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REPORT ON THE AREA REFERRED TO AS

BLOCK "A" PERMIT GROUP
(Permits Nos. 529, 530, 531, 532, 533, 534 and 591)

CAMERON HILLS BLOCK, NORTHWEST TERRITORIES

BY

D. A. POUNDER

THE CALIFORNIA STANDARD COMPANY

July, 1954.

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BLOCK "A" - CAMERON HILLS BLOCK, NORTHWEST TERRITORIES.

INTRODUCTION

This report is written in compliance with the regulations governing petroleum and natural gas rights in the Northwest Territories and the Yukon Territory. Section 25(2) and Section 30 of these regulations require a report on operations in connection with permits held under these regulations at the termination of eighteen months from the date of the permits.

On December 29, 1952, twenty-seven permits totalling 1,646,840 acres, more or less, were issued to the following companies:

California Dominion Company	6 permits
California Canadian Company	5 permits
California Mackenzie Company	8 permits
The California Standard Company	8 permits

On January 8, 1954, all permits were assigned to The California Standard Company.

This block of twenty-seven permits is referred to as the Cameron Hills Block. The regulations allow grouping of permits for work and expenditure purposes. The Cameron Hills block of twenty-seven permits has been divided into two groups as follows:

Block "A" - 7 permits

Permits Nos. 529, 530, 531, 532, 533, 534 and 591.

Block "B" - 20 permits

Permits Nos. 549 to 555, 561 to 563, 587 to 590 and 592.

This report deals with the group of 7 permits referred to as Block "A". The approximate location of these permits is shown on attached map "A". The 20 permits referred to as Block "B" are discussed in a separate report.

The acreage included in Block "A" group is as follows:

Permit No. 529	58,880 acres
Permit No. 530	58,880 acres
Permit No. 531	58,880 acres
Permit No. 532	58,880 acres
Permit No. 533	63,296 acres
Permit No. 534	63,296 acres
Permit No. 591	57,600 acres

The total acreage of the group is approximately 419,712 acres.

TOPOGRAPHY, DRAINAGE AND TRANSPORTATION FACILITIES

Block "A" group of permits forms the eastern portion of the Cameron Hills Block. This area straddles the valley of the Hay River. The terrain is flat and low-lying except for the northwest portion which rises abruptly to the Cameron Hills.

Surface ground conditions are typical of vast areas of northern bush and muskeg country. The terrain is covered with trees. Spruce, poplar and willow are the most plentiful varieties, but numerous tamarack and some birch are also seen. The growth is relatively light in the flat, lowlying areas, but quite heavy on the east slopes of the hills.

The area is drained in part by the Hay River and its tributaries. Swede Creek and a number of unnamed creeks flow eastward from the Cameron Hills to the Hay River. The eastern portion of the group is drained by creeks which flow into Buffalo Lake. The area is in large part covered by small to large muskegs and lakes which make transportation by any type of vehicle almost an impossibility during the months when muskegs and lakes are not solidly frozen.

The Mackenzie Highway from Grimshaw, Alberta, to Hay River Settlement, N.W.T., traverses the central portion of this group from southwest to northeast. The highway is an all-weather, gravelled road closely following higher ground on the northwest side of the Hay River. A winter tractor road used before the highway was constructed also parallels the Hay River on the Northwest side. The Hay River valley is a major barrier to access to the area southeast of the river.

HISTORY OF EXPLORATION AND METHODS OF INVESTIGATION.

In reporting the exploration work carried out, three main divisions are discussed under the following headings:

- (a) Surface Geological Investigations.
- (b) Subsurface Geological Investigations.
- (c) Geophysical Investigations.

(a) Surface Geological Investigations.

During the past number of years, The California Standard Company has been carrying out a geological evaluation of various portions of the Northwest Territories. This work was done as a normal part of exploration and the results are utilized in selecting lands on which further, more intensive methods of investigation, appears justified.

The greater part of the vast area of the Northwest Territories which is underlain by sedimentary rocks is covered by a mantle of glacial debris, muskeg or soil. This restricts the surface study of pre-glacial geology to areas where bedrock is exposed on ridges, in river or creek valleys, or along lake shores.

During the field season of 1949, a geological party carried out the first surface mapping for The California Standard Company in the Northwest Territories. The work in 1949 was restricted to a study of sections exposed along the Hay River valley and adjacent areas. The sections examined consisted of Cretaceous marine shales, and marine limestones and shales of Devonian age. The oldest rocks examined in surface exposures were Middle Devonian. The Upper Devonian limestones exposed at Alexandra and Louise Falls are of particular interest. These organic limestones in part exhibit reefoid characteristics.

The field season of 1951 saw another party of geologists carrying out studies along the Slave River, Little Buffalo River, Buffalo River and the shores of Great Slave Lake.

Sections examined ranged from Precambrian and early Paleozoic rocks on the Slave River to Upper Devonian limestones at Lady Evelyn Falls on the Kakisa River.

During the field season of 1952, a geological party conducted studies of sections along the Petitot River, Liard River and South Nahanni River. Valuable stratigraphic information was obtained which was incorporated with data collected previously in areas to the east. An overall study of all regional information was completed and it was decided that further more detailed examination was warranted in the general region of the Cameron Hills.

In the spring and summer of 1953, another geological party examined sections along Kakisa River, Kakisa Lake, Horn River, Bouvier River, Redknife River and a portion of the Mackenzie River. The sections examined were the closest exposures of bedrock in the vicinity of Cameron Hills that had not been previously studied.

All of the information obtained from studies of surface geology has been integrated with information obtained from studies of subsurface geology where it is available. These geological studies are the key to all other methods of exploration for oil or natural gas.

(b) Subsurface Geological Investigations.

The rapid advance of exploration for oil into frontier areas began some four to five years ago. About this time, an intensive study of the subsurface geology in these frontier areas was undertaken by a staff of geologists working for The California Standard Company. These studies entail an examination of drilling samples, cores, electrologs and other logging devices, which are available from wells, and core holes, drilled by the oil and mining industries.

The first work was carried out on wells drilled many years ago along the Mackenzie River and the shores of Great Slave Lake. In the past number of years wells or core holes drilled at Deep Bay, Big Island, Fort Providence, Mills Lake, Fort Simpson, Camell Bend, Pine Point, etc., have greatly increased the quantity of data available for study and interpretation.

The stratigraphic and structural information obtained from subsurface geological studies is integrated with similar information from studies of surface geology. All of these investigations are a continuing project and are an essential part of an oil company's evaluation of lands for exploration for oil and/or natural gas.

No wells have been drilled on Block "A" of the Cameron Hills Block, and the only subsurface information available to date is near-surface information obtained from the shallow shot holes drilled by a geophysical seismic crew. Seismic shot holes are usually from 40 to 60 feet deep where conditions permit that depth. In many areas of Block "A", the unconsolidated sediments overlying the bedrock are very thin (as little as 12 feet). They consist of sands, gravels, and boulders which are intermixed with clay. This mantle of glacial deposits covers the entire area investigated except in a few localities where it appears that soil or muskeg lies directly on Cretaceous shales or Devonian limestones. The glacial deposits appear to be very thin on the eastern and central portions of Block "A" but thicken rapidly on the slopes of the Cameron Hills in the western portion.

(c) Geophysical Investigations.

Preliminary to conducting a geophysical survey in un-mapped bush country, a great mass of preparatory work must be carried out. The operations must be especially designed and planned to meet the conditions present in the particular area to be investigated. Planning of such an operation requires the efforts of every department and division of a large organization.

The first steps taken prior to establishing of a plan of operations are to determine the exact conditions of the terrain. This was accomplished by purchasing aerial photographs and planimetric maps from government agencies, constructing aerial mosaics from the photographs and scouting the area in company owned aircraft and on foot. Familiarity with terrain is essential in planning best routes of access.

Communications and supply are the life line of any operation. A two-way radio network system was set up for direct continuous communications with a district base office. Three company owned and operated aircraft were used to supply operations in the field. The supply system requires a large investment and very careful planning and execution. The maintenance of geophysical survey parties in the field is entirely dependent on uninterrupted communications and supply.

The next step in planning geophysical operations in the Cameron Hills Block depended on technical considerations. Through experience in other areas of northern bush and muskeg country, it had been found it was necessary to "sample" an area to determine if data could be acquired, from seismic records obtained, which would permit a study of subsurface structure. Consequently, it was decided to carry out a seismic record quality reconnaissance of the Cameron Hills Block.

After this decision was made, actual ground work was commenced preparatory to carrying out the seismograph survey. Early in December, 1952, bulldozers and contract survey teams moved to the Cameron Hills Block. Four bulldozers working in teams of two and two survey parties began clearing and surveying trails to be shot by the seismograph party. The attached map (Map No. A-1) shows the line bulldozed and surveyed in Block "A" permit group during the winter of 1952-53. A total of 16.5 miles of line were cleared and surveyed. The preparatory bulldozing and surveying in the Cameron Hills Block was suspended in mid-March, 1953, when spring ground conditions prohibited any further work until the following winter freeze-up.

During the summer of 1953, plans were completed for a seismograph party to commence shooting of line in the Cameron Hills Block as soon as the ground was frozen solidly enough to permit the party to move about. A mobile fully equipped camp mounted on logging sleighs and pulled by bulldozers was readied to house the crew and serve as a base of operations. It was decided that Geophysical Service International Party No. 408 would carry out the survey. This party had many years of experience in bush operations.

The late freeze-up last winter caused costly delays in the crew reaching the start of seismic operations. Finally, early in February, 1954, the crew commenced shooting of the record quality reconnaissance program. This party was a fully equipped seismograph party. All equipment was mounted on vehicles called "all-tracks" which were especially designed to operate in bush and muskeg country. The seismic survey operations were commenced in the western portion of the Cameron Hills Block so that the crew would be out to the Mackenzie Highway in the eastern portion of the block when spring ground conditions would make operations in the muskeg and bush impossible.

In all, five bulldozers were used during the winter of 1953-54. Two bulldozers were used almost exclusively in moving the sleigh-mounted camp day by day. The other three bulldozers were used to snow-plow trails cut during the previous winter and to clear new line for the seismic crew to shoot. The seismic crew and bulldozers completed shooting of the program in mid-April, 1954, and moved from the area.

Some pertinent data respecting seismic operations in Block "A" permit group of the Cameron Hills Block are as follows:

Number of miles of line shot	44.08
Number of shot holes drilled	145.
Total footage drilled	4,762.

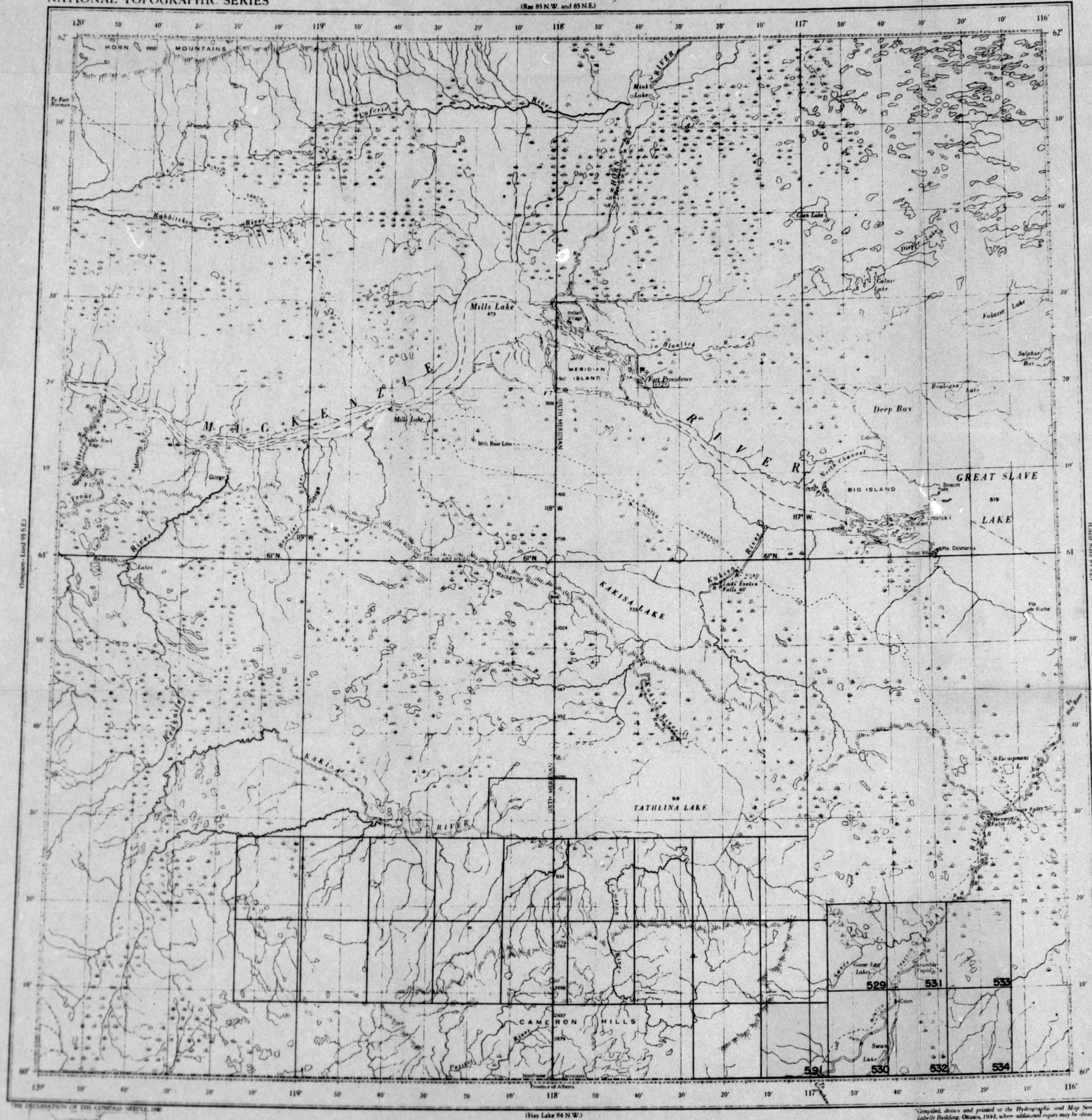
Map No. A-2 shows the location of each shot hole. The results of interpretation of data obtained from this seismograph survey are being studied and a final interpretation will not be completed by our own geophysical review staff for some months.

EXPENDITURES.

The various items of expenditure incurred in carrying out the exploratory investigations detailed in this report have previously been submitted to the Chief of the Lands Division, under separate cover. Many items of expenditure are a general charge to the entire Cameron Hills Block. These items have been prorated to Block "A" and Block "B" permit groups. The itemized statement of the expenditures on Block "A" permit group has been prepared from company records by our accounting staff, and this statement has been supported by a Statutory Declaration.



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Northern District,
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PERMIT GROUP BLOCK "A"

PROVIDENCE
NORTHWEST TERRITORIES
(DISTRICT OF MACKENZIE)
(PRELIMINARY EDITION)

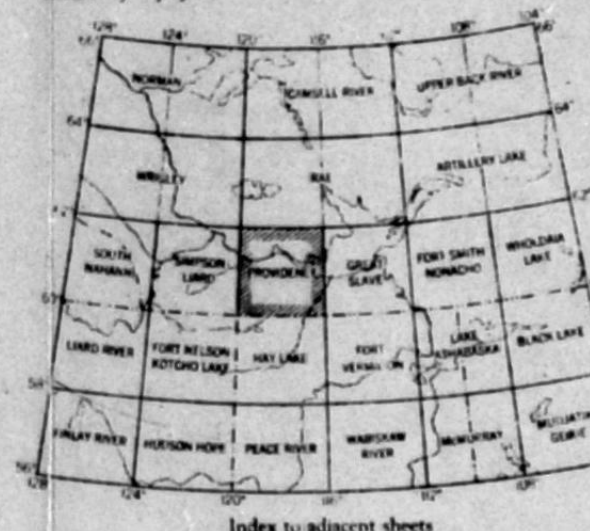
Scale 8 miles to 1 inch or 1:506,880

MAP No. "A"

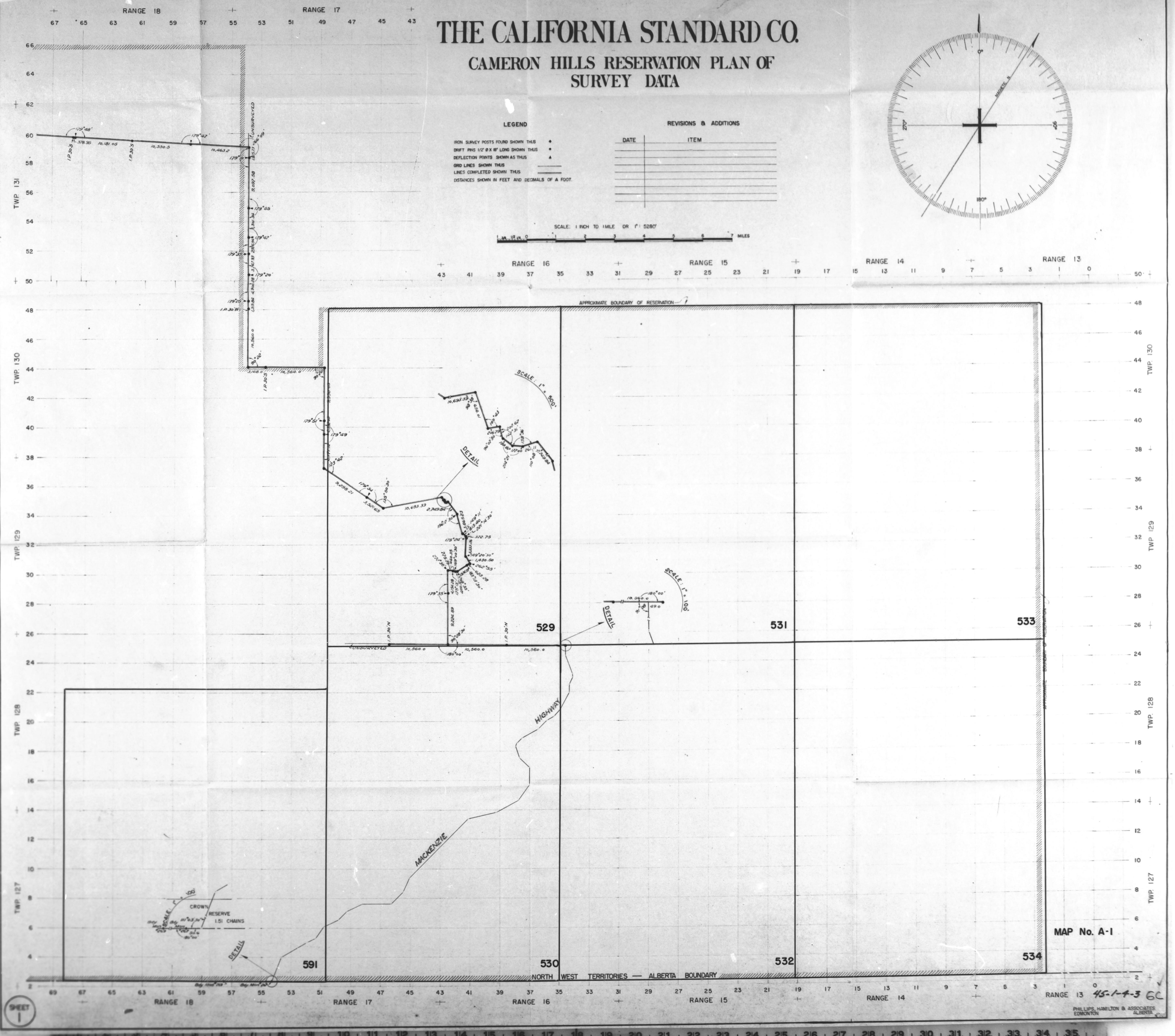
REFERENCE
Boundary provincial
General line
Town or village
Settlement
Waterless stream with coal bars
Navigation route usually followed
Height in feet
Marsh or swamp
Rocks and falls with drop in feet
Royal Canadian Mounted Police

The delineation of the various lands is not shown as a solid line in the diagram given in this sheet. It is shown as a dashed line in the diagram given in the accompanying sheet. The dashed line is the boundary between the various lands. The solid line is the boundary between the various lands. The dashed line is the boundary between the various lands. The solid line is the boundary between the various lands.

Compiled, drawn and printed at the Hydrographic and Map Service, Labelle Building, Ottawa, 1944, where additional copies may be obtained. Revision of map of 1942.



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MAP No. A



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