

Public-data File 91-21d

**BIOSTRATIGRAPHIC REPORT
OF
12 CRETACEOUS TO JURASSIC AGE
OUTCROP SAMPLES
FROM THE
SAGAVANIRKTOK, MT. MICHELSON AND CHANDLER LAKE
QUADRANGLES,
NORTH SLOPE, ALASKA**

Compiled by

Rocky R. Reifstahl

Alaska Division of
Geological and Geophysical Surveys

September 1991

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TEXT) OR FOR CONFORMITY TO THE
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794 University Avenue, Suite 200
Fairbanks, Alaska 99709-3645

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BIOSTRATIGRAPHIC REPORT OF 12 CRETACEOUS TO JURASSIC AGE OUTCROP SAMPLES FROM THE SAGAVANIRKTOK, MT. MICHELSON AND CHANDLER LAKE QUADRANGLES, NORTH SLOPE, ALASKA

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I **Introductory summary**

Field work was during 1991 from the helicopter-supported, Kavik River base camp. Results of this report are part of a joint project between DGGs Energy Section and the Alaska Division of Oil and Gas.

Microfossil paleontology analyses (palynology and foraminifera) is by Micropaleo Consultants, Inc.

The DGGs Public-data File 91-21 "series" (91-21a, b, c, and so forth) will address geology of the northeastern Brooks Range and adjacent North Slope:

Public-data File 91-21a, Surficial geologic maps of the Sagavanirktok A-1, A-2, and B-2 Quadrangles, northeastern Brooks Range, Alaska, by C.F. Waythomas, 5 p., scale 1:63,360, 3 sheets, \$9.50.

Public-data File 91-21b, Paleontology data from 29 outcrop samples of Late Cretaceous to Jurassic age, Sagavanirktok Quadrangle, northeastern Brooks Range, Alaska, by R.R. Reifstuhl, June 1991, 11 p., scale 1:250,000, 1 sheet, \$4.10.

Public-data File 91-21c, Preliminary results of 25 apatite fission tract analyses of samples from the Gilead Creek region, North Slope of Alaska, by P.B. O'Sullivan, May 1991, 40 p. \$4.

II **Foraminifera and palynomorph sample preparation summary**

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, a short sonifier treatment, and a sieving/panning technique. For samples with adequate organic recoveries, two permanent slide mounts were made. Each slide contained different size fractions. One slide had particles larger than 20 microns, and the other had particles between 10 and 20 microns. For samples with small recoveries, only one slide with particles larger than 10 microns were mounted.

III Results

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 notes the dominant kerogen material.

The foraminiferal abundances reported in this section represent the following quantities: VR = 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 palynological abundances used in this report represent the following quantities: VR = 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).

01) 91RR84-A Mt. Michelson B-4 (NW), Kemik/Kingak measured section on Canning River
Kingak Shale: 15 cm below pebble lag at base of Kemik Sandstone

Foraminifera:

| | |
|---------------------|---|
| <u>Age.</u> | Probable Early Cretaceous Probable Neocomian |
| <u>Zone.</u> | Probable F-12 to F-14 |
| <u>Environment.</u> | Indeterminate |
| <u>Fauna.</u> | Barren of Foraminifera Rounded frosted quartz floaters (F) |
| <u>Washed lith.</u> | Dark brownish-gray to black slightly sandy shale. |

Palynology:

| | |
|----------------------|--|
| <u>Age.</u> | Indeterminate |
| <u>Environment.</u> | Nonmarine? |
| <u>Palynomorphs.</u> | Undifferentiated bisaccates (R) |
| <u>Remarks.</u> | Sparse organics. Mainly black coaly fragments. |

02) 91RR84-B Mt. Michelson B-4 (NW), Kemik/Kingak measured section on Canning River
Kingak Shale: 15 cm below pebble lag at base of Kemik Sandstone

Foraminifera:

| | |
|---------------------|---|
| <u>Age.</u> | Probable Early Cretaceous Probable Berriasian to Valanginian |
| <u>Zone.</u> | Probable F-13/F14 |
| <u>Environment.</u> | Outer Neritic to Middle Bathyal |
| <u>Fauna.</u> | <i>Ammobaculites erectus</i> (R) <i>Arenaceous</i> sp. (large, coarse) (R) <i>Gaudryina leffingwelli</i> (F) <i>Gaudryina milleri</i> (F) <i>Glomospira subarctica</i> (R) <i>Glomospirella arctica</i> (VR) <i>Haplophragmoides coronis</i> (R) <i>Haplophragmoides duoflatis</i> (F) Glauconite (R) Rounded frosted quartz floaters (F); Tar (VR) |
| <u>Washed lith.</u> | Dark brownish-gray slightly sandy shale |

Palynology:

| | |
|----------------------|---|
| <u>Age.</u> | Indeterminate |
| <u>Environment.</u> | Nonmarine? |
| <u>Palynomorphs.</u> | Indeterminate spore (VR) |
| <u>Remarks.</u> | Sparse organics. Mainly black coaly material. |

03) 91RR84-19 Mt. Michelson B-4 (NW), Kemik/Kingak measured section on Canning River
Kemik, 17.5 m above base: brown and black organic-rich clay (= paleosol?)

Foraminifera:

Age. Indeterminate
Environment. Indeterminate
Fauna. Barren of Foraminifera
 Aragonite (C)
Washed lith. Dark brownish gray aragonitic siltstone.

Palynology:

Age. Indeterminate
Environment. Indeterminate
Palynomorphs. Barren of palynomorphs
Remarks. Abundant black coaly fragments.

04) 91RR84-D Mt. Michelson B-4 (NW), Kemik/Kingak measured section on Canning River
Kingak Shale: 1 cm below pebble lag at base of Kemik Sandstone

Foraminifera:

Age. Probable Early Cretaceous
 Probable Berriasian to Valanginian
Zone. Probable F-13/14
Environment. Outer Neritic to Middle Bathyal
Fauna. *Ammobaculites erectus* (R)
Ammodiscus sp. (small, thin) (VR)
Gaudryina leffingwelli (F)
Gaudryina milleri (F)
Glomospirella arctica (VR)
Haplophragmoides coronis (F)
Haplophragmoides duoflatis (F)
Haplophragmoides inflatigrandis (R)
 Glauconite (VR)
 Rounded frosted quartz floaters (R)
Washed lith. Dark brown - gray shale

Palynology:

Age. Indeterminate
Environment. Indeterminate
Palynomorphs. Barren of palynomorphs
Remarks. Sparse organic. Mainly black coaly fragments.

05) 91RR84-E Mt. Michelson B-4 (NW), Kemik/Kingak measured section on Canning River
Kemik, 27.5 m above base: brown and black organic-rich clay (= paleosol?)

Foraminifera:

Age. Indeterminate
Environment. Indeterminate
Fauna. Barren of Foraminifera
 Limonite (F) Tar? (F)
Washed lith. Dark brown-gray very fine-grain limonitic sandstone or siltstone.

Palynology:

Age. Indeterminate
Environment. Indeterminate
Palynomorphs. Barren of palynomorphs
Remarks. Abundant black coaly fragments.

06) 91RR85-A Mt. Michelson B-4 (NW), 100 m north of Kemik/Kingak measured section on Canning River

Foraminifera:

Age. Probable Early Cretaceous
Probable Neocomian
Zone. Probable F-12 to F-14
Environment. Marine
Fauna. *Glomospirella arctica* (VR)
Haplophragmoides coronis (VR)
Shell fragments (R)
Washed lith. Dark gray to black shale.

Palynology:

Age. Indeterminate
Environment. Indeterminate
Palynomorphs. Barren of palynomorphs
Remarks. Sparse organics. Mainly black coaly fragments.

07) 91RR92-A Sag. B-1 (NE), Tributary of Kemik Creek
Hue Shale (?), locally tuffaceous

Foraminifera:

Age. Indeterminate
Environment. Indeterminate
Fauna. Barren of Foraminifera
Coal (A)
Washed lith. Black coal seam.

Palynology:

Age. Probable Cretaceous
Undifferentiated
Environment. Marginal Marine
Palynomorphs. ?*Cyclonephellum* sp. (V)
Poorly preserved Peridinoid forms (R)
Pterospermopsis sp. (V)
Remarks. Abundant coaly fragments. Frequent dinocysts, all very poorly preserved.

08) 91MM01-A SE of Tuktu Bluff (5 km): interbedded sandstone and silty shale (below Tuktu Formation)

Foraminifera:

Age. Indeterminate
Environment. Indeterminate
Fauna. Barren of Foraminifera
Coal (F)
Washed lith. Dark gray very fine-grain sandstone or siltstone.

Palynology:

Age. Probable Early Cretaceous
Undifferentiated
Environment. Marine
Palynomorphs. Undifferentiated bisaccates (F)
Deltoidospora sp. (V)
Gleichenioidites senonicus (V)
Circulodinium brevispinosum (V)
?*Gardodinium trabeculosum* (V)
Oligosphaeridium complex (R)
Remarks. Abundant coaly fragments. Palynomorphs all very poorly preserved.

09) 91MM01-B SE of Tuktu Bluff (5 km): Interbedded sandstone and silty shale (below Tuktu Formation)

Foraminifera:

Age. Indeterminate
Environment. Indeterminate
Fauna. Barren of Foraminifera

Coal (C)

Washed lith. Dark gray to black coaly siltstone.

Palynology:

Age. Probable Cretaceous
 Undifferentiated

Environment. Marginal Marine

Palynomorphs. Undifferentiated bisaccates (F)
Cyclonephellum distinctum (V)
Oligosphaeridium complex (R)
Oligosphaeridium complex (thick-wall) (R)
 Tasmanaceae (V)

Remarks. Abundant coaly fragments.

10) 91MM01-C SE of Tuktu Bluff (5 km): Interbedded sandstone and silty shale (below Tuktu Formation)

Foraminifera:

Age. Early Cretaceous
 Aptian to Albian

Zone. F-11Environment. Probable BathyalFauna. *Bathysiphon vitta* (VR)Washed lith. Dark gray shale.

Palynology:

Age. Early Cretaceous
 Undifferentiated

Environment. Marine

Palynomorphs. Undifferentiated bisaccates (A)
Deltoidospora spp. (R)
Densosporites spp. (F) reworked
Lycopodiumsporites spp. (R)
Osmundacidites spp. (R)
Gardodinium trabeculosum (R)
Oligosphaeridium complex (R)
Splinterites sp. (V)

Remarks. Abundant coaly fragments.

11) 91MM01-D SE of Tuku Bluff (5 km): Interbedded sandstone and silty shale (below Tuku Formation)

Foraminifera:

Age. Early Cretaceous
Aptian to Albian

Zone. F-11

Environment. Probable Bathyal

Fauna. *Haplophragmoides excavata* (VR)
Megaspores (R)

Washed lith. Dark gray shale.

Palynology:

Age. Cretaceous
Undifferentiated

Environment. Marine

Palynomorphs. Undifferentiated bisaccates (A)
Densosporites spp. (R) reworked
Osmundacidites spp. (R)
Cleistosphaeridium sp. (R)
Cyclonephellum distinctum (VR)
Odontochitina operculata (VR)
Oligosphaeridium complex (F)
Sentusidinium rlouitii (R)

Remarks. Abundant coaly fragments.

12) 91MM01-E SE of Tuku Bluff (5 km): Interbedded sandstone and silty shale (below Tuku Formation)

Foraminifera:

Age. Early Cretaceous
Aptian to Albian

Zone. F-11

Environment. Probable Bathyal

Fauna. *Bathysiphon vitia* (VR)
Megaspores (R)

Washed lith. Dark gray shale.

Palynology:

Age. Cretaceous, Undifferentiated

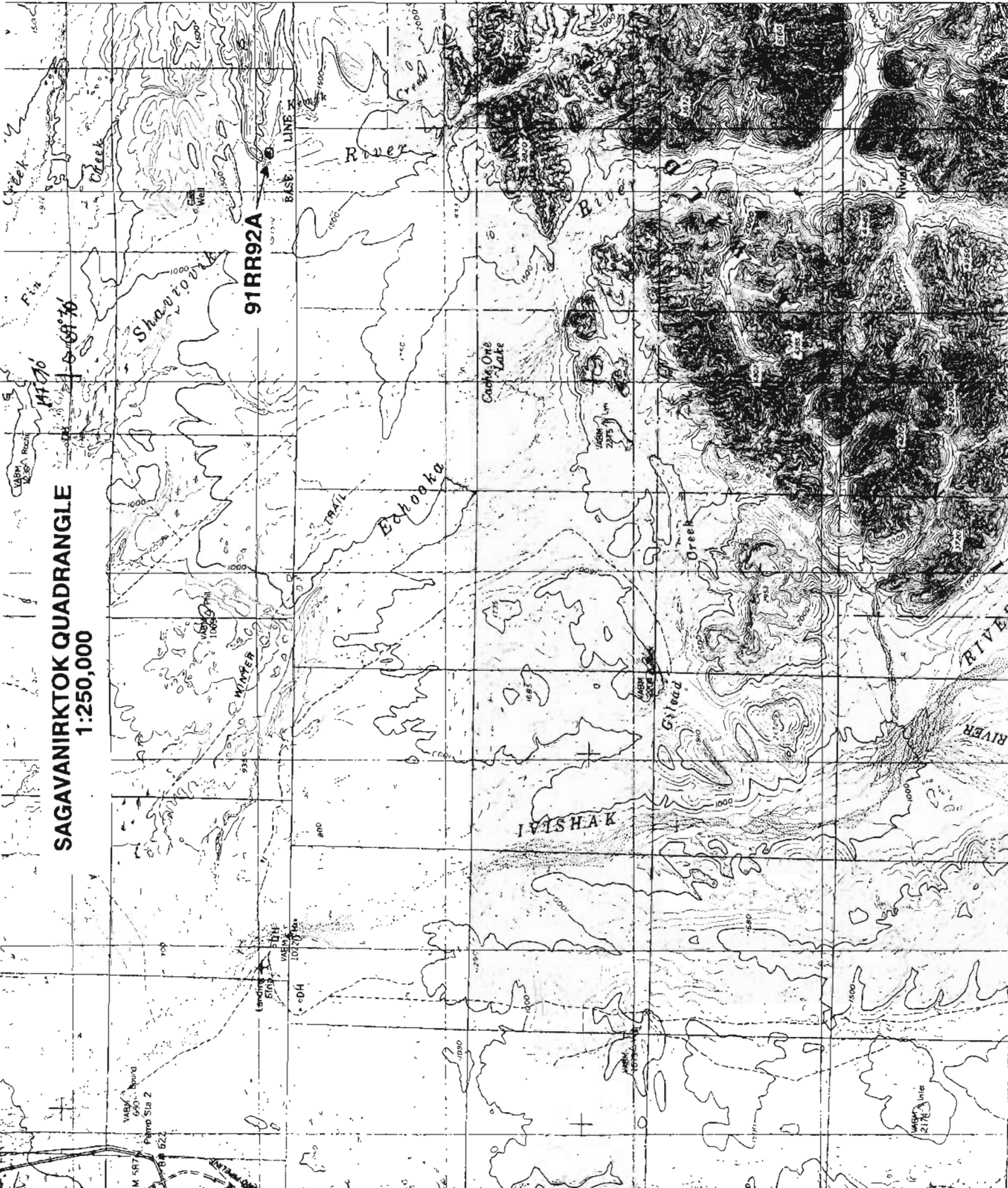
Environment. Marine

Palynomorphs. Undifferentiated bisaccates (A)
Densosporites spp. (R) reworked
Gleicheniidites senonicus (V)
Lycopodiumsporites spp. (R)
Osmundacidites spp. (R)
Cleistosphaeridium sp. (R)
Michrhystridium spp. (R)
Odontochitina operculata (R)
Oligosphaeridium complex (F)
Oligosphaeridium complex (thick-wall) (VR)
Pterospermopsis sp. (R)

Remarks. Abundant coaly fragments.

SAGAVANIRKTOK QUADRANGLE
1:250,000

91RR92A



VASB 630
Pamp Sta 2
BM 587
64 822

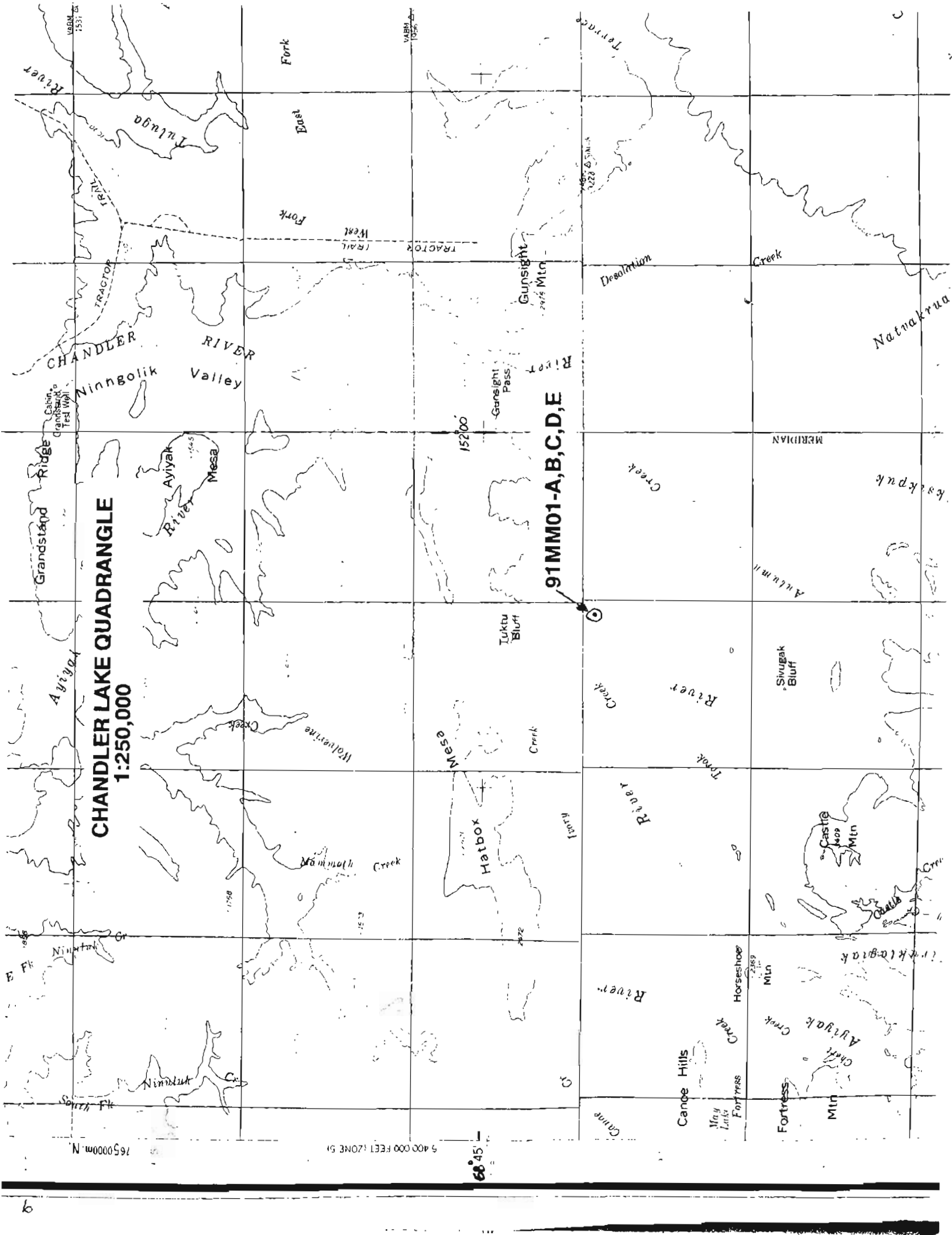
Landing Site
52H
VADP
102.71

5 600 000 FEET
(ZONE 3)

VASB 217
Lites

CHANDLER LAKE QUADRANGLE
1:250,000

91MM01-A,B,C,D,E



765000m. N

5 000 000 FEET (ZONE 5)

68°45'