

Supplemental Table 1. Paleocurrent measurements and locations (Abbreviations: trough cross bedding (TCB), planar cross bedding (PCB))

Abbreviations: trough cross bedding (TCB), planar cross bedding (PCB).

<u>Measurement</u>	<u>Sed Structure</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Formation</u>	<u>General Area</u>
340°	Small Scale TCB	44.74004°N	109.13447°W	Willwood Fm	North
15°	Small Scale TCB	44.74004°N	109.13447°W	Willwood Fm	North
250°	Small Scale TCB	44.74004°N	109.13447°W	Willwood Fm	North
35°	Small Scale TCB	44.74004°N	109.13447°W	Willwood Fm	North
85°	Small Scale TCB	44.74004°N	109.13447°W	Willwood Fm	North
190°	Small Scale TCB	44.74004°N	109.13447°W	Willwood Fm	North
110°	Small Scale TCB	44.74004°N	109.13447°W	Willwood Fm	North
165°	Small Scale TCB	44.74004°N	109.13447°W	Willwood Fm	North
160°	Small Scale TCB	44.74004°N	109.13447°W	Willwood Fm	North
330°	Large Scale TCB	44.74004°N	109.13447°W	Willwood Fm	North
105°	Large Scale TCB	44°44'19"N	109°7'44"W	Willwood Fm	North
15°	Large Scale TCB	44°44'19"N	109°7'44"W	Willwood Fm	North
95°	Large Scale TCB	44°44'19"N	109°7'44"W	Willwood Fm	North
295°	Small Scale TCB	44°44'19"N	109°7'44"W	Willwood Fm	North
395°	Small Scale TCB	44°44'19"N	109°7'44"W	Willwood Fm	North
290°	Small Scale TCB	44°44'19"N	109°7'44"W	Willwood Fm	North
285°	Large Scale TCB	44°47'9"N	109°6'39"W	Willwood Fm	North
310°	Small Scale TCB	44°47'9"N	109°6'39"W	Willwood Fm	North
244°	Large Scale TCB	44°47'9"N	109°6'39"W	Willwood Fm	North
165°	Large Scale TCB	44°47'14"N	109°6'25"W	Willwood Fm	North
117°	Large Scale TCB	44°47'14"N	109°6'25"W	Willwood Fm	North
177°	Large Scale TCB	44°47'14"N	109°6'25"W	Willwood Fm	North
133°	Large Scale TCB	44°47'14"N	109°6'25"W	Willwood Fm	North
320°	Small Scale TCB	44°47'26"N	109°6'32"W	Willwood Fm	North
250°	Small Scale TCB	44°47'26"N	109°6'32"W	Willwood Fm	North
200°	Small Scale TCB	44°47'26"N	109°6'32"W	Willwood Fm	North
230°	Large Scale TCB	44°47'26"N	109°6'32"W	Willwood Fm	North
280°	Large Scale TCB	44°47'26"N	109°6'32"W	Willwood Fm	North
294°	Small Scale TCB	44°47'12"N	109°6'28"W	Willwood Fm	North
298°	Small Scale TCB	44°47'12"N	109°6'28"W	Willwood Fm	North
300°	Large Scale TCB	44°47'12"N	109°6'28"W	Willwood Fm	North
245°	Large Scale TCB	44°47'12"N	109°6'28"W	Willwood Fm	North
150°	Large Scale TCB	44°48'53"N	109°2'59"W	Willwood Fm	North
130°	Large Scale TCB	44°48'53"N	109°2'59"W	Willwood Fm	North
350°	Large Scale TCB	44°48'53"N	109°2'59"W	Willwood Fm	North
345°	Large Scale TCB	44°48'53"N	109°2'59"W	Willwood Fm	North
310°	Small Scale TCB	44°48'53"N	109°2'59"W	Willwood Fm	North

292°	Large Scale TCB	44°14'50"N	108°50'60"W	Fort Union Fm	West
318°	Large Scale TCB	44°14'50"N	108°50'60"W	Fort Union Fm	West
319°	Large Scale TCB	44°16'6"N	108°47'26"W	Fort Union Fm	West
311°	Large Scale TCB	44°16'6"N	108°47'26"W	Fort Union Fm	West
25°	Large Scale TCB	44°16'41"N	108°46'37"W	Fort Union Fm	West
40°	Large Scale TCB	44°16'41"N	108°46'37"W	Fort Union Fm	West
28°	Large Scale TCB	44°19'9"N	108°44'7"W	Fort Union Fm	West
115°	Large Scale TCB	44°19'9"N	108°44'7"W	Fort Union Fm	West
14°	Small Scale TCB	44°19'9"N	108°44'7"W	Fort Union Fm	West
44°	Large Scale TCB	44°19'11"N	108°44'4"W	Willwood Fm	West
187°	Large Scale TCB	44°19'11"N	108°44'4"W	Willwood Fm	West
348°	Large Scale TCB	44°19'11"N	108°44'4"W	Willwood Fm	West
260°	Large Scale TCB	44°19'26"N	108°43'45"W	Willwood Fm	West
375°	Large Scale TCB	44°19'26"N	108°43'45"W	Willwood Fm	West
281°	Large Scale TCB	44°19'26"N	108°43'45"W	Willwood Fm	West
30°	Large Scale TCB	44°19'26"N	108°43'45"W	Willwood Fm	West
90°	Large Scale TCB	44°19'39"N	108°43'26"W	Willwood Fm	West
320°	Large Scale TCB	44°19'39"N	108°43'26"W	Willwood Fm	West
300°	Large Scale TCB	44°19'39"N	108°43'26"W	Willwood Fm	West
320°	Large Scale TCB	44°19'41"N	108°43'26"W	Willwood Fm	West
335°	Large Scale TCB	44°19'41"N	108°43'26"W	Willwood Fm	West
45°	Large Scale TCB	44°19'41"N	108°43'26"W	Willwood Fm	West
82°	Large Scale TCB	44°19'56"N	108°42'44"W	Willwood Fm	West
293°	Large Scale TCB	44°23'12"N	108°37'15"W	Willwood Fm	West
336°	Large Scale TCB	44°23'12"N	108°37'15"W	Willwood Fm	West
3°	Small Scale TCB	44°23'12"N	108°37'15"W	Willwood Fm	West
278°	Large Scale TCB	44°23'12"N	108°37'15"W	Willwood Fm	West
340°	Large Scale TCB	44°23'12"N	108°37'15"W	Willwood Fm	West
337°	Large Scale TCB	44°23'17"N	108°37'21"W	Willwood Fm	West
94°	Large Scale TCB	44°24'18"N	108°34'29"W	Willwood Fm	West
34°	Small Scale TCB	44°24'18"N	108°34'29"W	Willwood Fm	West
11°	Small Scale TCB	44°24'18"N	108°34'29"W	Willwood Fm	West
290°	Large Scale TCB	44°24'19"N	108°34'29"W	Willwood Fm	West
137°	Large Scale TCB	44°0'43"N	108°20'37"W	Willwood Fm	Southwest
61°	Large Scale TCB	44°0'43"N	108°20'37"W	Willwood Fm	Southwest
82°	Small Scale TCB	44°0'43"N	108°20'37"W	Willwood Fm	Southwest
192°	Large Scale TCB	44°0'41"N	108°20'39"W	Willwood Fm	Southwest
285°	Large Scale TCB	44°0'41"N	108°20'39"W	Willwood Fm	Southwest
315°	Large Scale TCB	44°0'41"N	108°20'39"W	Willwood Fm	Southwest
283°	Large Scale TCB	44°0'41"N	108°20'39"W	Willwood Fm	Southwest
115°	Large Scale TCB	44°0'43"N	108°20'53"W	Willwood Fm	Southwest
129°	Large Scale TCB	44°0'43"N	108°20'53"W	Willwood Fm	Southwest
290°	Large Scale TCB	44°0'43"N	108°20'53"W	Willwood Fm	Southwest

71°	Small Scale TCB	44°0'43"N	108°20'53"W	Willwood Fm	Southwest
31°	Large Scale TCB	44°1'4"N	108°21'7"W	Willwood Fm	Southwest
54°	Small Scale TCB	44°1'4"N	108°21'7"W	Willwood Fm	Southwest
55°	Large Scale TCB	44°1'6"N	108°21'6"W	Willwood Fm	Southwest
11°	Large Scale TCB	44°1'6"N	108°21'6"W	Willwood Fm	Southwest
136°	Large Scale TCB	44°1'6"N	108°21'6"W	Willwood Fm	Southwest
357°	Large Scale TCB	44°1'6"N	108°21'6"W	Willwood Fm	Southwest
359°	Large Scale TCB	44°1'8"N	108°21'7"W	Willwood Fm	Southwest
330°	Large Scale TCB	44°0'39"N	108°23'31"W	Willwood Fm	Southwest
339°	Large Scale TCB	44°0'39"N	108°23'31"W	Willwood Fm	Southwest
277°	Large Scale TCB	44°0'39"N	108°23'31"W	Willwood Fm	Southwest
30°	Large Scale TCB	44°0'41"N	108°23'33"W	Willwood Fm	Southwest
260°	Large Scale TCB	44°0'41"N	108°23'33"W	Willwood Fm	Southwest
314°	Large Scale TCB	44°0'41"N	108°23'33"W	Willwood Fm	Southwest
34°	Large Scale TCB	44°0'36"N	108°24'59"W	Willwood Fm	Southwest
55°	Large Scale TCB	44°0'38"N	108°24'44"W	Willwood Fm	Southwest
173°	Large Scale TCB	44°0'38"N	108°24'44"W	Willwood Fm	Southwest
29°	Small Scale TCB	44°0'38"N	108°24'44"W	Willwood Fm	Southwest
224°	Large Scale TCB	44°0'38"N	108°24'44"W	Willwood Fm	Southwest
343°	Large Scale TCB	44°0'38"N	108°24'44"W	Willwood Fm	Southwest
104°	Large Scale TCB	44°0'38"N	108°24'44"W	Willwood Fm	Southwest
357°	Large Scale TCB	44°0'32"N	108°26'54"W	Willwood Fm	Southwest
229°	Large Scale TCB	44°0'35"N	108°27'8"W	Willwood Fm	Southwest
42°	Large Scale TCB	44°0'35"N	108°27'8"W	Willwood Fm	Southwest
103°	Large Scale TCB	43°58'56"N	108°34'35"W	Fort Union Fm	Southwest
33°	Large Scale TCB	43°58'56"N	108°34'35"W	Fort Union Fm	Southwest
14°	Small Scale TCB	43°58'56"N	108°34'35"W	Fort Union Fm	Southwest
10°	Large Scale TCB	43°58'56"N	108°34'37"W	Fort Union Fm	Southwest
340°	Large Scale TCB	43°58'56"N	108°34'37"W	Fort Union Fm	Southwest
71°	Large Scale TCB	43°58'58"N	108°34'37"W	Fort Union Fm	Southwest
64°	Large Scale TCB	43°58'58"N	108°34'37"W	Fort Union Fm	Southwest
68°	Large Scale TCB	43°58'58"N	108°34'37"W	Fort Union Fm	Southwest
16°	Large Scale TCB	43°58'58"N	108°34'37"W	Fort Union Fm	Southwest
334°	Large Scale TCB	43°59'1"N	108°34'43"W	Fort Union Fm	Southwest
10°	Small Scale TCB	44°1'5"N	107°45'6"W	Willwood Fm	Southeast
133°	Small Scale TCB	44°1'5"N	107°45'6"W	Willwood Fm	Southeast
90°	Large Scale TCB	44°0'47"N	107°45'1"W	Willwood Fm	Southeast
289°	Large Scale TCB	44°0'19"N	107°44'55"W	Willwood Fm	Southeast
127°	Large Scale TCB	44°0'19"N	107°44'55"W	Willwood Fm	Southeast
169°	Large Scale TCB	44°0'19"N	107°44'55"W	Willwood Fm	Southeast
157°	Large Scale TCB	44°0'19"N	107°44'55"W	Willwood Fm	Southeast
355°	Small Scale TCB	44°2'56"N	107°50'40"W	Willwood Fm	Southeast
255°	Large Scale TCB	44°2'56"N	107°50'40"W	Willwood Fm	Southeast

307°	Large Scale TCB	44°5'54"N	107°47'49"W	Willwood Fm	Southeast
322°	Large Scale TCB	44°5'54"N	107°47'49"W	Willwood Fm	Southeast
320°	Small Scale TCB	44°5'54"N	107°47'49"W	Willwood Fm	Southeast
322°	Large Scale TCB	44°6'9"N	107°47'50"W	Fort Union Fm	Southeast
30°	Small Scale TCB	44°6'9"N	107°47'50"W	Fort Union Fm	Southeast
320°	Large Scale TCB	44°6'9"N	107°47'50"W	Fort Union Fm	Southeast
287°	Large Scale TCB	44°6'9"N	107°47'50"W	Fort Union Fm	Southeast
230°	Large Scale TCB	44°6'9"N	107°47'50"W	Fort Union Fm	Southeast
232°	Large Scale TCB	44°6'9"N	107°47'50"W	Fort Union Fm	Southeast
257°	Large Scale TCB	44°6'9"N	107°47'50"W	Fort Union Fm	Southeast
330°	Large Scale TCB	44°6'9"N	107°47'50"W	Fort Union Fm	Southeast
270°	Large Scale TCB	44°6'9"N	107°47'50"W	Fort Union Fm	Southeast
335°	Large Scale TCB	44°4'49"N	107°46'40"W	Fort Union Fm	Southeast
358°	Large Scale TCB	44°4'49"N	107°46'40"W	Fort Union Fm	Southeast
350°	Large Scale TCB	44°4'49"N	107°46'40"W	Fort Union Fm	Southeast
260°	Large Scale TCB	44°4'50"N	107°46'38"W	Fort Union Fm	Southeast
193°	Large Scale TCB	44°4'48"N	107°46'41"W	Fort Union Fm	Southeast
240°	Large Scale TCB	44°4'45"N	107°46'39"W	Fort Union Fm	Southeast
180°	Small Scale TCB	44°4'45"N	107°46'39"W	Fort Union Fm	Southeast
330°	Large Scale TCB	44°4'45"N	107°46'39"W	Fort Union Fm	Southeast
210°	Small Scale TCB	44°4'44"N	107°46'37"W	Fort Union Fm	Southeast
170°	Large Scale TCB	44°4'44"N	107°46'37"W	Fort Union Fm	Southeast
230°	Large Scale TCB	44°4'44"N	107°46'37"W	Fort Union Fm	Southeast
298°	Large Scale TCB	44°4'44"N	107°46'37"W	Fort Union Fm	Southeast
313°	Large Scale TCB	44°4'44"N	107°46'37"W	Fort Union Fm	Southeast
306°	Large Scale TCB	44°4'44"N	107°46'37"W	Fort Union Fm	Southeast
210°	Large Scale TCB	44°4'44"N	107°46'37"W	Fort Union Fm	Southeast
219°	Large Scale TCB	44°4'44"N	107°46'37"W	Fort Union Fm	Southeast
230°	Large Scale TCB	44°4'41"N	107°46'33"W	Fort Union Fm	Southeast
130°	Large Scale TCB	44°4'41"N	107°46'33"W	Fort Union Fm	Southeast
165°	Large Scale TCB	44°4'39"N	107°46'33"W	Fort Union Fm	Southeast
129°	Small Scale TCB	44°4'40"N	107°46'27"W	Fort Union Fm	Southeast
76°	Large Scale TCB	44°4'40"N	107°46'27"W	Fort Union Fm	Southeast
237°	Large Scale TCB	44°4'40"N	107°46'27"W	Fort Union Fm	Southeast
322°	Large Scale TCB	44°4'40"N	107°46'27"W	Fort Union Fm	Southeast
125°	Large Scale TCB	44°4'14"N	107°46'18"W	Fort Union Fm	Southeast
344°	Large Scale TCB	44°4'14"N	107°46'18"W	Fort Union Fm	Southeast
270°	Small Scale TCB	44°4'14"N	107°46'18"W	Fort Union Fm	Southeast
357°	Large Scale TCB	44°4'14"N	107°46'18"W	Fort Union Fm	Southeast
128°	Large Scale TCB	44°4'14"N	107°46'18"W	Fort Union Fm	Southeast
260°	Large Scale TCB	44°4'17"N	107°46'17"W	Willwood Fm	Southeast
181°	Large Scale TCB	44°4'17"N	107°46'17"W	Willwood Fm	Southeast
321°	Large Scale TCB	44°4'8"N	107°46'6"W	Willwood Fm	Southeast

323°	Large Scale TCB	43°55'35"N	108°3'51"W	Willwood Fm	Southeast
265°	Large Scale TCB	43°55'35"N	108°3'51"W	Willwood Fm	Southeast
354°	Small Scale TCB	43°55'35"N	108°3'51"W	Willwood Fm	Southeast
347°	Large Scale TCB	43°55'35"N	108°3'51"W	Willwood Fm	Southeast
285°	Large Scale TCB	43°55'35"N	108°3'51"W	Willwood Fm	Southeast
350°	Large Scale TCB	43°55'35"N	108°3'51"W	Willwood Fm	Southeast
349°	Large Scale TCB	43°55'35"N	108°3'51"W	Willwood Fm	Southeast
346°	Large Scale TCB	43°55'35"N	108°3'51"W	Willwood Fm	Southeast
313°	Large Scale TCB	43°55'35"N	108°3'51"W	Willwood Fm	Southeast
73°	Large Scale TCB	43°55'35"N	108°3'51"W	Willwood Fm	Southeast
317°	Large Scale TCB	43°56'13"N	108°4'25"W	Willwood Fm	Southeast
350°	Large Scale TCB	43°57'19"N	108°6'34"W	Willwood Fm	Southeast
52°	Large Scale TCB	43°53'37"N	107°59'23"W	Fort Union Fm	Southeast
105°	Large Scale TCB	43°53'37"N	107°59'23"W	Fort Union Fm	Southeast
81°	Large Scale TCB	43°53'37"N	107°59'23"W	Fort Union Fm	Southeast
313°	Large Scale TCB	43°53'37"N	107°59'23"W	Fort Union Fm	Southeast
31°	Large Scale TCB	43°53'37"N	107°59'23"W	Fort Union Fm	Southeast
31°	Large Scale TCB	43°53'37"N	107°59'23"W	Fort Union Fm	Southeast
163°	Large Scale TCB	43°53'37"N	107°59'23"W	Fort Union Fm	Southeast
23°	Large Scale TCB	43°53'34"N	107°59'29"W	Fort Union Fm	Southeast
119°	Large Scale TCB	43°54'31"N	107°58'45"W	Fort Union Fm	Southeast
316°	Large Scale TCB	43°54'31"N	107°58'45"W	Fort Union Fm	Southeast
320°	Large Scale TCB	43°54'31"N	107°58'45"W	Fort Union Fm	Southeast
219°	Large Scale TCB	43°54'30"N	107°58'45"W	Fort Union Fm	Southeast
10°	Large Scale TCB	44°6'59"N	108°10'52"W	Willwood Fm	Southeast
25°	Large Scale TCB	44°6'59"N	108°10'52"W	Willwood Fm	Southeast
330°	Small Scale TCB	44°6'59"N	108°10'52"W	Willwood Fm	Southeast
30°	Large Scale TCB	44°4'15"N	108°5'47"W	Willwood Fm	Southeast
315°	Large Scale PCB	44°4'15"N	108°5'47"W	Willwood Fm	Southeast
90°	Small Scale PCB	44°6'49"N	108°10'53"W	Willwood Fm	Southeast
223°	Small Scale PCB	44°5'17"N	108°8'6"W	Willwood Fm	Southeast
0°	Small Scale PCB	44°7'53"N	108°10'46"W	Willwood Fm	Southeast
20°	Large Scale PCB	44°7'52"N	108°10'43"W	Willwood Fm	Southeast
100°	Large Scale PCB	44°6'33"N	108°50'59"W	Willwood Fm	Southwest
140°	Small Scale PCB	44°6'32"N	108°11'0.6"W	Willwood Fm	Southeast
323°	Small Scale PCB	44°6'34"N	108°11'5"W	Willwood Fm	Southeast
107°	Small Scale TCB	44°6'33"N	108°11'0.71"W	Willwood Fm	Southeast
325°	Small Scale PCB	44°6'13"N	108°10'58"W	Willwood Fm	Southeast
115°	Small Scale PCB	44°6'13"N	108°10'57"W	Willwood Fm	Southeast
337°	Small Scale PCB	44°7'14"N	108°11'17"W	Willwood Fm	Southeast
47°	Small Scale PCB	44°6'9"N	108°10'45"W	Willwood Fm	Southeast
64°	Large Scale PCB	44°6'9"N	108°10'45"W	Willwood Fm	Southeast
258°	Small Scale PCB	44°6'9"N	108°10'45"W	Willwood Fm	Southeast

100°	Large Scale TCB	44°6'12"N	108°10'56"W	Willwood Fm	Southeast
193°	Large Scale TCB	44°6'12"N	108°10'56"W	Willwood Fm	Southeast
59°	Large Scale TCB	44°0'56"N	108°37'16"N	Fort Union Fm	Southwest
19°	Small Scale TCB	44°0'56"N	108°37'16"N	Fort Union Fm	Southwest