MICROPALEONTOLOGY OF 38 OUTCROP SAMPLES FROM THE CHANDLER LAKE, DEMARCATION POINTS, MT. MICHELSON, PHILIP SMITH MOUNTAINS, AND SAGAVANIRKTOK QUADRANGLES, NORTHEAST ALASKA

by

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THIS REPORT HAS NOT BEEN REVIEWED FOR TECHNICAL CONTENT (EXCEPT AS NOTED IN TEXT) OR FOR CONFORMITY TO THE EDITORIAL STANDARDS OF DGGS.
Foraminifera and Palynomorph Summary

A total of 38 outcrop samples were processed and examined for palynomorphs, and 37 of the 38 samples were processed, picked and examined for Foraminifera at Micropaleo Consultants Inc., San Diego, California. Outcrop samples are from five quadrangles in northeastern Alaska: Chandler Lake (1 sample), Demarcation Point (1 sample), Mt. Michelson (4 samples), Phillip Smith Mountains (30 samples), and Sagavanirktok (2 samples). A sample location map is not included for Demarcation Point quadrangle (latitude and longitude in Appendix A). Field work was done during the summers of 1990, 1991, and 1992 from a helicopter-supported base camp at Slope Mountain.

Foraminiferal sample preparations were made by standard procedures. This process involved boiling the rock material in Quaternary-O and washing over 20 and 200 mesh screens. A representative fauna and washed lithology were then picked into slides for examination.

Palynological preparations were made using hydrochloric, hydrofluoric and nitric acid treatments. The resultant residues were further concentrated by a heavy liquid separation, sonification and a sieving/panning technique. Permanent slide mounts were made for each sample.

The interpretations for the age, zone and environment of deposition are given for each discipline. A list of the recovered microfossils is listed for each sample. Foraminiferal analysis also includes the washed lithology description. The palynological analysis also includes comments about the dominant kerogen materials and the thermal alteration Index (T.A.I.).

The foraminiferal abundances reported in this section represent the following quantities: V = very rare (single specimen), R = rare (2 - 10 specimens), F = frequent (11 - 32 specimens), C = common (33 - 99 specimens) and A = abundant (100+ specimens).

The abundances for the palynomorphs represent the following quantities: V = very rare (single specimen), R = rare (2 - 5 specimens), F = frequent (6 - 15 specimens), C = common (16 - 30 specimens) and A = abundant (greater than 30 specimens).

FORAMINIFERA AND PALYNOLGY RESULTS

01) 92MU 29 Formation: Okpikruak Fm.?
General Location: Section Creek

PALYNOLOGY
Age. Indeterminate
Environment. No evidence of marine.
Palynomorphs. Indeterminate spore(?) fragments (F)
            Poor preservation.
Kerogen.  Mainly woody-fusinitic. T.A.I. = 2.8 - 3.0

FORAMINIFERA
Age. Indeterminate
Environment. Indeterminate
Fauna. Barren of Foraminifera.
Washed lith. Dark brownish gray shale

02) 92MU 29-2 Formation: Okpikruak Fm.?
General Location: Section Creek

PALYNOLOGY
Age. Indeterminate
Environment. No evidence of marine.
Palynomorphs. Indeterminate spore(?) fragments (R)
            Poor preservation.
Kerogen.  Mainly woody-fusinitic. T.A.I. = 2.8 - 3.0

FORAMINIFERA
Age. Indeterminate
Environment. Indeterminate
Fauna. Barren of Foraminifera.
Washed lith. Fecal pellets (F)
            Dark brownish gray slightly silty shale
03) 92MU 29-3 Formation: Torok Fm?
General Location: Section Creek

PALYNOLOGY

Age: Indeterminate
Environment: No evidence of marine.
Palynomorphs: Indeterminate spore fragments (F)
Kerogen: Mainly woody-fusinite. T.A.I. = 2.8 - 3.0

FORAMINIFERA

Age: Indeterminate
Environment: Indeterminate
Fauna: Barren of Foraminifera.
Washed lith: Dark brownish gray shale

04) 92MU 30A Formation: Okpikruak Fm.? General Location: Atigun Gorge

PALYNOLOGY

Age: Early Cretaceous
Zone: Hauterivian - Barremian
Environment: Marine
Palynomorphs: Undifferentiated bisaccates (A)
Lycopodiumsporites sp. (V)
Trilobosporites apiverrucatus (V)
Gonyaulacysta sp. (V)
Muderongia cf. M. simplex (F)
Oligosphaeridium complex (thick-wall) (R)
Kerogen: Mainly woody-fusinite. T.A.I. = 3.0

FORAMINIFERA

Age: Indeterminate
Environment: Indeterminate
Fauna: Barren of Foraminifera.
Washed lith: Dark brownish gray shale

05) 92MU 30B Formation: Okpikruak Fm.? General Location: Atigun Gorge

PALYNOLOGY

Age: Early Cretaceous
Zone: Hauterivian - Barremian
Environment: Marine
Palynomorphs: Undifferentiated bisaccates (A)
Classopolis classoides (V)
Gleicheniidites senonicus (V)
Lycopodiumsporites sp. (V)
Muderongia cf. M. simplex (R)
Santusidinium rioultii (V)
Kerogen: Mostly woody-fusinite. T.A.I. = 3.0

FORAMINIFERA

Age: Indeterminate
Environment: Indeterminate
Fauna: Barren of Foraminifera.
Washed lith: Dark brownish gray shale
06) 92MU 31  Formation: Echooka Fm  General Location: Section Creek
PALYNOLGY
Age.  Indeterminate
Environment.  Indeterminate
Palynomorphs.  Barren of palynomorphs.
Kerogen.  Mostly woody-fusinitic. T.A.I. = 3.0?
FORAMINIFERA
Age.  Indeterminate
Environment.  Indeterminate
Fauna.  Barren of Foraminifera.
Washed lith.  Dark gray to black slightly paper shale

07) 92MU 46-3  Formation: Phosphatic Shale  General Location: Sagavanirktok River Bluff
PALYNOLGY
Age.  Probable Early Cretaceous
Environment.  Undifferentiated
Palynomorphs.  Poor preservation.
Kerogen.  Mostly woody-fusinitic. T.A.I. = 3.0
FORAMINIFERA
Age.  Probable Early Cretaceous
Zone.  F-12 to F-14
Environment.  Indeterminate
Fauna.  Barren of Foraminifera.
Washed lith.  Dark brownish gray slightly paper shale
Discussion.  Based on lithology only.

08) 92MU 46-4  Formation: Phosphatic Shale  General Location: Sagavanirktok River Bluff
PALYNOLGY
Age.  Probable Early Cretaceous
Environment.  Undifferentiated
Palynomorphs.  Undifferentiated bisaccates (R)
Kerogen.  Mostly woody-fusinitic. T.A.I. = 3.0
FORAMINIFERA
Age.  Probable Early Cretaceous
Zone.  F-12 to F-14
Environment.  Middle Neritic to Bathyal
Fauna.  Lenticulina muensteri (R)
Washed lith.  Dark brownish gray paper shale
09) 92MU 48 Formation: Kingak Shale  General Location: Lupine River

**PALYNOMOLOGY**

- **Age:** Indeterminate
- **Environment:** Indeterminate
- **Palynomorphs:** Barren of palynomorphs.
  - Very sparse organics.
- **Kerogen:** Mostly woody-fusinltic. T.A.I. = 3.0?

**FORAMINIFERA**

- **Age:** Indeterminate
- **Environment:** Indeterminate
- **Fauna:** Barren of Foraminifera.
- **Washed lith:** Black shale

10) 92MU 51 Formation: Kingak Shale  General Location: Lupine River

**PALYNOMOLOGY**

- **Age:** Indeterminate
- **Environment:** Nonmarine?
- **Palynomorphs:** Undifferentiated bisaccates (C)
  - Hymenozonotriletes lepidophytus (R) reworked
- **Kerogen:** Mostly woody-fusinltic. T.A.I. = 3.5

**FORAMINIFERA**

- **Age:** Indeterminate
- **Environment:** Indeterminate
- **Fauna:** Barren of Foraminifera.
  - Paper shale (R)
- **Washed lith:** Dark brownish gray shale

11) 92MU 55 Formation: Kingak Shale  General Location: Lupine River

**PALYNOMOLOGY**

- **Age:** Early Cretaceous
  - Neocomian (Undiff.)
- **Environment:** Marine
- **Palynomorphs:** Densosporites sp. (V) reworked
  - Gleicheniidites senonicus (V)
  - Hymenozonotriletes lepidophytus (R) reworked
  - ?Nelchinopsis kostromiensis (V)
  - Oligosphaeridium complex (thick-wall) (R)
- **Kerogen:** Mostly woody-fusinltic. T.A.I. = 3.5

**FORAMINIFERA**

- **Age:** Possible Late Jurassic
  - Oxfordian? to Kimmeridgian?
  - F-16?
- **Zone:** Outer Neritic to Middle Bathyal
- **Fauna:** Haplophragmoides canui (X)
  - Reinholdella hofkeri (X)
  - Paper shale (F)
- **Washed lith:** Dark brownish gray slightly paper shale
- **Discussion:** Two (2) poorly preserved specimens only, could be reworked?
12) 92MU 59 Formation: Upper Nanushuk Grp. General Location: Nanushuk River

**PALYNOLOGY**

- **Age:** Early Cretaceous
- **Zone:** P-M18 to P-M17
- **Environment:** Marine
- **Palynomorphs:**
  - Undifferentiated bisaccates (C)
  - Taxodiaceae (A)
  - *Cribroperidinium edwardsi* (V)
  - *Cyclonephelium compactum* (R)
  - *Cyclonephelium distinctum* (R)
  - *Hystrichodinium pulchrum* (F)
  - *Hystrichosphaeridium stellatum* (V)
  - *Microdinium opacum* (V)
  - *Odontochitina operculata* (F)
  - *Oligosphaeridium complex* (F)
  - *Spiniferites spp.* (R)

- **Kerogen:** Mainly woody-fusinitic. T.A.I. = 2.5 Keroaen.

**FORAMINIFERA**

- **Age:** Early Cretaceous
- **Zone:** F-11?
- **Environment:** Outer Neritic to Bathyal
- **Fauna:**
  - *Gaudryina cf. tailleuri* (F)
  - *Haplophragmoides spissum* (F)
  - *Haplophragmoides collyra* (F)
  - *Trochammina mcmurrayensis* (C)
  - *Trochamminoides sp.* (small, thin) (C)

- **Washed lith.:** Orange-brown iron-stained siltstone or silty shale

13) 92MU 61 Formation: Upper Kingak Shale General Location: Echooka River

**PALYNOLOGY**

- **Age:** Possible Early Cretaceous
- **Environment:** Poor preservation.
- **Palynomorphs:**
  - Undifferentiated bisaccates (R)
  - *Classopollis classoides* (R)
  - *Gleicheniidites senonicus* (R)
  - *Lycopodiumsporites sp.* (V)
  - *Osmundacidites sp.* (V)
  - *Microdinium opacum* (V)

- **Kerogen:** Mostly woody-fusinitic. T.A.I. = 3.0 - 3.5 Keroaen.

**FORAMINIFERA**

- **Age:** Probable Early Cretaceous
- **Zone:** F-12 to F-14
- **Environment:** Middle Neritic to Bathyal
- **Fauna:**
  - Arenaceous spp. (large, coarse) (R)
  - Rounded frosted quartz floaters (C)

- **Washed lith.:** Dark brownish gray to black slightly sandy shale
14) 92MU 64  Formation: Arctic Creek Unit  General Location: Arctic Creek

PALYNOLOGY

Age: Possible Early Cretaceous
Environment: Undifferentiated Marine?
Palynomorphs: Indeterminate spore fragments (R)
Undifferentiated bisaccates (R)
Gleicheniidites senonicus (R)
Kerogen: Mostly woody-fusinitic. T.A.I. = 3.5

FORAMINIFERA
Age: Indeterminate
Environment: Indeterminate
Fauna: Barren of Foraminifera.
Washed lith: Dark gray iron-stained slightly silty shale

15) 92MU 66  Formation: Pebble Shale Unit  General Location: Katakturuk River

PALYNOLOGY

Age: Possible Early Cretaceous
Environment: Undifferentiated Marine
Palynomorphs: Oligosphaeridium complex (thick-wall) (V)
Kerogen: Mostly amorphous. T.A.I. = 3.0

FORAMINIFERA
Age: Probable Early Cretaceous Neocomian (Undiff.)
Zone: F-12 to F-14
Environment: Indeterminate
Fauna: Barren of Foraminifera.
Washed lith: Rounded frosted quartz floaters (F)
Discussion: Based on lithology only.

16) 92MU 68  Formation: Kingak Shale  General Location: Niguanak River

PALYNOLOGY

Age: Early - Middle Jurassic
Zone: P-M23
Environment: Marine
Palynomorphs: Undifferentiated bisaccates (F)
Classopollis clausoides (R)
Dansisorites spp. (C) reworked
Hymenozonotriletes lepidophytus (V) reworked
Lycopodiumsporites spp. (R)
Micrhystridium spp. (A)
Nannoceratopsis gracilis (A)
Tasmanaceae (F)
Kerogen: Mostly herbaceous. T.A.I. = 2.5

FORAMINIFERA
Age: Indeterminate
Environment: Indeterminate
Fauna: Barren of Foraminifera.
Washed lith: Orange-brown iron-stained very fine grained sandstone or siltstone
<table>
<thead>
<tr>
<th>Formation</th>
<th>General Location</th>
<th>PALYNOLOGY</th>
</tr>
</thead>
</table>
| 90AMU 6-2 Formation: Kemik Sandstone | Ignek Creek            | **Age:** Indeterminate<br>**Environment:** No evidence of marine.  
**Palynomorphs:** *Densosporites* spp. (R) reworked  
**Kerogen:** Sparse organics.  
Mostly woody-fusinitic.  
T.A.I. = ? |
| 90AMU 6-2 Formation: Kemik Sandstone | Ignek Creek            | **Age:** Indeterminate<br>**Environment:** No evidence of marine.  
**Palynomorphs:** *Densosporites* sp. (V) reworked  
**Kerogen:** Mostly woody-fusinitic.  
T.A.I. = 2.7? |
| 91MU 42-3 Formation: Upper Kingak Shale | Upper Shavlovik River | **Age:** Probable Early Cretaceous  
Barrasian to Valanginian<br>**Zone:** F-13 to F-14  
**Environment:** Outer Neritic to Middle Bathyal  
**Fauna:** *Ammobaculites fragmentarius* (X)  
*Arenaceous* spp. (large, coarse) (F)  
*Haplophragmoides duoflatis* (R)  
*Haplophragmoides goodenoughensis* (R)  
Rounded frosted quartz floaters (F)  
**Washed lith:** Dark brownish gray to black slightly sandy shale |
| 92RR 60A Formation: Kingak Shale | Savlukviayak           | **Age:** Indeterminate<br>**Environment:** Indeterminate  
**Palynomorphs:** Few Indeterminate, corroded palynomorphs (spores?).  
**Kerogen:** Mostly woody-fusinitic.  
T.A.I. = 3.8 |
| 92RR 60A Formation: Kingak Shale | Savlukviayak           | **Age:** Indeterminate<br>**Environment:** Indeterminate  
**Fauna:** Barren of Foraminifera.  
**Washed lith:** Black splintery shale |
21) 92TJR 01A Formation: Torok Fm.
General Location: Slope Mountain

PALYNOLOGY
Age: Probable Early Cretaceous
Possible Aptian - Albian

Zone: Possible P-M18 to P-M17

Environment: Marine

Palynomorphs:
Undifferentiated bisaccates
Cicatricosisporites sp. (V)
Classopollis classoides (V)
Densosorites spp. (R) reworked
Cleistosphaeridium sp. (V)
Cerioperostridium edwardsi (V)
Cyclonephelium distinctum (R)
Pseudoceratium retusum (V)
Sverdrupiella usitata (V) reworked

Kerogen:
Remarks.

FORAMINIFERA
Age: Early Cretaceous
Aptian to Albian

Zone: F-10 to F-11

Environment: Middle Neritic to Bathyal

Fauna:
Ammobaculites fragmentarius (F)
Haplophragmoides excavata (F)
Haplophragmoides topagorukensis (R)
Haplophragmoides kirki (F)
Lenticulina macrodisca (X)
Verneuilinoides borealis (F)
Fecal pellets (R)

Washed lith.
Dark brownish gray silty shale

22) 92TJR 01 E Formation: Torok Fm.
General Location: Slope Mountain

PALYNOLOGY
Age: Early Cretaceous
Aptian - Albian

Zone: P-M18 to P-M17

Environment: Marine

Palynomorphs:
Undifferentiated bisaccates
Cerioperostridium edwardsi (V)
Cyclonephelium distinctum (R)
Oligosphaeridium complex (R)
Oligosphaeridium complex (thick-wall) (V)
Pseudoceratium retusum (V)

Kerogen:
Remarks.
The presence of Pseudoceratium retusum suggests an age no younger than middle Albian.

FORAMINIFERA
Age: Early Cretaceous
Aptian to Albian

Zone: F-11?

Environment: Outer Neritic to Bathyal

Fauna:
Ammobaculites fragmentarius (F)
Gaudryina cf. tailleuri (F)
Haplophragmoides collyra (F)
Haplophragmoides spissum (F)
Coal (F)

Washed lith.
Dark gray siltstone or silty shale
23) 92TJR 01F  Formation: Torok Fm.  General Location: Slope Mountain

**PALYNOCYLOGY**

| Age       | Indeterminate |
| Environment | No evidence of marine. |
| Palynomorphs | Undifferentiated bisaccates (R) |
|            | *Deltoidospora* sp. (V) |
|            | *Densosporites* sp. (V) reworked |
| Kerogen    | Mostly woody-fusinitic. T.A.I. = 2.7 |

**FORAMINIFERA**

| Age       | Indeterminate |
| Environment | Indeterminate |
|            | Barren of Foraminifera. |
| Washed lith | Orange-brown heavily iron-stained slightly silty shale |

24) 92TJR 01G  Formation: Tuktu Fm.  General Location: Slope Mountain

**PALYNOCYLOGY**

| Age       | Early Cretaceous |
| Environment | Undifferentiated |
| Palynomorphs | Undifferentiated bisaccates (C) |
|            | *Gleicheniidites senonicus* (V) |
|            | *Trilobosporites perverulentus* (V) |
|            | *Cribroperidinium edwardsi* (R) |
| Kerogen    | Mostly woody-fusinitic. T.A.I. = 2.5 |

**FORAMINIFERA**

| Age       | Indeterminate |
| Environment | Indeterminate |
|            | Barren of Foraminifera. |
| Washed lith | Dark brownish gray slightly paper shale |

25) 92TJR 01H  Formation: Tuktu Fm.  General Location: Slope Mountain

**PALYNOCYLOGY**

| Age       | Indeterminate |
| Environment | No evidence of marine. |
| Palynomorphs | Undifferentiated bisaccates (F) |
| Kerogen    | Mostly woody-fusinitic. T.A.I. = 2.3 |

**FORAMINIFERA**

| Age       | Indeterminate |
| Environment | Indeterminate |
|            | Barren of Foraminifera. |
| Washed lith | Dark brownish gray iron-stained slightly paper shale |
26) 92TJR 01J Formation: Tuktu Fm.

**PALYNOLOGY**

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<tr>
<td>Zone</td>
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<tr>
<td>Environment</td>
<td>Marine</td>
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<td>Palynomorphs</td>
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<tr>
<td>Kerogen</td>
<td>Mostly woody-fusinitic. T.A.I. = 2.3 - 2.5</td>
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**FORAMINIFERA**

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<tr>
<td>Fauna</td>
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</tr>
<tr>
<td>Washed lith.</td>
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27) 92TJR 01N Formation: Tuktu Fm.

**PALYNOLOGY**

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<td>Palynomorphs</td>
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<tr>
<td>Kerogen</td>
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**FORAMINIFERA**

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<tr>
<td>Fauna</td>
<td>Barren of Foraminifera.</td>
</tr>
<tr>
<td>Washed lith.</td>
<td>Dark brownish gray iron-stained micaceous shale</td>
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28) 92TJR 01O Formation: Tuktu Fm.

**PALYNOLOGY**

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<td>Zone</td>
<td>Marine</td>
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<tr>
<td>Environment</td>
<td>Marine</td>
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<td>Palynomorphs</td>
<td>Undifferentiated bisaccates (C)</td>
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<tr>
<td>Kerogen</td>
<td>Mostly woody-fusinitic. T.A.I. = 2.3 - 2.5</td>
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**FORAMINIFERA**

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<td>Environment</td>
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<tr>
<td>Fauna</td>
<td>Barren of Foraminifera.</td>
</tr>
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<td>Washed lith.</td>
<td>Dark brownish gray paper shale</td>
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</table>
29) 92TJR 01Z  Formation: Chandler Fm.  General Location: Slope Mountain

**PALYNOLOGY**

- **Age:** Indeterminate
- **Environment:** No evidence of marine.
- **Palynomorphs:**
  - Undifferentiated bisaccates (A)
  - *Clitricosisporites* spp. (F)
  - *Deltoidospora* spp. (R)
  - *Densosporites* spp. (V) reworked
  - *Gleicheniidites senonicus* (V)
  - *Laevigatosporites* spp. (F)
  - *Osmundacidites* spp. (R)
- **Kerogen:** Mostly woody-fusinitic. T.A.I. = 2.3 - 2.5

**FORAMINIFERA**

Not analyzed for Foraminifera.

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30) 92RR 47B  Formation: Fortress Mtn. Fm.  General Location: Section Creek

**PALYNOLOGY**

- **Age:** Indeterminate
- **Environment:** No evidence of marine.
- **Palynomorphs:**
  - Indeterminate spores (R). Poor preservation.
- **Kerogen:** Mostly woody-fusinitic. T.A.I. = 3.0

**FORAMINIFERA**

- **Age:** Indeterminate
- **Environment:** Indeterminate
- **Fauna:** Barren of Foraminifera.
- **Washed lith:** Dark brownish gray silty shale

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31) 92RR 47D  Formation: Fortress Mt. Fm.  General Location: Section Creek

**PALYNOLOGY**

- **Age:** Indeterminate
- **Environment:** Indeterminate
- **Palynomorphs:** Barren of palynomorphs.
- **Kerogen:** Mostly woody-fusinitic. T.A.I. = 3.0?

**FORAMINIFERA**

- **Age:** Indeterminate
- **Environment:** Indeterminate
- **Fauna:** Barren of Foraminifera.
- **Washed lith:** Dark gray slightly silty shale

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32) 92RR 49C  Formation: Below Coquinoid Ls.  General Location: W. Elusive Lake

**PALYNOLOGY**

- **Age:** Indeterminate
- **Environment:** Indeterminate
- **Palynomorphs:** Barren of palynomorphs.
- **Kerogen:** Mostly woody-fusinitic. T.A.I. = 3.8

**FORAMINIFERA**

- **Age:** Indeterminate
- **Environment:** Indeterminate
- **Fauna:** Barren of Foraminifera.
- **Washed lith:** Paper shale (C)
- **Washed lith:** Black paper shale
33) 92RR 54A  Formation: Below Phosphatic Shale  General Location: Phillip Smith Mtns. D-3 Sect. 18

PALYNOCOLOGY

Age: Indeterminate
Environment: No evidence of marine.
Palynomorphs: Sparse organic recovery.
Paleod追cmorphs: Undifferentiated bisaccates (R)
Kerogen: Mostly woody-fusinitic. T.A.I. = 3.8

FORAMINIFERA

Age: Indeterminate
Environment: Indeterminate
Fauna: Barren of Foraminifera.
Washed lith: Dark brownish gray shale

34) 92RR 54D  Formation: Kingak Shale?  General Location: Phillip Smith Mtns. D-3 Sect. 18

PALYNOCOLOGY

Age: Indeterminate
Environment: Indeterminate
Palynomorphs: Barren of palynomorphs. Very sparse organics.
Kerogen: Mostly woody-fusinitic. T.A.I. = 3.8?

FORAMINIFERA

Age: Indeterminate
Environment: Indeterminate
Fauna: Barren of Foraminifera.
Washed lith: Paper shale (F)
Washed lith: Dark gray slightly paper shale

35) 92RR 54E  Formation: Kingak Shale  General Location: Phillip Smith Mtns. D-3 Sect. 18

PALYNOCOLOGY

Age: Early Cretaceous
Zone: Possible Berriasian - Valanginian
P-M20?
Palynomorphs: Indeterminate spores (F)
Undifferentiated bisaccates (F)
Gleicheniidites senonicus (R)
Oligosphaeridium complex (thick-wall) (R)
Gochtodinia villosa (V)
Kerogen: Mostly woody-fusinitic. T.A.I. = 3.8

FORAMINIFERA

Age: Probable Early Cretaceous
Zone: Neocomian (Undiff.)
Environment: F-12 to F-14
Fauna: Barren of Foraminifera.
Washed lith: Paper shale (A)
Washed lith: Rounded frosted quartz floaters (F)
Washed lith: Dark gray to black slightly sandy paper shale
Discussion: Based on lithology only.

PALYNOLOGY

Age: Indeterminate
Environment: Marine
Palynomorphs: Indeterminate spores (F)
Undifferentiated bisaccates (R)
Densosporites sp. (V) reworked
Micro foramin test-lining (V)
Kerogen: Mostly woody-fusinitic. T.A.I. = 3.8

FORAMINIFERA

Age: Indeterminate
Environment: Indeterminate
Fauna: Barren of Foraminifera.
Washed lith: Dark gray to black shale

37) 92RR 58A  Formation: Kingak Shale  General Location: Phillip Smith Mtns. D-3 Sect.24

PALYNOLOGY

Age: Possible Early Cretaceous
Environment: Undifferentiated
Marine
Palynomorphs: Oligosphaeridium complex (thick-wall) (V)
Kerogen: Mostly woody-fusinitic. T.A.I. = 2.5?

FORAMINIFERA

Age: Indeterminate
Environment: Indeterminate
Fauna: Barren of Foraminifera.
Washed lith: Dark gray to black shale

38) 92RR 59C  Formation: Tuktu Fm.  General Location: Lupine River

PALYNOLOGY

Age: Indeterminate
Environment: Indeterminate
Palynomorphs: Barren of palynomorphs.
Kerogen: Mostly woody-fusinitic. T.A.I. = 3.0?

FORAMINIFERA

Age: Indeterminate
Environment: Indeterminate
Fauna: Barren of Foraminifera.
Washed lith: Dark brownish gray shale
## APPENDIX A

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