Chronostratigraphic summaries based on palynological content of cuttings from the following Copper River Basin oil and gas exploratory wells:

Aledo Oil Company Eureka No. 2 (2,000' - 7,900'),
Amoco Production Co. Ahtna Inc. No. 1 (2,000' - 7,000'),
Mobil Oil Corp. Salmonberry Lake Unit No. 1 (1,500' - 7,800'),
Pan American Moose Creek Unit No. 1 (1,980' - 7,860'), and
Union Oil Company of California Tazlina No. 1 (2,670' - 8,837').

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CHRONOSTRATIGRAPHIC SUMMARIES

The chronostratigraphic interpretation of these wells based on palynological content is rather broad, and should be considered subject to revision as further information becomes available. Overall, the wells contain few taxa having stratigraphic ranges adequately constrained by previous documentation; no published information on biostratigraphy from this basin is known to me. Certain anomalies and observed ranges appearing to conflict with published data from elsewhere, coupled with the presence of apparently undescribed taxa complicate the interpretation further. Individual instances of these problems will be discussed as appropriate in the well summaries that follow. These chronostratigraphic summaries are to be considered current best estimates of ages based on observed distributions of particular taxa.

Pan American Moose Creek Unit No. 1

MOOSE CREEK #1

The examined section of the Moose Creek #1 well covers an interval from 1980-7860' measured depth, with individual samples composited over intervals generally of 100-150'. A few gaps occur in the sample coverage, indicated by blank intervals on the distribution chart. The interpreted chronostratigraphy is:

1980-3180'	probable Cenomanian
3180-5050'	?Aptian/Albian
5170-6280'	Hauterivian/?Barremian
6320-7860'	age uncertain

The probable Cenomanian interval (1980-3180') is dominated by nonmarine taxa, especially indeterminate bisaccate gymnospermous pollen, and including the spore species *Plicatella potomacensis*, *P. cristata*, *Costatoperforosporites foveolatus*, *Foveosporites* cf. *cenomanicus* and, near the base of the interval, *Cicatricosisporites crassiterminatus*. The latter species is widely recorded in Cenomanian strata in central

COPPER RIVER BASIN
ALASKA

FROM WELL CUTTINGS

North America, and the others cited also are characteristic of mid-Cretaceous assemblages. Taxa known to be limited to Albian and older strata were not seen in this interval. Marine dinoflagellate cysts are present, but are confined to forms of the genera *Spiniferites*, *Impletosphaeridium* and *Circulodinium*, and do not contain species of usefully limited stratigraphic occurrence.

The placement of the Albian-Cenomanian boundary at 3180' is based on a conspicuous event revealed by the correlation coefficient matrix for this well . It could comfortably be placed as low as 3400' based on the distribution of individual taxa, in particular the uppermost occurrence of *Impardecispora apiverrucata*. In this interval, other observed forms characteristic of Aptian/Albian strata include *Foveosporites pantostiktos*, *Ornamentifera baculata*, *O. echinata*, *Concavissimisporites variverrucatus*, *Callialasporites dampieri* and *Couperisporites complexus*. Dinoflagellate cysts are somewhat more abundant in this interval than they are above, and include various forms assignable to *Cribroperidinium*, *Odontochitina operculata*, *Oligosphaeridium* sp. - indet., *Dinopterygium*? sp. - indet., and the uppermost occurrence of a peculiar dinoflagellate designated here as cf. *Balcattia* sp. 1.

The interval from 5170-6280' is considered Hauterivian/?Barremian in age. The placement of the boundary again coincides with an event delineated by the correlation coefficient matrix. Dinoflagellate cysts become conspicuously more abundant and diverse in this interval than in the intervals above, and include forms such as *Hystrichosphaerina schindewolfii*, *Florentinia cooksoniae*, *Nelchinopsis kostromiensis* (a useful Hauterivian indicator on the Alaska North Slope), *Prolixosphaeridium parvispinum* and an abundance of cf. *Balcattia* sp. 1.

Below 6320', the observed palynological assemblage consists of a rich and diverse population of Paleocene pollen and spores considered to be contaminants from Ft. Union lignites, which are commonly used as mud additives. No clearly *in situ* taxa were observed, and below this horizon the age of the strata must be considered uncertain.

Union Oil Company of California Tazlina No. 1

TAZLINA #1

The examined section of the Tazlina #1 well covers an interval from 2670-8837 measured depth, with individual samples composited over intervals generally of 150'. Again there are a few gaps occur in the sample coverage, indicated by blank intervals on the distribution chart. The interpreted chronostratigraphy is:

2670-5520' ?Cenomanian-Santonian
5820-6570' probable Neocomian
6570-8837 ?middle Jurassic

The interval from 2670-5520' contains a mixture of late Cretaceous marine and nonmarine taxa, within which chronostratigraphic boundaries are difficult to place with confidence. The presence of *Odontochitina porifera* suggests an age of Santonian for at least the upper part of the interval, as does the extremely rare presence of *Aquilapollenites* spp., so long as these taxa are not caved from overlying strata. Most constituents of the overall assemblage observed in this interval are stratigraphically nondistinctive.

At 5820' and continuing downward is an assemblage containing the spore species *Contignisporites glebulentus*, a form most commonly recorded from Neocomian strata worldwide. *Deltoidospora* spp. become conspicuously more abundant than in the interval

above, although this characteristic of the assemblage is not strongly age-diagnostic. As above, most components of the population are long-ranging forms having little individual stratigraphic value.

Below 6570' the palynomorph population is rich and diverse, and consists dominantly of nonmarine forms (the few marine forms seen may be caved from above). *Deltoidospora* spp. dominate throughout the interval, along with consistent occurrences of *Eucommiidites troedssonii* and a form closely resembling (probably conspecific to) *Microreticulatisporites fuscus*, a form not known with certainty to range above middle Jurassic strata. The absence of well-known late Jurassic taxa suggests that this interval should be regarded as middle or possibly early Jurassic. The 6570' depth horizon coincides with a conspicuous boundary-signature event on the correlation coefficient matrix

Amoco Production Company Ahtna Inc. No. 1

AHTNA #1

Samples from the Ahtna #1 well were consistently the richest and most diverse of any well examined in this project. Samples were composited uniformly to 100' intervals over a total depth interval of 2000-7000', with no gaps. The interpreted chonostratigraphy is:

2000-2900' Cenomanian-?Santonian
2900-5600' ?Aptian-Albian
5600-6900' Neocomian-?Barremian
6900-7000' ?Jurassic (probable middle or early)

As in the Moose Creek well, the uppermost interval (2000-2900') in Ahtna #1 contains a mix of forms with somewhat contradictory known ranges of stratigraphic occurrence, including single specimens of *Contignisporites glebulentus* and *Taurocusporites segmentatus* (usually regarded as Early Cretaceous indicators) and *Aquilapollenites trialatus* (Santonian-Campanian). The former species may be reworked, or the latter may be caved. The consistent presence in abundance of *Distaltriangulisporites perplexus*, an indicator of Cenomanian and older strata on the Alaska North Slope, suggests a Cenomanian interpretation for the entire interval, if the occurrence of *A. trialatus* is from caved material. The boundary at 2900' is a conspicuous horizon on the correlation coefficient matrix

Strata from 2900-5600' are considered ?Aptian-Albian in age, and the palynomorph population from this interval includes such conspicuous Albian and older forms as *Rogalskaisporites cicatricosus*, *Callialasporites turbatus*, *Impardecispora marylandensis*, *I. excavata*, *Foraminisporis wonthaggiensis*, *Stoverisporites lunaris* and *Ornamentifera echinata*. Among the dinoflagellate cysts is *Senoniasphaera* cf. *microreticulata*; S. microreticulata sensu stricto is characteristic of Aptian and slightly older strata on the Alaska North Slope. The uppermost occurrence of *Hystrichosphaerina schindewolfii* at 5100' may signify Barremian strata, but there is some uncertainty about the range of this dinoflagellate cyst in Alaska.

A conspicuous correlation coefficient boundary at 5600' is used for placement of the Neocomian-?Barremian/?Aptian-Albian boundary in this well. Below 5600' a very rich, diverse assemblage of mixed dinoflagellate cysts and pollen/spores is present, including abundant occurrences of cf. *Balcattia* sp. 1 (note -- designated as "*Balcattia*? sp. - reduced ornament" on Enclosure 3) and an apparent elongated variant of *Prolixosphaeridium parvispinum*, the latter not observed in any other well. Age

determination of this interval is somewhat conjectural, as it is lacking in well-understood stratigraphic indicators.

The lowermost sample in the well (6900-7000') contains a single occurrence of *Microreticulatisporites fuscus*, and is regarded as questionably Jurassic on this basis.

Aledo Oil Company Eureka No. 2

EUREKA #1 *2

Samples from Eureka #1 were composited at 100' intervals over a total depth interval of 2000-7900', with several gaps in the lower portion of the well as indicated on Enclosure 4. The interpreted chronostratigraphy is:

2000-4600' ?Turonian-?Santonian
4600-6700' Albian-?Cenomanian
6800-7900' age uncertain

The uppermost interval (2000-4600') contains a mixed marine-nonmarine assemblage including the dinoflagellate cysts *Chatangiella* cf. *ditissima*, *Odontochitina operculata* and *Xenascus* cf. *ceratioides*. *C. ditissima sensu stricto* is present consistently in mid-Campanian to Santonian strata in the North Slope. As a group, *Chatangiella* spp. range downward into strata as old as Turonian in some places. Certain of the spore species present in this interval (e.g., *Distaltriangulisporites perplexus*, *D. mutabilis*, *Foraminisporis wonthaggiensis*, *Callialasporites dampieri*, *Sestrosporites pseudoalveolatus*) are usually suggestive of slightly older strata, but their uppermost range of occurrence may differ here, or there may be some reworking. The lower boundary corresponds to a conspicuous event signature on the correlation coefficient matrix

From 4600-6700' the palynological assemblage more clearly consists of characteristic mid-Cretaceous (Albian-Cenomanian) taxa, such as *Canningia colliveri*, *Cicatricosisporites crassiterminatus* and *Plicatella fucosa* .

The lowermost interval in the well (6800-6900') was only sparsely fossiliferous, and it is possible that even these sparse fossils represent material caved from strata above. Two samples were entirely barren, and the others nearly so. The age is regarded therefore as uncertain.

Mobil Oil Corp. Salmonberry Lake Unit No. 1

SALMONBERRY LAKE #1

Overall, assemblages from the Salmonberry Lake #1 well were the least diverse of any of the wells. Samples consisted uniformly of 100' composites over a total interval of 1500-7800' with no sample gaps. The interpreted chronostratigraphy is:

1500-1900' Tertiary, undifferentiated
1900-3100' Cenomanian-?younger
3100-7800' ?middle Jurassic

The uppermost interval contains an exclusively nonmarine assemblage, including characteristic long-ranging Tertiary pollen such as *Tiliaepollenites vescipites*, *Ericipites* sp., *Betulaceoipollenites* group and *Alnipollenites verus*. This assemblage was not observed in any other well.

A Cretaceous interval interpreted as Cenomanian-?younger, characterized by a relative abundance of *Distaltriangulisporites perplexus* is present from 1900-3100'. This interval contains little else in the way of stratigraphically distinctive forms, and is dominated by material of nonmarine origin. Rare occurrences of Tertiary pollen, such as *Alnipollenites verus*, are probably caved.

The longest interval in the well (3100-7800') consists of a relatively sparse and dominantly nonmarine ?middle Jurassic assemblage, of which *Microreticulatisporites fuscus* is the key element.

CORRELATIONS

Figure 1 below shows diagramatically the inferred stratigraphic relationships among wells examined for this project, along with depths of interpreted boundaries.

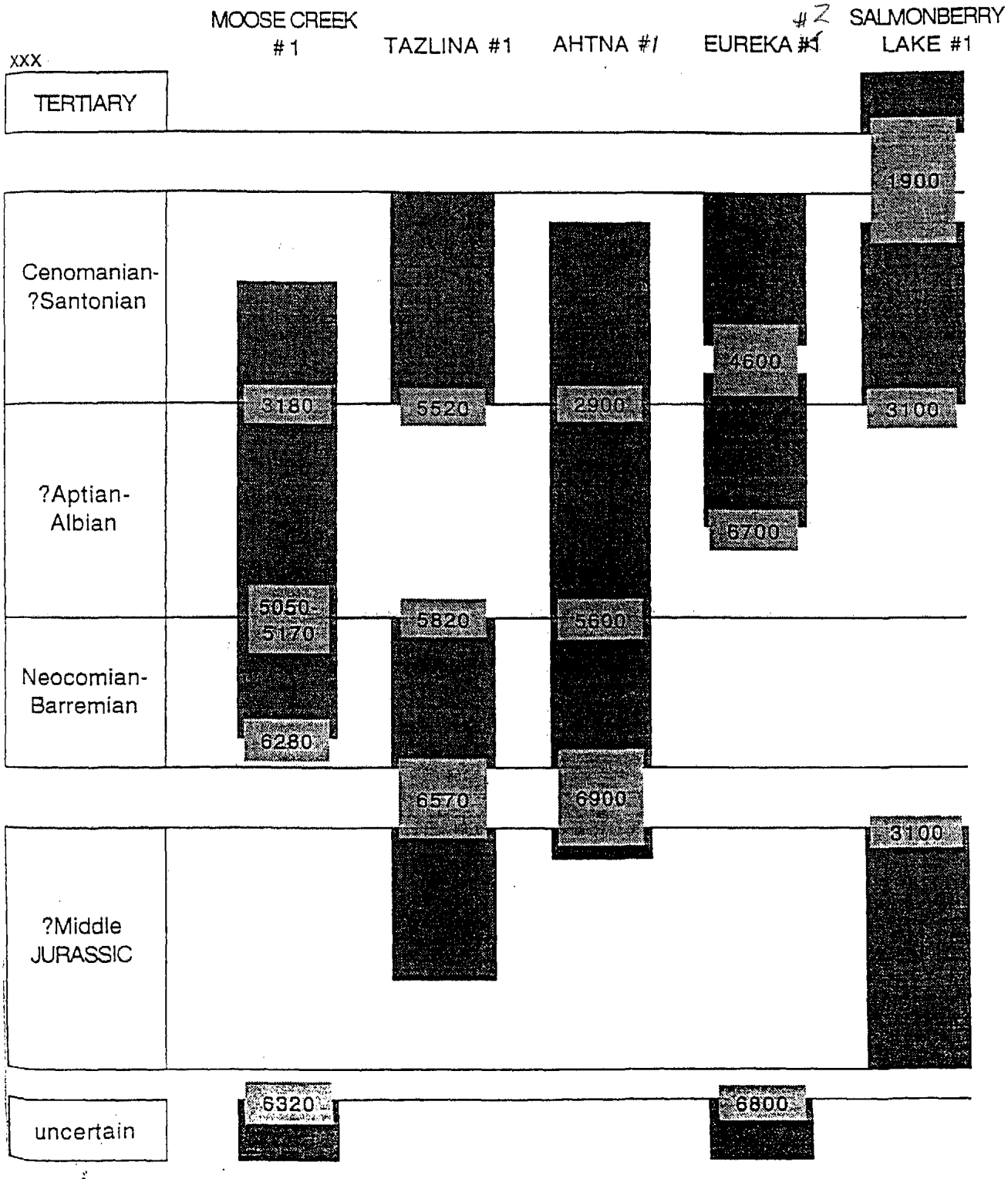

Figure 1