

TIME - ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	LITHOLOGIC SAMPLE	LITHOLOGIC DESCRIPTION
		FORAMS	NANNOS	RADS							
PLEISTOCENE	(F) Globorotalia truncatulinoides (N22) (N) Pseudoemiliania lacunosa (NN19)	CG			1	0.5				XM GZ CCL CCB	pebble Marly Foram Nanno Ooze dark yellowish brown (10YR 4/2), very uniform with no apparent structures.
		CG			1	1.0		dark yellowish brown (10YR 4/2)	Smear Slides quartz 2-80 clay 8 carb. unspec. 22 forams 10 nannos 15	GZ	4 cm pebble Carbonate Bomb 1-80 32% 4-80 39%
		CG			2			carbonaceous materials	Carbon Carbonate Total C Org. C CaCO ₃ 1-71 4.9 0.1 40.0 3-24 5.1 0.1 41.7	*80	
		CG			3			carbonaceous materials	Grain Size Sand Silt Clay 1-72 37.7 25.6 36.7 2-22 39.5 23.7 36.8	XM CCL	X-ray Analysis Bulk 1-77 3-21 <2μ (Partial) 1-77 3-21 Qtz. 9 12 Smec. 46 27 Cal. 31 36 Ill. 31 43 K-Feld. -- -- Kaol. 12 11 Plag. 6 -- Chlor. 11 19 Other 54 52
AG-CG			4		dense chert pebble				CCB		

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		FORAMS	NANNOS	RADS							
early PLIOCENE/late MIOCENE	(F) Globorotalia tumida (N18) (N) Ceratolithus tricorniculatus (NN12)	CG			1	0.5				CCB XM	Marly Foram Nanno Ooze bluish white (5B 9/1) with graded bed of forams and quartz. Nanno Ooze bluish white with streaks of very light gray (N8).
		CG			1	1.0		Very disrupted zone due to presence of large pebbles of various lithology. bluish white (5B 9/1)	*135 CCB GZ	Smear Slides 1-135 forams 5 nannos 95	
											Carbonate Bomb 1-50 44% 1-145 94%
											Carbon Carbonate Total C Org. C CaCO ₃ 1-119 11.3 0.0 94.1
											Grain Size Sand Silt Clay 2-11 4.7 36.3 58.9
											X-ray Analysis Bulk 1-62 <2μ (Partial) 1-62 Qtz. 15 Smec. 36 Cal. 37 Ill. 15 K-Feld. 12 Kaol. 17 Plag. 14 Chlor. -- Other 22

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		FORAMS	NANNOS	RADS							
Late MIOCENE	(F) Globorotalia plesiotumida-Globorotalia acostaensis-Globorotalia merotumida (N17-16) (N) Discoaster quinqueramus (NN1)	AM									bluish white (5B 9/1) Nanno Ooze bluish white (5B 9/1) with large (fine gravel) black pebbles. Carbonate Bomb 1-40 97% Carbon Carbonate 1-6 Total C 10.5 Org. C 0.0 CaCO ₃ 94.1 Grain Size 1-4 Sand 10.3 Silt 32.7 Clay 57.1 X-ray Analysis Bulk 1-12 <2μ (Partial) 1-12 Qtz. -- Smec. 43 Cal. 96 Ill. 37 K-Feld. -- Kao1. 10 Plag. -- Chlor. 10 Other 4
		AG	AG								

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		FORAMS	NANNOS	RADS							
middle EOCENE	(F) Hantkenina argonensis-Acarinina densa (P11-P10) (N) Discoaster subloquens (NP14)?	AP				0.5					*3 light greenish gray glauconitic layer Zoophycus Foram Nanno Ooze yellowish gray (5Y 7/2), very uniform, no apparent sedimentary structures except for subtle mottles. Scattered fine granules 1-3 mm of glauconite(?) mostly in 20-40 cm range of Sec. 1.
						1.0					yellowish gray (5Y 7/2) Nanno Ooze grayish orange (10YR 7/4), sand size pullouts (probably of forams) common. Streaks of pyrite and scattered pebbles present.
		CP				2					Smear Slides quartz 1-3 25 1-80 2 4-80 2 mica 5 10 clay 20 15 vol. glass tr glauconite 15 tr pyrite tr zeolite tr tr carb. unspec. 25 10 15 forams 15 5 nannos 45 63 65
		CP				3					Carbonate Bomb 1-80 70% 4-80 70% 6-80 67%
		CP				4					grayish orange (10YR 7/4) Carbon Carbonate 1-11 Total C 8.5 Org. C 0.1 CaCO ₃ 70.1 5-15 8.5 0.1 70.0 7-22 8.1 0.1 67.0
		CP				5					Grain Size 1-21 Sand 16.4 Silt 47.8 Clay 35.7 5-12 11.1 46.9 42.0 7-21 13.5 46.9 39.6
		CP				6					X-ray Analysis Bulk 2-91 5-11 <2μ (Partial) 2-91 5-11 Qtz. -- -- Smec. 44 38 Cal. 69 68 Ill. -- -- K-Feld. -- -- Kao1. -- -- Plag. -- -- Chlor. -- -- Other 31 32 Zeol. 56 62
AG-AP				7							

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		FORAMS	NANNOS	RADS							
middle EOCENE	(F) Globigerapsis kugleri-Acarinina densa (P11-10) (N) Discoaster subloboensis (NP14)	AG			1	0.5				GZ	Zoophycus
		CG			1	1.0					CCB CCL XM
		CG			2					*80	
		CG									
		CG									
		CG									
		AG									

Smear Slides		2-80
quartz		2
clay		20
heavy min.		tr
carb. unspec.		3
forams		7
nannos		58
diatoms		tr
rads		6
sp. spic.		4

Carbonate Bomb			
1-45	54%		

Carbon Carbonate			
	Total C	Org. C	CaCO ₃
1-53	6.2	0.1	50.7

Grain Size			
	Sand	Silt	Clay
1-4	6.2	51.5	42.3

X-ray Analysis			
Bulk	1-95	<2μ (Partial)	1-95
Qtz.	--	Smec.	100
Cal.	48	Ill.	--
K-Feld.	--	Kaol.	--
Plag.	--	Chlor.	--
Other	52		

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		FORAMS	NANNOS	RADS									
middle EOCENE	(F) Hantkenina aragonensis-Acarinina densa (P11-10) (N) Discoaster subloboensis (NP14)	CP			1	0.5				CCB	grayish orange (10YR 7/4)		
		AG			1	1.0					XM	Marly Foram Nanno Ooze grayish orange (10YR 7/4) to moderate yellowish brown (10YR 5/4) at bottom, very uniform. Speckles and tiny patches of dark minerals. Slight burrowing. Pebbles of fine clay (1-3 mm in diameter) are scattered in the disrupted cores, which are nanno ooze.	
		AG			2							Marly Nanno Ooze pale yellowish brown (10YR 6/2).	
		AG			2								Smear Slides
		AG			2								3-82 5-80 7-27
		AG			2								quartz 2 3 1 clay 20 15 10 glauconite tr zeolite 4 2 carb. unspec. 44 5 3 forams tr 10 2 nannos 30 66 83
		AG			2								Carbonate Bomb
		CM			3					CCB	1-50 34% 3-50 34% 5-50 21% -10 30%		
		AG			3					*82	Carbon Carbonate		
		CM			3						4-128 Total C Org. C CaCO ₃ 7-21 4.1 0.1 34.0 4.6 0.1 37.6		
		AG			3						Grain Size		
		CM			3						4-130 Sand Silt Clay 7-24 0.5 30.9 68.6 1.8 36.2 62.0		
		AG			3						X-ray Analysis		
		CM			3						Bulk 1-86 5-87 7-52		
		AG			3						Qtz. -- -- tr		
		CM			3						Cal. 36 29 40		
		AG			3						K-Feld. tr -- --		
		CM			3						Plag. -- -- --		
		AG			3						Other 64 71 60		
		AG			4						<2μ (Partial)		
		CM			4						1-86 5-87 7-52		
		AG			4						Smec. 86 100 90		
		CM			4						Ill. -- -- --		
		AG			4						Kaol. -- -- --		
		CM			4						Chlor. -- -- --		
		AG			4						Zeol. 14 -- 10		
		AG			4						moderate yellowish brown (10YR 5/4)		
		CM			4						pale yellowish brown (10YR 6/2)		
		AG			4								
		CM			4								
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middle EOCENE	(F) Hantkenina aragonensis-Acarinina densa (P11-10) (N) Discoaster sublodoensis (NP14)	AG				0.5				CCB *40	light olive gray (5Y 6/1) Marly Nanno Ooze light olive gray (5Y 6/1), uniform, subtle color change possibly due to burrows, but more probably disruption.
		CG	AG		CC						<u>Smear Slides</u> clay 1-40 zeolite 20 forams 5 nannos 1 nannos 74 <u>Carbonate Bomb</u> 1-40 30%

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		FORAMS	NANNOS	RADS																							
early EOCENE	(F) Hantkenina aragonensis-Acarinina densa (N) Discoaster lodoensis (NP13)	AG				0.5				CCB	olive gray (5Y 4/1) Calcareous Siliceous Mudstone olive gray (5Y 4/1) with patches and blebs of glauconitic material of dark greenish gray (5GY 4/1). Sec. 2-6 are disrupted.																
		CG				1.0				CCL GZ XM	<u>Smear Slides</u> 5-67 quartz 7 clay 23 nannos 40 rads 10 sp. spic. 20 <u>Carbonate Bomb</u> 1-70 27% 6-70 27% <u>Carbon Carbonate</u> <table border="1"> <thead> <tr> <th></th> <th>Total C</th> <th>Org. C</th> <th>CaCO₃</th> </tr> </thead> <tbody> <tr> <td>1-91</td> <td>3.7</td> <td>0.1</td> <td>30.4</td> </tr> <tr> <td>3-60</td> <td>3.2</td> <td>0.1</td> <td>25.2</td> </tr> <tr> <td>6-92</td> <td>3.6</td> <td>0.1</td> <td>28.5</td> </tr> </tbody> </table>		Total C	Org. C	CaCO ₃	1-91	3.7	0.1	30.4	3-60	3.2	0.1	25.2	6-92	3.6	0.1	28.5
			Total C	Org. C	CaCO ₃																						
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		CG					2																				
CG					3																						
CG					4				CCL																		
CG					5				*67 XM GZ																		
RP-CG					6				CCB CCL																		
CC					7						streaks of glauconite matter																

Calcareous Siliceous Mudstone
olive gray (5Y 4/1) with patches and blebs of glauconitic material of dark greenish gray (5GY 4/1). Sec. 2-6 are disrupted.

Smear Slides

5-67
quartz 7
clay 23
nannos 40
rads 10
sp. spic. 20

Carbonate Bomb

1-70 27%
6-70 27%

Carbon Carbonate

	Total C	Org. C	CaCO ₃
1-91	3.7	0.1	30.4
3-60	3.2	0.1	25.2
6-92	3.6	0.1	28.5

Grain Size

	Sand	Silt	Clay
1-100	0.5	42.8	56.7
5-101	2.3	48.3	49.4

X-ray Analysis

Bulk	1-98	5-98
Qtz.	--	20
Cal.	25	20
K-Feld.	--	--
Plag.	--	--
Other	75	80

<2µ (Partial)

	1-98	5-98
Smec.	100	100
Ill.	--	--
Kaol.	--	--
Chlor.	--	--

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early EOCENE	(F) Hantkenina aragonensis-Acarinina densa (P11-10) (N) Discoaster Iodoensis (NP13)	AG			1	0.5	▲▲▲▲▲	*23 XM CCL CCB	dark yellowish brown (10YR 4/2) <u>Siliceous Calcareous Mudstone</u> dark yellowish brown (10YR 4/2).																																											
		CG				1.0	▲▲▲▲▲	halo burrow	<u>Calcareous Siliceous Mudstone</u> grayish olive (10Y 4/2) many patches of greener color due to abundant glauconite. This core is just at the boundary between ooze and chalk.																																											
		AG			2		▲▲▲▲▲		grayish olive (10Y 4/2) <u>Mudstone</u> grayish olive green (5GY 3/2).																																											
		CG					▲▲▲▲▲		<u>Smear Slides</u>																																											
		CM					▲▲▲▲▲		<table border="1"> <tr><th></th><th>1-23</th><th>4-80</th><th>5-41</th></tr> <tr><td>quartz</td><td></td><td></td><td></td></tr> <tr><td>clay</td><td>20</td><td>30</td><td>83</td></tr> <tr><td>glauconite</td><td></td><td>tr</td><td></td></tr> <tr><td>zeolite</td><td></td><td></td><td>tr</td></tr> <tr><td>carb. unspec.</td><td></td><td></td><td>3</td></tr> <tr><td>forams</td><td></td><td></td><td>tr</td></tr> <tr><td>nannos</td><td>59</td><td>42</td><td>7</td></tr> <tr><td>rads</td><td>10</td><td>14</td><td>1</td></tr> <tr><td>sp. spic.</td><td>10</td><td>14</td><td>5</td></tr> <tr><td>plant frag.</td><td></td><td>tr</td><td></td></tr> </table>		1-23	4-80	5-41	quartz				clay	20	30	83	glauconite		tr		zeolite			tr	carb. unspec.			3	forams			tr	nannos	59	42	7	rads	10	14	1	sp. spic.	10	14	5	plant frag.		tr
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FM			5		▲▲▲▲▲		*41 CCB CCL	grayish olive green (5GY 3/2) <u>X-ray Analysis</u>																																												
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		FORAMS	NANNOS	RADS																															
early EOCENE	(N) Discoaster Iodoensis (NP13)				1	0.5	▲▲▲▲▲	*50	olive gray (5Y 4/1) <u>Marly Nanno Chalk</u> olive gray (5Y 4/1), with mottles, blebs and burrows of dusky green (5G 3/2).																										
						1.0	▲▲▲▲▲		<u>Smear Slides</u>																										
					2		▲▲▲▲▲		<table border="1"> <tr><th></th><th>1-50</th></tr> <tr><td>quartz</td><td>tr</td></tr> <tr><td>clay</td><td>30</td></tr> <tr><td>pyrite</td><td>tr</td></tr> <tr><td>forams</td><td>tr</td></tr> <tr><td>nannos</td><td>62</td></tr> <tr><td>diatoms</td><td>tr</td></tr> <tr><td>rads</td><td>3</td></tr> <tr><td>sp. spic.</td><td>5</td></tr> </table>		1-50	quartz	tr	clay	30	pyrite	tr	forams	tr	nannos	62	diatoms	tr	rads	3	sp. spic.	5								
			1-50																																
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rads	3																																		
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				▲▲▲▲▲			greenish laminae <u>Carbonate Bomb</u>																												
				▲▲▲▲▲			<table border="1"> <tr><th></th><th>Total C</th><th>Org. C</th><th>CaCO₃</th></tr> <tr><td>2-70</td><td>26%</td><td></td><td></td></tr> </table>		Total C	Org. C	CaCO ₃	2-70	26%																						
	Total C	Org. C	CaCO ₃																																
2-70	26%																																		
				▲▲▲▲▲			laminae inclined about 5° <u>Carbon Carbonate</u>																												
				▲▲▲▲▲			<table border="1"> <tr><th></th><th>Total C</th><th>Org. C</th><th>CaCO₃</th></tr> <tr><td>2-21</td><td>4.8</td><td>0.2</td><td>39.0</td></tr> </table>		Total C	Org. C	CaCO ₃	2-21	4.8	0.2	39.0																				
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2-21	4.8	0.2	39.0																																
				▲▲▲▲▲			<u>Grain Size</u>																												
				▲▲▲▲▲			<table border="1"> <tr><th></th><th>Sand</th><th>Silt</th><th>Clay</th></tr> <tr><td>2-18</td><td>0.2</td><td>38.9</td><td>60.9</td></tr> </table>		Sand	Silt	Clay	2-18	0.2	38.9	60.9																				
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				▲▲▲▲▲			<u>X-ray Analysis</u>																												
				▲▲▲▲▲			<table border="1"> <tr><th></th><th>2-27</th><th><2μ (Partial)</th><th>2-27</th></tr> <tr><td>Bulk</td><td></td><td></td><td></td></tr> <tr><td>Qtz.</td><td>--</td><td>Smec.</td><td>100</td></tr> <tr><td>Cal.</td><td>36</td><td>Ill.</td><td>--</td></tr> <tr><td>K-Feld.</td><td>--</td><td>Kaol.</td><td>--</td></tr> <tr><td>Plag.</td><td>--</td><td>Chlor.</td><td>--</td></tr> <tr><td>Other</td><td>--</td><td></td><td>--</td></tr> </table>		2-27	<2μ (Partial)	2-27	Bulk				Qtz.	--	Smec.	100	Cal.	36	Ill.	--	K-Feld.	--	Kaol.	--	Plag.	--	Chlor.	--	Other	--		--
	2-27	<2μ (Partial)	2-27																																
Bulk																																			
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TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	LITHOLOGIC DESCRIPTION	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	LITHOLOGIC SAMPLE
		FORAMS	NANNOS	RADS							
early EOCENE	Discoaster lodoensis (NP13)				1	0.5	grayish olive (10Y 4/2)	Calcareous Siliceous Mudstone grayish olive (10Y 4/2) intensively mottled by a combination of burrows and drilling effects.			CCL CCB *61 GZ
						1.0	halo burrow	Smear Slides -61 clay 10 forams tr nannos 60 rads 10 sp. spic. 20			
					2	abundant greenish patches and blebs	Carbonate Bomb 1-62 21% 3-70 19% 5-70 22% 7-20 24%				
						3	less green more brown mottling	Carbon Carbonate 1-50 Total C 3.3 Org. C 0.1 CaCO ₂ 26.4 3-80 2.9 0.1 23.2 6-68 3.0 0.1 24.0			
							4	less greenish patches	Grain Size 1-57 Sand 4.6 Silt 48.9 Clay 46.6 3-90 0.4 39.3 60.3		
									X-ray Analysis Bulk 3-78 <2μ (Partial) 3-78 Qtz. -- Smec. 100 Cal. 17 Ill. -- K-Feld. -- Kaol. -- Plag. -- Chlor. -- Other 83		
							5	intensive mottling of green			
						6					
					7						
						RM-CM					

Plus 15 cm long expanded segment

TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	LITHOLOGIC DESCRIPTION	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	LITHOLOGIC SAMPLE
		FORAMS	NANNOS	RADS							
early EOCENE	(F) Globorotalia aragonensis-Globorotalia pseudoemardii (P8-P4) Discoaster lodoensis (NP13)				1	0.5	dark greenish gray (5GY 4/1)	Calcareous Siliceous Mudstone dark greenish gray (5GY 4/1) with abundant mottles and streaks of olive gray (5Y 4/1) and greenish black (5GY 2/1). Slight to moderate burrowing.			CCL GZ XM
						1.0	Zoophycus	Smear Slides 1-97 6-120 quartz 2 tr clay 35 35 vol. glass tr tr glauconite tr tr carb. unspec. 10 10 forams tr 1 nannos 33 29 rads 10 10 sp. spic. 10 15			
					2	less greenish patches	Carbonate Bomb 1-97 20% 2-52 16% 3-80 15% 5-80 14% 7-20 14%				
							3	less greenish patches	Carbon Carbonate 1-50 Total C 2.3 Org. C 0.1 CaCO ₂ 18.4 3-80 2.4 0.1 18.9		
									4	large burrows	Grain Size 1-57 Sand 1.7 Silt 51.7 Clay 46.6 6-116 2.2 46.5 51.3
							5	less greenish patches			X-ray Analysis Bulk 1-55 6-120 Qtz. -- -- Cal. 25 15 K-Feld. -- tr Plag. -- tr Other 75 85
					6	intensive mottling of green			<2μ (Partial) 1-55 6-120 Smec. 100 100 Ill. -- -- Kaol. -- -- Chlor. -- --		
							7				
								RM-CM			

TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	LITHOLOGIC SAMPLE	LITHOLOGIC DESCRIPTION												
		FORAMS	NANNOS	RADS																			
early EOCENE	(F) Hantkenina aragonensis-Globorotalia uncinata/Globorotalia spiralis (P10-P2) Discoaster lodoensis (NP13)				1	0.5	▲▲▲▲	OOOO			dark greenish gray (5GY 4/1) <u>Calcareous Siliceous Mudstone</u> dark greenish gray (5GY 4/1) with streaks and mottles of olive gray (5Y 4/1) and greenish black (5GY 2/1).												
					1	1.0	▲▲▲▲				<u>Siliceous Mudstone</u> as above.												
		CG			2		▲▲▲▲				<u>Smear Slides</u> 3-48 6-50 mica tr clay 35 29 glauconite tr carb. unspec. 5 6 nannos 35 24 rads 20 25 sp. spic. 5 20												
		CG			3		▲▲▲▲				<u>Carbonate Bomb</u> 1-90 16% 3-50 13% 5-50 14% 6-50 16%												
		CG			4		▲▲▲▲				<u>Carbon Carbonate</u> <table border="1"> <tr><th></th><th>Total C</th><th>Org. C</th><th>CaCO₃</th></tr> <tr><td>1-105</td><td>2.7</td><td>0.2</td><td>21.2</td></tr> <tr><td>5-88</td><td>2.5</td><td>0.2</td><td>19.8</td></tr> </table>		Total C	Org. C	CaCO ₃	1-105	2.7	0.2	21.2	5-88	2.5	0.2	19.8
			Total C	Org. C	CaCO ₃																		
1-105	2.7	0.2	21.2																				
5-88	2.5	0.2	19.8																				
CM			5		▲▲▲▲				<u>Grain Size</u> 1-103 Sand Silt Clay 1.4 48.4 50.2														
CG			6		▲▲▲▲				<u>X-ray Analysis</u> Bulk 1-107 5-91 Qtz. -- tr Cal. 22 18 K-Feld. -- tr Plag. -- -- Other 78 82														
FM-CM					▲▲▲▲					<u><2μ (Partial)</u> 1-107 5-91 Smec. 100 -- Ill. -- -- Kaol. -- -- Chlor. -- --													

TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	LITHOLOGIC SAMPLE	LITHOLOGIC DESCRIPTION								
		FORAMS	NANNOS	RADS															
early EOCENE	(F) Globorotalia aragonensis-Globorotalia pusilla/Globorotalia angulata (P8-P3) Discoaster lodoensis (NP13)					VOID	OOOO				<u>Calcareous Siliceous Mudstone</u> dark greenish gray (5GY 4/1) with olive gray (5Y 4/1) and greenish black (5GY 2/1) mottles.								
		CG				0.5	▲▲▲▲				<u>Smear Slides</u> 1-79 mica ; clay 20 carb. unspec. 5 forams tr nannos 45 diatoms 2 rads 15 sp. spic. 15								
											<u>Carbon Carbonate</u> 1-50 18% <table border="1"> <tr><th></th><th>Total C</th><th>Org. C</th><th>CaCO₃</th></tr> <tr><td>1-79</td><td>2.6</td><td>0.2</td><td>20.2</td></tr> </table>		Total C	Org. C	CaCO ₃	1-79	2.6	0.2	20.2
	Total C	Org. C	CaCO ₃																
1-79	2.6	0.2	20.2																

TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	LITHOLOGIC SAMPLE	LITHOLOGIC DESCRIPTION
		FORAMS	NANNOS	RADS							
early EOCENE	(F) Globorotalia aragonensis-Globorotalia pseudomenardii (P8-P4) (N) Discoaster lodoensis (NP13)	AG			1	0.5		OOOOOO	CCB XM	diameter 4 cm - dark gneiss 3 cm - dark gneiss 3 cm - basalt 5GY 4/1 Calcareous Siliceous Mudstone dark greenish gray (5GY 4/1). Soupy consistency; contains pebbles of various lithologies which represent probable downhole contaminants. Thin Sections of cobbles: Sec. 1, 6-8 cm: Gray leucocratic gneiss. AnhedraI plagioclase and quartz make up 80-90% of the rock with subsidiary biotite, microcline, opaques, apatite, zircon, sphene and epidote. The texture varies between granitoid and granulitized, the latter occurring in elongate zones and probably associated with alteration processes causing development of epidote, sphene and muscovite. Sec. 1, 10-12 cm: Hornblende plagioclase gneiss. Dark green to pale yellow pleochroic hornblende in subhedral crystals forms a granoblastic texture with andesine and oligoclase, and a little quartz. Some quartz occurs as markedly rounded inclusions in the hornblende and plagioclase. Accessory minerals are rounded zircons, apatite and opaques, and fractures in the rock are filled with biotite, chlorite. Sec. 1, 17-19 cm: Feldspar porphyritic basalt. Phenocrysts of labradorite and micro-phenocrysts of ?basaltic (pseudomorphous after orthopyroxene) rest in a fine-grained (10-80µm) granular matrix of andesine, augite and opaques. In parts the pyroxene and plagioclase are subophitic. There are a few patches of olive green partly devitrified glass, and analcime may also be present. Carbonate Bomb 1-50 18% X-ray Analysis Bulk 1-65 <2µ (Partial) 1-65 Qtz. -- Smec. 100 Cal. 23 Ill. -- K-Feld. -- Kaol. -- Plag. -- Chlor. -- Other 77	
		FM	CG								

TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	LITHOLOGIC SAMPLE	LITHOLOGIC DESCRIPTION
		FORAMS	NANNOS	RADS							
early EOCENE	(F) Globorotalia aragonensis-Globorotalia pusilla/ Globorotalia angulata (P8-P3) (N) Discoaster lodoensis (NP13)	RM	CG					OO	CCB *25 XM	8 cm diameter - granite gneiss 5 cm diameter - hornblende granulite Calcareous Siliceous Mudstone dark greenish gray (5GY 4/1) mottled with greenish black (5GY 2/1). Contains pebbles probably from downhole contamination. Smear Slides 1-25 clay 20 carb. unspec. 34 nannos 15 rads 15 sp. spic. 15 plant frag. 1 Thin Sections: Sec. 1, 3-5 cm: Granitic gneiss. Andesine and oligoclase is intergrown with microcline and quartz in a granitoid texture. Many grains are sericitized and some saussuritized. Hornblende, green to pale green pleochroic when fresh, has likewise been extensively altered with development of biotite, clinozoisite quartz, calcite, opaques and sphene to give a sieve texture in parts. Perthite and microcline (typically twinned) mantle the plagioclase and mafic clusters, with quartz filling the interstices. Apatite is a common accessory. Sec. 1, 18-20 cm: Hornblende-biotite-granulite. Large crystals and augen of oligoclase and microcline rest in a matrix of sub to anhedraI grains of the same minerals with hornblende (dark green to green pleochroic), dark brown to pale yellow biotite, apatite (both as sub-rounded grains and tiny prisms), quartz and opaques. Rounded zircons occur in biotite and plagioclase. Carbonate Bomb 1-15 18% X-ray Analysis Bulk 1-19 <2µ (Partial) 1-19 Qtz. -- Smec. 100 Cal. 17 Ill. -- K-Feld. -- Kaol. -- Plag. -- Chlor. -- Other 83	

TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	LITHOLOGIC SAMPLE	LITHOLOGIC DESCRIPTION
		FORAMS	NANNOS	RADS							
early EOCENE	(N) Discoaster lodoensis (NP13)	CM				0.5			CCL CCB *27	X	diameter 6 cm - granite gneiss 7 cm - hornblende gneiss 5GY 4/1
		RM	AM		CC						0

Silicified Marly Nanno Chalk
dark greenish gray (5GY 4/1) with mottle of greenish black (5GY 2/1) and olive gray (5Y 4/1). Pebbles are probably downhole contaminants.

Smear Slides

	1-27
quartz	55
carb. unspec.	10
forams	tr
nannos	35
sp. spic.	tr

Thin Sections of cobbles:
Sec. 1, 4-6 cm: Granitic gneiss. Sericitized plagioclase, microcline and quartz make up 90% of the rock in a granitoid texture, modified in zones to a granulitic one. Sparse clusters of mafic minerals consist of opaques, biotite, chlorite and little clinozoisite. One cluster however contains a sieve-textured green hornblende with quartz, clinozoisite and olive green biotite inclusions. Rounded zircons, prisms of apatite, and calcite are accessory minerals.

Sec. 1, 9-11 cm: Hornblende-plagioclase-gneiss. Green to pale yellow pleochroic hornblende in clusters of coarse interlocking crystals is variably bleached and altered along cleavages to biotite and clinozoisite. Andesine in similar-sized crystals is cloudy and variably altered and replaced by euhedral clinozoisite, calcite and ?chlorite. A little quartz in the rock is also crowded with clinozoisite grains.

Carbonate Bomb
1-30 16%

Carbon Carbonate

	Total C	Org. C	CaCO ₃
1-20	5.2	0.2	41.7

X-ray Analysis

Bulk	1-51	<2μ (Partial)	1-51
Qtz.	--	Smec.	73
Cal.	28	Ill.	--
K-Feld.	--	Kaol.	--
Plag.	--	Chlor.	--
Other	--	Silica	27

TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	LITHOLOGIC SAMPLE	LITHOLOGIC DESCRIPTION
		FORAMS	NANNOS	RADS							
early EOCENE	(F) Globorotalia aragonensis-Globorotalia pseudomenardii (P8-P4) (N) Discoaster lodoensis (NP13)	FM				0.5			CCL *38 CCB	X	Cobbles diameter: 5 cm - porphyritic basalt 3 cm - plagioclase gneiss 5 cm - dolerite 5GY 2/1
		RM	CP		CC						0

Smear Slides

	1-38
clay	45
carb. unspec.	22
forams	tr
nannos	30
sp. spic.	tr
fish remain	2
plant frag.	1

Thin Sections of cobbles:
Sec. 1, 4-6 cm: Porphyritic basalt with phenocrysts of zoned clinopyroxene (pale brown core and brown rim) and abundant microphenocrysts of colorless orthopyroxene, brown clinopyroxene and labradorite many with "swallowtail" terminations to the laths. The groundmass is composed of plagioclase laths, pyroxene and opaques in an intergranular texture. Many clinopyroxene grains show shadowy extinction and a few are visibly bent.

Sec. 1, 7-9 cm: Plagioclase-hypersthene-gneiss. Large anhedral andesine crystals in a granitoid texture have been granulitized in zones with development of variable strain shadows and exsolution of ?quartz in plates along cleavage planes. Orthopyroxene is largely fresh but many grains are bent or cracked and some alteration to biotite has occurred. Subhedral opaques are associated with hypersthene, and apatite and zircon are generally found in plagioclase. Quartz is present in granitic and suture-textured zones.

Sec. 1, 13-15 cm: Metamorphosed dolerite. The original intergranular and subophitic texture of a two-pyroxene dolerite is recognizable even though the orthopyroxene has altered to golden brown ?chlorite, the clinopyroxene to green amphibole, and clusters of garnet euhedra have grown at the expense of plagioclase and orthopyroxene. The labradorite and andesine are clouded and a later phase of alteration has caused growth of a pale green amphibole, mobility of the opaques, and development of chlorite and calcite. The rock is probably from a Scourie dyke (Dearnley, pers. comm.).

Carbonate Bomb
1-40 22%

Carbon Carbonate

	Total C	Org. C	CaCO ₃
1-34	3.6	0.2	28.4

TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	LITHOLOGIC SAMPLE	LITHOLOGIC DESCRIPTION																																									
		FORAMS	NANNOS	RADS																																																
early EOCENE	(N) Discoaster lodoensis (NP13)	FP	CP		CC				TS XM *18 CCB CCL	<p>at 5 cm - very hard layer 15 cm - very hard layer</p> <p>Calcareous Mudstone dark greenish gray (5GY 4/1) mottled with greenish black (5GY 2/1) and olive gray (5Y 4/1). Slight to moderate burrowing. Contains two chert layers.</p> <p>Chert 2 very hard cherty layers.</p> <p>Smear Slides</p> <table border="1"> <tr><td>clay</td><td>1-18</td></tr> <tr><td>carb. unspec.</td><td>69</td></tr> <tr><td>forams</td><td>15</td></tr> <tr><td>nannos</td><td>tr</td></tr> <tr><td>plant frag.</td><td>15</td></tr> <tr><td></td><td>1</td></tr> </table> <p>Thin Section: Sec. 1, 6 cm: fine grained limestone containing abundant coccoliths, foraminifera, siliceous sponges and spicules, and liberally scattered with anhedral opaque grains, glauconite and flakes of chlorite or clay min-ral. Material of low birefringence in the matrix indicates some degree of silicification.</p> <p>Carbonate Bomb 1-20 22%</p> <p>Carbon Carbonate</p> <table border="1"> <tr><th>Total C</th><th>Org. C</th><th>CaCO₃</th></tr> <tr><td>1, CC-10</td><td>3.5</td><td>0.2 27.8</td></tr> </table> <p>X-ray Analysis</p> <table border="1"> <tr><th>Bulk</th><th>1, CC-13</th><th><2μ (Partial)</th><th>1, CC-13</th></tr> <tr><td>Qtz.</td><td>--</td><td>Smec.</td><td>76</td></tr> <tr><td>Cal.</td><td>18</td><td>Ill.</td><td>--</td></tr> <tr><td>K-Feld.</td><td>--</td><td>Kaol.</td><td>--</td></tr> <tr><td>Plag.</td><td>--</td><td>Chlor.</td><td>--</td></tr> <tr><td>Other</td><td>82</td><td>Silica</td><td>24</td></tr> </table>	clay	1-18	carb. unspec.	69	forams	15	nannos	tr	plant frag.	15		1	Total C	Org. C	CaCO ₃	1, CC-10	3.5	0.2 27.8	Bulk	1, CC-13	<2μ (Partial)	1, CC-13	Qtz.	--	Smec.	76	Cal.	18	Ill.	--	K-Feld.	--	Kaol.	--	Plag.	--	Chlor.	--	Other	82	Silica	24
clay	1-18																																																			
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TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	LITHOLOGIC SAMPLE	LITHOLOGIC DESCRIPTION																																																																								
		FORAMS	NANNOS	RADS																																																																															
early EOCENE	(N) Discoaster lodoensis (NP13)		CG								<p>Silicified Calcareous Mudstone dark greenish gray (5GY 4/1), olive black (5Y 2/1) and brownish black (5YR 2/1), mottled greenish black (5GY 2/1) and olive gray (5Y 4/1) with interbeds of chert. Zoophycus and halo burrows are common. Burrowing slight to moderate. The flattened burrows may be due to load compaction.</p> <p>Smear Slides</p> <table border="1"> <tr><td>clay</td><td>1-20</td><td>3-92</td></tr> <tr><td>glauconite</td><td>50</td><td>60</td></tr> <tr><td>carb. unspec.</td><td>8</td><td>tr</td></tr> <tr><td>forams</td><td>7</td><td>tr</td></tr> <tr><td>nannos</td><td>40</td><td>20</td></tr> <tr><td>sp. spic.</td><td>tr</td><td></td></tr> <tr><td>plant frag.</td><td>2</td><td>3</td></tr> </table> <p>Carbonate Bomb 1-80 15% 3-15 22%</p> <p>Carbon Carbonate</p> <table border="1"> <tr><th>Total C</th><th>Org. C</th><th>CaCO₃</th></tr> <tr><td>2-19</td><td>3.2</td><td>0.1 25.7</td></tr> <tr><td>2-74</td><td>1.7</td><td>0.1 13.6</td></tr> <tr><td>3-59</td><td>1.5</td><td>0.2 11.4</td></tr> <tr><td>3-100</td><td>2.1</td><td>0.3 15.4</td></tr> </table> <p>X-ray Analysis</p> <table border="1"> <tr><th>Bulk</th><th>1-74</th><th>2-23</th></tr> <tr><td>Qtz.</td><td>--</td><td>--</td></tr> <tr><td>Cal.</td><td>--</td><td>20</td></tr> <tr><td>K-Feld.</td><td>--</td><td>--</td></tr> <tr><td>Plag.</td><td>--</td><td>--</td></tr> <tr><td>Other</td><td>100</td><td>80</td></tr> </table> <p><2μ (Partial)</p> <table border="1"> <tr><th>Bulk</th><th>1-74</th><th>2-23</th></tr> <tr><td>Smec.</td><td>24</td><td>55</td></tr> <tr><td>Ill.</td><td>--</td><td>--</td></tr> <tr><td>Kaol.</td><td>--</td><td>--</td></tr> <tr><td>Chlor.</td><td>--</td><td>--</td></tr> <tr><td>Silica</td><td>76</td><td>45</td></tr> </table>	clay	1-20	3-92	glauconite	50	60	carb. unspec.	8	tr	forams	7	tr	nannos	40	20	sp. spic.	tr		plant frag.	2	3	Total C	Org. C	CaCO ₃	2-19	3.2	0.1 25.7	2-74	1.7	0.1 13.6	3-59	1.5	0.2 11.4	3-100	2.1	0.3 15.4	Bulk	1-74	2-23	Qtz.	--	--	Cal.	--	20	K-Feld.	--	--	Plag.	--	--	Other	100	80	Bulk	1-74	2-23	Smec.	24	55	Ill.	--	--	Kaol.	--	--	Chlor.	--	--	Silica	76	45
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		FORAMS	NANNOS	RADS																															
early EOCENE					CC	▲▲▲▲▲▲▲▲			XM	5GY 4/1	<p>Chert dark greenish gray (5GY 4/1). Fragments 3-5 cm long. Hard brecciated, slightly calcareous clasts have mottles of olive gray (5Y 4/1) in burrows.</p> <p>X-ray Analysis</p> <table border="1"> <tr><th>Bulk</th><th>1, CC-7</th><th><2μ (Partial)</th><th>1, CC-7</th></tr> <tr><td>Qtz.</td><td>--</td><td>Smec.</td><td>--</td></tr> <tr><td>Cal.</td><td>3</td><td>Ill.</td><td>--</td></tr> <tr><td>K-Feld.</td><td>--</td><td>Kaol.</td><td>--</td></tr> <tr><td>Plag.</td><td>--</td><td>Chlor.</td><td>--</td></tr> <tr><td>Other</td><td>97</td><td>Silica</td><td>100</td></tr> </table>	Bulk	1, CC-7	<2μ (Partial)	1, CC-7	Qtz.	--	Smec.	--	Cal.	3	Ill.	--	K-Feld.	--	Kaol.	--	Plag.	--	Chlor.	--	Other	97	Silica	100
Bulk	1, CC-7	<2μ (Partial)	1, CC-7																																
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		FORAMS	NANNOS	RADS							
early EOCENE	(N) Marthasterites tribrachiatus (NP12)	CM			1	0.5				CCL XM	dark greenish gray (5G 4/1) hard
		CM			1	1.0				CCB	dark greenish gray (5GY 4/1) Silicified Calcareous Mudstone dark greenish gray (5GY 4/1) mottled throughout with olive gray (5Y 4/1) with interbeds of chert. Burrows (moderate) flattened parallel to bedding. Fractures inclined up to 10°.
		CM			2					*125 CCL	Smear Slides quartz 1-125 3-60 clay 80 67 vol. glass tr opal 10 carb. unspec. 5 8 forams 2 nannos 15 10 plant frag. tr tr
		FG			3					CCL XM	hard Carbonate Bomb 1-70 23% 3-40 12%
		RP-CM								CCB	hard Carbon Carbonate Total C Org. C CaCO ₃ 1-17 1.8 0.2 13.5 2-22 1.9 0.2 13.8 3-4 3.2 0.2 25.4
										*60	X-ray Analysis Bulk 1-20 3-8 Qtz. -- -- Cal. 10 20 K-Feld. -- -- Plag. -- -- Other 90 80 <2μ (Partial) 1-20 3-8 Smec. -- tr Ill. -- -- Kaol. -- -- Chlor. -- -- Silica 100 100

TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	LITHOLOGIC SAMPLE	LITHOLOGIC DESCRIPTION
		FORAMS	NANNOS	RADS							
early EOCENE	(N) Marthasterites tribrachiatus (NP12)				1	0.5				CCL *101 CCL	olive black (5Y 2/1) Calcareous Silicified Mudstone olive black (5Y 2/1). Hard and dense, well cemented, moderately burrowed, well laminated. Burrows flattened parallel to laminations, moderate to intense diskings. Smear Slides quartz 1-101 2 clay 50 opal 30 carb. unspec. 8 forams 3 nannos 7 Carbonate Bomb 1-100 6% Carbon Carbonate Total C Org. C CaCO ₃ 1-112 2.1 0.3 15.0

TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	LITHOLOGIC SAMPLE	LITHOLOGIC DESCRIPTION
		FORAMS	NANNOS	RADS							
early EOCENE	(F) Globorotalia aragonensis-Globorotalia pseudonardii (P8-P4) Marthasterites tribrachiatus (NP12)	FP			1	0.5				CCL CCB	dark greenish gray (5GY 4/1) fault dark greenish gray (5GY 4/1) Calcareous Mudstone dark greenish gray (5GY 4/1) and greenish black, moderate burrowing with burrows filled by olive black (5Y 2/1). Most burrows are flattened parallel to bedding. Bedding inclined up to 15°.
		CP			2	1.0				*90 CCB	Chert dark greenish gray (5GY 4/1), no burrows. greenish black Smear Slides clay 1-90 2-83 20 88 pyrite 3 1 carb. unspec. 2 3 forams tr nannos 7 opal 75 1 Carbonate Bomb 1-50 17% 2-43 11% Carbon Carbonate Total C Org. C CaCO ₃ 1-30 2.1 0.1 16.6 2-146 2.0 0.1 16.1
		RP								*83 XM CCL	VOID large composite burrows X-ray Analysis Bulk 2-144 <2μ (Partial) 2-144 Qtz. tr Smec. 20 Cal. 15 Ill. -- K-Feld. 2 Kaol. -- Plag. 3 Chlor. -- Other 80 Silica 80

TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	LITHOLOGIC SAMPLE	LITHOLOGIC DESCRIPTION																																								
		FORAMS	NANNOS	RADS																																															
early EOCENE	(N) Marthasterites tribrachiatus (NP12)				1	0.5 1.0				CCB CCL	dark greenish gray (5GY 4/1) Calcareous Mudstone dark greenish gray (5GY 4/1). Laminations and burrows abundant, filled with olive black (5Y 2/1) and olive gray (5Y 4/1). Smear Slides clay 75 pyrite 2 opal 3 carb. unspec. 5 nannos 15 Carbonate Bomb 2-67 11% 1-42 7% Carbon Carbonate <table border="1"> <thead> <tr> <th></th> <th>Total C</th> <th>Org. C</th> <th>CaCO₃</th> </tr> </thead> <tbody> <tr> <td>1-103</td> <td>1.7</td> <td>0.2</td> <td>12.2</td> </tr> <tr> <td>2-57</td> <td>2.5</td> <td>0.2</td> <td>19.1</td> </tr> </tbody> </table> X-ray Analysis <table border="1"> <thead> <tr> <th></th> <th>2-57</th> <th><2μ (Partial)</th> <th>2-57</th> </tr> </thead> <tbody> <tr> <td>Bulk</td> <td>--</td> <td>Smec.</td> <td>20</td> </tr> <tr> <td>Qtz.</td> <td>--</td> <td>Ill.</td> <td>--</td> </tr> <tr> <td>Cal.</td> <td>16</td> <td>Kaol.</td> <td>--</td> </tr> <tr> <td>K-Feld.</td> <td>--</td> <td>Chlor.</td> <td>--</td> </tr> <tr> <td>Plag.</td> <td>--</td> <td>Silica</td> <td>80</td> </tr> <tr> <td>Other</td> <td>84</td> <td></td> <td></td> </tr> </tbody> </table>		Total C	Org. C	CaCO ₃	1-103	1.7	0.2	12.2	2-57	2.5	0.2	19.1		2-57	<2μ (Partial)	2-57	Bulk	--	Smec.	20	Qtz.	--	Ill.	--	Cal.	16	Kaol.	--	K-Feld.	--	Chlor.	--	Plag.	--	Silica	80	Other	84		
			Total C	Org. C	CaCO ₃																																														
1-103	1.7	0.2	12.2																																																
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				2		VOID			CCL CCB 50 XM																																										

TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	LITHOLOGIC SAMPLE	LITHOLOGIC DESCRIPTION
		FORAMS	NANNOS	RADS							
early EOCENE	(N) Marthasterites tribrachiatus (NP12)				1	0.5 1.0				CCL *40 CCB	dark greenish gray (5GY 4/1) Calcareous Silicified Mudstone dark greenish gray (5GY 4/1). Much less burrowed and laminated relative to above cores. Binocular microscope reveals small sclae lamination, abundant glauconite, and micro-cross bedding. Fracture and laminations inclined up to 20°.
					2				XM	halo burrow laminae	
					3					CCL	
										CCL	large burrow

Smear Slides			
	1-40		
quartz	3		
clay	45		
opal	35		
carb. unspec.	12		
forams	3		
nannos	3		

Carbonate Bomb			
	Total C	Org. C	CaCO ₃
1-95	11%		
3-85	13%		

Carbon Carbonate			
	Total C	Org. C	CaCO ₃
1-21	2.1	0.1	16.0
2-119	2.5	0.1	20.4
3-cc-145	1.5	0.1	11.5

X-ray Analysis			
	2-121	<2μ (Partial)	2-121
Bulk	--	Smec.	16
Qtz.	--	Ill.	--
Cal.	17	Kaol.	--
K-Feld.	--	Chlor.	--
Plag.	--	Silica	84
Other	83		

TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	LITHOLOGIC SAMPLE	LITHOLOGIC DESCRIPTION
		FORAMS	NANNOS	RADS							
early EOCENE	(N) Marthasterites tribrachiatus (NP12)	CP			1	0.5	▲▲▲		CCL XM	laminae light gray (N7)	
		FP			1	1.0	▲▲▲		*50	dark greenish gray (5GY 4/1). Burrowing absent to moderate, most burrows are filled with olive gray (5Y 4/1), or olive black (5Y 2/1) material.	
		FP			2		▲▲▲		CCL	lamination	
		FP					▲▲▲		CCB	Smear Slides	
		FP					▲▲▲		CCL	quartz 2	
		FP					▲▲▲		CCB	clay 58	
							▲▲▲			opal 15	
							▲▲▲			carb. unspec. 17	
							▲▲▲			nannos 3	
							▲▲▲			Carbonate Bomb	
							▲▲▲			2-98 17.2%	
							▲▲▲			3-60 14.0%	
							▲▲▲			Carbon Carbonate	
							▲▲▲			1-7 Total C Org. C CaCO ₃	
							▲▲▲			2-36 2.1 0.1 16.5	
							▲▲▲			3-58 2.6 0.1 20.3	
							▲▲▲			X-ray Analysis	
							▲▲▲			Bulk 1-7 <2μ (Partial) 1-7	
							▲▲▲			Qtz. -- Smec. 49	
							▲▲▲			Cal. 12 Ill. --	
							▲▲▲			K-Feld. -- Kaol. --	
							▲▲▲			Plag. -- Chlor. --	
							▲▲▲			Other 88 Silica 51	

TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	LITHOLOGIC SAMPLE	LITHOLOGIC DESCRIPTION
		FORAMS	NANNOS	RADS							
early EOCENE	(N) Marthasterites tribrachiatus (NP12)	RP			1	0.5	▲▲▲		*38	dark greenish gray (5GY 4/1)	
		FP			1	1.0	▲▲▲		CCB CCL	laminated	
		CM			2		▲▲▲		CCB *43	laminated	
		FP					▲▲▲		CCL XM	very light gray dolomitic marly limestone	
							▲▲▲			Zoophycus	
							▲▲▲			Smear Slides	
							▲▲▲			quartz 1	
							▲▲▲			clay 59	
							▲▲▲			pyrite 55	
							▲▲▲			chalcedony 2	
							▲▲▲			opal 25	
							▲▲▲			carb. unspec. 15	
							▲▲▲			dolomite 10	
							▲▲▲			forams 2	
							▲▲▲			nannos tr	
							▲▲▲			Carbonate Bomb	
							▲▲▲			1-80 8%	
							▲▲▲			2-30 12%	
							▲▲▲			Carbon Carbonate	
							▲▲▲			1-89 Total C Org. C CaCO ₃	
							▲▲▲			2-136 2.4 0.1 19.1	
							▲▲▲			2-136 2.6 0.1 21.0	
							▲▲▲			X-ray Analysis	
							▲▲▲			Bulk 2-139 <2μ (Partial) 2-139	
							▲▲▲			Qtz. -- Smec. 40	
							▲▲▲			Cal. 17 Ill. --	
							▲▲▲			K-Feld. -- Kaol. --	
							▲▲▲			Plag. -- Chlor. --	
							▲▲▲			Other 83 Silica 60	

TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	LITHOLOGIC SAMPLE	LITHOLOGIC DESCRIPTION	
		FORAMS	NANNOS	RADS								
early EOCENE	P5?	(N) Marthasterites tribrachiatus (NP12)			1	0.5	▲▲▲▲▲	◆	XM	dark greenish gray (5GY 4/1)	Calcareous Mudstone dark greenish gray (5GY 4/1). Burrows and laminations filled with olive gray (5Y 4/1) and olive black (5Y 2/1).	
						1.0	▲▲▲▲▲	◆	CCB	olive black (5Y 2/1)	Calcareous Silicified Mudstone intense burrowing and lamination color is olive black (5Y 2/1) and olive gray (5Y 4/1) as a result.	
					2			◆	*100	dark greenish gray (5GY 4/1)	Tuffaceous Mudstone composed of altered glass?	
								◆	CCB		Smear Slides	
					3			◆	CCB	olive gray (5Y 4/1)		minor lith.
								◆	CCL	dark greenish gray (5GY 4/1)	Carbonate Bomb	
					4			◆	CCB		Carbon Carbonate	
		◆	CCL			X-ray Analysis						
5			◆	*100	green streaks	<2μ (Partial)						
			◆	CCB		Smec.						
6			◆	CCL		Ill.						
			◆	XM		KaoI.						
7			◆	*51	lense of tuffaceous mudstone	Chlor.						
			◆	CCB		Silica						

3

TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	LITHOLOGIC SAMPLE	LITHOLOGIC DESCRIPTION
		FORAMS	NANNOS	RADS							
early PLIOCENE	(F) Sphaeroidinella dehiscens (N19) (N) (NN15) Reticulofenestra pseudumbilica										
		AG	AG		1	0.5	VOID				5B 9/1
					1	1.0	VOID				N8
				CC							

Nanno Ooze			
bluish white (5B 9/1) to very light gray (N8); generally homogeneous with some evidence of bioturbation.			
Smear Slides	Major lithology		
	1-100		
clay	5		
forams	3		
nannos	92		
diatoms	tr		
rads	tr		
sp. spic.	tr		
volcanic glass	tr		
Carbonate Bomb			
1-95	97%		
Carbon Carbonate			
	Total C	Org. C	CaCO ₃
1-89	11.2	0.1	92.6
Grain Size			
	Sand	Silt	Clay
1-86	3.3	35.9	60.9
X-ray Analysis			
Bulk	1-92	<2 μ m (partial)	1-92
Qtz.	--	Smec.	82
Cal.	91	Ill.	--
Dol.	--	Kaol.	--
Other	9		--
		Zeol.	--
		Sil.	18

Site 406, Core None, Wash Interval 5.0-62.0 m:
Interval washed down. No core taken.
Site 406, Core None, Wash Interval 71.5-138.0 m:
Washed down interval. No cores taken.
Site 406, Core None, Wash Interval 147.5-214.0 m:
Washed zone. No cores recovered.

TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	LITHOLOGIC SAMPLE	LITHOLOGIC DESCRIPTION
		FORAMS	NANNOS	RADS							
early PLIOCENE	(F) Globorotalia tumida (N18) (N) C. tricorniculatus (NN12/7)										
		Am	Am		1	0.5	VOID				5B 9/1
					1	1.0					N8
				CC							

Nanno Ooze			
bluish white (5B 9/1) to light gray (N8). Occasional black specs of pyrite; some burrowing.			
Smear Slides	Major lithology		
	1-100		
clay	5		
unsp. carb.	1		
forams	5		
nannos	89		
rads	tr		
sp. spic.	tr		
silicoflag.	tr		
Carbonate Bomb			
1-100	96%		2-68 98%
Carbon Carbonate			
	Total C	Org. C	CaCO ₃
1-115	11.4	0.1	94.5
2-49	11.4	0.1	94.1
Grain Size			
	Sand	Silt	Clay
1-120	3.6	37.9	58.5
2-39	3.5	40.5	56.0
X-ray Analysis			
Bulk	1-116	2-96	<2 μ m (partial) 1-116 2-96
Qtz.	9	--	Smec. -- 64
Cal.	22	89	Ill. 48 21
Dol.	--	--	Kaol. 18 9
Other	69	11	Chlor. 34 6
			Zeol. -- --
			Sil. -- --

Site 406, Core None, Wash Interval 223.5-318.5 m:
Washed zone. No core recovered. Between Cores 4 and 5.

TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	LITHOLOGIC DESCRIPTION
		FORAMS	NANNOS	RADS				
late MIOCENE	(F) Globorotalia tumida pleistotumida (N17-16) Globorotalia acostaensis - Globorotalia merotumida (N17-16) (N) Discoaster quinqueramus (NN11)	Am	AM		CC	VOID	5B 9/1 Nanno Chalk bluish white (5B 9/1) Smear Slides Major lithology 1-14 clay 5 unsp. carb. 1 forams 4 nannos 90 rads tr sp. spic. tr Carbonate Bomb 1-15 82%	

TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	LITHOLOGIC DESCRIPTION
		FORAMS	NANNOS	RADS				
late MIOCENE	(F) Globorotalia pleistotumida - Globorotalia merotumida (N17/16) (N) Discoaster quinqueramus (NN11)	Am	AM		CC	VOID	5B 9/1 Nanno Chalk bluish white (5B 9/1) to light gray (N7); occasional lamination of light greenish gray (5G 8/1) and grayish black (N2) to yellowish gray (5Y 8/1) burrows. Occasional Zoophycus and Composite burrows. Core discing throughout. Smear Slides Major lithology 2-86 clay 10 unsp. carb. 3 forams 7 nannos 80 rads tr sp. spic. tr Carbonate Bomb 1-6 95% 2-12 96% Carbon Carbonate 2-82 Total C 10.9 Org. C 0.1 CaCO ₂ 90.6 Grain Size 2-83 Sand 2.5 Silt 44.7 Clay 52.7 X-ray Analysis Bulk 2, 83-85 <2µm (partial) 2, 83-85 Qtz. tr Smec. 62 Cal. 82 Ill. 94 Dol. -- Kaoi. 7 Other 18 Chlor. 7 Zeol. -- Sil. --	

TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	LITHOLOGIC SAMPLE	LITHOLOGIC DESCRIPTION
		FORAMS	NANNOS	RADS							
Late MIOCENE	(F) Globorotalia acostaensis-Globorotalia merotumida (N16) (N) Discoaster quinqueramus (NN11)	AM-AM	CP		1	0.5	VOID			XM *9 GZ CCL *43	N8 very light gray (N8) with yellowish gray (5Y 8/1) laminations in Sec. 1. Occasional dark gray burrow. Moderate disturbance (discing) throughout.
					2	1.0			CCL		
				CC							

Smear Slides		Major lithology	
		1-9	1-43
clay		5	7
unsp. carb.		3	1
forams		7	2
nannos		85	88
diatoms		--	--
rads		tr	--
sp. spic.		tr	--

Carbonate Bomb			
1-120	95%		
Carbon Carbonate			
	Total C	Org. C	CaCO ₃
1-13	10.8	0.1	89.2
2-20	11.0	0.1	90.9

Grain Size		Sand	Silt	Clay
1-14		3.1	49.8	47.1

X-ray Analysis			
Bulk	1, 4-6	<2µm (partial)	1, 4-6
Qtz.	--	Smec.	72
Cal.	82	Ill.	16
Dol.	--	Kaol.	6
Other	18	Chlor.	6
		Zeol.	--
		Sil.	--

TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	LITHOLOGIC SAMPLE	LITHOLOGIC DESCRIPTION
		FORAMS	NANNOS	RADS							
Late MIOCENE	(F) Globorotalia acostaensis-Globorotalia merotumida (N16) (N) Discoaster quinqueramus (NN11)	AM-AM	AP		1	0.5	VOID			GZ CCL CCB *60	SB 9/1 Nanno Chalk bluish white (SB 9/1); occasional lamination, Zoophycus burrow, and pyrite specs. Core discing throughout.
					2	1.0			CC		

Smear Slides		Major lithology	
		1-60	
clay		5	
unsp. carb.		5	
forams		7	
nannos		83	
rads		tr	
sp. spic.		tr	

Carbonate Bomb			
1-67	94%		
Carbon Carbonate			
	Total C	Org. C	CaCO ₃
1-24	11.2	0.1	92.4

Grain Size		Sand	Silt	Clay
1-22		4.2	39.9	55.9

TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE SEDIMENTARY STRUCTURES LITHOLOGIC SAMPLE	LITHOLOGIC DESCRIPTION																																																											
		FORAMS	NANNOS	RADS																																																																
late MIOCENE	(F) Globorotalia costaeensis-Globorotalia merotumida (N16)	AM			1	0.5 1.0		Zoophycus Nanno Chalk Foram Nanno Chalk bluish white (5B 9/1) changing to light greenish gray (5GY 8/1) near base. Zoophycus burrows and diffuse wavy lamination common in nanno chalk. Core discing in Sec. 2. Evidence of grading in foram nanno chalk.																																																												
		AP			2	*70			5B 9/1 Smear Slides Major lithology clay 2-70 15 unsp. carb. 10 forams 15 nannos 59 rads tr sp. spic. 1 Carbonate Bomb 2-110 83.9% Carbon Carbonate <table border="1"> <thead> <tr> <th></th> <th>Total C</th> <th>Org. C</th> <th>CaCO₃</th> </tr> </thead> <tbody> <tr> <td>1-9</td> <td>10.7</td> <td>0.1</td> <td>88.7</td> </tr> <tr> <td>2-31</td> <td>10.7</td> <td>0.1</td> <td>88.5</td> </tr> </tbody> </table> Grain Size <table border="1"> <thead> <tr> <th></th> <th>Sand</th> <th>Silt</th> <th>Clay</th> </tr> </thead> <tbody> <tr> <td>1-10</td> <td>3.4</td> <td>49.2</td> <td>47.4</td> </tr> <tr> <td>2-24</td> <td>1.0</td> <td>53.2</td> <td>45.8</td> </tr> </tbody> </table> X-ray Analysis <table border="1"> <thead> <tr> <th></th> <th>1, 7-9</th> <th>2, 17-80</th> </tr> </thead> <tbody> <tr> <td>Bulk</td> <td>tr</td> <td>--</td> </tr> <tr> <td>Qtz.</td> <td>66</td> <td>85</td> </tr> <tr> <td>Cal.</td> <td>--</td> <td>--</td> </tr> <tr> <td>Dol.</td> <td>34</td> <td>15</td> </tr> <tr> <td>Other</td> <td>--</td> <td>--</td> </tr> </tbody> </table> <2µm (partial) <table border="1"> <thead> <tr> <th></th> <th>1, 7-9</th> <th>2, 17-20</th> </tr> </thead> <tbody> <tr> <td>Smec.</td> <td>33</td> <td>20</td> </tr> <tr> <td>Ill.</td> <td>50</td> <td>68</td> </tr> <tr> <td>Kaol.</td> <td>8</td> <td>6</td> </tr> <tr> <td>Chlor</td> <td>9</td> <td>6</td> </tr> <tr> <td>Zeol.</td> <td>--</td> <td>--</td> </tr> <tr> <td>Sil.</td> <td>--</td> <td>tr</td> </tr> </tbody> </table>		Total C	Org. C	CaCO ₃	1-9	10.7	0.1	88.7	2-31	10.7	0.1	88.5		Sand	Silt	Clay	1-10	3.4	49.2	47.4	2-24	1.0	53.2	45.8		1, 7-9	2, 17-80	Bulk	tr	--	Qtz.	66	85	Cal.	--	--	Dol.	34	15	Other	--	--		1, 7-9	2, 17-20	Smec.	33	20	Ill.	50	68	Kaol.	8	6	Chlor	9	6	Zeol.	--
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		FORAMS	NANNOS	RADS																																																																											
late MIOCENE	(F) Globorotalia acostaensis-Globorotalia merotumida (N16)	AP			1	0.5 1.0		laminated 5GY 8/1, 5B 9/1, 5B 7/7, and 5G 6/1 5B 9/1 5YR 6/1 5B 7/1-5GY 8/1 grading in ash - load cast at base																																																																							
		AP			2	*136 *140			Foram Nanno Chalk Nanno Chalk Light greenish gray (5GY 8/1) to bluish white (5B 9/1). Sec. 1 (0-40 cm) complex interlamination of light greenish gray, light bluish gray (5B 7/7) and greenish gray (5G 6/1). Lamination on mm scale and varies from plane to contorted. Light olive gray Calcareous Tuff occurs near base of Sec. 1 and ash occurs scattered through lower part of Sec. Zoophycus burrows are common.																																																																						
							CCL CCB *136 *140 CCL XM VOID 5B 9/1	Smear Slides Major lith. Minor lith. <table border="1"> <thead> <tr> <th></th> <th>1-36</th> <th>1-140</th> </tr> </thead> <tbody> <tr> <td>quartz</td> <td>tr</td> <td>--</td> </tr> <tr> <td>clay</td> <td>15</td> <td>15</td> </tr> <tr> <td>pyrite</td> <td>--</td> <td>2</td> </tr> <tr> <td>unsp. carb.</td> <td>15</td> <td>10</td> </tr> <tr> <td>forams</td> <td>15</td> <td>tr</td> </tr> <tr> <td>nannos</td> <td>52</td> <td>18</td> </tr> <tr> <td>diatoms</td> <td>tr</td> <td>2</td> </tr> <tr> <td>rads</td> <td>2</td> <td>2</td> </tr> <tr> <td>sp. spic.</td> <td>1</td> <td>2</td> </tr> <tr> <td>volcanic glass</td> <td>tr</td> <td>50</td> </tr> </tbody> </table> Carbonate Bomb 1-75 89.3% Carbon Carbonate <table border="1"> <thead> <tr> <th></th> <th>Total C</th> <th>Org. C</th> <th>CaCO₃</th> </tr> </thead> <tbody> <tr> <td>1-4</td> <td>10.8</td> <td>0.1</td> <td>89.8</td> </tr> <tr> <td>2-30</td> <td>10.7</td> <td>0.1</td> <td>88.4</td> </tr> </tbody> </table> X-ray Analysis <table border="1"> <thead> <tr> <th></th> <th>2, 26-28</th> </tr> </thead> <tbody> <tr> <td>Bulk</td> <td>tr</td> </tr> <tr> <td>Qtz.</td> <td>85</td> </tr> <tr> <td>Cal.</td> <td>--</td> </tr> <tr> <td>Dol.</td> <td>--</td> </tr> <tr> <td>Other</td> <td>tr</td> </tr> </tbody> </table> <2µm (partial) <table border="1"> <thead> <tr> <th></th> <th>2, 26-28</th> </tr> </thead> <tbody> <tr> <td>Smec.</td> <td>69</td> </tr> <tr> <td>Ill.</td> <td>18</td> </tr> <tr> <td>Kaol.</td> <td>9</td> </tr> <tr> <td>Chlor.</td> <td>6</td> </tr> <tr> <td>Zeol.</td> <td>--</td> </tr> <tr> <td>Sil.</td> <td>--</td> </tr> </tbody> </table>		1-36	1-140	quartz	tr	--	clay	15	15	pyrite	--	2	unsp. carb.	15	10	forams	15	tr	nannos	52	18	diatoms	tr	2	rads	2	2	sp. spic.	1	2	volcanic glass	tr	50		Total C	Org. C	CaCO ₃	1-4	10.8	0.1	89.8	2-30	10.7	0.1	88.4		2, 26-28	Bulk	tr	Qtz.	85	Cal.	--	Dol.	--	Other	tr		2, 26-28	Smec.	69	Ill.	18	Kaol.	9	Chlor.	6	Zeol.	--	Sil.	--
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TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	LITHOLOGIC SAMPLE	LITHOLOGIC DESCRIPTION
		FORAMS	NANNOS	RADS							
middle MIOCENE	(F) Orbulina suturalis-Globorotalia (T.) peripheroronda (N9)? (N) Discoaster exilis (NN6)	AP-			1	0.5 1.0	[Lithology Column]			GZ CCL	Nanno Chalk bluish white (5B 9/1) with mottles and burrows of olive gray (5Y 6/1). Moderate bioturbation; burrows include Zoophycus and Halo.
		AM- AP- AP- AM- AP-			2						CCB *80 CCB

TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	LITHOLOGIC SAMPLE	LITHOLOGIC DESCRIPTION
		FORAMS	NANNOS	RADS							
middle MIOCENE	(F) Globorotalia praefohsi (N11) (N) Discoaster exilis (NN6)	AM-			1	0.5 1.0	[Lithology Column]			XM CCL	Zoophycus 5B 9/1 Nanno Chalk bluish white (5B 9/1) with burrows and mottles of olive gray (5Y 6/1). Moderate bioturbation. Apparent cut and fill structure in laminated part of Sec. 1, 40-45 cm. Notable increase in siliceous biogenous remains in lower core.
		AG- AP- AP- AG- AP-									CCB CCL *34

TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	LITHOLOGIC SAMPLE	LITHOLOGIC DESCRIPTION
		FORAMS	NANNOS	RADS							
middle MIOCENE	(F) Globorotalia praefohsi (N11) (N) Discoaster exilis (NNS)	Am-CP	AP		0.5				CCB	5B 9/1 to 5GY 8/1 Nanno Chalk bluish white (5B 9/1) to light greenish gray (5GY 8/1), burrowing evident. Core discing and poor recovery. Carbonate Bomb 1-27 96.3%	

TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	LITHOLOGIC SAMPLE	LITHOLOGIC DESCRIPTION
		FORAMS	NANNOS	RADS							
middle MIOCENE	(F) Globorotalia praefohsi (N11) (N) Discoaster exilis (NNS)	RP-AP	AP	CC	0.5				XM CCB CCL *80	5GY 6/1 to 5GY 8/1 Nanno Chalk bluish white (5B 9/1) to light greenish gray (5GY 8/1). Moderate to intense bioturbation with mottles of greenish gray (5GY 6/1). Smear Slides 1-80 clay 24 volcanic glass 5 unsp. carb. 3 forams 3 nannos 60 rads 3 sp. spic. 3 plant debris 1 Carbonate Bomb 1-37 91.5% Carbon Carbonate Total C Org. C CaCO ₃ 1-55 10.5 0.1 86.7 X-ray Analysis Bulk 1-3 <2µm (partial) 1-3 Qtz. -- Smec. 87 Cal. 79 Ill. 19 Dol. -- Kaol. -- Other 21 Chlor. -- Zeol. -- Sil. --	

TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	LITHOLOGIC SAMPLE	LITHOLOGIC DESCRIPTION
		FORAMS	NANNOS	RADS							
middle MIOCENE	(F) Globigerinoides sicanus-Globigerinella insueta (NB) (N) Sphenolithus heteromorphus (NNS)	AM-CP	AM		0.5 1.0				CCL *20	Nanno Chalk dominantly light greenish gray (5GY 8/1) to bluish white (5B 5/1), with mottles and burrows of light brownish gray (5YR 6/1) and light olive gray (5Y 6/1). Moderate to intense bioturbation throughout; Halo, Zoophycus, Teichichnus and Composite burrows recognizable. No Core Catcher. Smear Slides Major lithology 1-20 clay 19 unsp. carb. 5 forams 3 nannos 65 rads 4 sp. spic. 4 Carbonate Bomb 3-90 83% Carbon Carbonate Total C Org. C CaCO ₃ 1-14 11.0 0.1 90.9 3-6 10.4 0.1 86.4 X-ray Analysis Bulk 3, 3-4 <2µm (partial) 3, 3-4 Qtz. -- Smec. 100 Cal. 82 Ill. -- Dol. -- Kaol. -- Other 18 Chlor. -- Zeol. -- Sil. --	
		CG-AM	AM		3				VOID-GEOCHEM. SAMPLE XM CCL CCB	5GY 8/1 Composite burrow	

TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	LITHOLOGIC SAMPLE	LITHOLOGIC DESCRIPTION
		FORAMS	NANNOS	RADS							
middle MIOCENE	(NN5)					0.5				CCL	5GY 8/1 Nanno Chalk Siliceous Nanno Chalk Siliceous Calcareous Chalk
						1.0				CCB *75	5GY 6/1 Zoophycus
early MIOCENE	(NN4) (N) Triquetrorhabdulus carinatus (NN1)?				2					XM *70	5GY 6/1 Smear Slides Major lithology
		CP AM CM					CCB	5Y 7/2			

Smear Slides		Major lithology	
		1-75	2-70
clay		20	25
pyrite		1	--
unsp. carb.		40	25
forams		2	3
nannos		25	35
diatoms		--	tr
rads		1	1
sp. spic.		9	9
plant debris		tr	--
volcanic glass		1	1
glauconite		1	tr

Carbonate Bomb	
Sample	%
1-54	67.0%
1-70	50.0%
2-123	41.5%

Carbon Carbonate		Total C	Org. C	CaCO ₃
1-2		9.2	0.1	75.6

X-ray Analysis	
Bulk	<2µm (partial)
Qtz.	Smec.
Cal.	Ill.
Dol.	Kaol.
Other	Chlor.
	Zeol.
	Sil.

TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	LITHOLOGIC SAMPLE	LITHOLOGIC DESCRIPTION
		FORAMS	NANNOS	RADS							
early MIOCENE	(N) Triquetrorhabdulus carinatus (NN1)					0.5				10Y 8/2	Diatomaceous Nanno Chalk pale greenish yellow (10Y 8/2); very thinly and well-laminated, fissile; lower core disturbed by discing.
						1.0				*68	Smear Slides 1-68

Smear Slides		Total C	Org. C	CaCO ₃
clay		25		
pyrite		tr		
forams		3		
nannos		25		
diatoms		55		
rads		1		
sp. spic.		1		

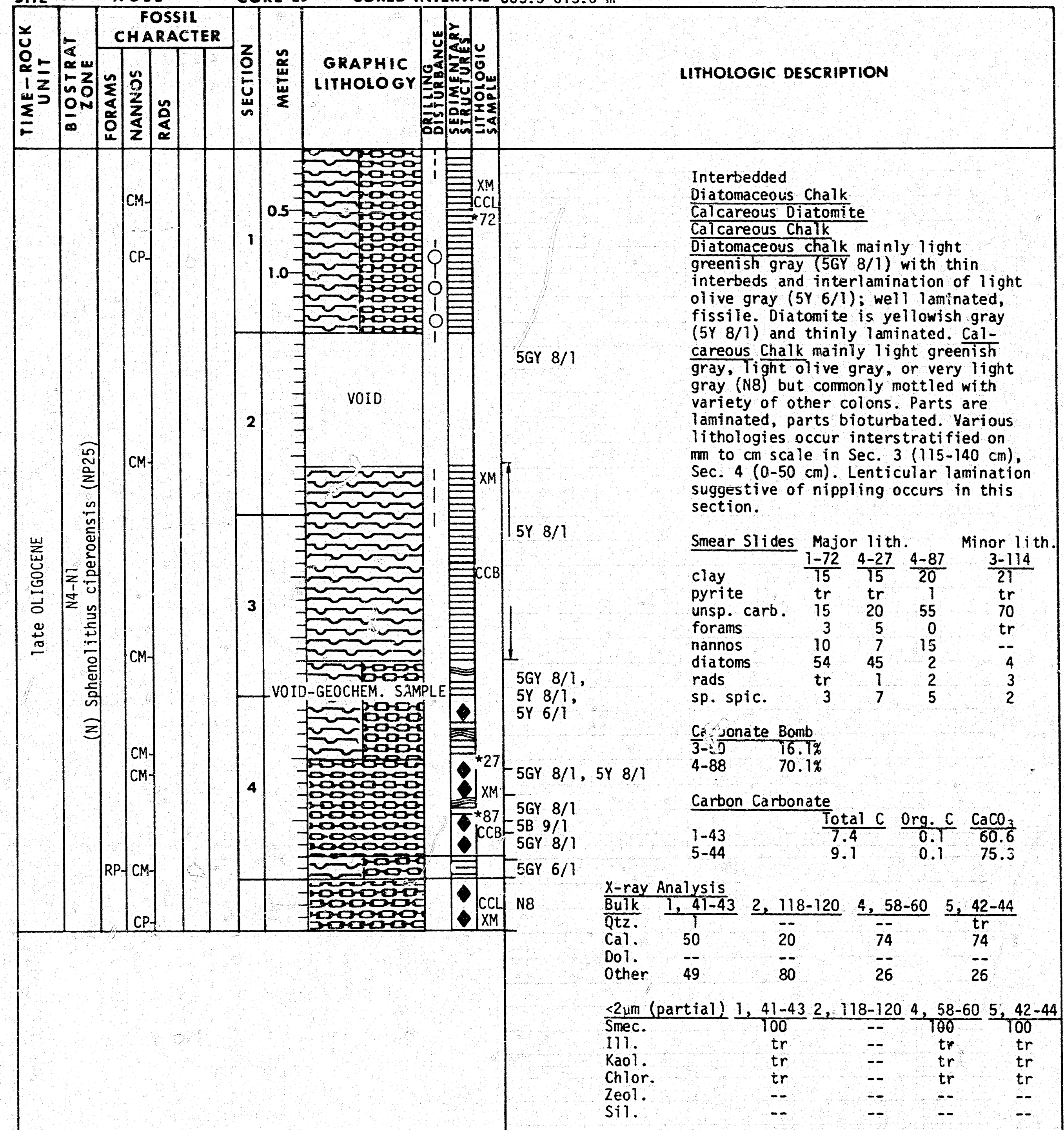
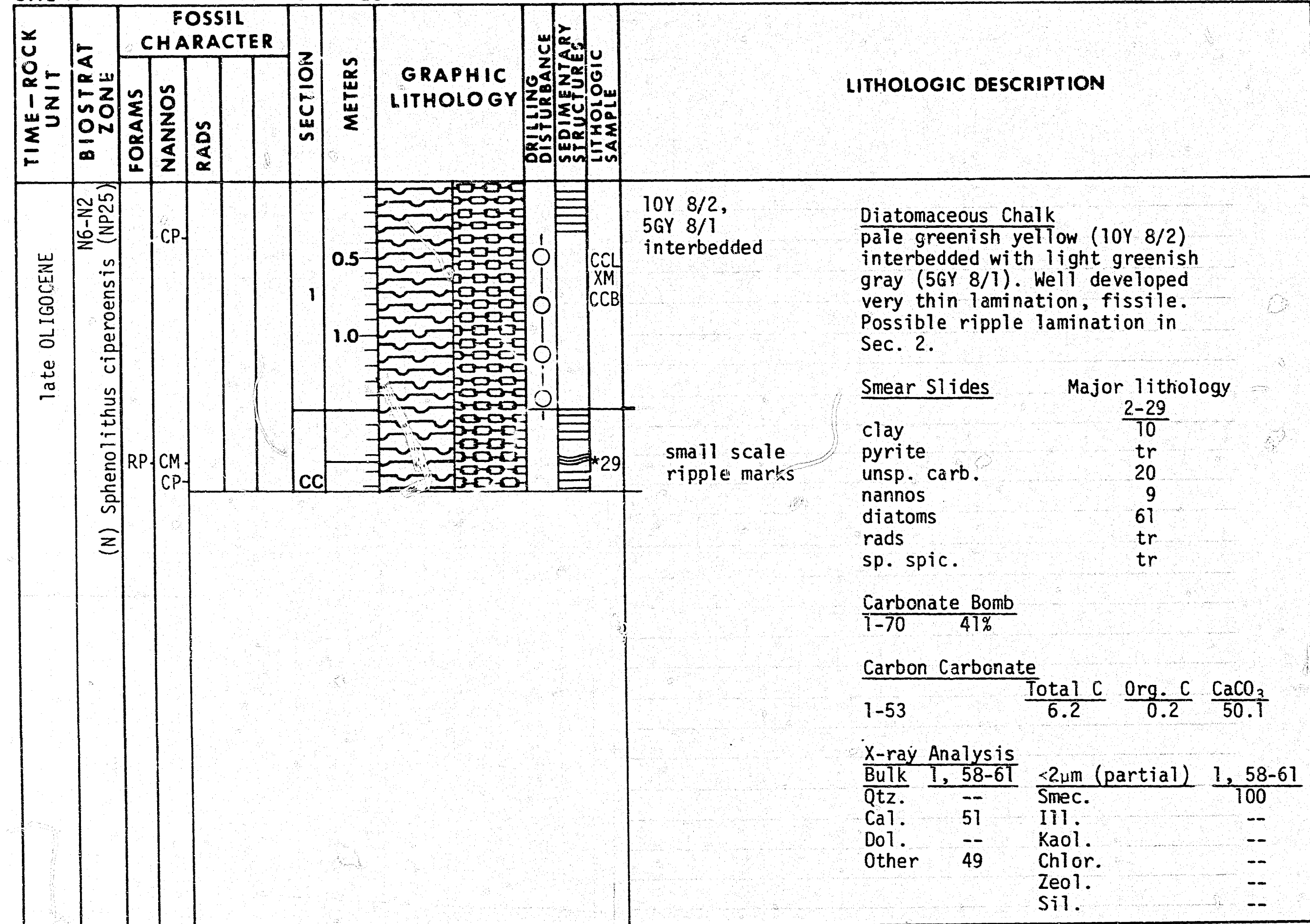
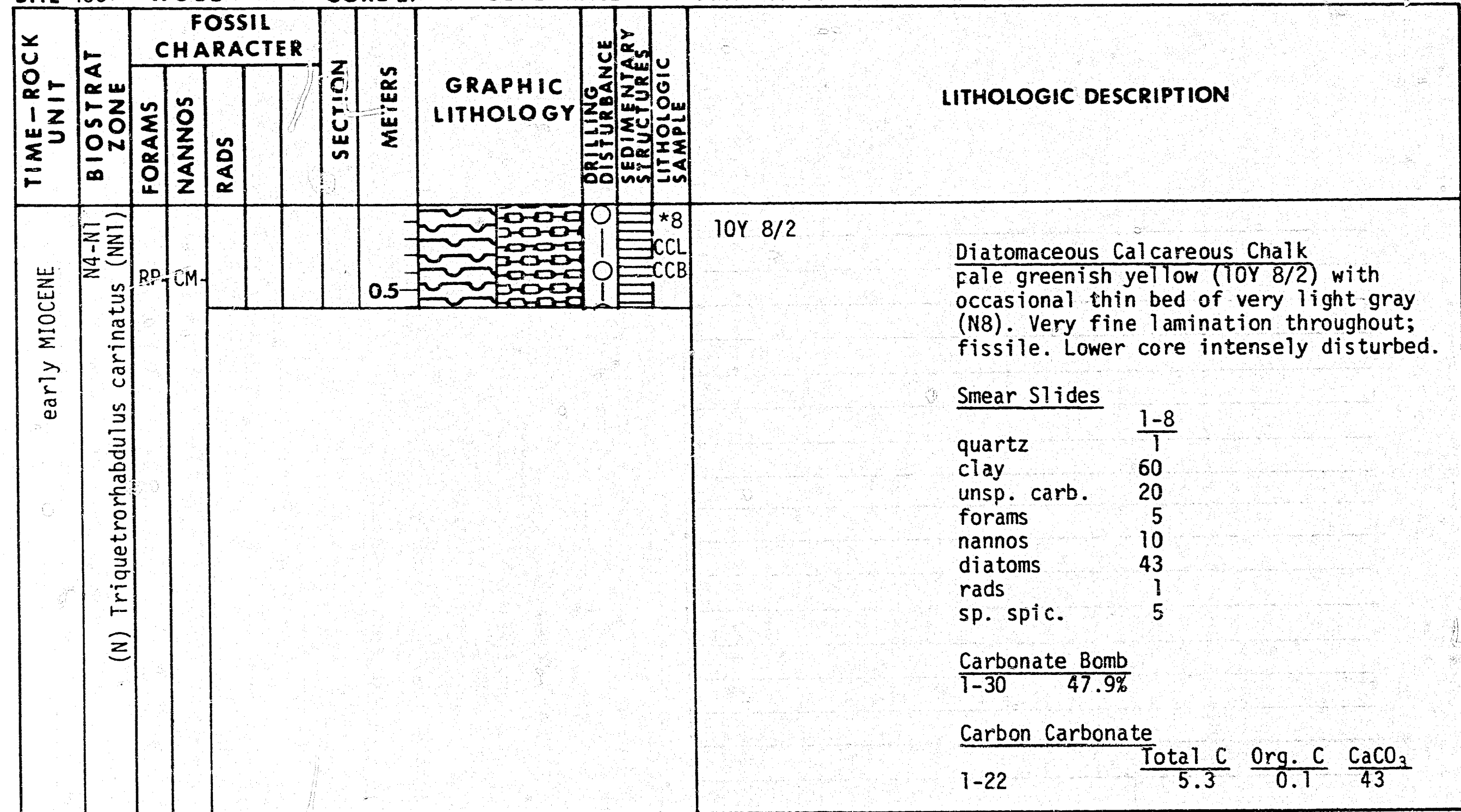
Carbonate Bomb	
Sample	%
1-64	38.3%

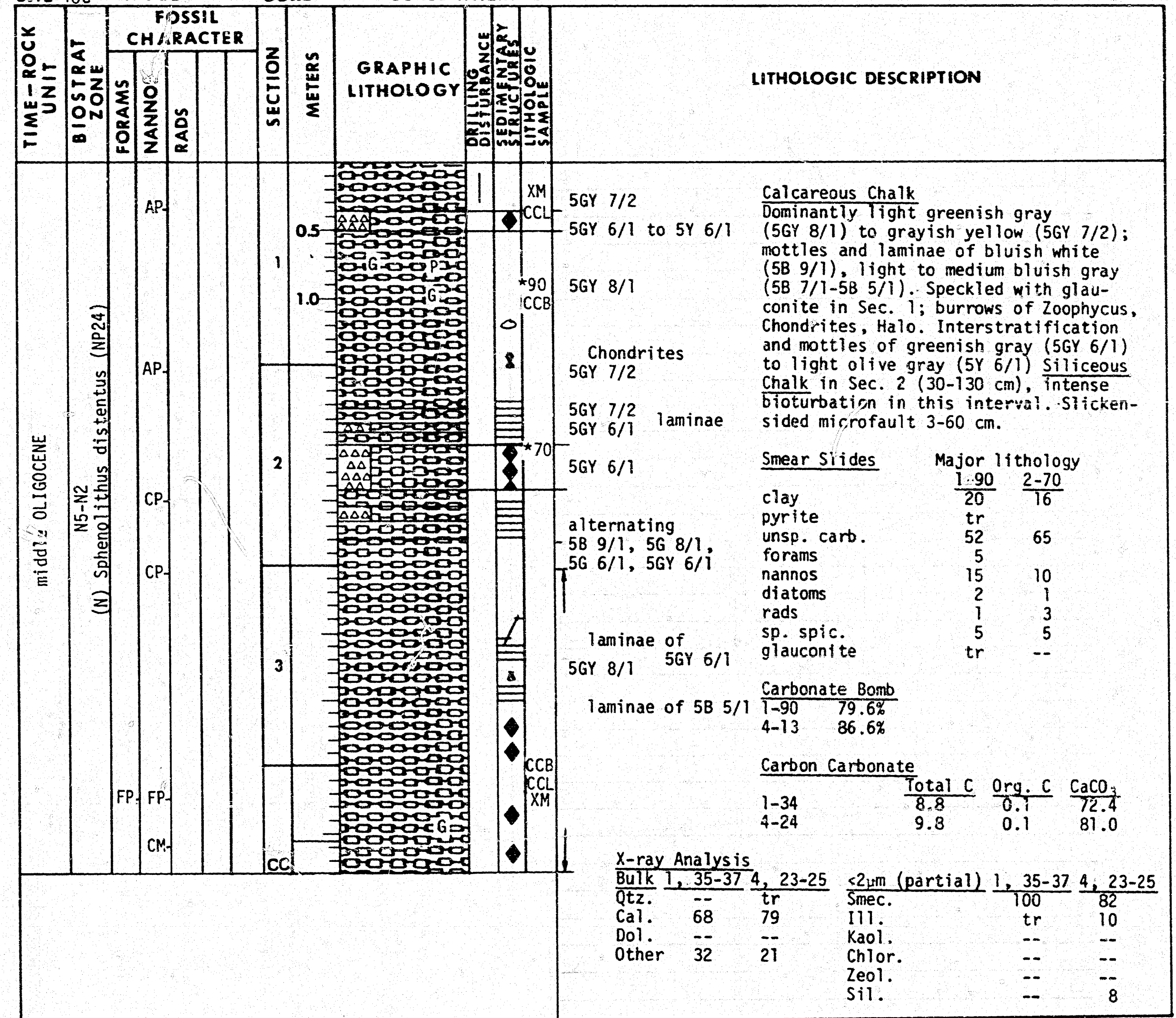
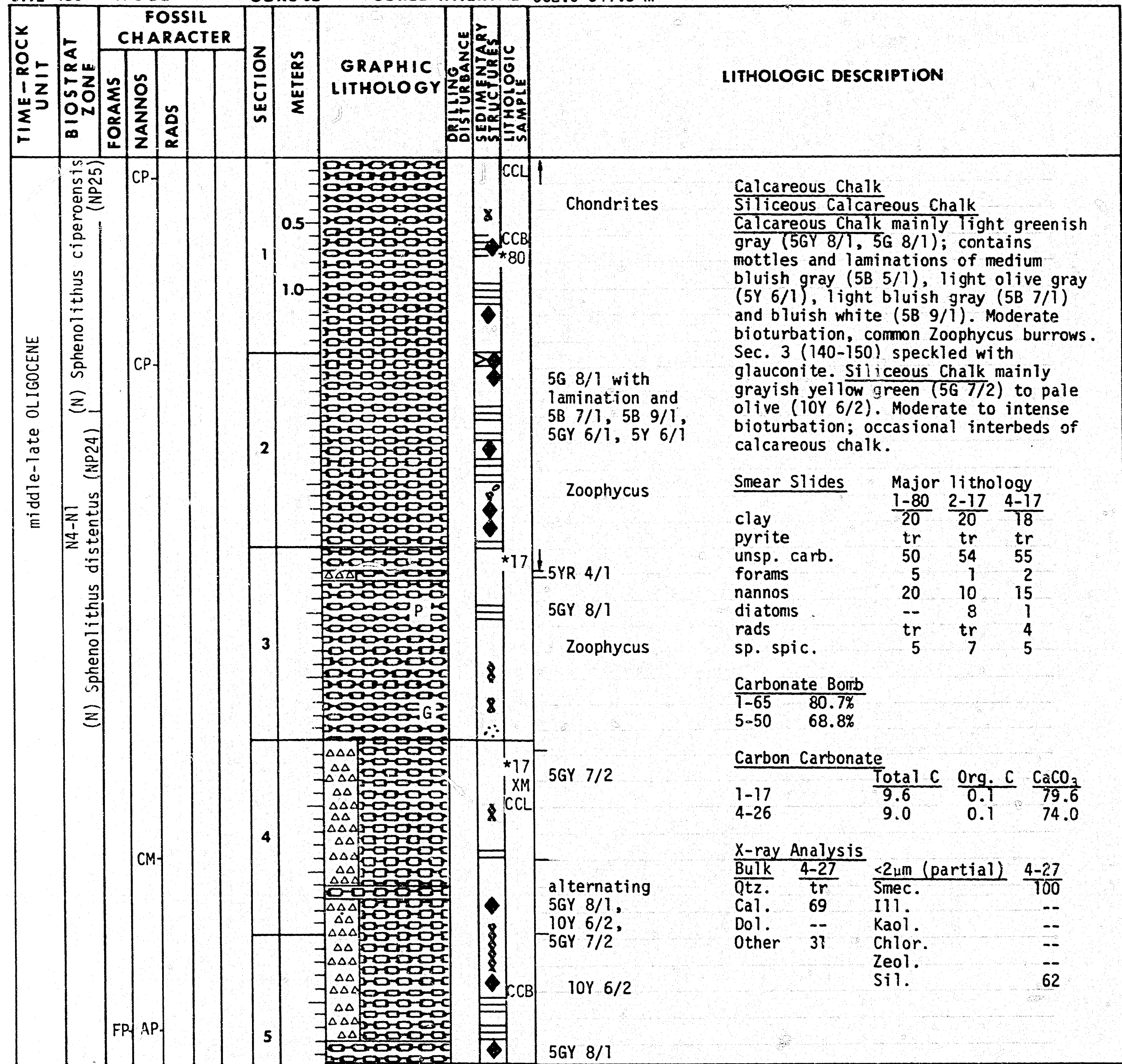
Carbon Carbonate		Total C	Org. C	CaCO ₃
1-69		5.8	0.1	46.7

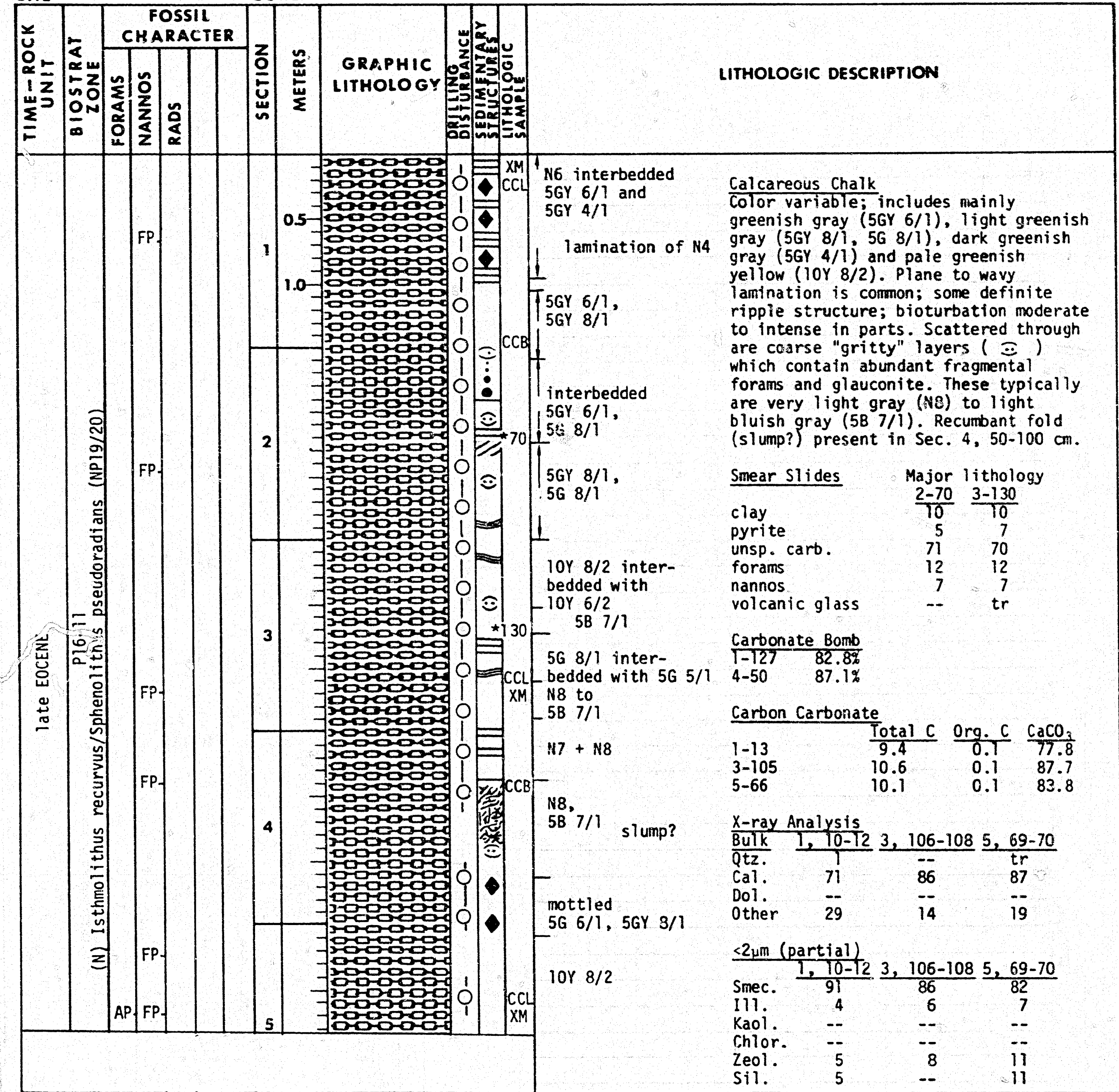
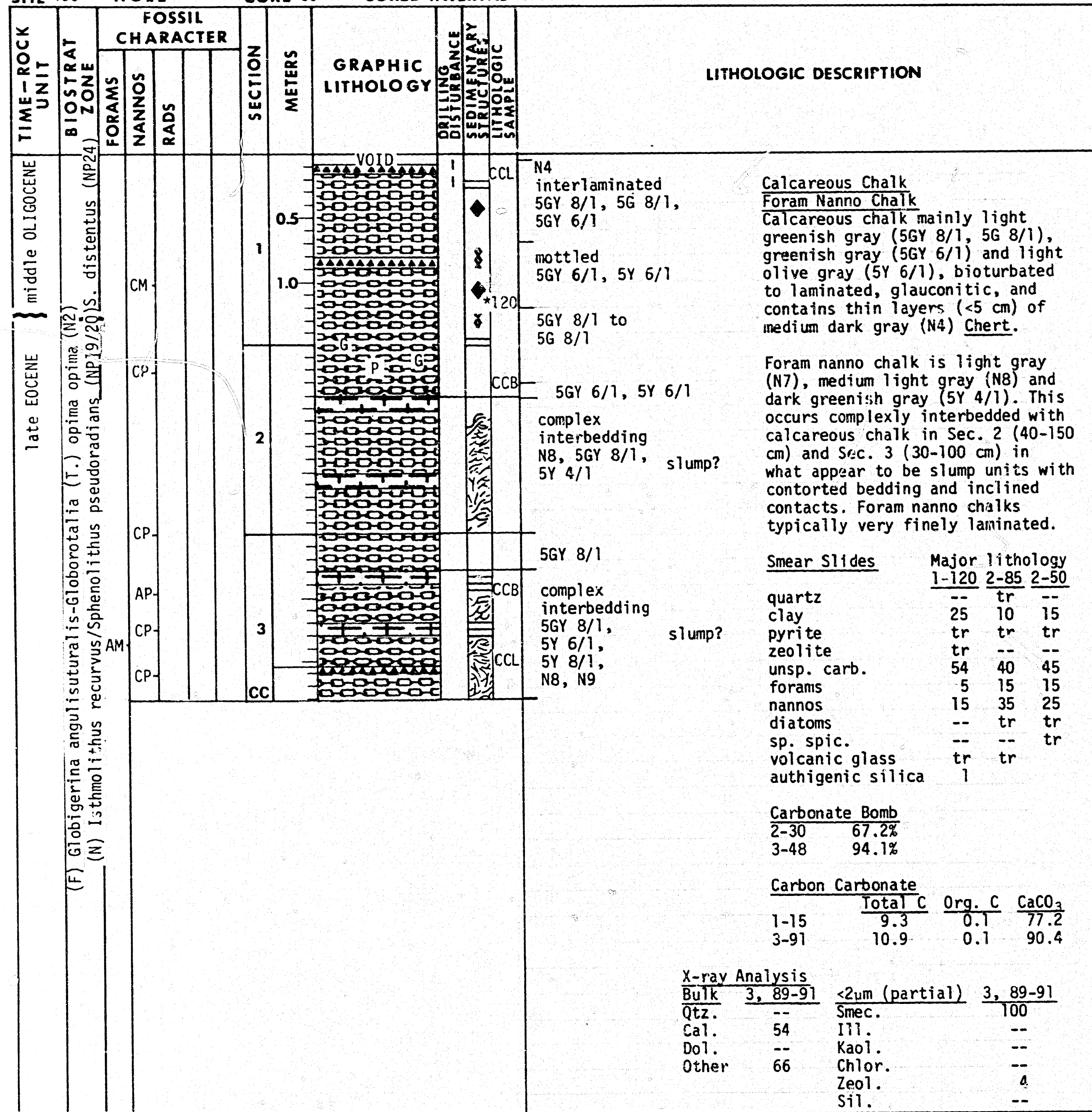
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		FORAMS	NANNOS	RADS							
early MIOCENE	(N) Triquetrorhabdulus carinatus (NN1)	RP	CM							10Y 8/2	Diatomaceous Nanno Chalk pale greenish yellow (10Y 8/2); thinly laminated, fissile.

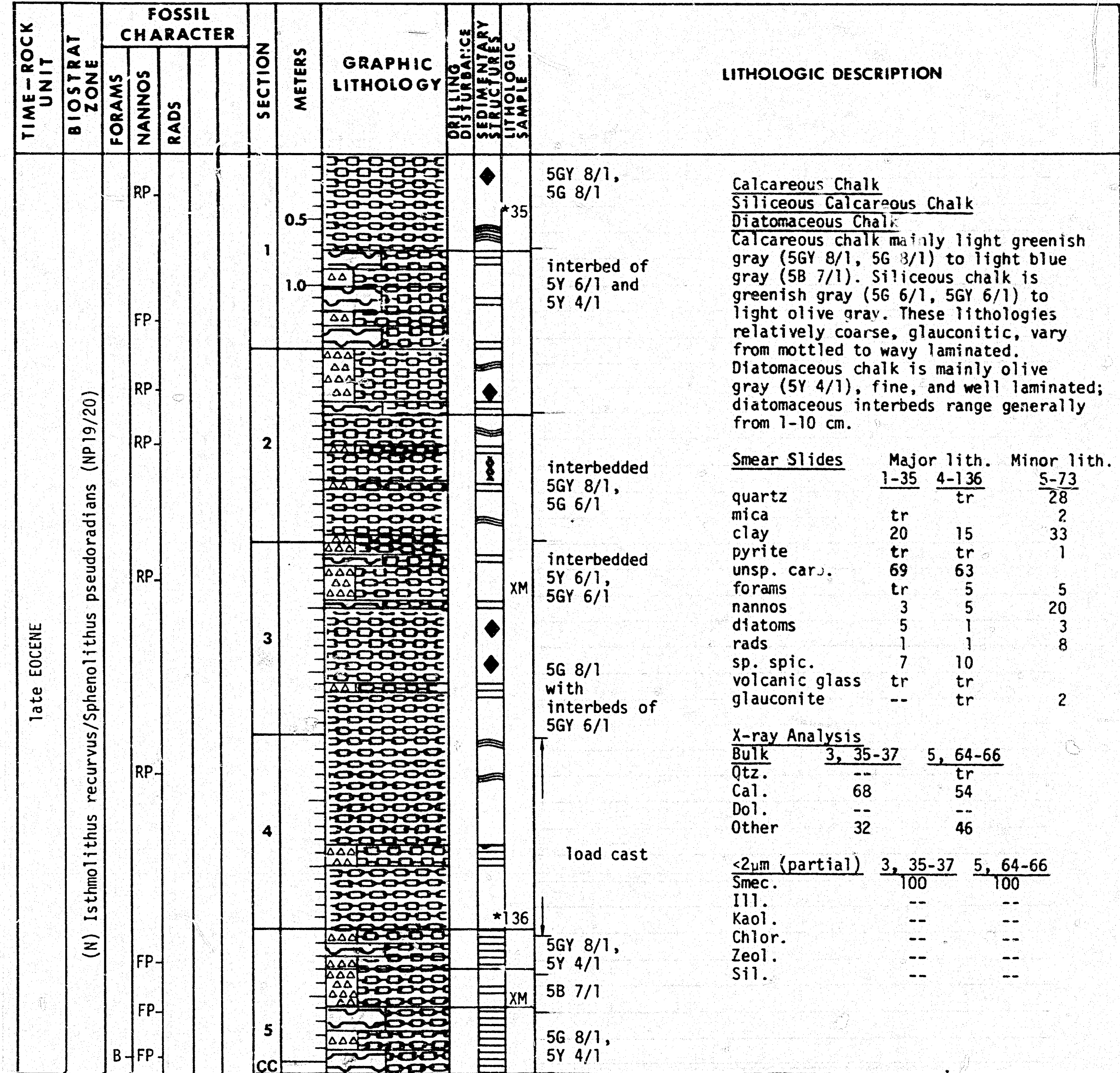
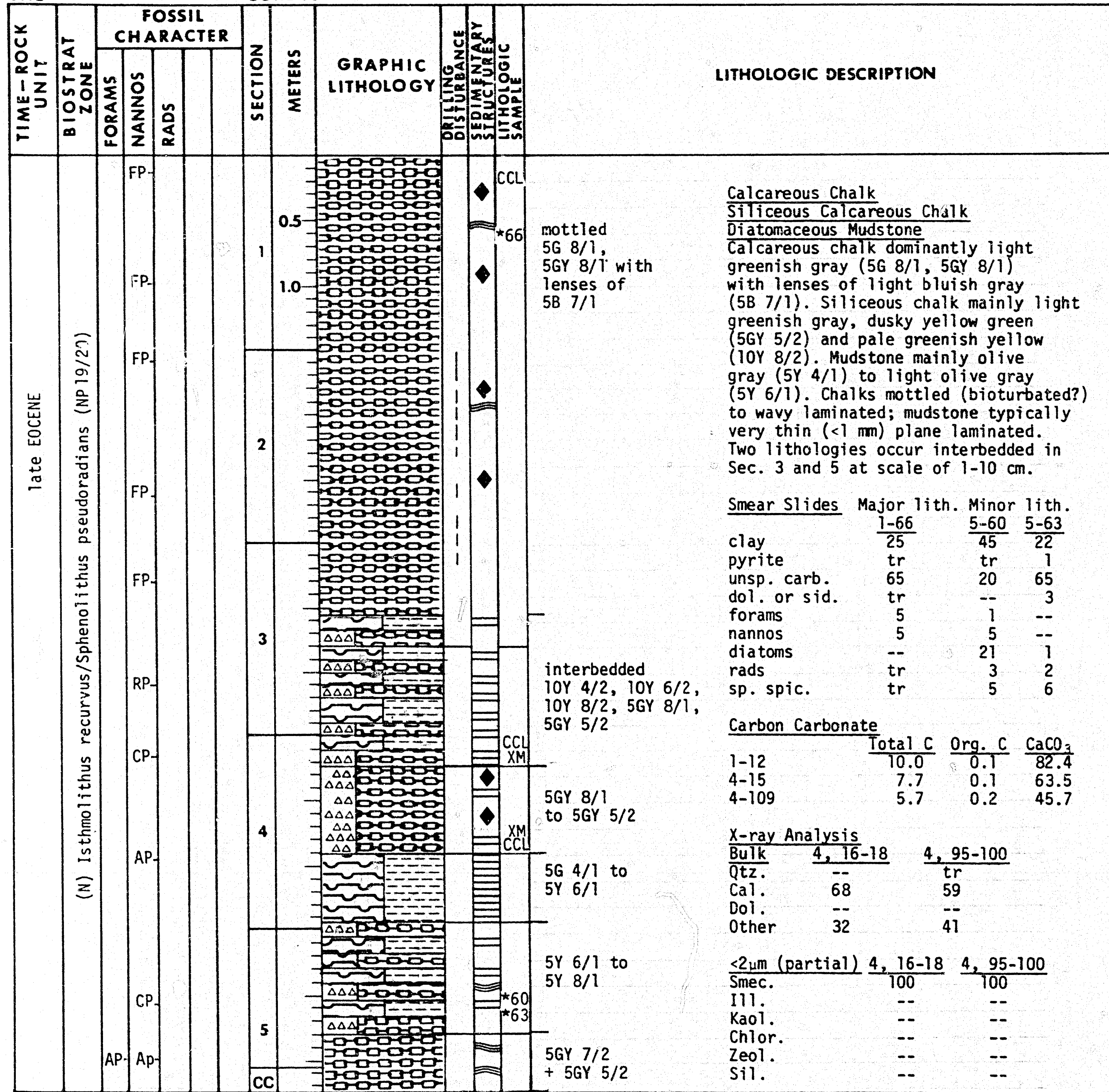
Carbonate Bomb	
Sample	%
1-15	30.9%

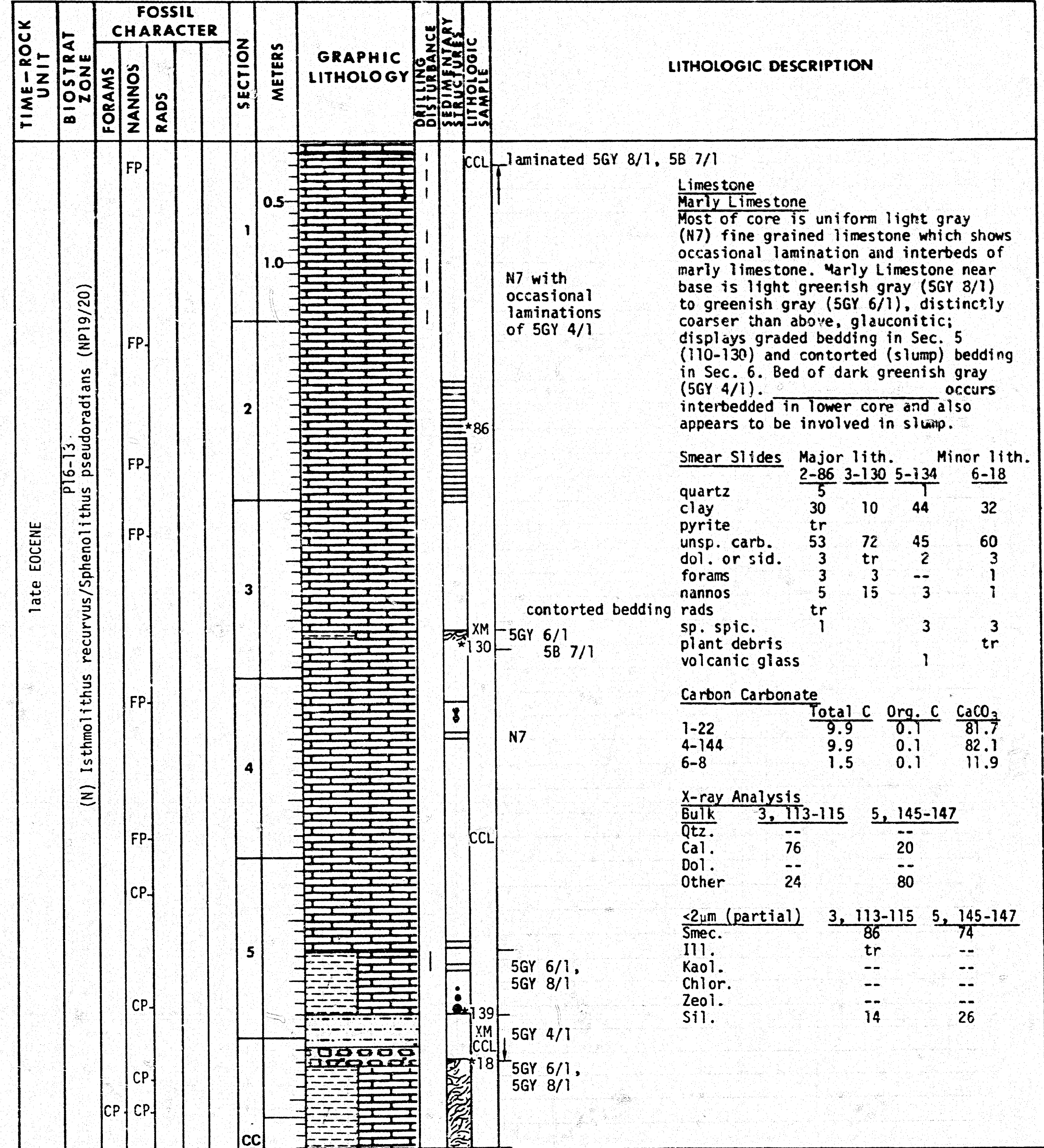
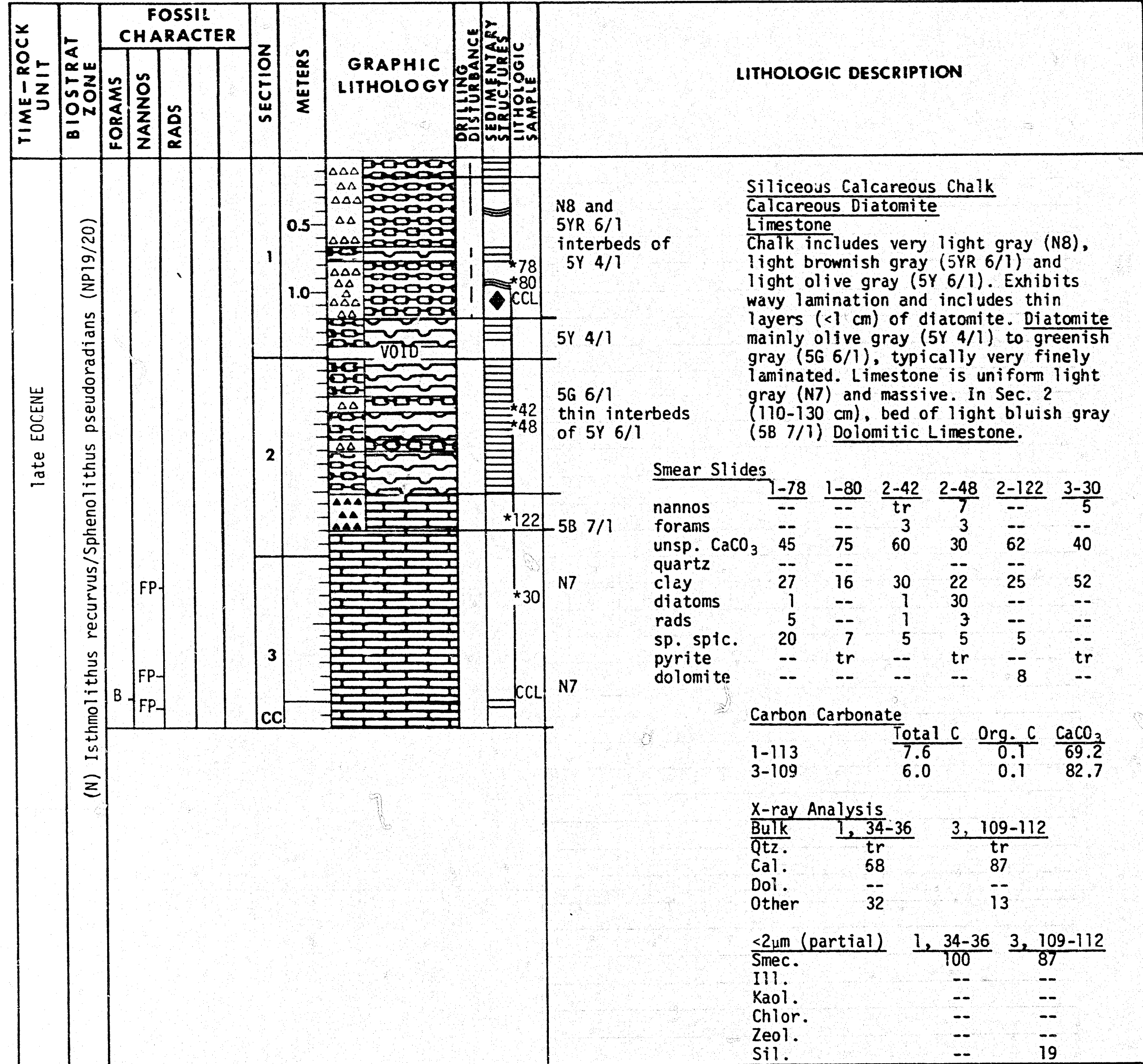
Carbon Carbonate		Total C	Org. C	CaCO ₃
1-3		4.5	0.2	36.3











TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	LITHOLOGIC SAMPLE	LITHOLOGIC DESCRIPTION
		FORAMS	NANNOS	RADS							
late EOCENE	(NP19/20) (F) <i>Orbulinooides beckmanni</i> (P13)? (N) <i>Chiasmolithus oamaruensis</i> (NP18)	CP			1	0.5				XM CCL	Limestone light greenish gray (5G 8/1) to light gray (N7). Entire core characterized by contorted bedding, which displays evidence of recumbent folding probably related to slumping. Slickensided shear fractures common in Sec. 2.
		FP			1.0	5G 8/1					
		FP									
		CP			2						Smear Slides Major lithology
		CP									clay 4-8
		CP									unsp. carb. 25
		CP									dol. or sid. 59
		CP									forams 1
		CP									nannos 5
		CP									rads 10
		CP									sp. spic. tr
		CP									volcanic glass tr
		CP									Carbon Carbonate
		CP									Total C Org. C CaCO ₃
		CP									1-26 10.9 0.1 90.3
		CP									4-19 9.5 0.1 78.2
		CP									X-ray Analysis
		CP									Bulk 1, 19-20 4, 20-21
		CP									Qtz. 1 tr
		CP									Cal. 71 71
		CP									Dol. -- --
		CP									Other 28 29
		CP									<2µm (partial) 1, 19-20 4, 20-21
		CP									Smec. 82 95
		CP									Ill. -- --
		CP									Kaol. -- --
		CP									Chlor. -- --
		CP									Zeol. -- --
		CP									Sil. 18 5

TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	LITHOLOGIC SAMPLE	LITHOLOGIC DESCRIPTION
		FORAMS	NANNOS	RADS							
late EOCENE ?	(N) <i>Chiasmolithus oamaruensis</i> (NP18)	FP	FP		CC						N7 Limestone light gray (N7) contorted bedding suggesting slump material.

TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	LITHOLOGIC SAMPLE	LITHOLOGIC DESCRIPTION
		FORAMS	NANNOS	RADS							
late EOCENE	(F) <i>Orbulinooides beckmanni</i> (P12)? (N) <i>Chiasmolithus oamaruensis</i> (NP18)	CP	FP		CC					13	N7 with N9 laminae Limestone very light gray (N7) with mm laminae of white (N9). Smear Slides 1 (CC) - 13 nannos 20 forams 5 unsp. CaCO ₃ 50 clay 25 other pyrite, dolomite

TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	LITHOLOGIC SAMPLE	LITHOLOGIC DESCRIPTION		
		FORAMS	NANNOS	RADS									
late Eocene	(F) <i>Orbulinoides beckmanni</i> - <i>Globigerapis kugleri</i> (P13-P11) (middle Eocene) (N) <i>Chiasmolithus oamarvensis</i> (NP18)	CP			1	0.5 1.0	VOID			CCL XM	N7 laminae of N8	Limestone Marly Limestone Limestone dominantly light gray (N7) to light greenish gray (5GY 8/1) with laminae of very light gray (N8), brownish gray (5YR 4/1) and dark greenish gray (5GY 4/1) which reflect variations in clay and siliceous remains. Contorted bedding through Sec. 1 and 2 suggests slump. Wavy to parallel lamination in Sec. 3. Zoophycus present; large glauconite filled burrows at base of Sec. 5. Marly limestone is grayish yellow green (5GY 7/2) to light greenish gray (5GY 8/1). Noticeably coarser than above or below due to foram fragments; speckled throughout with glauconite.	
		CP			2		5GY 8/1 interbed and laminae of 5YR 4/1, 5GY 4/1					5GY 8/1 interbed and laminae of 5YR 4/1, 5GY 4/1	
		CP			3		N8 laminae of 5YR 4/1					N8 laminae of 5YR 4/1	Smear Slides Major lithology mica 4-83 5-30 clay 30 20 unsp. carb. 50 58 dol. or sid. tr forams 8 7 nannos 5 15 fish 1 sp. spic. 3 plant debris 1 iron min. 1 glauconite 1
		CP			4		Zoophycus						Zoophycus Carbon Carbonate Total C Org. C CaCO ₃ 1-37 9.5 0.1 78.4 5-28 9.6 0.1 79.1
		FM				5GY 7/2				XM	N7		X-ray Analysis Bulk 1, 40-42 3, 119-122 Qtz. -- tr Cal. 74 79 Dol. -- -- Other 26 21
		CM				5GY 8/1				CCL *30			<2µm (partial) 1, 40-42 3, 119-122 Smec. 67 71 Ill. -- -- Kaol. -- -- Chlor. -- -- Zeol. -- -- Sil. 33 29

TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	LITHOLOGIC SAMPLE	LITHOLOGIC DESCRIPTION	
		FORAMS	NANNOS	RADS								
middle Eocene	(F) <i>Globigerapis kugleri</i> - <i>Hantkenina aragonensis</i> (P11-P10)? (N) <i>Discoaster subloboensis</i> (NP14)	RP	CM		1	0.5 1.0				*60 CCL	5YR 3/2 Zoophycus	Marly Nanno Chalk - Calcareous Claystone grayish brown (5YR 3/2) to dark yellowish brown (10YR 4/2) in upper part. Becomes more greenish downward and grades through grayish green (5G 5/2), greenish gray (5G 6/1) and dark greenish gray (5GY 4/1); homogeneous; claystone consistency. Dessiccate rapidly.
		CP			2		5YR 3/2					Smear Slides Major lithology 1-60 3-60 quartz tr mica -- tr heavy min. -- tr clay 75 72 pyrite -- tr zeolite tr -- forams tr 3 nannos 25 25 sp. spic. tr tr plant debris tr glauconite tr --
		RM	CG		3		5G 5/2					Carbon Carbonate Total C Org. C CaCO ₃ 1-63 4.8 0.1 39.5 3-78 6.2 0.1 50.5
		CP	CP					5GY 4/1			XM *60 CCL	
						VOID-GEOCHEM. SAMPLE						<2µm (partial) 1, 59-61 3, 59-63 Smec. 100 100 Ill. -- -- Kaol. -- -- Chlor. -- -- Zeol. tr Sil. tr tr

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middle EOCENE	(F) Orbulinoïdes beckmanni-Globigerapis kugleri (P13-P11) middle Eocene (N) Discoaster subloeoensis (NP14)	AM			1	0.5		CCL	<p><u>Marly Calcareous Chalk - Calcareous Claystone</u> dark greenish gray (5GY 4/1), brownish gray (5YR 4/1) and olive gray (5Y 4/1). Occasional lense and lamination of greenish gray (5GY 6/1) and greenish black (5GY 2/1). Thin interbeds (nodules?) of yellowish gray (5Y 8/1) sideritic limestone occur scattered through. Most of core disturbed by discing.</p> <p>Smear Slides</p> <table border="1"> <thead> <tr> <th></th> <th>Major lith. 1-62</th> <th>Minor lith. 1-123</th> <th>Minor lith. 4-29</th> </tr> </thead> <tbody> <tr><td>mica</td><td>2</td><td></td><td></td></tr> <tr><td>clay</td><td>56</td><td>15</td><td>25</td></tr> <tr><td>pyrite</td><td>1</td><td></td><td></td></tr> <tr><td>zeolite</td><td>1</td><td></td><td></td></tr> <tr><td>unsp. carb.</td><td>15</td><td>45</td><td>10</td></tr> <tr><td>dol. or sid.</td><td>--</td><td>35</td><td>50</td></tr> <tr><td>forams</td><td>3</td><td></td><td></td></tr> <tr><td>nannos</td><td>15</td><td>5</td><td>15</td></tr> <tr><td>sp. spic.</td><td>1</td><td>tr</td><td></td></tr> <tr><td>iron min.</td><td>2</td><td></td><td></td></tr> <tr><td>volcanic glass</td><td>1</td><td></td><td></td></tr> </tbody> </table> <p>Carbon Carbonate</p> <table border="1"> <thead> <tr> <th></th> <th>Total C</th> <th>Org. C</th> <th>CaCO₃</th> </tr> </thead> <tbody> <tr><td>1-33</td><td>4.1</td><td>0.1</td><td>32.8</td></tr> <tr><td>5-1</td><td>5.0</td><td>0.1</td><td>40.6</td></tr> </tbody> </table> <p>X-ray Analysis</p> <table border="1"> <thead> <tr> <th></th> <th>3, 42-45</th> <th>5, 4-5</th> </tr> </thead> <tbody> <tr><td>Bulk</td><td>3</td><td>5</td></tr> <tr><td>Qtz.</td><td>--</td><td>--</td></tr> <tr><td>Cal.</td><td>35</td><td>26</td></tr> <tr><td>Dol.</td><td>--</td><td>--</td></tr> <tr><td>Other</td><td>65</td><td>74</td></tr> </tbody> </table> <p><2µm (partial)</p> <table border="1"> <thead> <tr> <th></th> <th>3, 42-45</th> <th>5, 4-5</th> </tr> </thead> <tbody> <tr><td>Smec.</td><td>82</td><td>85</td></tr> <tr><td>Ill.</td><td></td><td></td></tr> <tr><td>Kaol.</td><td></td><td></td></tr> <tr><td>Chlor.</td><td></td><td></td></tr> <tr><td>Zeol.</td><td></td><td></td></tr> <tr><td>Sil.</td><td>18</td><td>15</td></tr> </tbody> </table>		Major lith. 1-62	Minor lith. 1-123	Minor lith. 4-29	mica	2			clay	56	15	25	pyrite	1			zeolite	1			unsp. carb.	15	45	10	dol. or sid.	--	35	50	forams	3			nannos	15	5	15	sp. spic.	1	tr		iron min.	2			volcanic glass	1				Total C	Org. C	CaCO ₃	1-33	4.1	0.1	32.8	5-1	5.0	0.1	40.6		3, 42-45	5, 4-5	Bulk	3	5	Qtz.	--	--	Cal.	35	26	Dol.	--	--	Other	65	74		3, 42-45	5, 4-5	Smec.	82	85	Ill.			Kaol.			Chlor.			Zeol.			Sil.	18	15
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middle EOCENE	(N) Discoaster subloeoensis (NP14)	FP			1	0.5		CCL	<p><u>Marly Nanno Chalk - Calcareous Claystone</u> dark greenish gray (5GY 4/1) with laminae of greenish black (5GY 2/1) and light olive gray (5Y 6/1). Very fine grained, greasy claystone feel, high dessicant. Occasional lense or nodule of yellowish gray (5Y 3/1) sideritic limestone. Slickensided fractures in Sec. 4 (10-30 cm).</p> <p>Smear Slides</p> <table border="1"> <thead> <tr> <th></th> <th>Major lith. 1-120</th> <th>Minor lith. 3-116</th> </tr> </thead> <tbody> <tr><td>quartz</td><td>tr</td><td>tr</td></tr> <tr><td>clay</td><td>80</td><td>95</td></tr> <tr><td>zeolite</td><td>tr</td><td>tr</td></tr> <tr><td>dol. or sid.</td><td>tr</td><td></td></tr> <tr><td>forams</td><td>tr</td><td></td></tr> <tr><td>nannos</td><td>20</td><td>5</td></tr> <tr><td>sp. spic.</td><td>tr</td><td></td></tr> <tr><td>plant debris</td><td>tr</td><td>tr</td></tr> <tr><td>volcanic glass</td><td>tr</td><td></td></tr> <tr><td>glauconite</td><td>tr</td><td></td></tr> </tbody> </table> <p>Carbon Carbonate</p> <table border="1"> <thead> <tr> <th></th> <th>Total C</th> <th>Org. C</th> <th>CaCO₃</th> </tr> </thead> <tbody> <tr><td>1-0</td><td>4.9</td><td>0.1</td><td>39.8</td></tr> <tr><td>4-64</td><td>5.1</td><td>0.1</td><td>41.1</td></tr> </tbody> </table> <p>X-ray Analysis</p> <table border="1"> <thead> <tr> <th></th> <th>3, 131-133</th> <th>4, 62-64</th> </tr> </thead> <tbody> <tr><td>Bulk</td><td>3</td><td>4</td></tr> <tr><td>Qtz.</td><td>tr</td><td>tr</td></tr> <tr><td>Cal.</td><td>28</td><td>23</td></tr> <tr><td>Dol.</td><td>--</td><td>--</td></tr> <tr><td>Other</td><td>72</td><td>77</td></tr> </tbody> </table> <p><2µm (partial)</p> <table border="1"> <thead> <tr> <th></th> <th>3, 131-133</th> <th>4, 62-64</th> </tr> </thead> <tbody> <tr><td>Smec.</td><td>97</td><td>100</td></tr> <tr><td>Ill.</td><td>--</td><td>--</td></tr> <tr><td>Kaol.</td><td>--</td><td>--</td></tr> <tr><td>Chlor.</td><td>--</td><td>--</td></tr> <tr><td>Zeol.</td><td>--</td><td>--</td></tr> <tr><td>Sil.</td><td>3</td><td>tr</td></tr> </tbody> </table>		Major lith. 1-120	Minor lith. 3-116	quartz	tr	tr	clay	80	95	zeolite	tr	tr	dol. or sid.	tr		forams	tr		nannos	20	5	sp. spic.	tr		plant debris	tr	tr	volcanic glass	tr		glauconite	tr			Total C	Org. C	CaCO ₃	1-0	4.9	0.1	39.8	4-64	5.1	0.1	41.1		3, 131-133	4, 62-64	Bulk	3	4	Qtz.	tr	tr	Cal.	28	23	Dol.	--	--	Other	72	77		3, 131-133	4, 62-64	Smec.	97	100	Ill.	--	--	Kaol.	--	--	Chlor.	--	--	Zeol.	--	--	Sil.	3	tr
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		FORAMS	NANNOS	RADS								
middle EOCENE	(N) Discoaster subloboensis (NP14)	B	CM								5GY 6/1	<p>Marly Calcareous Chalk greenish gray (5GY 6/1) with fine laminae of greenish black (5GY 2/1). Core Catcher sample only.</p>

TIME-ROCK UNIT	BIOSTRAT ZONE	FOSSIL CHARACTER			SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURBANCE	SEDIMENTARY STRUCTURES	LITHOLOGIC SAMPLE	LITHOLOGIC DESCRIPTION																	
		FORAMS	NANNOS	RADS																								
middle EOCENE	(F) Acarinina densa (P9) (N) Discoaster subloboensis (NP14)	AM	CM		CC					*10	5GY 4/1 - 5GY 6/1	<p>Calcareous Claystone greenish gray (5GY 6/1) to dark greenish gray (5GY 4/1); Core Catcher sample only.</p> <p>Smear Slides</p> <table border="1"> <tr> <td></td> <td>1-10</td> </tr> <tr> <td>quartz</td> <td>1</td> </tr> <tr> <td>heavy min.</td> <td>1</td> </tr> <tr> <td>clay</td> <td>82</td> </tr> <tr> <td>opaques</td> <td>1</td> </tr> <tr> <td>unsp. carb.</td> <td>5</td> </tr> <tr> <td>nannos</td> <td>10</td> </tr> <tr> <td>plant debris</td> <td>tr</td> </tr> </table>		1-10	quartz	1	heavy min.	1	clay	82	opaques	1	unsp. carb.	5	nannos	10	plant debris	tr
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middle EOCENE	(F) Acarinina densa (P9) (N) Discoaster subloboensis (NP14)	CM	CM		CC						5G 4/1	<p>Marly Calcareous Chalk dark greenish gray (5G 4/1). Core Catcher sample only.</p>