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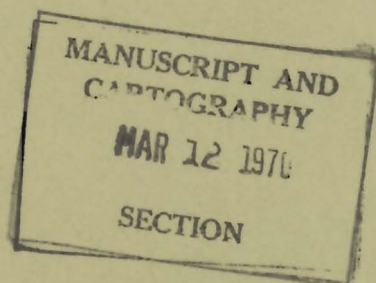
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PAPER 69-8

ORDOVICIAN AND SILURIAN BIOSTRATIGRAPHY OF THE
SOGEPET-AQUITAINE KASKATTAMA PROVINCE
No. 1 WELL, NORTHERN MANITOBA

(Report and 11 figures)

B. S. Norford





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ABSTRACT

Nine faunal assemblages and a barren interval can be recognized in the Ordovician and Silurian successions penetrated by a deep well in northern Manitoba. The nine assemblages span the interval from late Caradoc to late Llandovery or early Wenlock time but a hiatus is probably present between the Ordovician and Silurian, corresponding to an unconformity beneath the Severn River Formation in the Hudson Bay Lowlands.



Figure 1. Map showing location of the Sogepet-Aquitaine Kaskattama Province No. 1 Well.

ORDOVICIAN AND SILURIAN BIOSTRATIGRAPHY OF THE SOGEPET-AQUITAINE
KASKATTAMA PROVINCE NO. 1 WELL, NORTHERN MANITOBA

INTRODUCTION

A deep well was drilled in the northern part of the Hudson Bay Lowlands in 1966 and 1967 (Fig. 1). The well penetrated to the Precambrian basement and core was taken almost continuously from the top of the Silurian Attawapiskat Formation to the Precambrian. The core was sampled for macrofossils and, after a preliminary study (Nelson and Johnson, 1969; Johnson and Nelson, 1969), the macrofossils were presented to the Geological Survey of Canada by the Aquitaine Company of Canada, Limited, by arrangement with the Manitoba Department of Mines and Natural Resources. Biostratigraphic study of these fossils has now been completed and the zonation achieved is presented in advance of a more comprehensive study that will include data from collections made from outcrops throughout the Hudson Bay Lowlands in addition to the present subsurface material.

Acknowledgements

The co-operation and aid of R. Bonafoux of Aquitaine Company of Canada, Limited, and W.W. Taylor of Banff Oil, Limited, is gratefully acknowledged. Devonian fossils have been identified by A.E.H. Pedder, Geological Survey of Canada, and by J. Le Fevre, Société Nationale des Pétroles d'Aquitaine. Drafts of parts of the manuscript have been critically read by T.E. Bolton, M.J. Copeland, L.M. Cumming and A.W. Norris, all of the Geological Survey of Canada.

LITHOSTRATIGRAPHIC UNITS

The study of Ordovician and Silurian outcrops throughout the Hudson Bay Lowlands by Cumming and Norford in 1967, and the assessment of available subsurface data, resulted in the selection of the following map-units (in descending order) that were adopted by Norris, Sanford and Bostock (1967). None of the formations are new and, although several other units have been proposed by various authors, they cannot be mapped as readily over the whole area.

Kenogami River Formation (lower, middle and upper members)	Martison 1953
Attawapiskat Formation	Savage and Van Tuyl, 1919
Ekwan River Formation	Savage and Van Tuyl, 1919
Severn River Formation	Savage and Van Tuyl, 1919
Churchill River Group	Nelson, 1963
Bad Cache Rapids Group	Nelson, 1963

Manuscript received: August 28, 1969

Address of author: Institute of Sedimentary and Petroleum Geology, Calgary, Alberta

Several recent publications (Norris and Sanford, 1968, 1969; Norris, Sanford and Bostock, 1967; Sanford, Norris and Bostock, 1968) have included preliminary summaries of Ordovician and Silurian stratigraphy. None of the manuscripts of these publications were reviewed by Norford and some of the conclusions concerning Silurian rocks may be in error. For example, there is very little faunal evidence for the Attawapiskat being the same age as the Guelph Formation of southern Ontario. The Attawapiskat Formation may be, in part, the facies equivalent of the lower part of the Kenogami River Formation rather than being wholly older.

A thin, basal sandstone of the Bad Cache Rapids Group rests on the Precambrian, the rest of the Group consists of light grey-weathering, mottled limestones and dolomitic limestones. Outcrops of the carbonate rocks of the Churchill River Group are lithologically similar to those of the Bad Cache Rapids Group but most outcrops weather mottled light grey and pale yellowish brown.

The basal beds of the Severn River Formation are pale greyish orange-weathering, dolomitic limestones and dolomites. In the very few outcrops that show the Ordovician-Silurian contact the Severn River rests with apparent conformity on Ordovician rocks but, at Hawley Lake, on the Winisk River, and on the coast at Churchill, the Severn River rests with profound unconformity on Precambrian rocks. No Silurian rocks have yet been dated as older than Middle Llandovery and an unconformity is assumed to be present beneath the Severn River Formation throughout the Hudson Bay Lowlands.

The Severn River Formation is a heterogeneous assemblage of limestones, dolomitic limestones and, in the subsurface, also anhydrite. Many of the limestones are burrowed and mottled, some are layered and mounded by algae, others are flat-pebble conglomerates. Biogenic limestones are present but not very common. Limestones largely composed of ostracod fragments are typical of Severn River lithology.

Outcrops of the Ekwon River Formation generally lack the algal layering and mottling so common in the Severn River Formation. Biogenic calcarenites are very common and locally biostromal beds are developed in the uppermost part of the formation. Several rock types are common to the Severn River and Ekwon River Formations and there is difficulty in some exposures in deciding to which formation a particular outcrop should be assigned. Similar difficulty is encountered in the Kaskattama Well where the boundary between the two formations is somewhere within the interval 1,388 to 1,422 feet.

The Attawapiskat Formation is a swarm of limestone bioherms developed on the flanks of the Cape Henrietta Maria Arch and westward in the subsurface into Manitoba. The bioherms are basically algal and stromatoporoid frameworks with accessory corals, brachiopods, bryozoans and cephalopods, that occur mainly in pockets within the reef framework. The frameworks are flanked by detrital limestones with large depositional dips that flatten away from the bioherms. Thin-bedded dolomites of the basal Kenogami River Formation are present laterally between some patch reef

complexes on the Severn River and such beds are probably the lateral equivalents of the reefs. An alternative explanation is that the Kenogami River Formation is entirely younger than the Attawapiskat and was deposited on top of the limestone bioherms that formed a surface of considerable local relief. On the Severn River, however, beds of the lower member of the Kenogami River Formation appear to grade laterally into reef-flank deposits and, on the Little Current River, the member rests directly on the Ekwon River Formation. At the latter locality, the Attawapiskat Formation is not developed and Attawapiskat time is probably represented by part of the lower member of the Kenogami River Formation.

The Attawapiskat Formation is well developed in the Kaskattama Well and is between 278 and 322 feet thick. Samples were not recovered between 1,250 and 1,294 feet and the Attawapiskat-Ekwon River contact is within this interval.

The Kenogami River Formation can be divided into three members. The lower and upper members consist of thinly bedded dolomites and dolomitic limestones that weather yellowish grey, greyish orange and very pale orange. They are separated by a thick middle member composed of reddish brown and greenish grey, silty and dolomitic mudstones with minor amounts of quartz siltstones and sandstones. Interbedded anhydrite and gypsum are common in the Kaskattama Well but do not outcrop. In the well, the position of the top of the Kenogami River Formation is uncertain. A study of well cuttings and core indicates the top of the formation to be at 411 feet, overlain by carbonate rocks that are lithologically different from the nearest known outcrops of the upper member. However, those outcrops are on the Albany River, about 500 miles southeast of the well and significant facies changes could be expected within such a distance. The carbonate rocks could represent part of the upper member. Nevertheless, they are more likely to be part of the Devonian succession because tentaculitid fossils have been reported from the interval 398 to 399 feet and are thought to be similar to forms present higher in the well, in rocks of probable Middle Devonian age (Nelson and Johnson, 1969, p. 443). The carbonate rocks are probably part of the Devonian Stopping River Formation.

BIOSTRATIGRAPHIC UNITS

The rocks penetrated by the well are abundantly fossiliferous but the random sampling supplied by the narrow core does not give material complete enough to allow precise specific identifications of many taxa. Generic identifications are possible for many fossils and the interval 411 to 2,913 feet can be divided into ten divisions (A-J) based primarily on generic assemblages. Figures 3 to 11 show details of the occurrences of the taxa within the faunal divisions of the well.

Division A (depth 2,590 to 2,913 feet), Thaerodonta is common in this division which lacks Bighornia, Lobocorallium and Palaeofavosites. Correlation is with the Bad Cache Rapids Group of the northern Manitoba outcrops. No faunal differentiation between the equivalents of the Portage Chute and Surprise Creek Formations can be achieved.

Division B (depth 2,299 to 2,589 feet). The base of the division is picked at the lowest occurrence of Bighornia. Important genera include:

<u>Bighornia</u>	<u>Lobocorallium</u>
<u>Deiracorallium</u>	<u>Palaeophyllum</u>
<u>Favistina</u>	<u>Catenipora</u>
<u>Palaeofavosites</u>	<u>Plaesiomys</u>
<u>Thaerodonta</u>	

The interval can be correlated with the Churchill River Group of the outcrops of northern Manitoba. The present study does not allow faunal differentiation between the correlates of the Caution Creek and Chasm Creek Formations described by Nelson. However, the upper part (depths 2,299 to about 2,381 feet) is somewhat distinct from the remainder of Division B and includes Palaeofavosites cf. P. okulitchi Stearn, Phaulactis stummi Nelson and a distinctive but unidentified genus of strophomenid brachiopods. This upper part is equivalent to the upper part of the Chasm Creek Formation, probably Member 3.

Division C (depth 2,190 to 2,293 feet). The upper part of this division is sparsely fossiliferous; the highest diagnostic fossils are at 2,260 feet. The fauna is characterized by:

Angopora cf. A. manitobensis Stearn
solitary corals with dissepiments
? Megamyonia cf. ? M. nitens (Billings)
absence of large pentamerid brachiopods
absence of Bighornia

Correlation is with the Stonewall Formation of southern Manitoba that is probably of latest Ordovician age. The division appears to be younger than the uppermost beds of the Churchill River Group as described from the outcrops of northern Manitoba by Nelson (1963, 1964).

Division D (depth 2,002 to 2,185). The interval is characterized by the distinctive brachiopod Virgiana decussata and is thought to be Middle Llandovery in age (following Berry and Boucot, in press). Important taxa include:

<u>Asthenophyllum</u> sp.	<u>Alispira</u> sp.
" <u>Neozaphrentis</u> " cf. <u>N. hindi</u> Stearn	" <u>Atrypa</u> " aff. " <u>A. parksi</u> Williams
<u>Favosites</u> sp.	" <u>Camarotoechia</u> " cf. " <u>C. indianense</u>
<u>Palaeofavosites</u> sp.	(Hall)
<u>Multisolenia confluens</u> Stearn	<u>Virgiana decussata</u> (Whiteaves)
<u>Heliolites</u> sp.	<u>Eophacops</u> sp.

Correlation is with the Dyer Bay Member of the Cabot Head Formation of southern Ontario, with the Lime Island Dolomite of northern Michigan, and with the Fisher Branch Dolomite of southern Manitoba. A hiatus may be present in the well between divisions D and C for there is no faunal evidence of any Lower Llandovery rocks.

Division E (depth 1,695 to 1,995 feet). This is basically the zone of Plectatrypa lowi and "Camarotoechia" winiskensis. Important elements of the fauna include:

<u>Synamplexoides</u> sp.	? <u>Meristina</u> sp.
<u>Favosites</u> cf. <u>F. favosus</u> (Goldfuss)	? <u>Fardenia</u> sp.
<u>Multisolenia</u> sp.	? <u>Howellella</u> sp.
<u>Propora</u> sp.	" <u>Camarotoechia</u> " cf. " <u>C.</u>
<u>Catenipora</u> sp.	<u>winiskensis</u> Whiteaves
<u>Cystihalysites</u> sp.	<u>Plectatrypa lowi</u> (Whiteaves)
<u>Eostropheodonta</u> sp.	<u>Scutellum</u> sp.

The interval possibly can be divided at 1,775 feet; below this horizon all the halysitid corals are Catenipora, above they are all Cystihalysites, but this may be a local phenomenon. The division is early Late Llandovery in age and can be correlated with the Wabi Formation of Lake Timiskaming, with the Mindemoya Formation of southern Ontario, with part of the Hendricks Dolomite of northern Michigan, and with the Atikameg Dolomite of southern Manitoba.

Division F (depth 1,381 to 1,692 feet). The fauna of this interval includes:

<u>Pteroleperditia</u> sp.	? <u>Glassia</u> cf. <u>G. variabilis</u> Whiteaves
<u>Favosites</u> cf. <u>F. favosus</u> (Goldfuss)	<u>Eospirifer</u> sp.
<u>Multisolenia</u> sp.	? <u>Atrypa</u> sp.
<u>Cystihalysites</u> sp.	aff. <u>Rhynchotreta</u> sp.
<u>Synamplexoides</u> sp.	<u>Howellella</u> sp.

This is a Late Llandovery assemblage and the absence of Pentamerus indicates an early Late Llandovery age. Pteroleperditia is found in the Hendricks Dolomite of northern Michigan and Division F can be correlated with the upper part of that formation, with the lower part of the Fossil Hill Formation of southern Ontario, with the Thornloe Formation of Lake Timiskaming, and possibly with the East Arm Dolomite of southern Manitoba.

Division G (depth 1,379 to 1,380 feet). This thin interval marks the occurrence in the well of the large and distinctive ostracod Dihogmochilina latimarginata (Jones) that is widespread in outcrops in the Hudson Bay Lowlands. It also separates Late Llandoverly faunas with ?Pentamerus from those of Division F that lack Pentamerus. D. latimarginata was described from the East Arm Dolomite of southern Manitoba, is known also from the lower part of the Cedar Lake Dolomite of the same region, and from the Hendricks Dolomite of northern Michigan.

Division H (depth 1,298 to 1,378 feet). The assemblage includes a coral fauna similar to the Late Llandoverly coral faunas of British Columbia:

aff. <u>Ptychophyllum</u> sp.	<u>Cystihalysites</u> sp.
<u>Favosites</u> sp.	<u>Cystihalysites</u> aff. <u>C. compactus</u>
<u>Coenites</u> aff. <u>C. laminatus</u> (Hall)	(Rominger)
? <u>Pentamerus</u> sp.	<u>Cystihalysites</u> cf. <u>C. magnitubus</u>
	(Buehler)

The pentamerid brachiopod is represented only by fragments but is almost certainly Pentamerus, a genus characteristic of Late Llandoverly time. The age is Late Llandoverly; correlation is with the upper part of the Cedar Lake Dolomite of the outcrops of southern Manitoba, the Fossil Hill and Thornloe Formations of southern Ontario and Lake Timiskaming, and the Schoolcraft Dolomite of northern Michigan.

Division I (depth 1,072 to 1,250 feet). The major constituents of the fauna are algae and stromatoporoids. Quantitatively minor items of the fauna that are significant for correlation include:

<u>Palaeocyclus</u> sp.	<u>Heliolites</u> sp.
<u>Coenites</u> aff. <u>C. laminatus</u> (Hall)	<u>Cystihalysites</u> cf. <u>C. magnitubus</u>
<u>Syringopora</u> cf. <u>S. verticillata</u> Goldfuss	(Buehler)
<u>Favosites</u> cf. <u>F. favosus</u> (Goldfuss)	<u>Solenohalysites</u> sp.
<u>Pentameroides</u> cf. <u>P. expansa</u> (Whiteaves)	

The coral fauna is typical of the uppermost Llandoverly or lower Wenlock. Hill (1959, p. 153) considered Palaeocyclus to be an index fossil for Late Llandoverly time. The only other reported occurrences of Solenohalysites are of Wenlock and Ludlow ages and the genus, as yet, is not known from the widely distributed Late Llandoverly coral faunas of the Western Cordillera. The genus Pentameroides ranges from uppermost Llandoverly through the Wenlock and is present in the Reynales, Fossil Hill, Thornloe, and Amabel Formations of Ontario and the Cordell Dolomite of Michigan. The first appearance of the genus is later than that of Pentamerus (see Division H) which also begins in Late Llandoverly time. The age of Division I is early Wenlock or latest Llandoverly; correlation is with the Cordell Dolomite of northern Michigan.

Division J (depth 411 to 1,071 feet) is a thick, unfossiliferous interval that corresponds to the Kenogami River Formation. Based on its stratigraphic position in the well, the age of Division J is somewhere within the span latest Llandovery to Middle Devonian. Rare Silurian fossils are present in outcrops of the lower member of the Kenogami River Formation and also have been reported (cf. Glassia variabilis Whiteaves; Wilson, 1953, p. 63) from exposures now assigned to the upper member. The age of the formation is not well established; much of the Kenogami River Formation within the well is doubtless Silurian but the upper part could be Devonian.

The uppermost beds penetrated by the well contain a sparse brachiopod fauna that has been studied by A.E.H. Pedder. A Middle Devonian age is suggested for the interval 67 to 102 feet, based on the presence of Productella cf. P. belanskii Stainbrook and an undescribed species of Desquamatia. J. Le Fevre (in Nelson and Johnson, 1969) has identified some conodonts, ostracods and tentaculitids from horizons between depths 102 and 399 feet and suggested a late Early or early Middle Devonian age for this interval.

		ORDOVICIAN																			
MIDDLE LLANDOVERY		1,995		MOOSE LAKE																	
		2,002		INWOOD																	
EARLY LLANDOVERY		2,185		FISHER BRANCH																	
		?		?																	
ASHGILL	ALEXANDRIAN	2,190		STONEWALL																	
	RICHMOND	2,293		"Stonewall equivalent" (105 feet)																	
		2,299		CHURCHILL RIVER (295 feet)																	
		2,589		STONY MOUNTAIN																	
	MAYSVILLE	2,590																			
	EDEN			BAD CACHE RAPIDS (323 feet)																	
CARADOC (upper part)	BARNEVELD	2,913																			
	WILDERNESS			WINNIPEG																	
Underlying rocks																					
Source publications																					

Figure 2. Correlation table

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REFERENCES

- Berry, W.B.N., and Boucot, A.J.
in press: Silurian of North America; Geol. Soc. Am., Special Paper.
- Bolton, T.E.
1957: Silurian stratigraphy and palaeontology of the Niagara Escarpment in Ontario; Geol. Surv. Can., Mem. 289.
1966: Illustrations of Canadian fossils: Silurian faunas of Ontario; Geol. Surv. Can., Paper 66-5.
1968: Silurian faunal assemblages, Manitoulin Island, Ontario; Michigan Basin Geol. Soc., Ann. Field Excursion, Guidebook, pp. 38-49.
- Ehlers, G.M., and Kesling, R.V.
1957: Silurian rocks of the northern peninsula of Michigan; Michigan Geol. Soc., Ann. Geol. Excursion, Guidebook.
- Hill, Dorothy
1959: Distribution and sequence of Silurian coral faunas; Roy.Soc.New South Wales, J. and Proc., vol. 92, pt. 4, pp. 151-173.
- Hume, G.S.
1925: The Palaeozoic outlier of Lake Timiskaming, Ontario and Quebec; Geol. Surv. Can., Mem. 145.
- Johnson, R.D., and Nelson, S.J.
1969: Sogepet-Aquitaine Kaskattama Province No. 1 Well, Hudson Bay Lowland, Manitoba; Geol. Surv. Can., Paper 68-53, pp. 215-226.
- Liberty, B.A.
1968: Ordovician and Silurian stratigraphy of Manitoulin Island, Ontario; Michigan Basin Geol. Soc., Ann. Field Excursion, Guidebook, pp. 25-37.
- Martison, N.W.
1953: Petroleum possibilities of the James Bay Lowland Area; Ontario Dept. Mines, 61st Ann. Rept., vol. 61, pt. 6, pp. 1-58.
- Nelson, S.J.
1963: Ordovician paleontology of the northern Hudson Bay Lowland; Geol. Soc. Am., Mem. 90.
1964: Ordovician stratigraphy of northern Hudson Bay Lowland; Geol. Surv. Can., Bull. 108.

- Nelson, S.J., and Johnson, R.D.
1967: Geology of Hudson Bay Basin; Bull. Can. Petrol. Geol., vol. 14, pp. 520-578 (dated 1966).
- 1969: Kaskattama No. 1 Well, central Hudson Bay Lowland, Manitoba, Canada; Bull. Can. Petrol. Geol., vol. 16, pp. 431-445 (dated 1968).
- Norris, A.W., and Sanford, B.V.
1968: Operation Winisk-an air-supported geological reconnaissance survey of the Hudson Bay Lowlands; Ontario Petrol. Inst., Seventh Ann. Conf., pp. 1-33.
- 1969: Paleozoic and Mesozoic geology of the Hudson Bay Lowlands; Geol. Surv. Can., Paper 68-53, pp. 169-205.
- Norris, A.W., Sanford, B.V., and Bostock, H.H.
1967: Geology, Hudson Bay Lowlands, Manitoba, Ontario, Quebec and District of Keewatin; Geol. Surv. Can., Map 17-1967.
- Oberg, Rolland
1966: Winnipeg conodonts from Manitoba; J. Paleontol., vol. 40, pp. 130-147.
- Ollerenshaw, N.C., and Macqueen, R.W.
1960: Ordovician and Silurian of the Lake Timiskaming area; Geol. Assoc. Can., Proc., vol. 12, pp. 105-115.
- Porter, J.W., and Fuller, J.G.C.
1965: Ordovician-Silurian. Part 1 - Plains; in Geological History of Western Canada; Alta. Soc. Petrol. Geol., pp. 34-42.
- Sanford, B.V., Norris, A.W., and Bostock, H.H.
1968: Geology of the Hudson Bay Lowlands (Operation Winisk); Geol. Surv. Can., Paper 67-60, pp. 1-45.
- Savage, T.E., and Van Tuyl, F.M.
1919: Geology and stratigraphy of the area of Paleozoic rocks in the vicinity of Hudson and James Bays; Geol. Soc. Am., Bull., vol. 30, pp. 339-378.
- Sinclair, G.W.
1960: Succession of Ordovician rocks in southern Manitoba; Geol. Surv. Can., Paper 59-5 (dated 1959).
- 1965: Succession of Ordovician rocks at Lake Timiskaming; Geol. Surv. Can., Paper 65-34.

Stearn, C.W.

1956: Stratigraphy and palaeontology of the Interlake Group and Stonewall Formation of southern Manitoba; Geol. Surv. Can., Mem. 281.

Wilson, A.E.

1953: A report on fossil collections from the James Bay Lowland; Ontario Dept. Mines, 61st Ann. Rept., vol. 61, pt. 6, pp. 59-81.

Figures 3-11

Footage	2725	2726	2727	2730	2732	2735	2737	2738	2740	2741	2743	2744	2746	2748	2749	2750	2751	2754	2755	2756	2758.5	2759	2760	2761	2762	2764	2765	2776	2778	2779	
GSC Fossil Locality Number	C-1627	C-1628	C-1629	C-1630	C-1631	C-1632	C-1633	C-1634	C-1635	C-1636	C-1637	C-1638	C-1639	C-1640	C-1641	C-1642	C-1643	C-1644	C-1645	C-1646	C-1647	C-1648	C-1649	C-1650	C-1651	C-1652	C-1653	C-1654	C-1655	C-1656	
FAUNA																															
shell fragments and unidentified taxa	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
"conodonts"																															
bryozoans	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
graptolite fragments																															
diplograptid										x																					
stromatoporoid																															
solitary coral				x	x	x										x						x		x				x	x		
<i>Deiracoralium</i> sp.																															
<i>Grewingkia</i> sp.																															
tabulate coral																															
<i>Calapoecia</i> sp.																															
<i>Catenipora</i> sp.																															
? <i>Saffordophyllum</i> sp.																															
echinoid (?)								x																							
<i>Maclurites</i> sp.																															
resserellid brachiopod																															
? <i>Diceromyonia</i> sp.																															
<i>Austinella</i> sp.																															
<i>Plaesiomys</i> sp.																															x
<i>Platystrophia</i> sp.																						x	x								
? <i>Spinorthis</i> sp.																															
pentamerid brachiopod																															
strophomenid brachiopod		x	x	x	x	x					x	x	x	x																x	
? <i>Rafinesquina</i> sp.																															
<i>Strophomena</i> sp.																	x													x	
sowerbyellid brachiopod																															
<i>Thaerodonta</i> sp.			x	x	x	x	x	x	x	x	x	x	x				x	x		x			x		x	x					
rhynchonellid brachiopod		x	x	x	x	x	x		x	x																					
<i>Hypsitycha</i> sp.																															
<i>Rhychotrema</i> sp.																															
sponge																															
ostracod																															
clam																															
<i>Streptelasma</i> sp.																															

GSC

Figure 3. Continued

Footage	2780	2781	2783	2784	2786	2788	2790	2791	2792	2793	2796	2798	2799	2801	2802	2803	2806	2807	2808	2811	2812	2813	2815	2817	2820	2822	2823	2826	2827	2830			
GSC Fossil Locality Number	C-1657	C-1658	C-1659	C-1660	C-1661	C-1662	C-1663	C-1664	C-1665	C-1666	C-1667	C-1668	C-1669	C-1670	C-1671	C-1672	C-1673	C-1674	C-1675	C-1675a	C-1675b	C-1676	C-1677	C-1678	C-1679	C-1680	C-1680a	C-1681	C-1682	C-1683			
FAUNA																																	
shell fragments and unidentified taxa	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
"conodonts"																																	
bryozoans			x			x		x																									
graptolite fragments																																	
diplograptid																																	
stromatoporoid																																	
solitary coral			x	x	x						x																						
<i>Deiracorallium</i> sp.																																	
<i>Grewingkia</i> sp.			?																														
tabulate coral	x																																
<i>Calapoecia</i> sp.																																	
<i>Catenipora</i> sp.											x								x			x											
? <i>Salfordophyllum</i> sp.																																	
echinoid (?)																																	
<i>Maclurites</i> sp.																																	
resserellid brachiopod																																	
? <i>Diceromyonia</i> sp.	x						x	x																									
<i>Austinella</i> sp.									?																								
<i>Plaesiomys</i> sp.			x																	?													
<i>Platystrophia</i> sp.								x																									
? <i>Spinorthis</i> sp.	x																																
pentamerid brachiopod																	x																
strophomenid brachiopod					x			x																									
? <i>Rafinesquina</i> sp.	x																																
<i>Strophomena</i> sp.			?																														
sowerbyellid brachiopod																																	
<i>Thaerodonta</i> sp.					x	x				?	x		?				x		x	x			x										
rhynchonellid brachiopod					x	x	x	x		x																							
<i>Hysiptycha</i> sp.																x																	
<i>Rhynchotrema</i> sp.			?	?																													
sponge																																	
ostracod																																	
clam																																	
<i>Streptelasma</i> sp.																																	

GSC

Figure 3. Continued

Footage	2831	2832	2834	2835	2836	2838	2839	2841	2842	2844	2846	2849	2851	2855	2859	2862	2864	2865	2866	2867	2869	2870	2871	2873	2874	2875	2876	2878	2879	2880	
GSC Fossil Locality Number	C-1684	C-1685	C-1686	C-1687	C-1688	C-1689	C-1690	C-1691	C-1692	C-1693	C-1694	C-1695	C-1695a	C-1696	C-1697	C-1698	C-1699	C-1700	C-1701	C-1702	C-1703	C-1704	C-1705	C-1706	C-1707	C-1708	C-1709	C-1710	C-1711		
FAUNA																															
shell fragments and unidentified taxa	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
"conodonts"																															
bryozoans						x	x						x	x		x	x	x	x	x		x		x	x						
graptolite fragments																															
diplograptid																						x									
stromatoporoid																												x			
solitary coral					x			x					x																		
<i>Deracorallium</i> sp.																															
<i>Grewingkia</i> sp.																															
tabulate corals																														x	
<i>Calapoecia</i> sp.																															
<i>Catenipora</i> sp.					x																										
? <i>Saffordophyllum</i> sp.																															
echinoid (?)																															
<i>Maclurites</i> sp.						x																									
resserellid brachiopod																															
? <i>Diceromyonia</i> sp.																															
<i>Austinella</i> sp.													?																		
<i>Plaesiomys</i> sp.																															
<i>Platystrophia</i> sp.																x															
? <i>Spinorthis</i> sp.																															
pentamerid brachiopod																															
strophomenid brachiopod													x																		
? <i>Rafinesquina</i> sp.																															
<i>Strophomena</i> sp.																															
sowerbyellid brachiopod																															
<i>Thaerodonta</i> sp.							x					?							x	?											
rhynchonellid brachiopod																															
<i>Hypsitycha</i> sp.													x	?								?									
<i>Rhynchotrema</i> sp.																															
sponge																															
ostracod																															
clam																															
<i>Streptelasma</i> sp.																x															

GSC

Figure 3. Continued

Footage	2364	2365	2366	2367	2395	2400	2402	2405	2409	2415	2417	2418	2418.5	2419	2423	2424	2425	2426	2427	2429	2431	2432	2433	2439	2441	2444	2446	2448	2449	2450	2451						
GSC Fossil Locality Number	C-985	C-986	C-986a	C-987	C-988	C-989	C-990	C-991	C-992	C-993	C-994	C-995	C-996	C-997	C-998	C-999	C-1500	C-1501	C-1501a	C-1502	C-1503	C-1504	C-1505	C-1506	C-1507	C-1508	C-1509	C-1510									
FAUNA																																					
shell fragments and unidentified taxa				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x					
"conodonts"																																					
bryozoans					x		x									x						x											x				
dendroid graptolite																																					
sponge																																					
clam	x																																				
ostracod							x					x																									
stromatoporoid																																					
solitary coral																x				x	x	x															
<i>Bighornia</i> sp.									x	x				x	x	x						x				x	x	x	x								
<i>Deiracorallium</i> sp.							x																												x		
<i>Deiracorallium manitobense</i> Nelson																																					
<i>Grewingia</i> sp.																																					
<i>Lobocorallium</i> sp.																																					
<i>Streptelasma</i> sp.																																					
<i>Palaeophyllum</i> sp.																																					
<i>Phaulactis stummi</i> Nelson																																					
<i>Catenipora</i> sp.																																					
<i>Palaeolavosites</i> sp.																																					
<i>Palaeolavosites</i> cf. <i>P. okulitchi</i> Stearn																																					
<i>Tetradium</i> sp.																																					
inarticulate brachiopod	x	x																																			
<i>Austinella</i> sp.																																					
<i>Plaesiomys</i> sp.																																					
resserellid brachiopod																																					
pentamerid brachiopod																																					
atrypid brachiopod																																					
rhynchonellid brachiopod																																					
strophomenid brachiopod					x	x	x			x	x		x	x	x	x	x	x					x	x		x	x	x	x	x							
? <i>Kjerulfina</i> sp.																																					
<i>Thaerodontia</i> sp.																																					
? <i>Encrinuroides</i> sp.																																					
? <i>Isotelus</i> sp.																																					
<i>Rhynchotrema</i>																																					
<i>Favistina</i> sp.																																					

GSC

Figure 4. Continued

Footage	2488	2489	2490	2491	2492	2493	2497	2498	2499	2502	2503	2504	2507	2509	2512	2514	2515	2516	2517	2518	2519	2521	2522	2524	2527	2529	2530	2537	2538	2539	
GSC Fossil Locality Number	C-1541	C-1542	C-1543	C-1544	C-1545	C-1546	C-1547	C-1548	C-1549	C-1550	C-1551	C-1552	C-1553	C-1554	C-1555	C-1556	C-1557	C-1558	C-1559	C-1560	C-1561	C-1562	C-1563	C-1564	C-1565	C-1566	C-1567	C-1568	C-1569		
FAUNA																															
<i>Megamyonia</i> sp.																															
shell fragments and unidentified taxa	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
"conodonts"																				x											
bryozoans	x	x	x				x		x		x		x		x		x		x		x		x		x		x		x		
dendroid graptolite																						x									
sponge																?															
clam																															
ostracod																								x							
stromatoporoid																															
solitary coral								x			x		x		x			x	x		x		x		x	x	x	x			
<i>Bighornia</i> sp.	x		x		x						x		x							?				x		x		x			
<i>Deiracorallium</i> sp.						x																									
<i>Deiracorallium manitobense</i> Nelson			x																												
<i>Grewingkia</i> sp.																															
<i>Lobocorallium</i> sp.																x															
<i>Streptelasma</i> sp.							?			x																					
<i>Palaeophyllum</i> sp.																															
<i>Phaulactis stummi</i> Nelson																															
<i>Catenipora</i> sp.																															
<i>Palaeofavosites</i> sp.	x					x																									
<i>Palaeofavosites</i> cf. <i>P. okulitchi</i> Stearn																															
<i>Tetradium</i> sp.																															
inarticulate brachiopod																															
<i>Austinella</i> sp.							x																								
<i>Plaesiomys</i> sp.					x						?		x		?																
resserellid brachiopod																															
pentamerid brachiopod																															
atrypid brachiopod										x										x	x										
rhynchonellid brachiopod																															
strophomenid brachiopod	x	x				x			x	x	x		x		x	x				x		x	x					x	x		
? <i>Kjerullina</i> sp.																															
<i>Thaerodonta</i> sp.			x	x	?	x	?	x	x	?	x	x	x	?	x	x	x	x	?	x				?	?	x	x			x	
? <i>Encrinuroides</i> sp.											x																				
? <i>Isotelus</i> sp.																					x										
<i>Rhynchotrema</i> sp.							?	x	?				?																		
<i>Favistina</i> sp.																															
<i>Gravicalymene</i> sp.																															

GSC

Figure 4. Continued

Footage	C-1569	C-1570	C-1571	C-1572	C-1573	C-1574	C-1575	C-1576	C-1577	C-1578	C-1579	C-1580	C-1581	C-1582	C-1583	C-1584	C-1585	C-1586	C-1587	C-1588	C-1589	C-1590	C-1591	C-1592	C-1593	C-1594	C-1595	C-1596	C-1597		
GSC Fossil Locality Number	C-1569	C-1570	C-1571	C-1572	C-1573	C-1574	C-1575	C-1576	C-1577	C-1578	C-1579	C-1580	C-1581	C-1582	C-1583	C-1584	C-1585	C-1586	C-1587	C-1588	C-1589	C-1590	C-1591	C-1592	C-1593	C-1594	C-1595	C-1596	C-1597		
FAUNA																															
<i>Megamyonia</i> sp.			?					?																							
shell fragments and unidentified taxa	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
"conodonts"																															
bryozoans							x				x	x	x	x	x	x	x	x	x	x	x										
dendroid graptolite			x					x						x																	
sponge																															
clam																															
ostracod																															
stromatoporoid																															
solitary coral		x	x				x	x	x			x				x	x				x	x		x	x		x				
<i>Bighornia</i> sp.																														x	
<i>Deiracorallium</i> sp.																															
<i>Deiracorallium manitobense</i> Nelson																															
<i>Grewingia</i> sp.																															
<i>Lobocorallium</i> sp.																															
<i>Streptelasma</i> sp.												?																			
<i>Palaeophyllum</i> sp.																															
<i>Phaulactis stummi</i> Nelson																															
<i>Catenipora</i> sp.																															
<i>Palaeofavosites</i> sp.																															
<i>Palaeofavosites</i> cf. <i>P. okulitchi</i> Stearn																															
<i>Tetradium</i> sp.																															
inarticulate brachiopod																															
<i>Austinella</i> sp.								x																							
<i>Plaesiomys</i> sp.									?	?		?																			
resserellid brachiopod				x							x	x	x		x																
pentamerid brachiopod																															
atrypid brachiopod																															
rhynchonellid brachiopod																															
strophomenid brachiopod	x	x					x	x	x	x	x	x	x		x	x	x	x	x	x	x		x		x	x	x				
? <i>Kjerulfina</i> sp.																															
<i>Thaerodonta</i> sp.							x	x	x	x	x	x	x		x																
? <i>Encrinuroides</i> sp.																															
? <i>Isotelus</i> sp.																															
<i>Rhynchotrema</i> sp.																															
<i>Favistina</i> sp.																															
<i>Gravicalymene</i> sp.																															

Figure 4. Continued

GSC

Footage	2190	2205	2211	2220	2225	2231	2235	2236	2237	2250	2251	2252	2253	2260	2263	2264	2265	2267	2270	2272	2274	2277	2279	2281	2286	2289	2291	2292	2293
GSC Fossil Locality Number	C-929	C-930	C-931	C-932	C-933	C-934	C-935	C-935a	C-936	C-937	C-937a	C-938	C-939	C-940	C-941	C-942	C-943	C-944	C-945	C-946	C-947	C-948	C-949	C-950	C-951	C-952	C-953		
FAUNA																													
shell fragments and unidentified taxa	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x				x				
bryozoans	x						x				x	x	x																
solitary coral	x						x																						
<i>Angopora</i> cf. <i>A. manitobensis</i> Stearn														x	x	x			x										
inarticulate brachiopod																								x		x	x	x	
strophomenid brachiopod																					x								
? <i>Megamyonia</i> cf. <i>M. nitens</i> (Billings)																			x					x					
orthid brachiopod									x																				

GSC

Figure 5. Lists of fossil occurrences, Division C, Kaskattama Well

Footage	2002	2005	2006	2007	2008	2010	2012	2015	2016	2017	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2037	2038	2039	2040	2041	2043	2054	2064	2066	2068	
GSC Fossil Locality Number	C-844	C-845	C-846	C-847	C-848	C-849	C-850	C-851	C-852	C-853	C-854	C-855	C-856	C-857	C-858	C-859	C-860	C-861	C-862	C-863	C-864	C-865	C-866	C-867	C-868	C-869	C-870	C-871	C-872	C-873	
FAUNA																															
shell fragment and unidentified taxa	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
scolecodonts																															
bryozoans	x																														
ostracods																	x		x					x	x						
stromatoporoids																															
solitary coral																			x	x		x	x								
<i>Asthenophyllum</i> sp.																	x														
" <i>Neozaphrentis</i> " cf. <i>N. hindi</i> Stearn																															
" <i>Tryplasma</i> " sp.																															
favositid coral																															
<i>Favosites</i> sp.	x																	x		?	?	x	x							?	
<i>Palaeofavosites</i> sp.																															
<i>Multisolenia</i> sp.	x																														
<i>Multisolenia confluens</i> sp.																															
<i>Heliolites</i> sp.																									x						
<i>Catenipora</i> sp.																															
strophomenid brachiopod																															
stropheodontid brachiopod																	x	x		x		x	x		x						
pentamerid brachiopod																	x	x													
<i>Virgiana decussata</i> (Whiteaves)	x																														
<i>Alispira</i> sp.																															
rhynchonellid brachiopod																															
" <i>Camarotoechia</i> " cf. " <i>C. indianense</i> (Hall)	x		x	x	x	x	x																								
" <i>Atrypa</i> " aff. " <i>A. parksii</i> Williams																															
? <i>Hindella</i> sp.																															
<i>Monomerella</i> sp.																															
<i>Eophacops</i> sp.																															

GSC

Figure 6. Lists of fossil occurrences, Division D, Kaskattama Well

Footage	2070	2072	2079	2080	2082	2083	2084	2087	2089	2091	2092	2094	2097	2098	2099	2101	2103	2106	2108	2110	2111	2112	2113	2114	2115	2116	2118	2121	2122	2123			
GSC Fossil Locality Number	C-874	C-875	C-876	C-877	C-878	C-879	C-880	C-881	C-882	C-883	C-884	C-885	C-886	C-887	C-888	C-889	C-890	C-891	C-892	C-893	C-894	C-895	C-896	C-897	C-898	C-899	C-900	C-901	C-902				
FAUNA																																	
shell fragment and unidentified taxa	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
scolecodonts										?																							
bryozoans																																	
ostracods									x																								
stromatoporoids																																	
solitary coral		x																															
<i>Asthenophyllum</i> sp.																																	
" <i>Neozaphrentis</i> " cf. <i>N. hindi</i> Stearn																																	
" <i>Tryplasma</i> " sp.																																	
favositid coral																																	
<i>Favosites</i> sp.																																	
<i>Palaeofavosites</i> sp.			x																														
<i>Multisolenia</i> sp.																																	
<i>Multisolenia confluens</i> Stearn																																	
<i>Heliolites</i> sp.																																	
<i>Catenipora</i> sp.																																	
strophomenid brachiopod																																	
stropheodontid brachiopod																																	
pentamerid brachiopod																																	
<i>Virgiana decussata</i> (Whiteaves)																																	
<i>Alispira</i> sp.																																	
rhynchonellid brachiopod																																	
" <i>Camarotoechia</i> " cf. " <i>C. indianense</i> (Hall)																																	
" <i>Atrypa</i> " aff. " <i>A. parksi</i> Williams																																	
? <i>Hindella</i> sp.																																	
<i>Monomerella</i> sp.																																	
<i>Eopracops</i> sp.																																	

GSC

Figure 6. Continued

Footage	2125	2126	2127	2128	2129	2131	2132	2133	2137	2138	2139	2141	2142	2144	2146	2148	2152	2153	2154	2155	2156	2157	2158	2159	2160	2183	2184	2185	
GSC Fossil Locality Number	C-901	C-902	C-903	C-904	C-905	C-906	C-907	C-908	C-909	C-910	C-911	C-912	C-913	C-914	C-915	C-916	C-917	C-918	C-919	C-920	C-921	C-922	C-923	C-924	C-925	C-926	C-927	C-928	
FAUNA																													
shell fragment and unidentified taxa	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x				x	x						x	x	
scolecodonts																													
bryozoans		x	x		x		x		x		x	x	x		x	x					x	x	x	x				x	
ostracods		x	x	x	x		x											x	x		x		x	x	x				
stromatoporoids				x									x						x										
solitary coral				x	x			x	x		x	x	x					x	x	x						x	x		
<i>Asthenophyllum</i> sp.																													
" <i>Neozaphrentis</i> " cf. <i>N. hindi</i> Stearn																x						x							
" <i>Tryplasma</i> " sp.																													
favositid coral																												x	x
<i>Favosites</i> sp.	?	?		x	x		x	x		?			x			x					x	x							
<i>Palaeofavosites</i> sp.																													
<i>Multisolenia</i> sp.																													
<i>Multisolenia confluens</i> Stearn																					x								
<i>Heliolites</i> sp.								x																					
<i>Catenipora</i> sp.													x																
strophomenid brachiopod														x	x				x	x		x			x		x	x	
stropheodontid brachiopod																													
pentamerid brachiopod						x	x	x								x		x										x	x
<i>Virgiana decussata</i> (Whiteaves)	x		x	x							x	x	x					x											
<i>Alispira</i> sp.																x		?	?	x	x	x	x	x	x	x			
rhynchonellid brachiopod																x							x					x	
" <i>Camarotoechia</i> " cf. " <i>C. indianense</i> (Hall)																													
" <i>Atrypa</i> " aff. " <i>A. parksi</i> Williams																													
? <i>Hindella</i> sp.														x															
<i>Monomerella</i> sp.									x							x													
<i>Eopracops</i> sp.										x																			

GSC

Figure 6. Continued

Footage	1695	1697	1700	1701	1703	1705	1706	1707	1708	1710	1712	1713	1714	1715	1716	1717	1718	1720	1721	1722	1725	1726	1727	1728	1745	1747	1748
GSC Fossil Locality Number	C-743	C-744	C-745	C-746	C-747	C-748	C-749	C-750	C-751	C-752	C-753	C-754	C-755	C-756	C-757	C-758	C-759	C-760	C-761	C-762	C-763	C-764	C-765	C-766	C-767	C-768	
FAUNA																											
shell fragments and unidentified taxa	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
conodonts or scolecodonts																											
bryozoans																		x									
ostracods																											
clams																											
stromatoporoids		x	x	x	x	x	x																				
<i>Monograptus</i> sp.																											
solitary coral					x	x	x				x	x	x	x								x	x	x		x	
<i>Asthenophyllum</i> sp.																											
? <i>Neozaphrentis</i> sp.																											
<i>Synamplexoides</i> sp.					x																						
<i>Favosites</i> sp.		x	x	x	?								x	?													
<i>Favosites</i> cf. <i>F. favosus</i> (Goldfuss)																x	x										
<i>Palaeofavosites</i> sp.		?	x			?	x																				x
<i>Multisoenia</i> sp.																											
<i>Propora</i> sp.																											
<i>Catenipora</i> sp.																											
<i>Cystihalysites</i> sp.				x	?	x	x																				x
stropheodontid brachiopod																											
<i>Eostropheodonta</i> sp.																			x								?
meristinid brachiopod																											
? <i>Meristina</i> sp.																											
? <i>Fardenia</i> sp.																											
? <i>Howelliella</i> sp.																											
" <i>Camarotoechia</i> " cf. <i>C. winiskensis</i> Whiteaves	x		x																								
<i>Plectatrypa lowi</i> (Whiteaves)								x	x	x	x	x						x									x
<i>Encrinurus</i> sp.																						x					
<i>Scutellum</i> sp.																											

GSC

Figure 7. Lists of fossil occurrences, Division E, Kaskattama Well

Footage	1749	1750	1751	1752	1755	1758	1759	1762	1764	1765	1766	1768	1769	1770	1772	1773	1774	1775	1777	1779	1780	1783	1784	1787	1788	1790		
GSC Fossil Locality Number	C-769	C-770	C-771	C-772	C-773	C-774	C-775	C-776	C-777	C-778	C-779	C-780	C-781	C-782	C-783	C-784	C-785	C-786	C-787	C-788	C-789	C-790	C-791	C-792	C-793	C-794	C-795	
FAUNA																												
shell fragments and unidentified taxa	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
conodonts or scolecodonts																												
bryozoans									x										x		x							
ostracods																												
clams																												
stromatoporoids	x			x		x		x									x	x	x	x	x	x						
<i>Monograptus</i> sp.																x												
solitary coral	x					x		x	x		x				x		x					x					x	
<i>Asthenophyllum</i> sp.																											?	
? <i>Neozaphrentis</i> sp.																												
<i>Synamplexoides</i> sp.																												
<i>Favosites</i> sp.						x			?										?								x	
<i>Favosites</i> cf. <i>F. favosus</i> (Goldfuss)																												
<i>Palaeofavosites</i> sp.	x			x																	x	x	?	x				
<i>Multisolenia</i> sp.							x														x	x						
<i>Propora</i> sp.	x																											
<i>Catenipora</i> sp.																												
<i>Cystihalysites</i> sp.							x	x																				
stropheodontid brachiopod																												
<i>Eostropheodonta</i> sp.				?					x	x			x	x	x												x	
meristinid brachiopod																												
? <i>Meristina</i> sp.																												
? <i>Fardenia</i> sp.																												
? <i>Howellella</i> sp.																											x	
<i>Camarotoechia</i> cf. <i>C. winiskensis</i> Whiteaves																												
<i>Plectatrypa lowi</i> (Whiteaves)										x			x	x	x													
<i>Encrinurus</i> sp.																												
<i>Scutellum</i> sp.						x																						

GSC

Figure 7. Continued

Footage	1791	1792	1793	1795	1796	1799	1800	1801	1802	1803	1805	1808	1810	1812	1814	1816	1831	1833	1835	1836	1837	1846	1848	1850	1852	1853	1854	1855	
GSC Fossil Locality Number	C-795a	C-796	C-797	C-798	C-799	C-800	C-801	C-802	C-803	C-805	C-804	C-805	C-805a	C-806	C-807	C-808	C-809	C-810	C-811	C-811a	C-812	C-813	C-813a	C-814	C-815	C-816	C-817		
FAUNA																													
shell fragments and unidentified taxa	X	X	X	X			X	X	X	X	X	X	X	X		X	X		X	X	X	X	X	X	X	X	X	X	
conodonts or scolecodonts																													
bryozoans																													
ostracods				X			X		X		X						X								X		X		
clams																		X											
stromatoporoids																										X			
<i>Monograptus</i> sp.																													
solitary coral																										X		X	
<i>Asthenophyllum</i> sp.																										X		X	
? <i>Neozaphrentis</i> sp.																													
<i>Synamplexoides</i> sp.																													
<i>Favosites</i> sp.													X	X															
<i>Favosites</i> cf. <i>F. favosus</i> (Goldfuss)																													
<i>Palaeofavosites</i> sp.																													
<i>Multisolenia</i> sp.																													
<i>Propora</i> sp.																													
<i>Catnipora</i> sp.																													
<i>Cystihalysites</i> sp.																													
stropheodontid brachiopod																										X			
<i>Eostropheodonta</i> sp.																													
meristid brachiopod																													
? <i>Meristina</i> sp.							X	X	X																				
? <i>Fardenia</i> sp.																X	X												
? <i>Howellella</i> sp.																													
<i>Camarotoechia</i> cf. <i>C. winiskensis</i> Whiteaves				X	X																								
<i>Plectatrypa lowi</i> (Whiteaves)																													
<i>Encrinurus</i> sp.																													
<i>Scutellum</i> sp.																													

GSC

Figure 7. Continued

Footage	1856	1867	1873	1875	1876	1877	1881	1882	1890	1935	1937	1939	1956	1957	1958	1961	1962	1966	1967	1970	1976	1978	1987	1991	1992	1994	1995
GSC Fossil Locality Number	C-818	C-819	C-820	C-821	C-822	C-823	C-824	C-825	C-826	C-827	C-828	C-829	C-829a	C-830	C-831	C-832	C-833	C-834	C-835	C-836	C-837	C-838	C-839	C-840	C-841	C-842	C-843
FAUNA																											
shell fragments and unidentified taxa	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
conodonts or scolecodonts																						?					
bryozoans																											
ostracods			x			x		x			x	x			x												
clams																											
stromatoporoids											x																
<i>Monograptus</i> sp.																											
solitary coral												x								x							
<i>Asthenophyllum</i> sp.											x																
? <i>Neozaphrentis</i> sp.																		x	x								
<i>Synamplexoides</i> sp.																											
<i>Favosites</i> sp.																											
<i>Favosites</i> cf. <i>F. favosus</i> (Goldfuss)																											
<i>Palaeofavosites</i> sp.																											
<i>Multisolenia</i> sp.																											
<i>Propora</i> sp.																											
<i>Catenipora</i> sp.																											
<i>Cystihalysites</i> sp.																											
stropheodontid brachiopod										x	x	x												x			x
<i>Eostropheodonta</i> sp.										?																	
meristinid brachiopod																											
? <i>Meristina</i> sp.																											
? <i>Fardenia</i> sp.																											
? <i>Howellella</i> sp.																											
" <i>Camarotoechia</i> " cf. <i>C. winiskensis</i> Whiteaves																			x	x							
<i>Plectatrypa lowi</i> (Whiteaves)																											
<i>Encrinurus</i> sp.																											
<i>Scutellum</i> sp.																											

GSC

Figure 7. Continued

Footage	1381	1384	1385	1386	1436	1440	1441	1443	1444	1446	1447	1448	1449	1450	1451	1454	1455	1493	1494	1495	1496	1497	1498	1499	1500	1501	1502
GSC Fossil Locality Number	C-669	C-670	C-671	C-672	C-673	C-673a	C-674	C-675	C-676	C-677	C-678	C-679	C-680	C-681	C-682	C-683	C-684	C-685	C-686	C-687	C-688	C-689	C-690	C-691	C-692		
FAUNA																											
shell fragments and unidentified taxa	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
scolecodonts																						x					
bryozoans																											
ostracods						x										x					x						
<i>Pteroleperditia</i> sp.																											
straight cephalopods																											
stromatoporoids	x	x	x		x	x		x	x	x	x	x				x	x		x				x	x	x	x	x
solitary coral				x									x										x				
<i>Synamplexoides</i> sp.																											
undetermined tabulate coral				x																							
<i>Favosites</i> sp.		x	x				x	x	x	x		x				?			x				x				
<i>Favosites</i> cf. <i>F. favosus</i> (Goldfuss)																							x				
<i>Multisolenia</i> sp.																											
<i>Cystihalysites</i> sp.			x	x									?							?							
? <i>Atrypa</i> sp.																											
<i>Eospirifer</i> sp.																											
<i>Glassia variabilis</i> Whiteaves																											
<i>Hesperorthis</i> sp.																											
<i>Howellella</i> sp.																											
aff. <i>Rhynchotreta</i> sp.							x	x		x	x	x															
strophonellid brachiopod	x	x																									
<i>Encrinurus</i> sp.								x																			

GSC

Figure 8. Lists of fossil occurrences, Division F, Kaskattama Well

Footage	1503	1505	1506	1507	1509	1510	1511	1513	1547	1549	1551	1552	1562	1571	1573	1607	1609	1611	1612	1613	1614	1615	1616	1617	1618	1620	1622
GSC Fossil Locality Number	C-693	C-694	C-695	C-696	C-697	C-698	C-699	C-700	C-701	C-702	C-703	C-704	C-705	C-706	C-707	C-708	C-709	C-710	C-711	C-712	C-713	C-714	C-715	C-716	C-717	C-718	C-719
FAUNA																											
shell fragments and unidentified taxa	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
scolecodonts																											
bryozoans																											
ostracods						x																					
<i>Pteroleperditia</i> sp.					x		x																				
straight cephalopods																x											
stromatoporoids	x	x	x			x	x	x			x	x	x	x	x	x	x	x	x			x					
solitary coral						x									x				x					x	x		
<i>Synamplexoides</i> sp.																											
undetermined tabulate coral																											
<i>Favosites</i> sp.															x		x	x	x					x		?	x
<i>Favosites</i> cf. <i>F. lavosus</i> (Goldfuss)																											
<i>Multisolenia</i> sp.																											
<i>Cystihalysites</i> sp.																											
? <i>Atrypa</i> sp.									x	x																	
<i>Eospirifer</i> sp.																									x		
<i>Glassia variabilis</i> Whiteaves																											
<i>Hesperorthis</i> sp.						?																					
<i>Howellella</i> sp.			x																								
aff. <i>Rhynchotreta</i> sp.																											
strophioidid brachiopod																											
<i>Encrinurus</i> sp.																											

GSC

Figure 8. Continued

Footage	1623	1624	1628	1634	1639	1643	1645	1656	1657	1658	1660	1662	1663	1664	1665	1667	1669	1670	1675	1676	1677	1680	1682	1689	1691	1692	
GSC Fossil Locality Number	C-720	C-721	C-722	C-723	C-724	C-724a	C-725a	C-725	C-726	C-727	C-728	C-729	C-730	C-731	C-732	C-733	C-734	C-735	C-736	C-737	C-738	C-739	C-740	C-741	C-742		
FAUNA																											
shell fragments and unidentified taxa	x	x		x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
scolecodonts																											
bryozoans																											
ostracods																									x		
<i>Pteroleperditia</i> sp.																											
straight cephalopods																											
stromatoporoids								x		x		x		x	x	x	x	x	x	x	x	x		x			
solitary coral														x	x	x	x										
<i>Synamplexoides</i> sp.																											
undetermined tabulate coral																											
<i>Favosites</i> sp.						x	?						?	x	x	x	x	x	x	x							
<i>Favosites</i> cf. <i>F. favosus</i> (Goldfuss)							x																				
<i>Multisolenia</i> sp.																x											
<i>Cystihalysites</i> sp.															x												
? <i>Atrypa</i> sp.																											
<i>Eospirifer</i> sp.																											
<i>Glassia variabilis</i> Whiteaves											?																
<i>Hesperorthis</i> sp.																											
<i>Howellella</i> sp.																											
aff. <i>Rhynchotrete</i> sp.																											
strophonellid brachiopod																											
<i>Encrinurus</i> sp.																											

GSC

Figure 8. Continued

Footage	1379	1380
GSC Fossil Locality Number	C-667	C-668
FAUNA		
shell fragments and unidentified taxa	X	X
ostracods	X	X
<i>Dihogmochilina latimarginata</i> (Jones)	X	X
<i>Synamplexoides</i> sp.	X	X
stromatoporeid	X	X
undetermined tabulate coral	X	X
? <i>Eophaeops</i> sp.	X	X

Figure 9. Lists of fossil occurrences, Division G, Kaskattama Well

Footage	C-632	C-633	C-633	C-634	C-635	C-636	C-637	C-638	C-639	C-640	C-641	C-642	C-643	C-644	C-645	C-646	C-647	C-648	C-649	C-650	C-651	C-652	C-653	C-654	C-655	C-656	C-657	C-658	C-659	C-660	C-661	C-662	C-663	C-664	C-664	C-665	C-666		
GSC Fossil Locality Number	1298	1302	1303	1306	1311	1312	1313	1314	1316	1317	1318	1319	1322	1323	1326	1327	1333	1334	1336	1339	1341	1343	1347	1348	1351	1352	1353	1368	1369	1371	1372	1373	1374	1375	1377	1378			
FAUNA																																							
shell fragments and unidentified taxa	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
bryozoans																																							
stromatoporeids																																							
solitary corals																																							
aff. <i>Ptychophyllum</i> sp.																																							
<i>Alveolites</i> sp.																																							
<i>Favosites</i> sp.																																							
<i>Coenites</i> aff. <i>C. laminatus</i> (Hall)																																							
<i>Cystihalysites</i> sp.																																							
<i>Cystihalysites</i> aff. <i>C. compactus</i> (Rominger)																																							
<i>Cystihalysites</i> cf. <i>C. magnificus</i> (Buehler)																																							
? <i>Pentamerus</i> sp.																																							
sowerbyellid brachiopod																																							
ostracod																																							
? <i>Stegerhynchus</i> sp.																																							

Figure 10. Lists of fossil occurrences, Division H, Kaskattama Well

Footage	1072	1097	1100	1108	1113	1125	1126	1131	1132	1133	1134	1135	1136	1139	1143	1152	1154	1157	1158	1159	1161	1162	1163	1164	1165	1166	1171	1180	1183	1185	1189			
GSC Fossil Locality Number	C-579	C-580	C-581	C-582	C-583	C-583a	C-584	C-585	C-586	C-587	C-588	C-589	C-590	C-591a	C-591	C-592	C-593	C-594	C-595	C-596	C-597	C-598	C-599	C-600	C-601	C-602a	C-602	C-603	C-604	C-605				
FAUNA																																		
shell fragments and unidentified taxa	x	x	x	x	x	x	x	x					x	x	x			x		x		x	x	x	x	x	x	x	x	x	x			
algae	?	?								?	?							?								?	?					?		
clams																																x		
bryozoans																																		
stromatoporoids					x		x	x	x				x	x	x			x	x	x	x	x	x	x	x	x					?			
solitary corals					x					x			x											x							?	x		
<i>Palaeocyclus</i> sp.																																		
<i>Aulopora</i> sp.																																	?	
<i>Coenites</i> aff. <i>C. laminatus</i> (Hall)																																		
<i>Favosites</i> sp.									?	?	x					?	?	?									x					x		
<i>Favosites</i> cf. <i>F. lavosus</i> (Goldfuss)																																		
<i>Syringopora</i> cf. <i>S. verticillata</i> Goldfuss																																		
<i>Helioilites</i> sp.														x																			?	
<i>Cystihalysites</i> sp.										?									?	x						?								
<i>Cystihalysites</i> cf. <i>C. magnitubus</i> (Buehler)																																		
<i>Solenohalysites</i> sp.							?																											
pentamerid brachiopod																																		
<i>Pentameroides</i> cf. <i>P. expansa</i> (Whiteaves)																																		
spiriferid brachiopod																																		
<i>Cosmoilithus</i> sp.																																		
? <i>Alveolites</i> sp.																																		

GSC

Figure 11. Lists of fossil occurrences, Division I, Kaskattama Well

