

U.S.G. D.F. 1861 PALYNOLOGICAL ANALYSIS OF THE INTERVAL 900-
1000', HOME ET AL 147' DEEP J-57 WELL, SCOTIAN SHELF

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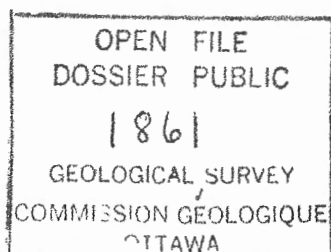
BUJAK DAYLES GROUP

PALYNOLOGICAL ANALYSIS OF THE
INTERVAL 900-6030M, HOME ET AL
LOUISBOURG J-47 WELL,
SCOTTIAN SHELF

REPORT No. 88-0008

March 1988

CALGARY, ALBERTA



BIOSTRATIGRAPHIC SUMMARY

900-1120m:	<u>Areoligera senonensis</u> Zone (early Eocene)
1140-1340m:	<u>Ceratiopsis diebelii</u> - <u>Palaeoperidinium pyrophorum</u> Zone (early Paleocene)
1350-1390m:	<u>Odontochitina operculata</u> Zone (Campanian)
1410-1540m:	Late Cretaceous undifferentiated
1560-1635m:	<u>Surculosphaeridium longifurcatum</u> Zone (Turonian)
1650-1845m:	<u>Kiokansium polypes</u> Zone (Cenomanian)
1860-2265m:	<u>Chichaouadinium</u> cf. <u>vestifum</u> Zone (Albian)
2280-2895m:	<u>Hystrichosphaerina schindewolfii</u> - <u>Subtilisphaera</u> <u>perlucida</u> Zone (Aptian)
2910-4072.5m:	<u>Aptea anaphrissa</u> Zone (Barremian)
4087.8-4265m:	Early Cretaceous undifferentiated
4280-4515m:	Valanginian
4528-4860m:	Late Berriasian
4875-4980m:	Portlandian - Early Berriasian
4995-5445m:	No age assignment
5453-5490m:	Late Jurassic
5505-6030m:	No age assignment

SELECTED PALYNOMORPHS

Listings show highest occurrences unless otherwise specified.

(+) indicates marker species.

900-1120m: Areoligera senonensis Zone (early Eocene)

900m	<u>Apectodinium hyperacanthum</u> (Rare) (+) <u>Deflandrea denticulata</u> <u>Deflandrea phosphoritica</u> <u>Hafniasphaera septata</u> (+) <u>Plicatopollis magniorbicularis</u> <u>Wetzeliiella articulata</u>
930m	<u>Betulaceopollenites betuloides</u> (Common)
960m	<u>Diporites iszkaszentgyrogi</u> (Common) <u>Duosphaeridium nudum</u> (Rare)
990m	<u>Plicatopollis magniorbicularis</u>
1020m	<u>Ericipites compactipolleniatus</u> (+)

1140-1340m: Ceratiopsis diebelii - Palaeoperidinium pyrophorum Zone (early Paleocene)

Remarks: Ceratiopsis speciosa has a depressed top within this interval at 1320m.

1140m	<u>Alterbidinium acutulum</u> (Rare) (+) <u>Rugubivesiculites rugosus</u> (Rare)
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- 1170m Ceratiopsis pannucea
 Metasequoia papillapollenites (Common) (+)
- 1200m Palaeoperidinium pyrophorum (Rare) (+)
- 1230m Ceratiopsis striata (Rare) (+)
- 1320m Isabelidium bakeri (Rare)
 Palaeocystodinium benjaminii (Common)
 Palaeocystodinium bulliformum (Rare)

1350-1390m: Odontochitina operculata Zone (Campanian)

Remarks: The presence of I. utinensis and S. delitiense, whose ranges are restricted to the Maastrichtian, suggests that a very thin Maastrichtian interval is present between samples. The presence of these two species below 1350m is considered to be the result of caving.

- 1350m Chatangiella tripartita (Rare) (+)
 Dinogymnium sp. A, May 1980 (Present) (+)
 Isabelidium cooksoniae (Rare)
 Triblastula utinensis (Present)
- 1380m Cannosphaeropsis utinensis (Rare) (+)
 Ceratiopsis diebelii (Common) (+)
 Coronifera oceanica (Rare)
 Spongodinium delitiense (Rare)

1410-1540m: Late Cretaceous undifferentiated

Remarks: A good assemblage of Late Cretaceous dinoflagellates and other palynomorphs occurs within this interval. However, none of the species has a sufficiently restricted range to use for age determination.

1560-1635m: Surculosphaeridium longifurcatum Zone (Turonian)

- 1560m Chatangiella victoriensis (Rare)
 Hystrichosphaeridium difficile (Rare)
- 1590m Florentinia radiculata (rare)
 Surculosphaeridium longifurcatum (Rare) (+)
- 1620m Callaiosphaeridium asymmetricum (Rare)
 Florentinia ferox (Rare)
 Odontochitina costata (Common)
 Oligosphaeridium complex (Common)
 Oligosphaeridium pulcherrimum (Rare)
 Trichodinium castaneum (Abundant) --

1650-1845m: Kiokansium polypes Zone (Cenomanian)

- 1650m Cyclonephelium vannophorum (Common) (+)
 Kiokansium polypes (Abundant) (+)
 Palaeohystrichophora infusorioides (Common) (+)
 Surculosphaeridium longifurcatum (Rare)
 Tenua hystrix (Abundant) (+)
 Trilobosporites trioreticulosus (Present)
- 1680m Afropollis jardinus (Present)
 Stellatopollis largissimus (Rare)
- 1710m Stiphrosphaeridium dictyophorum (Rare)
- 1740m Apteodinium granulatum (Common)
 Balmeisporites glenelgensis (Rare)
 Cribroperidinium exilicristatum (Abundant)
 Cribroperidinium globosum (Common)

1860-2265m: Chichaouadinium cf. vestifum Zone (Albian)

1860m Chichaouadinium vestitum (Present) (+)
 Eucommiidites minor (Rare) (+)
 Vesperopsis mayi (Present) (+)

1890m Cyclonephelium chabaca (Abundant)
 Cyclonephelium distinctum (Abundant)
 Liliacidites crassatus (Rare)
 Nyctericysta pentagona (Rare) (+)
 Oligosphaeridium totum (Common) (+)

2045m Stiphrosphaeridium arbustum (Rare)
 Taleisphaera hydra (Rare)

2280-2895m: Hystrichosphaerina schindewolfii - Subtilisphaera perlucida Zone (Aptian)

Remarks: An unconformity almost certainly occurs between 2670m and 2700m. There is a drastic change between the poor preservation due to deposition in an anoxic environment causing pyrite damage to the fossils in the sample from 2670m to the beautiful preservation seen in the samples from 2700m where no pyrite damage is seen.

2280m Cyclonephelium chabaca (Common) (+)
 Nyctericysta #TA
 Nyctericysta davisii (Common) (+)
 Odontochitina ancala (Rare) (+)
 Vesperopsis digitata (Rare) (+)
 Vesperopsis mayi (Rare) (+)

2310m *Coronifera albertii* (Rare)

2370m *Oligosphaeridium diluculum* (Rare)

Xenascus plotei (Present) (+)

2400m *Aptea anaphrissa* (Rare)

2490m Muderongia staurota (Present)

2910-4072.5m: *Aptea anaphrissa* Zone (Barremian)

2910m *Aptea anaphrissa* (Rare) (+)

Aptea polymorpha (Rare)

Apteodinium reticulatum (Common) -

Hystrichosphaerina schindewolfii (Present)

Muderongia simplex perforata (Common) (+)

Occisucysta duxburyi (Present) (+)

Subtilisphaera pirnaensis (Rare) (+)

3030m *Tehamadinium sousensis* (Rare) (+)

3210m *Cassiculosphaeridia magna* (Rare)

Sentusidinium pillosum (Present)

3540m Achomosphaera neptunii (Present) (+)

Perisseiasphaeridium insolitum (Rare) (+)

3600m Pareodinia ceratophora

4072.5m Kiokansium vetusculum (Present)

Occisucysta balios (Present) (+)

4087.8-4265m: Early Cretaceous undifferentiated

- 4100m Systematophora silyba (Rare)
4160m Ctenidodinium panneum (Present)
4190m Classopollis classoides (Rare)

4280-4515m: Valanginian

- 4280m Escharisphaeridia pelionensis (Common) (+)
 Sentusidinium cuculliforme (Common) (+)
4414m Systematophora fasciculigera (Rare) (+)

4528-4860m: Late Berriasian

Remarks: The top of the Late Berriasian is placed at the latest occurrence of Amphorula metaelliptica. The interval contains very few age-diagnostic fossils.

- 4528m Amphorula metaelliptica (Present) (+)

4875-4980m: Portlandian - Early Berriasian

Remarks: This interval conforms, for the most part, to the Amphorula metaelliptica Zone of Van Helden, 1976, which was defined for the Jeanne D'Arc Subbasin. However, on the Scotian Shelf the species Amphorula metaelliptica is consistently found in the Late Berriasian. The other species in his zonation have comparable ranges on the Scotian Shelf.

4875m Amphorula delicata (Present) (+)
 Senoniasphaera jurassica (Rare) (+)
 Sentusidinium rioultii (Rare) (+)

4995-5445m: No age assignment

No diagnostic palynomorphs occur in this interval.

5453-5490m: Late Jurassic

5453m Escharisphaeridia pocockii (Common) (+)

5505-6030m: No age assignment

No palynomorphs were observed in this interval.

APPENDIX A

Alphabetical Listing of Species Shown on Occurrence Chart:Marine Dinoflagellates

Taxa location index

Index numbers are the columns in which the taxon appears

Index number	Taxon names	Index number	Taxon names
204	Achomosphaera neptunii	73	Cribroperidinium orthoceras
56	Achomosphaera ramulifera	143	Cribroperidinium paraorthoceras
149	Achomosphaera verdieri	156	Cribroperidinium sepimentum
47	Adnatosphaeridium multispinosum	161	Cribroperidinium tensifrense
81	Adnatosphaeridium reticulense	213	Ctenidodinium panneum
57	Alisocysta cf. circumtabulata	209	Ctenidodinium sp. indet.
21	Alisocysta ornata	157	Cyclonephelium #TA
46	Alterbidinium acutum	43	Cyclonephelium brevispinum
189	Amphorula #TA	131	Cyclonephelium chabaca
228	Amphorula delicata	93	Cyclonephelium distinctum
225	Amphorula metaelliptica	51	Cyclonephelium distinctum brevispinum
1	Apectodinium hyperacanthum	182	Cyclonephelium hexalobosum
180	Aptea anaphrissa	98	Cyclonephelium hughesii
153	Aptea polymorpha	158	Cyclonephelium intonsa
140	Apteodinium granulatum	132	Cyclonephelium paucimarginatum
188	Apteodinium reticulatum	122	Cyclonephelium vannophorum
22	Araneosphaera araneosa	101	Danea californica
82	Areoligera #TA	144	Dapsilidinium chems
44	Areoligera cf. coronata	4	Deflandrea #TA
58	Areoligera senonensis	5	Deflandrea denticulata
2	Areoligera tauloma	6	Deflandrea phosphoritica
23	Areosphaeridium arcuatum (small form)	26	Deflandrea phosphoritica australis
116	Callaiosphaeridium asymmetrica	118	Diconodinium #TA
164	Canningia colliveri	102	Dinogymnium lanceolatum
165	Canningia palliata	74	Dinogymnium sp. A, May '80
83	Cannosphaeropsis utinensis	99	Dinopterygium #TA
197	Cassiculosphaeridia magna	133	Dinopterygium cladoides
71	Ceratiopsis diebelii	27	Diphyes colligerum
45	Ceratiopsis pannucea	214	Druggidium (?) #TA
64	Ceratiopsis speciosa speciosa	36	Duosphaeridium nudum
59	Ceratiopsis striata	90	Eisenackia crassitabulata
183	Cerbia tabulata	134	Endoscrinium cf. campanula
72	Chatangiella tripartita	224	Endoscrinium galeritum
97	Chatangiella victoriensis	202	Endosporites #TA
147	Chichaouadinium vestitum	196	Escharisphaeridia #TA
117	Chlamydothorella nyei	215	Escharisphaeridia pelionensis
35	Cleistosphaeridium microcystum	231	Escharisphaeridia pocockii
61	Cleistosphaeridium tenuifilum	232	Escharisphaeridia rudis
129	Codoniella psigma	75	Exochosphaeridium bifidum
24	Cometodinium cf. whitei	103	Florentinia #TA
50	Cordosphaeridium #TA	52	Florentinia cf. verdieri
25	Cordosphaeridium cantharellum	136	Florentinia cooksoniae
3	Cordosphaeridium funiculatum	119	Florentinia ferox
48	Cordosphaeridium multispinosum	111	Florentinia radiculata
65	Cordosphaeridium varians	135	Florentinia verdieri
173	Coronifera albertii	146	Fromea amphora
84	Coronifera oceanica	7	Glaphyrocysta exuberans
227	Cribroperidinium cauda	8	Glaphyrocysta ordinata
130	Cribroperidinium edwardsii	85	Glaphyrocysta sp. indet.
141	Cribroperidinium exilicristatum	9	Glaphyrocysta texta
49	Cribroperidinium giuseppi	219	Gochteodinia verrucosa
142	Cribroperidinium globosum	186	Gonyaulacysta cassidata
208	Cribroperidinium longicorne	10	Hafniasphaera septata

APPENDIX A cont'dAlphabetical Listing of Species Shown on Occurrence Chart:Marine Dinoflagellates

Index number	Taxon names	Index number	Taxon names
11	Heteraulacacysta campanula	166	Oligosphaeridium poculum
37	Heteraulacacysta porosa	201	Oligosphaeridium porosum
221	Histiophora ornata	77	Oligosphaeridium pulcherrimum
86	Hystrichodinium pulchrum	125	Oligosphaeridium totum
217	Hystrichogonyaulax #TA	30	Operculodinium centrocarpum
28	Hystrichokolpoma granulata	68	Palaeocystodinium benjaminii
12	Hystrichokolpoma rigaudiae	69	Palaeocystodinium bulliformum
38	Hystrichokolpoma unispinum	31	Palaeocystodinium golzowense
13	Hystrichosphaeridium #TA	32	Palaeohystrichophora infusorioides
107	Hystrichosphaeridium bowerbankii	138	Palaeoperidinium cretaceum
110	Hystrichosphaeridium difficile	55	Palaeoperidinium pyrophorum
108	Hystrichosphaeridium stellatum	78	Palynodinium grillator
53	Hystrichosphaeridium tubiferum	179	Pareodinia borealis
192	Hystrichosphaerina schindwolfii	207	Pareodinia ceratophora
66	Isabelidinium bakeri	205	Perisseiasphaeridium insolitum
67	Isabelidinium cooksoniae	70	Phelodinium magnificum
174	Kalyptea dicerax	33	Phthanoperidinium levimurum
123	Kiokansium #TA	41	Phthanoperidinium multispinosum
124	Kiokansium polytes	185	Pseudoceratium pelliiferum
210	Kiokansium vetusculum	79	Pterodinium cingulatum
62	Kisselovia coleothrypta	181	Pyxidiniopsis #CA
76	Kleithriasphaeridium loffrense	42	Rhombodinium draco
39	Lentinia serrata	87	Samlandia #TA
14	Lentinia wetzelii	223	Scriniodinium (?) #TA
226	Leptodinium antigonium	200	Senoniasphaera #TA
212	Leptodinium arcuatum	104	Senoniasphaera inornata
199	Leptodinium mamilliferum	229	Senoniasphaera jurassica
40	Lingulodinium machaerophorum	145	Senoniasphaera microreticulata
127	Litosphaeridium siphoniphorum	109	Sentusidinium #TA
194	Meiourugonyaulax #TA	216	Sentusidinium cuculliforme
29	Melitasphaeridium pseudorecurvatum	198	Sentusidinium pillosum
54	Membranophoridium #TA	230	Sentusidinium rioultii
63	Membranophoridium #TB	92	Silicisphaera ferox
15	Membranophoridium aspinatum	88	Silicisphaera sp. (pl.7, fig.6-7) May '80
167	Muderongia parvata	105	Spinidinium echinoideum
190	Muderongia simplex	170	Spinidinium sp. indet.
193	Muderongia simplex perforata	16	Spiniferites cf. crassipellis
184	Muderongia staurata	17	Spiniferites ramosus
168	Nyctericysta #TA	89	Spongodinium delitiense
175	Nyctericysta #TB	154	Stiphrosphaeridium arbustum
169	Nyctericysta davisii	128	Stiphrosphaeridium dictyophorum
150	Nyctericysta pentagona	151	Stiphrosphaeridium diluculum
211	Occisucysta balia	178	Subtilisphaera #TA
191	Occisucysta cf. tentoria	120	Subtilisphaera foliacea
187	Occisucysta duxburyi	171	Subtilisphaera perlucida
159	Odontochitina ancala	121	Subtilisphaera pirnaensis
91	Odontochitina costata	112	Surculosphaeridium longifurcatum
137	Odontochitina operculata	220	Systematophora fasciculigera
94	Odontochitina porifera	222	Systematophora palmula
163	Oligosphaeridium #TA	206	Systematophora silyba
162	Oligosphaeridium asterigerum	155	Taleisphaera hydra
60	Oligosphaeridium complex	113	Tanyosphaeridium variecalamum
177	Oligosphaeridium diluculum	100	Tehamadinium (?) #TA

APPENDIX A cont'dAlphabetical Listing of Species Shown on Occurrence Chart:Marine Dinoflagellates

Index number	Taxon names
152	Tehamadinium cf. dodekovae
195	Tehamadinium sousensis
126	Tenua hystrix
176	Tetraguladinium conspicuum
18	Thalassiphora pelagica
80	Triblastula utinensis
114	Trichodinium castaneum
106	Trichodinium cf. pellitum
115	Trichodinium magnum
95	Trithyrodinium suspectum
19	Turbiosphaera filosa
218	Valensiella (?) #TA
172	Vesperopsis digitata
148	Vesperopsis mayi
20	Wetzeliella articulata
34	Wilsonidium lineidentatum
96	Xenascus ceratioides
160	Xenascus perforatus
139	Xenascus plotei
203	Yalkalpodium #TA

APPENDIX A (cont'd)

Alphabetical Listing of Species Shown on Occurrence Chart:Pollen and Spores

Taxa location index

Index numbers are the columns in which the taxon appears

Index number	Taxon names	Index number	Taxon names
69	Aequitriradites baculatus	103	Klukisporites scaberis
81	Aequitriradites sp. A, Burger '80	22	Laevigatosporites ovatus
34	Aequitriradites spinulosus	71	Liliacidites crassatus
58	Afropollis #TA	64	Liliacidites magnus
53	Afropollis jardinus	36	Lycopodiumsporites austroclavitudites
1	Alangiopollis #TA	78	Lycopodiumsporites crassatus
2	Alnipollenites verus	105	Mathesisporites tumulosus
10	Annutriporites subconvexus	65	Matonisporites crassiangularatus
42	Ariadnaesporites spinocaperatus	66	Megaspore sp. indet. #TA
94	Baculatisporites #TA	106	Megaspore sp. indet. #TB
29	Baculatisporites comaumensis	26	Metasequoia papillapollenites
74	Balmeisporites #TA	51	Microreticulatisporites uniformis
48	Balmeisporites glenelgensis	27	Momipites coryloides
3	Betulaceoipollenites betuloides	85	Neoraistrickia truncata
55	Biretisporites potoniae	44	Ornamentifera echinata
82	Biretisporites spectabilis	100	Osmundacidites major
46	Bisaccate Pollen undif.	76	Phyllocladites inchoatus
7	Boehlensipollis #TA	79	Phyllocladites microreticulatus
93	Callialasporites dampieri	104	Pilosporites sp. A
102	Callialasporites trilobatus	52	Pilosporites trichopapillosus
89	Callialasporites trilobatus cf.	16	Pinuspollenites spp.
30	Camerozonosporites concinnus	28	Plicatella cristata
56	Camerozonosporites insignis	40	Plicatella matesovae
5	Camerozonosporites sp. A W. & B. '75	6	Plicatopollis magniorbicularis
4	Caryapollenites simplex	54	Pollen indet. cf. Caryophyllaceae
11	Choanopollenites #TA	67	Polycingulatisporites segmentatus
12	Choanopollenites #TB	17	Polypodiumsporites 4TA
31	Choanopollenites #TC	39	Polypodiumsporites #TB
20	Cicatricosporites #TA	68	Pristinipollenites elongatus
59	Classopollis classoides	75	Pseudowalchia landesii
60	Clavatipollenites #TA	18	Ranunculacidites #TA
90	Concavissimisporites variverrucatus	23	Rhoipites #TA
49	Converrucosisporites exquisitus	73	Rouseisporites reticulatus
96	Crybelosporites stylosus	86	Rouseisporites triangularis
24	Cyathidites australis	25	Rugubivesiculites reductus
50	Cyathidites minor	37	Rugubivesiculites rugosus
97	Cycadopites spp.	41	Saxosporites #EB
61	Cyrbelosporites pannuceus	57	Sestrosporites pseudoalveolatus
13	Diporites iszkaszentgyrogyi	47	Stellatopollis largissimus
32	Distaltriangulispores irregularis	19	Stereisporites antiquasporites
91	Distaltriangulispores perplexus	38	Taxodiaceapollenites hiatus
99	Ephedripites #TA	9	Tricolpites #TA
62	Ephedripites multicostatus	84	Tricolpites #TB
8	Ericipites compactipolleniatus	101	Trilete spore #TA
63	Eucommidites minor	98	Triletes simplex cf.
35	Extratropipollenites #TA	87	Trilobosporites #TA
83	Foveotrilletes subtriangularis	80	Trilobosporites crassus
92	Gleicheniidites circinidites	72	Trilobosporites marylandensis
21	Gleicheniidites senonicus	77	Trilobosporites tribotrys
14	Hippocrateaceadites #TA	45	Trilobosporites trioreticulosus
15	Horniaella fissurata	33	Triporolates #TA
95	Ischyosporites #TA	88	Verrucosisporites cf. subrotundus
43	Ischyosporites disjunctus	107	Verrucosisporites manumii
70	Ischyosporites tuberosus		

APPENDIX A (cont'd)Alphabetical Listing of Species Shown on Occurrence Chart:Algae and Miscellaneous

Taxa location index
Index numbers are the columns in which the taxon appears

Index number	Taxon names
9	Schizocystia laevigata
4	Fungal hyphae
10	Gen.et sp. indet D240-1200-6
6	Microhystridium stellatum
8	Microthallites spp.
5	Multicellisporites spp.
2	Palambages sp.
3	Pediastrum boryanum
1	Veryhachium cf. europaeum
7	Veryhachium spp.

APPENDIX BExamined Samples: Louisbourg J-47

900.00 : CUT	2700.00 : CUT	4414.00 : CORE
930.00 : CUT	2730.00 : CUT	4419.89 : CORE
960.00 : CUT	2760.00 : CUT	4425.00 : CUT
990.00 : CUT	2790.00 : CUT	4455.00 : CUT
1020.00 : CUT	2820.00 : CUT	4485.00 : CUT
1050.00 : CUT	2880.00 : CUT	4515.00 : CUT
1080.00 : CUT	2910.00 : CUT	4528.89 : CORE
1110.00 : CUT	2940.00 : CUT	4531.00 : CORE
1140.00 : CUT	2970.00 : CUT	4545.00 : CUT
1170.00 : CUT	3000.00 : CUT	4575.00 : CUT
1200.00 : CUT	3030.00 : CUT	4605.00 : CUT
1230.00 : CUT	3060.00 : CUT	4635.00 : CUT
1260.00 : CUT	3090.00 : CUT	4665.00 : CUT
1290.00 : CUT	3120.00 : CUT	4695.00 : CUT
1320.00 : CUT	3150.00 : CUT	4725.00 : CUT
1350.00 : CUT	3175.00 : CUT	4755.00 : CUT
1380.00 : CUT	3210.00 : CUT	4785.00 : CUT
1410.00 : CUT	3240.00 : CUT	4815.00 : CUT
1440.00 : CUT	3270.00 : CUT	4845.00 : CUT
1470.00 : CUT	3300.00 : CUT	4875.00 : CUT
1500.00 : CUT	3330.00 : CUT	4905.00 : CUT
1530.00 : CUT	3360.00 : CUT	4935.00 : CUT
1560.00 : CUT	3390.00 : CUT	4965.00 : CUT
1590.00 : CUT	3420.00 : CUT	4995.00 : CUT
1620.00 : CUT	3450.00 : CUT	5025.00 : CUT
1650.00 : CUT	3480.00 : CUT	5055.00 : CUT
1680.00 : CUT	3510.00 : CUT	5085.00 : CUT
1710.00 : CUT	3540.00 : CUT	5115.00 : CUT
1740.00 : CUT	3570.00 : CUT	5145.00 : CUT
1770.00 : CUT	3600.00 : CUT	5175.00 : CUT
1800.00 : CUT	3630.00 : CUT	5205.00 : CUT
1830.00 : CUT	3660.00 : CUT	5235.00 : CUT
1860.00 : CUT	3690.00 : CUT	5265.00 : CUT
1890.00 : CUT	3720.00 : CUT	5295.00 : CUT
1920.00 : CUT	3750.00 : CUT	5325.00 : CUT
1950.00 : CUT	3780.00 : CUT	5355.00 : CUT
1980.00 : CUT	3810.00 : CUT	5385.00 : CUT
2005.00 : CUT	3840.00 : CUT	5415.00 : CUT
2045.00 : CUT	3870.00 : CUT	5439.00 : CORE
2070.00 : CUT	3900.00 : CUT	5445.00 : CUT
2100.00 : CUT	3930.00 : CUT	5453.00 : CORE
2130.00 : CUT	3960.00 : CUT	5475.00 : CUT
2160.00 : CUT	3990.00 : CUT	5505.00 : CUT
2190.00 : CUT	4020.00 : CUT	5535.00 : CUT
2220.00 : CUT	4045.00 : CUT	5565.00 : CUT
2250.00 : CUT	4070.00 : CUT	5595.00 : CUT
2280.00 : CUT	4072.50 : CORE	5625.00 : CUT
2310.00 : CUT	4087.87 : CORE	5655.00 : CUT
2340.00 : CUT	4100.00 : CUT	5685.00 : CUT
2370.00 : CUT	4130.00 : CUT	5715.00 : CUT
2400.00 : CUT	4160.00 : CUT	5745.00 : CUT
2430.00 : CUT	4190.00 : CUT	5775.00 : CUT
2460.00 : CUT	4220.00 : CUT	5805.00 : CUT
2490.00 : CUT	4250.00 : CUT	5835.00 : CUT
2520.00 : CUT	4280.00 : CUT	5865.00 : CUT
2550.00 : CUT	4305.00 : CUT	5895.00 : CUT
2580.00 : CUT	4340.00 : CUT	5925.00 : CUT
2610.00 : CUT	4370.00 : CUT	5955.00 : CUT
2640.00 : CUT	4395.00 : CUT	5985.00 : CUT
2670.00 : CUT	4410.39 : CORE	6015.00 : CUT