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DEPARTMENT OF NATIONAL DEVELOPMENT.  
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ALLUVIAL TIN INVESTIGATION KINGS PLAINS, COOKTOWN DISTRICT,  
NORTH QUEENSLAND.

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by

J.G.Best and W.B.Dallwitz.

The information contained in this report has been obtained by the Department of National Development, as part of the policy of the Commonwealth Government, to assist in the exploration and development of mineral resources. It may not be published in any form or used in a company prospectus without the permission in writing of the Director, Bureau of Mineral Resources, Geology and Geophysics.

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## ALLUVIAL TIN INVESTIGATION, KINGS PLAINS, NORTH QUEENSLAND

### SUMMARY

An alluvial tin prospect in the Kings Plains area, about twenty miles south-west of Cooktown, was recognised in 1961 during the course of regional geological mapping by a combined party from the Bureau of Mineral Resources and the Geological Survey of Queensland. Subsequently a reservation was placed over thirty five square miles of country between the Annan and Normanby Rivers by the Queensland Department of Mines to enable the Bureau of Mineral Resources to investigate the prospect by drilling during 1962. The object of the drilling was to test whether the alluvium was stanniferous, and determine the depth to bedrock. Prior to drilling, the Geophysical Branch of the Bureau carried out gravity surveys along fourteen traverses to determine the configuration of the valley beneath the alluvium, and guide the location of the drill holes.

A contract was let for two thousand feet of percussion drilling, but the onset of the monsoon forced abandonment of the project before the target footage had been completed. The geophysical survey indicated deeply incised valleys beneath the broad expanse of alluvium. The drilling (which, it must be emphasized, was scout boring only) confirmed the presence of alluvial cassiterite, but the grade was low, and the depth to bedrock greater than expected.

The investigation suggests that attention should be focussed on the Mungumby Creek valley, immediately to the east of the area drilled.

### INTRODUCTION

Kings Plains is a cattle station located in a west-trending valley about 20 miles south-west of Cooktown; the alluvial tin prospect was named after this property. The valley is about 16 miles long, from the Annan River in the east to the Normanby River in the west. It has been eroded in shale, chert, and greywacke of the Devonian to (?) Lower Carboniferous Hodgkinson Formation; these sediments strike about north, dip steeply, and form prominent hills on both sides. Strike-ridges of chert dominate the hills, and in places project into the valley and divide it into several partly-closed basins. At a late stage in its history the valley has aggraded, and it now has a broad, flat floor up to 4 miles wide (plate 2; Figure 1). The valley floor has an average altitude of about 450 ft. above sea level, and the drilling indicated that the depth of the alluvium ranges down to about 170 ft.

The Annan River flows northwards across the eastern end of the valley, and drains that part of it by medium of Scrubby Creek and its tributaries. Likewise, the Normanby River drains the western end of the valley, but the central part has no clearly defined drainage system, and contains numerous shallow lakes and swamps which tend to dry out during the dry season (April to early December).

The Annan River Tinfield flanks the Kings Plains valley on the east and south-east. Since its discovery in about 1885 about 12,000 tons of cassiterite concentrates have been produced from this tinfield; almost the whole of this output came from rich placers in the headwaters of the Annan River and its tributaries. Before World War II test-drilling was carried out by the Broken Hill Pty. Co. Ltd. in the lower parts of the Annan River valley in an attempt to discover dredgeable alluvial tin deposits. The areas tested were around Helenvale and the lower reaches of the Annan River towards its junction with Oaky Creek (see Plate 1). Cassiterite was found in both areas, but the grade was not economic (Department of Mines, Queensland, 1937)!

In 1961 the Bureau of Mineral Resources and the Geological Survey of Queensland carried out regional geological mapping on the Cooktown 1:250,000 Sheet Area. As a result of this work, Lucas (1962) recognised that the lower reaches of the Annan River were comparatively young, and considered that the upper part of the valley of the Annan may have formerly been drained by a stream flowing westwards through the Kings Plains valley into the Normanby River.

In August, 1962, Dr. M.J. Bik, geomorphologist with the C.S.I.R.O. Division of Land Research and Regional Survey, carried out, at the request of the Bureau of Mineral Resources, a geomorphological examination of the Annan River Tinfield and Kings Plains area. He concluded (Bik and Lucas, 1963) that the "capture" of the Annan River was initiated by a slight easterly regional tilt which caused the valley to aggrade, and finally forced the river to spill over a saddle in the area where it now flows through a gorge (see Plate 2; Figure 1.). Initially this northerly drainage probably operated only during periods of spate, but ultimately it was permanently established, and the westerly course through Kings Plains was abandoned. Bik points out that the degree of tilting was probably greater farther north, and caused Oaky Creek and the Endeavour River to reverse their courses and become separated from the Normanby River (see Plate 1).

Lucas' (op.cit.) recognition of the change in stream course led to the realization that parts of the Kings Plains valley could contain stanniferous placer deposits; gravel beds found in a gully about half a mile west of the Annan River proved to be stanniferous. The Bureau of Mineral Resources therefore requested the Queensland Department of Mines to place a reservation over the area to enable prospecting to be carried a stage further (see Plate 1). Tenders were called for contract percussion drilling to be carried out during the winter and spring of 1962. The drilling was designed, as a scout test only, to determine the depth of alluvium in the valley, to establish whether or not it is stanniferous at depth, and to give some indication whether or not more detailed investigation would be warranted. It was not intended to prove or disprove the area as a dredging property.

The alluvium in the Kings Plains valley is mainly in the clay/sand size-range. Typically, 40 to 50 ft. of clay and silt overlies 100 to 120 ft. of sand with clay and "wash" interbeds, and the drilling suggested that these layers are lenticular. Beds of gravel containing cobbles up to 3 to 4 inches in diameter were intersected in the bottom 20 to 30 feet of most of the completed holes. These beds are commonly saturated with water. An abundance of quartz and tourmaline in the sand and gravel beds proves that much of the alluvium was transported from the granitic areas to the east and south-east of the prospect. The coarser grains of quartz commonly

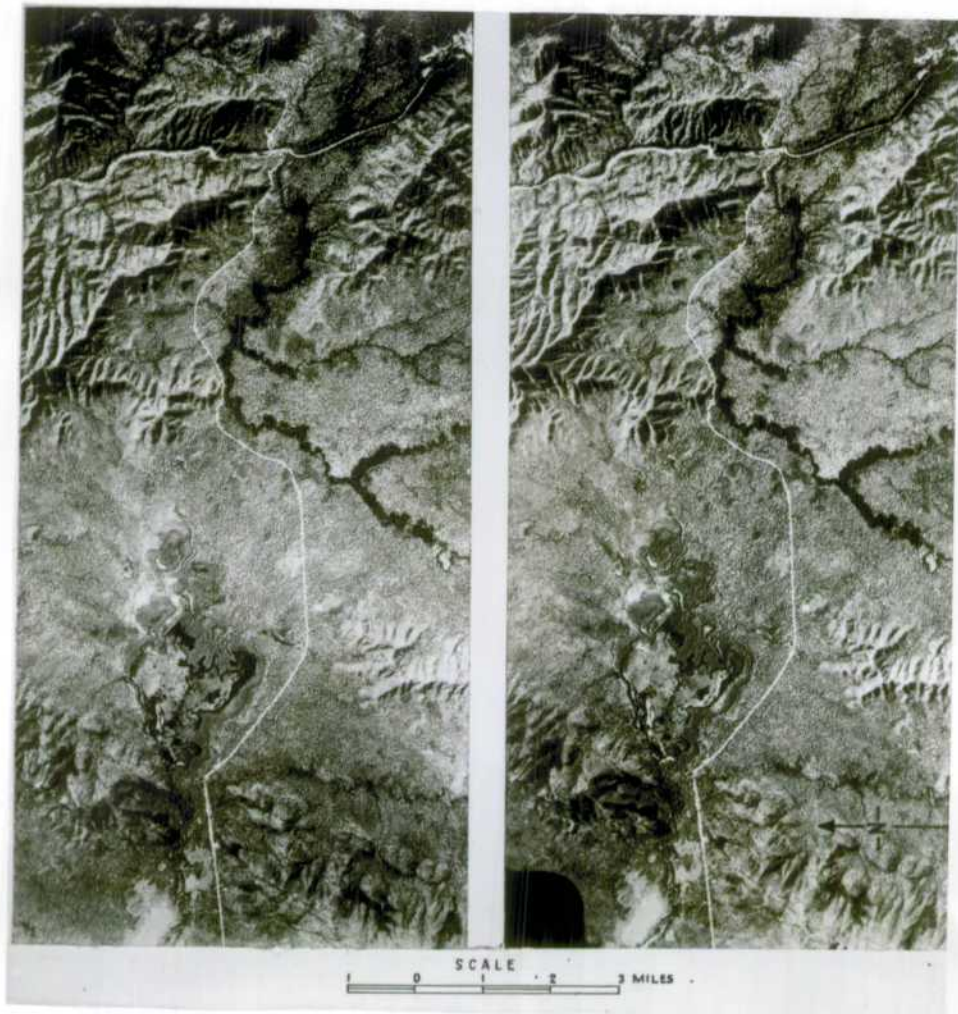


FIGURE 1

Stereoscopic pair of aerial photographs of the eastern part of Kings Plains valley (see also Plate 2).

The photographs show the eastern basin of the Kings Plains valley, bounded on the west by the steeply dipping Hodgkinson sediments, and on the east by the Annan River. The Mulligan Highway follows the valley, skirts south around Kings Plains Lake, and leaves the basin at the western end through the gap formerly occupied by the Annan River; at present the Annan River flows northward through a gorge (north of the highway, near the eastern end of the area covered by the photographs).

have a faintly amethystine tinge like those in the granite at Big Tableland and elsewhere in the Tinfield. Some of the clay interbeds are dark grey to black, have a fetid odour, and contain carbonised plant remains and pyrite concretions.

## PROSPECTING

### Geophysical surveys.

Prospecting for stanniferous placers in the Kings Plains valley was based on the assumption that, in general, they would be located in the deeper parts of the valley, so, in order to make the most effective use of the drilling, a geophysical survey was undertaken to get some idea of the shape of the valley beneath the alluvium. The Geophysical Branch of the Bureau made fourteen gravity traverses in the Kings Plains/Mungumby Creek area; most of the traverses crossed the alluviated areas more or less at right angles to their lengths, and all the profiles suggested deeply incised valleys beneath the alluvium (see Plates 2 and 4-9).

### Location of drill holes.

The easternmost basin of the Kings Plains valley (see Plate 2; Figure 1) was selected for the initial investigation because it was known that any cassiterite introduced into the valley had to come from the east; and it was assumed that the chert ridge about 11 miles west of the Annan River would have served as a barrier and aided deposition of cassiterite in the eastern end of the valley. If the eastern end of the valley should prove barren or low-grade there would be no point in prospecting farther west.

The most accessible part of the eastern basin is the centre; the western part is occupied by a large, shallow lake, and the eastern part is deeply dissected by Scrubby Creek and its tributaries (see Plate 2; Figure 1). The first drill holes were, therefore, located along gravity traverse "A". These holes were irregularly spaced, and were designed to probe the deeper ground indicated on the gravity profile.

Subsequently a crossing was bulldozed across Scrubby Creek near its junction with the Annan River, and 5 holes at 200-foot centres were drilled along gravity traverse "N" (see Plate 2).

## DRILLING

The contract called for a minimum of 2000 feet of 6-inch-diameter percussion drill hole to be completed within 6 months of the commencement date. Sampling was to be handled by the Bureau of Mineral Resources. The contractor was Allan Royle Pty. Ltd., Sydney.

### Equipment

- Drill rigs. (i) Failing "500" rotary drill fitted with a percussion attachment (used 1st July to 1st August).  
(ii) Hydromaster "1500" percussion drill (used 3rd September to 1st December).

Casing. 6-inch-diameter, thin-walled (3/16"), flush-coupled, water-bore casing, in lengths ranging up to 20 feet.

### Drilling methods and performance

Holes MRK 1, 1A, 2, 2B (to 112'9"), 3 (to 65') 4 (to 40'), 5 (to 40'), 6 (to 30'), and 7 (to 156') were drilled with the Failing "500", using it both as a rotary and as a percussion drill; holes MRK 7 (156'-165'), 2B (112'9" to 146'), 3 (65'-167'), 11, 12, 13, 14, 15, and 6 (30' to 154'4") were drilled with the Hydromaster "1500" (see Table I for details of each hole). Hole MRK 7 was the only more or less satisfactory hole drilled with the Failing, and hole MRK3 was the only unsatisfactory hole drilled with the Hydromaster.

Hole MRK 1 and most of Hole MRK 1A were drilled rotary with a tricone roller bit, at the request of the contractor, to demonstrate the performance of the machine. But as equipment had not been provided to ensure high core and/or cuttings recovery, the quantity and quality of the samples was most unsatisfactory, and the contractor was requested to drill the remaining holes by percussion methods. However, the percussion drilling attachment on the Failing proved unsuitable for prolonged operation, and finally, after two unsuccessful attempts to complete holes to "bottom", the Failing was withdrawn and replaced by the Hydromaster percussion drill, which commenced full time operations in September. After some initial difficulties had been overcome, a satisfactory rate of advance was attained, and it is probable that, if this type of machine had been supplied in the first place, the full contract would have been completed in September. Instead, the investigation had to be abandoned, uncompleted, in early December because of the onset of the monsoon. By that time fourteen holes had been drilled; eleven of them had bottomed, but reliable samples were obtained from only seven (see Table I).

The main objections to the use of a rotary drill in the testing at Kings Plains were:-

- i) Recirculation of the drilling fluid put most of the cuttings into suspension, especially in alluvium with a high proportion of fine material, so that, with increase in depth, the volume of cuttings recovered progressively diminished.
- ii) The time-lag between drilling the cuttings and their delivery at the surface increased with depth, and so did the uncertainty as to where the cuttings came from. Stopping the advance of the drill at regular intervals to ensure complete flushing generally resulted in a "belled-out" hole, the diameter of which would, presumably, depend primarily on the competence of the alluvium at that depth.
- iii) Casing could not be used, and so the hole diameter, and contamination from upper levels, could not be controlled.

All percussion holes were begun with a 7-inch earth-socket, and drilled with this tool until a bed of coarser material, commonly sand, was encountered. The casing was then run and driven. Where possible the foot of the casing-shoe was kept in advance of the bottom of the hole, but this was not always practicable, especially in clay beds and near bedrock, and in such situations it became necessary to drill ahead of the casing-shoe. Had

thick-walled, butt-jointed casing been used instead of the thin-walled, flush-coupled casing supplied, the need to drill below the casing would have been reduced, and less casing would have been rendered unserviceable.

### Problems

Apart from mechanical failures and unsuitable casing, the major drilling problem was "running sand". Beds of water-bearing sand are intercalated with the clay and silt, and where the drill broke through into these the sand was forced up the drill hole by hydrostatic pressure. In some holes the sand rose rapidly 20-35 ft up the drill hole, and ultimately all holes were drilled with the casing filled with water. A marked increase in the depth of a hole after the casing had been driven commonly indicated an imminent break-through into a bed of "running sand"; on these occasions the driller was urged to drive the casing as far ahead as possible in an attempt to seal off the "running sand".

### Underground water

Underground water was encountered in all the holes, but only in the first few holes were water levels recorded and samples taken. Subsequently the practice of drilling with the casing full of water to combat the "running sand" precluded these observations.

In hole MRK 1A water was struck at about 124 feet, and "running sand" and water rose 30 feet up the casing.

In hole MRK 2B water was struck at 85 feet, and rose 20 feet up the casing. At 98 ft. water and "running sand" rose to about 65 feet below the collar. Water was again encountered at about 112 feet, and rose to about 38 feet below the collar. The sand layers were interbedded with tough clay, and appeared to be independent aquifers. Pump tests on the lowest aquifer at the rate of about 1000 gallons/hour showed no appreciable draw-down.

In hole MRK 7, water and "running sand" proved troublesome at about 95 feet and 109 feet.

Samples of muddy water taken from the first few holes settled readily. Commonly a bottle of muddy water, after being shaken, settled so that within about an hour the top half contained clear water.

A partial analysis of water samples from two of the holes shows:-

|                                    | <u>MRK 3</u> | <u>MRK 7.</u> |
|------------------------------------|--------------|---------------|
| pH                                 | 7.0          | 7.5           |
| Conductivity (micromhos/cm.)       | 790          | 1020          |
| Chlorine                           | 50 p.p.m.    | 130 p.p.m.    |
| Hardness (p.p.m. $\text{CaCO}_3$ ) | 180          | 60            |

(Analyses by S. Baker, Bureau of Mineral Resources)

## HANDLING AND TREATMENT OF SAMPLES IN THE FIELD

Earth socket cuttings were grab-sampled, panned, and examined for cassiterite.

Percussion Drill cuttings were recovered from the hole with a sand pump, emptied into a steel dump-box, and flushed into containers ( $\frac{1}{2}$  44-gallon drums). Cuttings were collected in sections (5 feet, where practicable) in individual containers, and puddled and decanted three times. The cuttings were then sieved through a 6-mesh sieve. Both fractions were measured in a volume bucket (graduated in 500ths of one cubic yard), and the volumes recorded on the Panner's Log. The plus 6-mesh fraction was examined for coarse cassiterite and discarded. The minus 6-mesh fraction was panned to a "rough" concentrate, dried, bagged, and labelled.

## TREATMENT OF SAMPLES IN THE LABORATORY

By design drill cuttings were reduced to only rough concentrates in the field. This was done mainly to ensure security of information.

When the drilling was finished the field concentrates were brought to Canberra for further treatment, microscopic examination, and assay. Each concentrate was passed through a 36-mesh B.S.S. sieve, and the plus 36-mesh material was examined for cassiterite; only two samples (at 130'-135' and 135'-140' in hole MKK 11) were found to contain cassiterite coarser than 36 mesh.

After sieving, fragments of iron (derived from drilling tools and casing) and grains of magnetite were removed from each sample by a hand-magnet. The sample was then panned, and both the light and heavy fractions were passed through a Carpc magnetic roll separator from 5 to 15 times, according to the quantity of magnetic minerals present. The magnetic minerals were then added to the material already removed by the hand-magnet.

The "light" fractions obtained from panning the samples taken from each hole were then bulked, and the composite sample was further reduced by panning. The final "concentrate" was then weighed and assayed for tin. Most of the pyrite in the field concentrates was removed during these two pannings.

The magnetic fractions obtained from each sampled interval were weighed and then bulked and assayed for tin.

The non-magnetic (cassiterite-rich) fraction of each heavy-mineral concentrate was treated with bromoform to remove quartz and feldspar. It was then examined for impurities with a hand-lens. Some of the concentrates were found to contain more than 95 percent pyrite. Those containing more than an estimated 2 percent pyrite were treated with aqua regia so that all concentrates would be reasonably uniform. Failure to remove pyrite from the concentrates would have invalidated subsequent calculations of grade. The concentrates from the upper part of each hole were much richer in tourmaline, ilmenite, topaz, zircon, etc., than those from the lower parts, but no further attempt to remove these minerals was made. After the pyrite had been removed, each concentrate was weighed, and the concentrates from each hole were bulked, microscopically examined, and assayed for tin.

### Laboratory results

Table II shows the results of tin assays carried out on bulked cassiterite concentrates, magnetic concentrates, and re-concentrated "light" fractions for each hole. The amount of tin (expressed as 72 percent-cassiterite concentrate) in each composite sample assayed is also shown.

In Table III size analyses of cassiterite concentrates from each hole are given, and Table IV shows the weighted percentage compositions of the cassiterite concentrates from traverses "A" and "N" according to the selected mesh sizes. As expected, the results show that the cassiterite concentrates from traverse "N", which is nearer the source, contain a lower percentage of minus 100-mesh grains than do those from traverse "A".

Appendix II shows the weights of cassiterite concentrates and magnetic fractions obtained from each interval in the holes. It is obvious from the tabulated results that there is no significant correspondence between the weights of cassiterite concentrates and magnetic concentrates at the various intervals, but three of the holes show close correspondence in the ratio total weight of cassiterite concentrate: total weight of magnetic fraction.

Weights of bulked and re-panned "light" fractions are also tabulated in Appendix II.

Microscopic examination of the bulked cassiterite concentrates, magnetic fractions, and "light" fractions showed that the following minerals are present:

Cassiterite concentrates: Cassiterite, tourmaline, topaz, opaque minerals (probably almost entirely ilmenite), minor epidote and quartz, and traces of sericitized feldspar, leucoxene, siderite, pyrite, monazite, blue and grey corundum, rutile, (?) kyanite, and green spinel. The cassiterite is nearly all light-coloured (brown of various shades, light grey, red, and whitish, as seen with a hand lens), and under the microscope it is grey, colourless, claret-coloured or brownish. Colour-zoning is common, and claret-coloured varieties are mostly pleochroic.

Magnetic fractions: Opaque minerals (largely ilmenite, probably a little magnetite), tourmaline, metallic iron, minor red iron oxide (abundant in hole 13), quartz, leucoxene, pyrite, and siderite (abundant in hole 13), and rare metamict zircon, sericitized feldspar, cassiterite, and biotite. Nearly all the siderite occurs as globular, light brown concretions measuring from 0.1 to 1 mm. across; some of them contain inclusions of pyrite, either as minute cubes or as aggregates of cubes.

"Light" fractions (re-concentrated): Pyrite, quartz, cassiterite, opaque minerals (probably mainly ilmenite), tourmaline, minor topaz, leucoxene, red iron oxide, siderite, and sericitized feldspar, and rare zircon and corundum. Pyrite mostly takes the form of aggregates of minute cubes, but some smooth, globular aggregates were noted. The zircon is mostly very fine-grained, and some equally fine-grained cassiterite is also present. The cassiterite content of the re-panned "light" fractions ranges from a few percent to over 30 percent (by weight). The high percentage of cassiterite in some of the "light" fractions is due to the fact that their volume was greatly reduced by re-panning to facilitate sampling for assay; however, the maximum

calculated weight of cassiterite in any one bulked sample did not exceed 0.6 oz. (See Table II). Most of the cassiterite in the "light" fractions is fairly coarse, and it is difficult to explain why it was discarded during earlier stages of panning; a possible reason is that it may have been carried over with rough aggregates of pyrite measuring up to several millimeters across. These aggregates could have interfered with the separation because of their roughness and their irregular shapes - features due to the breaking-up, during drilling, of argillaceous beds rich in pyrite, or, much less commonly, of sandy beds cemented by pyrite.

### RESULTS OF GEOPHYSICAL INVESTIGATION

The ancestral valley system is shown as a broad, smudged line on Plate 2. Part of the ancestral Annan valley is not shown because traverses "G" and "Q" did not cross the present Annan River.

The gravity traverses indicate that the ancestral Scrubby Creek (draining a non-stanniferous area) joined the ancestral Annan River near traverse "A". This could, in part, account for the much lower grades on traverse "A", and suggests that they may improve to the east of this line.

The location of each gravity traverse is described in Appendix III. The position of each gravity profile is shown on Plate 2, together with the ancestral valleys.

The gravity profiles and ground-surface profile for each traverse are shown in Plates 4-9.

### RESULTS OF DRILLING

The general results of the drilling are listed in Table I. In calculating the grade the measured volume of cuttings for each section was arbitrarily increased by 25 percent to allow for the clay and silt lost by puddling and decantation. The reciprocal of the adjusted cuttings-volume (expressed in cubic yards:  $\frac{500}{\text{cuttings vol.} + 25\%}$ ) was multiplied by the mass of cassiterite concentrate, and by the interval (expressed in feet). The products for each interval were summed, and the total divided by the depth (in feet) to bedrock.

The cassiterite concentrates from each hole were bulked and assayed, and the grade adjusted to a 72 percent concentrate (shown in column 6, Table I). Microscopic examination of the cassiterite concentrates during cleaning showed that the concentrates from the bottom 30 to 40 ft of each hole contained much less impurity (tourmaline, ilmenite, topaz, etc.) than those from higher up.

The magnetic mineral concentrate and the "light" mineral residue for each hole were also bulked and assayed, but these figures were not used in the calculation of grade. They are shown in Appendix I together with the details for each hole. Only the holes from which satisfactory results were obtained have been listed (see also Table I).

## CONCLUSIONS AND RECOMMENDATIONS

The investigation confirmed the presence of a deep valley trending westwards beneath the extensive alluvium of Kings Plains. The drilling indicated that it ranges down to at least 155 feet deep, proved that it is stanniferous, and showed that the cassiterite is mainly concentrated at depths below 100 feet.

The grade of the stanniferous alluvium is higher, and the cassiterite is coarser, in the eastern end of the Kings Plains area; these results confirmed the original assumption that any alluvial tin in the Kings Plains valley was derived from the east and south-east. But whereas, at the beginning of the investigation, the Annan River and its tributaries, were assumed to have been the chief source of tin, it now appears that Mungumby Creek may also have been a major contributor. Mungumby Creek valley has never been drilled, and, although Saint Smith (1916, p.80) reported test-pitting in the Mungumby Creek area in 1914 by the Brisbane-Cooktown Tin Dredging Syndicate, it appears from his description that the area tested was on the western side of the Annan River, not far north of Helenvale (see Plate 1).

The headwaters of Mungumby Creek drain the Big Tableland area (a perched valley about 1800 feet above Mungumby Creek valley) which has been mined extensively for alluvial tin. On the other hand, only a small amount of tin has been produced from Mungumby Creek, in the head of the valley, near the foot of Big Tableland. This may mean that very little tin was shed from the Big Tableland area, or alternatively, and more probably, that the stanniferous alluvium in the lower part of Mungumby Creek valley was buried when the valley aggraded, partly as a result of the easterly regional tilt postulated by Bik (Bik & Lucas, op.cit.)

The gravity survey (traverses G, K, L, P, Q) indicated a broad valley, about three miles long, sloping gently north-westwards into the Kings Plains area. This information, coupled with the encouraging results obtained in drill holes MRK 11 and MRK 15 (see Table I and Appendix I), suggests that any future testing in the area should begin in the eastern part of Mungumby Creek valley, and work north-westwards into the Kings Plains valley. Should the results of the testing prove satisfactory, re-appraisal of that part of the Annan River valley formerly tested and abandoned by the Broken Hill Proprietary Co. Ltd. may be warranted.

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TABLE I.

## DRILL HOLE SUMMARY

| Hole       | Location             | Depth  | Grade of cassiterite concentrate (oz./c.yd.) | Assay % Sn. | Grade corrected to 72% cassiterite concentrate (oz./c.yd.) | Remarks.                                                                                                                                                                                                                                                                                                    |
|------------|----------------------|--------|----------------------------------------------|-------------|------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MRK 1      | Traverse "A" Stn 26. | 146'   |                                              |             |                                                            | Drilled rotary with Failing "500". Sampling unsatisfactory.                                                                                                                                                                                                                                                 |
| MRK 1A     | Traverse "A" Stn 26. | 131'   |                                              |             |                                                            | Drilled rotary to 107' with Failing "500". 107 - 131' percussion-drilled with Failing "500". "Running sand" struck at 113'6" - samples unreliable.                                                                                                                                                          |
| MRK 2      | Traverse "A" Stn 32. | 40'    |                                              |             |                                                            | Drilled rotary with Failing "500". Hole abandoned; MRK 2B drilled instead.                                                                                                                                                                                                                                  |
| MRK 2B     | Traverse "A" Stn 32. | 146'   |                                              |             |                                                            | Drilled percussion with Failing "500" to 112'9". Completed percussion to 146' by Hydromaster "1500". Sampling unsatisfactory. <i>Some cassiterite recovered</i>                                                                                                                                             |
| MRK 3      | Traverse "A" Stn 38. | 167'   |                                              |             |                                                            | Drilled percussion with Failing "500" to 65'. Completed percussion with Hydromaster "1500". Sampling unsatisfactory. <i>Grade 1.33 - to 1' approx. 2.5 oz/c.yd.</i>                                                                                                                                         |
| MRK 4      | Traverse "A" Stn 43. | 40'    |                                              |             |                                                            | Drilled percussion with Failing "500" earth socket, while awaiting arrival of casing. Hole abandoned when monsoon stopped investigation.                                                                                                                                                                    |
| MRK 5      | Traverse "A" Stn 50. | 40'    |                                              |             |                                                            | Ditto.                                                                                                                                                                                                                                                                                                      |
| MRK 6      | Traverse "A" Stn 77. | 154'4" | 1.6<br>(to 150')                             | 67.8        | 1.5<br>(to 150')                                           | Drilled percussion to 30' with Failing "500". Completed percussion with Hydromaster "1500".                                                                                                                                                                                                                 |
| MRK 7      | Traverse "A" Stn 84. | 165'   | 0.8<br>(to 165')                             | 71.1        | 0.8<br>(to 165')                                           | Drilled percussion to 156' with Failing "500". Hole deepened to 165' with Hydromaster "1500". Buckled casing shoe caused temporary abandonment; onset of monsoon prevented completion of this hole. Poor sampling in this hole suggests that the grade may be higher than that calculated (see Appendix I). |
| MRK 8,9,10 | NOT DRILLED          |        |                                              |             |                                                            |                                                                                                                                                                                                                                                                                                             |
| MRK 11     | Traverse "N" Stn 26. | 149'   | 4.8<br>(to 145')                             | 66.9        | 4.5<br>(to 145')                                           | Drilled percussion with Hydromaster "1500".                                                                                                                                                                                                                                                                 |
| MRK 12     | Traverse "N" Stn 28. | 137'   | 1.0<br>(to 135')                             | 44.0        | 0.6<br>(to 135')                                           | Ditto.                                                                                                                                                                                                                                                                                                      |
| MRK 13     | Traverse "N" Stn 24. | 146'6" | 3.0<br>(to 140')                             | 58.3        | 2.4<br>(to 140')                                           | Ditto.                                                                                                                                                                                                                                                                                                      |
| MRK 14     | Traverse "N" Stn 22. | 152'4" | 2.3<br>(to 145')                             | 67.3        | 2.1<br>(to 145')                                           | Ditto.                                                                                                                                                                                                                                                                                                      |
| MRK 15     | Traverse "N" Stn 20. | 143'9" | 6.0<br>(to 140')                             | 63.9        | 5.3<br>(to 140')                                           | Ditto.                                                                                                                                                                                                                                                                                                      |

TABLE II

## TIN ASSAYS AND CASSITERITE CONTENTS OF BULKED CONCENTRATES AND RESIDUES

| <u>Hole</u> | <u>Cassiterite Concentrate</u> |             |                                                             | <u>Magnetic Fraction</u> |             |                                                             | <u>"Light" Fraction</u> |             |                                                             |
|-------------|--------------------------------|-------------|-------------------------------------------------------------|--------------------------|-------------|-------------------------------------------------------------|-------------------------|-------------|-------------------------------------------------------------|
|             | Weight (oz.)                   | (a)<br>% Sn | Weight of Sn expressed as 72% cassiterite concentrate (oz.) | Weight (oz.)             | (b)<br>% Sn | Weight of Sn expressed as 72% cassiterite concentrate (oz.) | Weight (oz.)            | (a)<br>% Sn | Weight of Sn expressed as 72% cassiterite concentrate (oz.) |
| MRK 6       | 1.21                           | 67.8        | 1.1                                                         | 10.91                    | 0.25        | less than 0.1                                               | 2.88                    | 6.5         | 0.3                                                         |
| MRK 7       | 0.76                           | 71.1        | 0.7(5)                                                      | 5.77                     | 0.5         | less than 0.1                                               | 0.41                    | 22.8        | 0.1                                                         |
| MRK 11      | 3.74                           | 66.9        | 3.5                                                         | 9.19                     | 0.75        | 0.1                                                         | 1.56                    | 26.1        | 0.6                                                         |
| MRK 12      | 0.72                           | 44.0        | 0.4                                                         | 9.24                     | 0.75        | 0.1                                                         | 2.98                    | 3.3         | 0.1                                                         |
| MRK 13      | 1.17                           | 58.3        | 0.9                                                         | 11.98                    | 0.25        | less than 0.1                                               | 8.41                    | 4.1         | 0.5                                                         |
| MRK 14      | 1.45                           | 67.3        | 1.4                                                         | 14.81                    | 0.25        | less than 0.1                                               | 0.59                    | 25.3        | 0.2                                                         |
| MRK 15      | 3.13                           | 63.9        | 2.8                                                         | 17.82                    | 0.25        | less than 0.1                                               | 3.08                    | 8.0         | 0.3                                                         |

(a) Assayed by S. Baker and A.D. Haldane.

(b) Semi-quantitative spectrographic estimations by E.J. Howard and A.D. Haldane.

TABLE IIIPERCENTAGE SIZE ANALYSES OF BULKED CASSITERITE CONCENTRATES

| <u>Hole</u> | (1),(2)<br><u>+ 60 mesh</u> | (1),(3)<br><u>+ 100 mesh</u> | <u>- 100 mesh</u> |
|-------------|-----------------------------|------------------------------|-------------------|
| MRK 6       | 3                           | 39                           | 58                |
| MRK 7       | 23                          | 50                           | 27                |
| MRK 11      | 38                          | 46                           | 16                |
| MRK 12      | 12                          | 51                           | 37                |
| MRK 13      | 21                          | 55                           | 24                |
| MRK 14      | 25                          | 44                           | 31                |
| MRK 15      | 29                          | 50                           | 21                |

(1) British Standard Screen

(2) Aperture 251 microns

(3) Aperture 152 microns

TABLE IVWEIGHTED PERCENTAGE SIZE ANALYSES OF BULKED CASSITERITE CONCENTRATES

| <u>Traverse</u>                       | <u>+ 60 mesh</u> | <u>+ 100 mesh</u> | <u>- 100 mesh</u> |
|---------------------------------------|------------------|-------------------|-------------------|
| "A" (Holes<br>MRK 6 & 7)              | 11               | 44                | 45                |
| "N" (Holes<br>MRK 11,12,<br>13,14,15) | 30               | 48                | 22                |

## TABLE I

## DRILL HOLE DETAILS

| Hole         | MRK 6.                                                                                                             |                                     |                                                        |       | Cassiterite Concentrate      | Corrected to 72% cassiterite concentrate |
|--------------|--------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------------------------------------|-------|------------------------------|------------------------------------------|
| Location     | Traverse "A"<br>31 ft at 324°<br>magnetic from<br>Stn 77.                                                          | Drill                               | Failing "500" percussion<br>drilled to 30'.            | Grade | 0 - 150' = 1.6 oz/c.yd.      | 1.5 oz/c.yd.                             |
|              |                                                                                                                    |                                     | Hydramaster "1500"<br>percussion drilled to<br>154'4". |       | 0 - 100' = 0.5 oz/c.yd.      | 0.4 oz/c.yd.                             |
|              |                                                                                                                    |                                     |                                                        |       | 100 - 150' = 3.8 oz/c.yd.    | 3.6 oz/c.yd.                             |
| Collar level | R.L. 444'                                                                                                          |                                     |                                                        | Assay | (i) Cassiterite concentrate  | 67.5%Sn.                                 |
|              | (datum assumed from Cooktown-<br>Daintree 1" = 1/2 mile contoured<br>map prepared by Forestry Dept.,<br>Brisbane.) | External Diameter<br>of Casing Shoe | 6 1/4 inches.                                          |       | (ii) Magnetic fraction       | 0.25%Sn.                                 |
|              |                                                                                                                    |                                     |                                                        |       | (iii) Residue (See Table II) | 6.5%Sn.                                  |

| Depth (in feet) |        | Weight of cassiterite concentrate (oz.) | Cuttings volume (cubic yard) |          | Lithology                                                 | Remarks                                                            |
|-----------------|--------|-----------------------------------------|------------------------------|----------|-----------------------------------------------------------|--------------------------------------------------------------------|
| Section         | Total  |                                         | - 6 mesh                     | + 6 mesh |                                                           |                                                                    |
| 29'             | 29'    | -                                       | -                            | -        | Mottled red and white clay.                               | Hole drilled with 7" earth socket.                                 |
| 1'              | 30'    | -                                       | -                            | -        | Coarse sandy clay.                                        | " " " " " "                                                        |
| 15'             | 45'    | -                                       | -                            | -        | Mottled silty clay.                                       | Casing run at 30 ft. Hole drilled and pumped from there to bottom. |
| 5'              | 50'    | -                                       | -                            | -        | Silty sandy clay.                                         | Water entered the hole at 49'.                                     |
| 5'              | 55'    | tr.                                     | 4.35                         | 0.25     | Some fine sand, rare medium wash with amethystine quartz. |                                                                    |
| 5'              | 60'    | tr.                                     | 11.75                        | 0.25     | Mostly fine brown yellow sand.                            |                                                                    |
| 5'              | 65'    | 0.04                                    | 13.75                        | 2.25     | Sand and gravel.                                          |                                                                    |
| 5'              | 70'    | 0.02                                    | 9.0                          | 2.0      | Sand and gravel.                                          |                                                                    |
| 5'              | 75'    | 0.09                                    | 11.4                         | 0.6      | Silty sandy clay and very fine sand.                      |                                                                    |
| 5'              | 80'    | 0.05                                    | 8.5                          | 2.0      | Fine and coarse sand.                                     |                                                                    |
| 5'              | 85'    | 0.02                                    | 11.0                         | 1.5      | " " " "                                                   |                                                                    |
| 5'              | 90'    | 0.01                                    | 9.75                         | 1.0      | " " " "                                                   | No cuttings recovered between 88' and 89'6".                       |
| 5'              | 95'    | tr.                                     | 7.0                          | 1.0      | " " " "                                                   | Narrow bands of blue-grey and brown sandy clay about 95'.          |
| 5'              | 100'   | 0.01                                    | 2.75                         | 0.25     | Clay and fine sandy clay.                                 |                                                                    |
| 5'              | 105'   | 0.03                                    | 5.35                         | 0.25     | " " " "                                                   |                                                                    |
| 5'              | 110'   | 0.02                                    | 4.0                          | 0.75     | Silty sandy clay, fine and coarse sand.                   | Some fragments of carbonised wood.                                 |
| 5'              | 115'   | 0.04                                    | 11.0                         | 0.5      | Silty sandy clay, fine and coarse sand.                   | Fragments of carbonised wood partly pyritised.                     |
| 5'              | 120'   | tr.                                     | 18.5                         | 2.5      | Silty sandy clay, fine and coarse sand.                   | "Running sand", some carbonised wood fragments.                    |
| 5'              | 125'   | 0.02                                    | 6.5                          | 1.5      | Silty sandy clay, fine and coarse sand and some gravel.   | Thin layers of blue-grey and brown clay.                           |
| 5'              | 130'   | 0.35                                    | 6.5                          | 1.5      | Silty sandy clay, fine and coarse sand and some gravel.   | Some pyrite.                                                       |
| 2'              | 132'   | 0.07                                    | 1.75                         | 0.25     | Silty sandy clay and some gravel.                         |                                                                    |
| 2'6"            | 134'6" | -                                       | -                            | -        | - - -                                                     | No cuttings recovered.                                             |
| 1'6"            | 136'   | 0.10                                    | 3.0                          | 0.25     | Silty sandy clay and some gravel.                         |                                                                    |
| 4'              | 140'   | 0.02                                    | 3.5                          | 0.5      | Fine and coarse sand, some gravel and clay.               |                                                                    |
| 5'              | 145'   | 0.03                                    | 3.5                          | 0.5      | Fine and coarse sand, some gravel and clay.               |                                                                    |
| 5'              | 150'   | 0.01                                    | 6.5                          | 0.25     | Fine and coarse sand, some gravel and clay.               |                                                                    |
| 4'4"            | 154'4" | -                                       | -                            | -        | Grey slate fragments.                                     | Bedrock at 150 feet.                                               |

1.21  
(incl. tr. = 0.01)

|                     |                                                           |                                             |                                                      |                                                                                                    |                                                 |
|---------------------|-----------------------------------------------------------|---------------------------------------------|------------------------------------------------------|----------------------------------------------------------------------------------------------------|-------------------------------------------------|
| <u>Hole</u>         | MRK 7.                                                    | <u>Drill</u>                                | Failing "500"<br>percussion drilled<br>to 156'.      | <u>Cassiterite<br/>concentrate</u>                                                                 | Corrected to<br>72% cassiterite<br>concentrate. |
| <u>Location</u>     | Traverse "A"<br>18 ft at 193°<br>magnetic from<br>Stn 84. |                                             | Hydromaster "1500"<br>percussion drilled<br>to 165'. | <u>Grade</u> 0 - 165' = 0.8 oz./c.yd.<br>0 - 100' = 0.2 oz./c.yd.<br>100 - 165' = 1.6 oz./c.yd.    | 0.8 oz./c.yd.<br>0.2 oz./c.yd.<br>1.6 oz./c.yd. |
| <u>Collar level</u> | L.L. 440'<br>(datum assumed)                              | <u>External Diameter<br/>of Casing Shoe</u> | 6 $\frac{1}{4}$ inches.                              | <u>Assay</u> (i) Cassiterite concentrate<br>(ii) Magnetic fraction<br>(iii) Residue (See Table II) | 71.1% Sn.<br>0.5% Sn.<br>22.8% Sn.              |

| <u>Depth (in feet)</u> |              | <u>Weight of<br/>cassiterite<br/>concentrate<br/>(oz.)</u> | <u>Cuttings volume (<math>\frac{\text{cubic yard}}{500}</math>)</u> |          | <u>Lithology</u>                                                      | <u>Remarks</u>                                                                      |
|------------------------|--------------|------------------------------------------------------------|---------------------------------------------------------------------|----------|-----------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <u>Section</u>         | <u>Total</u> |                                                            | - 6 mesh                                                            | + 6 mesh |                                                                       |                                                                                     |
| 64'                    | 64'          | -                                                          | -                                                                   | -        | Mottled clay with thin beds<br>of sand towards base.                  |                                                                                     |
| 6'                     | 70'          | 0.01                                                       | -                                                                   | -        | -                                                                     | No record of cuttings volume in<br>log. Grade not calculated.                       |
| 5'                     | 75'          | -                                                          | -                                                                   | -        | -                                                                     | No cuttings recovered from<br>this section.                                         |
| 5'                     | 80'          | 0.05                                                       | 17                                                                  | -        | Coarse sand, some clay.                                               |                                                                                     |
| 5'                     | 85'          | 0.10                                                       | 20.7                                                                | -        | " " " "                                                               |                                                                                     |
| 7'                     | 92'          | 0.02                                                       | 7                                                                   | -        | " " " "                                                               |                                                                                     |
| 5'                     | 97'          | 0.03                                                       | -                                                                   | -        | " " " "                                                               | Cuttings volume not recorded<br>in log.                                             |
| 12'                    | 109'         | -                                                          | -                                                                   | -        | " " " "                                                               | "Running sand" - cuttings<br>discarded.                                             |
| 7'                     | 116'         | 0.08                                                       | 11                                                                  | -        | " " " "                                                               | "Running sand"                                                                      |
| 8'                     | 124'         | 0.04                                                       | 10                                                                  | -        | " " " "                                                               | "Running sand", total cuttings<br>32/500 c.yd, but only 10/500<br>c.yd were panned. |
| 6'                     | 130'         | 0.15                                                       | 13                                                                  | -        | " " " "                                                               | "Running sand"                                                                      |
| 9'                     | 139'         | 0.02                                                       | 3                                                                   | -        | " " " "                                                               | "Running sand"                                                                      |
| 13'6"                  | 152'6"       | tr.                                                        | -                                                                   | -        | Grey blue sandy clay.                                                 | Hole dug with earth socket<br>beneath the casing.                                   |
| 3'6"                   | 156'         | 0.04                                                       | -                                                                   | -        | Coarse sand and gravel,<br>some blue-grey clay.                       | Cuttings volume not recorded<br>in log.                                             |
| 1'                     | 157'         | -                                                          | 2                                                                   | -        | -                                                                     | Sample lost.                                                                        |
| 1'                     | 158'         | -                                                          | 4                                                                   | -        | -                                                                     | No heavy mineral concentrate<br>recovered.                                          |
| 5'                     | 163'         | 0.19                                                       | 18.25                                                               | -        | Green-blue-grey clay, fine<br>sand and gravel.                        |                                                                                     |
| 2'11"                  | 165'11"      | 0.03                                                       | -                                                                   | -        | Green-blue clay, sand and<br>gravel, cobbles up to 3" in<br>diameter. | Hole not bottomed; abandoned<br>at this depth because of faulty<br>casing shoe.     |
|                        |              | 0.76                                                       |                                                                     |          |                                                                       |                                                                                     |

|                     |                                                            |                                             |                        |                                                                                                    |                                                  |
|---------------------|------------------------------------------------------------|---------------------------------------------|------------------------|----------------------------------------------------------------------------------------------------|--------------------------------------------------|
| <u>Hole</u>         | MRK 11.                                                    | <u>Drill</u>                                | Hydromaster "1500".    | Cassiterite concentrate                                                                            | Corrected to 72% cassiterite concentrate.        |
| <u>Location</u>     | "Traverse "N"<br>20 ft at 196°<br>magnetic from<br>Stn 26. | <u>External Diameter<br/>of Casing Shoe</u> | 6 $\frac{1}{4}$ inches | <u>Grade</u> 0 - 145' = 4.8 oz./c.yd.<br>0 - 100' = 0.6 oz./c.yd.<br>100 - 145' = 14.1 oz./c.yd.   | 4.5 oz./c.yd.<br>0.5 oz./c.yd.<br>13.1 oz./c.yd. |
| <u>Collar level</u> | R.L. 450 feet.<br>(datum assumed)                          |                                             |                        | <u>Assay</u> (i) Cassiterite concentrate<br>(ii) Magnetic fraction<br>(iii) Residue (See Table II) | 66.9% Sn.<br>0.75% Sn.<br>26.1% Sn.              |

| <u>Depth (in feet)</u> |              | <u>Weight of<br/>cassiterite<br/>concentrate<br/>(oz.)</u> | <u>Cuttings volume (<math>\frac{\text{cubic yard}}{500}</math>)</u> |          | <u>Lithology</u>                                                                 | <u>Remarks</u>              |
|------------------------|--------------|------------------------------------------------------------|---------------------------------------------------------------------|----------|----------------------------------------------------------------------------------|-----------------------------|
| <u>Section</u>         | <u>Total</u> |                                                            | - 6 mesh                                                            | + 6 mesh |                                                                                  |                             |
| 53'                    | 53'          | -                                                          | -                                                                   | -        | Mottled red-brown clay, some fine sand.                                          | Bored with 7" earth socket. |
| 2'8"                   | 55'8"        | 0.02                                                       | 9.75                                                                | 0.25     | Clay, fine sand and some gravel.                                                 |                             |
| 7'10"                  | 63'6"        | -                                                          | -                                                                   | -        | -                                                                                | No cuttings recovered.      |
| 1'6"                   | 65'          | 0.01                                                       | 2.5                                                                 | -        | Fine sandy clay, some sand.                                                      |                             |
| 5'                     | 70'          | 0.11                                                       | 10.25                                                               | -        | " " " " "                                                                        | Coarse sand at 67'.         |
| 5'                     | 75'          | 0.05                                                       | 0.25                                                                | 0.25     | " " " " "                                                                        |                             |
| 5'                     | 80'          | 0.03                                                       | 5.5                                                                 | 0.75     | Yellow-brown fine sandy clay, some sand and fine gravel.                         |                             |
| 2'6"                   | 82'6"        | -                                                          | -                                                                   | -        | -                                                                                | No cuttings recovered.      |
| 2'6"                   | 85'          | 0.01                                                       | 1.75                                                                | -        | Yellow-brown fine sandy clay, some sand and fine gravel.                         |                             |
| 10'                    | 95'          | 0.07                                                       | 15.25                                                               | 0.5      | Fine sand and gravel, some silty sandy clay.                                     |                             |
| 5'                     | 100'         | 0.01                                                       | 8.0                                                                 | 0.25     | Fine sand and gravel, some silty sandy clay and some coarse sand.                |                             |
| 5'                     | 105'         | 0.01                                                       | 8.5                                                                 | 0.25     | Fine sand and gravel, some silty sandy clay and some coarse sand.                |                             |
| 5'                     | 110'         | 0.01                                                       | 5.75                                                                | 0.25     | Fine sand and gravel, some silty sandy clay, some coarse sand and rare cobbles.  |                             |
| 5'                     | 115'         | tr.                                                        | 12.75                                                               | 0.25     | Silty sandy clay and fine sand.                                                  |                             |
| 5'                     | 120'         | 0.14                                                       | 5.25                                                                | 0.75     | Silty sandy clay, fine and coarse sand.                                          |                             |
| 5'                     | 125'         | 1.65                                                       | 16.2                                                                | 1.75     | Clay, coarse sand and gravel.                                                    |                             |
| 5'                     | 130'         | 0.62                                                       | 6.5                                                                 | 0.25     | Clay, coarse sand and gravel and some fine sand.                                 |                             |
| 5'                     | 135'         | 0.31                                                       | 8.5                                                                 | 0.75     | Clay, coarse sand and gravel and some fine sand.                                 |                             |
| 5'                     | 140'         | 0.49                                                       | 9.25                                                                | 0.75     | Clay, coarse sand and gravel and some fine sand.                                 | Some pyrite.                |
| 5'                     | 145'         | 0.02                                                       | 7.25                                                                | 0.75     | Clay, coarse sand and gravel, some fine sand and rare blue-grey slate fragments. |                             |
| 4'                     | 149'         | -                                                          | -                                                                   | -        | Blue grey angular slate fragments.                                               | Hole bottomed at 145'.      |
|                        |              | 3.74                                                       |                                                                     |          |                                                                                  |                             |

|                     |                                                          |                                             |                         |                                                                                                     |                                                 |
|---------------------|----------------------------------------------------------|---------------------------------------------|-------------------------|-----------------------------------------------------------------------------------------------------|-------------------------------------------------|
| <u>Hole</u>         | MRK 12.                                                  | <u>Drill</u>                                | Hydromaster "1500"      | Cassiterite<br>concentrate                                                                          | Corrected to<br>72% cassiterite<br>concentrate. |
| <u>Location</u>     | Traverse "I"<br>6 ft at 321°<br>magnetic from<br>Stn 28. | <u>External Diameter<br/>of Casing Shoe</u> | 6 $\frac{1}{4}$ inches. | <u>Grade</u> 0 - 135' = 1.0 oz./c.yd.<br>0 - 100' = 1.2 oz./c.yd.<br>100 - 135' = 1.3 oz./c.yd.     | 0.6 oz./c.yd.<br>0.7 oz./c.yd.<br>0.8 oz./c.yd. |
| <u>Collar level</u> | R.L. 450 ft.<br>(datum assumed)                          |                                             |                         | <u>Assay</u> (i) Cassiterite concentrate<br>(ii) Magnetic fraction<br>(iii) Residue. (See Table II) | 44.0% Sn.<br>0.75% Sn.<br>3.3% Sn.              |

| Depth (in feet) |        | Weight of<br>cassiterite<br>concentrate<br>(oz.) | Cuttings volume ( $\frac{\text{cubic yard}}{500}$ ) |          | Lithology                                      | Remarks                  |
|-----------------|--------|--------------------------------------------------|-----------------------------------------------------|----------|------------------------------------------------|--------------------------|
| Section         | Total  |                                                  | - 6 mesh                                            | + 6 mesh |                                                |                          |
| 40'             | 40'    | -                                                | -                                                   | -        | Mottled red-brown clay, some<br>fine sand.     |                          |
| 4'6"            | 44'6"  | 0.06                                             | 12.0                                                | -        | Silty clay and fine sand.                      |                          |
| 5'6"            | 50'    | 0.01                                             | 2.5                                                 | -        | Silty sandy clay.                              |                          |
| 5'              | 55'    | 0.04                                             | 7.75                                                | -        | Fine sand, some clay.                          |                          |
| 2'6"            | 57'6"  | 0.03                                             | 7.75                                                | 0.25     | Fine sand, some clay and<br>coarse sand.       |                          |
| 2'              | 59'6"  | -                                                | -                                                   | -        | -                                              | No cuttings recovered.   |
| 5'6"            | 65'    | 0.17                                             | 10.25                                               | 1.25     | Silty sandy clay, sand,<br>and gravel.         |                          |
| 5'              | 70'    | 0.05                                             | 6.0                                                 | -        | Silty sandy clay, some fine<br>sand.           |                          |
| 5'              | 75'    | tr.                                              | 1.25                                                | -        | Silty sandy clay.                              |                          |
| 5'              | 80'    | tr.                                              | 0.75                                                | -        | " " "                                          |                          |
| 5'              | 85'    | tr.                                              | 2.0                                                 | -        | " " "                                          |                          |
| 4'              | 89'    | 0.03                                             | 8.0                                                 | -        | Clay and fine sand.                            |                          |
| 6'              | 95'    | 0.04                                             | 6.25                                                | 0.25     | Sand and fine gravel,<br>some clay.            |                          |
| 5'              | 100'   | 0.01                                             | 4.5                                                 | 0.75     | Clay, some sand and fine<br>gravel.            |                          |
| 4'6"            | 104'6" | tr.                                              | 0.6                                                 | -        | Blue-grey clay, some sand.                     |                          |
| 5'6"            | 110'   | tr.                                              | 1.2                                                 | -        | " " " " "                                      |                          |
| 5'              | 115'   | tr.                                              | 11.1                                                | 1.5      | Fine and coarse sand, some<br>gravel and clay. |                          |
| 5'              | 120'   | 0.21                                             | 11.5                                                | 2.5      | Sand and gravel, some clay.                    |                          |
| 5'              | 125'   | 0.04                                             | 5.75                                                | 0.25     | Clay, sand, and gravel.                        |                          |
| 4'6"            | 129'6" | 0.03                                             | 13.75                                               | 0.25     | Clay, sand, and gravel; rare<br>cobbles.       |                          |
| 5'6"            | 135'8" | tr.                                              | -                                                   | -        | -                                              |                          |
| 1'8"            | 137'   | tr.                                              | -                                                   | -        | Angular grey slate fragments.                  | Hole bottomed at 135'8". |

|                     |                                                           |                                             |                         |                                                                                                     |                                                 |
|---------------------|-----------------------------------------------------------|---------------------------------------------|-------------------------|-----------------------------------------------------------------------------------------------------|-------------------------------------------------|
| <u>Hole</u>         | M&K 13.                                                   | <u>Drill</u>                                | Hydromaster "1500"      | Cassiterite concentrate                                                                             | Corrected to 72% cassiterite concentrate.       |
| <u>Location</u>     | Traverse "N"<br>22 ft at 235°<br>magnetic from<br>Stn 24. | <u>External Diameter<br/>of Casing Shoe</u> | 6 $\frac{1}{4}$ inches. | <u>Grade</u> 0 - 140' = 3.0 oz./c.yd.<br>0 - 100' = 1.5 oz./c.yd.<br>100 - 140' = 5.3 oz./c.yd.     | 2.4 oz./c.yd.<br>1.2 oz./c.yd.<br>4.3 oz./c.yd. |
| <u>Collar level</u> | R.L. 449'.<br>(datum assumed)                             |                                             |                         | <u>Assay</u> (i) Cassiterite concentrate<br>(ii) Magnetic fraction<br>(iii) Residue. (See Table II) | 58.3% Sn.<br>0.25% Sn.<br>4.1% Sn.              |

| <u>Depth (in feet)</u> |              | <u>Weight of<br/>cassiterite<br/>concentrate<br/>(oz.)</u> | <u>Cuttings volume (<math>\frac{\text{cubic yard}}{500}</math>)</u> |          | <u>Lithology</u>                   | <u>Remarks</u>                          |
|------------------------|--------------|------------------------------------------------------------|---------------------------------------------------------------------|----------|------------------------------------|-----------------------------------------|
| <u>Section</u>         | <u>Total</u> |                                                            | - 6 mesh                                                            | + 6 mesh |                                    |                                         |
| 5'                     | 5'           | -                                                          | -                                                                   | -        | Silty sandy clay.                  |                                         |
| 21'                    | 26'          | 0.02                                                       | 23.95                                                               | 1.05     | Sand and clay.                     | Sand - coarser towards base of section. |
| 28'3"                  | 54'3"        | -                                                          | 1.25                                                                | -        | Clay.                              |                                         |
| 9"                     | 55'          | 0.01                                                       | 1.0                                                                 | -        | Clay and sand.                     |                                         |
| 5'                     | 60'          | 0.14                                                       | 6.0                                                                 | 1.0      | Clay, sand, and gravel.            |                                         |
| 5'                     | 65'          | 0.07                                                       | 6.5                                                                 | 1.0      | " " " "                            |                                         |
| 5'                     | 70'          | 0.04                                                       | 4.5                                                                 | 0.25     | " " " "                            |                                         |
| 5'                     | 75'          | 0.01                                                       | 0.75                                                                | -        | Clay and some sand.                |                                         |
| 9'6"                   | 84'6"        | -                                                          | 0.25                                                                | -        | " " " "                            | No heavy mineral concentrate.           |
| 15'6"                  | 100'         | 0.01                                                       | 16.85                                                               | 0.5      | Clay and fine sand.                |                                         |
| 10'                    | 110'         | -                                                          | -                                                                   | -        | Clay.                              | No heavy mineral concentrate.           |
| 5'                     | 115'         | 0.03                                                       | 2.25                                                                | -        | Clay and fine sand.                |                                         |
| 5'                     | 120'         | 0.26                                                       | 7.25                                                                | 0.5      | Clay, fine and coarse sand.        |                                         |
| 5'                     | 125'         | 0.11                                                       | 6.5                                                                 | 0.25     | " " " " "                          |                                         |
| 5'                     | 130'         | 0.16                                                       | 6.5                                                                 | 0.25     | " " " " "                          |                                         |
| 5'                     | 135'         | 0.22                                                       | 6.25                                                                | 0.25     | " " " " "                          |                                         |
| 5'                     | 140'         | 0.09                                                       | 5.75                                                                | 0.25     | " " " " "                          |                                         |
| 6'6"                   | 146'6"       | -                                                          | -                                                                   | -        | Blue-grey angular slate fragments. | Hole bottomed at 140 feet.              |
|                        |              | 1.17                                                       |                                                                     |          |                                    |                                         |

|                     |                                                          |                                             |                     |                                                                                                     |                                                 |
|---------------------|----------------------------------------------------------|---------------------------------------------|---------------------|-----------------------------------------------------------------------------------------------------|-------------------------------------------------|
| <u>Hole</u>         | MRK 14.                                                  | <u>Drill</u>                                | Hydromaster "1500". | Cassiterite concentrate                                                                             | Corrected to 72% cassiterite concentrate        |
| <u>Location</u>     | Traverse "N"<br>9 ft at 225°<br>magnetic from<br>Stn 22. | <u>External Diameter<br/>of Casing Shoe</u> | 6½ inches.          | <u>Grade</u> 0 - 145' = 2.3 oz./c.yd.<br>0 - 100' = 0.6 oz./c.yd.<br>100 - 145' = 6.1 oz./c.yd.     | 2.1 oz./c.yd.<br>0.5 oz./c.yd.<br>5.7 oz./c.yd. |
| <u>Collar level</u> | R.L. 450'.<br>(datum assumed)                            |                                             |                     | <u>Assay</u> (i) Cassiterite concentrate<br>(ii) Magnetic fraction<br>(iii) Residue. (See Table II) | 67.3% Sn.<br>0.25% Sn.<br>25.3% Sn.             |

| Depth (in feet) |        | Weight of cassiterite concentrate (oz.) | Cuttings volume ( $\frac{\text{cubic yard}}{500}$ ) |          | Lithology                                    | Remarks                       |
|-----------------|--------|-----------------------------------------|-----------------------------------------------------|----------|----------------------------------------------|-------------------------------|
| Section         | Total  |                                         | - 6 mesh                                            | + 6 mesh |                                              |                               |
| 17'             | 17'    | -                                       | -                                                   | -        | Mottled red-brown clay.                      |                               |
| 3'              | 20'    | tr.                                     | 14.7                                                | 0.25     | Clay and sand.                               |                               |
| 6'              | 26'    | tr.                                     | 19.75                                               | 2.25     | " " "                                        |                               |
| 27'             | 53'    | -                                       | -                                                   | -        | Clay.                                        | No heavy mineral concentrate. |
| 1'              | 54'    | tr.                                     | -                                                   | -        | Clay and sand.                               |                               |
| 10'4"           | 64'4"  | -                                       | -                                                   | -        | -                                            | No cuttings recovered.        |
| 5'8"            | 70'    | 0.01                                    | 10.5                                                | 1.5      | Clay, sand, and gravel.                      |                               |
| 1'              | 71'    | 0.01                                    | 2.75                                                | 0.25     | " " " "                                      |                               |
| 7'4"            | 78'4"  | -                                       | -                                                   | -        | -                                            | No cuttings recovered.        |
| 2'8"            | 81'    | tr.                                     | 4.0                                                 | -        | Sandy clay and sand.                         |                               |
| 2'              | 83'    | tr.                                     | 7.5                                                 | -        | Clay and fine sand.                          |                               |
| 3'              | 86'    | -                                       | -                                                   | -        | -                                            | No cuttings recovered.        |
| 4'              | 90'    | tr.                                     | 10.5                                                | -        | Clay and sand.                               |                               |
| 5'              | 95'    | 0.11                                    | 12.1                                                | 0.5      | " " "                                        |                               |
| 5'              | 100'   | 0.09                                    | 4.0                                                 | 0.5      | " " "                                        |                               |
| 2'8"            | 102'8" | 0.01                                    | 3.0                                                 | 0.5      | " " "                                        |                               |
| 4'              | 106'8" | -                                       | -                                                   | -        | -                                            | No cuttings recovered.        |
| 3'4"            | 110'   | 0.01                                    | 4.5                                                 | 0.5      | " " "                                        |                               |
| 5'              | 115'   | 0.07                                    | 5.0                                                 | 0.5      | " " "                                        |                               |
| 4"              | 115'4" | -                                       | -                                                   | -        | -                                            | No cuttings recovered.        |
| 4'8"            | 120'   | 0.12                                    | 14.0                                                | 0.5      | Sand and some clay.                          |                               |
| 5'              | 125'   | 0.05                                    | 6.5                                                 | 1.0      | " " " "                                      |                               |
| 5'              | 130'   | 0.07                                    | 7.0                                                 | 7.75     | " " " "                                      |                               |
| 5'              | 135'   | 0.29                                    | 7.1                                                 | 0.5      | Fine and coarse sand, some clay and gravel.  |                               |
| 5'              | 140'   | 0.31                                    | 8.25                                                | 0.5      | Fine and coarse sand, some clay and gravel.  |                               |
| 3'8"            | 143'8" | 0.20                                    | 5.1                                                 | 0.5      | Fine and coarse sand, some clay and gravel.  |                               |
| 1'4"            | 145'   | -                                       | -                                                   | -        | -                                            | No cuttings recovered.        |
| 4'              | 150'   | -                                       | 5.25                                                | 0.25     |                                              | Sample lost.                  |
| 2'4"            | 152'4" | -                                       | -                                                   | -        | Dark grey-green angular greywacke fragments. | Hole bottomed at 150 feet.    |

1.45  
(incl. tr. = 0.01)

|                     |                                                           |                                             |                         |                                                                                                    |                                                  |
|---------------------|-----------------------------------------------------------|---------------------------------------------|-------------------------|----------------------------------------------------------------------------------------------------|--------------------------------------------------|
| <u>Hole</u>         | MRK 15.                                                   | <u>Drill</u>                                | Hydromaster "1500"      | Cassiterite concentrate                                                                            | Corrected to 72% cassiterite concentrate         |
| <u>Location</u>     | Traverse "N"<br>12 ft at 287°<br>magnetic from<br>Stn 20. | <u>External Diameter<br/>of Casing Shoe</u> | 6 $\frac{1}{4}$ inches. | <u>Grade</u> 0 - 140' = 6.0 oz./c.yd.<br>0 - 100' = 2.9 oz./c.yd.<br>100 - 140' = 13.6 oz./c.yd.   | 5.3 oz./c.yd.<br>2.5 oz./c.yd.<br>12.2 oz./c.yd. |
| <u>Collar level</u> | R.L. 450 feet.<br>(datum assumed)                         |                                             |                         | <u>Assay</u> (i) Cassiterite concentrate<br>(ii) Magnetic fraction<br>(iii) Residue (See Table II) | 63.9% Sn.<br>0.5% Sn.<br>8.0% Sn.                |

| Depth (in feet) |        | Weight of cassiterite concentrate (oz.) | Cuttings volume ( $\frac{\text{cubic yard}}{500}$ ) |          | Lithology                                                  | Remarks                                                                |
|-----------------|--------|-----------------------------------------|-----------------------------------------------------|----------|------------------------------------------------------------|------------------------------------------------------------------------|
| Section         | Total  |                                         | - 6 mesh                                            | + 6 mesh |                                                            |                                                                        |
| 9'10"           | 9'10"  | tr.                                     | -                                                   | -        | Silty sandy clay and sand.                                 | Coarse sand towards bottom of section.                                 |
| 1'8"            | 11'6"  | 0.01                                    | 4.5                                                 | 0.5      | Clay and sand.                                             |                                                                        |
| 9'6"            | 21'    | -                                       | -                                                   | -        | Clay.                                                      |                                                                        |
| 7'              | 28'    | -                                       | -                                                   | -        | -                                                          | No cuttings recovered.                                                 |
| 2'              | 30'    | -                                       | 2.6                                                 | -        | Fine sand and clay.                                        |                                                                        |
| 5'              | 35'    | -                                       | 6.75                                                | -        | " " " "                                                    |                                                                        |
| 8'              | 43'    | -                                       | -                                                   | -        | Clay.                                                      |                                                                        |
| 2'              | 45'    | 0.02                                    | 7.75                                                | -        | Clay, fine sand, and brown slate pebbles.                  |                                                                        |
| 5'              | 50'    | 0.05                                    | 7.0                                                 | -        | Sand and clay.                                             | "Running sand". Total cuttings 19/500 c.yd., but only 7/500 panned.    |
| 5'              | 55'    | 0.09                                    | 12.0                                                | -        | " " "                                                      | "Running sand". Total cuttings 21.5/500 c.yd., but only 12/500 panned. |
| 2'6"            | 57'6"  | 0.23                                    | 9.0                                                 | 0.5      | Sand, gravel, and clay.                                    |                                                                        |
| 7'7"            | 65'1"  | -                                       | -                                                   | -        | -                                                          | No cuttings recovered.                                                 |
| 4'11"           | 70'    | 0.31                                    | 10.65                                               | 0.6      | Sand, gravel, and clay.                                    |                                                                        |
| 5'              | 75'    | 0.30                                    | 5.25                                                | 0.25     | " " " "                                                    |                                                                        |
| 1'              | 76'    | -                                       | -                                                   | -        | -                                                          | No cuttings recovered.                                                 |
| 4'              | 80'    | 0.06                                    | 6.75                                                | 0.25     | Sand and clay.                                             |                                                                        |
| 5'              | 85'    | 0.12                                    | 11.0                                                | 0.5      | Sand, gravel and clay.                                     |                                                                        |
| 5'              | 90'    | 0.10                                    | 12.5                                                | 1.0      | " " " "                                                    |                                                                        |
| 5'              | 95'    | 0.06                                    | 5.1                                                 | 0.5      | " " " "                                                    | Carbonised wood at 92'6".                                              |
| 5'              | 100'   | 0.01                                    | 7.35                                                | 0.25     | Clay and fine sand.                                        |                                                                        |
| 5'              | 105'   | 0.01                                    | 5.2                                                 | 0.2      | " " " "                                                    |                                                                        |
| 5'              | 110'   | 0.01                                    | 7.0                                                 | 0.5      | Clay and fine sand and some coarse sand and gravel.        |                                                                        |
| 5'              | 115'   | 0.49                                    | 6.5                                                 | 0.5      | Sand, gravel, and clay.                                    |                                                                        |
| 5'              | 120'   | 0.49                                    | 5.0                                                 | 0.5      | " " " "                                                    |                                                                        |
| 5'              | 125'   | 0.32                                    | 7.25                                                | 0.75     | " " " "                                                    |                                                                        |
| 5'              | 130'   | 0.43                                    | 6.45                                                | 0.3      | " " " "                                                    |                                                                        |
| 5'              | 135'   | 0.02                                    | 3.0                                                 | -        | Clay and fine sand.                                        |                                                                        |
| 5'              | 140'   | tr.                                     | 1.75                                                | 0.25     | Clay, fine sand, and angular fragments of dark grey slate. |                                                                        |
| 3'9"            | 143'9" | -                                       | -                                                   | -        | Angular fragments of dark grey slate.                      | Hole bottomed at 140 feet.                                             |

# APPENDIX II

## WEIGHTS OF BULKED CASSITERITE CONCENTRATES, MAGNETIC FRACTIONS, AND "LIGHT" FRACTIONS

(Samples treated with aqua regia to remove  
pyrite are marked (P) ).

| <u>HOLE</u> | <u>INTERVAL</u>                                                                           | <u>CASSITERITE</u><br><u>CONCENTRATE</u><br><u>(OZ)</u> | <u>MAGNETIC</u><br><u>FRACTION</u><br><u>(OZ)</u> | <u>"LIGHT"</u><br><u>FRACTION</u><br><u>(OZ)</u> |
|-------------|-------------------------------------------------------------------------------------------|---------------------------------------------------------|---------------------------------------------------|--------------------------------------------------|
| MRK 6       | 50'-55' (P)                                                                               | tr.                                                     | 0.09                                              |                                                  |
|             | 55'-60' (P)                                                                               | tr.                                                     | 0.33                                              |                                                  |
|             | 60'-65'                                                                                   | 0.04                                                    | 0.44                                              |                                                  |
|             | 65'-70'                                                                                   | 0.02                                                    | 0.25                                              |                                                  |
|             | 70'-75'                                                                                   | 0.09                                                    | 0.90                                              |                                                  |
|             | 75'-80'                                                                                   | 0.05                                                    | 0.30                                              |                                                  |
|             | 80'-85'                                                                                   | 0.02                                                    | 0.63                                              |                                                  |
|             | 85'-90'                                                                                   | 0.01                                                    | 0.43                                              |                                                  |
|             | 90'-95'                                                                                   | tr.                                                     | 0.36                                              |                                                  |
|             | 95'-100'                                                                                  | 0.01                                                    | 0.18                                              |                                                  |
|             | 100'-105'                                                                                 | 0.03                                                    | 0.55                                              |                                                  |
|             | 105'-110'                                                                                 | 0.02                                                    | 0.36                                              |                                                  |
|             | 110'-115' (P)                                                                             | 0.04                                                    | 0.72                                              |                                                  |
|             | 115'-120' (P)                                                                             | tr.                                                     | 0.83                                              |                                                  |
|             | 120'-125' (P)                                                                             | 0.20                                                    | 1.44                                              |                                                  |
|             | 125'-130' (P)                                                                             | 0.35                                                    | 1.25                                              |                                                  |
|             | 130'-132'                                                                                 | 0.07                                                    | 0.34                                              |                                                  |
|             | 134'6"-136'                                                                               | 0.10                                                    | 0.28                                              |                                                  |
|             | 136'-140' (P)                                                                             | 0.02                                                    | 0.58                                              |                                                  |
|             | 140'-145' (P)                                                                             | 0.03                                                    | 0.37                                              |                                                  |
|             | 145'-150' (P)                                                                             | 0.01                                                    | 0.28                                              |                                                  |
|             |                                                                                           | 1.21                                                    | 10.91                                             | 2.88                                             |
|             | (including<br>0.01 from traces)                                                           |                                                         |                                                   |                                                  |
|             | $\frac{\text{Wt. cassiterite concentrate}}{\text{Wt. magnetic fraction}} = \frac{1}{9}$   |                                                         |                                                   |                                                  |
| MRK 7       | 64'-70'                                                                                   | 0.01                                                    | 0.09                                              |                                                  |
|             | 75'-80'                                                                                   | 0.05                                                    | 1.04                                              |                                                  |
|             | 80'-85'                                                                                   | 0.10                                                    | 0.32                                              |                                                  |
|             | 85'-92'                                                                                   | 0.02                                                    | 0.19                                              |                                                  |
|             | 92'-97'                                                                                   | 0.03                                                    | 0.69                                              |                                                  |
|             | 109'-116'                                                                                 | 0.08                                                    | 1.27                                              |                                                  |
|             | 116'-124'                                                                                 | 0.04                                                    | 0.22                                              |                                                  |
|             | 124'-130'                                                                                 | 0.15                                                    | 0.96                                              |                                                  |
|             | 130'-139'                                                                                 | 0.02                                                    | 0.31                                              |                                                  |
|             | 139'-152'6"                                                                               | tr.                                                     | 0.10                                              |                                                  |
|             | 152'6"-156'                                                                               | 0.04                                                    | 0.15                                              |                                                  |
|             | 158'-163' (P)                                                                             | 0.19                                                    | 0.20                                              |                                                  |
|             | 163'-165'1" (P)                                                                           | 0.03                                                    | 0.24                                              |                                                  |
|             |                                                                                           | 0.76                                                    | 5.77                                              | 0.41                                             |
|             | $\frac{\text{Wt. cassiterite concentrate}}{\text{Wt. magnetic fraction}} = \frac{1}{7.5}$ |                                                         |                                                   |                                                  |

APPENDIX II (Contd)

| <u>HOLE</u> | <u>INTERVAL</u> | <u>CASSITERITE</u><br><u>CONCENTRATE</u><br>(OZ) | <u>MAGNETIC</u><br><u>FRACTION</u><br>(OZ) | <u>"LIGHT"</u><br><u>FRACTION</u><br>(OZ) |
|-------------|-----------------|--------------------------------------------------|--------------------------------------------|-------------------------------------------|
| MRK 11      | 53'-55'8"       | 0.02                                             | 0.73                                       |                                           |
|             | 55'8"-63'6"     | 0.01                                             | 0.17                                       |                                           |
|             | 65'-70' (P)     | 0.11                                             | 0.16                                       |                                           |
|             | 70'-75' (P)     | 0.05                                             | 0.13                                       |                                           |
|             | 75'-80' (P)     | 0.03                                             | 0.18                                       |                                           |
|             | 82'6"-85' (P)   | 0.01                                             | 0.44                                       |                                           |
|             | 85'-95'         | 0.07                                             | 1.03                                       |                                           |
|             | 95'-100'        | 0.01                                             | 0.18                                       |                                           |
|             | 100'-105' (P)   | 0.01                                             | 0.09                                       |                                           |
|             | 105'-110'       | 0.01                                             | 0.36                                       |                                           |
|             | 110'-115'       | tr.                                              | 2.00                                       |                                           |
|             | 115'-120'       | 0.14                                             | 1.67                                       |                                           |
|             | 120'-125' (P)   | 1.65                                             | 0.56                                       |                                           |
|             | 125'-130' (P)   | 0.62                                             | 0.74                                       |                                           |
|             | 130'-135' (P)   | 0.31                                             | 0.29                                       |                                           |
|             | 135'-140' (P)   | 0.49                                             | 0.27                                       |                                           |
|             | 140'-145' (P)   | 0.20                                             | 0.19                                       |                                           |
|             |                 | <hr/>                                            | <hr/>                                      | <hr/>                                     |
|             |                 | 3.74                                             | 9.19                                       | 1.56                                      |

$$\frac{\text{Wt. cassiterite concentrate}}{\text{Wt. magnetic fraction}} = \frac{1}{2.5}$$

|        |                   |       |       |       |
|--------|-------------------|-------|-------|-------|
| MRK 12 | 40'-44'6"         | 0.06  | 2.48  |       |
|        | 44'6"-50'         | 0.01  | 0.41  |       |
|        | 50'-55'           | 0.04  | 1.72  |       |
|        | 55'-57'6" (P)     | 0.03  | 0.12  |       |
|        | 59'6"-65' (P)     | 0.17  | 0.15  |       |
|        | 65'-70' (P)       | 0.05  | 0.07  |       |
|        | 70'-75' (P)       | tr.   | 0.03  |       |
|        | 75'-80' (P)       | tr.   | 0.07  |       |
|        | 80'-85'           | tr.   | 0.20  |       |
|        | 85'-89' (P)       | 0.03  | 0.83  |       |
|        | 89'-95' (P)       | 0.04  | 0.36  |       |
|        | 95'-100' (P)      | 0.01  | 0.19  |       |
|        | 100'-104'6"       | tr.   | 0.03  |       |
|        | 104'6"-110'       | tr.   | 0.14  |       |
|        | 110'-115'         | tr.   | 1.32  |       |
|        | 115'-120'         | 0.21  | 0.95  |       |
|        | 120'-125' (P)     | 0.04  | 0.06  |       |
|        | 125'-129'6" (P)   | 0.03  | 0.06  |       |
|        | 129'6"-135'8" (P) | tr.   | 0.01  |       |
|        | 135'8"-138' (P)   | tr.   | 0.04  |       |
|        |                   | <hr/> | <hr/> | <hr/> |
|        |                   | 0.72  | 9.24  | 2.98  |

$$\frac{\text{Wt. cassiterite concentrate}}{\text{Wt. magnetic fraction}} = \frac{1}{12.8}$$

APPENDIX II (Contd)

| <u>HOLE</u> | <u>INTERVAL</u> | <u>CASSITERITE</u><br><u>CONCENTRATE</u><br>(OZ) | <u>MAGNETIC</u><br><u>FRACTION</u><br>(OZ) | <u>"LIGHT"</u><br><u>FRACTION</u><br>(OZ) |
|-------------|-----------------|--------------------------------------------------|--------------------------------------------|-------------------------------------------|
| MRK 13      | 5'-26'          | 0.02                                             | 2.92                                       |                                           |
|             | 54' 3"-55'      | 0.01                                             | 0.27                                       |                                           |
|             | 55'-60' (P)     | 0.14                                             | 0.06                                       |                                           |
|             | 60'-65' (P)     | 0.07                                             | 0.09                                       |                                           |
|             | 65'-70' (P)     | 0.04                                             | 0.08                                       |                                           |
|             | 70'-75' (P)     | 0.01                                             | 0.04                                       |                                           |
|             | 84' 6"-100'     | 0.01                                             | 0.55                                       |                                           |
|             | 110'-115' (P)   | 0.03                                             | 0.59                                       |                                           |
|             | 115'-120' (P)   | 0.26                                             | 0.72                                       |                                           |
|             | 120'-125' (P)   | 0.11                                             | 0.43                                       |                                           |
|             | 125'-130' (P)   | 0.16                                             | 0.94                                       |                                           |
|             | 130'-135' (P)   | 0.22                                             | 0.62                                       |                                           |
|             | 135'-140' (P)   | 0.09                                             | 0.57                                       |                                           |
|             | 140'-146' 6"    | Nil                                              | 4.10                                       |                                           |
|             |                 | <hr/>                                            | <hr/>                                      | <hr/>                                     |
|             |                 | 1.17                                             | 11.98                                      | 8.41                                      |

$$\frac{\text{Wt. cassiterite concentrate}}{\text{Wt. Magnetic fraction}} = \frac{1}{10}$$

|        |                  |       |       |       |
|--------|------------------|-------|-------|-------|
| MRK 14 | 17'-20'          | tr.   | 0.23  |       |
|        | 20'-26'          | tr.   | 0.45  |       |
|        | 53'-54'          | tr.   | 0.09  |       |
|        | 64' 4"-70' (P)   | 0.10  | 1.61  |       |
|        | 70'-71' (P)      | 0.01  | 0.08  |       |
|        | 78' 4"-81' (P)   | tr.   | 0.12  |       |
|        | 81'-83' (P)      | tr.   | 0.13  |       |
|        | 86'-90' (P)      | tr.   | 0.04  |       |
|        | 90'-95' (P)      | 0.11  | 0.77  |       |
|        | 95'-100' (P)     | 0.09  | 0.29  |       |
|        | 100'-102' 8" (P) | 0.01  | 0.11  |       |
|        | 106' 8"-110' (P) | 0.01  | 5.25  |       |
|        | 110'-115' (P)    | 0.07  | 0.90  |       |
|        | 115'-120' (P)    | 0.12  | 0.65  |       |
|        | 120'-125'        | 0.05  | 0.69  |       |
|        | 125'-130'        | 0.07  | 0.23  |       |
|        | 130'-135'        | 0.29  | 1.25  |       |
|        | 135'-140' (P)    | 0.31  | 0.81  |       |
|        | 140'-143' 8" (P) | 0.20  | 0.80  |       |
|        | 143' 8"-150      | Nil   | 0.31  |       |
|        |                  | <hr/> | <hr/> | <hr/> |
|        |                  | 1.45  | 14.81 | 0.59  |

(including 0.01  
from traces)

$$\frac{\text{Wt. cassiterite concentrate}}{\text{Wt. magnetic fraction}} = \frac{1}{10}$$

APPENDIX II (Contd)

| <u>HOLE</u> | <u>INTERVAL</u> | <u>CASSITERITE</u><br><u>CONCENTRATE</u><br><u>(OZ)</u> | <u>MAGNETIC</u><br><u>FRACTION</u><br><u>(OZ)</u> | <u>"LIGHT"</u><br><u>FRACTION</u><br><u>(OZ)</u> |
|-------------|-----------------|---------------------------------------------------------|---------------------------------------------------|--------------------------------------------------|
| MRK15       | 0'-9'10"        | tr.                                                     | 0.20                                              |                                                  |
|             | (P4'-9'10")     |                                                         |                                                   |                                                  |
|             | 9'10"-11'6"(P)  | 0.01                                                    | 0.19                                              |                                                  |
|             | 28'-30'         | Nil                                                     | 0.18                                              |                                                  |
|             | 30'-35'         | Nil                                                     | 0.30                                              |                                                  |
|             | 43'-45'         | 0.02                                                    | 1.49                                              |                                                  |
|             | 45'-50'         | 0.05                                                    | 0.77                                              |                                                  |
|             | 50'-55'         | 0.09                                                    | 0.56                                              |                                                  |
|             | 55'-57'6"       | 0.23                                                    | 1.89                                              |                                                  |
|             | 65'1"-70'       | 0.31                                                    | 1.45                                              |                                                  |
|             | 70'-75'         | 0.30                                                    | 1.19                                              |                                                  |
|             | 76'-80'         | 0.06                                                    | 1.03                                              |                                                  |
|             | 80'-85'         | 0.12                                                    | 2.19                                              |                                                  |
|             | 85'-90'(P)      | 0.10                                                    | 0.91                                              |                                                  |
|             | 90'-95'(P)      | 0.06                                                    | 0.39                                              |                                                  |
|             | 95'-100'(P)     | 0.01                                                    | 0.35                                              |                                                  |
|             | 100'-105'       | 0.01                                                    | 0.09                                              |                                                  |
|             | 105'-110'       | 0.01                                                    | 0.30                                              |                                                  |
|             | 110'-115'       | 0.49                                                    | 1.46                                              |                                                  |
|             | 115'-120'       | 0.49                                                    | 1.51                                              |                                                  |
|             | 120'-125'       | 0.32                                                    | 0.58                                              |                                                  |
|             | 125'-130'       | 0.43                                                    | 0.62                                              |                                                  |
|             | 130'-135'(P)    | 0.02                                                    | 0.08                                              |                                                  |
|             | 135'-140'       | tr.                                                     | 0.09                                              |                                                  |
|             |                 | <hr/>                                                   | <hr/>                                             | <hr/>                                            |
|             |                 | 3.13                                                    | 17.82                                             | 3.08                                             |

$$\frac{\text{Wt. cassiterite concentrate}}{\text{Wt. magnetic fraction}} = \frac{1}{5.7}$$

### APPENDIX III

#### DESCRIPTION OF GRAVITY TRAVERSE LOCATIONS

- Traverse "A" Zero on crest of ridge south of Mulligan Highway, bearing  $33^{\circ}$  M; centre line of Mulligan Highway at 1180 ft; into swamp at 9480 ft, where traverse transposed 700 ft north-west and parallel. Transposed traverse 9000 ft to 10,900 ft. Trafficable for vehicles.
- Traverse "B" Zero on small outcrop south of Mulligan Highway, bearing  $33^{\circ}$  M; centre line of Mulligan Hwy at 2575 ft, 8060 ft, and 8970 ft. Total length 9600 ft. Trafficable for vehicles.
- Traverse "C" Zero north of Mulligan Highway on prominent ridge, bearing  $125^{\circ}$  M; centre line of Mulligan Highway at 45 ft. Cuts Scrubby Creek at 160-220 ft, and Beasley Creek at 2900 ft. Total length 5400 ft. Untrafficable for vehicles.
- Traverse "D" Zero at foot of ridge, near gravel pit on south side of Mulligan Highway, bearing  $336^{\circ}$  M. Centre line of Mulligan Highway at 454 ft; crosses small creek at 2200 ft - trafficable to this point. Total length 2400 ft.
- Traverse "E" Zero on small outcrop north of Mulligan Highway, bearing  $180^{\circ}$  M. Centre line of Mulligan Highway at 118 ft; crosses small gully at 1350 ft; not trafficable beyond this point. Crosses Scrubby Creek at 2780 ft. Total length 5700 ft.
- Traverse "F" Zero south of Mulligan Highway, bearing  $33^{\circ}$  M. Centre line of Mulligan Highway at 490 ft. Total length 11,000 ft. Trafficable except where swampy.
- Traverse "G" Zero at foot of Black Mountain, bearing  $207^{\circ}$  M. Centre line of Shiptons Flat road at 1630 ft. Total length 5900 ft; ends about 30 ft east of Annan River on top of high bank. Not trafficable.
- Traverse "H" Zero on ridge south of old Cooktown road about  $\frac{1}{2}$  mile west of Scrubby Creek crossing, bearing  $30^{\circ}$  M. Crosses old road at 780 ft, Scrubby Creek at 1580 ft, and Beasley Creek at 6790 ft. Total length 10,200 ft; trafficable to 6700 ft.
- Traverse "I" Zero south of old Cooktown road on ridge on south side of narrow gap, bearing  $16^{\circ}$  M. Crosses old road at 70 ft, fence at 130 ft. Total length 1500 ft. Trafficable except for fence.
- Traverse "K" Zero south of road to Big Tableland, 1.2 miles from Shiptons Flat road, bearing  $25^{\circ}$  M. Total length 6100 ft. Untrafficable.
- Traverse "L" Zero 295 ft north of Big Tableland road, 1.8 miles from Shiptons Flat road, bearing  $25^{\circ}$  M. Total length 6300 ft. Untrafficable.

APPENDIX III (Ctd)

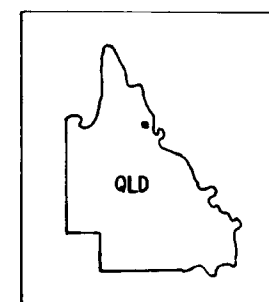
- Traverse "M" Zero north of Mulligan Highway, bearing  $174^{\circ}$ M. Crosses Scrubby Creek at 4300 ft. Total length 5500 ft. Untrafficable.
- Traverse "N" Zero south of Mulligan Highway near western approach to the Annan River bridge, bearing  $181^{\circ}$ M. Crosses Scrubby Creek at 200-300 ft. Total length 4800 ft. A crossing was bulldozed across Scrubby Creek in this vicinity to get the drill to sites MRK 11, 12, 13, 14, and 15, but it was undoubtedly washed out in the 62/63 monsoon.
- Traverse "P" Zero on fence on east side of Shiptons Flat road, 1000 ft north of Big Tableland road turn-off. Bearing  $36^{\circ}$ M. Total length 5300 ft. Trafficable.
- Traverse "Q" Zero at Zero for Traverse "P", bearing  $188^{\circ}$ M. Total length 1600 ft. Trafficable.

145°00'

PLATE. 1.

## LOCALITY PLAN

## KINGS PLAINS AREA

ENDEAVOUR  B.M.R. Prospecting Reserve

N

LAURA

COOKTOWN

15°30'

15°30'

BASIN

SOUTH PACIFIC OCEAN

HIGHWAY

Gorge (capture point)

ANNAN

RIVER

TINFIELD

SCALE

4 0 4 8 MILES

BLOOMFIELD R

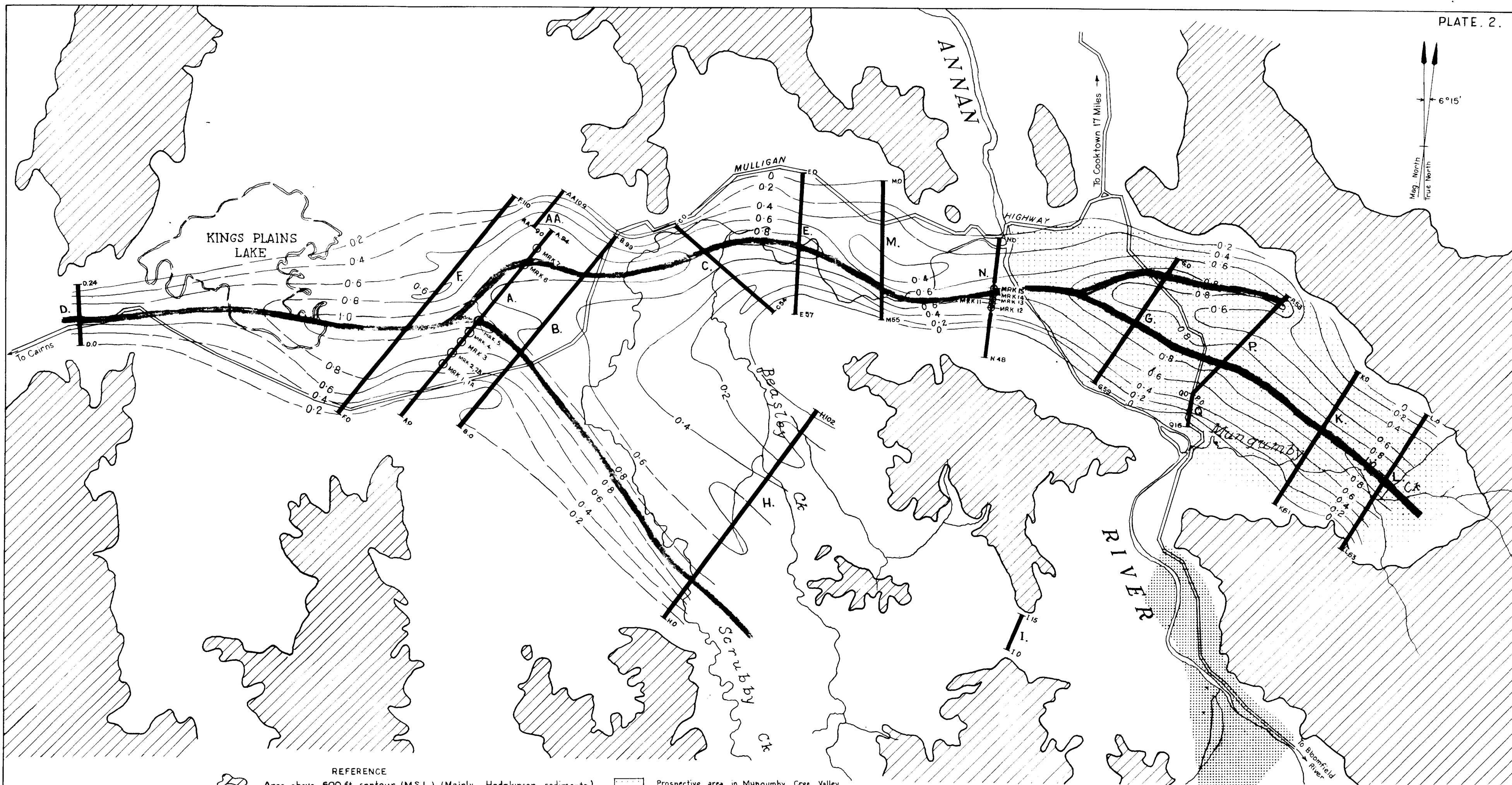
16°00'

145°30'

145°00'

To Laura 40 Miles

To Cairns 150 Miles



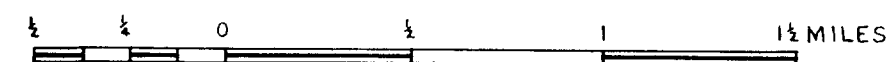
- REFERENCE
- Area above 600 ft contour (M.S.L.) (Mainly Hodgkinson sediments)
  - B.M.R. boreholes
  - Trend of gravity lows (probable course of deep lead)
  - Gravity traverse (E.O. start, E 57. finish)
  - Road
  - Gravity contour - contour interval 0.2 milligal (Elevation correction for density 2.2)
  - Prospective area in Mungumby Cree Valley
  - Area test-bored by B.H.P. in 1937.

# KINGS PLAINS-MUNGUMBY CREEK AREA.

NORTH QUEENSLAND

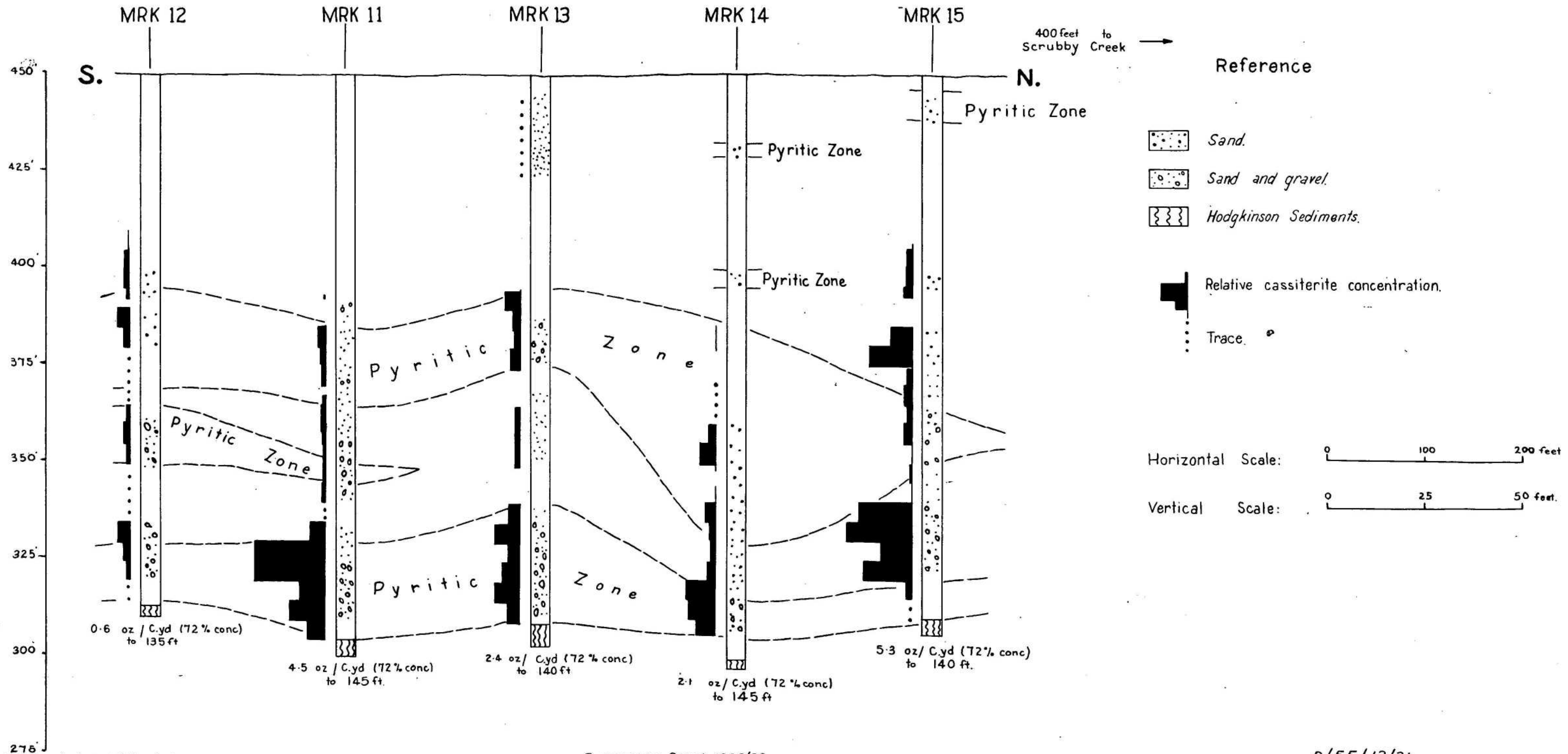
(after plan supplied by Geophysical Branch, B.M.R.)

SCALE



D/55/13/20

# GRAPHIC SECTION, TRAVERSE "N," KINGS PLAINS PROSPECT



# KINGS PLAINS GRAVITY PROFILES

Traverses A & B May 1962 J.T.H.  
with latitude corrections

STATION INTERVAL = 100 ft

Gravity Units =  $\gamma$  (0.01) mgal

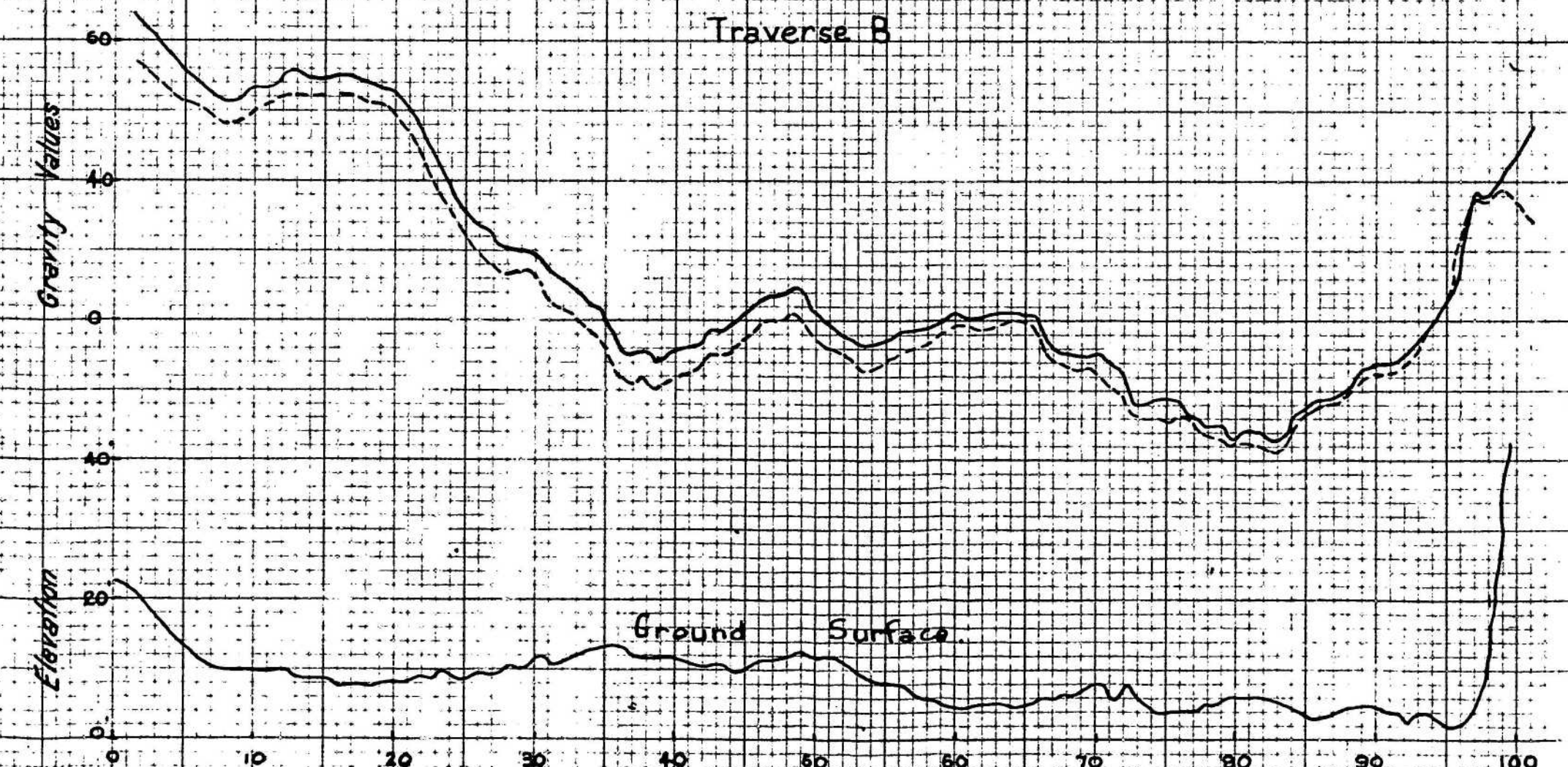
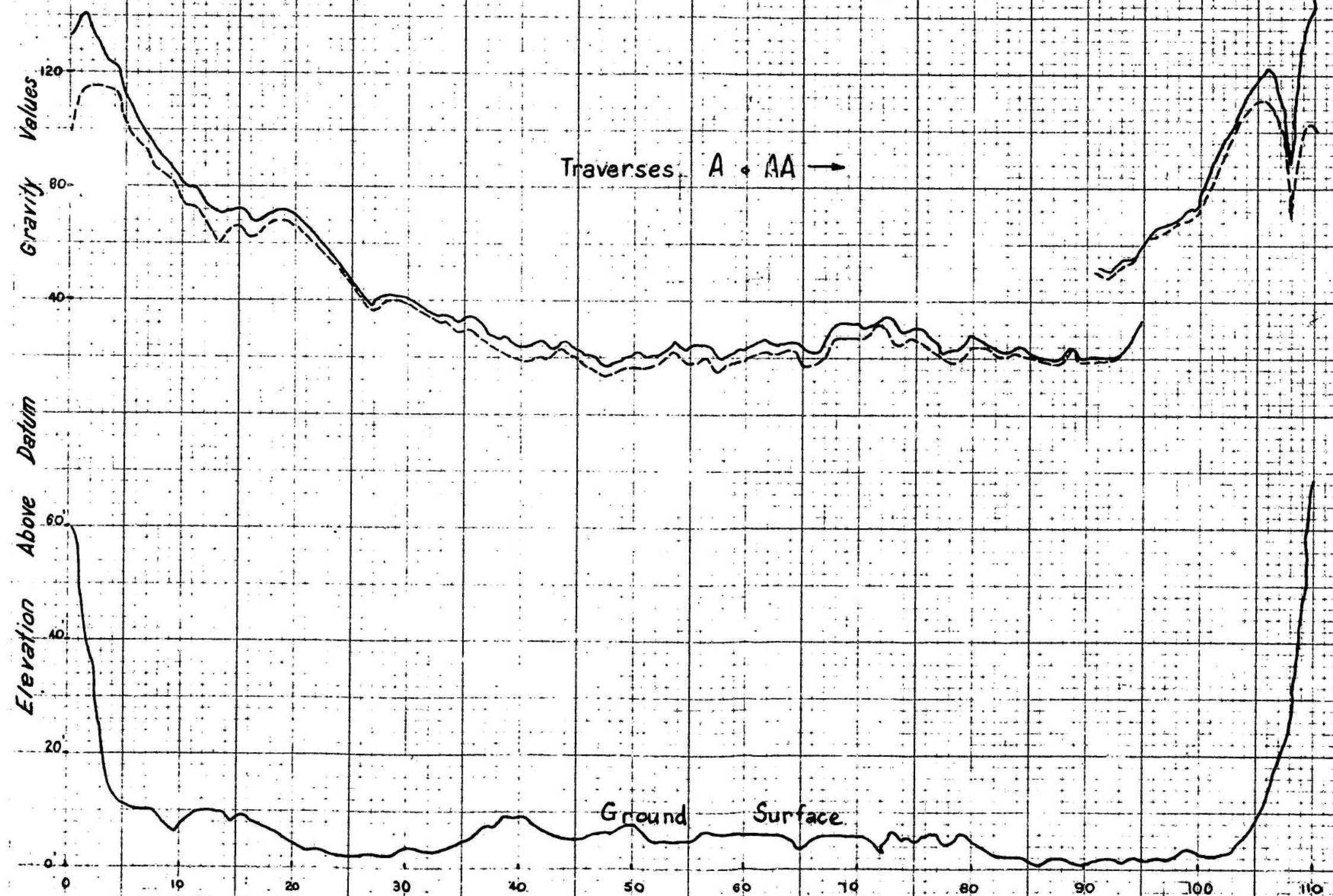
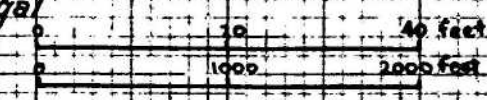
Vertical Scale

Horizontal Scale

— 2.2 g/cc density

- - - 2.7 g/cc density

(Profiles prepared by Geophysical Branch, B.M.R.)



# KINGS PLAINS GRAVITY PROFILES

Plate 5

Traverses C-E May 1962 J.J.H.  
with latitude corrections

STATION INTERVAL: 100 ft.

Gravity Units: In (0.01) mgal

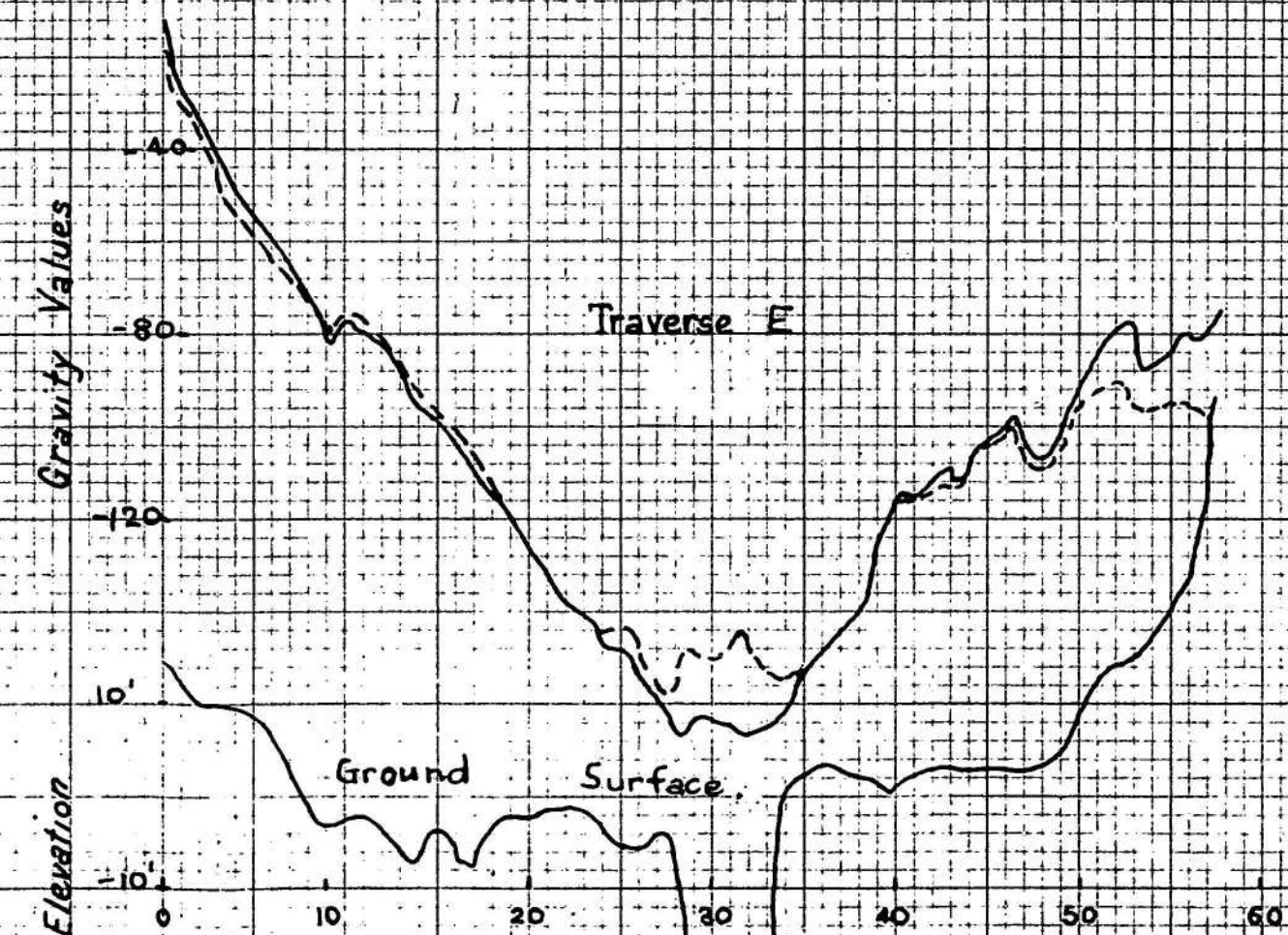
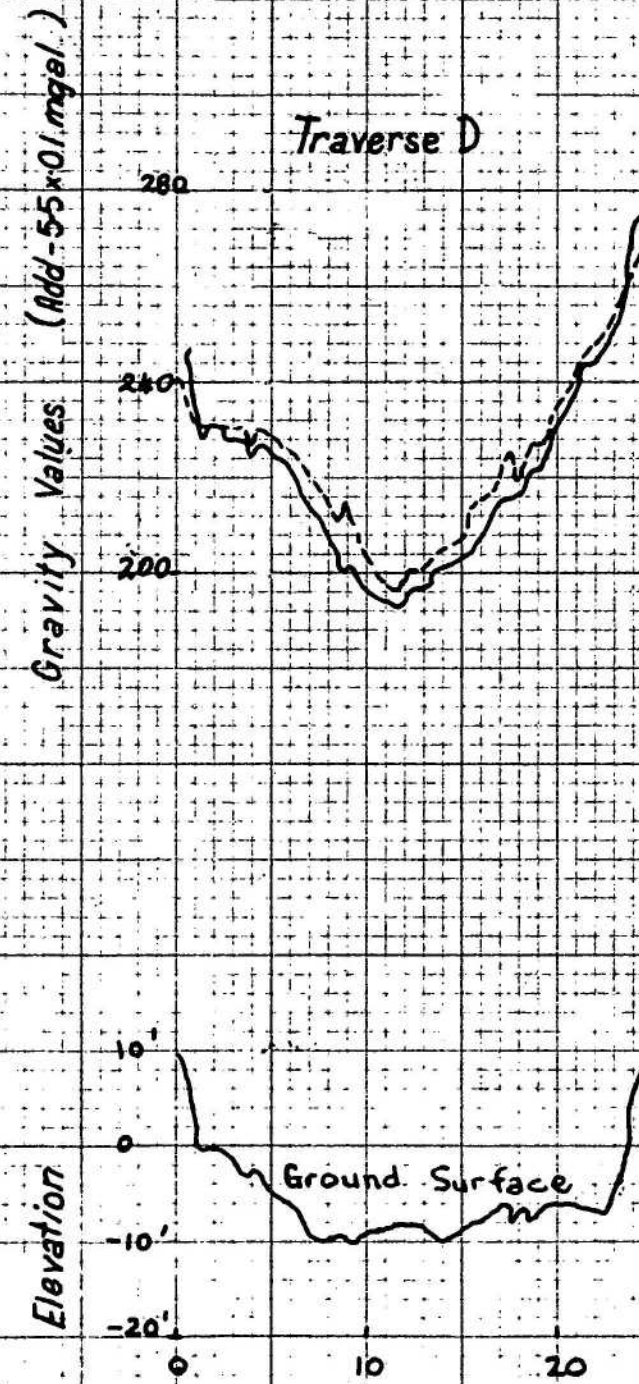
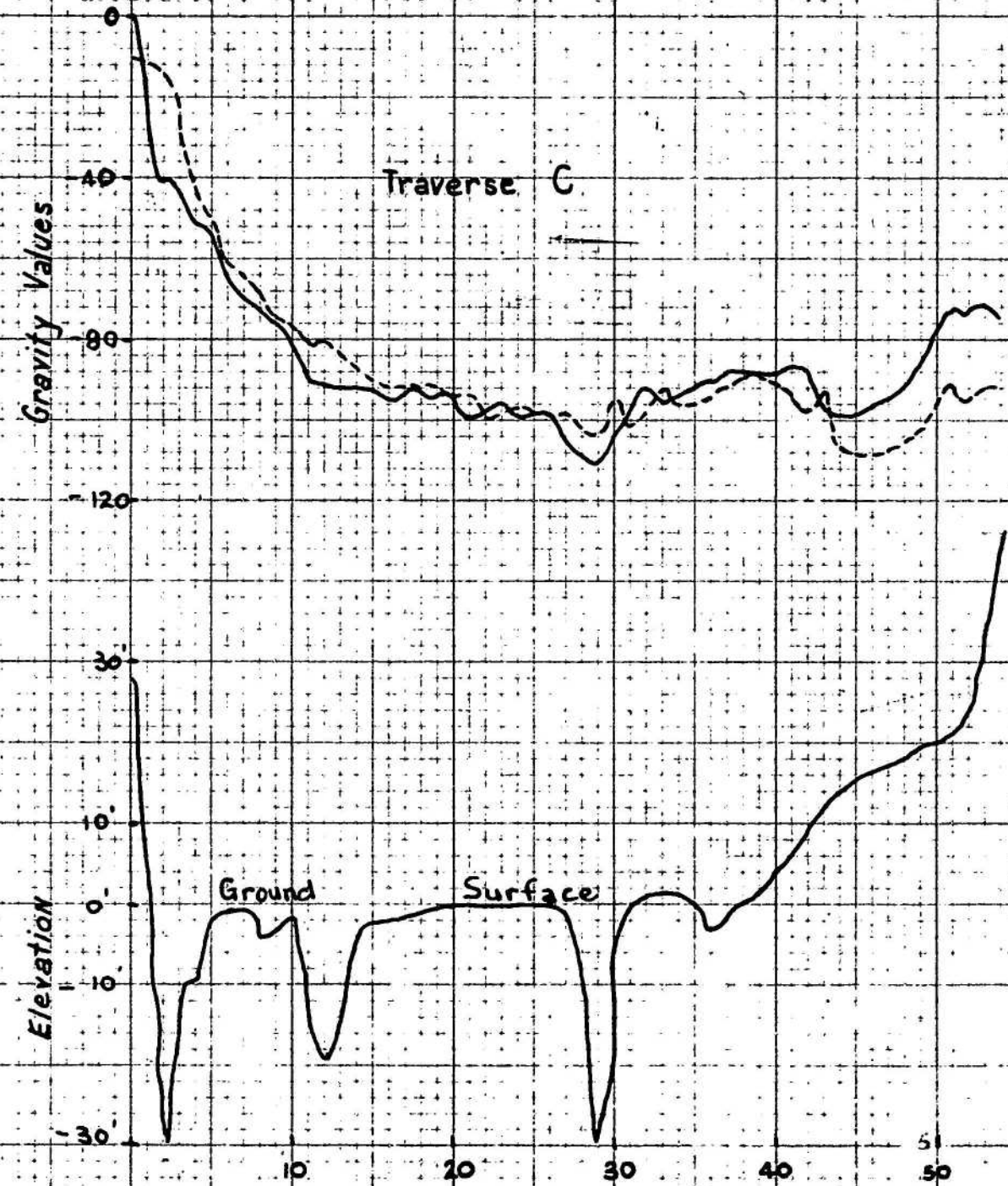
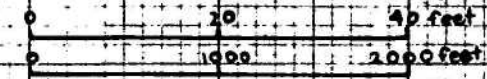
Vertical Scale:

Horizontal Scale:

— 2.2 g/cc density

— 2.7 g/cc density

(Profiles prepared by Geophysical Branch, B.M.R.)



# KINGS PLAINS GRAVITY PROFILES

Traverses F+G May 1902 J. J. H.

with latitude corrections

STATION INTERVAL = 100 ft

Gravity Units In (0.01) mgal.

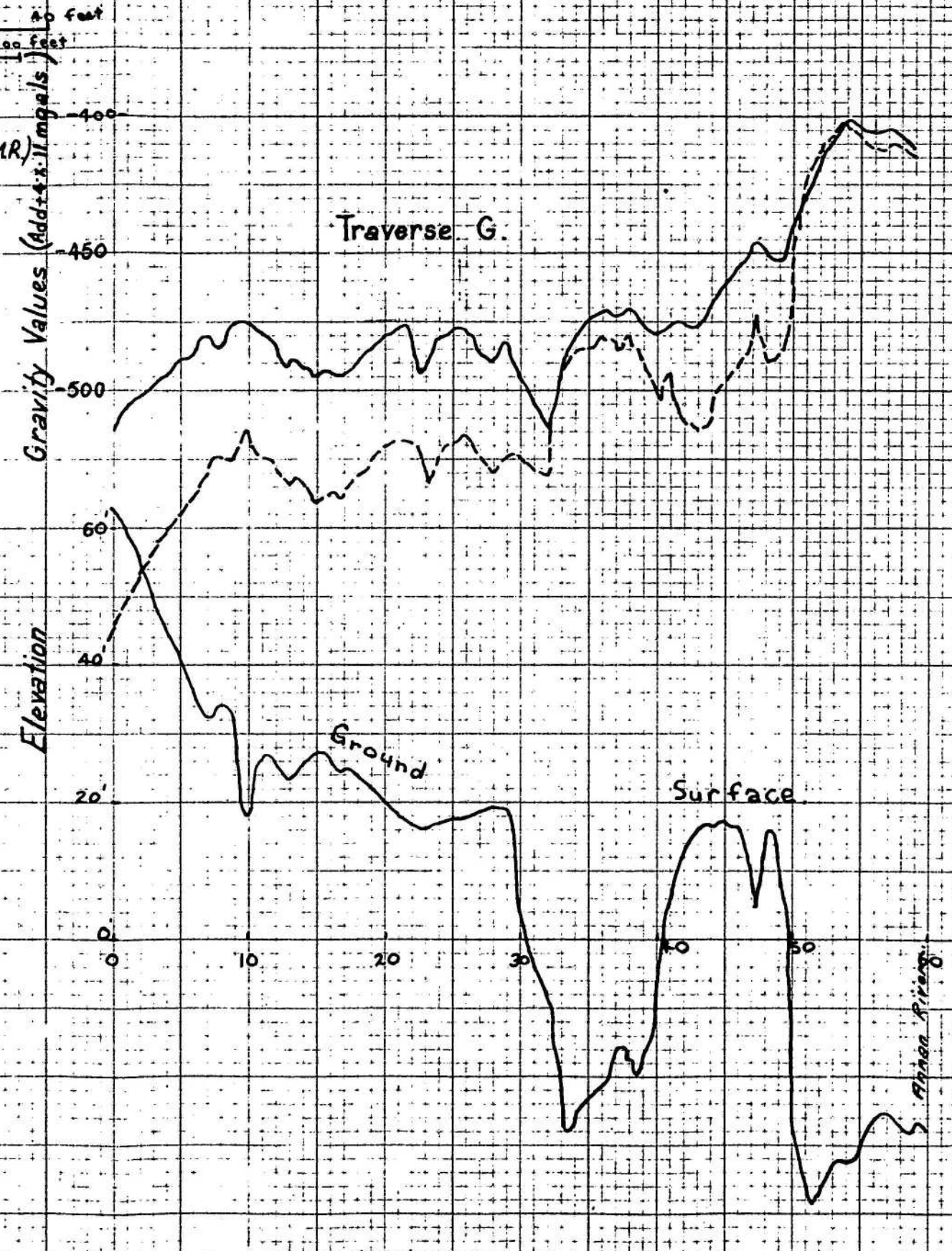
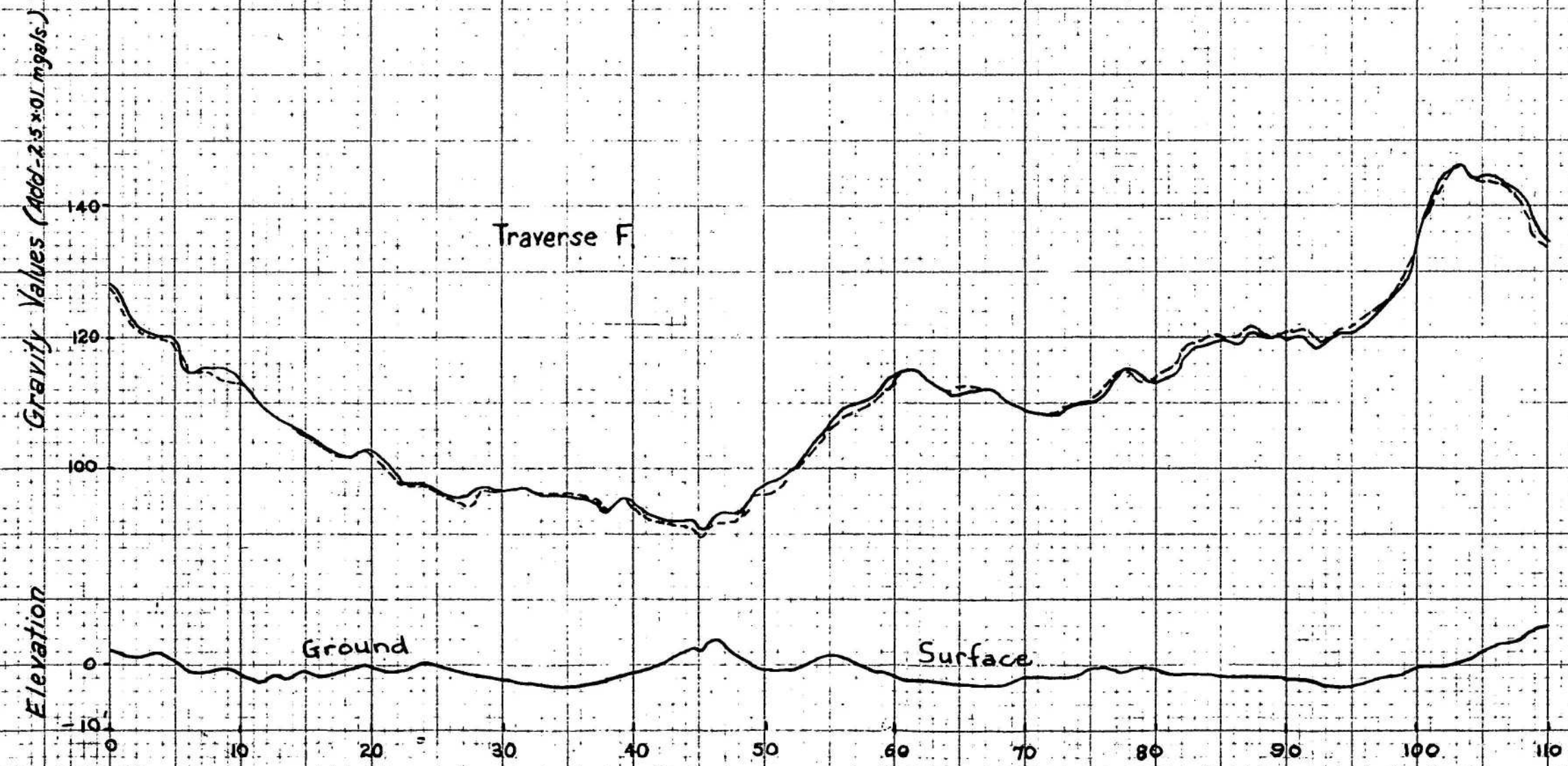
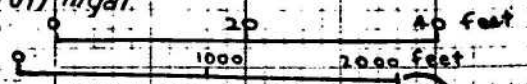
Vertical Scale

Horizontal Scale

— 2.2 g/cc density

- - - 2.7 g/cc density

(Profiles prepared by Geophysical Branch, BMR)



# KINGS PLAINS GRAVITY PROFILES

Plate 7.

Traverses H, I & K May 1962 T.J.H.  
with latitude corrections

STATION INTERVAL 100 ft.

Gravity Units in (0.01) mgal

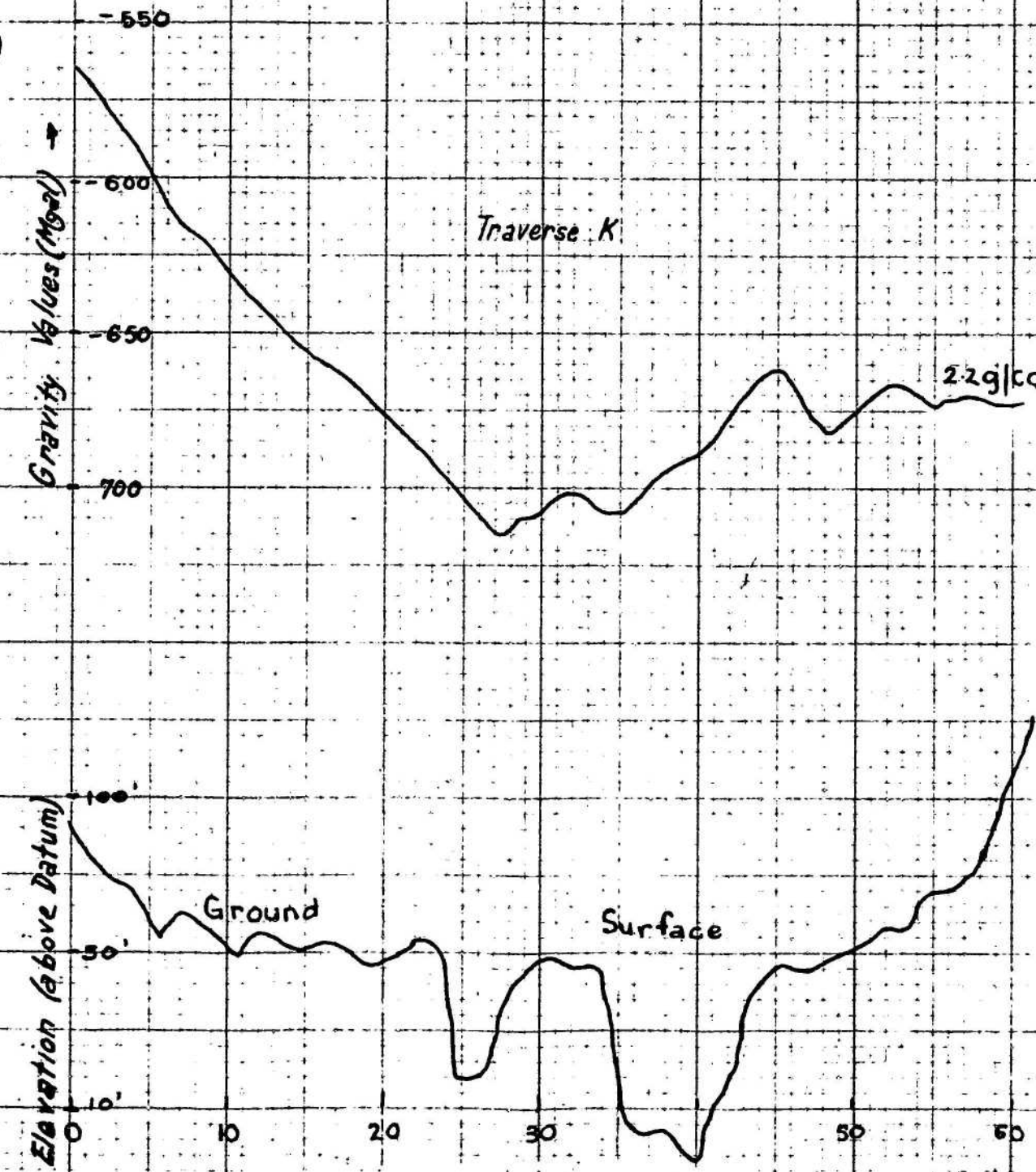
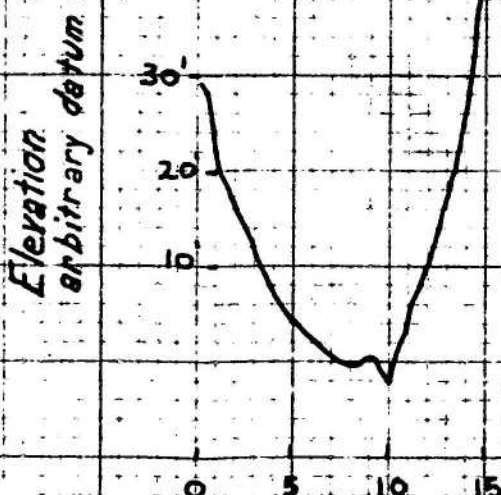
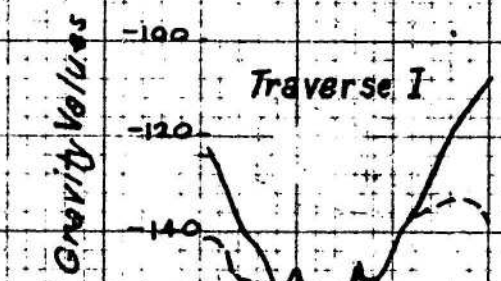
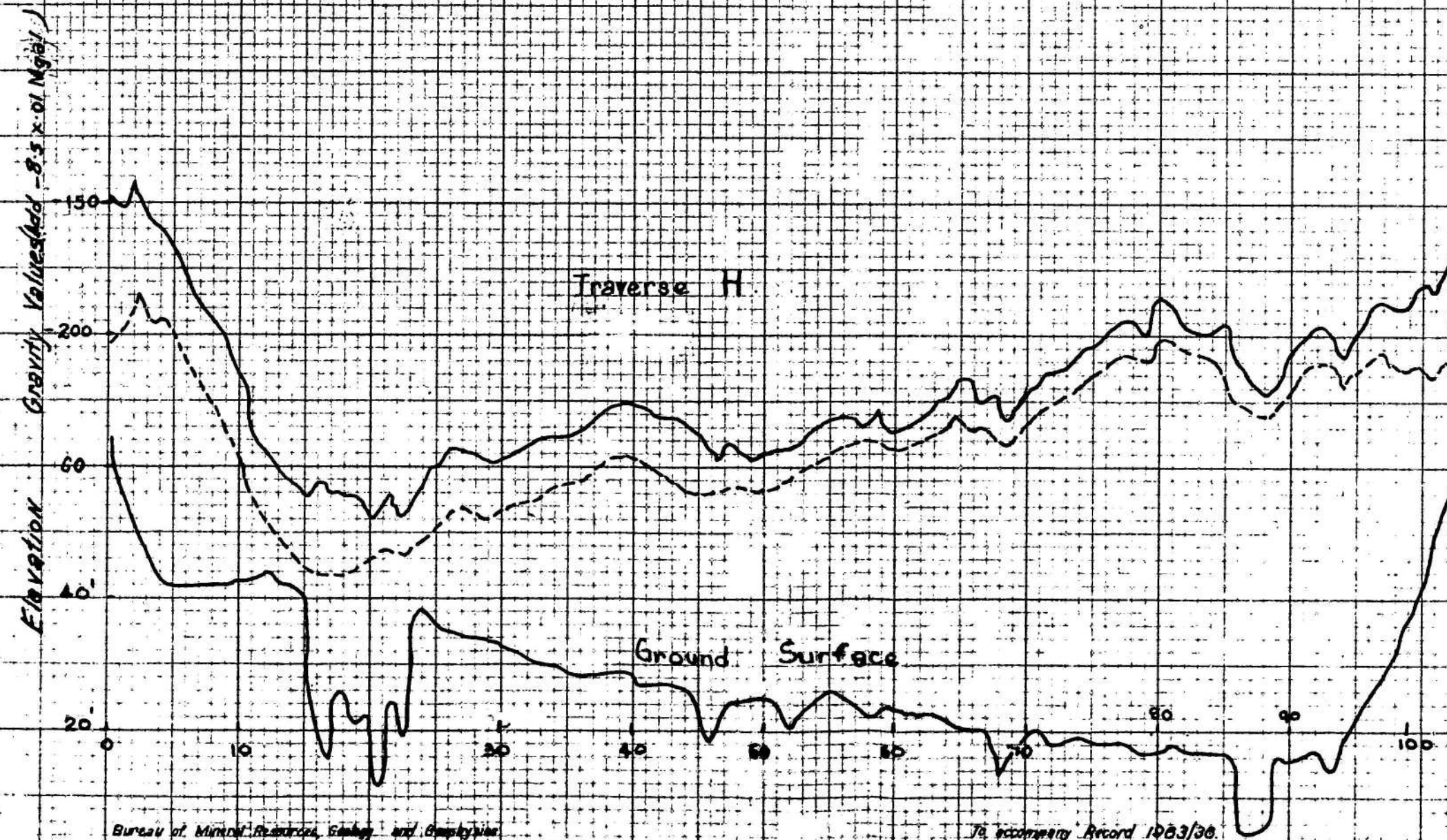
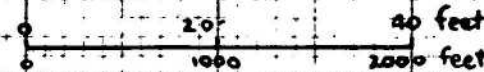
Vertical Scale

Horizontal Scale

— 2.2 g/cc density

- - - 2.7 g/cc density

(Profiles prepared by Geophysical Branch, BMR)



# KINGS PLAINS GRAVITY PROFILES

Traverses L, M + N May 1962 J.J.H.

with latitude corrections

STATION INTERVAL : 100ft

Gravity Units =  $1 \text{ m (0.01) mgal}$

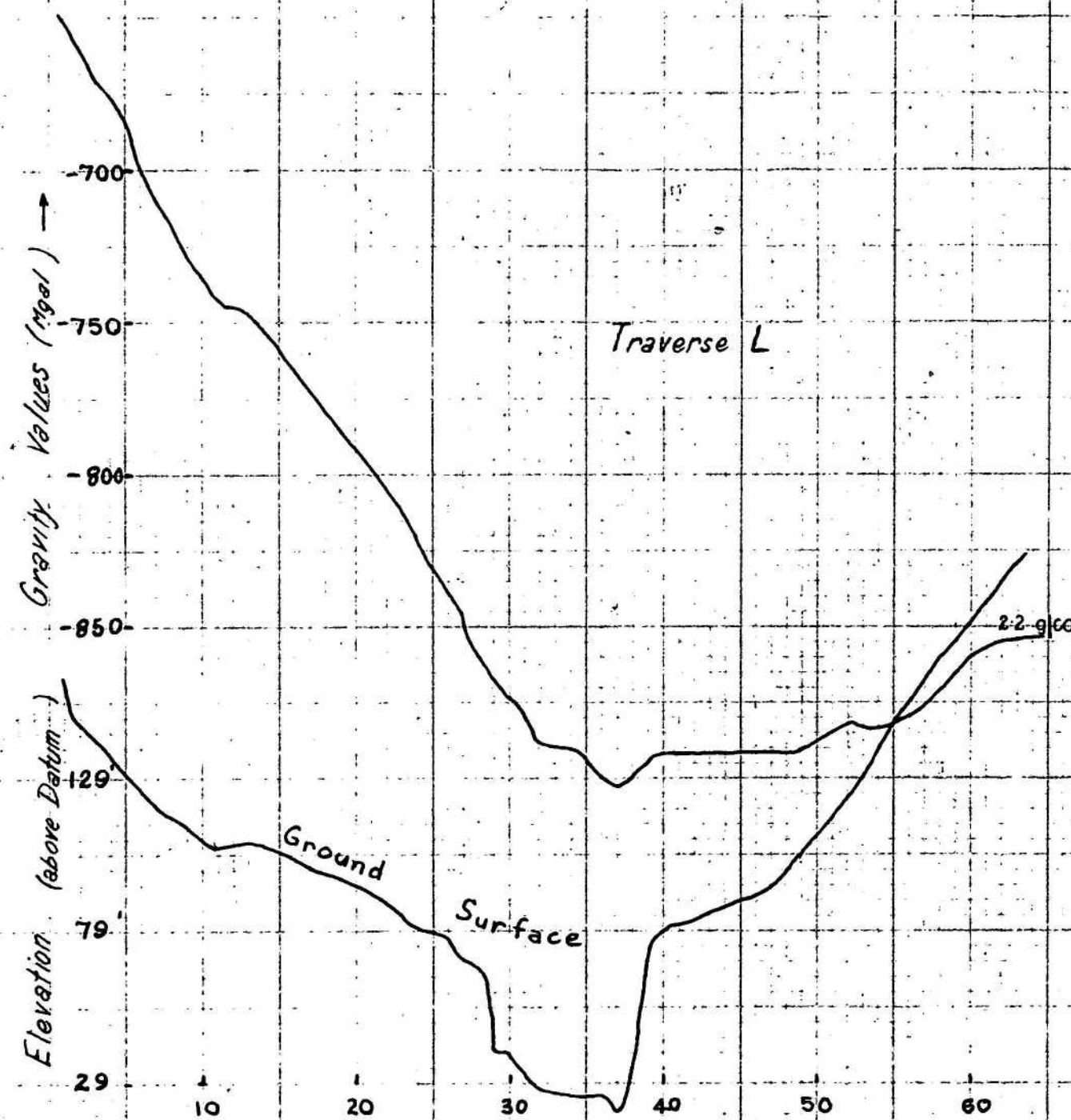
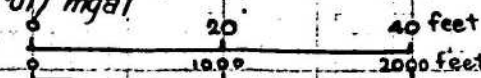
Vertical Scale

Horizontal Scale

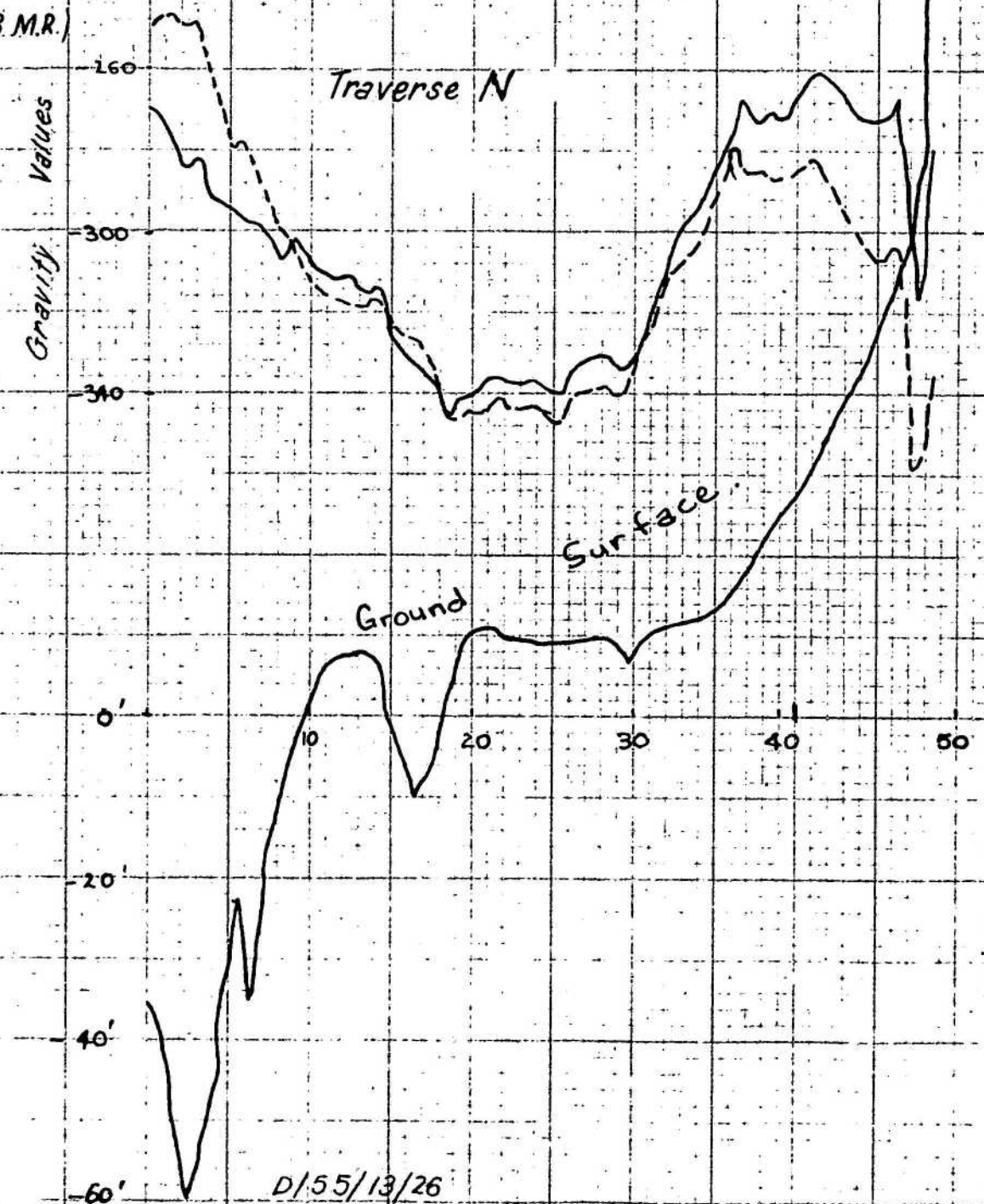
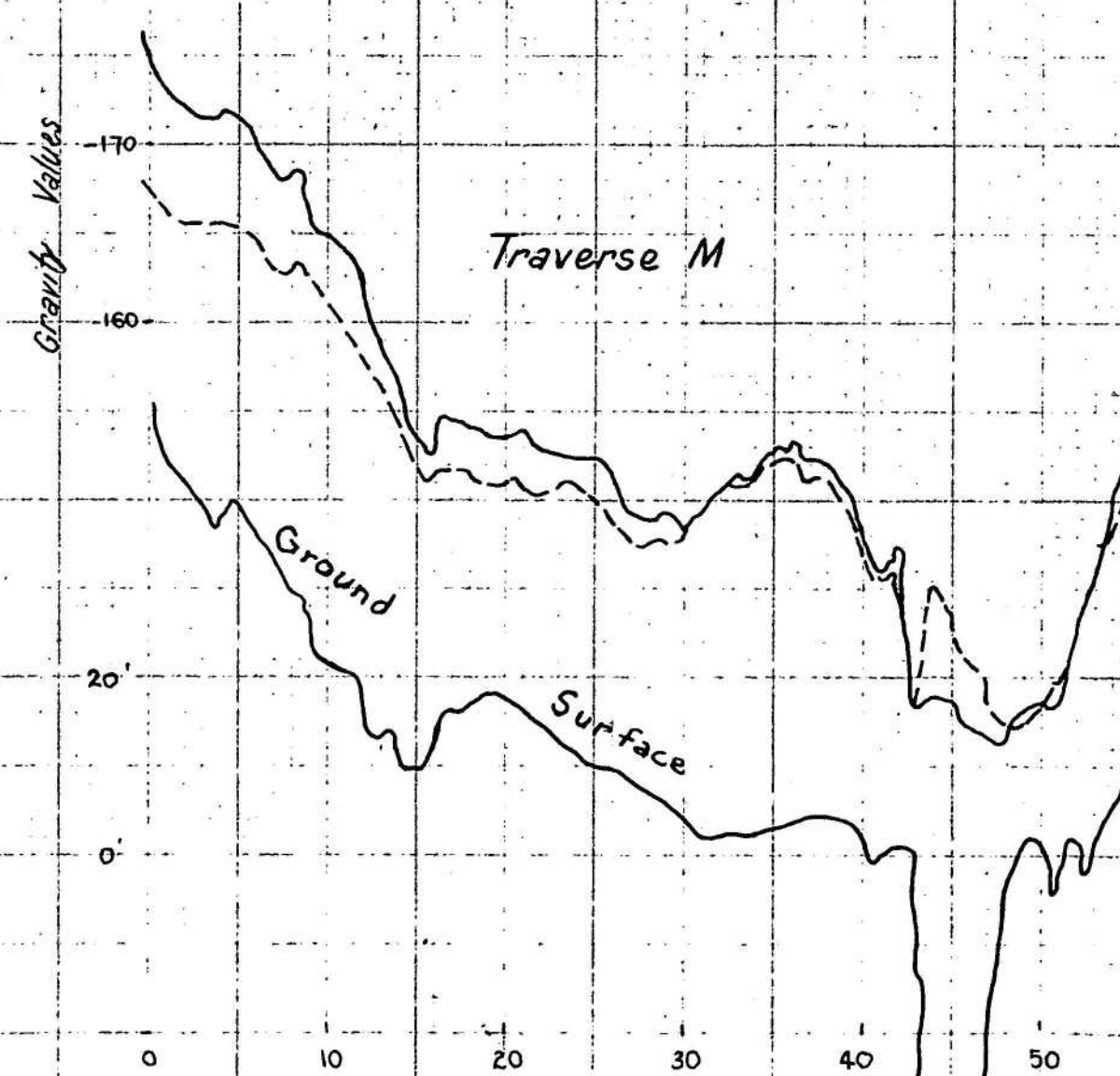
— 2.2 g/cc density

- - - 2.7 g/cc density

(Profiles prepared by Geophysical Branch, B.M.R.)



Subtract 2.5 from all values.



# KINGS PLAINS GRAVITY PROFILES

Traverses Q & P May 1962  
with latitude corrections

J.J.H.

Plate 9

STATION INTERVAL 100ft

Gravity Units in (0.01) mgal

Vertical Scale

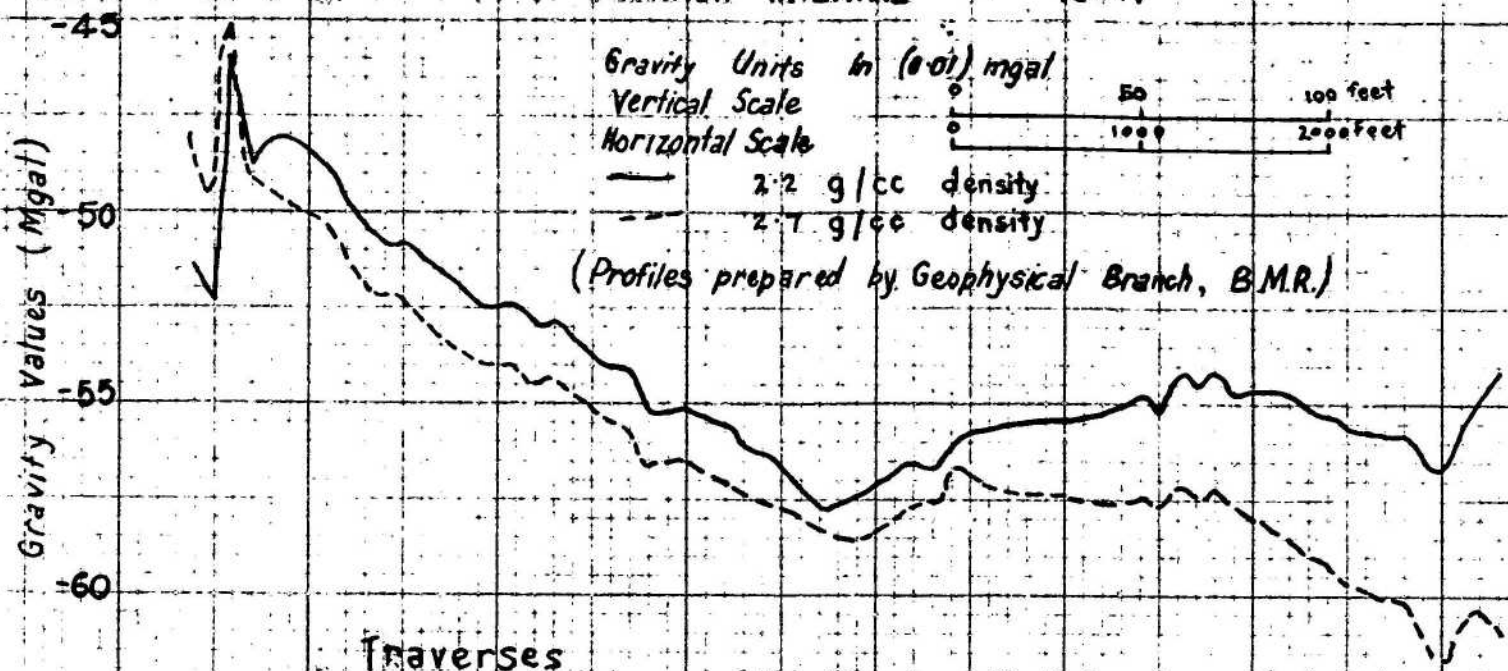
Horizontal Scale



— 2.2 g/cc density

- - - 2.7 g/cc density

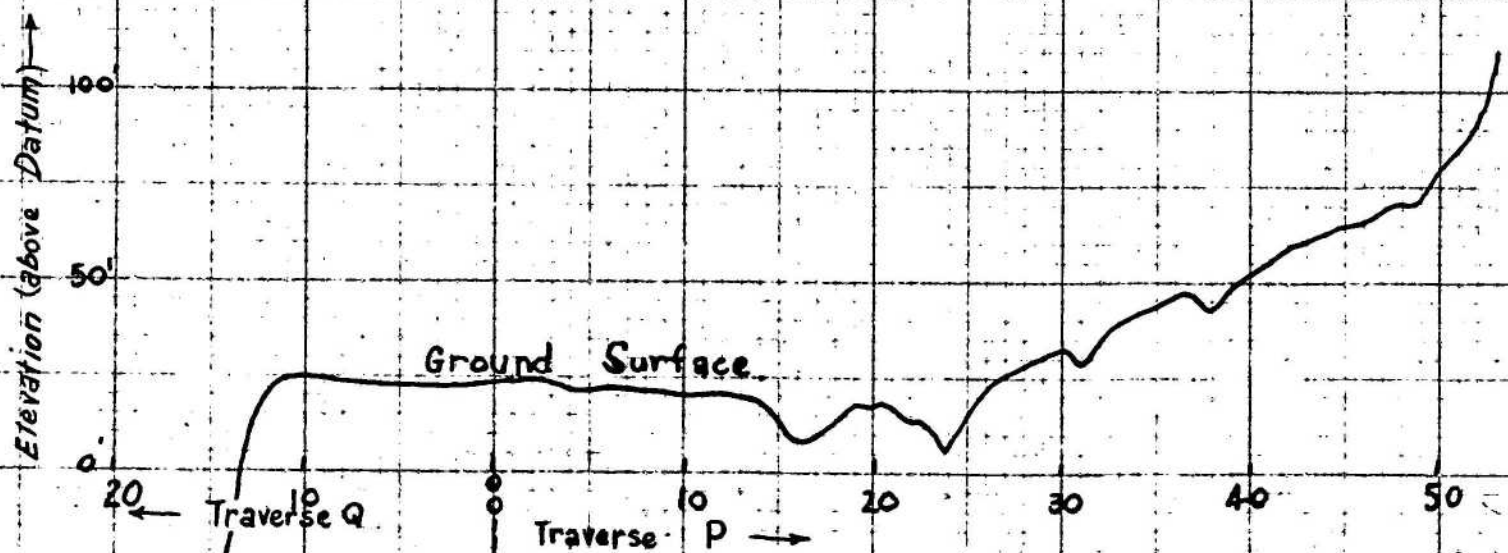
(Profiles prepared by Geophysical Branch, B.M.R.)



Traverses

Q

P



Ground Surface