MAR 19680074: BUFFALO PRAIRIE

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REPORT ON FIELD WORK

OF CORE DRILLING

IN THE

BUFFALO PRAIRIE PROSPECT AREA

OF

ALBERTA, CANADA

FOR

BURN OIL LANDS LTD.

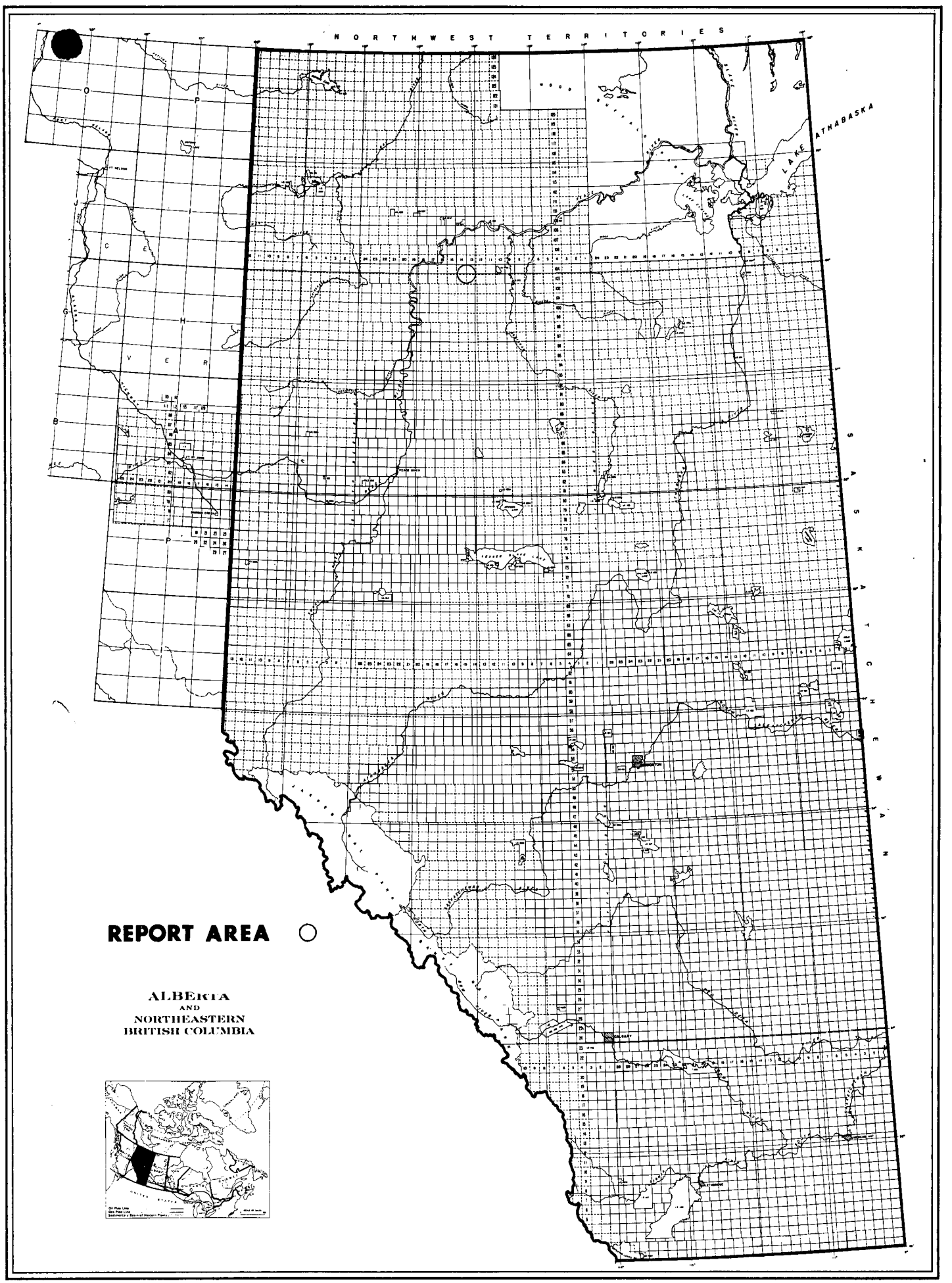
BY

SIGMA EXPLORATIONS LTD.

PROJECT NO. 79

Calgary, Alberta, Canada November 1968

19680074 Figure 1



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LOCATION OF AREA

The Sulphur Permit is located in Northern Alberta, Twp. 103 & 104, Rges. 14 & 15, W.5M., approximately 25 miles south-southwest of the Fort Vermilion settlement, and immediately south of Buffalo Prairie. Permit Number 79 covers a portion of the north flank of the Buffalo Head Hills and as a result elevation changes across the permit area range from a low at the north of some 1200 feet above sea level to 2600 feet in the south west corner, giving a total relief over the permit of some 1400 feet. The permit is cut through in a north south direction by the head waters of the Bear River and considerable relief is expressed along the valley system of this river. The general drainage pattern is towards the north with all creeks emptying into the Bear River which drains this entire area.

Forest cover through most of the prospect area grades from very light to medium, with no forests of commercial size being observed. It would appear that a forest fire some 30 to 40 years ago has destroyed most of the commercial timber and that all present forest cover is second growth. Mainly poplar, willow and swamp spruce were encountered.

Access

Access to the area was gained by local rural roads which run through the agricultural area from Fort Vermilion to La Crete Settlement and on south to Buffalo Prairie. From this

point on, the Forestry access road to the Buffalo Fire Tower was utilized, plus existing seismic lines which have been recently cut in the area.

No major problems were encountered in gaining access to the prospect and road conditions are considered to be passable most of the year. Because of the high relief and clay soil used in construction of the Forestry road, travel is virtually impossible after even the slightest rain fall, and only during dry weather is it possible to travel this road.

Weather

Weather conditions encountered during the field operation were warm and dry with only occasional thunder showers being encountered one afternoon. Temperatures ranged from $50^{\circ}F$ to $65^{\circ}F$ during the time the survey period, which are considered normal for this time of the year.

FIELD OPERATIONS

Field operations were commenced on the permit area on August 27 and concluded on August 29, 1968. During this period a total of 10 test holes were completed, water samples were taken in certain key areas, and geologic sampling was carried out along certain areas of interest on the slopes leading down to the Bear River Valley.

No bulldozers were utilized in this program as the terrain was extremely rough and broken, but field mapping was

carried out using a compass and pacing method to map geological contacts along the edge of the Bear River Valley where exposed cutbanks showed occurrances of low grade limonite and cassiterite. These exposures were followed extensively by the crew in the hopes that commercial deposits of sulphur may be exposed along these geological contacts.

Travel for the crew was extremely slow and difficult because of the deadfall and dense undergrowth and considerable time and effort was spent in attempts to gain some accuracy in mapping this area without necessitating extensive cutting of control lines.

Drilling

Drilling on this permit was done with a general model GT-30 powered hand auger. This drill was equipped with additional section drill stems which made it possible to extend the holes down to a maximum depth of 12 feet in this area. No difficulty was experienced in drilling on this permit area and a minimum of three samples per hole were obtained in all of the drilling locations. Because of the presence of dry clays, sands and soft shales over most of the permit area surveyed, no drilling problems were encountered in any of the drill holes, and a fair rate of penetration was obtained by manual drilling methods.

Sampling

An average of three samples per hole were obtained from

each of the drilling locations. These samples were bagged individually, and when the assay work was done the samples from the eight foot and the twelve foot levels were "batched" so that an average value of between six feet to twelve feet was obtained for each of the assay results.

A list of the assay values for sulphur, iron content and sulphate for each sample are contained in the back of this report.

Plugging

Holes were plugged with wooden hole plugs after drilling to prevent accidents to the workmen while walking up and down the roadway, or to any wild animals which may stray onto the drill locations later.

Surveying

No vertical control was carried over the permit area, but horizontal control was maintained by chaining. A transit was used to check angles at intersections of existing lines. Control was established from maps made from aerial surveys showing existing seismic cut lines or identifiable topographic features on the ground.

Bore hole locations were permanently marked by blazing trees a few feet from the cut-line or road, and marking the hole number on the tree with ink pens and metal tapes nailed to the tree. Thus each of the hole locations could be easily re-established for future reference.

RESULTS & RECOMMENDATIONS

After reviewing the results of the assays of the ten drill holes on Permit 79, and also the water studies contained in the letter of September 18, 1968 of Chemical & Geological Laboratories Limited, it is considered unlikely that commercial deposits of sulphur exist on this permit.

The program undertaken to date has only been of a very general reconnaissance nature with a total of five days being spent on the Permit, three days on August 27 to August 29 and again on December 9 and 10 when certain parts of the Permit were examined using a Bell G-2 Helicopter. By using the aircraft many of the more inaccessable portions of the Permit were visited, but no signifigant observations were made as to the presence of elemental sulphur in these areas.

It would therefore be recommended that the sulphur lease in this area be dropped and the area reverted back to the Government of Alberta.

Respectfully submitted,

[redacted]

J. D. Fowlie, Supervisor

Approved [redacted]

W. N. Rabey, P. Eng.

CHEMICAL & GEOLOGICAL LABORATORIES LTD.

14240 - 115 AVENUE, EDMONTON, ALBERTA

Date Reported: October 7, 1968 Laboratory Report Number: C68-4135

SIGMA EXPLORATIONS LTD.

Kind of Sample: Soil Date Received: October 1, 1968..

Permit #79 for sulphur, iron and sulphate analyses as requested by J. Fowlie.

SAMPLE NUMBER		SULPHUR (% by Weight)	IRON CONTENT (% by Weight)	SULPHATE (% by Weight)
79-1-1	(3' - 6')	1.92	1.50	0.05
79-1-2	(7' x 10')	< 1.00	3.13	0.12
79-1-3	(4' x 8')	< 1.00	2.52	0.31
79-1-4	(8' x 12')	< 1.00	3.35	0.14
79-1-5	(4' x 8')	< 1.00	13.39	0.17
79-2-6	(8' x 12')	< 1.00	3.74	0.07
79-2-7	(8' x 12')	< 1.00	2.86	0.17
79-2-8	(8' x 12')	< 1.00	2.99	0.31
79-2-9	(8' x 12')	< 1.00	2.84	0.11
79-2-10	(8' x 12')	< 1.00	2.54	0.06

[redacted]

CHEMICAL & GEOLOGICAL LABORATORIES LTD.

14240 - 115 AVENUE, EDMONTON, ALBERTA

September 18, 1968

Mr. J. Fowlie
Sigma Explorations Ltd.,
613, 309 - 8th Avenue S.W.,
Calgary, Alberta.

Dear Mr. Fowlie:

Re: Laboratory Report Number: C68-4042
"Special Water from Permit 79"

We have examined and tested the water described above and we found the following:

Iron content:	0.0355% or 355 p.p.m.
Sulphur content:	Nil (as elemental sulphur)
Hydrogen sulphide:	Trace only (barely detectable)
Total sulphides:	Trace only
Sulphate content:	0.16%

The water would be carrying 0.05% to 0.06% sulphur but not in the form of elemental sulphur. This figure is arrived at by calculating the sulphur content of the sulphate etc.

The iron content is very high as 0.3 p.p.m. of iron can produce illness in animals.

We found that a very low heating of the water could drive out the humic acid, carbonic acid etc., and cause the dissolved iron to precipiate out.

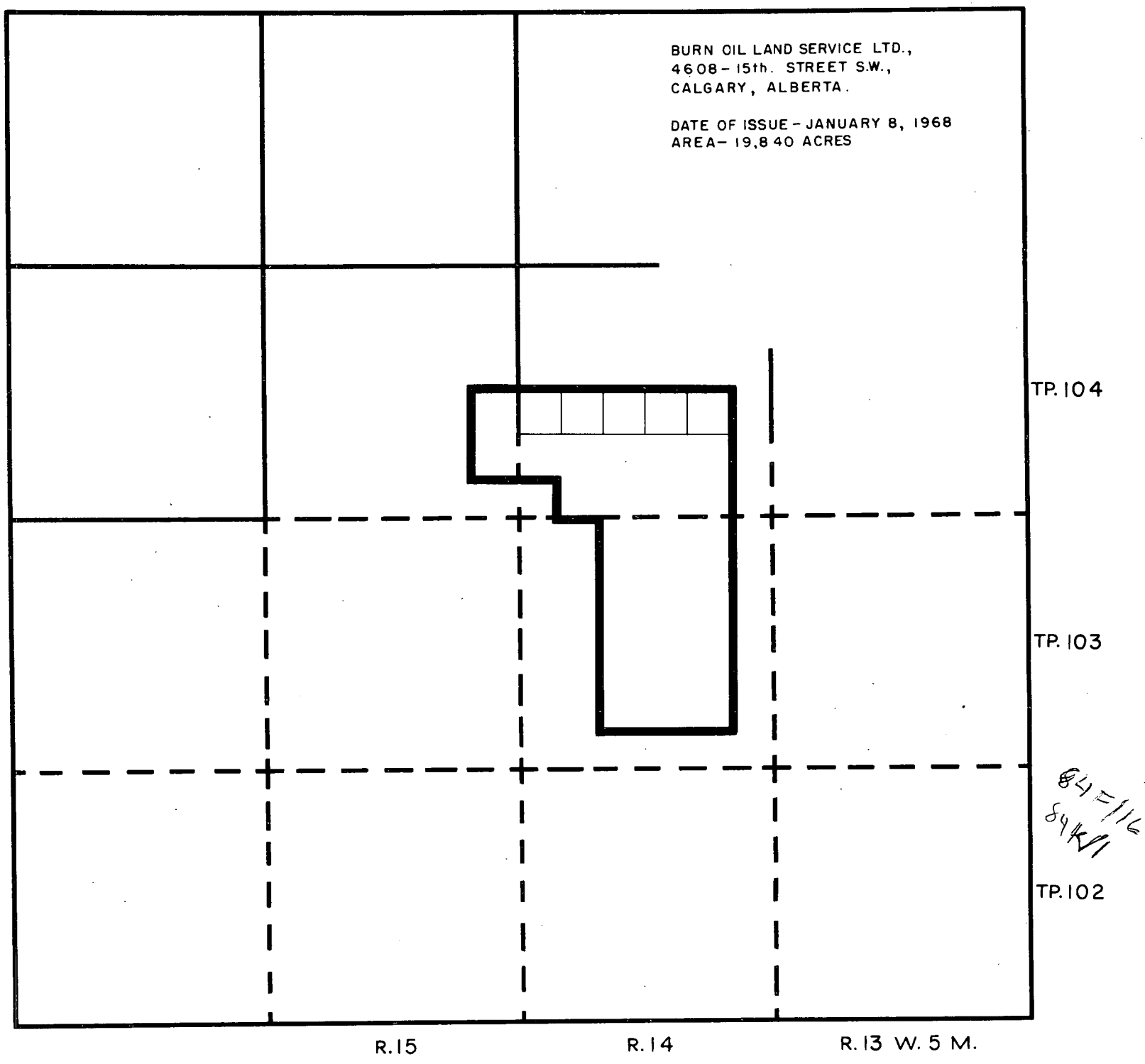
Yours truly,

CHEMICAL & GEOLOGICAL LABORATORIES LTD.

[redacted]

W.M. Morrison

SULPHUR PROSPECTING PERMIT No. 79



Rge. 14 W. 5 M.

Twp. 104

Twp. 103

79-2-10
79-2-9
79-2-6
79-2-7
79-2-8

FORESTRY ROAD

79-1-5
79-1-4
79-1-3
79-1-2
79-1-1

ROAD IMPASSABLE FROM THIS POINT - Aug. 29/68

AIRSTRIP

• BORE HOLE LOCATION

Σ SIGMA EXPLORATIONS LTD.

309 8th Ave. S.W. Calgary, Alberta Phone 264-7865

SULPHUR EXPLORATION PROGRAM
PERMIT No. 79

SCALE: 1" - 1 Mile

DEC / 1968

1968 0074 Map No. 1