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#5

January 17, 1980

TO: Husky/U. S. Geological Survey

RE: Husky/USGS, NPRA
Tunalik #1
Sec. 20, 10N/36W
North Slope, Alaska
AFE#22-8345-7182

PALYNOLOGY REPORT

A total of 395 samples were processed and examined from the subject well. The total consisted of 227 ditch, 19 sidewall cores and 149 core samples covering the well from 90 feet to 20,330 feet.

The results are summarized by intervals, and accompanying the report are two (2) distribution charts illustrating occurrences for the recognized palynomorph taxa.

Summary of Results

90-8230'

Undifferentiated bisaccates (C-A), Schizosporis parvus (R); rare scattered occurrences of Cerebropollenites mesozoicus, Concavissimisporites punctatus, Cicatricosisporites australiensis, Aequitriradites spinulosus; numerous occurrences of reworked spores.

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90-8230' (con't.)

Cyclonephelium distinctum (R), Gardodinium trabeculosum (R, sporadic), Odontochitina operculata (R), Oligosphaeridium complex (R-C), Palaeoperidinium cretaceum (R-F); rare scattered occurrences of Pseudoceratium retusum, Muderongia asymmetrica; numerous occurrences of reworked Triassic- to Neocomian-aged dinocysts.

AGE: Early Cretaceous; Aptian-Albian (P-M18 to P-M17)

ENVIRONMENT: Marine to very Marginal Marine or Nonmarine

The top part of this interval (90-2100') had very meager dinocyst recoveries, and probably represents nonmarine to marginal marine strata. Below 2100 feet the dinocyst recoveries increase and reflect a better marine depositional environment that the section above that depth.

8230-10,692'C

Indeterminate spores and spore fragments, poorly preserved (R).

AGE: Indeterminate

ENVIRONMENT: Nonmarine?

This interval is essentially barren of palynomorphs. No significant occurrences of spore-pollen or dinocysts were recorded.

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10,692-13,340'

Undifferentiated bisaccates (R-A), indeterminate spores and spore fragments (R-C), Classopollis classoides (R-F).

Oligosphaeridium complex (thick-wall)(R-F).

AGE: Early Cretaceous; Neocomian (probable P-M19)

ENVIRONMENT: Marine

The main constituent identifying this interval is O. complex (thick-wall), which is most common in the Neocomian section.

Overall, the best recovery of palynomorphs through this interval occurs below approximately 12,500 feet, as evidenced in the ditch and core samples.

13,340-13,520'?

Undifferentiated bisaccates (F), indeterminate spores and spore fragments (F).

Oligosphaeridium complex (thick-wall)(R), Gonyaulacysta hyalodermopsis (R), Pareodinia dasyforma (R).

AGE: Early Cretaceous; Neocomian (probable P-M20)

ENVIRONMENT: Marine

This narrow interval is marked by the appearance of P. dasyforma. The bottom of the interval is questionably placed at the apparent base for O. complex as observed in the ditch samples.

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13,520-13,880'

Undifferentiated bisaccates (C-A), Classopollis classoides (F-C), indeterminate spores and spore fragments (A).

Pareodinia osmingtonese (R), Endoscrinium galeritum (R), Tubotuberella apatela (R), Nannoceratopsis pellucida (R).

AGE: Late Jurassic; Oxfordian (P-M22)
ENVIRONMENT: Marine

This interval is marked by the top occurrence of P. osmingtonese. A somewhat better, but still not very well developed, Oxfordian dinocyst assemblage appears below about 13,700 feet.

Preservation from this interval through the underlying Late Triassic is extremely poor. The dinocyst specimens are all highly corroded.

13,880-14,330'?

Undifferentiated bisaccates (F-A), Classopollis classoides (R-F), indeterminate spores and spore fragments (C-A), Triancoraesporites sp. (single, reworked?).

Nannoceratopsis gracilis (R), N. senex (R), JRD-2 (R), Micrhystridium spp. (R), Sverdrupiella usitata (single, reworked?).

AGE: Early to Middle Jurassic (P-M24? to P-M23)
ENVIRONMENT: Marine

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13,880-14,330'? (con't.)

The base of this interval is questioned because the ditch sample at 14,150-14,240' contained two (2) specimens of Triassic palynomorphs. The problem is that Triassic species can be seen reworked throughout much of the drilled section above and the rare occurrences here may also be reworked. The more frequent Late Triassic evidence is not seen until 14,330 feet.

14,330-14,690'?

Undifferentiated bisaccates (C-A), Classopollis classoides (R), Gleicheniidites senonicus (R), Taeniaesporites sp. (R).

Sverdrupiella usitata (R-C), Micrhystridium spp. (R), Veryhachium spp. (R).

AGE: Late Triassic; Norian (P-M26)
ENVIRONMENT: Marine

The lowermost limit for S. usitata in the ditch samples is used to mark the base of this interval. The lower boundary might be better placed at 14,510 feet or 14,600 feet, where the land-derived Triassic assemblage begins to appear somewhat more consistently.

14,690-16,929'C

Undifferentiated bisaccates (R-C), indeterminate spores and spore fragments (C-A), Taeniaesporites spp. (F-C),

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14,690-16,929'C (con't.)

Dulhuntyspora minuta (R), Lueckisporites spp. (R), Striatites richteri (R-F), Monosulcites spp. (R).

Micrhystridium spp. (C-A), Veryhachium spp. (R-F), Leiofusa jurassica (R).

AGE: Triassic (P-T16 to P-T15)
ENVIRONMENT: Marine to Marginal Marine

No evidence was seen to enable the differentiation of zonule P-T17.

The Permian/Triassic boundary is placed at the top of Core #15 (16,929-16,947') wherein the first Permian evidence was recovered.

16,929-17,858'C?

Taeniaesporites spp. (F), Striatites richteri (R), Aratrisporites sp. (R, sporadic), Kraeuselisporites sp. (R), Vittatina sp. (R).

Micrhystridium (F-C).

AGE: Permian (P-T18)
ENVIRONMENT: Marginal Marine

The base of the Permian is placed tentatively at what appears to be the lowermost indigenous occurrence of Vittatina sp.

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17,858-19,620'

The palynomorph assemblage remains similar to the above interval, but with fewer and less consistent occurrences. The forms observed are judged to be derived from up-hole.

AGE: Indeterminate
ENVIRONMENT: Indeterminate

19,620-19,890'

The significant form occurring in this interval is Potoniesporites sp.

AGE: in Pennsylvanian (P-T19)
ENVIRONMENT: Marginal Marine?

19,890-20,330'

Only Permo-Triassic palynomorphs derived from up-hole were recovered through this interval.

AGE: Indeterminate
ENVIRONMENT: Indeterminate

The total depth for the well is given as 20,335 feet, however, the deepest sample depth received was 20,330 feet.

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Hideyo Haga