TETRA TECH, INC.

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

(5)

DAILY GEOLOGICAL REPORT

ELL KUYANAK #1 Date 2-12-81 Time 0600

resent Depth - Previous Depth - Footage 24 Hrs. -

ormation(s) - Top

resent Activity: Rigging up. Anticipate spud AM today.

ITHOLOGIC DESCRIPTION

nterval Reported Sampling Interval ft. Sample Quality
ag Time: min. @ ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| | | |

GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Ditch Gas (Units): Background Connection Trip Peaks

Mud: Wt. Vis W.L. ph cc Oil % $Cl_2$ Temp. °F. in °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| | | | |

Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| [illegible] examined | | | |
| [illegible] | No. | | |

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TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

DAILY GEOLOGICAL REPORT

VELL KUYANAK #1 Date 2/13/81 Time 0600

resent Depth _____ Previous Depth _____ Footage 24 Hrs. _____

ormation(s) _____ Top _____

resent Activity: Rigging up. Repairing leaking pumps. Anticipate spud PM today.

ITHOLOGIC DESCRIPTION

nterval Reported _____ Sampling Interval _____ ft. Sample Quality _____
ag Time: _____ min. @ _____ ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| | REQUEST: 1. #3 Staples for 7-11 Swingline Stapler. | |
| | 2. Info. from Baroid rep. on duties of Baroid employees on well-site. | |
| | Will order Schlumberger to well-site on 2-14-81 in anticipation of 60'/hr drlg. rate after spudding. | |

GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
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Ditch Gas (Units): Background _____ Connection _____ Trip _____ Peaks _____

Mud: Wt. _____ Vis _____ W.L. _____ ph _____ cc Oil _____ % $Cl_2$ _____ Temp. _____ °F. in _____ °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| | | | |
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Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| ores | No | | |

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

# DAILY GEOLOGICAL REPORT

WELL KUYANAK #1 Date 2-14-81 Time 0600

Present Depth 317' Previous Depth 100' Footage 24 Hrs. 217'

Formation(s) Nanushuk Top Surface

Present Activity: Drilling

## LITHOLOGIC DESCRIPTION

Interval Reported 100-270 Sampling Interval 30 ft. Sample Quality Fair
Lag Time: 4 min. @ 263 ft. (250 strokes)

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| 100-194 | Clyst, lt gy, pt slty, tr dk gy sh, pyr incls, occ sd grns, scat thn slt & ss bds | 0.2 |
| 194-211 | Ss, lt gy to gy, m - f grnd, SA, m srtd qtz, dk cht, coal & arg grns, calc, sid, tt, no shows, intb sid, tan col | 1.5 |
| 211-270 | Ss, lt gy, f-grn, sl salt & pepper, SA, calc, sl slty & cly carb grns & flks, coaly strs, thn sid strgs from 250-270, mod fri, fr por, no show, inoc frags | 0.65 |
| | NOTE: Need to check with Baroid rep. re making sepios @ well site; no paper @ wellsite. | |

## GAS OCCURRENCE/SHOWS (NONE)

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
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Ditch Gas (Units): Background 2 Connection None Trip None Peaks None

Mud: Wt. 9.0 Vis 39 W.L. 20 ph 10.5 cc Oil None % $Cl_2$ 600 Temp. 72 °F. in 73 °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| 200 | - | .76 | - |
| 250 | - | .92 | - |
| 300 | - | .94 | - |
| | | | |
| | | | |
| | | | |

Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (Canned) | | | |
| Cores | No. | | |

PROGRAM

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

# DAILY GEOLOGICAL REPORT

ELL KUYANAK #1 Date 2/15/81 Time 0600

esent Depth 1390' Previous Depth 317' Footage 24 Hrs. 1073'

rmation(s) Nanushuk Top Surface

esent Activity: Tripping for new bit

## THOLOGIC DESCRIPTION

terval Reported 270-1380 Sampling Interval 30 and 20 ft. Sample Quality Fair
g Time: 32 min. @ 1390 ft. (56 strokes /min)

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| 270-345 | Intbd clyst, lt gy, v sft, slty, pt sdy, pyr incls, w/ss, lt gy, pt salt & pepper, f - v f grn, w/m - grn strs, SA to ang, calc, pt sid, pyr incls, fos frags, carb grns, strs w/fr por, no show, occ sltst lams, coal str @ base. | 0.3 |
| 345-375 | clyst, lt gy to gy, slty, sdy, w/lt gy slst strgs, coal strg @ base | 0.4 |
| 375-384 | Ss, lt tannish gy, v f - f grn, SA, m - srtd, calc, sid, hd, tt, no show, rare fos frags. | 1.2 |
| 384-1180 | Intb clyst, lt gy, sft, slty, sdy, w/ss, ss is lt & v-lt gy, sl salt & pepper, m - v f grn, SA, m - srtd, calc, pt sid, carb, chert & arg grns, occ w/sl por, no show, scat fos frags, occ Forams, occ sltst strg. | 0.5 |
| 1180-1390 | Ss, v - lt gy, f - v f grn, SA, m - srtd, pt slty, calc, sl sil, carb grns & flks, sid ptgs & nods, pyr incl, scat fos frags, thn sltst strgs becoming gy & dk gy and tr dk gy sh, clyst strgs | 1.3 |
| | NEED: Geochem labels | |

## GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
| 740-780 | 5 | 1 | 1 | 1 | | (NOT WORKING) | | | |
| 975-1000 | 11 | 1 | 5 | 5 | | | | | |
| 1090-1110 | 45 | 1 | 5 | 15 | | | | | |
| | | | | | (Background gas slowly increasing from 15 Units @ 1115 to 35 units @ 1300.) | | | | |

Ditch Gas (Units): Background 35 Connection 70 @ 1310 / 50 @ 1370 Trip None Peaks As Above

Mud: Wt. 9.5 Vis 34 W.L. 24 ph 8.5 cc Oil None % Cl 1600 @ 600 / 1250 @ 900 / 1000 @ 1390 Temp. 60 °F. in 62 °F. out

Data Unit:

| Depth | $D_c$ EXPONENT ~~Shale Density~~ | DEPTH ~~Dc Exponent~~ | $D_c$ EXPONENT ~~Pore Pressure~~ |
|---|---|---|---|
| 350 | 0.93 | 850 | - |
| 400 | 1.00 | 900 | 1.09 |
| 450 | .99 | 950 | 1.10 |
| 500 | 1.00 | 1000 | 1.09 |
| 550 | 1.04 | 1050 | 1.03 |
| 600 | 1.04 | 1100 | 1.07 |
| 650 | 1.05 | 1150 | 1.03 |
| 700 | 1.09 | 1200 | 1.10 |
| 750 | 1.08 | 1250 | 1.16 |
| 800 | 1.06 | 1300 | 1.16 |
| | | 1350 | 1.17 |

Dispatched Samples:

| Type | Interval | | |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| Cores | No | | |

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

# DAILY GEOLOGICAL REPORT

WELL KUYANAK #1 Date 2/16/81 Time 0600

Present Depth 1529' Previous Depth 1390' Footage 24 Hrs. 139'

Formation(s) Nanushuk Top Surface
Torok 1424'

Present Activity: LOGGING

## LITHOLOGIC DESCRIPTION

Interval Reported 1380-1529 Sampling Interval 20 ft. Sample Quality Fair
Lag Time: 33 min. @ 1529 ft. (59 SPM)

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| 1380-1384 | Clyst, lt gy, tr v - dk gy sh | 2.0 |
| 1384-1391 | Ss, v lt gy to lt gy, f - to v f grn, SA, calc, sil, carb, pyr incl, tt, no show | 0.3 |
| 1391-1417 | Clyst, lt gy, sft, slty, w/ v dk gy sh strs, intbd ss as above | 2.0 |
| 1417-1432 | Ss, lt & v lt gy, f - v f grn, SA, calc, clayey in pt, sl carb, pyr incl, tt, no show, occ Crin | 1.1 |
| 1432-1529 | Intb ss as abv w/ clyst, lt gy, slty, v dk gy sh, and sltst, lt to m gy, calc, carb, pt v sft, occ Forams & Crin, sl incr in dk cols @ 1500'. | 1.2 |
| | Ran Logs: DI/BHCS/LSS/FDC/CNL; @ 0600 were rerunning DI | |

## GAS OCCURRENCE/SHOWS (NONE)

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
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Ditch Gas (Units): Background 20 Connection 35 Trip 65 @ 1390 Peaks None

Mud: Wt. 9.7 Vis 53 W.L. 12 ph 9 cc Oil - % $Cl_2$ 1000 Temp. 61 °F. in 68 °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| 1400 | - | 1.22 | - |
| 1450 | - | 1.22 | - |
| 1500 | - | 1.18 | - |
| | | | |
| | | | |
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Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | 100-1529 | 2 (box #1) | A & B |
| Unwashed Ditch (Paleo) | 100-1529 | 2 (boxes #1 & #2) | - |
| Unwashed Ditch (USGS) | 100-1280 | 1 (box #1) | - |
| GeoChem (canned) | 100-1240 | 4 (boxes 1,2,3,4) | - |
| Cores | No. | | |

Geologist [illegible]

TETRA TECH, INC.

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U. S. GEOLOGICAL SURVEY/ONPRA

DAILY GEOLOGICAL REPORT

WELL KUYANAK #1 Date 2-17-81 Time 0600

Present Depth 1529' Previous Depth 1529' Footage 24 Hrs. _____

Formation(s) Torok Top 1424'

Present Activity: Circulating prior to cementing.

LITHOLOGIC DESCRIPTION

Interval Reported _____ Sampling Interval _____ ft. Sample Quality _____
Lag Time: _____ min. @ _____ ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| | Finished logging; DIL re-run and dipmeter @ 1100 hrs. | |
| | Set casing, 13-3/8 to 1521'. | |
| | | |
| | | |
| | | |
| | REQUEST: Tablet of | |
| | morning report forms. | |

GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
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Ditch Gas (Units): Background _____ Connection _____ Trip _____ Peaks _____

Mud: Wt. _____ Vis _____ W.L. _____ ph _____ cc Oil _____ % $Cl_2$ _____ Temp. _____ °F. in _____ °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| | | | |
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Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| Core: | No. | | |

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

# DAILY GEOLOGICAL REPORT

ELL KUYANAK #1 Date 2-18-81 Time 0600

esent Depth 1529' Previous Depth 1529' Footage 24 Hrs. -

ormation(s) Torok Top

resent Activity: Nippling up BOP & WOC

ITHOLOGIC DESCRIPTION

nterval Reported Sampling Interval ft. Sample Quality

ag Time: min. @ ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| | Cemented 13-3/3 casing @ 1521' | |
| | NOTE: Sidewall Coring Program abandoned due to large diameter hole. | |

GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
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Ditch Gas (Units): Background Connection Trip Peaks

Mud: Wt. Vis W.L. ph cc Oil % $Cl_2$ Temp. °F. in °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| | | | |
| | | | |
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Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| Cores | No. | | |

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

# DAILY GEOLOGICAL REPORT

WELL KUYANAK #1 Date 2/19/81 Time 0600

Present Depth 1529' Previous Depth - Footage 24 Hrs. -

Formation(s) Torok Top 1250'

Present Activity: Nippling up BOP's & WOC.

## LITHOLOGIC DESCRIPTION

Interval Reported _____ Sampling Interval _____ ft. Sample Quality _____
Lag Time: _____ min. @ _____ ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| | NOTE: Anticipate drilling out from under casing late this P.M. | |

## GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Ditch Gas (Units): Background _____ Connection _____ Trip _____ Peaks _____

Mud: Wt. _____ Vis _____ W.L. _____ ph _____ cc Oil _____ % $Cl_2$ _____ Temp. _____ °F. in _____ °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| | | | |

Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS | | | |

TETRA TECH, INC.

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U. S. GEOLOGICAL SURVEY/ONPRA

DAILY GEOLOGICAL REPORT

WELL KUYANAK #1 Date 2/20/81 Time 0600

Present Depth 1529' Previous Depth _____ Footage 24 Hrs. _____

Formation(s) Torok Top _____

Present Activity: Pressure testing Tri-flo Choke.

LITHOLOGIC DESCRIPTION

Interval Reported _____ Sampling Interval _____ ft. Sample Quality _____
Lag Time: _____ min. @ _____ ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| | | |
| | NOTE: Estimate drilling out from under surface casing this AM. | |

GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Ditch Gas (Units):
Background _____ Connection _____ Trip _____ Peaks _____

Mud: Wt. _____ Vis _____ W.L. _____ ph _____ cc Oil _____ % $Cl_2$ _____ Temp. _____ °F. in _____ °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| | | | |

Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| Cores | No. | | |

K-40

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

# DAILY GEOLOGICAL REPORT

ELL KUYANAK #1 Date 2-21-81 Time 0600

esent Depth 1679' Previous Depth 1529' Footage 24 Hrs. 150'

ormation(s) Torok Top 1250'

resent Activity: Tripping, adding stabilizers & reamers.

ITHOLOGIC DESCRIPTION

nterval Reported 1529-1670' Sampling Interval 20 & 30 ft. Sample Quality Good
ag Time: 15 min. @ 1670 ft. (57 SPM)

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| 1529-1640 | Sltst, gy, carb, cly, sl mica, tr fos frags, occ ss lams, w/intbd sh, gy to lt gy, sft, fis, slty, sl carb | 0.7 |
| 1640-1670 | Sh, dk gy to gy, micromicac, fis, carb, pt slty | 1.1 |
| | NOTE: Advise incoming wellsite geologist to bring "OO" Rapidograph pens. | |

GAS OCCURRENCE/SHOWS (NONE)

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
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Ditch Gas (Units): Background 5 Connection None Trip None Peaks None

Mud: Wt. 9.4 Vis 38 W.L. 22 ph 9.0 cc Oil NC % $Cl_2$ 1200 Temp. 62 °F. in 55 °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| 1600 | - | 1.20 | |
| 1650 | 2.31 | 1.18 | |
| | | | |
| | | | |
| | | | |

Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS | | | |

TETRA TECH, INC.

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U. S. GEOLOGICAL SURVEY/ONPRA

DAILY GEOLOGICAL REPORT

WELL KUYANAK #1 Date 2/22/81 Time 0600

Present Depth 2780' Previous Depth 1679' Footage 24 Hrs. 1101'

Formation(s) _____ Top _____

Present Activity: _____

LITHOLOGIC DESCRIPTION

Interval Reported 1670-2680 Sampling Interval _____ ft. Sample Quality _____
Lag Time: 25 min. @ 2600 ft.

(GENERALIZED DESCRIPTION: SEE NOTE)

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| 1670-2680 | Pred sh, dk gy to gy-brn, fis, carb, w/intbd sltst & occ ss strgs; one thn 4' ss @ 2204-2208 w/240 units gas. | 0.8 |
| | REQUEST: Urgently need Geochem Labels, qt. cans and Geochem boxes. Alert Schlumberger and Armour Kane that may be needed at site tomorrow night or Tues. morning. | |
| | NOTE: Direct telephone communication to site inoperable; must route calls through Lonely & minimize coversation, due to heavy traffic. A more detailed report will be sent from wellsite sometime 2-23-81 and should be attached to this one. | |

GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
| 2205 | 240 | None | 10 | 20 | - | - | - | - | - |

Ditch Gas (Units): Background 20-25 Connection 35 Trip None Peaks None

Mud: Wt. 9.5 Vis 34 W.L. 18 ph 8.5 cc Oil - % $Cl_2$ 800 Temp. 71 °F. in 67 °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| (WILL BE SENT BY MAIL) | | | |

Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | 1530-2660 | 1 | |
| Unwashed Ditch (USGS) | 1380-2461 | 1 | |

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

# DAILY GEOLOGICAL REPORT

WELL KUYANAK #1 Date 2/22/81 Time 0600

Present Depth 2780' Previous Depth 1679' Footage 24 Hrs. 1101'

Formation(s) Torok Top 1250'

Present Activity: Drilling

## LITHOLOGIC DESCRIPTION

Interval Reported 1670-2680 Sampling Interval 30 & 20' ft. Sample Quality Good
Lag Time: 25 min. @ 2600 ft. 60 SPM

NOTE: This should be attached to Daily Geo. Report of the same date, 2/22/81 as a followup. This info. recv'd. direct from wellsite 2/23/81.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| 1670-1783 | Sh, dk gy, gy, mic-mica, fis, carb, pt slty/intbd sltst gy, carb, cly, sl mica & occ ss strg, v lt gy, sl sep, f gr, SA-A, m srt, v sl calc & sil, slty, cly, carb flk & gr, NS | 0.8 |
| 1783-2147 | Intbd sh, dk gy, gy, mic-mica, fis, sft, slty, carb ptg & flks w/ sltst, gy, carb, cly, sl mica | 0.8 |
| 2147-2590 | Sh, gy-brn, brn-gy, fis sft, carb, occ pyrincl, rr Foram rr glau pel, intbd sltst, gy, sl brn, shy, carb, occ calc str, tr glau, & rr ss, v lt gy - gy, f, v f gr, SA, mod sort, pt sil, slty, tr glau, 240 u gas in sd @ 2204-2207 | 0.9 |
| 2590-2680 | Sh, gy, dk gy, fis, pt slty, carb, occ pyr incl, occ intbd sltst, lt gy, gy, carb, shy & ss, lt gy, gy, v f gr SA, carb, sl sil TT NS | 0.9 |

## GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
| 2205 | 240 | | 10 | 20 | - | - | - | - | - |

Ditch Gas (Units): Background 20-25 Connection 35 Trip - Peaks -

Mud: Wt. 9.5 Vis 34 W.L. 18 ph 8.5 cc Oil - % $Cl_2$ 800 Temp. 71 °F. in 67 °F. out

Data Unit:

| DEPTH | DC X | | DEPTH | DC X | DENSITY | | DEPTH | DC X | DENSITY |
|---|---|---|---|---|---|---|---|---|---|
| 1700 | | | 2000 | 1.17 | | | 2300 | 1.19 | 2.30 |
| 1750 | 1.18 | | 2050 | 1.16 | | | 2350 | 1.20 | 2.33 |
| 1800 | 1.18 | | 2100 | 1.18 | | | 2400 | 1.23 | 2.24 |
| 1850 | 1.20 | | 2150 | 1.18 | | | 2450 | 1.22 | 2.40 |
| 1900 | 1.21 | | 2200 | 1.18 | | | 2500 | 1.25 | 2.40 |
| 1950 | 1.24 | | 2250 | | | | 2550 | 1.26 | 2.45 |
| | | | | | | | 2600 | 1.27 | 2.50 |
| | | | | | | | 2650 | 1.27 | 2.47 |
| | | | | | | | 2700 | 1.30 | |

Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | 1530-2660 | 1 | Box #2 |
| Unwashed Ditch (USGS) | 1380-2480 | 1 | Box #2 |
| GeoChem (canned) | 1240-2420 | 3 | Boxes 5,6,7 |
| Cores | No. | | |

TETRA TECH, INC.

# DAILY GEOLOGICAL REPORT

WELL KUYANAK #1 Date 2/23/81 Time 0600

Present Depth 3310' Previous Depth 2780' Footage 24 Hrs. 530'

Formation(s) Torok Top 1250'

Present Activity: Drilling

## LITHOLOGIC DESCRIPTION

Interval Reported 2680-3260 Sampling Interval 20 ft. Sample Quality Good

Lag Time: 30 min. @ 3100 ft. (60 SPM)

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| 2680-2792 | Sh, dk gy & gy, fis, pt slty, carb, occ pyr incl, occ intbd sltst, lt gy & gy, carb, shy; ss, lt gy & gy, v f grn, SA, carb, sl slty, tt, no show. | 0.9 |
| 2792-2972 | Sh, dk brn & gy, fis, carb, pl slty w/intbd sltst, dk brn & gy, sh in pt, sl carb, occ thn ss strgs, lt gy, v f to f grn, SA, slty, clayey, sl calc, carb, tt, no show | 1.0 |
| 2972-3087 | Sh, dk gy, sl brn, fis, sft, sl slty, sl carb; sltst, dk gy & gy brn, tr Fe-st, w/sd grns, orng-red, and occ sil ss strgs in up 30', occ sid nods, Crin & pyr worm tubes (?) | 1.4 |
| 3087-3093 | Ss, v lt gy, sl salt & pepper, f grn, SA, clayey, sil, arg & dk cht grns, sl carb, rare glau, v sl por, 750 units gas, no flour or cut | 0.6 |
| 3093-3260 | Sh, brn-gy to dk gy, fis, sft, sl carb, sl mic w/intbd sltst, gy & dk gy, pt shly, and thn ss as above | 1.2 |

## GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
| 3081 | 750 | None | 20 | 35 | 75000 | 8000 | 4000 | 2500 | 500 |

Ditch Gas (Units): Background 30-35 Connection 20-90 Trip 275 @ 2974 Peaks as above

Mud: Wt. 9.5 Vis 35 W.L. 11 ph 9.0 cc Oil - % $Cl_2$ 650 Temp. 73 °F. in 85 °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| 2750 | 2.48 | 1.30 | - |
| 2800 | 2.48 | 1.30 | - |
| 2850 | 2.48 | 1.29 | - |
| 2900 | 2.49 | 1.33 | - |
| 2950 | 2.50 | 1.34 | - |
| 3000 | 2.50 | 1.21 | - |
| 3050 | 2.52 | 1.39 | - |
| 3100 | 2.55 | 1.29 | - |
| 3150 | 2.56 | 1.35 | - |
| 3200 | 2.57 | 1.28 | - |
| 3250 | 2.56 | 1.30 | |

Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Washed Ditch (SGS) | | | |
| Unwashed Ditch (SGS) | | | |

TETRA TECH, INC.

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

DAILY GEOLOGICAL REPORT

WELL KUYANAK #1 Date 2/24/81 Time 0600

Present Depth 3789' Previous Depth 3310' Footage 24 Hrs. 479'

Formation(s) Torok Top 1250'

Present Activity: Tripping for new bit.

LITHOLOGIC DESCRIPTION

Interval Reported 3260-3780 Sampling Interval 20 & 10 ft. Sample Quality Fair
Lag Time: 32 min. @ 3700 ft. (65 SPM)

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| 3260-3345 | Sh as last reported | 1.1 |
| 3345-3543 | Sh, brn-gy, dk gy, fis, carb, w/intbd sltst, brn-gy, shy, carb, mod sft; ss, lt gy, gy, v f - f grn, SA, slty, v sl calc, tt, no show | 1.8 |
| 3543-3619 | Sltst, brn-gy, shy, carb, sdy strs, w/intbd sh, dk & med - brn gy, pt slty, scat pyr xls; ss, gy-brn, v f grn, SA, tt, no show | 1.9 |
| 3619-3623 | Ss, lt brn-gy, f - v f grn, SA-ang, sil, clyey, arg & gy-brn cht grns, sl por, fnt sp lt yel flour, v fnt lt yel cut, 270 units gas | 1.5 |
| 3623-3688 | Intbd sh, sltst & ss as abv | 2.4 |
| 3688-3694 | Ss, lt gy, gr-brn, f - v f grn, SA, clyey, slty, coal grns, carb flks, arg & dol (?) grns, rare pk (pos qtz) grns & chlorite grns, tt, no flour or cut, 300 units gas | 1.6 |
| 3694-3780 | Intbd sh, gy-brn, dk gy, fis, pt slty, w/sltst, gy-brn, shy; ss, lt gy, sl brn, f - v f grn, SA-ang, clyey, sil, mica, rr glau, sl calc, tt, no show | 3.2 |

GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
| 3482 | 290 | 280 | 20 | 25 | 5000 | 2000 | 1500 | 600 | 100 |
| 3615 | 270 | 290 | 20 | 30 | 80000 | 800 | 500 | 250 | 100 |
| 3680 | 300 | 260 | 20 | 15 | 95000 | 2500 | 1000 | 1000 | 500 |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

Ditch Gas (Units): Background 20-25 Connection - Trip - Peaks as abv

Mud: Wt. 9.7 Vis 35 W.L. 18 ph 8.0 cc Oil - % $Cl_2$ 18,000 Temp. - °F. in - °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| 3300 | 2.56 | 1.34 | |
| 3350 | 2.56 | 1.41 | |
| 3400 | 2.57 | 1.42 | |
| 3450 | 2.55 | 1.37 | |
| 3500 | 2.52 | 1.30 | |
| 3550 | 2.53 | 1.33 | |
| 3600 | 2.54 | 1.40 | |
| 3650 | 2.54 | 1.65 | |
| 3700 | 2.57 | 1.74 | |
| 3750 | 2.58 | 1.75 | |

Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| Core: | No | | |

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

# DAILY GEOLOGICAL REPORT

WELL KUYANAK #1 Date 2/25/81 Time 0600

Present Depth 4205' Previous Depth 3789' Footage 24 Hrs. 416'

Formation(s) TOROK Top 1250'

Present Activity: Drilling

## LITHOLOGIC DESCRIPTION

Interval Reported 3780-4190 Sampling Interval 10 ft. Sample Quality Fair
Lag Time: 45 min. @ 4100 ft. (56 SPM)

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| 3780-4080 | Sh, gy-brn, dk gy, fis, pt slty, carb, micromicac, sl sil, w/intbd sltst, gy-brn, shy, carb, sl mica, & ss strgs, v lt gy, gy-brn, v f grn, SA, clyey, slty, carb grns & flks, occ sl sil, no show | 2.6 |
| 4080-4190 | Intbd sh, gy-brn, dk gy, fis, pt slty, v sl carb, w/sltst, gy-brn, gy, shy, sdy strs, & ss, brn-gy to v lt gy, v f grn, SA, v slty, clyey, sl calc, pt dol & sil, tt, no show; thn 4' ss @ 4133-4137 w/lt yel sp flour & v fnt slow lt gn-yel crushed cut. | 2.7 (4.0-1.4) |
| | NOTE: Cuttings gas units measured since 2-24-81 using steam still rather than blender, thus accounting for higher readings. | |

## GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
| 4132-35 | 25 | 15 | 5 | 5 | 2000 | tr | tr | - | - |

Ditch Gas (Units): Background 5 Connection - Trip - Peaks see abv

Mud: Wt. 9.9 Vis 38 W.L. 16 ph 8.0 cc Oil - % $Cl_2$ 32,000 Ca $cl_2$ 49,000 Temp. 61 °F. in 113 (?) °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| 3950 | 2.57 | 1.57 | - |
| 4000 | 2.56 | 1.50 | - |
| 4050 | 2.54 | 1.58 | - |
| 4100 | 2.57 | 1.64 | - |
| 4150 | 2.47 | 1.61 | |
| 3800 | 2.57 | 1.7 | |
| 3850 | 2.56 | 1.57 | |
| Dispatched Samples: 3900 | 2.58 | 1.61 | |

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | 1530-4050 | 4 | A & B (Bxs 2 & 3) |
| Unwashed Ditch (Paleo) | 2660-4200 | 2 (boxes 3 & 4) | - |
| Unwashed Ditch (USGS) | 2480-3850 | 2 (boxes 3 & 4) | - |
| GeoChem (canned) | 2420-3860 | 4 (boxes 8,9,10,11) | - |
| Cores | No. | | |

Geologist RON BROCKWAY

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

# DAILY GEOLOGICAL REPORT

WELL KUYANAK #1 Date 2/26/81 Time 0600

Present Depth 4614' Previous Depth 4205' Footage 24 Hrs. 409'

Formation(s) Torok Top 1250'

Present Activity: Drilling

## LITHOLOGIC DESCRIPTION

Interval Reported 4190-4590 Sampling Interval 10' ft. Sample Quality Fair
Lag Time: 58 min. @ 4650 ft. (60 SPM)

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| 4190-4204 | Intbd sh, sltst & ss as last reported | 1.1 |
| 4204-4408 | Intbd sltst, gy brn, mod hd, shy, sil, pt sid, sl carb, w/sh, gy-brn to dk brn-gy, fis, firm, slty, sl carb; & ss, lt gy to lt gy-brn, f grn, SA, clyey, sil, carb, hd, tt, no show | 3.0 |
| 4408-4420 | Ss, lt brn, gy-brn, v f - f grn, SA, slty, clyey, calc, tt, w/sh & sltst strgs, lt yel-wh flour, v slow pale yel to v lt yel streaming crush cut | 2.2 |
| 4420-4527 | Intbd sh, gy brn, dk brn gy, fis, slty, carb flks, micromicas, w/sltst, gy-brn, slty, carb flks, micac, & ss, gy-brn to lt gy, f - v f grn, clyey, slty, sl sil, pt calc, tt, no show, tr ls ptgs | 3.0 |
| 4527-4533 | Ss, lt brn, f grn, SA, slty, pt v f grn, clyey, sil, mod hd, no show | 2.5 |
| 4533-4558 | Sh, dk gy-brn & dk brn-gy, fis, slty, w/intbd sltst & ss | 3.9 |
| | (CONTINUED ON PAGE 2) | |

## GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
| 4560 | 25 | - | 5 | 10 | 2800 | 400 | 100 | tr | tr |
| 4560 | | (USING BLENDER) | | | 8000 | 6000 | 4000 | 4500 | 2400 |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

Ditch Gas (Units): Background 20 Connection None Trip None Peaks as abv

Mud: Wt. 10 Vis 41 W.L. 14 ph 8 cc Oil - % $Cl_2$ 35,000 Temp. 95 °F. in 109 °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| 4200 | 2.56 | 1.64 | |
| 4250 | 2.57 | 1.69 | |
| 4300 | 2.57 | 1.62 | |
| 4350 | 2.49 | 1.62 | |
| 4400 | 2.56 | 1.60 | |
| 4450 | 2.55 | 1.59 | |
| 4500 | 2.51 | 1.68 | |
| Dispatched Samples: 4550 | 2.55 | 1.60 | |

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo | | | |
| Ur washed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| Cores | No. | | |

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

# DAILY GEOLOGICAL REPORT

WELL KUYANAK #1 Date 2/26/81 Time 0600

Present Depth _____ Previous Depth _____ Footage 24 Hrs. _____

Formation(s) _____ Top _____

Present Activity: _____

## LITHOLOGIC DESCRIPTION

Interval Reported _____ Sampling Interval _____ ft. Sample Quality _____
Lag Time: _____ min. @ _____ ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| 4558-4573 | Ss, lt brn, f grn, SA, sl calc, clyey, sil, carb, occ arg & cht grns, nil - v sl por, bri yel-wh to dull yel flour, v slow to q strong lt yel crush cut, pt w/lt brn stn | 1.7 |
| 4573-4590 | Sh, dk gy-brn, dk brn-gy, fis w/sltst intbds | 3.8 |
| | NOTE: Temperatures "in" and "out" (Ditch Gas) for 2-25-81 should be 101° and 108° respectively instead of 61° and 113° as reported | |
| | REQUEST: About 15 Geochem boxes. | |

## GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| | | | | | | | | | |
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| | | | | | | | | | |

Ditch Gas (Units):
Background _____ Connection _____ Trip _____ Peaks _____

Mud: Wt. _____ Vis _____ W.L. _____ ph _____ cc Oil _____ % $Cl_2$ _____ Temp. _____ °F. in _____ °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| Cores | No. | | |

TETRA TECH, INC.

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

DAILY GEOLOGICAL REPORT

WELL KUYANAK #1 Date 2/27/81 Time 0600

Present Depth 4715' Previous Depth 4614' Footage 24 Hrs. 101'

Formation(s) Pebble Shale Top 4643

Present Activity: Preparing to enter hole for wiper trip & drill 40'.

LITHOLOGIC DESCRIPTION

Interval Reported 4590-4715 Sampling Interval 10' ft. Sample Quality Fair
Lag Time: 57 min. @ 4700 ft. (63 SPM)

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| 4590-4601 | Ss, lt brn, lt gy, f - v f grn, SA, clyey, sil, sl calc, carb, sl por, dull lt yel flour, g streaming lt yel crush cut | 2.1 |
| 4601-4643 | Sh, dk brn to v dk gy, firm, sl sil, micromicac, pt pyr, occ ss & sltst strgs | 4.3 |
| 4643-4715 | Sh, v dk gy, gy-blk, fis, pt flky, v carb w/buff & lt gy bent strs; and buff, lt gy & gn zeolite, pyr ptgs & incls, occ f coal ptg & tr gn homogenous glau | 2.2 |
| | NOTE: Ran CNL/FDC from 4710' | |
| | Hole in poor condition, 6 bridges. | |
| | Trouble getting CNL tool to bottom. | |

GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
| 4645 | 50 | blender | 10 | 10 | 2600 | 1000 | 1000 | 500 | 200 |
| 4657 | 75 | blender | 10 | 15 | 8500 | 5100 | 4900 | 2000 | 800 |
| 4645 | | steam still | | | 11000 | 2000 | 1100 | 1000 | 800 |

Ditch Gas (Units): Background 10-20 Connection 30-40 Trip 250 Peaks as abv

Mud: Wt. 10.1 Vis 53 W.L. 12 ph 8 cc Oil - % $Cl_2$ 34 Temp. 98 °F. in 111 °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| 4600-4650 | 2.54 | 1.72 | |
| 4650-4700 | 2.46 | 1.62 | |

Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | 4050-4710 | 2 (Box #4) | A & B |
| Unwashed Ditch (Paleo) | 4200-4550 | 1 (Box #5) | |
| Unwashed Ditch (USGS) | 3850-4710 | 2 (Box #5, #6) | |
| GeoChem (canned) | 4020-4310 | 1 (Box #12) | |
| Cores | No. | | |

TETRA TECH, INC.

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

DAILY GEOLOGICAL REPORT

VELL KUYANAK #1 Date 2/28/81 Time 0600

resent Depth 4755' Previous Depth 4715' Footage 24 Hrs. 40'

ormation(s) Pebble Sh Top 4643'

resent Activity: Going in hole w/DIL

ITHOLOGIC DESCRIPTION

nterval Reported 4715-4755 Sampling Interval 10 ft. Sample Quality Fair
ag Time: 58 min. @ 4700 ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| 4715-4755 | Sh, v dk gy, gy - bl & gy brn, fis, sl blky, carb, pyr incl & ptgs, lt gy bent strgs w/ lt gy & gn zeolite, tr dk brn, ls nods, occ sltst & ss lams | 5.5 |

GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
| 4755 | 250 | (steam still) | - | - | 15,400 | 2500 | 2500 | 1200 | 800 |

tch Gas (Units): Background 15 Connection - Trip as abv Peaks

lud: Wt. 10.4 Vis 95 W.L. 12 ph 8.0 cc Oil - % $Cl_2$ 34000 Temp. - °F. in - °F. out

ata Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| | | | |

spatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| Cores | No. | | |

ologist RON BROCKWAY

TETRA TECH, INC.

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

DAILY GEOLOGICAL REPORT

WELL KUYANAK #1 Date 3/1/81 Time 0600

Present Depth 4755' Previous Depth 4755' Footage 24 Hrs. -

Formation(s) Pebble Shale Top 4643'

Present Activity: Building mud to 11.3 & conditioning hole.

LITHOLOGIC DESCRIPTION

Interval Reported _____ Sampling Interval _____ ft. Sample Quality _____
Lag Time: _____ min. @ _____ ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| | LOGS: DLL, 1515' to 4756' | |
| | BHCS, 1515' to 4748' | |
| | LSS, (no depth available) | |
| | Dipmeter (aborted due to hole conditions) | |
| | | |
| | | |
| | PRELIMINARY: Electric Log Calculations (assuming $R_w$ = .31) | |
| 1878-1887 | 31% porosity, 40% $H_2O$ | |
| 4508-4522 | 15% porosity, 56% $H_2O$ | |
| 4550-4556 | 18% porosity, 58% $H_2O$ | |
| 4562-4568 | 16% porosity, 40% $H_2O$ | |
| 4572-4576 | 20% porosity, 40% $H_2O$ | |
| 4616-4622 | 22% porosity, 60% $H_2O$ | |
| | | |
| | | |

GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

Ditch Gas (Units): Background _____ Connection _____ Trip _____ Peaks _____

Mud: Wt. 10.8 Vis 85 W.L. 12 ph 8.0 cc Oil - % $Cl_2$ 30,000 Temp. _____ °F. in _____ °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| Cores | No. | | |

Geologist: ROK BROTHERS

TETRA TECH, INC.

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

DAILY GEOLOGICAL REPORT

WELL KUYANAK #1 Date 3/2/81 Time 0600

Present Depth 4755 (driller) Previous Depth _____ Footage 24 Hrs. _____

Formation(s) Pebble Shale Top _____

Present Activity: Circulating & Conditioning Hole for Casing.

LITHOLOGIC DESCRIPTION

Interval Reported _____ Sampling Interval _____ ft. Sample Quality _____
Lag Time: _____ min. @ _____ ft.

| Interval | (LOG RESULTS) Description | Avg. Drill Rate min./ft. |
|---|---|---|
| 1st run | Ran dipmeter, tore off arm @ 4050' in tight spot. | |
| 2nd run | Ran to 4000', relative bearing not working. | |
| 3rd run | Ran velocity survey, good records. | |
| 4th run | Ran dipmeter to 4000', good log (1515'-4758' total run) | |
| 5th run | Ran sidewall cores, shot 30, recovered 30. | |
| | | |
| | NOTE: Schulumberger TD is 4758'. | |

GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
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Ditch Gas (Units): Background _____ Connection _____ Trip _____ Peaks _____

Mud: Wt. 11.4 Vis 81 W.L. 6 ph 8.0 cc Oil - % $Cl_2$ 18000 Temp. _____ °F. in _____ °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| | | | |
| | | | |
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| | | | |

Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| Cores | No. | | |

Geologist: RON BROCKWAY

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

DAILY GEOLOGICAL REPORT

L KUYANAK #1 Date 3/3/81 Time 0600

ent Depth 4755' Previous Depth - Footage 24 Hrs. -

nation(s) Pebble Shale Top 4643'

ent Activity: Running 9-5/8" Casing.

HOLOGIC DESCRIPTION

rval Reported Sampling Interval ft. Sample Quality
Time: min. @ ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| | | |

S OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

h Gas (Units):
Background Connection Trip Peaks

d: Wt. Vis W.L. ph cc Oil % $Cl_2$ Temp. °F. in °F. out

a Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| | | | |

atched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| ashed & Dried Ditch | | | |
| washed Ditch (Paleo) | | | |
| washed Ditch (USGS) | | | |
| eoChem (canned) | | | |
| ores | No. | | |

RON BROCKWAY

TETRA TECH, INC.

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

DAILY GEOLOGICAL REPORT

WELL KUYANAK #1 Date 3/4/81 Time 0600

Present Depth 4755' Previous Depth 4755' Footage 24 Hrs. 0

Formation(s) Pebble Shale Top 4643' (Log)

Present Activity: Working on BOP's, Nippling Down

LITHOLOGIC DESCRIPTION

Interval Reported _____ Sampling Interval _____ ft. Sample Quality _____
Lag Time: _____ min. @ _____ ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| | Ran 111 joints, 9-5/8" casing to 4755' | |
| | REQUEST: 1" Filament tape, Scotch, 10 rolls. | |

GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Ditch Gas (Units): Background _____ Connection _____ Trip _____ Peaks _____

Mud: Wt. _____ Vis _____ W.L. _____ ph _____ cc Oil _____ % $Cl_2$ _____ Temp. _____ °F. in _____ °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| | | | |

Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| Cores | No. | | |

Geologist BILL REYNOLDS

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

# DAILY GEOLOGICAL REPORT

ELL KUYANAK #1 Date 3/5/81 Time 0600

sent Depth 4755' Previous Depth 4755' Footage 24 Hrs. 0

rmation(s) Pebble Shale Top 4643'

sent Activity: Nipple up BOP's

## THOLOGIC DESCRIPTION

erval Reported _____ Sampling Interval _____ ft. Sample Quality _____
g Time: _____ min. @ _____ ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| | NOTE: Est. drilling out from under casing 3/6/81 (AM) at earliest. | |

## GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Ditch Gas (Units): Background _____ Connection _____ Trip _____ Peaks _____

Mud: Pit Sample
Wt. 10.9 Vis 90 W.L. 9 ph 8.0 cc Oil - % $Cl_2$ 50000 Temp. _____ °F. in _____ °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| | | | |

Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| Cores | No. | | |

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

# DAILY GEOLOGICAL REPORT

ELL KUYANAK #1 Date 3-6-81 Time 7 AM

esent Depth 4755' Previous Depth 4755' Footage 24 Hrs. 0

ormation(s) PEBBLE SH Top 4643'

esent Activity: WOC

## THOLOGIC DESCRIPTION

terval Reported _____ Sampling Interval _____ ft. Sample Quality _____
g Time: _____ min. @ _____ ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| | Laying down 7" drill collars; waiting on cement (WOC) hope to drill out in next 24 hrs., could be 48 hrs. | |

## GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
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Ditch Gas (Units): Background _____ Connection _____ Trip _____ Peaks _____

Mud: Wt. 11.2 Vis 94 W.L. 12 ph 8 cc Oil 0 % $Cl_2$ 3300 Temp. _____ °F. in _____ °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| | | | |
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Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| Cores | No. | | |

B. REYNOLDS

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

# DAILY GEOLOGICAL REPORT

WELL KUYANAK #1 Date 3/7/81 Time 0600

Present Depth 4755' Previous Depth 4755' Footage 24 Hrs. 0

Formation(s) Pebble Sh. Top 4643'

Present Activity: Test BOP

## LITHOLOGIC DESCRIPTION

Interval Reported _____ Sampling Interval _____ ft. Sample Quality _____
Lag Time: _____ min. @ _____ ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
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## GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
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Ditch Gas (Units): Background _____ Connection _____ Trip _____ Peaks _____

Mud: Wt. 11.2 Vis 10.2 W.L. 14 ph 10 cc Oil 0 % $Cl_2$ 32K Temp. - °F. in - °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| | | | |
| | | | |
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Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| Cores | No. | | |

Geologist BILL REYNOLDS

TETRA TECH, INC.

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

DAILY GEOLOGICAL REPORT

WELL KUYANAK #1 Date 3/8/81 Time 0600

Present Depth 4767' Previous Depth 4755' Footage 24 Hrs. 12

Formation(s) Pebble Sh. Top 4643'

Present Activity: Circulating - drilled out shoe

LITHOLOGIC DESCRIPTION

Interval Reported _____ Sampling Interval _____ ft. Sample Quality _____
Lag Time: _____ min. @ _____ ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| | | |

GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Ditch Gas (Units):
Background _____ Connection _____ Trip _____ Peaks _____

Mud: Wt. 10.5 Vis 45 W.L. 22 ph 11.0 cc Oil 0 % $Cl_2$ 33K Temp. - °F. in - °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| | | | |

Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| Cores | No. | | |

Geologist BILL REYNOLDS

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

# DAILY GEOLOGICAL REPORT

WELL KUYANAK #1 Date 3/9/81 Time 0600

Present Depth 4965' Previous Depth 4767' Footage 24 Hrs. 198'

Formation(s) Pebble Sh Top 4643'

Present Activity: Tripping out to core.

## LITHOLOGIC DESCRIPTION

Interval Reported 4750-4965 Sampling Interval 10 ft. Sample Quality Good
Lag Time: 26 min. @ 4965 ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| 4750-4760 | 80% cmt., 20% sh, m gy sli slty, fairly soft | 4.12 |
| 4760-4780 | Sh, m gy, sli slty, fairly soft, tr coal, pyr & bent. | 4.29 |
| 4780-4830 | Sh, m brn/gy - dk gy - sli slty, fairly soft, w/ fltg, & free fr to lag R. & occ fros qtz grn. tr pyr & bent. | 3.28 |
| 4830-4890 | Sh, m gy/brn gy, sli slty, fairly soft, w/qtz grn & occ. R. cht grn a/a, tr. pyr, occ tr dk brn ls frag (nod) tr. coal | 3.1 |
| 4890-4910 | Sh, m gy-dk gy - w/ qtz grn a/a fairly hard, tr pyr | 2.4 |
| 4910-4955 | Sh, m gy - sli slty, fairly hard, fltg & free fine to crs R and occ Fros. qtz grn, tr. pyr, occ tr. m gy ls frag. | 2.5 |

## GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
| 4750-4760 | 27 | 30 | - | - | 5000 | Tr | Tr | Tr | - |
| 4760-4780 | 15 | 25 | - | - | 2800 | Tr | Tr | Tr | - |
| 4780-4830 | 15 | 30 | - | - | 2800 | Tr | Tr | - | - |
| 4830-4890 | 18 | 27 | - | - | 3300 | Tr | Tr | - | - |
| 4890-4910 | 18 | 20 | - | - | 3200 | Tr | Tr | Tr | - |
| 4910-4965 | 17 | 29 | - | - | 3200 | Tr | Tr | - | - |

Ditch Gas (Units): Background 15-20 Connection 25 Trip - Peaks -

Mud: Wt. 10.5 Vis 45 W.L. 12 ph 9.0 cc Oil 0 % $Cl_2$ 32K Temp. - °F. in - °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| 4750-4760 | 2.46 | 1.75 | - |
| 4760-4780 | 2.52 | 1.70 | - |
| 4780-4830 | 2.44 | 1.67 | - |
| 4830-4890 | 2.43 | 1.72 | - |
| 4890-4910 | 2.46 | 1.69 | - |
| 4910-4965 | 2.46 | 1.66 | - |

Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| Cores | No. | | |

Geologist BILL REYNOLDS

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

# DAILY GEOLOGICAL REPORT

ELL KUYANAK #1 Date 3/10/81 Time 0600

resent Depth 5022' Previous Depth 4965' Footage 24 Hrs. 57'

ormation(s) Pebble Shale Top 4643'

resent Activity: Coring

## ITHOLOGIC DESCRIPTION

nterval Reported 4965-5022 Sampling Interval (Coring) ft. Sample Quality Poor
ag Time: 27 min. @ 5022 ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| 4965-5022 | Appears to be sh as previously reported | 3.45 |

## GAS OCCURRENCE/SHOWS

( NONE)

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Ditch Gas (Units): Background 8 Connection 13 Trip 30 Peaks None

Mud: Wt. 10.1 Vis 39 W.L. 14 ph 8.5 cc Oil 0 % $Cl_2$ 30000 Temp. 74 °F. in 79 °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| 5020 | 2.44 | 1.71 | |
| | | | |
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| | | | |
| | | | |

Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| Cores | No. | | |

Geologist BILL REYNOLDS

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

# DAILY GEOLOGICAL REPORT

/ELL KUYANAK #1 Date 3/11/81 Time 0600

resent Depth 5025' Previous Depth 5022' Footage 24 Hrs. 3'

ormation(s) Pebble Shale Top 4643'

resent Activity: Cutting Core #2

## ITHOLOGIC DESCRIPTION

nterval Reported 4965-5024' Sampling Interval _____ ft. Sample Quality _____
ag Time: 27 min. @ 5000 ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| 4965-5024 | Cut Core #1 (recovered 58.2', 98.6% recovery) | |
| 4965-5023.2 | Sh, m-dk gy, sl slty to slty, w/ f-crs, SR-R, in pt fros fltg qtz grns w/ mica, pyr, carb frags & lams & a few fish scales, teeth, & skeletal frags; fairly hd, s amt sks | 16-18 |

## GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
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Ditch Gas (Units): Background 5-10 Connection _____ Trip 30 Peaks _____

Mud: Wt. 10.4 Vis 42 W.L. 12.6 ph 8.5 cc Oil 0 % $Cl_2$ 34000 Temp. 74 °F. in 79 °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| 4950-5000 | 2.44 | 1.66 | |
| | | | |
| | | | |
| | | | |
| | | | |

Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| Cores | No. | | |

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

# DAILY GEOLOGICAL REPORT

WELL KUYANAK #1 Date 3-12-81 Time 0600

Present Depth 5075' Previous Depth 5025' Footage 24 Hrs. 50'

Formation(s) PEBBLE SH Top 4643'

Present Activity: Tripping w/bit #9

## LITHOLOGIC DESCRIPTION

Interval Reported 5025-5075' Sampling Interval _____ ft. Sample Quality _____
Lag Time: 30 min. @ 5072 ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| 5024-5075' | Core #2, Cut 51', Rec. 50.9'. | 20 - 21 |
| | 37.6' Sh, 11.1' grty sdy Sh w/Cht pbls and 0.1' thn cgl at | |
| | 5072'; also 0.8' Ls, 1.4' Sh, rbly, broken. | |

## GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| | | | | | | | | | |
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| | | | | | | | | | |

Ditch Gas (Units): Background 5 Connection _____ Trip 20 Peaks _____

Mud: Wt. 10.2 Vis 42 W.L. 14 ph 8.0 cc Oil 0 % $Cl_2$ 34000 Temp. 69 °F. in 87 °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| 5025-5075' | 2.46 | 1.70 | - |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| Cores | No. | | |

BIL REYNOLDS

K-22

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

# DAILY GEOLOGICAL REPORT

ELL KUYANAK #1 Date 3/13/81 Time 0600

sent Depth 5153' Previous Depth 5075' Footage 24 Hrs. 78

rmation(s) Kingak Top 5073'

sent Activity: Coring (Core #3)

## THOLOGIC DESCRIPTION

erval Reported 5075-5153' Sampling Interval 10 ft. Sample Quality Poor
g Time: 31 min. @ 5100 ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| 5075-5080 | Pred cvgs w/ tr clyst & ss | - |
| 5080-5093 | Ss, lt-m gy, f - m grn, qtz, SA w/ abun glau, fis, tt, w/ rare tr por | - |
| 5075-5090 | (Drill rate only) | 5.0 |
| 5090-5093 | (Drill rate only) | 2.0 |
| | Coring time on Core #3: | |
| | 5093-5097' - 5 min. | |
| | 5097-5103' - 2.5 min. | |
| | 5103-5138' - 6-8 min. | |
| | 5138-5153' - 10-13 min. | |

## GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | (cuttings gas) CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
| 5090-93 | 10 | 20 | 5 | 5 | 2500 | 800 | 800 | tr | - |
| 5100 | 7 | 40 | 5 | 5 | 4500 | 1200 | 1900 | 800 | - |

itch Gas (Units): Background 5 Connection - Trip 20 Peaks -

Mud: Wt 10.3 Vis 40 W.L. 14.4 ph 8.0 cc Oil 0 % $Cl_2$ 32000 Temp. 67 °F. in 85 °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| 5075-5100 | 2.44 | 1.78 | - |
| 5100-5150 | 2.46 | 1.58 | - |

ispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| Cores | No. | | |

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

# DAILY GEOLOGICAL REPORT

WELL KUYANAK #1 Date 3/14/81 Time 0600

Present Depth 5186' Previous Depth 5153' Footage 24 Hrs. 33'

Formation(s) Simpson Top 5090' (drlg. time & samples)

Present Activity: Tripping in hole w/ drilling assembly.

## LITHOLOGIC DESCRIPTION

Interval Reported 5093-5186 Sampling Interval (Cored) ft. Sample Quality

Lag Time: 30 min. @ 5155 ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| 5093-5153 | Core #3: Cored 60', recovered 58.4', ss, lt gy, f grn, qtz w/ abun glau, ang, p srtd, fis to fri w/ difficulty, patchy cly cmt here & there, por is f overall w/ 20-35' g & 10-15' p, no fluor, no oil stn, no cut, no petroliferous odor. | |
| 5153-5186 | Core #4: Cored 33', recovered 33'; 11.6' ss as abv w/ f - g por, no hydro carbon shows & tt in bottom ±2'; contact w/ sh is @ 5164.6'; 21.4' sh, m grn w/ occ pyr incl, shell fos, fairly hd. | |
| | 5153-5161 Core #4, drilling time only | 14 |
| | 5161-5165 Core #4, drilling time only | 9 |
| | 5165-5168 Core #4, drilling time only | 18 |
| | REQUEST: White Plastic Bags | |
| | U.S.G.S. labels | |
| | Core Labels | |
| | Geology Mgr. labels | |
| | Waterproof marking pens (small) | |

## GAS OCCURRENCE/SHOWS (NONE)

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| | | | | | | | | | |
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| | | | | | | | | | |

Ditch Gas (Units): Background 0-5 Connection - Trip 10 Peaks -

Mud: Wt. 10.3 Vis 39 W.L. 12.6 ph 8.0 cc Oil 0 % $Cl_2$ 34000 Temp. - °F. in - °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| 5150-5175 | - | 1.79 | - |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| Cores | No. | | |

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

# DAILY GEOLOGICAL REPORT

WELL KUYANAK #1 Date 3/15/81 Time 0600

Present Depth 5401' Previous Depth 5186' Footage 24 Hrs. 215'

Formation(s) Kingak Top 5073'

Present Activity: Tripping for new bit.

## LITHOLOGIC DESCRIPTION

Interval Reported 5186-5401 Sampling Interval 10' ft. Sample Quality Fair
Lag Time: 37 min. @ 5350 ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| 5186-5300 | Sh, m - dk gy, sl slty to slty, in pt splty, fairly hd | 4-6 |
| 5300-5400 | Sh as abv & sltst varying from lt gy to tan to m gy in minor pt w/ mica, tr pyr, occ w/ glau, fairly hd | 4-7 |

## GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
| 5351 | 150 | 180 | 50 | 30 | - | - | - | - - | - |

Ditch Gas (Units): Background 20-30 Connection - Trip 5 Peaks 150 @ 5351' 140 @ 5355'

Mud: Wt. 10.2 Vis 44 W.L. 15 ph 8 cc Oil 0 % $Cl_2$ 29000 Temp. 82 °F. in 100 °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| 5200-5250 | 2.47 | 1.80 | - |
| 5250-5300 | 2.48 | 1.91 | - |
| 5300-5350 | 2.48 | 1.90 | |
| 5350-5400 | 2.48 | 1.87 | - |
| | | | |
| | | | |

Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| Cores | No. | | |

TETRA TECH, INC.

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

DAILY GEOLOGICAL REPORT

WELL KUYANAK #1 Date 3/16/81 Time 0600

Present Depth 5553' Previous Depth 5401' Footage 24 Hrs. 152'

Formation(s) Xingak Top 5073'

Present Activity: Drilling

LITHOLOGIC DESCRIPTION

Interval Reported 5401-5530 Sampling Interval 10 ft. Sample Quality GOOD
Lag Time: 37 min. @ 5530 ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| 5401-5490 | Sltst, lt gy, w/ mica, occ f pyr, occ becomes sl calc, fairly hd, w/ intbd sh (5%-30%), m - dk gy, slty, pt splty, bri, fairly hd. | 3-4 |
| 5490-5530 | Sltst as abv and sh (10%) as abv | 4-7 |

GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
| 5420 | 160 | 150 | 70 | 70 | - | - | - | - | - |

Ditch Gas (Units): Background 20-40 Connection 40 Trip 160 Peaks 165 @ 5420', 80 @ 5430'

Mud: Wt. 10.3 Vis 43 W.L. 9.4 ph 8 cc Oil 0 % $Cl_2$ 33000 Temp. 78 °F. in 92 °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| 5400-5450 | 2.47 | 1.63 | - |
| 5450-5500 | 2.46 | 1.72 | - |
| 5500-5550 | 2.48 | 1.85 | - |

Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| Cores | No. | | |

TETRA TECH, INC.

**TETRA TECH, INC.**
**U. S. GEOLOGICAL SURVEY/ONPRA**

# DAILY GEOLOGICAL REPORT

VELL KUYANAK #1 Date 3/17/81 Time 0600

Present Depth 5649' Previous Depth 5553' Footage 24 Hrs. 96'

Formation(s) Kingak Top 5073'

Present Activity: Building Mud.

## LITHOLOGIC DESCRIPTION

Interval Reported 5530-5645 Sampling Interval 10 ft. Sample Quality Good

Lag Time: 37 min. @ 5649 ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| 5530-5600 | Sltst, m lt gy, w/ mica, sl calc in pt, v sparse pyr, occ weak lams, mod hd; sh (10-20%), m to mostly dk gy, mica, slty, in pt splty, fairly hd, bri. | 7-10 |
| 5600-5630 | Sltst as abv, 35-45% sh as abv | 6-7 |
| 5630-5645 | Sltst as abv, 70% sh as abv | 8-10 |

## GAS OCCURRENCE/SHOWS (NONE)

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Ditch Gas (Units): Background 10-20 Connection - Trip - Peaks -

Mud: Wt. 10.5 Vis 44 W.L. 15.4 ph 8.0 cc Oil 0 % $Cl_2$ 35000 Temp. 84 °F. in 92 °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| 5550-5600 | 2.48 | 1.93 | - |
| 5600-5649 | 2.47 | 1.94 | - |

Dispatched Samples:

| Type | Interval | No. of boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| Cores | No. | | |

BILL REYNOLDS

TETRA TECH, INC.

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

DAILY GEOLOGICAL REPORT

WELL KUYANAK #1 Date 3/18/81 Time 0600

Present Depth 5736' Previous Depth 5649' Footage 24 Hrs. 87'

Formation(s) Kingak Top 5073'

Present Activity: Drilling

LITHOLOGIC DESCRIPTION

Interval Reported 5640-5730 Sampling Interval 10 ft. Sample Quality Good
Lag Time: 48 min. @ 5650 ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| 5645-5730 | Sh, m gy - dk gy, mica, slty, in pt splty, fairly hd, bri, w/ tr pyr; and sltst (0-20%), lt m gy, mica, arg, fairly hd. | 7-9 |

GAS OCCURRENCE/SHOWS (NONE)

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Ditch Gas (Units): Background 15-20 Connection - Trip 130 Peaks -

Mud: Wt. 10.2 Vis 41 W.L. 15.8 ph 8.0 cc Oil - % $Cl_2$ 32000 Temp. 74 °F. in 94 °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| 5650-5700 | 2.47 | 1.80 | - |
| 5700-5725 | 2.47 | 1.75 | - |
| | | | |
| | | | |
| | | | |
| | | | |

Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| Cores | No. | | |

Geologist BILL REYNOLDS

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

DAILY GEOLOGICAL REPORT

ELL KUYANAK #1 Date 3/19/81 Time 0600

sent Depth 5867' Previous Depth 5736' Footage 24 Hrs. 131'

rmation(s) Kingak Top 5073'

sent Activity: Drilling

THOLOGIC DESCRIPTION

erval Reported 5730-5850 Sampling Interval 10 ft. Sample Quality Good
g Time: 46 min. @ 5850 ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| 5730-5750 | Sh (70% of intv), m gy to mnr dk gy, micromica, slty, in pt splty, fairly hd, bri, tr pyr; and sltst, m lt gy, w/ tr glau, fairly hd, mica | 8-9 |
| 5750-5800 | Sh (60-80%) as abv and sltst as abv | 6-8 |
| 5800-5850 | Sltst as abv and sh (25-40%) as abv | 8-10 |

AS OCCURRENCE/SHOWS (NONE)

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

ch Gas (Units).
Background 20-25 Connection - Trip 10 Peaks -

ud: Wt. 10.6 Vis 39 W.L. 20.4 ph 8.0 cc Oil 0 % $Cl_2$ 35000 Temp. 85 °F. in 83 °F. out

ata Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| 5700-5750 | 2.47 | 1.76 | - |
| 5750-5800 | 2.47 | 1.69 | - |
| 5800-5850 | 2.46 | 1.72 | - |
| | | | |
| | | | |
| | | | |

spatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (Canned) | | | |
| Cores | No. | | |

ologist BILL REYNOLDS

TETRA TECH, INC.

**TETRA TECH, INC.**
**U. S. GEOLOGICAL SURVEY/ONPRA**

DAILY GEOLOGICAL REPORT

WELL KUYANAK #1 Date 3/20/81 Time 0600

Present Depth 5980' Previous Depth 5867' Footage 24 Hrs. 113'

Formation(s) Kingak Top 5073'

Present Activity: Breaking in bit #13.

LITHOLOGIC DESCRIPTION

Interval Reported 5850-5980 Sampling Interval 10 ft. Sample Quality FAIR
Lag Time: 36 min. @ 5900 ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| 5850-5980 | Sltst (30-90%), lt m gy, mica, arg, tr glau, occ weak arg lams, mod hd; sh, m gy to mnr dk gy, micromica, slty, in mnr pt sft & fis, mostly hd & brit & in mnr pt splty, tr pyr. | 8-10 |

GAS OCCURRENCE/SHOWS (NONE)

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Ditch Gas (Units): Background 20-25 Connection - Trip - Peaks -

Mud: Wt. 10.5 Vis 39 W.L. 22.8 ph 8.0 cc Oil 0 % $Cl_2$ 33000 Temp. 79 °F. in 90 °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| 5900-5950 | 2.47 | 1.72 | - |

Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| Cores | No. | | |

Geologist BILL REYNOLDS

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

# DAILY GEOLOGICAL REPORT

WELL KUYANAK #1 Date 3/21/81 Time 0600

Present Depth 6152' Previous Depth 5980' Footage 24 Hrs. 172'

Formation(s) Kingak Top 5073'

Present Activity: Tripping for new bit

## LITHOLOGIC DESCRIPTION

Interval Reported 5980-6150 Sampling Interval 10 ft. Sample Quality Fair
Lag Time: 37 min. @ 6150 ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| 5980-6000 | Sh, m gy, mica, slty, fairly hd, and sh, dk gy, sl slty, mica, splty, fairly hd & brit; and 35-45% sltst, m lt gy, mica, tr glau, occ becoming sl calc, fairly cln to arg, mod sft to mod hd. | 7.0 |
| 6000-6150 | From 40% to 90% sh as abv, w/ tr glau in bottom 40'; 10% to 60% sltst as abv. | 4-6 |

## GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
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Ditch Gas (Units): Background 25-35 Connection - Trip 120 Peaks -

Mud: Wt. 10.4 Vis 47 W.L. 9.0 ph 8.0 cc Oil 0 % $Cl_2$ 35000 Temp. 85 °F. in 87 °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| 6000-6050 | 2.44 | 1.87 | - |
| 6050-6100 | 2.44 | 1.83 | - |
| 6100-6150 | 2.46 | 1.86 | - |
| | | | |
| | | | |
| | | | |

Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| Cores | No. | | |

TETRA TECH, INC.

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

DAILY GEOLOGICAL REPORT

WELL KUYANAK #1 Date 3/22/81 Time 0600

Present Depth 6219' Previous Depth 6152' Footage 24 Hrs. 67'

Formation(s) _____ Top _____

Present Activity: Coring

LITHOLOGIC DESCRIPTION

Interval Reported 6150-6203 Sampling Interval 10 ft. Sample Quality Fair
Lag Time: 38 min. @ 6200 ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| 6150-6198 | 60%-30% sh, m gy to minor dk gy, slty, micromica, w/ tr glau, in pt splty, fairly hd, brit; 40%-70% sltst, m to lt gy, mica, w/ rare tr glau, occ sl calc, fairly hd. | 5-8 |
| 6198-6203 | 45% sh as abv; 45% sltst as abv; 10% ss, m lt gy, v f grn; qtz ang, p srtd, sl calc, w/ tr glau, lt arg cmt, mod hd - mod sft, tt, no shows. | 2-3 |

GAS OCCURRENCE SHOWS (NONE)

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
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Ditch Gas (Units): Background 15-25 Connection - Trip 95-80 Peaks -

Mud: Wt. 10.4 Vis 39 W.L. 12.8 ph 8.0 cc Oil 0 % $Cl_2$ 31000 Temp. 80 °F. in 86 °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| 6150-6200 | 2.47 | 1.84 | - |
| | | | |
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| | | | |

Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| Cores | No. | | |

TETRA TECH, INC.

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

DAILY GEOLOGICAL REPORT

WELL KUYANAK #1 Date 3/23/81 Time 0600

Present Depth 6254' Previous Depth 6219' Footage 24 Hrs. 35'

Formation(s) _____ Top _____

Present Activity: Tripping for core barrel.

LITHOLOGIC DESCRIPTION

Interval Reported 6203-6254 Sampling Interval 10 ft. Sample Quality Fair
Lag Time: 38 min. @ 6250 ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| 6203-6236' | Core #5 (cut 33', rec 33') | |
| | 6203-6223.9 (20.9'), ss, m lt gy, v f grn, slty grdg to aren sltst, qtz, SA-SR, p srtd, sparsely glau w/ incr glau in places, blk carb grns & frags, ireg arg strs, occ sh frags (incls), tr to occ tiny patch pore por, in general tt w/ 3' (6209-6212) arg shy zone; no shows; fairly well ind & hd, general mot marble-like appearance | 10 |
| | 6223.9-6236' (12.1'), sh, m gy, slty w/ v slty strs, mica w/ tiny carb frags & ireg lams, lenses, and bands of sltst, fairly hd, brit | 16-17 |
| 6236-6250 | Sh (85%), m gy, micromica, slty, fairly hd, tr pyr; sltst (10%), lt-m gy, sparsely mica w/ cly cmt, fairly hd; ss (5%), lt gy, v f grn, qtz, SR-SA, p srtd, sparsely glau w/ occ carb frags & grns, lt cly cmt, tt. | 5-6 |
| 6250-6254 | Sh (90%) as abv; ss (10%) as abv | 1.4 |

GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
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Ditch Gas (Units): Background 15 Connection - Trip 60 Peaks -

Mud: Wt. 10.4 Vis 43 W.L. 18.2 ph 7.5 cc Oil 0 % $Cl_2$ 32000 Temp. 65 °F. in 80 °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| 6200-6250 | 2.47 | 1.73 | - |
| | | | |
| | | | |
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| | | | |

Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| Cores | No. | | |

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

# DAILY GEOLOGICAL REPORT

ELL KUYANAK #1 Date 3/24/81 Time 0600

esent Depth 6369' Previous Depth 6254' Footage 24 Hrs. 115'

ormation(s) Shublik (?) Top

esent Activity: Drilling

ITHOLOGIC DESCRIPTION

nterval Reported 6254-6350 Sampling Interval 10 ft. Sample Quality Good
ag Time: 40 min. @ 6350 ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| 6254-6314 | Core #6 (cut 60', rec. 60'); Ss, lt gy, occ w/ grn tinge from glau, brn-gy to m-gy, arg in bottom ±0.8', v f grn & sltv in top & bottom 10', qtz, ang - SR, p srtd, w/ sparse mica, rr pyr, few carb grns, calc to sl calc in places, occ v calc w/ calc cmt in a couple places, approaching an aren, arg, brn ls @ 6294', the rest w/ cly cmt, mod fri, w/ fos shell frags Pecten shells & unidentified Plcy scat thro core; @ 6258' had 0.3' blk, sm, rd nod or pos fos, irreg arg strks & burrows - bioturbated por ls tt to tr por from 6254-6270, tr to por to fr from 6270-86', fr & fr-g por from 6286-6303', dec to tt in basal 5-6' w/ some sec por in core. | 5.4 |
| 6314-6320 | Sh, brn-gy to m-gy, micromica, slty, pt splty, hd, brit & ss (25%) as abv, tt to tr por. | 4.0 |
| 6320-6340 | Ss, lt gy as abv, p to fr por & ss, dk gy, v f grn, qtz, SR-R, p srtd w/ few m rd blk sft grns, sparsely mica, bit - gave cut w/ hot solvent; sh (15%) as abv | 1-2 (6319-39') |
| 6340-6350 | Ss as abv, abunt glau, tt, min dk gy ss as abv, also sh (40%), brn-gy as abv, tr shell frags, pels, tr brn hd dol. | 7-9 |

GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
| 6300 | 160 | 40 | 40 | 40 | 30000 | 1500 | 100 | - | - |
| 6320 | 240 | 40 | 40 | 50 | 60000 | 600 | 100 | - | - |
| 6320-23 | 175 | 50 | 50 | 30 | 70000 | 1200 | 400 | tr | - |

Ditch Gas (Units): Background 25-40 Connection - Trip 50 Peaks 240 & 275

Mud: Wt. 10.3 Vis 44 W.L. 12.8 ph 7.0 cc Oil 0 % $Cl_2$ 31000 Temp. 73 °F. in 75 °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| 6250-6300 | 2.47 | 1.47 | |
| 6300-6350 | 2.49 | 1.58 | |

Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| Cores | No. | | |

TETRA TECH, INC.

**TETRA TECH, INC.**
**U. S. GEOLOGICAL SURVEY/ONPRA**

## DAILY GEOLOGICAL REPORT

WELL KUYANAK #1 Date 3/25/81 Time 0600

Present Depth 6565' Previous Depth 6369' Footage 24 Hrs. 196'

Formation(s) Shublik Top 6249' (tentative)

Present Activity: Drilling

### LITHOLOGIC DESCRIPTION

Interval Reported 6350-6540 Sampling Interval 10 ft. Sample Quality Good
Lag Time: 41 min. @ 6500 ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| 6350-6370 | Ss, lt to m gy, v f grn, qtz, SA-SR, p srtd, calc to occ v calc, w/ glau, sparse mica, cly cmt, mod hd to tt; 15-40% sh, m brn-gy, mica, slty, mod hd, splty, brit, tr fos, tr ls frags | ↑ |
| 6370-6390 | Ss, as abv & min ss, m gy, arg, slty, tt; 90-95% sh, w/ few fos frags in sh w/ free fos frags. | |
| 6390-6430 | Ss as abv w/ occ fos in ss; 20-40% sh as abv w/ few sh frags & ls frags | 6-9 (avg. for entire section) |
| 6430-6500 | Sh, m brn-gy as abv, tr shell frags & ls frags; 10-40% sltst, m gy to m brn-gy, arg, calc, sp mica & in minor pt grdg to ss as abv | |
| 6500-6540 | Ss, lt gy, v f grn, qtz, SA-SR, abunt glau, calc to v calc sparsely mica, w/ calc - arg cmt, mod hd, tt, w/ few shell fos; & 10-40% sh as abv. | ↓ |
| | NEED: About 20 Geochem cans (1 qt) ASAP<br>U.S.G.S. labels (Attn: Adkinson) | |

### GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
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Ditch Gas (Units): Background 10-20 Connection - Trip - Peaks -

Mud: Wt. 10.4 Vis 39 W.L. 8.3 ph 7.0 cc Oil 0 % $Cl_2$ 35000 Temp. 81 °F. in 86 °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| 6350-6400 | 2.48 | 1.79 | - |
| 6400-6450 | 2.48 | 1.87 | - |
| 6450-6500 | 2.48 | 1.90 | - |
| 6500-6550 | 2.48 | 1.90 | - |
| | | | |
| | | | |

Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| Cores | No. | | |

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

DAILY GEOLOGICAL REPORT

WELL KUYANAK #1 Date 3/26/81 Time 0600

Present Depth 6665' Previous Depth 6565' Footage 24 Hrs. 100'

Formation(s) Shublik Top 6249' (tentative)

Present Activity: Drilling

LITHOLOGIC DESCRIPTION

Interval Reported 6540-6660 Sampling Interval 10 ft. Sample Quality Good
Lag Time: 38 min. @ 6660 ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| 6540-6550 | Ss, lt gy to mostly lt med gy, v f grn qtz, A-SA, p srtd, sl glau, v calc, tt; & sh (10%), m brn-gy, mica, slty, hd, few chips brn bioclastic ls. | 4-5 |
| 6550-6560 | Ss as abv, sh (40%) as abv & ls (15%), lt gy, coarsely micro xl, aren, fos-bioclastic, sil, tr Crinoid (?) | 7-8 |
| 6560-6580 | Sh, red to brn-gy, pt slty, micromica, sft to fairly hd, pt splty, hd & brit; & ss (40 to 15%) as abv, cgl w/ lag cht grns & grnls, lots of partly rd lt & dk gy cht frags | 7-9 |
| 6580-6590 | Sh, red as abv, mar, gn, gn is mostly hd & sil; 5% ss cgl as abv. | 7-9 |
| 6590-6600 | Sh, m to m dk gy, sl dol, sil, mica on fresh broken surf, hd. | 7-9 |
| 6600-6660 | Sh, m dk gy, dol w/ wh dol veinlets to 6630, as abv on fresh broken surf, hd, sil, below 6630 is non-dol, no veining, sil & hd to v hd | (see note) |
| | NOTE: Drlg break from 6561-6566, 7-8 min/ft to 2-3 min/ft; from 6650-65 drlg at 10-12 min/ft; from 6561-6650 drlg @ 7-9 min/ft. | |

GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
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Ditch Gas (Units): Background 10-15 Connection - Trip 75 Peaks -

Mud: Wt. 10.3 Vis 45 W.L. 15.2 ph 7.0 cc Oil 0 % $Cl_2$ 31000 Temp. 88 °F. in 88 °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| 6550-6600 | 2.50 | 1.85 | - |
| 6600-6650 | 2.58 | 1.93 | - |
| | | | |
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Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| Core Chem (canned) | | | |
| Cores | No. | | |

Geologist BILL REYNOLDS

TETRA TECH, INC.

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

DAILY GEOLOGICAL REPORT

WELL KUYANAK #1 Date 3/27/81 Time 0600

Present Depth 6690' Previous Depth 6665' Footage 24 Hrs. 25'

Formation(s) Neruokpuk Top 6595'

Present Activity: Logging

LITHOLOGIC DESCRIPTION

Interval Reported 6660-6690 Sampling Interval Core ft. Sample Quality Good
Lag Time: 41 min. @ 6680 ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| 6660-6682 | Sh, m gy, mica, slty to v slty, sil, hd | 10-12 |
| 6682-6690 | Core #7 (Cut 8', rec. 7.7'): Sh, m to dk gy, mica, slty to v slty in places w/ occ thn sltst lam, sil, hd, banded @ 80°-90° vertical. | 25-26 |

GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
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Ditch Gas (Units): Background 5-10 Connection - Trip - Peaks -

Mud: Wt. 10.4 Vis 48 W.L. 9.2 ph 7.0 cc Oil 0 % $Cl_2$ 33000 Temp. 89 °F. in 90 °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| 6650-6690 | 2.60 | 2.01 | - |
| | | | |
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Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| Cores | No. | | |

Geologist BILL REYNOLDS

TETRA TECH, INC.

TETRA TECH, INC.
U. S. GEOLOGICAL SURVEY/ONPRA

DAILY GEOLOGICAL REPORT

WELL KUYANAK #1 Date 3/28/81 Time 0600

Present Depth 6690' Previous Depth 6690' Footage 24 Hrs. -0-

Formation(s) Neruokpuk Top 6595

Present Activity: Logging

LITHOLOGIC DESCRIPTION

Interval Reported _____ Sampling Interval _____ ft. Sample Quality _____
Lag Time: _____ min. @ _____ ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| | | |
| | Temperature log run | |

GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

Ditch Gas (Units): Background _____ Connection _____ Trip _____ Peaks _____

Mud: Wt. 10.3 Vis 47 W.L. 10.0 ph 7.0 cc Oil - % $Cl_2$ Ca 53K 33K Temp. - °F. in - °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| | | | |

Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| Cores | No. | | |

TETRA TECH, INC.

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U. S. GEOLOGICAL SURVEY/ONPRA

DAILY GEOLOGICAL REPORT

WELL KUYANAK #1 Date 3/29/81 Time 0600

Present Depth 6690' Previous Depth 6690' Footage 24 Hrs. -

Formation(s) _____ Top _____

Present Activity: Logging

LITHOLOGIC DESCRIPTION

Interval Reported _____ Sampling Interval _____ ft. Sample Quality _____
Lag Time: _____ min. @ _____ ft.

| Interval | Description | Avg. Drill Rate min./ft. |
|---|---|---|
| | Logging Runs: | |
| | Temp. 4600 - TD (will re-run to surface) | |
| | DLL 4700-6686 | |
| | CNL/FDC 4745-6686 | |
| | HRD 4742-6682 (will re-run) | |
| | BHCS 4744-6672 | |
| | Prep to run: Dipmeter | |
| | Temp. Log | |

GAS OCCURRENCE/SHOWS

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
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Ditch Gas (Units): Background _____ Connection _____ Trip _____ Peaks _____

Mud: Wt. 10.3 Vis 44 W.L. 10.8 ph 7.0 cc Oil - % $Cl_2$ Ca 50K 32K Temp. _____ °F. in _____ °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| | | | |
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Dispatched Samples:

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| Cores | No. | | |

K-9

BILL REYNOLDS

TETRA TECH, INC.

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U. S. GEOLOGICAL SURVEY/ONPRA

DAILY GEOLOGICAL REPORT

WELL KUYANAK #1 Date 3/30/81 Time 0600

Present Depth 6690' Previous Depth 6690' Footage 24 Hrs. 0

Formation(s) Neruokpuk Top 6595'

Present Activity: Plugging

LITHOLOGIC DESCRIPTION

Interval Reported - Sampling Interval - ft. Sample Quality -
Lag Time: - min. @ - ft.

| Interval | Description | | | Avg. Drill Rate min./ft. |
|---|---|---|---|---|
| | Logs: | Re-ran Temp & Dipmeter | | |
| | | GR/SP/DLL/MSFL | 4747-6686 | |
| | | GR/CAL/FDC | 4745-6682 | |
| | | GR/BHCS | 4744-6672 | |
| | | HRD Dipmeter | 4741-6683 | |
| | Tops: | Walakpa sd. | 5090 | |
| | | Kingak sh | 5158 | |
| | | Simpson sd. | 5378 | |
| | | Shublik | 6312 | |
| | | Argelite | 6557 | |
| | SWC | 3 @ 6571' | Geochem Shot 17 | |
| | | 1 @ 6282' | Hydrocarbons Rec. 16 | |
| | | 3 @ 6110' | Geochem | |
| | | 3 @ 5622' | Geochem | |
| | | 3 @ 5078' | Geochem (2 rec.) | |
| | | 4 @ 4772' | Geochem | |
| | Problems w/ headings on logs. | | | |

GAS OCCURRENCE/SHOWS None

| INTERVAL | Total Gas Units | Cuttings Gas Units | Background Gas Units Before | Background Gas Units After | CHROMATOGRAPH (PPM) $C_1$ | $C_2$ | $C_3$ | $C_4$ | $C_5$ |
|---|---|---|---|---|---|---|---|---|---|
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Ditch Gas (Units): None
Background ____ Connection ____ Trip ____ Peaks ____

Mud: Wt. 10.3 Vis 44 W.L. 10.8 ph 7.1 cc Oil - % $Cl_2$ Ca 31K 51K Temp. - °F. in - °F. out

Data Unit:

| Depth | Shale Density | Dc Exponent | Pore Pressure |
|---|---|---|---|
| | | | |
| | | | |
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Dispatched Samples: TO BE SENT IN TODAY.

| Type | Interval | No. of Boxes | Set No. |
|---|---|---|---|
| Washed & Dried Ditch | | | |
| Unwashed Ditch (Paleo) | | | |
| Unwashed Ditch (USGS) | | | |
| GeoChem (canned) | | | |
| Cores | No. | | |

K - FINAL REPORT

TETRA TECH, INC.

TETRA TECH, INC.
U.S. GEOLOGICAL SURVEY/ONPRA

LOGGING REPORT

WELL NAME KUYANAK TEST WELL #1

Date March 27-29, 1981 Driller Depth 6690'

Elevation 28 KB Logger Depth 6688'

Logs Ran and Intervals

| | | |
|---|---|---|
| DLL/SP/GR/MSFL | 4747-6686' | Birdwell Velocity Survey |
| CNL/FDC/GR/CAL | 4745-6683 | CST - Top Shot 4772' Bottom 6571' |
| BHCS/GR | 4744-6672' | |
| HRD Dipmeter | 4741-6683' | |

Temperature Survey (2) - Run 1: 4755-6697' Run 2: 300-6680

Additional Logs to Run

None

Zones of Interest

| Depth | Gross Thickness | Net Feet of Porosity | Lith | Porosity | Probable Fluid Content |
|---|---|---|---|---|---|
| 5092-5168 | 66 | 66 | SS | 19% | Water |
| | | | | | |
| | | | | | |
| NO ZONES OF INTEREST | | | | | |
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Discussion:

Walapka sand Ø ranges from 18-22% with an average of 19%± and is 100% wet

Simpson Sand is of low porosity, 9%-12%. Tight & shaly. Sag River porosities range from 9%-18% and fairly low rt valves. Shublik porosity is very low.

Log Tops & Correlations:

| | |
|---|---|
| Walakpa Sand | 5090' |
| Kingak | 5158' |
| Simpson Sand | 5378' |
| Sag River Sand | 6242' |
| Shublik | 6312' |
| Argillite | 6559' |

Additional Evaluation Plans:

W. Reynolds
Wellsite Geologist

A. Kane
Log Analyst