4.3	2-7		5	3.6	2-5		2	11.5	11-12													
Chlorite, kaolinite %	4	2.8	2-5		1	3			7	5.6	2-9		5	5.6	2-9		2	13.5	12-15													
Galena %	4	40.0	28-46		1	8			7	20.9	16-28		5	15.2	6-22		2	24.0	24-24													
Dolomite %	4	4.0	2-8		1	4.4			7	7.1	5-8		5	4.8	3-6		2	9.5	9-10													
PEAK HEIGHT RATIOS																																
Feo/Feo+Fe <sub>2</sub> O <sub>3</sub> %	4	8.5	5-11		1	15			7	8.6	7-12		5	6.8	5-11		2	13.5	12-15													
Al <sub>2</sub> O <sub>3</sub> /Al <sub>2</sub> O <sub>3</sub> +FeO %	37	86.3	67-100	8.1	14	79.6	55-97	12.9	7	89.3	71-100		7	84.3	75-90		4	88.0	77-100		4	92.0	93-100									
Al <sub>2</sub> O <sub>3</sub> /Al <sub>2</sub> O <sub>3</sub> +FeO %	37	30.2	6-97	20.5	14	35.6	5-85	25.8	7	25.4	19-34		7	28.3	12-47		6	27.4	14-66		7	27.6	0-38									
CARBON ANALYSIS																																
Organic C %																																
Mineral C %	2	2.33	2.17-2.46														4	3.28	1.81-4.34		8	2.5	1.0-3.29									
Galena (calcd.) %	2	12.0	11-13														4	16.8	4-27		5	4.4	9-18									
Dolomite (calcd.) %	2	6.5	6-7														4	9.5	8-11		5	5.6	0-7									
POINT COUNT																																
Quartz %	9	63.4	54-72		5	58.2	49-65						4	61.3	55-70						4	64.3	59-74									
Coarse clasts %	9	0.7	TR-2		5	0.6	TR-1						4	0.5	TR-1						4	1.8	1-3									
Feldspar %	9	2.1	2-7		5	7.6	5-13						4	4.8	2-8						4	4.8	2-7									
Muscovite %	9	1.9	1-4		5	2.2	1-3						4	1.8	TR-4						4	2.5	1-5									
Illite %	9	1.1	TR-4		5	0.6	TR-1						4	TR	TR-7R						4	1.8	TR-2									
Chlorite %	9	1.3	TR-3		5	1.0	1-1						4	1.0	TR-2						4	1.3	1-2									
Katzenbach %	9	2.3	TR-4		5	1.4	1-4						4	4.0	2-7						4	3.8	1-5									
Volcanics %	9		0-TR <sup>2</sup>		5	0	0-0						4	0	0-0						4	0	0-0									
Carbonate clasts %	9	24.4	19-31		5	28.2	18-41						4	25.3	14-34						4	20.8	8-27									

N = number of data  $\bar{X}$  = arithmetic mean RMS = root mean square (standard deviation)

SHEET 1

-69-

Stratigraphic unit	EIDS			
Section #	7-9			
Interval (m)				
" (ft)				
Age	EARLY TO MIDDLE(?)			
"	MEDIANIAN			
Lithology	SILTSTONE			
"				
X-RAY DIFFRACTION				
PEAK HEIGHTS	N	$\bar{X}$	Range	RMS
Quartz %	3	42.7	40-45	
K-feldspar %	3	7.2	7R-7R	
Plagioclase %	3	5.0	5-5	
Muscovite %	3	5.3	3-7	
Chlorite, kaolinite %	3	4.7	4-5	
Calcite %	3	34.7	31-39	
Dolomite %	3	7.7	6-9	
PEAK HEIGHT RATIOS				
sp/feroxy %	3	10.7	10-11	
plao/alc+fo %	1	16.3	81-100	
dol/dol+sp %	1	20.0	14-25	
CARBON ANALYSIS				
Organic C %				
Inorganic C %				
Calcite (calcul.) %				
Dolomite (calcul.) %				
POINT COUNT				
Quartz %				
Chart clasts %				
Feldspar %				
Muscovite %				
Plattite %				
Calcite %				
Metamorphic %				
Volcanics %				
Carbonate clasts %				

SHEET 5

N= number of data  $\bar{X}$ = arithmetic mean RMS= root mean square (standard deviation)

70-

9

Table 6: Variations in plagioclase /plagioclase + K-feldspar  
(based on peak heights in whole-rock x-ray diffractograms)

SECTION	INTERVAL	FORMATION OR MEMBER	LITHOLOGY	N	$\bar{X}$	RANGE	RMS	AGE	DEPOSITIONAL SITE	INFERRED SOURCE
4-1		ALLEN BAY-READ BAY	SILTSTONE, LIMESTONE	3	74.0	67-80		LUDLOVIAN	TOP OF CARBONATE BUILDUP	PEARAYA GRANITICLITE
1-1	0.9-210.9 H (3-612 FT.)	HAZEN	LIMESTONE, MINOR SHALE	7	9.7	0-26		LATE MIDDLE ORDEVICIAN TO MID-LANADOVERIAN	HAZEN TROUGH	CRATON
	13.3 H (43.5 FT.)		SLATE	1	TR?		LATE MIDDLE ORDEVICIAN			
5-1	50.3-206.5 H (165-684 FT.)	CAPE PHILLIPS	SILTSTONE	5	72.6	57-84		LANADOVERIAN AND/OR YOUNGER	BACK-REEF BASIN	PEARAYA GRANITICLITE CRATON
	17.1-24.4 H (56-80 FT.)			3	0	0-0	LANADOVERIAN			
3	113.4-204.2 H (372-670 FT.)		SILTSTONE	5	76.6	69-81		LUDLOVIAN AND/OR PRIDOLIAN	FLANK OF CARBONATE BUILDUP	PEARAYA GRANITICLITE "
	109.3-164.1 H (329-538.5 FT.)		LIMESTONE, DOLOSTONE	3	87.3	80-100		"		
	28.2-64.5 H (92.5-211.5 FT.)		LIMESTONE, MINOR SILTSTONE	3	6.7	0-20		WENLOCKIAN AND/OR LUDLOVIAN		
2-1			SILTSTONE	7	81.6	65-100		PRIDOLIAN	HAZEN TROUGH	PEARAYA GRANITICLITE
4-2			SILTSTONE	3	79.7	67-77		"	"	"
			SANDSTONE	2	70.0	72-84		"	"	"
1-2-1		LOWER IMINA	SILTSTONE	2	52.5	47-58		LIFE LANADOVERIAN OR WENLOCKIAN	HAZEN TROUGH	PEARAYA GRANITICLITE
			SANDSTONE	6	50.5	36-73				
1-2-2		CALEDONIAN BAY CONGLOMERATE	SANDSTONE	2	34.0	29-39		LUDLOVIAN	HAZEN TROUGH	PEARAYA GRANITICLITE, SEV'S TROUGH DOLITE
1-2-4		UPPER IMINA	SILTSTONE	4	75.3	68-80		EARLY GEDWINIAN OR LATE SILURIAN	HAZEN TROUGH	PEARAYA GRANITICLITE
			SANDSTONE	21	68.4	28-84	15.2			
2-2		IMINA	SILTSTONE	21	86.1	67-100	7.6	EARLY GEDWINIAN	HAZEN TROUGH	PEARAYA GRANITICLITE
			SANDSTONE	37	86.3	67-100	8.11			
4-3			SANDSTONE	14	79.6	55-97	12.9	"	"	"
5-2			SILTSTONE	7	84.3	71-100		"	"	"
			SANDSTONE	7	84.3	75-90		"	"	"
1-3		FIDS	SILTSTONE	4	88.0	77-100		LATE EARLY TO MIDDLE GEDWINIAN	HAZEN TROUGH	PEARAYA GRANITICLITE
3			SANDSTONE	1	92.0	83-100		"	"	"
4-4			SILTSTONE	4	91.5	81-100		"	"	"

N=number of readings       $\bar{X}$ = arithmetic mean (in %)      RMS= root mean square (standard deviation) (in %)

Table 7: Notes on stratigraphic sections

- Section 1-1: incomplete section of Hazen Formation (base not exposed); total thickness 407 m (1336 ft); age late Middle Ordovician to Early Silurian (late Llandoveryian)
- Section 1-2-1: partial section of lowermost part of lower Imina Formation; thickness of section 128.5 m (421.5 ft.), thickness of lower Imina Formation 1057 m (3467 ft); age late Early and (?) Middle Silurian (latest Llandoveryian and ? Wenlockian)
- Section 1-2-2: complete section of Caledonian Bay Conglomerate Member of Imina Formation; total thickness 42.0 m (137.75 ft); age probably Late Silurian (Ludlovian)
- Section 1-2-4: detailed section within upper part of upper Imina Formation; thickness of section 4.65 m (15.27 ft), total thickness of upper Imina Formation 1637 m (5372 ft); age Late Silurian or earliest Devonian (probably earliest Gedinnian)
- Section 1-3: incomplete section of Eids Formation (top not preserved); thickness 854 m (2802 ft); age early Devonian (late early to middle Gedinnian)
- Section 2-1: complete section of Cape Phillips Formation; total thickness 64 m (209 ft); age latest Silurian (Pridolian)
- Section 2-2: complete section of Imina Formation; total thickness 620 m (2,034 ft); age earliest Devonian (early Gedinnian)
- Section 3: incomplete section of Cape Phillips Formation (top faulted); thickness 229 m (750 ft); age late Early or early Middle Silurian [late Llandoveryian or early Wenlockian to Late Silurian (Ludlovian or Pridolian)]
- Section 4-1: detailed section of uppermost part of undivided Allen Bay and Read Bay Formations; thickness of section 14 m (46 ft); age probably Late Silurian (Ludlovian)
- Section 4-2: complete section of Cape Phillips Formation; total thickness 147 m (482 ft); age latest Silurian (Pridolian)
- Section 4-3: complete section of Imina Formation; total thickness 251 m (824 ft); age earliest Devonian (early Gedinnian)
- Section 4-4: incomplete section of Eids Formation (top not preserved); thickness 335 m (1100 ft); age early Devonian (late early to middle Gedinnian)

Section 5-1: complete (?;stratigraphic position of base of formation not entirely certain) section of Cape Phillips Formation;total thickness 471 m (1546 ft),but exposures limited to lower 254.8 m (836 ft);age of specimens Early Silurian (middle Llandoveryian) probably to Middle or Late Silurian (Wenlockian or Ludlovian)

Section 5-2: incomplete section of Imina Formation (top not preserved);thickness 176 m (576 ft);age probably earliest Devonian (early Gedinnian)