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**Open File 3785**

**DESCRIPTION OF CORES FROM PERMIAN AND MESOZOIC  
STRATA OF EAGLE PLAIN, YUKON**

**By**

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Although every effort has been made to ensure accuracy, this Open File Report has not been edited for conformity with Geological Survey of Canada standards.

## CONTENTS

<b>Well Name</b>	<b>Page</b>
Bell River #1 N-50 (Core 1)	3
Birch B-34 (Cores 1-2)	4
Birch E-53 (Cores 1-7)	5
Blackie M-59 (Cores 1-5)	8
Chance G-08 (Cores 1-2)	10
Chance #1 L-08 (Core 1)	11
Eagle Plains #1 N-49 (Core 1)	12
East Porcupine I-13 (Core 1)	13
Ellen C-24 (Cores 1-2)	16
Molar P-34 (Cores 1-16)	17
North Parkin D-61 (Cores 1-2)	21
Pine Creek O-78 (Cores 1-6)	22
Porcupine K-56 (Core 1)	24
Ridge F-48 (Cores 1-2)	25
South Chance D-63 (Core 1)	26
West Parkin C-33 (Cores 1-2)	27
Whitefish I-05 (Cores 1-5)	28
Whitefish J-70 (Core 1)	30
Whitestone N-26 (Cores 1-2)	31

AMERADA ET AL CROWN BELL RIVER YT #1 N-50

**Core 1** 4195-4208 ft

Rec. 5 ft. 1 box. Full diameter. Moderately well preserved.  
Unknown formation or ?Mount Goodenough Fm (Barremian)

*Mudstone*: black; highly indurated; siliceous.

Examined: December 1985

## SOCONY MOBIL WESTERN MINERALS BIRCH YT B-34

### Core 1 944-964 ft

Rec. 20 ft. 5 boxes. Moderately well preserved.

Whitestone River Fm (Albian) and Permian (?Jungle Creek Fm)

### WHITESTONE RIVER FM

944-952 ft *Shale/mudstone*: black; indurated; trace pyrite in basal few cm. Abruptly overlies conglomerate. Slight colour variations suggestive of bedding, although most of interval is homogenous. A few vague indications of burrows or burrow mottling

### JUNGLE CREEK FM

952-953 ft *Conglomerate*: granules to small pebbles in a sandstone matrix. Normally graded. Top 12-15 cm is sideritized and many pebbles have been replaced by siderite. Black and white pebbles of chert and quartzite; some coaly wood clasts. Abrupt basal contact.

953-964 ft *Interlayered conglomerate-sandstone*: Highly variable thickness of layers (6-50 cm). Thicker layers of conglomerate tend to be multiple layers/beds - distinguished by grain size variations and sand content. Sandy layers vary from fine grained to granular. Interlayering suggests large-scale, low-angle cross bedding.

Interpretation of Permian: possibly non-marine, fluvial deposits.

Examined: November 1985 and 12th May 1993

### Core 2 1289-1309 ft

Rec. 18ft. 5 boxes (4 wooden, 1 cardboard). Good preservation.

Jungle Creek Fm (Permian)

1289-1298 ft *Sandstone-conglomerate*: thin to thick layers of conglomerate and sandstone (1-55 cm thick). Thickest layer is a sandstone. Pebbles of white and grey chert and siliceous sandstone. Largest pebble 2.5 cm. Some argillaceous pebbly sandstone beds near base of interval. Sandstones tend to be fine grained and in massive to finely laminated layers/beds.

1298-1302 ft *Mudstone*: silty. Dull black to dark grey. Vague indications of disrupted bedding. Upper contact not preserved, but apparently an abrupt lithological change. Lower contact gradational over a 15-20 cm interval.

1302-1303.3 ft *Conglomerate*: granules to very small pebbles. Normally graded. Abrupt, erosional basal contact. No visible sedimentary structures.

1303.3-1307 ft *Sandstone*: fine grained; brownish grey. Badly fractured. Possible trace of a vertical burrow. Some stylolites. Remnant of a conglomerate at base of core.

Interpretation: Possibly non-marine, fluvial deposits. If the burrow structure is real, this could indicate a marginal marine setting, possibly a fan-delta.

Examined: 12 May 1993

## CHEVRON SOBC WESTERN MINERALS BIRCH YT E-53

### **Core 1** 1331-1340 ft.

Rec. 9 ft. 3 boxes. Well preserved.

Jungle Creek Fm (Permian)

Predominantly *granulestone* and very small pebble *conglomerate*, with scattered layers of very fine to fine grained sandstone (few mm to 8 cm thick). Rich in carbonized wood fragments and layers and laminae of organic detritus.

Pebbles dominated by white and grey chert - giving a very distinct look to the conglomerate. Pebbles are subrounded and generally well sorted.

### **Core 2** 1340-1368 ft.

Rec. 28 ft. 8 boxes. Well preserved.

Jungle Creek Fm (Permian)

1330-1354 ft *Conglomerate*: similar to core 1. A large ironstone concretion in box 1, at top of core.

1354-1368 ft *Conglomerate*: a distinct change in character from overlying conglomerate - no coaly fragments/organic detritus and a generally lighter coloured interval (due to lack of black organic debris). Upper 8 ft tends to be uniform in appearance - consisting of a small-pebble conglomerate with a low concentration of pebbles "floating" in a sand matrix and few indicators of bedding.

Lower 6 ft consists of granulestone to small-pebble conglomerate interlayered with medium to coarse grained sandstone.

### **Core 3** 1368-1374 ft

1 Rec. 4 ft. 1 box. Well preserved.

Jungle Creek Fm (Permian)

Similar to basal 6 ft of core 2. Pebbles up to 3 cm.

Interpretation of cores 1-3: probably non-marine; possibly braided river deposits.

### **Core 4** 1426-1430 ft

Rec. 3.5 ft. 1 box. Well preserved.

Jungle Creek Fm (Permian)

1426-1427 ft *Mudstone*: pebbly, with pebbles up to 10 cm in diameter in a mud matrix.

1427-1429.5 ft *Conglomerate-sandstone*: interlayered; layers/beds few cm to 38 cm thick; subhorizontally aligned. Some of conglomerate beds appear to have abrupt, erosional bases;

are normally graded and grade up into sandstone. The thinner interlayering appears to be low-angle cross bedding.

Pebbles mostly <1 cm and dominated by white and grey chert and sandstone.

Interpretation: probably non-marine; possibly braided channel deposits.

**Core 5** 1511-1513 ft

No core available due to minimal recovery.

**Core 6** 1620-1677 ft

Rec. 43.9 ft. 10 boxes. Well preserved.

It appears that the bulk of the missing core is from the top of the cored interval.

1620-1633 ft Missing

1633-1636.5 ft *Sandstone*: light grey; medium grained. Cross bedded. A few mud clasts (up to 4 cm) and a few scattered granules. A thin (3-4 cm) mudstone interbed at about 1625 ft. Abrupt basal contact.

1636.5-1639 ft *Mudstone*: disrupted laminae and thin beds of silty mudstone. Scattered carbonaceous detritus. Fissile.

1639-1640 ft *Sandstone*: very fine grained; light grey. Gradational base/top. Vague, disrupted laminae.

1640-1642 ft *Mudstone*: cf. above.

1642-1649 ft *Sandstone*: very fine grained; argillaceous. Thin interbeds of mudstone throughout. Mottled to vaguely and irregularly laminated. Some soft sediment deformation.

1649-1651 ft *Sandstone*: fine grained; "clean". Abrupt base/top. Massive.

1651-1660 ft *Conglomerate*: very small to small pebbles are dominant. Clast supported, with a few scattered sandstone lenses. Pebbles are mostly grey chert and sandstone. Vague traces of crude bedding. Basal contact appears to be load deformed.

1660-1674 ft *Mudstone*: dark grey; carbonaceous; silty. Vague, disrupted bedding/laminae; generally massive in appearance.

1674-1677 ft *Sandstone*: fine to coarse grained; scattered pebbles in lower 10 cm. Appears to be load deformed in places; mostly massive in appearance.

Interpretation: appears to be channel and floodplain deposits.

**Core 7** 1807-1830 ft

Rec. 22.4 ft. 5 boxes. Well preserved.

Jungle Creek Fm (Permian)

1807-1809.5 ft *Mudstone*: medium grey; silty to sandy. Mottled to crudely bedded/laminated.

1809.5-1826 ft *Conglomerate-sandstone*: interlayered to interbedded. An overall fining-upward trend - reduced pebble/grain size and reduced conglomerate content. Lower 10-12 ft is crudely bedded, whereas upper part is more massive, or vaguely bedded. Abrupt basal contact; upper contact also abrupt but non-erosional. Pebbles up to 2 cm and consist of mostly grey and black chert and sandstone, with subordinate amounts of white chert.

1826-1830 ft *Mudstone*: medium to dark grey. Top 2 ft is carbonaceous and crudely bedded/laminated; contains scattered fragments of thick-walled brachiopods. Bottom 2 ft is very silty to sandy, with a downward increase in sand content; mottled appearance.

Interpretation: probably non-marine or marginal marine (brachiopod fragments). If marginal marine, these beds could be part of a coastal fan-delta complex.

Examined: 13th May 1993

## SOCONY MOBIL WESTERN MINERALS BLACKIE YT #1 M-59

### **Core 1** 1960-1980 ft

Rec. 20 ft. 5 wooden boxes. Well preserved.

Jungle Creek Fm (Permian)

*Mudstone*: silty to sandy; medium grey. Load deformed bedding throughout. Small, flattened horizontal burrows are common. Isolated to small accumulations of thin-walled shell debris.

Interpretation: marine shale. Cored from the shale member, just over a hundred feet above the flooding surface that separates the shale and sandstone members.

### **Core 2** 2115-2130 ft

Rec. 15 ft. 4 boxes. Well preserved.

Jungle Creek Fm (Permian)

*Interlayered-interbedded conglomerate and sandstone*. Defines low-angle cross stratification. Layers/beds are a few cm to 28 cm thick.

*Conglomerate*: mostly very small pebbles and granules; clast supported. Rounded clasts of white, grey and black chert and sandstone.

*Sandstone*: fine to medium grained; generally finely to coarsely laminated with a few thin horizons of current ripple laminae. Layer/bed contacts range from abrupt to rapidly gradational.

It is possible that the conglomerate-sandstone units are depositional couplets but the evidence is unequivocal - many of the bed contacts are broken or have been cut.

### **Core 3** 2132-2154 ft

Rec. 22 ft. 5 boxes. Well preserved.

Jungle Creek Fm (Permian)

Similar to core 2: *alternations of conglomerate and sandstone*.

Evidence for beds of conglomerate grading up into sandstone more conclusive than in core 2.

Conglomerate beds commonly have erosional bases and the conglomerates rapidly grade up into sandstone. Sandstone intervals tend to be massive rather than laminated, as in core 2.

### **Core 4** 2154-2194 ft

Rec. 39.5 ft. 9 boxes. Well preserved.

Jungle Creek Fm (Permian)

2154-2168 ft *Sandstone*: fine to medium grained with some thin beds/layers of coarse to granular sandstone. Some scattered small pebbles. Fine laminae; some cross bedding, but mostly



massive in appearance. Basal 1.5 ft consists of well sorted, massive granulestone. Abrupt basal contact.

2168-2173 ft *Mudstone*: dull dark grey. Rich in organic detritus. Uneven laminae to thin beds of silty mudstone - commonly load deformed. Local occurrences of thin-walled shell debris.

2173-2174 ft *Sandstone*: coarse grained. Some mud laminae but generally massive. Contacts not preserved.

2174-2176 ft *Mudstone*: as above as well as containing a few thin pebble layers and pebbly mudstone beds. Contacts not preserved.

2176-2194 ft *Sandstone-conglomerate*: fine to medium grained sandstone is dominant in the upper part of interval and a general downward increase in conglomerate content. Sandstone contains scattered pebbles and granules as well as some thin beds of conglomerate. Vague, crude bedding. Conglomerate commonly matrix supported. Pebbles of grey, white and black chert and sandstone as well as less commonly occurring, but distinct, orange-coloured quartzite clasts.

Interpretation of cores 2-4: probably non-marine or marginal marine strata. The presence of shell debris could indicate a marginal marine setting, suggesting perhaps a coastal plain fan-delta.

#### **Core 5 2357-2377 ft**

Rec. 19.5 ft. 5 boxes. Well preserved.

Jungle Creek Fm (Permian)

*Interlayered to interbedded conglomerate and sandstone.* Sandstone is dominant in top 2-3 ft; conglomerate in remainder. Layers/beds range from 1 pebble thick to >3 ft (uppermost sandstone interval).

*Conglomerate*: mostly very small pebbles and large granules; some larger pebbles, up to 1 cm. Clast supported. Grey and white chert and sandstone clasts. Generally massive.

*Sandstone*: subhorizontal to very low-angle fine laminae. Fine to medium grained.

Where conglomerate-sandstone depositional units are recognizable the units are underlain by a basal scour that is overlain by conglomerate which, in turn, rapidly grades up into sandstone. The transition from conglomerate to sandstone may be within an interval consisting of alternating pebble and sandstone layers.

Interpretation: possible non-marine or fan-delta deposits.

Examined: 13th May 1993

## SOCONY MOBIL WESTERN MINERALS CHANCE YT G-08

### **Core 1** 2283-2324 ft

Rec. 41 ft. 9 boxes. Well preserved.

Fishing Branch Fm of the Eagle Plain Group (Upper Cretaceous).

General Description: fine grained, finely laminated (very low angle and current ripple laminae) *sandstone* with some layers of sideritized mudstone clasts. There is a single prominent mudstone bed about 4 m below top of core.

#### Detailed Description:

Stacked depositional units consisting of the following ideal cycle:

- a) Basal scour overlain by mudstone clasts although in many units the scour is overlain by sandstone.
- b) Sandstone - finely laminated, very fine to medium grained. Carbonaceous debris is common on the laminae. Cross cutting bundles (sets) of laminae with very low-angle intersections. This later property indicates that laminae are inclined at a very low angle. One of the units has contorted laminae in this part of the cycle.
- c) Laminated sandstone grades upward into multiple sets of ripple laminated sandstone. Although internal laminae suggest unidirectional current origin the synoptic form is that of a wave-modified current ripple. Cross laminae commonly in opposing directions in juxtaposed sets. Some mud drapes present. Complex laminae are common and at least one of the units contains deformed laminae.
- d) Mudstone with laminae of silt/very fine sand. Only a few of the units contain this part of the cycle.

The thickness of the cycles are highly variable, ranging from a few tens of centimetres to over 1 metre.

Interpretation: inner shelf deposits. The cycles have many similarities to beds produced from waning storm activity which produces HCS structures.

### **Core 2** 3613-3623 ft

Rec. 10 ft. 2 boxes. Badly broken core.

Whitestone River Fm (Albian).

*Mudstone*: medium to dark grey; breaks with a distinct conchoidal fracture subparallel to bedding. Moderately well indurated but not hard or brittle like many of the Paleozoic shales in the Eagle Plain area.

Examined: November 1985

## WESTERN MINERALS CHANCE YT #1 L-08

**Core 1** 1255-1279 ft.

Rec. ?ft. 5 boxes. Well preserved.

Cody Creek Fm of the Eagle Plain Grp (Upper Cretaceous)

Top to bottom description:

a) 43 cm of plane and current-ripple laminated *sandstone*. Base of unit is a scour surface overlain by mudstone clasts that are up to 2 cm in diameter; in turn overlain by 8 cm of plane laminated, medium grained sandstone. This in turn is overlain by 23-25 cm of current-ripple laminated fine grained sandstone. In top 10 cm there is plane laminated sandstone erosionally resting on ripple laminated sandstone.

b) 16 cm of *mudstone*

c) 65 of *sandstone* consisting of:

9 cm of plane laminae

45 cm of current ripple laminae

11 cm of vague laminae

Current ripple tend to have a dominant orientation in one direction with only a few in an opposing direction.

d) 6.06 m of *interbedded and interlaminated mudstone-very fine grained sandstone*. Sandstone beds are a few mm to 20 cm thick and contain current ripple laminae many of which are deformed with at least one example of a sand ball.

Interpretation: shallow-water, inner shelf deposits.

Examined: November 1985

## WESTERN MINERALS EAGLE PLAINS #1 N-49

**Core 1** 2101-2122 ft

Rec. 20 fr. 4 boxes. Broken core.

Whitestone River Fm (Albian)

*Mudstone*: medium to dark grey; a few thin (<2 cm) beds of plane laminated, very fine grained sandstone.

Interpretation: low-energy deposition on an outer shelf to slope environment.

Examined: December 1985

## CHEVRON SOBC WESTERN MINERALS EAST PORCUPINE YT I-13

**Core 1** 3658-3718 ft

Rec. 12 boxes. Well preserved.

Fishing Branch Fm; Eagle Plain Grp (Upper Cretaceous)

General Description: fine to medium grained, cross laminated and ripple laminated *sandstone* interbedded with thin beds of *mudstone*, arranged in fining-upward units.

Detailed Description (bottom to top):

1. 5 cm: two sets of low-angle laminae in fine grained *sandstone*. Sets separated by a planar, possibly scoured surface.
  2. 17 cm: Basal scour surface overlain by 1 cm thick layer of small (<1 cm) mud clasts (discoidal, ellipsoidal and flattened). Overlain by 12 cm of plane laminated *sandstone* containing abundant organic detritus (amount of carbonaceous debris declines upward). 4 cm above base of unit is a small scour-and-fill structure 1 cm thick at its deepest point. Within the plane laminated interval is a single, 4 cm long, vertical burrow. Capped by 3 cm of multiple sets of current ripple laminae (each set has opposing current directions).
  3. 3 cm: thinly *interbedded to interlaminated mudstone and sandstone*. Abrupt base.
  4. 30 cm: finely laminated, fine grained *sandstone*. Abrupt basal contact. Top 6 cm more carbonaceous than rest of interval. Top contact is a rippled surface. Laminae contain several very low-angle intersecting surfaces.
  5. 19 cm: *mudstone* with a few sandstone laminae.
  6. 6 cm: current ripple laminated fine grained *sandstone*. Multiple ripple sets. Abrupt base/top.
  7. 2.3 cm: *mudstone*.
  8. 35 cm: planar to very low-angle cross laminated, very fine grained *sandstone* grading up into current ripple laminated sandstone in top 5-6 cm of unit. Some of the ripples have convex-up laminae. Abrupt base/top.
  9. 1-2 cm: sideritized *mudstone*; earthy brown colour.
  10. 35 cm: fine grained, carbonaceous *sandstone*. Basal 6 cm contains current ripple laminae that grade up into flattened current ripple laminae and near-horizontal laminae.
  11. 1-2 cm: coaly *mudstone*.
  12. 1.18 m: fine grained, locally medium grained, cross bedded *sandstone*. Abrupt change in dip of cross beds about 52 cm above base could mark the base of another bed, or it could represent an overlapping bedform (actual contact has been obliterated by a cut across the core). Abrupt base/top.
  13. 2.88 m: medium grained, cross bedded *sandstone*. Abundant carbonaceous debris. 3-4 cm thick basal layer containing mud clasts overlaying a basal scour surface. 30 cm above base of unit is a 5 cm thick layer of current ripple laminae (abrupt base/top to this interval) overlain by 2-3 cm of muddy, carbonaceous, laminated sandstone.
- 69 cm above base of unit is a 2-3 cm thick layer containing current ripple laminae (abrupt base, gradational top).
- 1.04 m above base of unit is a 5 cm thick layer containing current ripple laminae (abrupt base, gradational top). Sandstone immediately underlying the rippled layer is rich in carbonaceous debris

and clay (up to 6 cm below rippled layer).

Cross bedding varies from very low angle to moderate inclinations. Upper third of unit has less distinct cross bedding. This whole interval appears to consist of several depositional units.

14. 1.56 m: interbedded *sandstone-mudstone*. General upward increase in percentage of sandstone beds.

Lower 45 cm mostly carbonaceous mudstone, above which there is about 2:1 ratio of sandstone to mudstone and contains laminae and beds (up to 9 cm thick) of very fine grained sandstone. The thicker sandstone beds (>1 cm) contain plane or current laminae and some burrows. Thinner sandstone beds are more intensely burrowed. A few of the beds are load deformed.

15. 68 cm: cross bedded, medium grained grading upward to fine grained *sandstone*. Abrupt base/top.

21 cm above base of unit there is a bed consisting of a single layer of ripple laminae. Coaly debris is common in the uppermost laminae of the ripple.

16. 2 mm: *clay-drape* over a scour surface.

17. 2.88 m: fine to medium grained *sandstone*

a) 7-8 cm of low-angle, cross bedded sandstone. Asymptotic bottomset laminae. Capped by 2 mm of clay/carbonaceous laminae.

b) 20 cm of very low-angle to planar laminae; laminae dip in opposite direction to those in interval a.

c) 5.5 cm of high-angle planar cross beds. Very slightly asymptotic on the bottomsets. Abrupt base/top.

d) 42 cm of planar to low-angle cross laminae. Contains a single vertical burrow. Upper 7 cm contains current ripple laminae and top few mm is carbonaceous.

e) 8 cm of very low-angle cross laminae.

f) 7-8 cm of current ripple laminae. Abrupt base; top not preserved.

g) 17 cm of very low-angle cross laminae with some possibly moderately inclined cross laminae about half-way through interval.

h) 3-5 cm of laminae, parallel to the basal scour surface. Minor internal reactivation/scour surfaces.

i) 88 cm of planar to very low-angle cross laminae. Numerous large diameter (1.5 cm) vertical burrows, up to 7 cm long.

j) 60 cm of current ripple laminae in fine to medium grained sandstone. Laminae become coarser upward.

18. 40 cm: a basal scour overlain by 1-1.5 cm of mudstone clasts (up to 6 mm in diameter), in turn overlain by planar laminated, medium grained *sandstone*. 20 cm above base is a 12 cm interval of contorted laminae overlain by current ripple laminae.

19. 1 cm of *mudstone*.

20. 19 cm: basal 2-3 cm consists of micro-trough laminated *sandstone* overlain by 12 cm of massive sandstone, in turn overlain by 3-4 cm of micro-trough laminae.

21. 2 cm: 1 cm of chert pebbles resting on a scour surface, overlain by 1 cm of medium grained *sandstone*.

22. 65 cm: basal scour overlain by 3-5 cm of densely packed, clast supported, poorly sorted, chert pebbles (up to 2 cm diameter) in turn overlain by low-angle cross bedded medium grained *sandstone*

that grades up into cross bedded fine grained sandstone. Scattered chert pebbles and granules in medium grained sandstone. At least two reactivation surfaces within the cross bedded sandstone interval.

23. 8 cm of *mudstone* containing fine silt laminae.

24. 8.5 cm of contorted laminae in fine grained *sandstone*.

25. 52 cm of *mudstone* containing fine laminae and thin beds (0.5-1 cm) of silt or current ripple laminated very fine grained sandstone.

26. 7 cm of laminated fine grained *sandstone*.

27. 26 cm of *mudstone* (cf. unit 25).

28. 31 cm: abrupt basal scour overlain by 7 cm of very low-angle and planar laminated fine grained *sandstone*, capped by a reactivation/scour surface, in turn overlain by 9-10 cm of moderately inclined cross beds in sandstone that grades up into current ripple laminated sandstone. Dip of cross beds/current ripples generally in one direction.

29. 56 cm of interlaminated to interbedded *mudstone-siltstone-sandstone*. Sandstone beds are generally <1 cm thick, contain current ripple or planar laminae and some minor load deformation.

30. 32 cm of fine grained sandstone containing several sets of low-angle cross laminae separated by reactivation/scour surfaces. Abrupt base/top to interval.

31. 40 cm of interlaminated to interbedded *mudstone and very fine grained sandstone*. Sandstone beds are less than <1 cm thick and are similar to those seen in unit 29.

32. 61 cm of fine grained *sandstone* containing several (possibly 4) sets of low-angle laminae each set separated by a reactivation/scour surface. Abrupt base. Clean sandstone grades over a 1-2 cm interval into sandstone with clay laminae in turn abruptly overlain by a mudstone bed.

33. 20 cm of interlaminated to interbedded *mudstone and sandstone*. Thickest bed is 2 cm, but most are <1 cm. Current ripple laminae are present.

34. 1.59 m of fine grained *sandstone* with the following vertical divisions:

a) 26 cm: abrupt base overlain by very low-angle cross bedded sandstone that contains at least one reactivation/scour surface.

b) 47 cm: several sets (at least 6; each set 1-7 cm thick) of micro-trough cross laminated sandstone each set separated by 1-7 cm thick beds of planar laminated sandstone.

c) 37 cm: abrupt base overlain by very low-angle cross laminated sandstone that contains several reactivation/scour surfaces.

d) 49 cm: alternating beds of planar laminated and micro-trough cross laminated sandstone. Contact between bed types can be either abrupt or gradational.

Interpretation: this succession has all the attributes of storm generated deposit found on an inner shelf to shoreline succession (HCS bedding). Also, the sedimentary structures are similar to the HCS-dominant equivalent strata seen in outcrop.

Examined: November 1985

SOCONY MOBIL WESTERN MINERALS ELLEN YT C-24

**Core 1** 3065-3074 ft

Rec. 3.5 ft. 1 box. Poor preservation.

Fishing Branch Fm of the Eagle Plain Grp (Upper Cretaceous)

*Shale*: dark grey to black; fissile. Possibly laminated.

Interpretation: low-energy outer shelf deposition.

**Core 2** 4212-4221 ft

Rec. 9 ft. 2 boxes. Broken core.

Whitestone River Fm (Albian)

*Shale/mudstone*: medium to dark grey. A few pieces of core with mm-thick silt laminae.

Interpretation: low-energy outer shelf to slope environment.

Examined: November 1985



## SOCONY MOBIL WESTERN MINERALS MOLAR YT P-34

### **Core 1** 1352-1361 ft

Rec. 6 ft. 2 boxes. Poor preservation.

Fishing Branch Fm of the Eagle Plain Grp (Upper Cretaceous)

*Mudstone*: medium grey; mm-scale silt laminae. Degree of cementation/compaction noticeably less than deeper cores in Molar P-34.

Interpretation: low-energy mid to out shelf sediment.

### **Core 2** 1986-1998 ft

Rec. 8.9 ft. 2 boxes. Well preserved.

Parkin Fm of the Eagle Plain Grp (Upper Cretaceous)

*Interbedded sandstone-mudstone.*

Mudstone: medium to dark grey; silty; finely laminated; beds 2-3 cm thick.

Sandstone: very fine grained (some beds may be very coarse silt); beds 5-6 cm thick. Current ripple laminae the dominant structure - some of the ripples show load deformation and some have contorted laminae. Beds have abrupt bases and gradational or abrupt tops. Some of the thinner beds have the characteristics of starved ripples.

Interpretation: generally low-energy deposition with influxes of sediment-laden currents. Probably mid-shelf.

### **Core 3** 2171-2189 ft

Rec. 6.7 ft. 2 boxes. Well preserved.

Whitestone River Fm (Albian).

Similar to core 2 but sandstone beds are generally <1 cm thick and interlaminae of *sandstone-mudstone* is more prevalent.

Interpretation: generally low-energy deposition, possibly mid to outer shelf, or even upper slope.

### **Core 4** 3085-3094.3 ft

Rec. 9.3 ft. 2 boxes. Well preserved.

Whitestone River Fm (Albian)

*Mudstone*: medium to dark grey; silty. Massive appearance; no trace of primary sedimentary structures. Some faint mottling which could indicate bioturbation.

Interpretation: low-energy sedimentation, possibly outer shelf to slope.

**Core 5** 4101-4119 ft

Rec. 18 ft. 4 boxes. Well preserved.

Whitestone River Fm (Albian)

*Mudstone*: mm-scale laminae of silt/very fine sand present throughout core. Several intervals of burrowed mudstone (horizontal to oblique burrows that have been flattened due to compaction).

Interpretation: low-energy deposition, possibly outer shelf to slope.

**Core 6** 4967-4977 ft

Rec. 10 ft. 3 boxes. Well reserved.

Whitestone River Fm (Albian)

*Mudstone*: dark grey to black; very faint, mm-scale silt laminae.

Interpretation: low-energy deposition on outer shelf or slope environment.

**Core 7** 5983-5996 ft

Rec. 13 ft. 3 boxes. Well preserved.

Whitestone River Fm. (Albian)

*Mudstone*: dark grey; laminae and very thin beds (<0.5 cm) of silt/very fine sand . Load deformed beds and contorted laminae are common. Small-scale starved ripples are present.

Interpretation: low-energy deposition on outer shelf or slope environment.

**Core 8** 6196-6206 ft

Rec. 9.5 ft. 2 boxes. Well preserved.

Whitestone River Fm (Albian)

*Interlaminated mudstone-very fine grained sandstone-siltstone*. Mm-scale laminae. In box 2 there are several burrowed horizons (mostly horizontal burrows).

Interpretation: low-energy deposition on an outer shelf, slope or basin plain environment.

**Core 9** 7119-7129 ft  
Rec. 10 ft. 3 boxes. Well preserved.  
Whitestone River Fm (Albian).

Similar to core 8.

**Core 10** 7395-7403 ft  
Rec. 8 ft. 2 boxes. Well preserved.  
Whitestone River Fm (Albian).

Similar to core 8 but with no burrowed horizons.

**Core 11** 7480-7490 ft  
Rec. 10 ft. 2 boxes. Well preserved.  
Whitestone River Fm (Albian)

Similar to core 8 but without the burrowed horizons and a greater density of laminae

**Core 12** 7879.5-7890 ft  
Rec. 10.5 ft. 3 boxes. Well preserved.  
Jurassic strata (probably Porcupine River Fm).

Extensively burrow mottled, silty to sandy *mudstone*. Remnants of fine laminae in the sandier beds (especially in box 2) suggest that the original deposit had discrete mudstone-sandstone beds prior to bioturbation. In some of the bioturbated intervals there are small diameter (few mm), white-walled burrows.

Interpretation: generally low-energy depositional environment on a mid-shelf setting.

**Core 13** 7952.5-7968 ft  
Rec. 15.5 ft. 4 boxes. Well preserved.  
Jurassic strata (probably Porcupine River Fm).

*Sandstone*: fine grained with scattered coarser grains of black chert. Massive appearance. Silica cement. No visible sedimentary structures. Clay-lined stylolites present throughout the core.

Interpretation: probably marine, inner shelf to shoreline deposit.

**Core 14** 8141.5-8151.5 ft

Rec. 10 ft. 3 boxes. Well preserved.

Paleozoic (probably Imperial Fm).

*Mudstone*: dark grey to black. Traces of fine silt laminae in a few intervals. Highly indurated. Fracturing is present at several levels within the core and at some levels the fracturing has produced a tectonic breccia.

Interpretation: low-energy deposition; could be outer shelf, slope, or basin plain.

**Core 15** 8354-8363 ft

Rec. 9 ft. 2 boxes. Moderately well preserved.

Paleozoic (probably Imperial Fm)

Similar to core 14.

**Core 16** 8684-8704 ft

Rec. 20 ft. 5 boxes. Well preserved.

Paleozoic (probably Imperial Fm).

Muddy, fine to coarse grained or granular *sandstone* beds a few cm to 45 cm thick separated by thin (few cm) mudstone beds. Sandstone beds have abrupt bases and the tops are generally abrupt. Some of the coarser grained beds show normal size grading.

Upper most 50-60 cm of core consists of interlaminated mudstone and very fine grained sandstone or siltstone.

Interpretation: appear to be typical turbidite beds.

Examined: November 1985

## CHEVRON SOBC WESTERN MINERALS NORTH PARKIN YT D-61

### **Core 1** 995-1023 ft

Rec. 28 ft. 6 boxes. Full diameter core; well preserved.  
Parkin Fm; Eagle Plain Grp (Cenomanian-Turonian).

*Mudstone*: dark grey to black. Some burrowed intervals.

Interpretation: low-energy deposition, probably mid to outer shelf.

### **Core 2** 1024-1075 ft.

Rec. 51 ft. 11 boxes. Full diameter core; well preserved.  
Parkin Fm, Eagle Plain Grp (Cenomanian-Turonian).  
Contains contact between the shale and sandstone members.  
Corresponding log depths appear to be 1018-1069 ft.

1018-1060 ft (log depths) *Mudstone*: dark grey to black; a few burrowed horizons. About 63 cm above basal contact there is a 2-3 cm layer of medium grained sandstone that displays sediment loading. Abrupt basal contact.

1060-1069 ft (log depths) *Sandstone*: medium grained; greenish coloured; bioturbated. Top of interval marked by a 4 cm thick pebble bed resting abruptly (probably erosionally) on the sandstone - pebbles of chert and sandstone and up to 5 cm in diameter.

Interpretation: contact between the basal marine transgressive sandstone and the overlying offshore marine shale is marked by a pebble lag deposit, in turn capped by a marine flooding surface.

Examined: November 1985

## CHEVRON SOBC WESTERN MINERALS EAST PINE CREEK YT O-78

### **Core 1** 2185-2245 ft

Rec. 60 ft. 12 boxes. Full diameter; well preserved.

Whitestone River Fm. (Albian)

*Mudstone*: dark grey; mm-scale laminae of silt and very fine sand throughout the core. Some of the thicker laminae (up to 7 mm) are low-amplitude, starved current-ripples with abrupt bases/tops, and commonly load deformed. No bioturbation present.

Interpretation: low-energy deposition; probably outer shelf or slope.

### **Core 2** 2345-2405 ft

Rec. 60 ft. 13 boxes. Full diameter; well preserved.

Whitestone River Fm (Albian)

Similar to core 1, although the rippled beds tend to be thicker (up to 1 cm). Carbonaceous particles on bedding planes. Concretions present in core of box 12 and 13 - laminae pass through and are compacted around the concretions.

Interpretation: low-energy deposition; outer shelf or slope.

### **Core 3** 2412-2472 ft

Rec. 60 ft. 13 boxes. Full diameter; well preserved.

Whitestone River Fm (Albian).

Similar to core 1 and 2. Contains a few concretions. Less silt/sand laminae in bottom third of core.

Interpretation: low-energy deposition; outer shelf or slope.

### **Core 4** 2473-2501 ft

Rec. 28 ft. 6 boxes. Full diameter; well preserved.

Whitestone River Fm (Albian).

*Mudstone*: massive; fewer laminae than cores 1-3, especially in bottom half of core.

Interpretation: low-energy deposition; outer shelf or slope.

**Core 5** 2501-2536 ft

Rec. 35 ft. 7 boxes. Full diameter; well preserved.

Whitestone River Fm (Albian).

Similar to core 4.

**Core 6** 2536-2596 ft

Rec. 60 ft. 13 boxes. Mostly full diameter; well preserved.

Whitestone River Fm (Albian) - Imperial Fm (Devonian).

Contact between two formations is at log depth 2552 ft, but core depth appears to be about 1-1.5 ft higher.

**WHITESTONE RIVER FM**

2536-2552 ft *Mudstone*: grey, massive, and bioturbated, gradationally underlain by about 1.1 m of thoroughly bioturbated, argillaceous, very fine to fine grained sandstone.

**IMPERIAL FM**

2552-2596 ft *Granulestone and sandstone* beds separated by thin (few cm to 20 cm thick) beds of interlaminated sand and clay, commonly ripple laminated.

Granulestone/sandstone: 10-50 cm thick beds; abrupt, erosional bases; tops may be abrupt or gradational over a thin (1 cm) interval. Commonly normally graded with granulestone at the bases of some beds. Discrete beds of granulestone also present. Typical vertical succession in a single bed is as follows:

- a) Basal scour
  - b) Granulestone (locally occurring very small pebbles) grading up into unit c
  - c) Plane laminated very fine to fine grained sandstone
  - d) Current ripple laminated sandstone
  - e) Interlaminated to thinly interbedded mudstone and current ripple laminated sandstone
- Some beds contain deformed laminae. Not all beds have the above ideal succession.

Interpretation: typical turbidites.

Examined: December 1985

**SOCONY MOBIL WESTERN MINERALS EAST PORCUPINE YT K-56**

**Core 1** 957-965 ft

Rec. 7.3 ft. 2 boxes. Moderately well preserved.

Cody Creek Fm., Eagle Plain Grp (Upper Cretaceous).

Predominantly *mudstone* with a *sandstone* in the top 30 cm.

Mudstone: medium to dark grey; fine, subhorizontal laminae - some of which are contorted; silty; plant impressions and abundant carbonaceous debris.

Sandstone: medium grey; very fine grained; massive; mottled appearance. Appears to have a gradational basal contact.

Interpretation: possibly part of a floodplain deposit (based on regional context).

Examined: November 1985



## CHEVRON SOBC GULF RIDGE YT F-48

### **Core 1** 4647-4674 ft

Rec. 26.5 ft. 6 boxes. Well preserved.

Porcupine River Fm (Jurassic).

*Sandstone*: light grey; very fine to fine grained; massive; stylolites are common. Burrows and bivalves (*Buchia*-like) are present throughout the core. Burrows have a light coloured core surrounded by darker material and commonly found as clusters of subhorizontal to inclined burrows.

### **Core 2** 4679-4699 ft

Rec. 20 ft. 5 boxes. Well preserved.

Porcupine River Fm (Jurassic)

Similar to core 1.

Examined: December 1985

CHEVRON SOBC WESTERN MINERALS SOUTH CHANCE YT D-63

**Core 1** 5436-5462 ft

Rec. 22 ft 6 boxes. Well preserved.

Missing core probably 2 ft from top and 2 ft from base.

Jungle Creek Fm (Permian)

5438-5450 ft *Mudstone*: silty to sandy. Dull, medium grey. Massive to indistinct, thin silty beds.

Silty beds tend to be load deformed. Possible vertical burrows. Fragments of brachiopod shells. Less silty in basal 2-3 ft. Gradational change from underlying sandstone.

5450-5460 ft *Sandstone*: top 4 ft consists of interlayered fine grained sandstone and granulestone and very small pebble conglomerate. Layers are 1-20 cm thick and are suggestive of large-scale cross bedding. Remainder of interval consists of light grey, very fine grained sandstone containing anastomosing clay/organic-rich laminae - these are the only indicators of bedding.

Interpretation: cored from the uppermost part of a coarsening-upward cycle. Presence of brachiopods and being part of a coarsening-upward cycle suggests a shoreline and/or lagoonal deposit.

Examined: 12th May 1993

## CHEVRON SOBC WESTERN MINERALS WEST PARKIN YT C-33

### Cores 1 and 2 2268-2286 ft

Core 1: rec. 18 ft. 4 boxes. Well preserved.

Core 2: full rec. 7 boxes. Well preserved.

Whitestone River Fm (Albian).

### Unit 1: 2268-2285.5 ft

Basal 17 ft consists of fine to medium grained *sandstone* with pebbly layers and scattered pebbles. Contains several depositional units identified by a basal scour for each unit. A typical depositional unit consists of a basal scour overlain by a pebble layer that ranges in thickness from 1 -15 cm, but most are < 5 cm thick; in turn overlain by massive to indistinctly bedded fine to medium grained sandstone in which floating pebbles may occur.

Upper 4.5 ft of unit consists of clast-supported, small-pebble (< 1 cm) conglomerate with a sand matrix. Massive appearance. May contain two depositional units.

### Unit 2: 2285.5-2317 ft

Dark grey to black indurated *shale* (equivalent log depth for top of unit could be at 2288 ft).

Interpretation: possibly turbidite beds (pebbly sandstones) underlain by low-energy deposits (shale).

Examined: November 1985

## CHEVRON SOBC WESTERN MINERALS WHITEFISH YT I-05

### **Core 1** 3986-4046 ft

Rec. 60 ft. 13 boxes. Full diameter; well preserved.

Mount Goodenough Fm (Barremian)

Equivalent log interval could be 3991 or 3992 ft to 4051/4052 ft.

a) Boxes 1-6 (23 to 24 ft of core): *mudstone* interlaminated to interbedded with silt and very fine sand. Siltstone-sandstone beds up to 5 cm thick, but are generally <2 cm thick; most contain current ripple laminae, a few ripples are wave modified.

Burrows in the sandstone beds are common and there are several thin intervals that are thoroughly bioturbated. Most sandstone beds have abrupt bases/tops, except where tops are penetrated by burrows. Minor load deformation of the ripples.

b) Boxes 7-13 (26-27 ft of core): mostly very fine to fine grained *sandstone* with thin interbeds of mudstone.

Sandstone: beds few cm to 33 cm thick; most are 5-10 cm thick. Abrupt bases; tops abrupt or gradational. Thinner beds contain current ripple laminae; a few beds have bidirectional laminae and/or wave modified ripples. Thicker beds (>15 cm) have cross laminae of indeterminate origin.

Mudstone: contains flaser-like stratification. Units 1-10 cm thick. Burrows are common. Load deformed beds and deformed laminae present ( a few highly contorted beds are present; e.g. in box 13).

### **Core 2** 4047-4071 ft

Rec. 16 ft. 4 boxes. Full diameter; well preserved.

Mount Goodenough Fm (Barremian).

Continuation of core 1.

Similar to core 1 but there is a noticeable downward decline in the thickness of the sandstone beds and the ration of mudstone: sandstone is about 1:1.

Sandstone: beds few mm to 8 cm thick; most <2 cm. All beds are ripple laminated, mostly current ripples.

Sand-filled burrows are present but not common. Carbonaceous debris on bedding planes.

Interpretation of cores 1 and 2: moderate energy levels of deposition; probably deposited below normal wave base on an inner shelf setting.

### **Core 3** 4456-4480 ft

Rec. 18 ft. 4 boxes. Full diameter; well preserved.

Mount Goodenough Fm. (Barremian).

*Mudstone*: dark grey to black. Mm-scale silt laminae throughout the core; a few laminae up to 5 mm thick and consist of starved ripple laminae.

Interpretation: low-energy sedimentation on an outer shelf, slope or basin-plain environment. Regional setting would suggest outer shelf or slope.

**Core 4** 4696-4758 ft

Rec. 11 ft. 3 boxes. Moderately well preserved; basal part broken.

Mount Goodenough Fm - basal sandstone (Barremian).

*Sandstone*: mostly fine grained but with two horizons of medium grained to granular sandstone (latter contains abundant grains of white chert). Alternations of massive-appearing and cross bedded sandstone. Several sets of cross beds, separated by erosion/reactivation surfaces.

In box 1 there is a "ball" of coarse grained sandstone, indicating some soft sediment deformation. Carbonaceous particles are common.

Interpretation: transgressive marine sandstone.

**Core 5** 4759-4797 ft

Rec. 38 ft. 8 boxes. Full diameter; moderately well preserved.

Imperial Fm (Devonian).

The contact between Mesozoic and Devonian strata should have been preserved in this core but presumably the missing part of core contained the contact.

Estimated 20 degree dip relative to horizontal axis of core (in contrast to near-horizontal aspect of overlying Mesozoic strata).

*Mudstone*: medium to dark grey; interbedded with thin (up to 19 cm) sandstone beds.

*Sandstone*: very fine grained; plane or current-ripple laminae, many of which are contorted and some beds are load deformed. Abrupt bases.

Estimate that core consists of about 90% mudstone.

Interpretation: basinal deposits (based on regional context).

Examined: December 1985

**CHEVRON SOBC WESTERN MINERALS WHITEFISH YT J-70**

**Core 1** 6714-6721 ft

Rec. 7 ft. 2 boxes. Well preserved.

Mount Goodenough Fm (Barremian).

*Sandstone*: very fine to fine grained; four beds containing low-angle cross beds separated from each other by three intervals of bioturbated sandstone. Cross bedded units 3-55 cm thick (thickest bed is an incomplete thickness). Abrupt basal contacts, gradational into bioturbated intervals. Latter are 5-40 cm thick.

Interpretation: marine, inner shelf deposit.

Examined: December 1985

SOCONY MOBIL WESTERN MINERALS WHITESTONE YT N-26

**Core 1** 3512-3521 ft

Rec. 4.5 ft. 1 box.

Fishing Branch Fm - Eagle Plain Grp (Upper Cretaceous).

*Mudstone*: medium grey with fine laminae of silt to very fine sand. Some of laminae are contorted.

Interpretation: low-energy sedimentation, probably on a mid to outer shelf setting.

**Core 2** 5073-5082 ft

Rec. 19 ft. 2 boxes.

Whitestone River Fm (Albian).

*Shale/mudstone*: medium grey; fine laminae of silt/very fine sand.

Interpretation: outer shelf or slope environment.

Examined: December 1985