

REPORT ON GEOPHYSICAL EXPLORATION
DEPARTMENT OF NATURAL RESOURCES AND NORTHERN AFFAIRS
PETROLEUM AND NATURAL GAS
PERMIT NO. 227

for the period

AUGUST 4, 1958 TO AUGUST 3, 1959

CALGARY, ALBERTA
OCTOBER 6, 1959.

BY: C. E. BAYNHAM, SUPERINTENDENT
NORTHERN FOOTHILLS AGREEMENT

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INTRODUCTION

This report is submitted in support of an application for credit on those crown lands granted to and held jointly by the Northern Foothills Agreement group, which includes Texaco Exploration Company (Operator of N.F.A.), Shell Oil Company of Canada Limited, Mobil Oil of Canada, Ltd., and The British American Oil Company Limited.

The subject permit is in the Northwest Territories and extends in a north-south direction from 60°00' North Latitude to 60°10' North Latitude and in an east-west direction from 122°52' to 123°06' West Longitude. The center of the permit block is about twelve miles south and twelve miles east of Fort Liard, N.W.T.

ENCLOSURES

- (1) A complete topographic map of Crown Permit No. 227.
- (2) A complete Mississippian depth map of Crown Permit No. 227.
- (3) A tabulation of all shotholes drilled in the area during the period under report listing the shothole number, the total depth and the drill log.

GENERAL DISCUSSION OF OPERATIONS

The Liard centre Project (Permit No. 227) is in an

area of generally flat, featureless terrain, however, this permit encompasses one major topographical feature. This is a high ridge which extends in a north-south direction from the middle of the southern boundary of the permit to the middle of the north boundary of the permit block.

Universal Seismic Surveys Limited began operations in the area on October 22, 1958 and continued until November 3, 1958.

The purpose of the survey was to attempt to establish the attitude of the subsurface strata by means of the reflection seismograph method.

All vehicles used in the survey were bombardier tractor types and included the following units: a recorder unit, a personnel carrier, a survey unit, two drill units and a water carrier for the drills. The drills used were Failing CFD-2 types and no difficulties were encountered in drilling holes to the required depth.

The average depth of shotholes was about forty-five feet.

Universal Seismic Surveys Ltd. were equipped with Southwestern Industrial Electronic Company recording equipment and included S.I.E. MR 4 magnetic tape recorder, modified S.I.E. GA-7H amplifiers set to record all signals for 0-600 c.p.s. and S.I.E. S-16 geophones peaked at 28 cycles.

The reflection seismograph work was done by the split spread method of continuous profiling. Shotholes were spaced at 1320 foot intervals and the standard setup had twenty-four groups with four geophones per group. There were twelve groups on each side of the hole stretching to the next shot-hole and to the previous shotpoint. Results obtained with this method were generally good. The average explosive charge used was five pounds. The geophone cables used were the portable type which were laid out and picked up by hand.

Surveying was done with a transit and elevations were obtained at all shotpoints and most geophone stations.

Vertical control was tied to control points on the British Columbia-Northwest Territories boundary and is believed to be accurate within three feet.

Shotpoints and spreads were laid out by means of a surveyors chain.

WEATHERING CONDITIONS

Raw seismic lines were reduced to a datum plane of 1200 feet above sea level by means of a rectilinear type correction. The entire permit area is overlain with a thick mantle of unconsolidated glacial drift which varied in thickness from 300 feet to 1000 feet and after some experimenting it was found that the rectilinear method of correction was most accurate for this area.

SEISMIC RESULTS

Record quality varied from good to not usable. The records however are a little difficult to correlate because of a lack of continuity from record to record.

In order to improve this, certain lines were reshot with a spread length of 600 feet instead of 1320 feet.

The scarcity of well information in the area makes it difficult to identify any reflecting event accurately. However, the major reflecting event present on most records have been tentatively identified as Mississippian Limestone.

STRUCTURAL RESULTS

The control established to date has revealed a subsurface east-west reversal of considerable magnitude, which is coincident with the surface ridge, and extends also across the permit block from north to south.

Additional seismic work is not planned for the foreseeable future.

Respectfully submitted,



C. E. Baynham, Superintendent,
NORTHERN FOOTHILLS AGREEMENT.

CALGARY, ALBERTA
OCTOBER 6, 1959.

LIARD PROJECT
RESERVATION NO. 9043
SHOT HOLE DRILLING LOG
FOR NOVEMBER, 1958

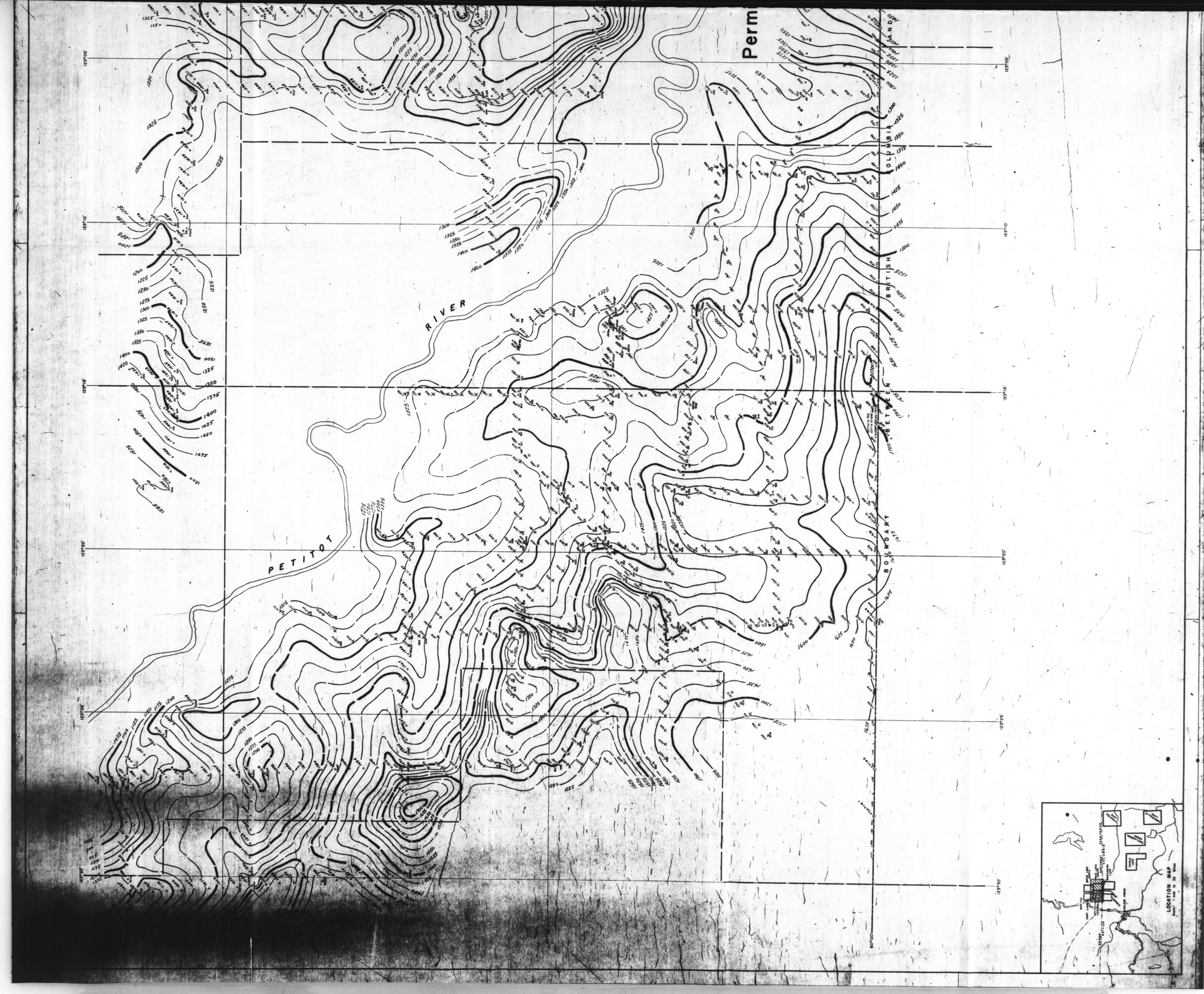
| <u>SHOT HOLE NO.</u> | <u>FORMATION LOG</u> | <u>TOTAL DEPTH</u> |
|----------------------|------------------------|--------------------|
| U - 3196 | 0-40 Cl. Sd. (Redrill) | 40 |
| 3197 | 0-40 Cl. (Redrill) | 40 |
| 3286 | 0-10 Cl. 10-25 Gr. | 25 |
| 3287 | 0-10 Cl. 10-25 Gr. | 25 |
| 3307 | 0-40 Cl. Gr. | 40 |
| 3308 | 0-40 Cl. Gr. | 40 |
| 3309 | 0-40 Cl. Gr. | 40 |
| 3310 | 0-40 Cl. Gr. | 40 |
| 3311 | 0-40 Cl. Gr. | 40 |
| 3312 | 0-40 Sd. Cl. | 40 |
| 3313 | 0-25 Cl. 25-40 Sh. | 40 |
| 3314 | 0-40 Cl. Gr. | 40 |
| 3315 | 0-40 Cl. Rocks | 40 |
| 3317 | 0-40 Cl. Sh. | 40 |
| 3318 | 0-20 Cl. Gr. 20-30 Gr. | 30 |
| 3319 | 0-20 Sdy. Gr. | 20 |
| 3320 | 0-40 Cl. Rocks | 40 |
| 3321 | 0-40 Cl. Rocks | 40 |
| 3322 | 0-30 Gr. | 30 |
| 3323 | 0-30 Gr. | 30 |
| 3324 | 0-7 Sdy. Cl. 7-30 Sd. | 30 |
| 3325 | 0-30 Gr. | 30 |
| 3326 | 0-40 Cl. Gr. | 40 |
| 3327 | 0-40 Cl. Gr. | 40 |
| 3328 | 0-40 Cl. Gr. | 40 |
| 3329 | 0-40 Cl. Gr. | 40 |
| 3330 | 0-40 Cl. Gr. | 40 |
| 3331 | 0-40 Cl. Bld. | 40 |
| 3332 | 0-40 Cl. Gr. | 40 |
| 3333 | 0-40 Cl. Rocks | 40 |
| 3334 | 0-40 Cl. Gr. | 40 |
| 3335 | 0-40 Cl. Gr. | 40 |
| 3336 | 0-40 Cl. Gr. | 40 |
| 3337 | 0-40 Cl. Gr. | 40 |
| 3338 | 0-40 Cl. Rocks | 40 |

| <u>SHOT HOLE NO.</u> | <u>FORMATION LOG</u> | <u>TOTAL DEPTH</u> |
|----------------------|--------------------------------|--------------------|
| U - 3101 | 0-40 Cl. Rocks | 40 |
| 3102 | 0-40 Cl. | 40 |
| 3103 | 0-40 Cl. Rocks | 40 |
| 3104 | 0-40 Cl. Gr. | 40 |
| 3105 | 0-40 Cl. Gr. 20-40 Hard Cl. | 40 |
| 3106 | 0-40 Cl. Gr. Rocks 40 Hard Cl. | 40 |
| 3107 | 0-30 Cl. Gr. Rocks | 30 |
| 3108 | 0-8 Cl. 9-11 Rock 11-30 Sh. | 30 |
| 3109 | 0-15 Cl. Rocks 15-40 Sh. | 40 |
| 3110 | 0-5 Hard Rock | 5 |
| 3110 | 5-20 Hard Rock | 15 |
| 3110 | 20-30 Hard Rock | 10 |
| 3111 | 0-5 Hard Rock | 5 |
| 3111 | 5-30 Hard Rock | 25 |
| 3112 | 0-30 Hard Rock No. S.S. | 30 |
| 3113 | 0-40 Cl. Rocks | 40 |
| 3114 | 0-40 Cl. Rocks | 40 |
| 3115 | 0-40 Cl. Rocks | 40 |
| 3116 | 0-40 Cl. Rocks | 40 |
| 3117 | 0-40 Cl. Rocks | 40 |
| 3118 | 0-40 Cl. Rocks | 40 |
| 3119 | 0-40 Cl. Rocks | 40 |
| 3120 | 0-40 Cl. Rocks Shells | 40 |
| 3121 | 0-40 Cl. Rocks Shells | 40 |
| 3122 | 0-40 Cl. Rocks Shells | 40 |
| 3123 | 0-40 Cl. Rocks Shells | 40 |
| 3124 | 0-40 Cl. Rocks Shells | 40 |
| 3125 | 0-40 Cl. Gr. Shells | 40 |
| 3126 | 0-40 Cl. Gr. Shells | 40 |
| 3127 | 0-40 Cl. Rocks Shells | 40 |
| 3128 | 0-40 Cl. Shells Shells | 40 |
| 3128A | 0-40 Cl. Gr. | 40 |
| 3129 | 0-40 Cl. Gr. | 40 |
| 3130 | 0-40 Cl. Gr. | 40 |
| 3131 | 0-40 Cl. Bds. | 40 |
| 3132 | 0-40 Cl. Sd. Gr. | 40 |
| 3133 | 0-40 Sd. Gr. | 40 |
| | 0-40 Cl. Gr. 20-40 S.S. | 40 |

| <u>SHOT HOLE NO.</u> | <u>FORMATION LOG</u> | <u>TOTAL DEPTH</u> |
|----------------------|-------------------------------|--------------------|
| U - 3134 | 0-40 Cl. Gr. | 40 |
| 3135 | 0-30 Gr. | 30 |
| 3136 | 0-40 Cl. Rocks | 40 |
| 3137 | 0-40 Cl. Rocks | 40 |
| 3138 | 0-20 Cl. Blds. 20-40 Hard Cl. | 40 |
| 3139 | 0-20 Cl. Blds. 20-40 Hard Cl. | 40 |
| 3140 | 0-40 Hard Cl. Rocks | 40 |
| 3141 | 0-35 C.l. Gr. | 35 |
| 3142 | 0-10 Mus. 10-40 Cl. | 40 |
| 3143 | 0-40 Cl. Gr. | 40 |
| 3144 | 0-40 Cl. Rocks | 40 |
| 3145 | 0-10 Cl. 10-40 Sh. | 40 |
| 3146 | 0-30 Cl. Gr. | 30 |
| 3147 | 0-25 Cl. Gr. | 25 |
| 3148 | 0-10 Cl. 10-30 Sh. S.S. | 30 |
| 3149 | 0-20 Hard Rock | 20 |
| 3150 | 0-20 Hard Rock | 20 |
| 3151 | 0-20 Gr. | 20 |
| 3152 | 0-40 Cl. | 40 |
| 3153 | 0-40 Cl. Gr. | 40 |
| 3154 | 0-40 Cl. | 40 |
| 3155 | 0-40 Cl. | 40 |
| 3156 | 0-40 Cl. Small Rocks | 40 |
| 3157 | 0-40 Cl. Small Rocks | 40 |
| 3158 | 0-40 Cl. Small Rocks | 40 |
| 3159 | 0-40 Cl. Small Rocks | 40 |
| 3160 | 0-40 Cl. Small Rocks | 40 |
| 3161 | 0-40 Cl. Small Rocks | 40 |
| 3162 | 0-40 Cl. Small Rocks | 40 |
| 3163 | 0-40 Cl. Small Rocks | 40 |
| 3164 | 0-40 Cl. Small Rocks | 40 |
| 3165 | 0-40 Cl. Gr. | 40 |
| 3166 | 0-40 Cl. Gr. | 40 |
| 3167 | 0-40 Cl. Gr. | 40 |
| 3168 | 0-40 Cl. Gr. | 40 |
| 3169 | 0-40 Cl. Gr. | 40 |
| 3170 | 0-40 Cl. Gr. | 40 |
| 3171 | 0-20 Cl. Gr. 20-40 S.S. | 40 |

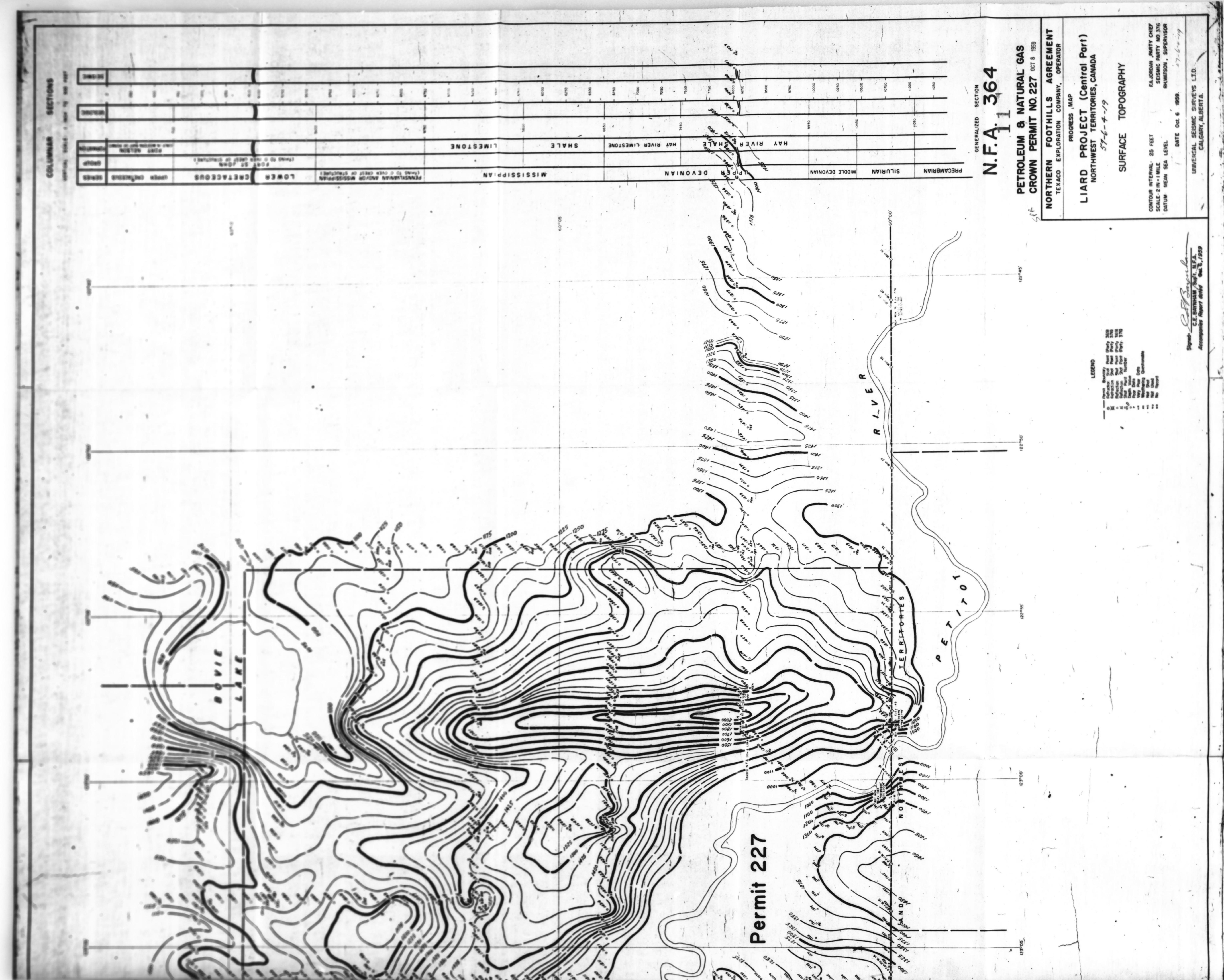
| <u>SHOT HOLE NO.</u> | <u>FORMATION LOG</u> | <u>TOTAL DEPTH</u> |
|----------------------|-------------------------------|--------------------|
| U - 3134 | 0-40 Cl. Gr. | 40 |
| 3135 | 0-30 Gr. | 30 |
| 3136 | 0-40 Cl. Rocks | 40 |
| 3137 | 0-40 Cl. Rocks | 40 |
| 3138 | 0-20 Cl. Blds. 20-40 Hard Cl. | 40 |
| 3139 | 0-20 Cl. Blds. 20-40 Hard Cl. | 40 |
| 3140 | 0-40 Hard Cl. Rocks | 40 |
| 3141 | 0-35 C.l. Gr. | 35 |
| 3142 | 0-10 Mus. 10-40 Cl. | 40 |
| 3143 | 0-40 Cl. Gr. | 40 |
| 3144 | 0-40 Cl. Rocks | 40 |
| 3145 | 0-10 Cl. 10-40 Sh. | 40 |
| 3146 | 0-30 Cl. Gr. | 30 |
| 3147 | 0-25 Cl. Gr. | 25 |
| 3148 | 0-10 Cl. 10-30 Sh. S.S. | 30 |
| 3149 | 0-20 Hard Rock | 20 |
| 3150 | 0-20 Hard Rock | 20 |
| 3151 | 0-20 Gr. | 20 |
| 3152 | 0-40 Cl. | 40 |
| 3153 | 0-40 Cl. Gr. | 40 |
| 3154 | 0-40 Cl. | 40 |
| 3155 | 0-40 Cl. | 40 |
| 3156 | 0-40 Cl. Small Rocks | 40 |
| 3157 | 0-40 Cl. Small Rocks | 40 |
| 3158 | 0-40 Cl. Small Rocks | 40 |
| 3159 | 0-40 Cl. Small Rocks | 40 |
| 3160 | 0-40 Cl. Small Rocks | 40 |
| 3161 | 0-40 Cl. Small Rocks | 40 |
| 3162 | 0-40 Cl. Small Rocks | 40 |
| 3163 | 0-40 Cl. Small Rocks | 40 |
| 3164 | 0-40 Cl. Small Rocks | 40 |
| 3165 | 0-40 Cl. Gr. | 40 |
| 3166 | 0-40 Cl. Gr. | 40 |
| 3167 | 0-40 Cl. Gr. | 40 |
| 3168 | 0-40 Cl. Gr. | 40 |
| 3169 | 0-40 Cl. Gr. | 40 |
| 3170 | 0-40 Cl. Gr. | 40 |
| 3171 | 0-20 Cl. Gr. 20-40 S.S. | 40 |

| <u>HOLE NO.</u> | <u>FORMATION LOG</u> | <u>TOTAL DEPTH</u> |
|-----------------|-------------------------------|--------------------|
| U - 3172 | 0-30 Cl. Gr. 20-40 S.S. | 40 |
| 3173 | 0-40 Cl. Gr. | 40 |
| 3174 | 0-40 Cl. Gr. | 40 |
| 3175 | 0-40 Cl. Gr. | 40 |
| 3176 | 0-40 Cl. Gr. | 40 |
| 3177 | 0-30 Cl. Gr. 25-40 S.S. | 40 |
| 3178 | 0-40 Shy. Cl. | 40 |
| 3179 | 0-40 Shy. Cl. | 40 |
| 3180 | 0-40 Shy. Cl. | 40 |
| 3181 | 0-40 Shy. Cl. | 40 |
| 3182 | 0-15 Cl. Rocks 15-40 Hard Sh. | 40 |
| 3183 | 0-8 Cl. Rocks 8-40 Hard S.S. | 40 |
| 3184 | 0-10 Sh. 10-30 Sh. 30-40 S.S. | 40 |
| 3185 | 0-30 Cl. 35-40 S.S. | 40 |
| 3186 | 0-10 Cl. Gr. 10-40 S.S. | 40 |
| 3187 | 0-30 Cl. 30-30 S.S. | 30 |
| 3188 | 0-10 Shy. Cl. 10-40 S.S. | 30 |
| 3189 | 0-30 Cl. Gr. 30-40 S.S. | 40 |
| 3190 | 0-10 Cl. Gr. 10-40 S.S. | 40 |
| 3191 | 0-40 Cl. Gr. | 40 |
| 3192 - | 0-30 Cl. Rocks 30-40 S.S. | 40 |
| 3193 | 0-40 Cl. Rocks | 40 |
| 3194 | 0-40 Cl. Rocks | 40 |
| 3195 | 0-40 Cl. Rocks | 40 |
| 3196 | 0-40 Cl. Rocks | 40 |
| 3197 | 0-40 Cl. Rocks | 40 |
| 3198 | 0-40 Cl. Rocks | 40 |
| 3199 | 0-40 Cl. Rocks | 40 |
| 3200 | 0-40 Cl. Gr. | 40 |
| 3201 | 0-40 Cl. Gr. | 40 |
| 3202 | 0-40 Cl. Gr. | 40 |
| 3203 | 0-12 Cl. 12-30 Black Rock | 30 |
| 3205 | 0-30 Hard Rock | 30 |
| 3206 | 0-30 Hard Rock | 30 |
| 3207 | 0-40 Cl. Rock | 40 |
| 3208 | 0-40 Cl. Rock | 40 |
| 3209 | 0-40 Cl. Rock | 40 |
| 3210 | 0-30 Cl. Rock | 30 |
| 3211 | 0-25 Cl. Rock | 25 |



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