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OPERATION

PRAIRIE FLAT

PROJECT OFFICERS REPORT—PROJECT LN 3.01
(and associated Canadian Programme H)

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PROJECT OFFICERS REPORT — PROJECT LN 3.01
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CRATER AND EJECTA STUDY (U)

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Project Officer

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ABSTRACT

This report gives the full details of the experimental procedures used and the data obtained during the study of the crater produced by the detonation of 500 tons of TNT in a spherical configuration tangential to the surface of undisturbed lacustrine sands and silts. The overall programme associated with this detonation has been nicknamed PRAIRIE FLAT.

It is shown that all the data obtained from a variety of nominally independent projects are internally consistent, and also exhibit a marked consistency with data obtained in earlier trials. It is shown that the ejecta blanket consists of a coherently overturned flap of the upper few feet of sediment, combined with thrust blocks on the inside of the hinge region of this flap. In addition, it is shown that there is a general tendency towards downwarping of the strata under the rim, despite occasional local upthrusts. The crater exhibits a symmetrical pattern of ring folding, and circumferential cracks both inside and outside the main crater. The central regions of the crater have not been excavated, due to the continued presence of water and wet sedimentary deposits brought in by the water. Comments are made upon long range fallout of tagged particles and on the relatively close range fallout of spheroids composed of fused sands and silts. Full data are provided on the movement of marked elements of the

ground, by the modified sand column technique and by an extension of this technique to provide greater numbers of markers. Detailed topographic survey data are presented in tabular and graphical form.

The overall morphology is compared with several other craters, notably to the 1961 crater produced by a 100-ton detonation. It is shown that there is precise agreement in all major facets of the morphology.

PREFACE

The format used in this report is basically that of the Short Form described in DASA-26. The authors feel this is more appropriate than a subdivision by chapters, owing to the interrelationship of the various sets of data provided. Though each data set is independent, the experimental procedure was such that all the sets were obtained during the same period of excavation. It has therefore appeared more logical to subdivide the report into a pre- and post-shot phase, and a discussion phase. In each phase, the development of understanding of the overall phenomenology is presented according to the proper chronology. This is an apt system for any report where the "conclusions" tend to be inherent in the data, rather than derived from some second-stage analysis of the data.

The text shows clearly that the particular project reported, LN 3.01, Crater and Ejecta Study on PRAIRIE FLAT, was completely integrated with many other allied programmes. Cooperation among all the agencies involved was excellent, and special mention is made of Project LN 3.03 (Dr. Roddy), USGS, and of Dr. Dence, Dominion Observatory. Throughout the field phase continuous consultations were held among the authors and Dr. Dence and Dr. Roddy. Only in this way could we arrive at an agreed interpretation of the field data, reduce our preconceptions, and come to a close understanding of the detailed morphology of this complex crater.

In addition, it is remarked that equally close and cordial arrangements were necessary with several other U.S. agencies, not directly concerned in crater studies but involving subsurface installations in the area to be studied by excavation. In some cases, the Suffield Group supervised drilling operations for these installations, and in others the timing of installation and excavation was agreed among the various agencies. Specifically, close coordination was achieved with Stanford Research Institute, Waterways Experiment Station, and the Ballistic Research Laboratory. The Bell Telephone Laboratory provided funds for one of the experiments carried out in association with Project LN 3.01.

The Project Officer, Dr. G.H.S. Jones, wishes to emphasise that the whole of the field work was planned and supervised by Mr. C.H.H. Diehl, with only nominal control by the Project Officer.

CONTENTS

INTRODUCTION

U.S. Project LN 3.01 and the Canadian Programme H on Operation PRAIRIE FLAT form a fully integrated programme of crater study sponsored jointly by the Canadian and U.S. Governments, and further supported by independently funded agencies. The programme was carried out by the Crater Study Group of the Geophysics and Structures Section, Defence Research Establishment Suffield, Canada. This Final Report gives full details of all the field programmes, and of the data obtained in the posttrial phase of the operation. Where it has appeared to be suitable, interpretative comments have been interspersed throughout the report, and there are several detailed discussions of the data. However, the enormous scope precludes any possibility of a single Final Report containing all the possible interpretations of and deductions from the data. It has appeared to the authors to be of prime importance to present all the data in full, even where interpretation has to be limited or even deferred entirely. It is further stressed that additional field studies of this crater are possible. Specifically, the crater excavation carried out so far has been limited entirely to one sector (120°) of the crater, and further restricted to the area beyond the crater wall. It is intended that the excavation of the centre of the crater will be completed by the Canadian team as soon as the central regions become sufficiently dry for working. Hopefully, this will be in the summer of 1969. No other programme exists for additional studies by excavation, but the crater is to be preserved indefinitely so that additional work can be carried out if required.

Attention is drawn to U.S. Project LN 3.03, which was carried out in close association with the work reported herein. Project LN 3.03 was to some extent dependent upon the excavation carried out under 3.01, but the mission of 3.03 was specifically related to photogeological studies with advantage being taken of a crater of known provenance (and subject to excavation) to investigate the credibility of deductions made from aerial photographs according to the standard practices of the U.S.G.S. Branch of Astrogeology.

PRETRIAL PHASE OF OPERATION PRAIRIE FLAT

DETAILS OF CHARGE AND DETONATION

The charge consisted of 31,676 blocks of TNT of various sizes, mainly 12 by 12 by 4 inches, built into a spherical configuration tangential to and above the surface of the undisturbed prairie on the Watching Hill test site of the Defence Research Establishment Suffield, Alberta, Canada. The total charge weight was 498.3 ± 1 short tons, and initiation was by one of two X128 detonators set into the booster charge of CE/TNT 70/30 at the approximate centre point of the sphere. This charge was supported by a structure of styrofoam ring sections and blocks, resulting in a combined stack in the form of a hemisphere supported on a cylinder, the composite stack resting on a plywood base. Fig.1 is a photograph of the completed stack just before detonation.

Detonation of the charge occurred at 78 ± 1 msec after 1800 hours UT2 on 9 August 1968, the flame front reaching the surface of the charge 670 ± 10 msec after detonation zero.

PRESHOT STRATIGRAPHY AND TOPOGRAPHY

The Ground Zero for the PRAIRIE FLAT detonation was on the Watching Hill test site, on previously undisturbed ground but in the close vicinity of areas used for previous trials, notably the

SNOWBALL shot of 500 tons in 1964 and the DISTANT PLAIN 6 shot of 100 tons in 1967. In many ways the PRAIRIE FLAT shot was intermediate to the SNOWBALL and DISTANT PLAIN 6 shot, being situated roughly midway between the two earlier GZ's, and also being intermediate in charge configuration. SNOWBALL was a 500-ton hemisphere on the surface, while DISTANT PLAIN 6 was of the same spherical configuration as PRAIRIE FLAT but only 100 tons in weight.

Fig.2 is a grid plot of the elevations measured preshot, on a 400 ft square grid centred on GZ. It will be observed that the ground was sensibly flat, only varying a maximum of one foot over this area.

Fig.3 is a plot of two exploratory holes drilled as part of a preliminary soil test programme for DISTANT PLAIN 6 and PRAIRIE FLAT. These are abstracted from a report (Diehl and Jones, 1966) which gives similar information for a variety of other boreholes in the same general area. The stratigraphic pattern observed in all these boreholes was essentially coherent, and no evidence was observed of any marked stratigraphic change over the area. Owing to the very fine interleaving of strata, however, it was found to be quite difficult to identify minor strata consistently from borehole data.

One deep hole, to the effective bedrock, was sunk at the GZ of PRAIRIE FLAT. In this hole continuous sampling through the drill stem was undertaken, and the resulting log is shown in Fig.4. This was the best preshot information available, and subsequent to the detonation it was found that correlation of the upper few tens of feet exposed by excavation with this log was satisfactory.

In addition to the above information, some data were obtained on vane shear tests and on densities from a variety of minor boreholes in the area. These data are summarised in Tables 1 and 2. Attention is drawn to Diehl, Pinnell, and Jones (1968), who though dealing specifically with DISTANT PLAIN 6 gives information which is in part relevant to PRAIRIE FLAT. The same comment applies to Jackson and Windham (1967) who gives additional information on soil properties.

In the years before PRAIRIE FLAT, some seismological data were obtained in the general area of the test site. Much of this is summarised in Jones (1963), but the salient points are given below.

The seismic velocity stratification obtained along C1-C38, Fig.5, a refraction and velocity profile running almost exactly through the GZ of PRAIRIE FLAT (near C2), is shown in Figs.6, 7, and 8. Discussion of these profiles is included in Jones (1963), but the dominant characteristics are evident from the Figures.

We may best describe the PRAIRIE FLAT test site as being composed of lacustrine deposits and Glacial Till, overlying a softly indurated bedrock at an approximate depth of 220 ft below the surface. More specifically, it appears that the test site is within the confines of the preglacial Milk River Channel, in an area which for lengthy periods contained a large Pleistocene Lake, now known as Lake Medicine Hat. A succession of Tills and Lake deposits has been identified in this system, the most recent description available being by Berg (1968), who states that the buried valley is a continuation of Geiger's (1965) "Lethbridge Valley." Berg's detailed survey is from another section of the valley, in the southern confines of the Suffield range, but shows only minor changes in overall lithology. Bedrock is presumed to be of the Foremost Formation, of brackish to salt water deposits of Upper Cretaceous age. However, this identification is based primarily on elevation data, and in these beds it is difficult to identify the contact between the Foremost Formation and the overlying Oldman Formation, which though only marginally different in age appear to be fresh water deposits.

PRESHOT PREPARATION

Sand Columns Sand Columns were installed according to the method of Jones and Diehl (1964) along two radii roughly ninety degrees apart. Installation was completed by 14 May 1968 and the details are given in Table 3. Fig.9 shows the layout of the sand columns and of the other close-in experiments described below.

Asphalt Strips Three radial asphalt strips were installed, two bordering the sub surface study sector and one offset 20° from the centre of the sector. This offset was necessary to avoid conflict with another U.S. project. These strips extended from

75 ft from GZ to 250 ft from GZ. Each strip was composed of cold rolled asphalt, 3-inches thick and 18-inches wide and was flush with the surrounding ground surface. Every 5 ft in the strip, a 10-inch marker nail was inserted flush with the surface to act as a survey control point, and similar spikes were also installed along side the strips. The two sand column lines were adjacent to the two boundary asphalt strips.

BTL Ejecta Markers At the request of, and with funding from, the Bell Telephone Laboratory, to obtain specific data on the original and final location of finite elements of the cratered material, the number of marked elements in the ground was increased over and above those normally obtained from the tagged sand columns, in the following way:

Pretrial preparation consisted of the manufacture of 1,382 small, silt-filled aluminum canisters, 1 ½ inches long and ½ inch in diameter, 50-solid aluminum rods of similar dimensions, and 50 silt-filled canisters (35 mm film canisters) similar to those used in the sand column study. These markers were installed in boreholes placed within the "subsurface study sector", the details of the array being as given in Table 4 and Fig.10.

In contrast to the sand column holes, these boreholes were refilled with silt material compacted to approximately the original consistency, so as to make the dispersal of the canisters by the blast as typical as possible of undisturbed zones. The small silt-filled aluminum canisters were spaced approximately 6 inches apart in all of the boreholes with the exception of those on 193° line. On this line the solid aluminum rods and the 35 mm film canisters were used along with the small aluminum canisters and the spacing was 3 inches. The pretrial installation was completed by 21 May 1968.

Fluorescent Bead Installation During a recent liaison visit to Sweden by G.H.S. Jones, the question of obtaining data on long range fallout from the Suffield detonations was raised. As no data were available at the time, it was decided that a modest programme should be undertaken on PRAIRIE FLAT. A preliminary experiment to test techniques was undertaken on the DISTANT PLAIN 6 detonation in 1967, but the PRAIRIE FLAT detonation was the first in which care had been taken to avoid any possibility of contamination of the collectors in the pre-shot phase.

The technique adopted was to install 200 lb of glass microspheres, 100μ diameter, which had been coated with an acetone soluble, water insoluble dye (Switzer Bros. Daylight Fluorescent Pigment)(Diehl and Harvey, 1958) in shallow boreholes near the charge and to observe the down wind dispersion of these beads using the "sticky paper" collection technique routinely used at DRES for studies on the dissemination of powders and liquids from towers and aircraft.

The use of this technique requires meticulous attention to cleanliness at all stages of the operation, even to the extent of using different personnel and laboratories for the preparation of the beads and the samplers.

3 As the dispersion of the beads is primarily a function of the ambient meteorological conditions, after the initial blast dispersion, it is not possible to predict the area of probable concentration many hours ahead of the detonation. This precludes any possibility of laying the samplers down in the days before the detonation, even if the requirements of cleanliness could be met. As a result, installation of the samplers was undertaken on the morning of the trial, after the first meteorological predictions that day, by a crew working out of a CF (Air Branch) helicopter. The individual samplers consist of sheets of "sticky paper" (7 by 13 in.) mounted on metal sheets, and for PRAIRIE FLAT an array of these plates was laid down, along four radial lines, 70°, 90°, 110°, and 130° at 1, 2, 3, 4, 5, 10, 15, 20, 25, 30, and 35 miles distant from GZ.

EJECTA COLLECTING PADS AND MISSILE STRIP

Preshot preparation consisted of installing radial lines of metal collecting plates having a surface area of $1 m^2$ at 350°, 82°, 129°, 163°, 215°, 262°, 309°, and 343°, starting 250 feet from GZ and extending out to 1,200 feet from GZ. Single plates were set out along each line at 250, 275, 300, 325, 350, 375, 400, 450, 500, 600, 700, 800, 900, and 1,000 feet from GZ and double plates at 1,100 and 1,200 feet from GZ, as shown in Fig.11. Each plate was fastened to the ground surface by six 8-inch spikes. Immediately preshot these plates were swept clean of debris, and in the immediate post-shpt phase the material on the plates was collected, seived and the seive fractions weighed. In previous trials data have been obtained on discrete "missiles" which travel beyond the main ejecta blanket. A similar study was intended on PRAIRIE FLAT, and pretrial preparation for this study consisted of grading and leveling a 6^{o} segment of an annulus extending from 300 feet to 2 000 feet from GZ. Strong winds and several rain showers left this area in ideal shape for readily identifying and recognizing all the missiles landing on it.

DOMINION OBSERVATORY STUDY

The Dominion Observatory Study consisted of the preshot installation of a core of shield rock, roughly † inch in diameter, vertically below the charge, but offset from GZ. The objective of the experiment was to investigate the possibility of producing shock metamorphism in granitic rocks, using a conventional TNT explosion in terrain of the Suffield type which makes installation and recovery rather easier than in hardrock trials.

The installation of the core sheathed as shown in Fig.12 was completed successfully.

TABLE 1 RESULTS OF VANE SHEAR TESTS

Position	Depth from Surface	Shear Strength	Shear Strength
	inches	psi	lbs/ft^2
95 ft. E of GZ	20-28	38.7	5573
	31-40	31.7	4565
	45-53	23.3	3355
	56-64	33.6	4838
	66-74	43.3	6235
	74-82	29.7	4277
	84-92	44.5	6408
	108-115	42.0	6048
	115-124	51.6	7430
	132-139	31.6	4550
	149-158	24.6	3542
200 ft SE of GZ (open pit)	48-53	45.3	6510
	89-96	12.9	1860
280 ft SE of GZ (open pit)	84-89	27.8	4000

TABLE 2 DENSITIES FROM BOREHOLE

104 ft SE of GZ

Depth Below Surface	Classification	Field Density	Dry Density
feet		lbs/ft^3	lbs/ft^3
Surface	Silty clay	97.0	88.5
1.0- 1.5	Tan silt	88.6	82.0
3.0- 3.5	Silty clay	97.0	86.6
4.0- 4.5	Silty clay	95.0	87.5
6.5- 7.0	Silt	106.5	97.0
7.0- 7.5	Sand	105.0	104.0
12.0-12.5	Sandy silt	112.5	100.0

TABLE 3 LAYOUT OF COLOURED SAND COLUMNS

Hole Number	Bearing	Distance from GZ	Depth
		feet	feet
GZ	37°00'00"	1.5 ft North GZ on South Can Line	230
E15	127°00'00"	5	65
E14	"	10	65
E13	"	20	40
E12	"	30	35
E11	"	40	30
E10	"	60	30
E 9	"	70	25
E 8	"	75	25
E 7	"	80	20
E 6	"	85	20
E 5	"	90	20
E 4	"	100	20
E 3	"	120	20
E 2	"	160	20
E 1	"	250	10
S15	217°00'00"	5	65
S14	"	10	65
S13	"	20	40
S12	"	30	40
S11	"	40	30
S10	"	60	35
S 9	"	70	25
S 8	"	75	25
S 7	"	80	20
S 6	"	85	20
S 5	"	90	20
S 4	"	100	20
S 3	"	120	20
S 2	"	160	20
S 1	"	250	10

TABLE 4 LAYOUT OF BOREHOLES FOR BTL EJECTA STUDIES

Distance from GZ	Depths of Columns (ft.) on Given Bearings				
feet	124°	148°	171°40'	193°	215°
7	20	–	–	20	–
15	20	20	20	20	20
25	20	20	20	20	20
35	20	20	20	20	20
45	20	20	20	20	20
55	20	20	20	20	20
65	20	20	20	20	20
75	10	10	10	10	10

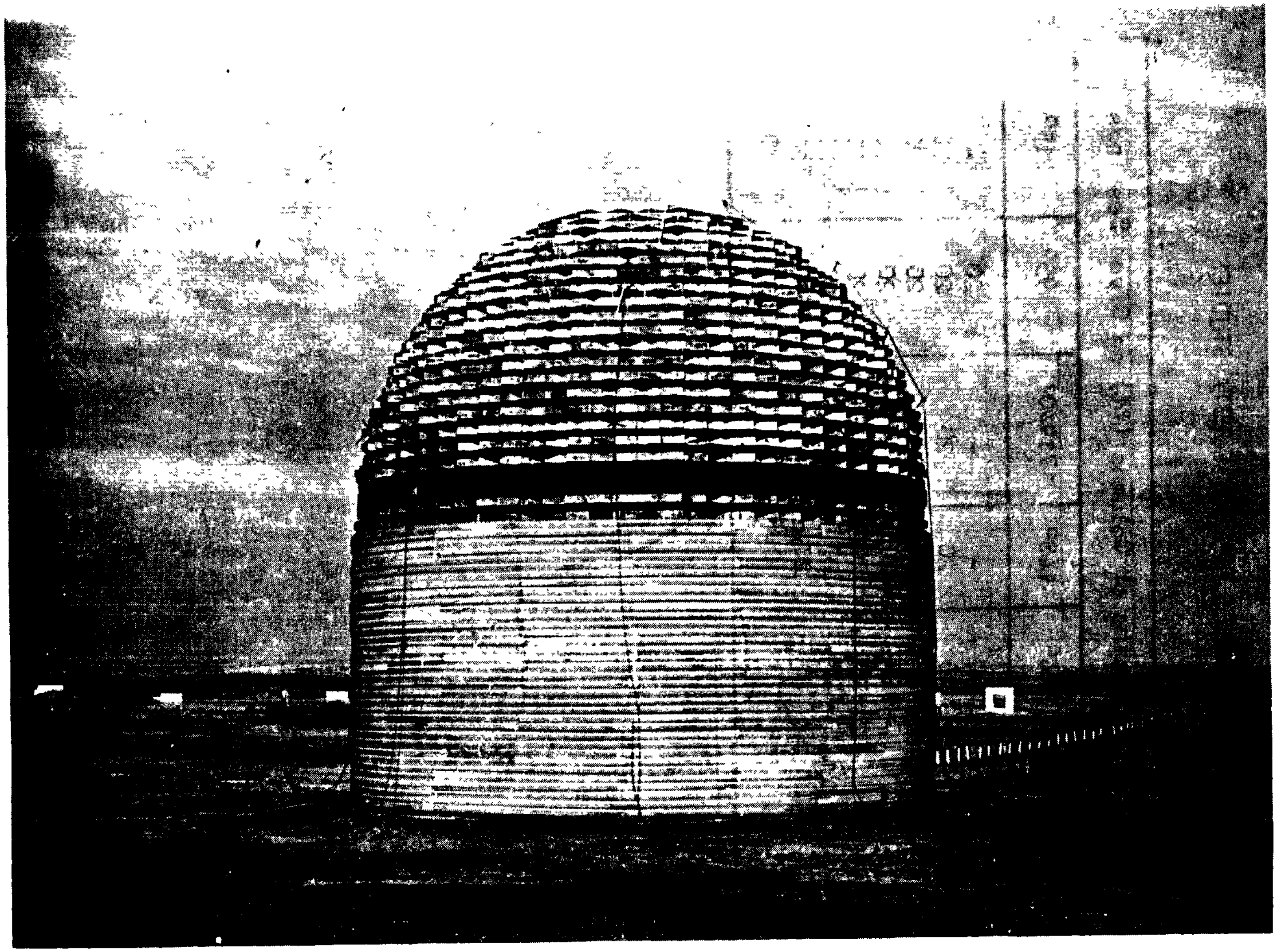

Figure 1. Photograph of charge stack.

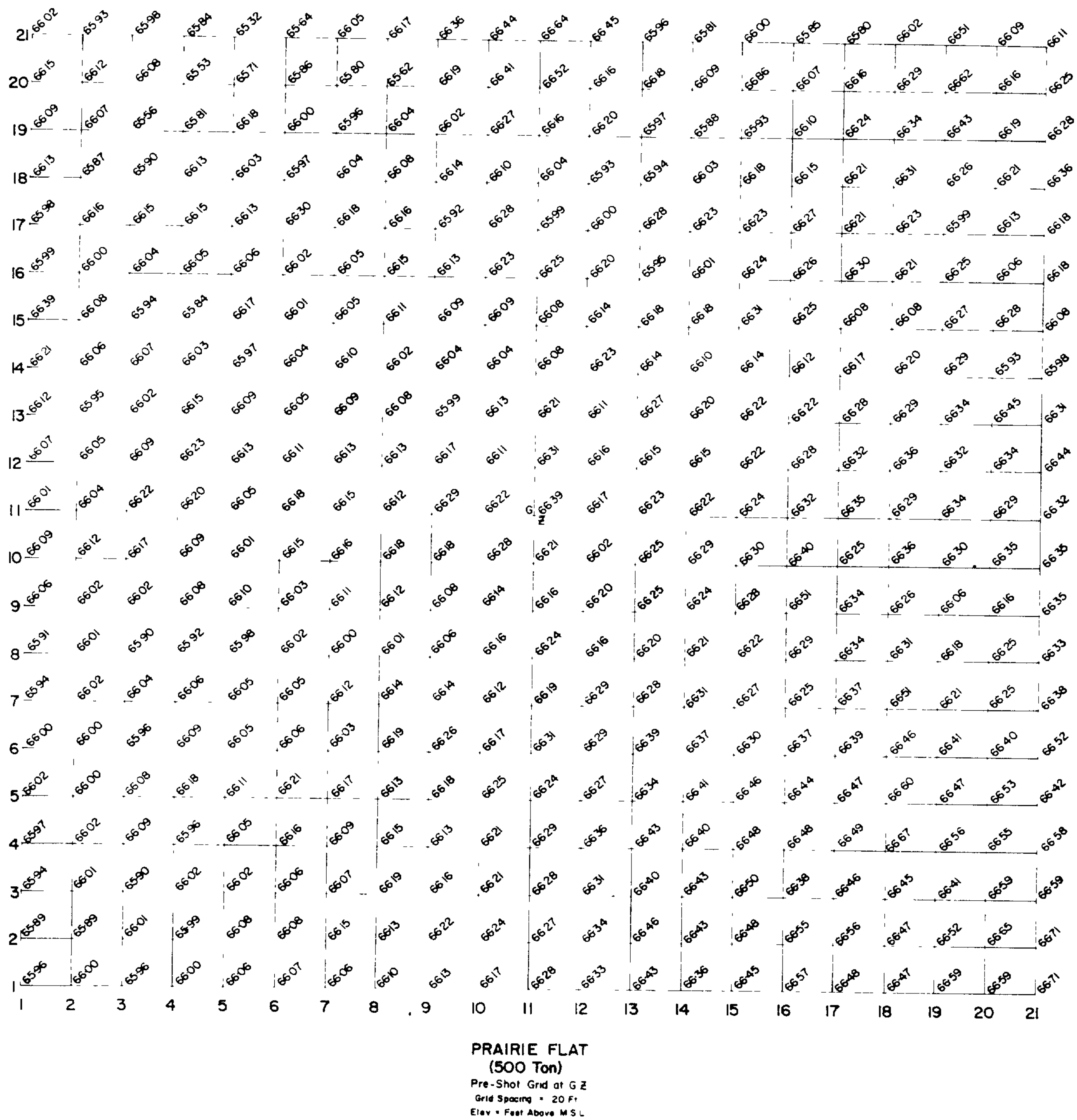

Figure 2. Pre-shot grid at ground zero.

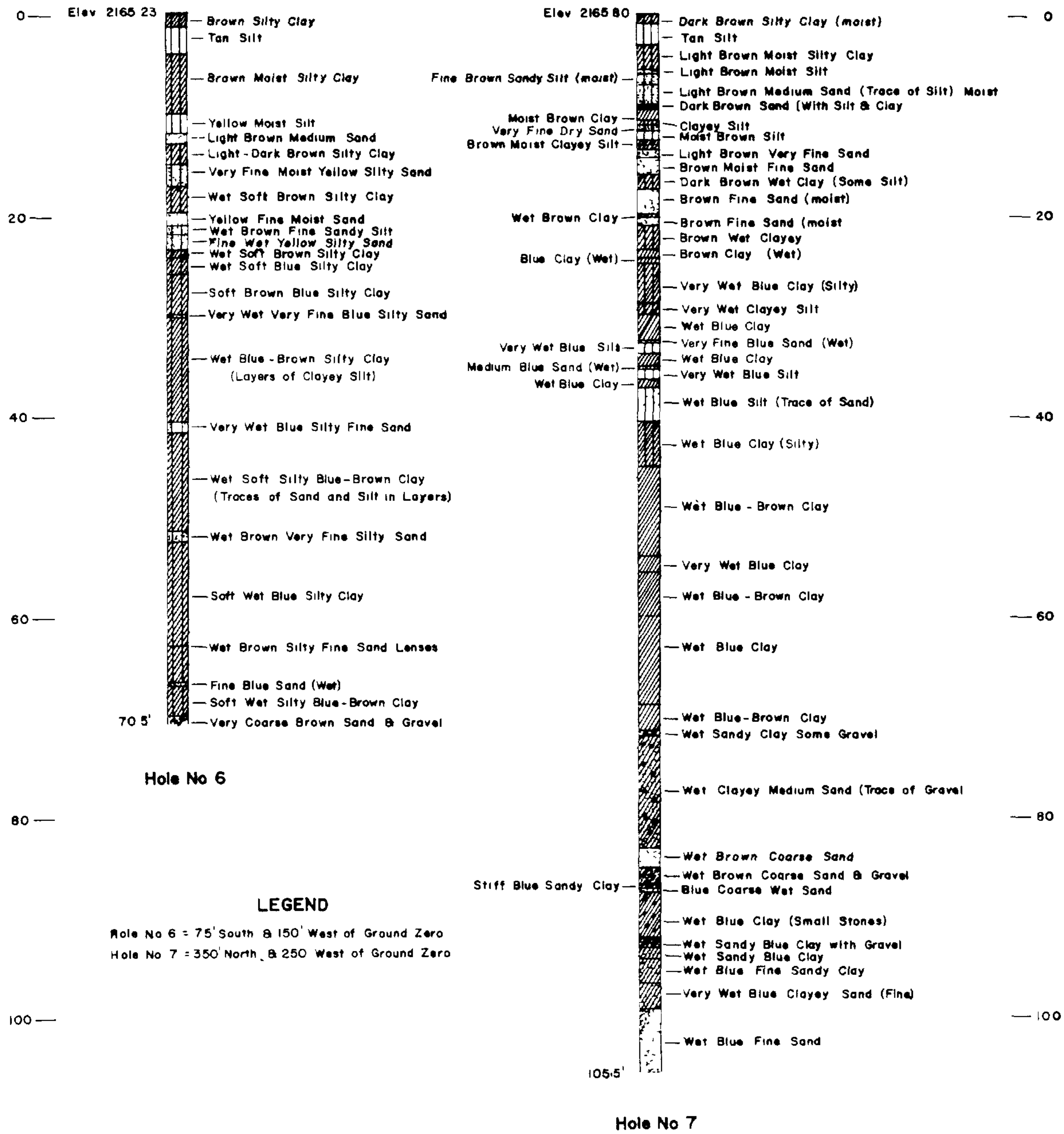

Figure 3. Exploratory boreholes for PRAIRIE FLAT.

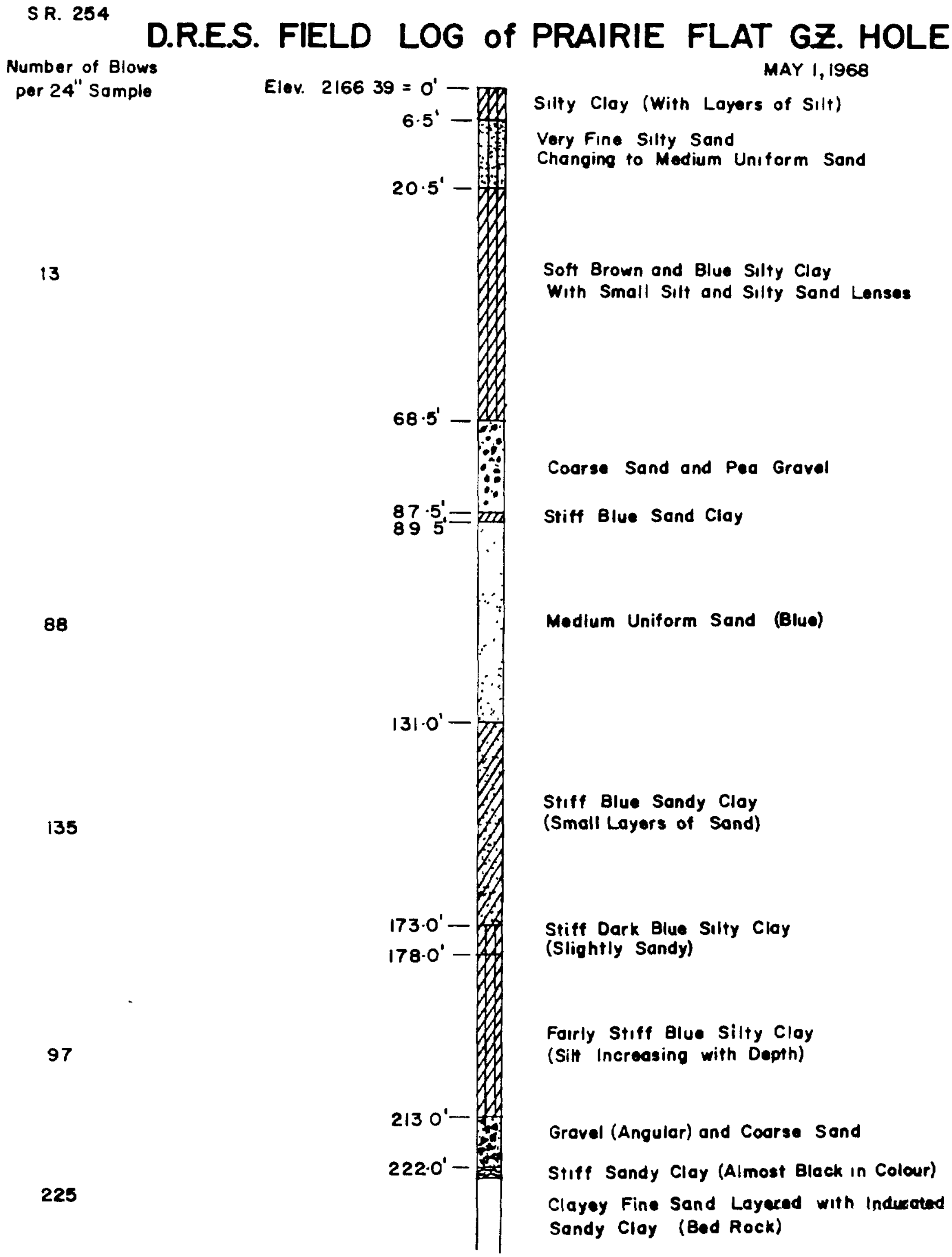

Figure 4. DRES field log of PRAIRIE FLAT ground-zero hole.

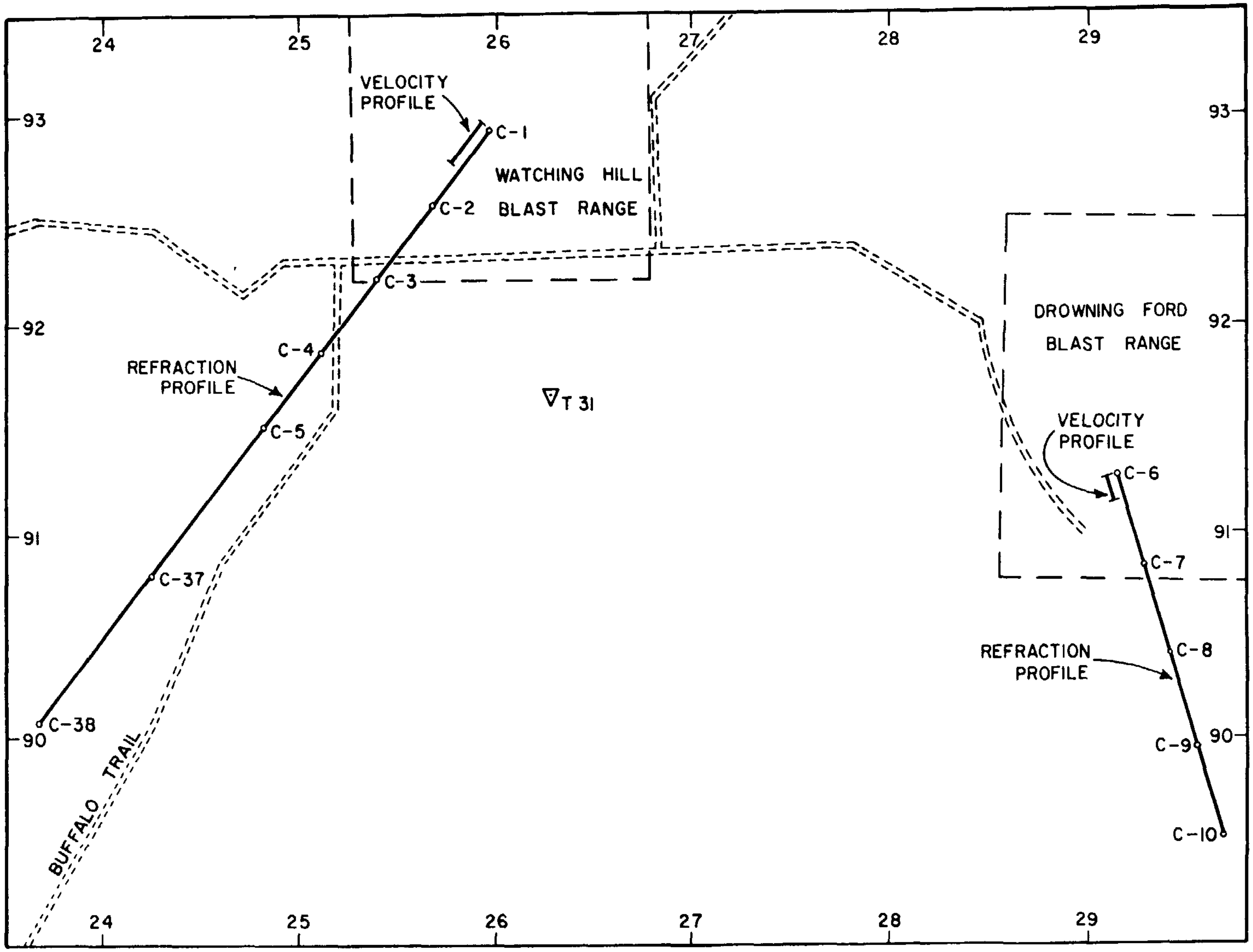

Figure 5. Location of velocity and refraction survey.

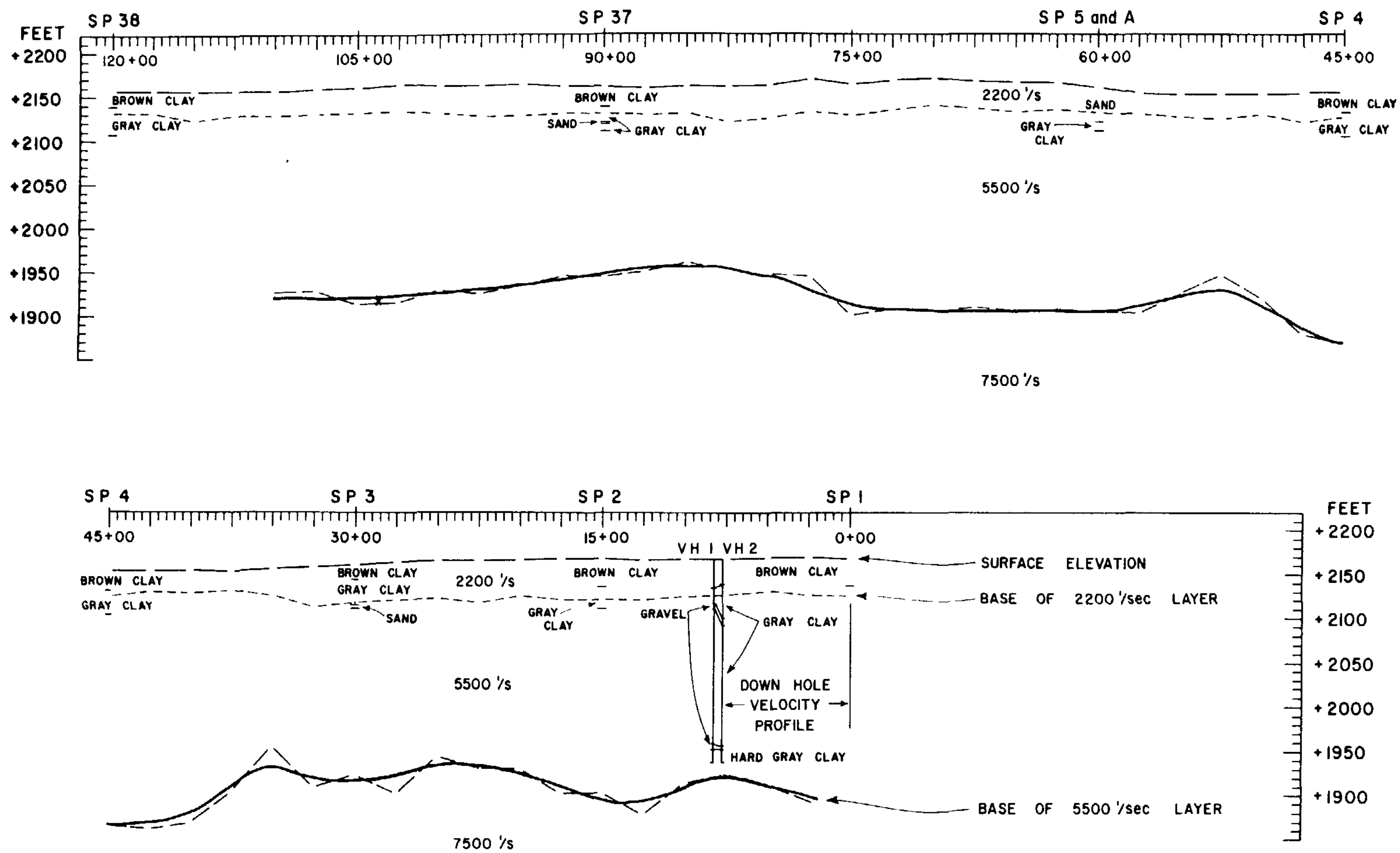

Figure 6. Seismic section Watching Hill site.

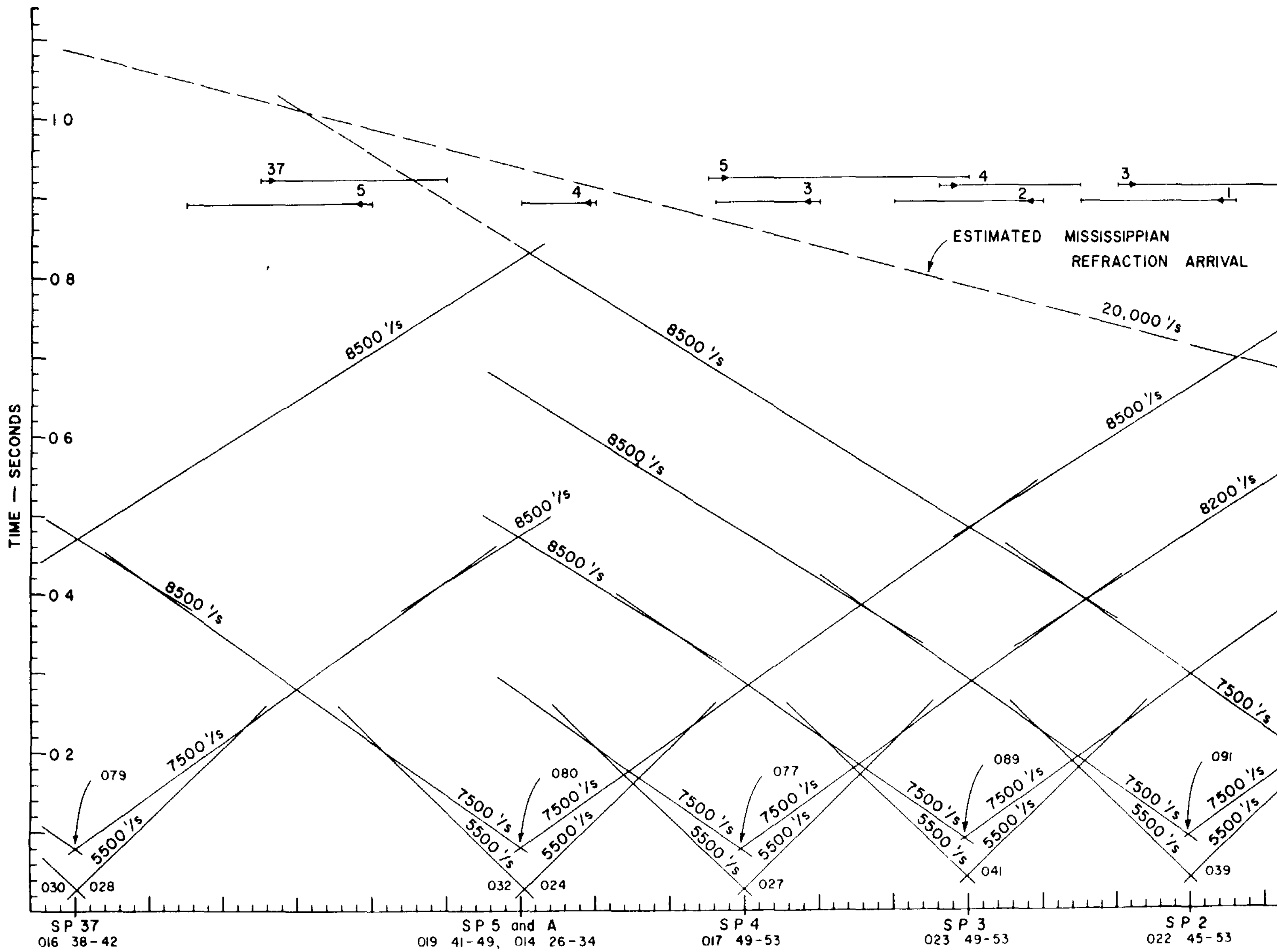

Figure 7. Time distance plot Watching Hill.

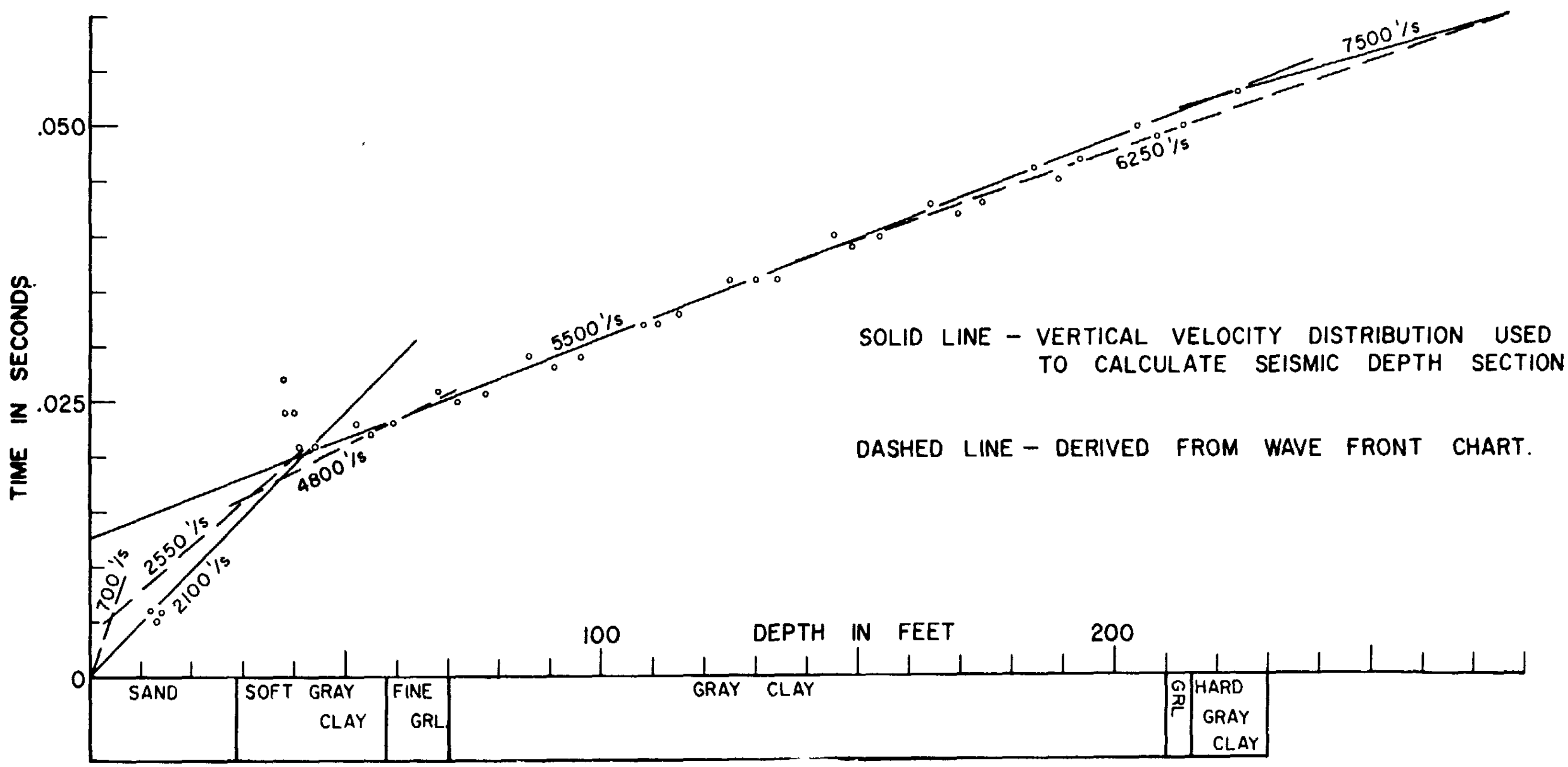

Figure 8. Vertical velocity survey—Watching Hill site.

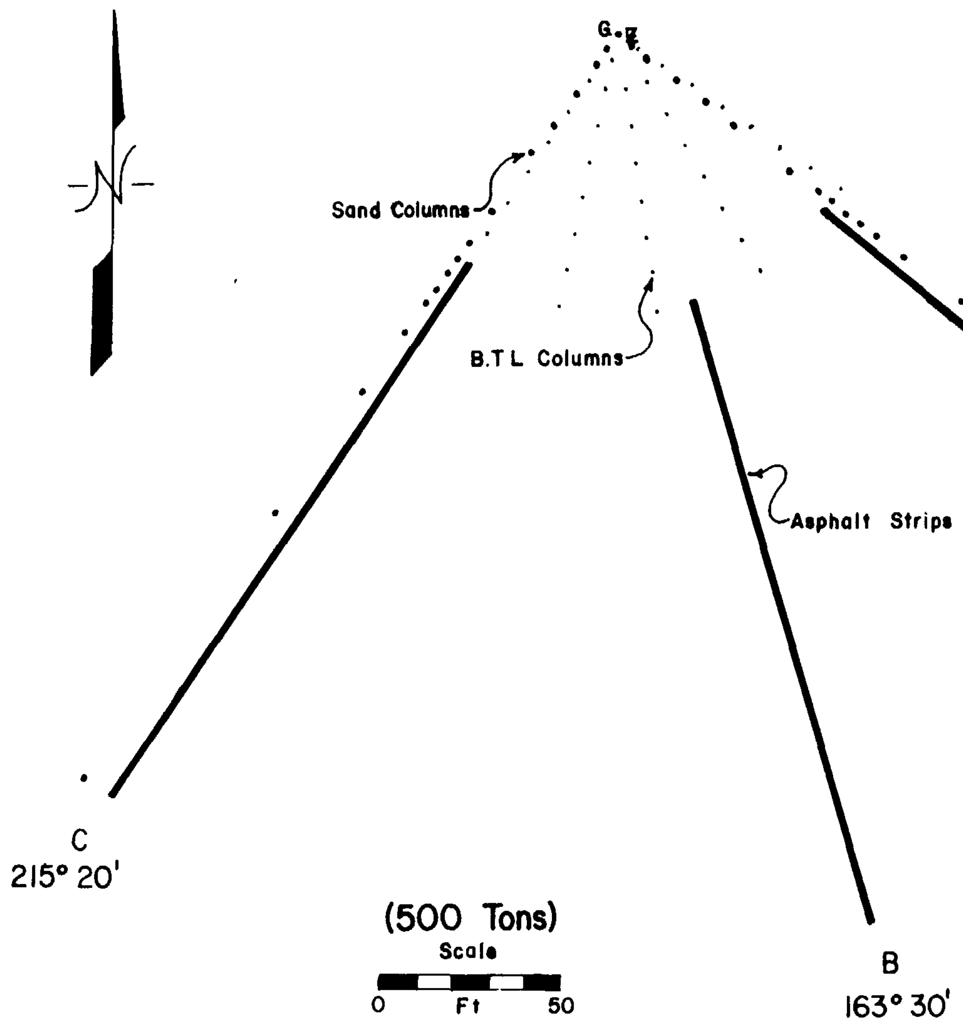

Figure 9. Layout showing sand columns, BTL columns, and asphalt strips.

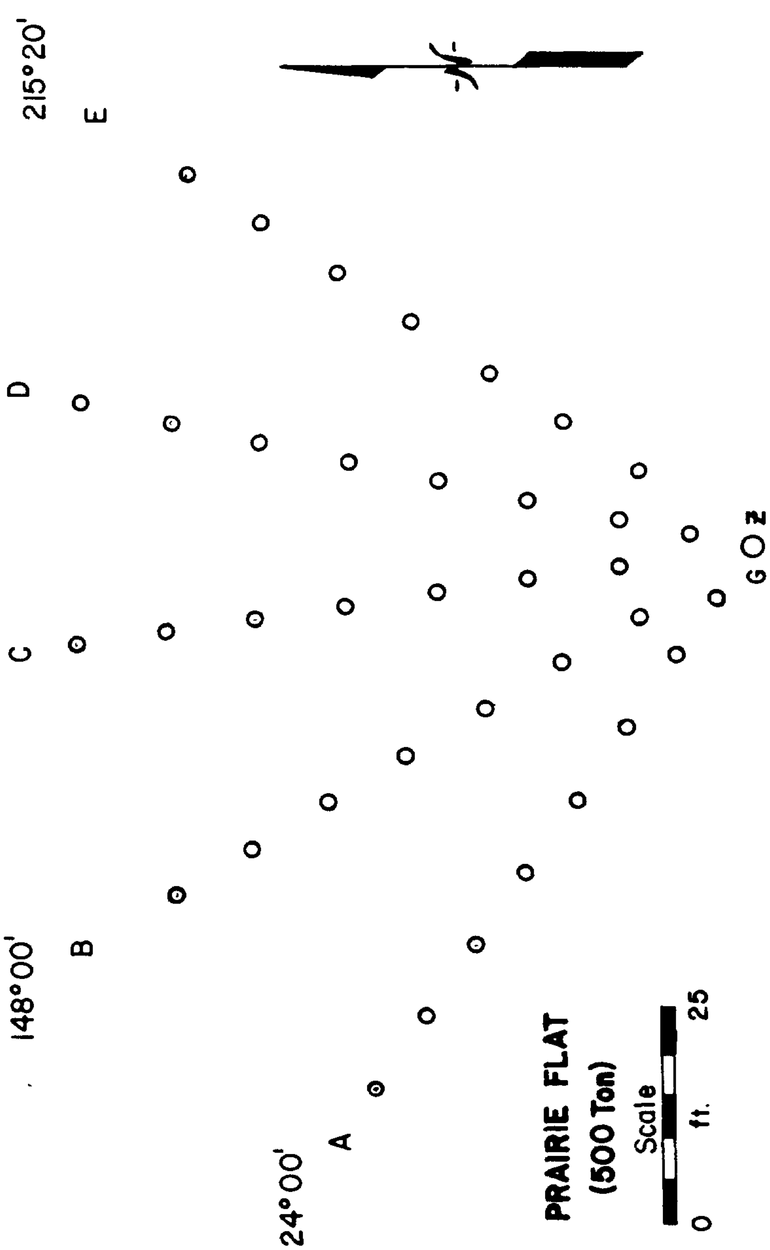

Figure 10. BTL layout showing location of boreholes.

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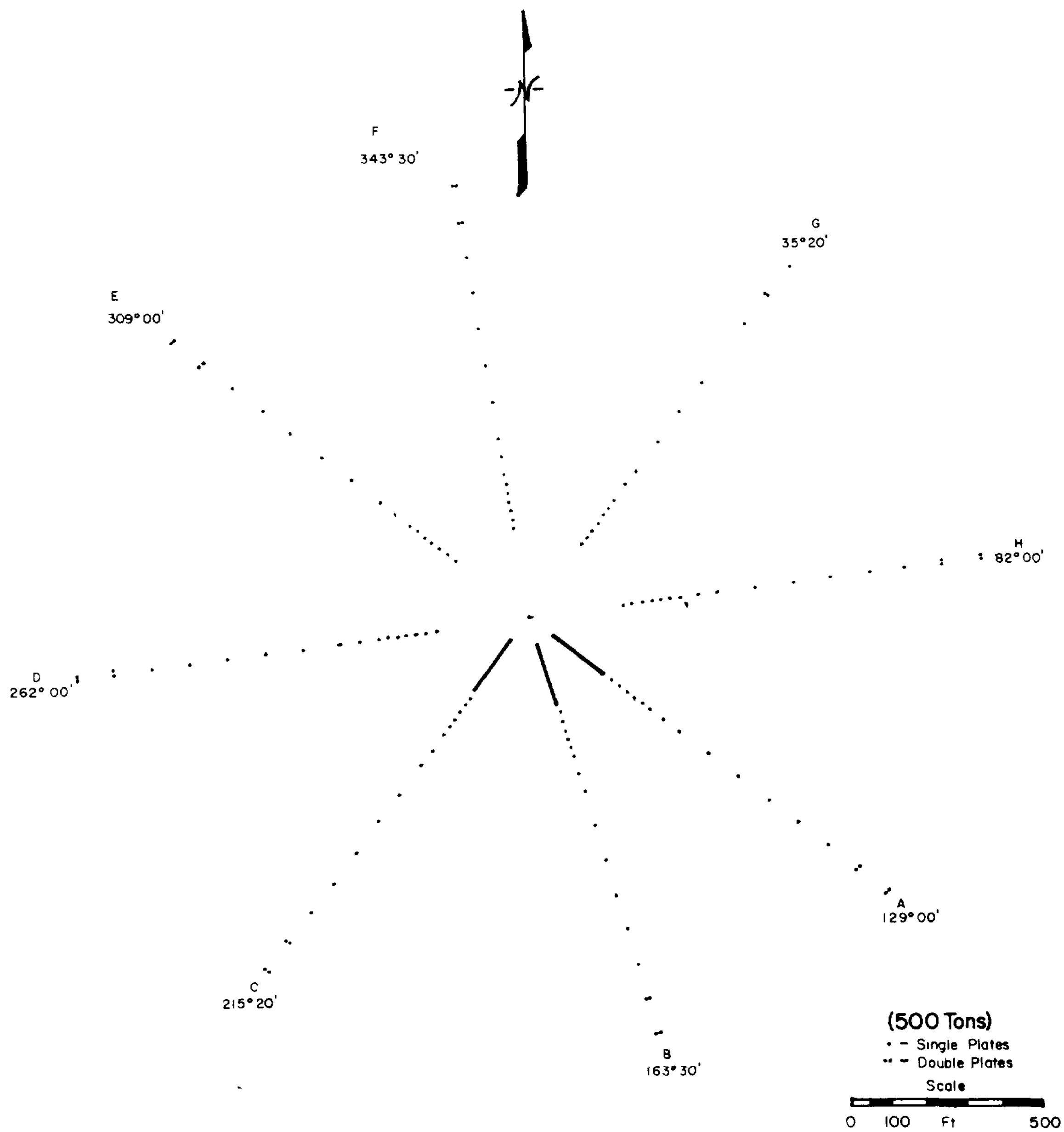


Figure 11. Asphalt strips and ejecta collection.

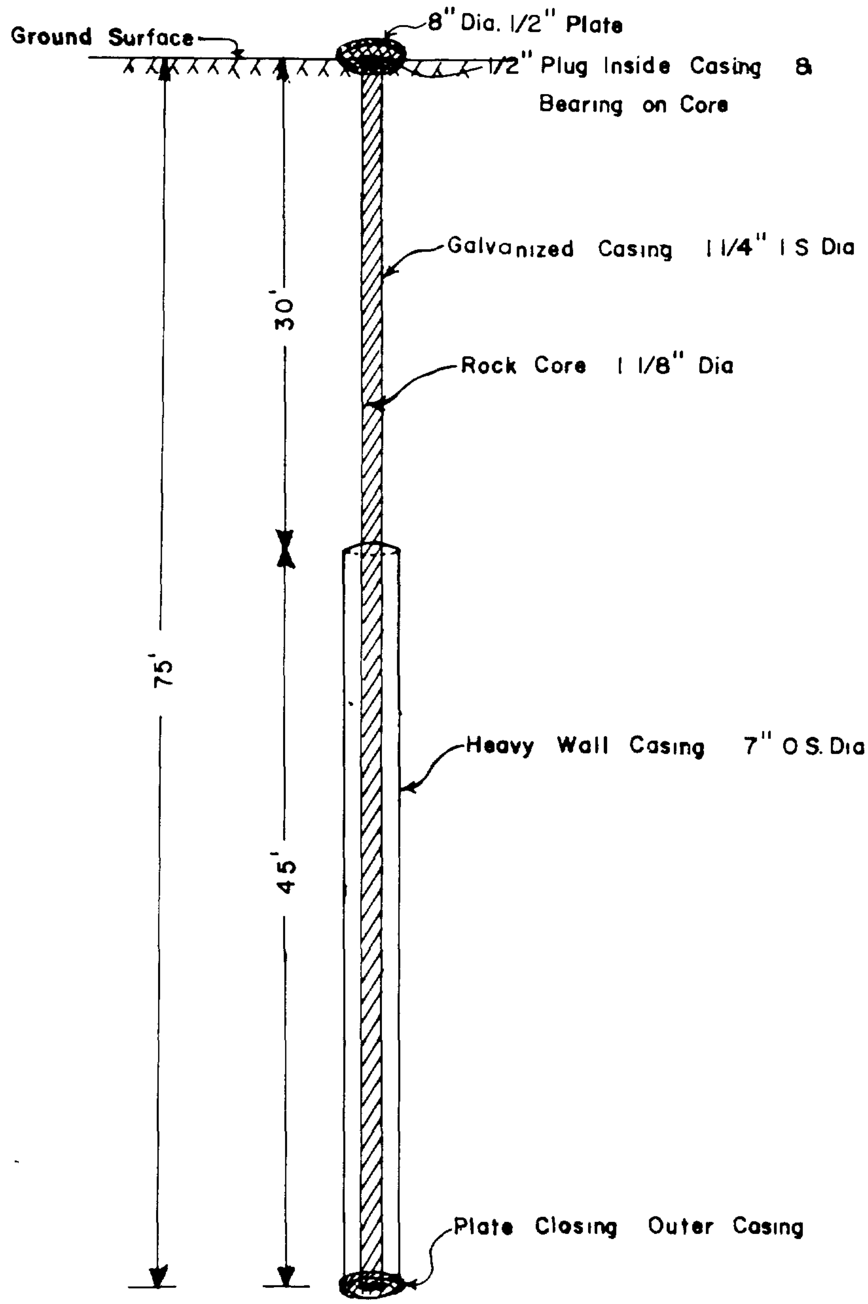


Figure 12. Installation of Dominion Observatory rock core.

POSTTRIAL PHASE OF PRAIRIE FLAT

DETONATION AND IMMEDIATE EFFECTS

Visual Impressions Immediately following the disappearance of the fireball, the DRES Crater Study Group accompanied by Dr. Roddy (USGS) and Dr. Dence (Dominion Observatory) proceeded by vehicle from the Tech OP to within 800 ft of the crater and then on foot to the crater.

It was noted that in the immediate crater area, debris up to 3/4-inch diameter continued to fall until $7\frac{1}{2}$ minutes after zero.

The visual impression was that the rim of the crater was shallower but much wider than expected from the results of previous trials and appeared to consist of a number of concentric ridges of ejecta covered with a layer of fine carbon.

The crater itself resembled none of the previous craters from trials held at DRES. The crater appeared very symmetrical but shallower than expected. The floor of the crater consisted of a large but low central uplift surrounded by two concentric ridges which were almost as high as the central uplift itself. The centre portion of the central uplift appeared to be slightly depressed. The height of the concentric ridges varied greatly around their circumference.

There was a considerable amount of white sand and sandstone material on the floor of the crater. This resembled the material found surrounding the central uplift on DISTANT PLAIN Shot 6.

The fallback material on the crater floor was very warm and could not be held comfortably in the hands. The material a few inches below the surface was so hot that 15 minutes after zero contact with the skin was very uncomfortable.

Entry of Water At Z+10 minutes water began to enter the crater at a point approximately 1 foot south of GZ. Almost immediately after this, water began to flow from 5 or 6 points within a 15-20 ft radius of GZ and shortly after from various points scattered across the crater floor. At one time over 70 points were counted where water was flowing in. At first the water flowed rather slowly, but the flow rapidly increased. At approximately 10 minutes after the water started to flow there was a gushering from the first point to a height of 2-3 ft, which brought up pieces of clay weighing 2 to 3 lbs. A considerable amount of sand was brought up by the water and was distributed around the points of emission in the form of sand boils or cones. The similarity between this crater and West Clearwater Lake was immediately recognised by Dr. Dence and others.

This entry of water to the crater had been anticipated on the basis of experience gained at the SNOWBALL trial, In that case, the flow of water was not restricted to within the crater proper, but was also associated with circumferential and radial cracks beyond the crater rim. In SNOWBALL the water subsided after several weeks, but entry of the water was limited to the first two or three days. In some ways this experience was repeated in PRAIRIE FLAT, but the flow of water continued for a much longer period, amounting to several weeks of slow-steady flow. After the major flows had stopped, it was observed that water continued to flow rather intermittently from several of the central "sand boils" which had grown up around the water sources. Strangely enough, it appeared that this flow became reduced almost to zero during the day, but started up again overnight, and this continued in some cases throughout the working season, a matter of some three months after the detonation. No obvious explanation has occurred to the authors for this phenomenon, and it is considered unlikely that the rainfall which occurred at odd intervals had any influence on the water flow.

In order to allow the survey and excavation to proceed, it became necessary to start pumping water out of the crater immediately the pumps could be brought in without unacceptable damage to the crater rim.

Fig.13 is an aerial oblique obtained several days after the detonation, showing approximately the maximum stage of water filling and sand boil creation in the crater. The relatively slow late flows of water from the central ring of sand boils continued to allow accretion of material in this area, until eventually an almost complete dome was formed in the central region.

Early Photographs and Measurements Around the outer edge of the crater floor were large pieces of flat or slightly curved moist clay different from the fallback material covering the crater floor.

Material continued to fall out in appreciable quantities from the drifting fireball cloud for at least fifteen minutes after the detonation. Some of this late fallout material was without doubt the low density hollow silica spheroids discussed later in this report.

High angle oblique photos were obtained of the crater area immediately after the detonation. A typical example is shown in Fig.14.

Due to the almost uniformly black coating on the outer layer of debris and the low relief, it was difficult to identify elements of the rim structure visually. In fact, the initial measurement of the "Crater Lip Diameter" was taken from points on the top of the inner slope of the crater wall, and found to be 212 ft. Later measurements taken correctly across the high points of the crater, which actually occurred slightly back of the inner slope, showed that the **Crater Lip Diameter** was in fact 270 ft, measured with the debris in place. The Apparent Diameter, measured at the original ground level with the debris in place was found to be 200 ft exactly.

Several minutes after the detonation a photographic mission was flown under the control of Theodore Vogel of the Photographic Interpretation Research Division of the U.S. Army Terrestrial Sciences Centre to obtain vertical stereo-pairs of the crater area. A single still from this mission is shown in Fig.15.

During these first few minutes at the crater, several bag-samples were obtained of material inside and outside the crater which appeared to typify different zones of material. A search was initiated immediately for ejected markers from the sand columns and from the BTL layout. Where such markers were found, survey stakes were installed and any necessary notes made on site. Approximately 1 1/2 hours after the detonation, a start was made to collect the ejecta from the various ejecta collection pads. Insufficient labour was available to allow a simultaneous start to be made on missile collection. Collection of material from the ejecta pads was completed on the day of the trial. On the same day, the first few markers required for the topographical survey were installed.

POSTTRIAL OPERATIONS PRIOR TO EXCAVATION

Fluorescent Bead Study. The study of long range fallout, using fluorescent beads, was as successful as could be expected for the scale of effort involved. Fallout was detected out to 30 miles, out of a possible detection range of 35 miles.

Details of the particulate collection are given in Table 5 which may be related to Fig. 16 which shows the layout of collectors used. There is some evidence of a peak in the fallout pattern on the 90° line and the 110° degree line around ten miles from GZ, but of course the data are barely sufficient to justify a quantitative conclusion of this kind. At the present time, it appears that the best conclusion to be drawn from this study is that quantitative data on long range fallout can be obtained using this technique, without the use of any form of radioactive tagging. A detailed study would, however, require a relatively large number of samplers, and considerable helicopter support. The technique is probably preferable to any used hitherto, but the decision to develop the technique further must depend upon other, nontechnical factors of logistics and strategic importance.

Following the detonation, the samplers were recovered, and subsequently studied under ultraviolet light, which causes the dyed beads to fluoresce a bright red. Many years of experience at Suffield has proven that this particular variety of dyed beads cannot be confused with any naturally occurring spores or other contaminants — though many such contaminants fluoresce under ultraviolet light.

Fused Silica Spheroids A striking, and hitherto unobserved feature of the ejecta was the existence of very large numbers of small hollow spheres of fused material, with a bulk density considerably less than one. These spheres — nicknamed Spackman's Tears — are tentatively assumed to be formed from the preexisting sand or clay layers, and this assumption has been verified by preliminary analysis by U.S.G.S. and McGill University. A roughly equal quantity of partially fused material showing cores of sand and silt also existed. Immediately after the trial, collection of samples of this material was quite a tedious task, but due to its low density the material became concentrated when a heavy rain shower produced pools of standing water on top of the ejecta blanket. The hollow spheres were washed into these pools, and concentrated as a scum on the surface. Thereafter, sampling the material became a simple matter of collecting it by the handful. The material is superficially similar to the descriptions available of fused spheres encountered at the Wabar Crater in the Rub-al-Khali of Saudia Arabia (Philby, 1933). Fig.17 is a photograph of a typical range of this material. The U.S.G.S. estimated composition of the PRAIRIE FLAT fused spheres (Roddy, personal communication) is given in Table 6 for one sample.

Although this composition is obviously related to the soil composition, rather than to the parent body composition as in the case of the Wabar phenomenon, and the phenomena reported by Krinov (in Middlehurst and Kuiper, 1963) in association with the Sikhote-Alin meteoritic shower, the physical attributes are almost identical. Krinov discusses in some detail the formation of hollow, drop-like particles, hollow "flasks" and so on, both in the meteoritic case and in the case of a variety of industrial dusts. The composition is frequently different from that of the parent body, and thus confusion can arise in any specific case. The relevance to the present observation is that one can easily recognise the probability of misinterpretation if the PRAIRIE FLAT crater had been studied many years later, in ignorance of the actual mode of formation. It seems highly probable that the discovery of an abundance of small, hollow spheroidal fused silica particles associated with the crater would have led to an assumption of aerolite-impact origin. Samples of these fused silica spheroids were found at a distance of at least one mile from GZ. The distribution is unquestionably much greater down wind.

Ejecta and Missiles Collection of material deposited upon the "ejecta collecting plates" was started and completed on the day of the trial. In this context, the term "ejecta" is used for all material found on the collecting surfaces. Readers are warned, however, that elsewhere in this report a distinction is made between true ejecta, that is to say, fragmented material which has at some time been in a full ballistic trajectory, and other lip material which appears to have been emplaced in the form of a coherent overturned flap. For many purposes, certainly in comparison with the bulk of data from both this and other test sites, use of the term "ejecta" in the broader sense is acceptable and less likely to lead to confusion than would be an insistence on identifying the method of emplacement at all times. Great care should, however, be taken to recognise that this distinction does in fact exist when reading the relevant sections both of this report and the report on Project LN 3.03.

Teams of three men collected the material off the individual metal sampling surfaces by sweeping the surface lightly and bagging the material. Due to the nature of the material, this technique does not normally result in significant change in the size distribution of the particles. The bagged material was then brought to a central collecting station, where it was passed through a series of screens with mesh openings of 2 in., 1 in., $\frac{1}{2}$ in., and $\frac{1}{4}$ in. size. Material retained on the screens, and the material passing through the smallest screen was weighed and the individual weights recorded. The majority of the plates remained firmly anchored to the ground, but it was found that those plates closer to GZ than about 500 ft had been ripped free of their anchors, and thus lost as collecting surfaces. The plate data are therefore restricted to areas of relatively low density, and (possibly) mainly true ejecta in the limited sense. The data obtained are given in full in Table 7, and due to the low areal density do not lend themselves to contour mapping of the deposit. However, these data may be compared directly with the analysis by the photogeological technique of Project LN 3.03.

On the day following the trial the collection of "ejecta" was continued, by obtaining the areal densities at selected areas on the asphalt strips. Areas eighteen inches square on the asphalt strips, at separations of ten feet along the strips, were excavated and treated in the same way as material from the ejecta collecting plates. Due to the depth of material on the asphalt strips close in to the crater lip, this collection procedure could not be completed quickly and with complete uniformity. Collection took roughly three weeks after the detonation, during which time there had been several heavy rain showers. For this reason some of the samples taken at late stages, in zones of great depth, were not passed through screens as the final size distribution would be modified by the rain. Total weights, however, remain basically unaffected as no material was collected or weighed while wet. Changes in retained moisture would be quite minimal in most cases due to the nature of the material, which was initially saturated silty clay. The data obtained from the asphalt strips according to this technique are given in Table 8. Additional data from the asphalt strips are discussed in a later section of this report.

Due to the heavy rain showers in the day immediately following the trial, the collection of missiles was abandoned. In contrast to the effect of the rain on the continuous ejecta blanket, discussed above, the rain had seriously damaging effect on the large discrete lumps which when found in isolation in earlier trials have been termed "missiles". These lumps tended to disintegrate and fuse with the underlying silt when subjected to heavy rain. As in earlier trials, it was noted before the rain started that many of the "missiles" had formed minor impact craters with rays of disintegrated material radial to the main crater. In some cases the missiles did not disintegrate but penetrated the ground and remained inside the "impact crater".

Topographical Survey The topographical survey was started on the day of the trial, and continued throughout the remainder of the

1968 working season. Elevations were determined relative to permanent markers installed preshot at four points distant 300 ft, 600 ft, 900 ft, and 1,200 ft from GZ, which were themselves surveyed in relation to the permanent trigonometrical bench marks in the area. The marker at 300 ft was found to have moved as a result of the detonation, but the outer three markers were unchanged relative to the permanent bench marks, and were used for this survey.

The elevations were taken sequentially on a north-south orientated grid of 5 ft square spacing, numbered serially from 1 to 136 in the west to east direction, and alphabetically A to Z, AA to AZ, BA to BZ, and so to EK from south to north (Note, both letters I and J were used in this coding, though it is common practice in this type of indexing to leave out the letter I).

It was found in the extreme limits of the ejecta blanket that a 5-foot grid spacing was finer than required, and therefore the 5-foot spacing was reserved for a 200 ft square grid centred on GZ. Elsewhere, elevations were taken only at 25 ft intervals, that is at every fifth grid intersection.

Survey of the central 200 ft square, into the crater rim, was completed within four days of the detonation. Entry to the crater area was prohibited for two days, immediately following the detonation due to rain, thus all survey is subsequent to the first heavy shower of rain. In the two days following the close in survey to the rim, there was some more rain, and survey was stopped in this period. In the next three days, the survey was completed to the outer limits of the grid.

At this stage, the crater bottom was filled with water, mainly water from the subsurface, while the inner wall of the crater was wet due to the rainfall. Thus survey was delayed for a further period of 1 week, and at this time survey started on the inner walls of the crater, and was completed to the edge of the water in 5 days.

Thus survey of the crater area with the exception of the lake-filled floor, was completed in just under three weeks after the detonation. Survey of the crater floor had to wait until the major proportion of the water had subsided, and was then completed over the fresh infilling of sediment brought in by the water. (Note: pumping of water from the crater started as soon as survey of the walls was completed.) Fig.18 shows the inner trench before it was filled by water and sand.

Full numerical survey data are given in Appendix A in accordance with the grid code described above. Subsequently, these data were plotted on a large scale grid, and contours drawn in by hand at 6-inch vertical intervals. The resulting contour map of the crater is shown in Fig.19.

It must be recognised that as a result of the time required to undertake this survey, the contour map represents in all essentials the state of the crater several weeks after the detonation. Stereo-pair photography is available (see Fig.15) which could, if required, be used to produce an immediate post detonation contour map for comparison.

The PRAIRIE FLAT crater, in contrast to the SNOWBALL crater, did not have a strikingly obvious system of radial and circumferential cracks outside the crater rim, nor did water gush forth bearing sand to cover the debris, as happened on SNOWBALL. However, during later excavation it was found that a crack and fold pattern of similar type did in fact exist under the heavy debris, and this pattern is described later in this report. Though no obvious circumferential cracks existed external to the crater rim, the mode of entry of the water within the crater, and the subsequent sand boil pattern, did indicate circular fracture patterns inside the crater proper.

In order to assist Project LN 3.03, a traverse of the area was undertaken to provide a specific net of surveyed points which would act as a control for photo-leveling the area. The resulting net is shown in Fig.20, and the various key points are listed and described in Table 9.

EXCAVATION OF ASPHALT STRIPS

<u>The Installation</u> The technique of using asphalt strips was pioneered by the Waterways Experiment Station as a method of re-locating the preshot ground surface after the detonation, and thus determining the upthrust or other deformation in the rim of the crater. The Suffield Crater Group adopted the method and increased its usefulness by using the asphalt as an ejecta

collection surface and also as a measure of radial displacement by installing survey pins in and alongside the asphalt. Close in to the crater, this asphalt strip technique is almost the only satisfactory way of determining the mass of the ejecta blanket.

The method of installing the strips is shown in Fig.21, which shows (a) the shallow trench before insertion of the asphalt and (b) installation and rolling of the prepared surface. In PRAIRIE FLAT, these surfaces were prepared in three radial lines, between 75 ft and 250 ft from GZ.

Immediately after the detonation, the asphalt strips were completely hidden by the ejecta blanket, with the exception of a few locations where small elements of the strip, rotated into a vertical attitude, protruded through the ejecta.

The Excavation Process Excavation of the asphalt strips was a long, slow process, which had to proceed in step with the total excavation of the ejecta blanket in the 120° sector. All the excavation was by teams of men using hand shovels, searching for the various ejecta markers described in a later section of this report, and for specific features such as folds and faults in the ground. Simultaneously, samples of the ejecta on the strips were collected for analysis as described in the relevant section on ejecta in this report. As the excavation started at points remote from the crater, and only progressed slowly into the crater rim, we must presume that the elevation data from these strips represent a late stage by which time any short term relaxation effects had finished.

Survey of the Strips Survey proceeded in step with the excavation, elevations being taken at each pin as it was relocated. Finally, after excavation was complete, a new detailed elevation survey was undertaken on the strips, independently of the pins. The survey data are given in full in Appendix B, Table B-1 and Table B-2. Plotted sections of the asphalt strips from these data are shown in Fig.22. The three elevations show an obviously consistent picture from the three strips, indicating that the PRAIRIE FLAT crater did not have any residual upthrust in the rim, but showed a continuously increasing depression as one approached the central area, precisely as was found in the case of SNOWBALL. Detailed comparison with other craters is deferred to a later section of this report. It should be observed that consequent upon the excavation of the sand columns, two of the asphalt strips had to be destroyed at a later stage. However, the central strip has been preserved intact for future studies. Fig.23 shows a general view of one of the strips, after clearing of overburden, looking in towards the crater. In this view, only relatively intact asphalt strip is visible, since the steep inner slope is hidden.

Special Features (a) The Wave Pattern. A striking feature of the asphalt strips relatively remote from the rim of the crater was a large amplitude "wave pattern". Similar effects have been seen at earlier Suffield craters, and detailed comparisons are given in a later section. In this section, attention is concentrated upon the PRAIRIE FLAT results. Fig.24 shows (a) a typical side view of this wave pattern on one strip, after clearing the overburden and partial excavation alongside the strip, and (b) the detail of one wavelength of the pattern. In some cases, as illustrated in Fig.25, the smooth waveform changed into an abrupt anticlinal fold with a fracture along the top surface. In rare cases, this folding and fracturing proceeded to the ultimate stage in which a section of the asphalt was overturned to lie on the asphalt on the side remote from the crater. In such cases, there was sufficient radial movement in the asphalt on the side nearer to the crater that the gap made by the overturned element was almost completely closed. When first found, examples of this type were presumed to be slabs of asphalt actually ejected from points close to the detonation but detailed investigation, including a study of the survey markers showed clearly that this material was only local overturning from a sharp fold pattern. An example of this type of overturning is shown in Fig.26, where the material was positively identified from the survey marks and the correspondence of the torn edges.

A wave pattern of this type is less easy to find in unmarked ground, and casual observers tend to inquire whether the fold is a function of the relative rigidity of the asphalt itself. While the preservation of the full amplitude of the wave motion <u>may</u> be influenced by the asphalt, it is quite certain that the wave pattern also existed in the normal ground. Fig.27 is a view of carefully cleared ground between two of the asphalt strips, showing quite clearly a similar wave pattern which correlates well with the wave pattern visible in the asphalt strip in the background.

(b) The Inner Slope. As one moves inward along the strips, there is at first a gradually increasing slope, superimposed on top of the wave pattern described above. With the exception of the relatively sharp folds and fractures discussed earlier, the asphalt in this region is essentially coherent and unbroken. However, a point is suddenly reached, some 170 ft from GZ, in which the asphalt strip becomes much more broken, and at the same time dips sharply in towards the crater centre, that is, it defines the relatively steep true inner slope of the crater. In two out of the three strips, the asphalt was broken and "jumbled," but remained to all intents and purposes aligned along its original radial line. In the third strip the basic effects were similar, but at the inner end of the strip the individual slabs of the fragmented strip were also scattered laterally away from the radial line. Fig.28 shows views of the steep inner slope region, including a view of the scattered strip elements.

(c) Evidence of Radial Movement and Compression. Originally, the strips extended from 250 ft to a distance of 75 ft from GZ. After excavation, the first impression gained is that the inner parts of the strip have been destroyed and lost as a result of the blast. However, as will be seen from Fig.22, the total length of the asphalt strip relocated in the elevations shown is within very close limits the same as the original length. Thus it would appear that the surface zone, at least as defined by the asphalt, suffered a progressively decreasing radial displacement and compression, so that the original surface lying between about 75 ft and 190 ft from GZ became compressed into a region between 110 ft and 190 ft, the inner zone moving at least 30 to 40 ft radially outward from GZ. In this particular facet of the experiment, no information is available on displacements nearer to GZ, nor on displacements with increasing depth below the surface. However, additional data are obtained from other parts of the programme, and also closely correlated data have since been recognised in relation to an earlier crater at Suffield, and will be discussed in due course. In this section, only the bare statement of the data obtained from this particular set of asphalt strips is presented.

RECOVERY OF BTL EJECTA MARKERS

As discussed above in the "pretrial" section of this report, 1,462 additional markers were installed in specially prepared boreholes, according to the pattern given in Table 4 and Fig. 10. It was anticipated that the majority of these markers would be in the volume of ground subject to true "ejection" from the crater.

After the trial, search for these markers started immediately, and continued throughout the working season. Whenever a marker was located, a stake was installed for later survey, and any necessary field notes made on site. After the preliminary search for markers remote from the crater centre, search for these markers (and the equivalent markers from the sand columns) involved a laborious sorting of the material in the ejecta blanket during its removal as the first stage of crater excavation. As has been stressed above, it should be noted that there is evidence of a coherent overturning of a flap of ground to form at least part of what is normally termed the ejecta blanket. In this section, data are given only on the BTL markers, but it should be realized that there is little if any difference in nature between these data and the data given in the next section on markers from the sand columns. Most of the sand columns are from greater distances from GZ, and are thus more likely to be involved in flap formation than are the BTL markers. Every individual marker requires to be studied in relation to the stratigraphic study before it can be decided whether or not it was ejected along a ballistic trajectory. Thus in this section, no attempt is made to plot the final locations of markers, the raw survey data alone being presented. These data are given in full in Appendix C to this report.

A total of 567 BTL markers have been located up to the end of the 1968 working season. Few of these markers are from the very close in positions. It is probable that more markers will be located during the 1969 season, when excavation of the central regions of the crater is undertaken. A certain number of markers were, undoubtedly, destroyed by the blast and will not be relocated. Due to the nature of the installation, in silt filled holes, displaced but not ejected cans will be less easy to find than the sand column markers, since there will be no dye trace to lead to the markers.

EXCAVATION OF OUTER SAND COLUMNS AND MARKERS

Post Shot Excavation Details of the installation according to the method of Jones and Diehl (1964) are given in the pretrial section of this report, and the technique has also been described in detail in several earlier reports on crater studies at Suffield. It is only necessary, therefore, to remind readers that in PRAIRIE FLAT two radial lines of sand columns were installed roughly 120° apart, and these were partly excavated in the 1968 working season. As has been discussed above, in relation to the Ejecta Studies and the BTLMarker Studies, the initial work consisted of a hand-sorting of the "ejecta" blanket in order to relocate markers which had suffered gross displacement. In the early stages it was assumed that all markers found in the "ejecta" blanket had, indeed, been ejected. Only at a later stage did it become evident that another mechanism was involved. This, however, does not lead to any inconsistency in the data, since no matter how a marker traveled to its final position, the final data obtained were the same—that is to say a surveyed position for the marker, together with, in most cases, field notes describing the nature of the material surrounding the marker. Thus, there is no essential difference in the data relating to a marker whether it be found in true "ejected" position, inside an overturned flap, or still obviously in situ in a sand column, possibly displaced from the original sand column position.

Due to the very incompetent sandy-silts which were involved, it was relatively rare in PRAIRIE FLAT to obtain a large exposed area showing sand columns in situ. In general, both within the "ejecta" blanket, and in the relatively undisturbed ground, the sand column line was excavated a small portion at a time, and the relevant data obtained before moving on to the next element. Only the very early work could be undertaken by handtools alone, and it soon became necessary to use a variety of heavy equipment, including a large backhoe, small backhoe, bulldozer, and scraper. Even after the introduction of this heavy equipment, all the final clearing of the sand columns preparatory to survey was undertaken with handtools. The technique is very closely similar to that of any archaeological "dig". The data obtained are in three parts (a) survey data on relocated markers, (b) survey data on shears in the re-located columns and (c) photographs and field sketches taken as excavation proceeded. In addition, full observations were made upon the stratigraphic pattern encountered throughout the excavation.

Appendix D, Tables D1 and D2, give the survey data on marker cans as obtained for the two lines of sand columns. These are the essential raw data upon which quantitative correlation is based.

Some of the deductions from these data, and certain graphical summaries of parts of the data are given in the next section.

Basic Correlations It is obvious that the data presented in Appendix D are capable of being presented in many different ways, each of which will throw light upon some specific facet of the crater morphology. In this section, some of the more basic, and general interpretations are presented. In later sections, more specific relationships with such data as the stratigraphic succession are presented separately where they serve to emphasise detailed interpretation.

The sand columns themselves, independent of the markers, indicate the pattern of gross displacement and shearing in the ground. This was the original purpose of the sand column technique when it was introduced in its simplest form by Perkins (1954). Figs. 29 and 30 show respectively, the sand column patterns on the south and east lines, from the extreme outer columns to the columns which ended up in the crater "rim". Excavation of the central regions is not yet complete. It should be noted that throughout this report the sand column on a bearing of 217° is called "South" while that on a bearing of 127° is called "East". This inexact terminology is too well entrenched to be changed at this late stage and should not lead to confusion.

In Fig. 29, which shows the south line, column S-2 illustrates the situation where a column has suffered little displacement at depth, but in which the top few feet have been displaced radially outward, partly by discrete small shears, and partly by a bulk movement of the whole upper zone. (It should perhaps be stressed that in all cases, only information on the final position is available. Greater movements may have occurred during the formation of the crater.)

As we move in towards the crater, the pattern of motion is consistent with that in column S-2, but there is an increasing degree of "smearing" of the tops of the columns radially outwards.

The term "smearing" is used at this time to avoid any suggestion that the mechanism is defined as, for example, a shear. It will be noted that in the figure the upper markers in each column are connected by a dotted line, rather than the continuous line used for marking the lower parts of the columns. Initially, there was some doubt as to whether the upper markers had moved integrally with the columns, or had been "ejected". This could not be determined until the total column had been excavated, even though it was found almost immediately that a continuous filament of dyed material from the sand columns connected the markers from a given column.

On PRAIRIE FLAT the sand column technique was improved slightly by changing the dye colour in the immediate vicinity of every marker. Thus as the excavations followed a dye filament in the ground, the approach to a marker was indicated by a change in the colour of the dye trace.

In several locations in Figs. 29 and 30 a marker can is indicated as "missing". In many cases these cans were found, but the excavators recognised that they had been moved from the correct location by the heavy equipment or by collapse of the excavated wall. In all such cases, the marker is shown as "missing", but it must be recognised that occasionally such an erroneous displacement would not be recognised, leading to a displacement vector obviously inconsistent with the overall pattern. Such vectors are included in all cases.

The final pattern, as shown in Fig.29, tends to indicate that a coherent movement is involved throughout. However, verification of this must depend upon correlation with other data, as shown elsewhere in this report.

It will be seen that, in the case of column S-9, there is a residual outward movement of at least 10 feet at a depth of 20 feet below the original surface.

Presentation of the displaced columns in this way does, of course, reduce the apparent motion to a single plane. While the bulk of the movement is, indeed, planar (that is, radially outward) there is some lateral motion, or "twisting" of the ground. In this way, columns nearer to ground zero can end up with elements which have suffered a greater apparent radial displacement than the column adjacent to it on the side away from GZ. On the planar plot, this will result in an apparent crossing of the columns. It is stressed that this apparent crossing is solely due to the reduction to a single plane, and does not indicate relative movement between the ground and columns.

Fig.30 shows the equivalent plot for the east sand column line. The data are essentially consistent with those from the south line, but for some reason the smearing of the columns radially outward is somewhat more uniform. This increased uniformity may be due to the nature of the ground, which was marginally different in bulk consistency.

Due to the close spacing of the columns, and the large movements involved, it becomes impossible to plot all the displacement trajectories, discretely on a single small drawing similar to Figs. 29 and 30. However, Fig.31 shows the displacement vectors for two of the columns, Nos. S-9 and S-10, in their correct relative position radially, but displaced vertically to separate the vectors. It will be seen that these two columns provide a completely consistent picture of the displacement vectors, showing a radially decreasing amount of "smearing" of the upper layers of the ground. (Large scale plots may easily be produced from the survey data given in this report.)

Notice should be taken of the fact that in both columns there is a tendency for the vectors from the deeper layers to cross the vectors from the shallow layers. Although the evidence is not sufficient from this source alone, the tendency to form an inverted flap is inherent in this relative motion.

It will be noted, further, that the radial displacement shown by the vectors of column S-10 originally at 60 ft from GZ amounts to some 40 ft, rather similar to the displacement suggested by the asphalt strips discussed earlier. If, in fact, the two measurements systems are coherent, there should be a close correlation between the displacement pattern of the asphalt strip, and the displacement vectors of the top two or three markers from each sand column in the same radial range. Complete correlation is not to be expected, since the sand column line differs by a small angle from the asphalt strip, and (as discussed above) there is some twisting or rotary shear in the ground. (The extent of the non-radial motion is indicated in the relevant tables of Appendix B and Appendix D.) Fig.32 is a plot showing the correlation between the 215° asphalt strip and the 217° (south) sand column line markers, restricted to the top three markers of the relevant columns. The gross correlation of the movement patterns is close, but there are quite definite detailed discrepancies. These discrepancies are, however, of a very interesting type, as it will be observed that the displacement vectors again tend to demonstrate an overturning action in the upper layers, with a tendency to form a coherent flap pattern, with the inner and lower elements overlying the outer and upper elements. In the case of the asphalt strip, this action is not evident, but is replaced by the crumpling and overfolding of small zones of asphalt. This is, perhaps, an indication that the asphalt did act as a bonding agent in the limited area covered. If this was the case, one would anticipate that there would be a shearing action alongside the strip, with the strip phenomena being sharper than the phenomena in the ground alongside. This, indeed, occurred, as was demonstrated in Fig.27 and Fig.25. Despite this effect, and the difference in azimuth the total displacement pattern is consistent.

RECOVERY OF DOMINION OBSERVATORY CORE

Immediately after the detonation, it was observed that portions of the outer casing of the Dominion Observatory core were protruding from the central mound. One portion appeared completely detached, and a second portion apparently remained connected to the deeply buried core. Both these sections became buried by the sand brought in by the gushers of water in the following several weeks.

After excavation had proceeded up to the edge of the water filled central regions of the crater, these core sections were recovered by winching and digging with the large backhoe. In addition to these two main sections, several small lengths of core, varying from 1 to 3 feet in length were found during the excavation, apparently pushed down into the ground near ground zero. These small sections were immediately sent to the Dominion Observatory for further study. No trace of the core or its casing was found during the excavation of the "ejecta" blanket.

It is not in the province of the present authors to report upon the scientific data obtained from this experiment. However, the condition of the casing does provide some additional data of interest in the crater formation context.

The top of the main section recovered from the central mound was grossly twisted and compressed, as shown in Fig.33. In addition, the total column recovered was found to be bent into a curve, basically consistent with the pattern of displacement shown by the sand columns farther out. Further, two of the sections of casing had been impacted into each other so that the case above the joint had been swaged outwards into a considerably larger diameter (from 7.25 to 8.5 inches). Such marked deformation of a heavy casing confirms our assumption that any marker cans in this region would be completed destroyed.

No additional data on this experiment are given in this report.

STRATIGRAPHIC STUDIES

Crater Cross Sections   As part of the topographic survey, attention was paid to obtaining as accurately as possible the actual crater cross sections along diameters coincident with the two radial sand column lines. These two sections are plotted in Fig.34, in which each section is shown twice, first without distortion of the vertical to horizontal scale ratio, and secondly with the vertical scale exaggerated.

It is immediately obvious from the nondistorted scale sections that the PRAIRIE FLAT crater was really quite a shallow, wide depression in the ground. This is significant when one is considering the mechanism of formation of the ejecta blanket, since it tends to correct the visual impression of relatively deep excavation and high angle trajectory for the material. When the true scale is considered, it is clear that the ejecta blanket is formed out of the upper few layers in the stratigraphic succession, by an almost horizontal radial smearing of the ground. Also, the central uplift, which is quite a prominent feature visually, is seen to be a relatively small scale effect.

In the exaggerated vertical scale sections, three additional sets of data, previously discussed, are indicated in order to show the interrelationship of the various data sets. In the central region is indicated the approximate situation of the Dominion Observatory core casing in its final position with the curvature indicating a radial shearing action decreasing with depth. In the rim section are shown (a) the final elevation of an asphalt strip and (b) a sample set of displacement vectors from the sand column markers. It should be noted that the Dominion Observatory casing as illustrated consists of a section of the case initially at a depth of between 40 and 50 feet, uplifted into its final position between 10 feet and 20 feet below the ground surface. The data from the topographical survey, asphalt strip survey, sand column survey, and the Observatory core are all consistent with each other.

Although, as we have discussed earlier, the dominant feature of the crater lip is a downwarping rather than an upthrust, it must be recognised that locally distinct upthrust does occur in a narrow band around the crater rim at about 160 ft radius.

Circumferential Cracks and Folds Although circumferential cracking and folding of the ground external to the inner rim of the crater was not a marked feature of PRAIRIE FLAT (in contrast to SNOWBALL), it was nevertheless found that such cracking and folding did occur, in a consistent way. To some extent this has been illustrated in Fig.27, but more detail is shown in Fig.35. In this figure are plotted the surveyed locations of the major folds and cracks found during the excavation of the 120° sector between the asphalt strips, together with the locations of a small number of folds detected elsewhere protruding through the ejecta blanket. The area between the strips at 215° and 163° was studied in detail, and the figure gives full information on the folding and cracking. In the sector between 163 and 129, less attention was paid to this aspect of the survey, and only a representative sample of the features is shown. There was actually little if any difference between the numbers of features in the two sectors, and we may presume that the pattern continues under the ejecta blanket which has not been excavated. The main fold and crack pattern appears to coincide very well with the start of the steep inner slope of the crater, which also coincides with the region of relatively shattered asphalt.

In further contrast to SNOWBALL, no long radial crack was observed, though there were a few minor radial cracks. Even on SNOWBALL, only two long radial cracks were observed, and these were made most evident by the pattern of water emission. It is possible that the radial features do in fact exist on PRAIRIE FLAT. On SNOWBALL it was noted that radial cracks tended to close and become undetectable after a short period except where outlined by sand boils.

The Stratigraphic Sections During the whole of the excavation process, data were obtained on the detailed stratigraphy encountered, quite independently of all the specific survey data relating to preestablished markers. A continuous record was made of all changes in stratigraphy as and when encountered; all major features being surveyed when found. In addition to the survey data obtained in this way, field sketches and colour photographs were taken for later correlation with the survey data and, also with the totality of other data. Wherever it appeared suitable, soil samples were taken for further laboratory correlations.

Obviously, this stratigraphic study was undertaken in stages which were not necessarily ideal for the stratigraphic work. For example, the outer limits of the ejecta blanket were first excavated down to the original ground surface, and at this time it was not suspected that valid correlations would be made between the blanket layers and the subsurface layers. This only became evident when it was found that certain layers in the ejecta blanket were continuous towards the crater centre, despite their very incompetent nature — for example, stringers of free running sand sandwiched between layers of silt. As the work progressed it became more and more certain that the original strata found in the subsurface region were continuously mappable through a folded region of the crater rim — at about 80 to 100 feet from GZ. After passing through this "hinge" region, the individual strata could then be mapped continuously through the "ejecta" blanket to the extreme limits of this blanket. Inevitably, as the material in the blanket came initially from the central circular area of the crater, and was spread out over the large annulus of the "ejecta" blanket, these individual strata were made to thin out. An initial thickness of perhaps 1 or 2 feet could end as thin stringers of less than 1/10 of a foot at the extreme limit of the blanket.

This phenomenon was first recognised at a late stage of excavating the south sand column line, and some confusion was caused by the complexity of the hinge region. This confusion was resolved later, and is discussed in more detail later in this section. Both the nature of the ground, and the existence of preconceptions regarding the nature of the ejecta blanket make it inevitable that some inconsistencies existed in the field observations. Thus, two layers later recognised to be identical, could well be given different key names or numbers at an early stage in the excavation. Only by repeated field correlations, and correlations among survey, photographic, and soils classification data could these inconsistencies be resolved. Nevertheless, the stratigraphic data in this section are essentially original data, independent of all other data.

The resulting stratigraphic section obtained for the south sand column line is shown in Fig.36. It will be seen that remote from the crater the strata remain virtually horizontal. We may take this as representing the predetonation situation throughout the area. Approaching the crater, one encounters the outlying region of the ejecta blanket at about 220 ft, but the strata upon which the blanket lies remain virtually horizontal until a point about 160 ft from GZ, where the ground starts to dip appreciably. At this point the overlying blanket is already about 3 to 4 feet thick, and the major layering pattern can be identified with ease in the field. Two distinct medium grain sand layers acted as clearly defined marker horizons in the blanket in this region, and could be mapped continuously from this point throughout the hinge region until they connected with sand layers in the depressed ground, showing that the blanket consisted primarily of an overturned flap.

At this stage in the excavation and interpretation process, considerable difficulty was found in correlating the field observations in the hinge region from about 100 ft all the way to about 140 ft. It was obvious at this time that on the outside of the hinge, the coherent overturning described above had indeed occurred. However, inside the hinge region, there arose a marked difficulty in interpretation. It was found that there existed zones in which one, two, and three "undisturbed ground surfaces" lay one above the other. While in retrospect, the situation is clear, it must be remembered that during excavation the first "undisturbed" surface encountered was assumed to be the only one. Confusion immediately reigned when a second surface was found, followed by yet a third at greater depth. Due to the friable nature of the excavated wall, no long continuous exposure could be obtained to clarify the situation. In some areas, it appeared that there had been an overturning of strata, while in another region two layers of "undisturbed ground" both in the pre-shot orientation were definitely encountered. This difficulty was not resolved until a much later stage in the total interpretation.

Thus in Fig.36, all the section is direct surveyed data on site, with the exception of a small region in the hinge at 120 ft. This section has been corrected from the original field notes in terms of colour photographs taken of this section. The detail and scale can be interpreted accurately from such photographs, one of which is reproduced in black and white as Fig.37. It now appears that in this hinge region a block of the surface reaching from 120 ft inwards towards the crater, and to a depth of some 3 or 4 feet actually sheared along an almost horizontal line, and moved radially outwards so that there was an overlap of about 20 feet in which the strata repeated themselves in correct order. The inner end of this sheared slab, however, overturned as a part of the generally coherent overturning.

In this sect: , the stratigraphic data and the above interpretation of the hinge region are given in isolation. Later, it is shown that this interpretation is confirmed completely by data on the displacement of markers in the sand columns. It is stressed that true ejecta appear to be limited to a thin layer at the very surface of the section shown. As the nature of this blanket is a principal topic of Project LN 3.03, attention is drawn to the final report on that project.

The section shown refers to data obtained in the 1968 working season. Similar data will become available for the central regions in due course. For the present, we only mention that beyond the limit shown in this section, the strata which are truncated in this section appear to dip back down to form a ring anticline structure.

After completion of the excavation of the south line to this stage, attention was turned to the east line. By this time, the existence of the coherent overturning had been recognised, and attention was concentrated upon this aspect in the stratigraphic study of the east line. In general, the field notes on the stratigraphy of the undisturbed ground are consistent with those for the south line, though there are minor differences where, for example, fine sand on the one section becomes medium sand on the other. Depth correlation is excellent, and one may presume that the differences in nomenclature are partly due to real changes and partly due to differing field classifications in essentially similar material.

Although particular attention was being paid on the east line to the overturning phenomenon, the section shown in Fig.38 is not a single, excavated wall, but a composite of survey and field sketching obtained as the sand column excavation proceeded. This region appeared to be much more finely shattered than the south line, and it was also in the region of one of the "rays" in the blanket, discussed in detail by Roddy in Project LN 3.03. The coherent overturning of the deeper layers, exposed at the top of the blanket and in the outside of the hinge at about 90 ft from GZ was quite easy to follow, and left no room for doubt in its interpretation. However, as on the south line, the inside region of the hinge left room for argument. The interpretation shown in Fig.38 is consistent with all the available data but it is possible that a buckling and thrusting did occur inside the very thick region shown as Sandy Silt and Silty Clay. There is evidence of such a radial thrust in the bulging of the strata, and also in the way some of the deeper strata lens out above the hinge. In fact, no evidence was found to indicate the presence as an overturned layer of the first tan silt layer which underlies the undisturbed surface. In this section, this upper stratum appears to have been scoured away completely in the crater region, and presumably contributed to the true "ejecta". The displacement markers shown in the east sand column plot of Fig.30 confirm in all essentials the pattern of this stratigraphic section, including evidence of a thrust in the hinge region.

TABLE 5 RECOVERY OF 100 MICRON FLUORESCENT COATED GLASS SPHERES

Bearing	Distance from GZ	Number of Spheres
	miles	
70°	1	5
	2	3
	3	13
	4	6
	5	2
	10	0
	15	0
	20	0
	25	2
	30	0
	35	0
90°	1	8
	2	5
	3	1
	3.5	13
	5	6
	10	11
	15	0
	20	3
	27	0
	30	2
	35	4
110°	1	3
	2	9
	3	8
	4	4
	5	4
	10	23
	15	4
	20	2
	25	3
	30	3
	35	3
130°	1	4
	2	6
	3	4
	5	0
	10	missing
	15	5
	20	2
	25	4
	30	1
	35	0

TABLE 6 X-RAY FLUORESCENCE ANALYSIS OF FUSED SPHEROID

SiO_2	Al_2O_3	Fe_2O_3	CaO	K_2O	TiO_2	MnO
65.5	12.3	3.65	1.56	2.20	0.58	0.08

Detailed analysis will be presented by Roddy in the Final Report on Project LN 3.03

TABLE 7 EJECTA RECOVERY FROM METAL COLLECTING PLATES

Position	Distance from GZ	Passing ¼" Screen		Retained on ¼" Screen		Retained on ½" Screen		Retained on 1" Screen		Retained on 2" Screen		Total
	feet	Wt lbs/ft²	Percentage passing	Wt lbs/ft²	Percentage retained	Wt lbs/ft²	Percentage retained	Wt lbs/ft²	Percentage retained	Wt lbs/ft²	Percentage retained	Wt lbs/ft²
A- 7	400	0.190	24.9	0.079	10.4	0.126	16.5	0.153	20.1	0.214	28.1	0.762
-8	450	--		--		--		--		--		--
-9	500	0.016	21.3	0.009	12.0	0.017	22.7	0.033	44.0	--		0.075
-10	600	0.020	33.9	0.007	11.9	0.009	15.3	0.023	38.9	--		0.059
-11	700	0.007	17.9	0.004	10.3	0.021	53.8	0.007	17.9	--		0.039
-12	800	0.007	15.9	0.007	15.9	0.009	20.5	0.021	47.7	--		0.044
-13	900	0.009	14.1	0.003	4.7	0.006	9.4	0.046	71.9	--		0.064
-14	1000	0.010	45.5	0.003	13.6	0.009	40.9	--		--		0.022
-15	1100	0.005	55.6	0.001	11.1	0.003	33.3	--		--		0.009
-16	1100	0.003	3.4	0.005	5.7	0.019	21.8	0.060	69.0	--		0.087
-17	1200	T		0.002	14.3	0.003	21.4	0.009	64.3			0.014
-18	1200	0.002	4.9	0.002	4.9	0.009	22.0	0.028	68.3	--		0.041
B- 7	400	--		--		--		--		--		--
- 8	450	--		--		--		--		--		--
- 9	500	0.015	88.2	0.002	11.8	--		--		--		0.017
-10	600	0.020	66.7	0.002	6.7	0.002	6.7	0.006	20.0	--		0.030
-11	700	0.016	39.0	0.006	14.6	0.005	12.2	--		0.014	34.1	0.041
-12	800	0.009	60.0	0.003	20.0	0.003	20.0	--		--		0.015
-13	900	M		M		M		M		M		M
-14	1000	0.014	66.7	0.006	28.6	0.001	4.8	--		--		0.021
-15	1100	0.013	68.4	0.006	31.6	--		--		--		0.019
-16	1100	0.008	61.5	0.004	30.8	0.001	7.7	--		--		0.013
-17	1200	0.002	40.0	0.003	60.0	--		--		--		0.005
-18	1200	0.003	60.0	0.001	20.0	0.001	20.0	--		--		0.005
C- 7	400	--		--		--		--		--		--
- 8	450	--		--		--		--		--		--
- 9	500	--		--		--		--		--		--
-10	600	0.025	35.7	0.016	22.9	0.023	32.9	0.006	8.6	--		0.070
-11	700	0.030	50.8	0.013	22.0	0.016	27.1	--		--		0.059
-12	800	[illegible]	64.3	0.051	21.4	0.031	13.0	0.003	1.3	--		0.238
-13	900	[illegible]	88.0	0.002	8.0	0.001	4.0	--		--		0.025
-14	1000	[illegible]	83.7	0.004	9.3	0.003	7.0	--		--		0.043
-15	1100	0.013	81.2	0.002	12.5	0.001	6.2	--		--		0.016
-16	1100	[illegible]	84.2	0.003	15.8	--		--		--		0.019
-17	1200	[illegible]	70.6	0.003	17.6	0.002	11.8	--		--		0.017
-18	1200	[illegible]	53.8	0.004	30.8	0.002	15.4	--		--		0.013
D- 7	400	--		--		--		--		--		--
- 8	450	--		--		--		--		--		--
- 9	500	--		--		--		--		--		--
-10	600	[illegible]	37.5	0.003	37.5	0.002	25.0	--		--		0.008
-11	700	0.001	5.3	0.004	21.1	0.003	15.8	0.011	57.9	--		0.019
-12	800	0.003	50.0	0.003	50.0	--		--		--		0.006
-13	900	0.003	50.0	0.003	50.0	--		--		--		0.006
-14	1000	0.001	25.0	0.001	25.0	0.002	50.0	--		--		0.004
-15	1100	T		T		B		B		B		T
-16	1100	T		T		B		B		B		T
-17	1200	T		T		B		B		B		T
-18	1200	T		0.001	33.3	0.002	66.7	--		--		0.003

T - Trace (<0.001 lbs/ft²) M - Missing B - Blank

TABLE 7 (continued)

Position	Distance from GZ	Passing ¼" Screen		Retained on ¼" Screen		Retained on ½" Screen		Retained on 1" Screen		Retained on 2" Screen		Total
	feet	Wt lbs/ft²	Percentage passing	Wt lbs/ft²	Percentage retained	Wt lbs/ft²	Percentage retained	Wt lbs/ft²	Percentage	Wt lbs/ft²	Percentage	Wt lbs/ft²
E- 7	400	M		--		--		--		--		--
- 8	450	M		--		--		--		--		--
- 9	500	M		--		--		--		--		--
-10	600	0.011	25.6	0.004	9.3	0.003	7.0	0.025	58.1	--		0.043
-11	700	0.005	45.5	0.003	27.3	0.003	27.3	--		--		0.011
-12	800	0.006	23.1	0.007	26.9	0.009	34.6	0.004	15.4	--		0.026
-13	900	0.005	29.4	0.006	35.3	0.001	5.9	0.005	29.4	--		0.017
-14	1000	0.002	5.4	0.002	5.4	0.002	5.4	0.001	2.7	0.030	81.1	0.037
-15	1100	0.001	2.6	0.003	7.9	0.003	7.9	0.002	5.3	0.029	76.3	0.038
-16	1100	T		0.001	6.3	0.001	6.3	0.002	12.5	0.012	75.0	0.016
-17	1200	0.005	38.5	0.003	23.1	0.003	23.1	0.002	15.4	--		0.013
-18	1200	0.001	16.7	0.002	33.3	0.003	50.0	--		--		0.006
F- 7	400	--		--		--		--		--		--
- 8	450	--		--		--		--		--		--
- 9	500	--		--		--		--		--		--
-10	600	0.506	30.2	0.200	11.9	0.279	16.6	0.242	14.4	0.451	26.9	1.678
-11	700	0.002	7.7	0.005	19.2	0.014	53.8	0.005	19.2	--		0.026
-12	800	0.046	63.9	0.007	9.7	0.019	26.4	--		--		0.072
-13	900	T		0.002	5.9	0.004	11.8	0.028	82.4	--		0.034
-14	1000	T		0.003	33.3	0.006	66.7	--		--		0.009
-15	1100	0.001	16.7	0.001	16.7	0.004	66.7	--		--		0.006
-16	1100	0.002	25.0	0.003	37.5	0.003	37.5	--		--		0.008
-17	1200	T		T		T		--		--		T
-18	1200	T		T		T		--		--		T
G- 7	400	--		--		--		--		--		--
- 8	450	--		--		--		--		--		--
- 9	500	0.040	63.5	0.002	3.2	0.002	3.2	--		0.019	30.2	0.063
-10	600	0.074	28.9	0.021	8.2	0.011	4.3	--		0.150	58.6	0.256
-11	700	0.076	68.5	0.014	12.6	0.019	17.1	0.002	1.8	--		0.111
-12	800	0.111	65.3	0.024	14.1	0.026	15.3	0.009	5.3	--		0.170
-13	900	0.153	49.5	0.060	19.4	0.077	24.9	0.019	6.1	--		0.309
-14	1000	0.093	31.2	0.041	13.8	0.062	20.8	0.058	19.5	0.044	14.8	0.298
-15	1100	0.025	33.3	0.016	21.3	0.020	26.7	0.014	18.7	--		0.075
-16	1100	0.019	36.5	0.005	9.6	0.012	23.1	0.016	30.8	--		0.052
-17	1200	0.015	48.4	0.005	16.1	0.011	35.5	--		--		0.031
-18	1200	0.005	25.0	0.003	15.0	0.012	60.0	--		--		0.020
H- 6	375	0.031	14.4	0.021	9.7	0.039	18.1	0.079	36.6	0.046	21.3	0.216
- 7	400	M		M		M		M		M		M
- 8	450	0.030	50.8	0.007	11.9	0.008	13.6	0.014	23.7	--		0.059
- 9	500	0.00[illegible]	28.6	0.003	42.9	0.002	28.6	--		--		0.007
-10	600	0.020	10.2	0.030	15.3	0.056	28.6	0.090	45.9	--		0.196
-11	700	0.023	34.8	0.014	21.2	0.010	15.2	0.019	28.8	--		0.066
-12	800	0.002	25.0	0.003	37.5	0.003	37.5	--		--		0.008
-13	900	0.001	20.0	0.002	40.0	0.002	40.0	--		--		0.005
-14	1000	0.001	7.1	0.003	21.4	0.004	28.6	0.006	42.9	--		0.014
-15	1100	T		T		T		--		--		T
-16	1100	0.00[illegible]	10[illegible].0	T		T		--		--		0.002
-17	1200	T		T		0.001	33.3	0.002	66.7	--		0.003
[illegible]	1200	0.012	40.0	0.007	23.3	0.005	16.7	0.006	20.0	--		0.030

T - Trace (<0.001 lbs/ft²) M - Missing

10

TABLE 8 EJECTA RECOVERY FROM ASPHALT STRIPS

Position	Distance from GZ	Passing ¼" Screen		Retained on ¼" Screen		Retained on ½" Screen		Retained on 1" Screen		Retained on 2" Screen		Total
	feet	Wt lbs/ft^2	Percentage passed	Wt lbs/ft^2	Percentage retained	Wt lbs/ft^2	Percentage retained	Wt lbs/ft^2	Percentage retained	Wt lbs/ft^2	Percentage retained	Wt lbs/ft^2
A-250	250	0.22	1.7	0.81	6.1	1.76	13.3	1.54	11.7	8.87	67.2	13.20
-240	240	0.82	7.2	1.22	10.7	2.12	18.6	2.35	20.7	4.86	42.7	11.37
-230	230	0.56	4.5	0.87	6.9	1.46	11.7	1.30	10.4	8.33	66.5	12.52
-220	220	3.98	8.2	4.95	10.2	5.40	11.1	5.10	10.5	29.23	60.1	48.66
-210	210	2.79	4.3	5.23	8.1	8.31	12.8	8.91	13.7	39.59	61.1	64.83
-200	200	4.80	6.8	6.18	8.7	7.04	9.9	7.37	10.4	45.54	64.2	70.93
-190	190	2.92	6.8	5.43	12.6	5.30	12.3	4.65	10.8	24.68	57.4	42.98
-180	180	0.90	3.1	3.93	13.5	4.11	14.1	2.91	10.0	17.36	59.4	29.21
-170	170		No sieve	measurements	taken							37.84
-160	160		No sieve	measurements	taken							76.32
-150	150		No sieve	measurements	taken							285.00
-140	140		No sieve	measurements	taken							451.25
-130	130		No sieve	measurements	taken							475.00
-120	120		No sieve	measurements	taken							570.00
-110	110		No sieve	measurements	taken							475.00
B-250	250	--		0.20	28.6	0.08	11.4	0.05	7.1	0.37	52.9	0.70
-240	240	0.16	9.2	0.12	6.9	0.09	5.2	0.13	7.5	1.24	71.3	1.74
-230	230	1.04	38.5	0.40	14.8	0.31	11.5	0.22	8.1	0.73	27.0	2.70
-220	220	0.12	3.4	0.78	22.3	0.71	20.3	0.63	18.0	1.26	36.0	3.50
-210	210	4.56	21.4	1.68	7.9	3.02	14.2	2.94	13.8	9.12	42.8	21.32
-200	200	4.56	12.5	4.21	11.5	5.52	15.1	4.40	12.0	17.93	49.0	36.62
-190	190	7.67	18.7	7.50	18.3	7.20	17.6	6.45	15.7	12.16	29.7	40.98
-180	180	8.13	11.1	6.16	8.4	7.27	9.9	7.42	10.1	44.19	60.4	73.17
-170	170		No sieve	measurements	taken							320.00
-160	160		No sieve	measurements	taken							240.00
-150	150		No sieve	measurements	taken							303.60
-140	140		No sieve	measurements	taken							427.50
-130	130		No sieve	measurements	taken							456.00
-120	120		No sieve	measurements	taken							693.50
-110	110		No sieve	measurements	taken							807.50
C-250	250	0.14	5.3	0.12	4.5	0.21	8.0	0.37	14.0	1.80	68.2	2.64
-240	240	0.34	8.9	0.44	11.5	0.57	15.0	0.54	14.2	1.92	50.4	3.81
-230	230	--	--	0.90	14.6	0.95	15.4	1.06	17.2	3.26	52.8	6.17
-220	220	--	--	3.08	7.7	4.48	11.2	6.04	15.1	26.40	66.0	40.00
-210	210	4.32	15.7	3.60	13.1	3.40	12.4	2.54	9.2	13.60	49.5	27.46
-200	200	3.02	15.3	2.76	14.0	2.56	13.0	2.40	12.2	9.00	45.6	19.74
-190	190	4.42	4.9	6.44	7.1	6.20	6.9	8.00	8.9	65.33	72.3	90.39
-180	180	1.12	3.4	2.40	7.4	3.52	10.8	4.22	13.0	21.24	65.4	32.50
-170	170	5.12	5.1	5.28	5.3	8.76	8.8	9.92	10.0	70.44	70.8	99.52
-160	160		No sieve	measurements	taken							106.80
-150	150		No sieve	measurements	taken							224.40
-140	140		No sieve	measurements	taken							--
-130	130		No sieve	measurements	taken							633.65
-120	120		No sieve	measurements	taken							672.60
-110	110		No sieve	measurements	taken							760.00

TABLE 9 DETAILS OF KEY POINTS FOR PHOTO LEVELLING

Position #1	Position #2	Bearing Degree	Min	Sec	Distance feet	Elevation feet	Description of Position #2
Instrument at 900.0 ft on South Can Line (Bearing 217°00") and 0°00" on GZ							
Start	A	07	31	30	223.15	2165.16	Asphalt pad - line intersection behind mount
A	B	254	24.	57	284.86	65.99	Location - centre of hole - elevation 3 ft South
A	C	260	12	35	275.44	65.95	South end of concrete piece - South of road
C	D	138	07	37	363.24	66.13	Northwest corner of collection plate - South of road
D	E	81	09	39	197.39	66.76	Southeast corner of collection plate - North of road
E	F	235	39	35	218.08	67.37	South generator pit - side toward GZ
F	G	259	51	45	337.87	67.87	Southeast corner - second plate from road
G	H	48	12	02	332.55	66.40	Southwest corner - double gauge mount
H	I	205	21	00	221.19	66.19	Northwest corner - collection plate - see plot
I	J	156	02	03	387.13	67.65	South side - concrete circle
J	K	142	55	24	162.57	67.63	Southwest corner collection plate - see plot
K	L	95	39	37	459.80	66.04	Southeast corner - large piece of metal nearest GZ
L	M	242	33	45	461.29	65.27	Southeast corner of structure - see plot
M	N	177	06	22	264.71	62.64	Southwest corner - collection plate
N	O	59	08	05	496.22	65.03	Southwest corner - appears as light square in photo
O	P	153	24	12	249.03	65.62 69.24	Surface) and gauge) centre of steel post
P	Q	273	02	30	189.13	66.15 65.64	Concrete) Southwest corner of large concrete and surface) structure
Q	R	146	33	43	424.21	64.83	Northeast corner - double gauge mount - South of road
R	Start	90	16	54	106.00	--	
Instrument at 135.38 ft on South Can Line 0°00" on GZ (point)							
Point	T	06	24	36	206.50	54.09	Clay fold in crater - northwest side - small lump east of "U"
Point	U	04	13	15	207.00	55.17	Large clay lump above water level in photo

Survey completed October 9, 1968

Figure 13. Oblique photograph of water-filled crater.

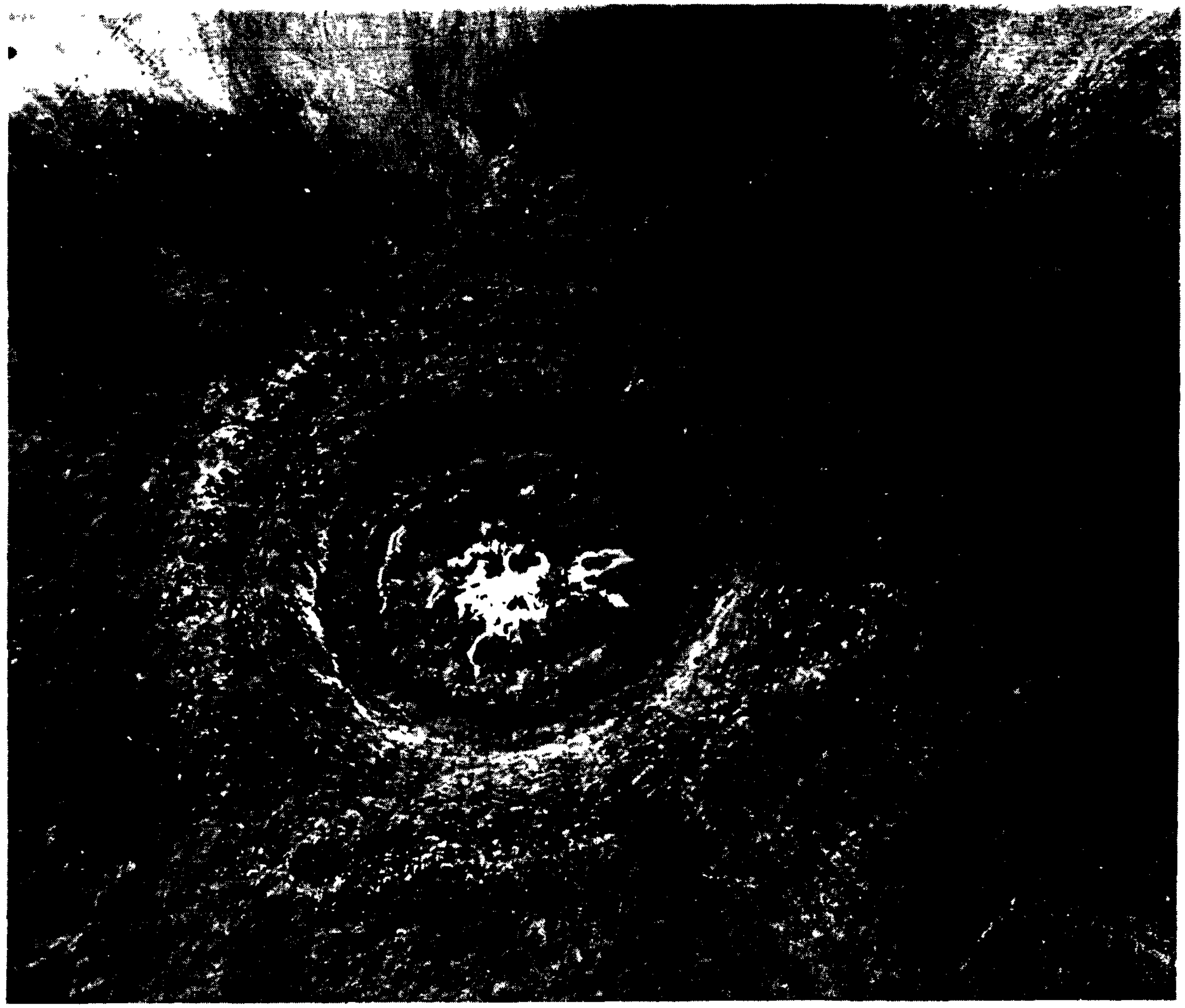


Figure 14. Oblique photograph of crater immediately after shot.

Figure 15. Vertical photograph of crater area.

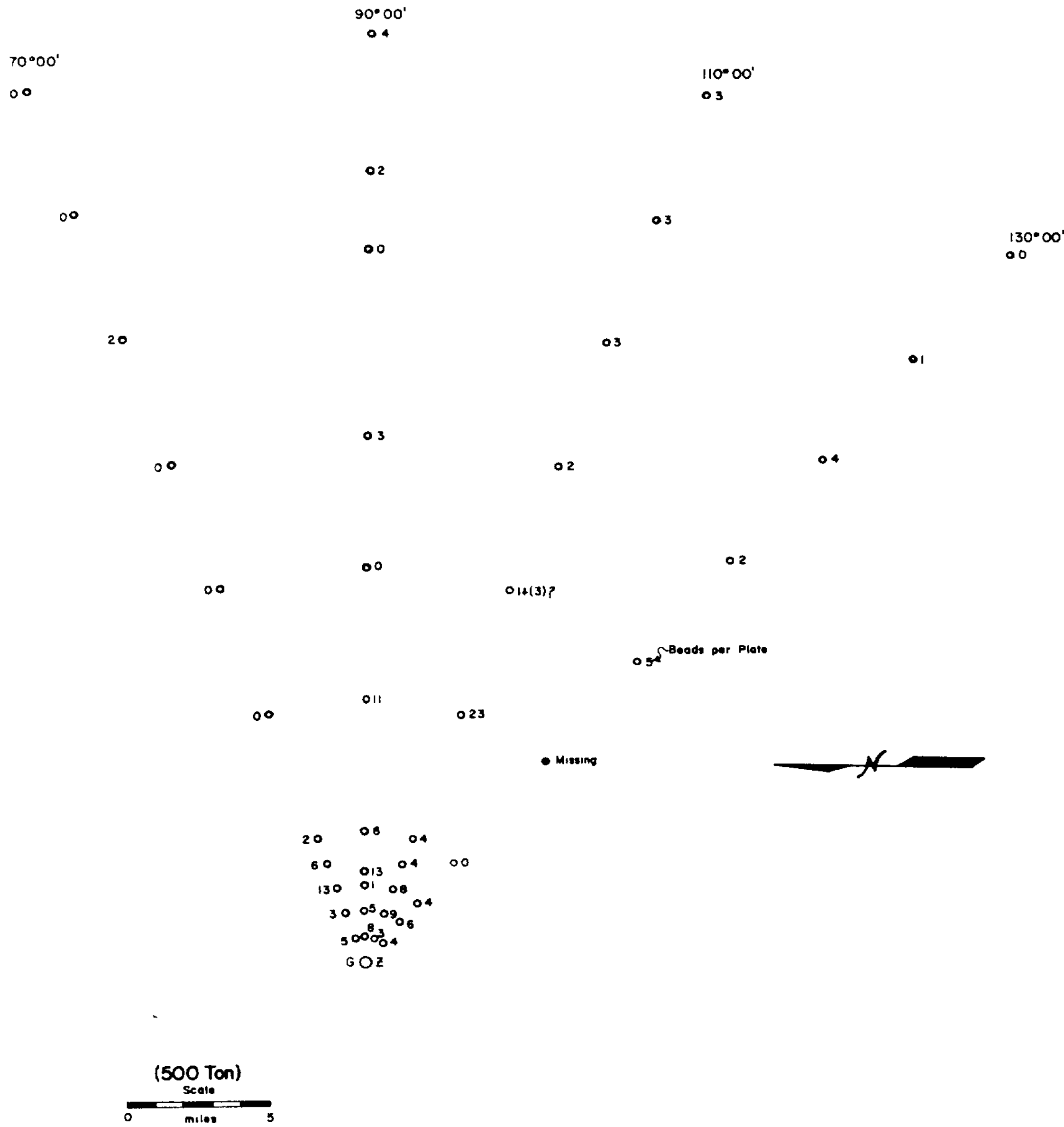
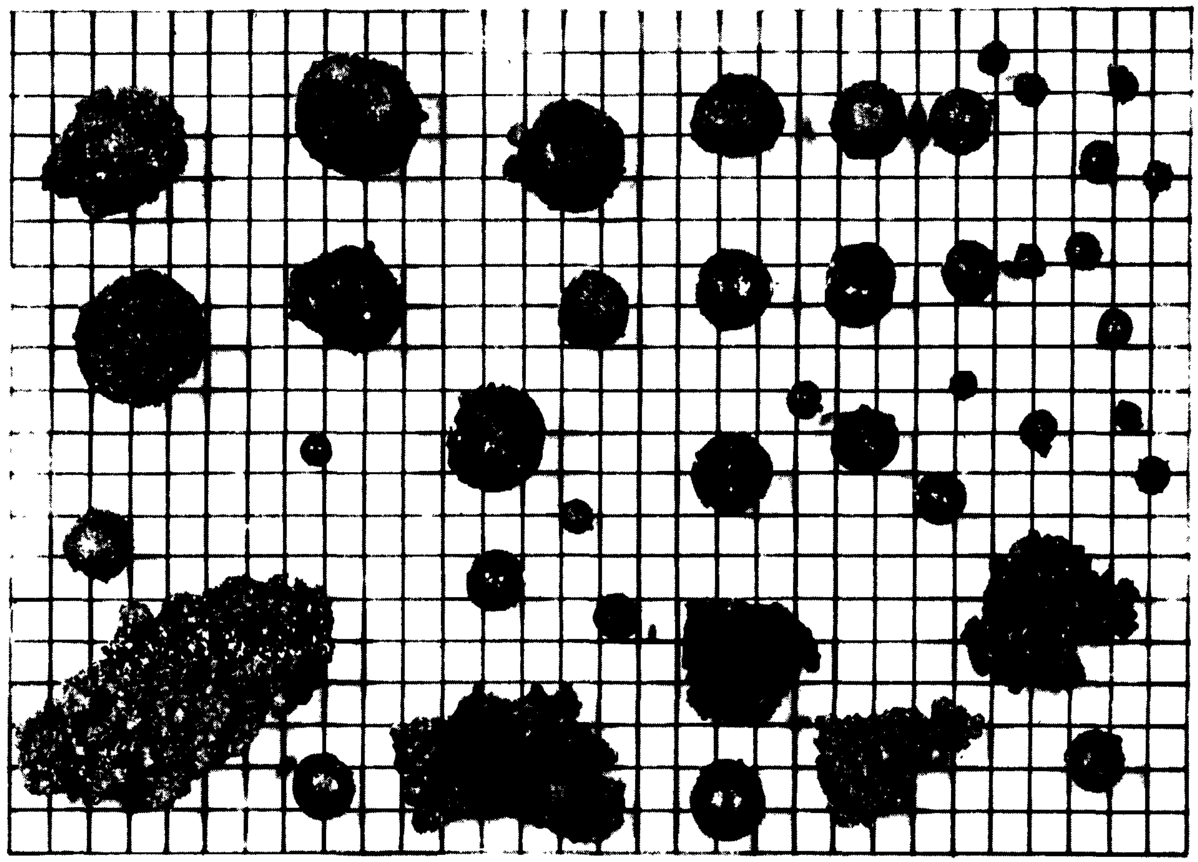


Figure 16. Bead collection layout.



Grid Spacing 1/10 inch

Figure 17. Fused silica spheroids.

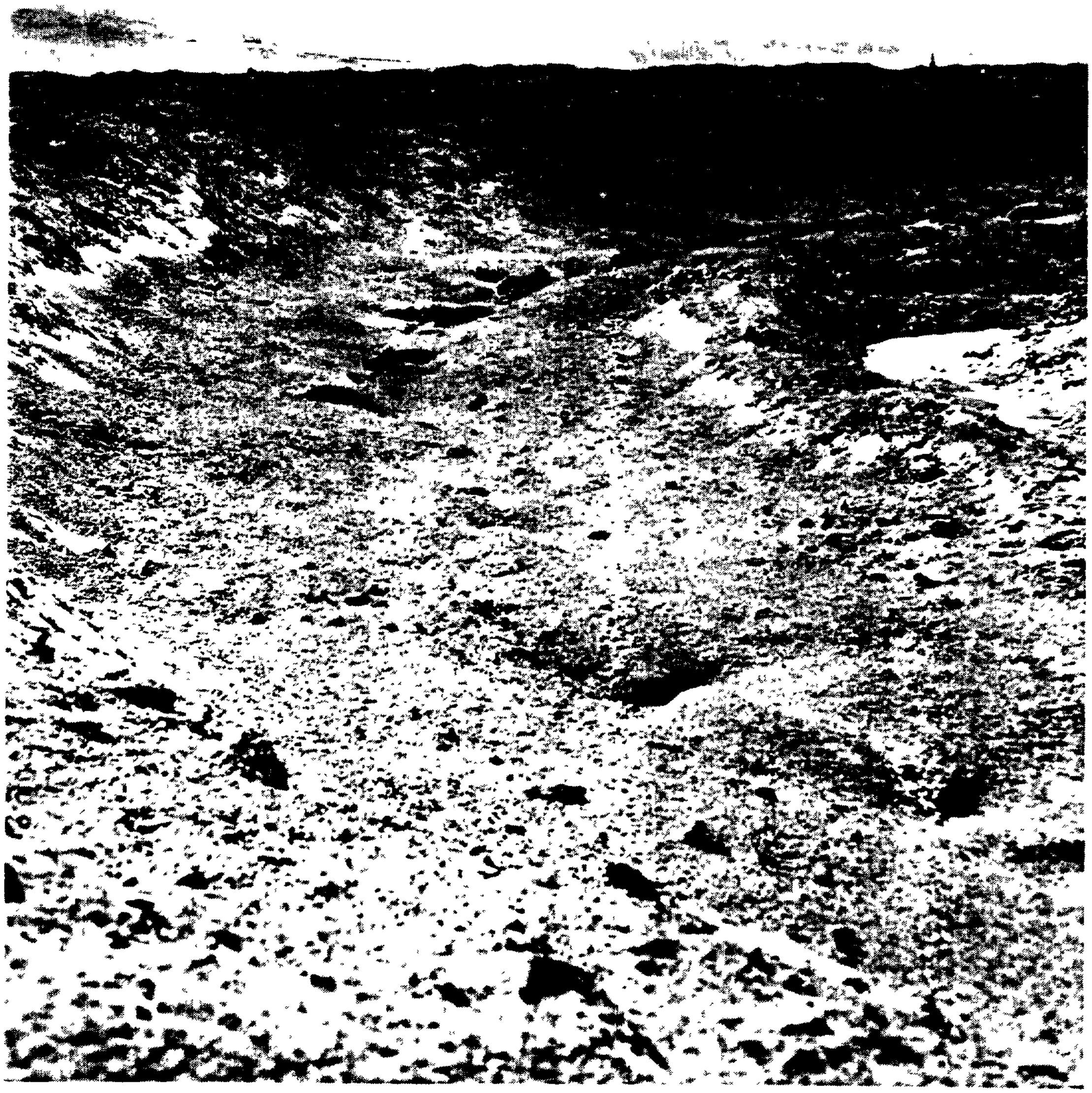


Figure 18. Inner trench in crater.

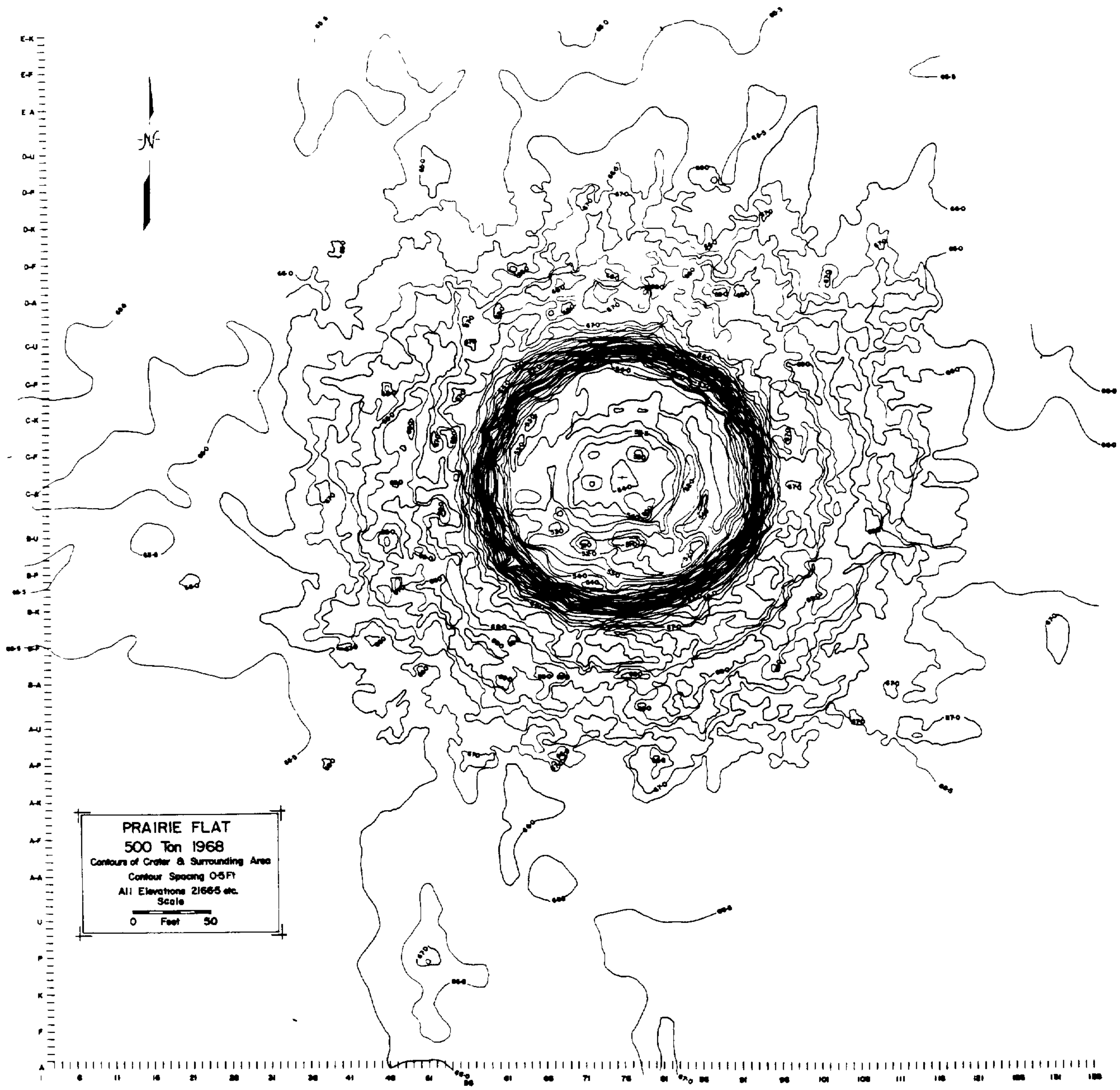


Figure 19. Contours of crater and surrounding area.

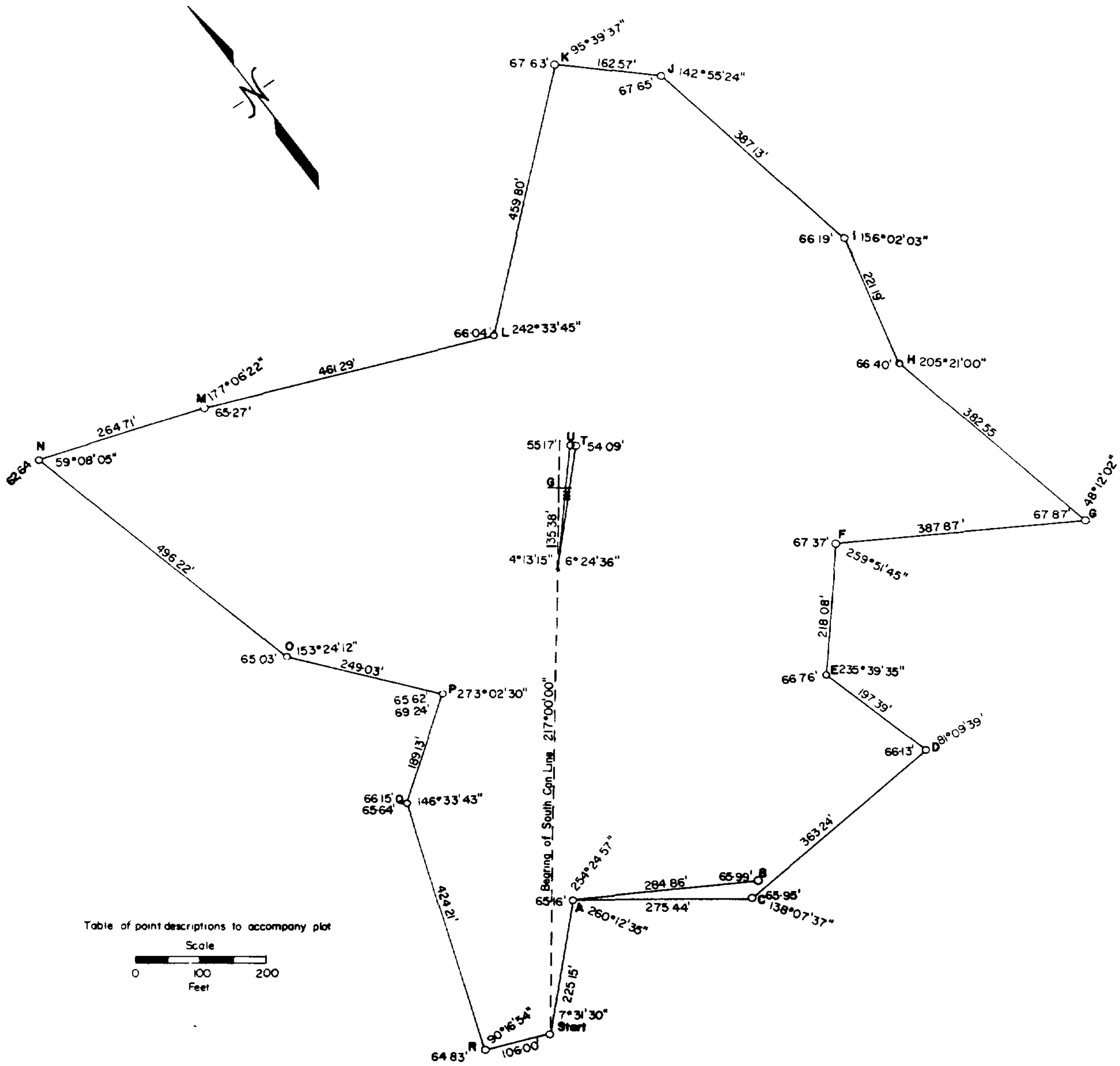


Figure 20. Traverse of PRAIRIE FLAT area for photo leveling.

(a)

(b)

Figure 21. Installation of asphalt strips.

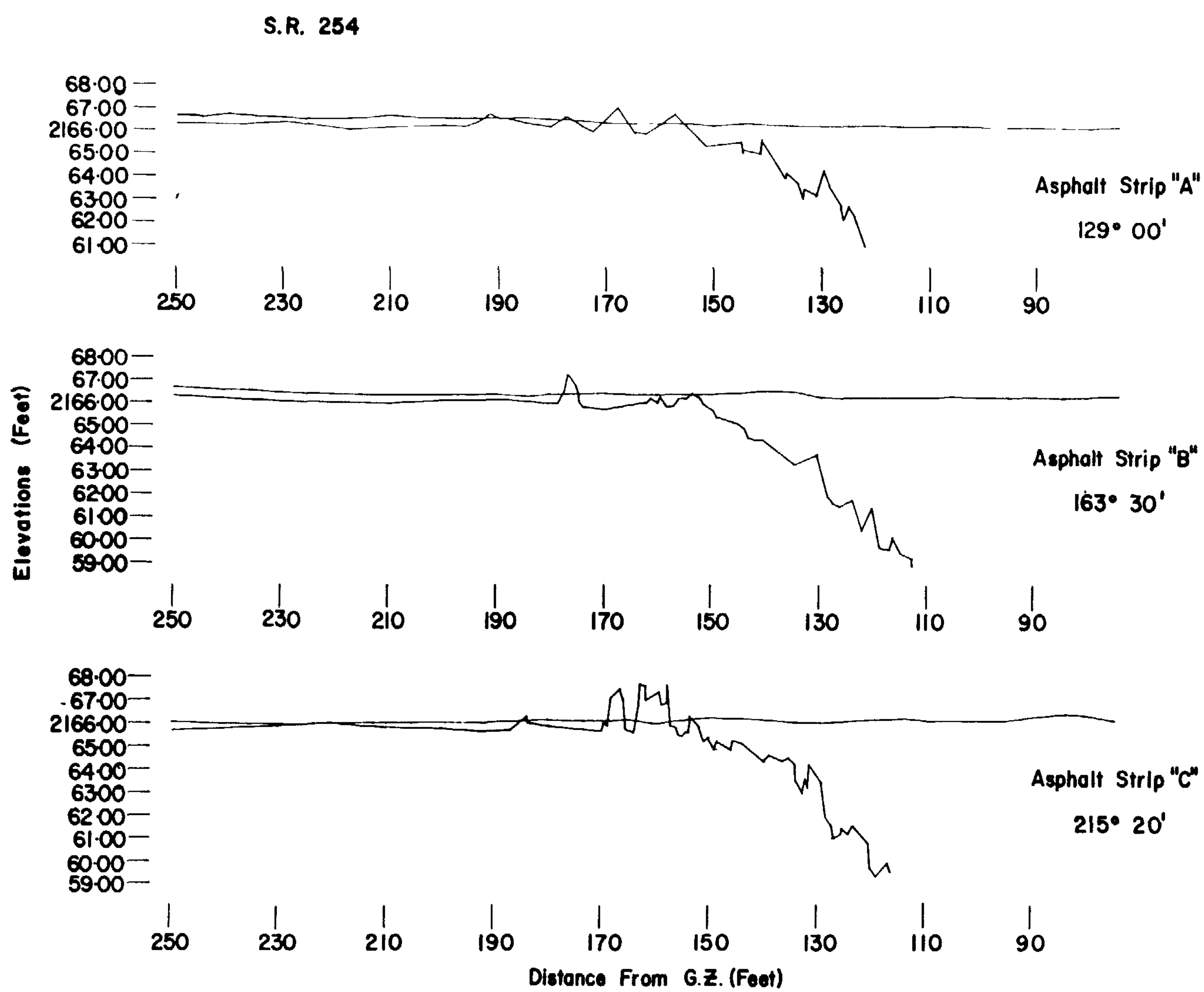


Figure 22. Pre-shot and post-shot elevations of asphalt strips.

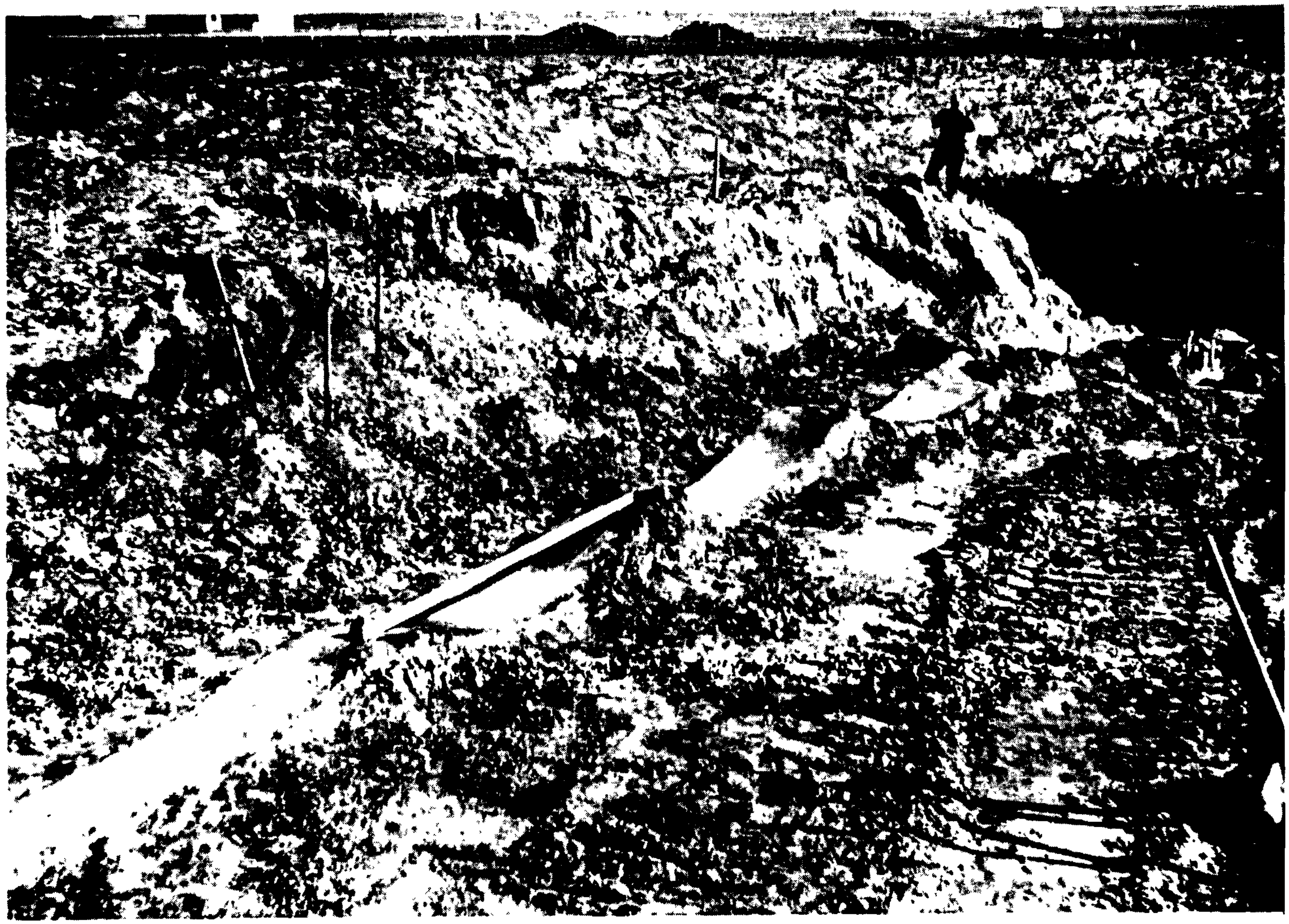
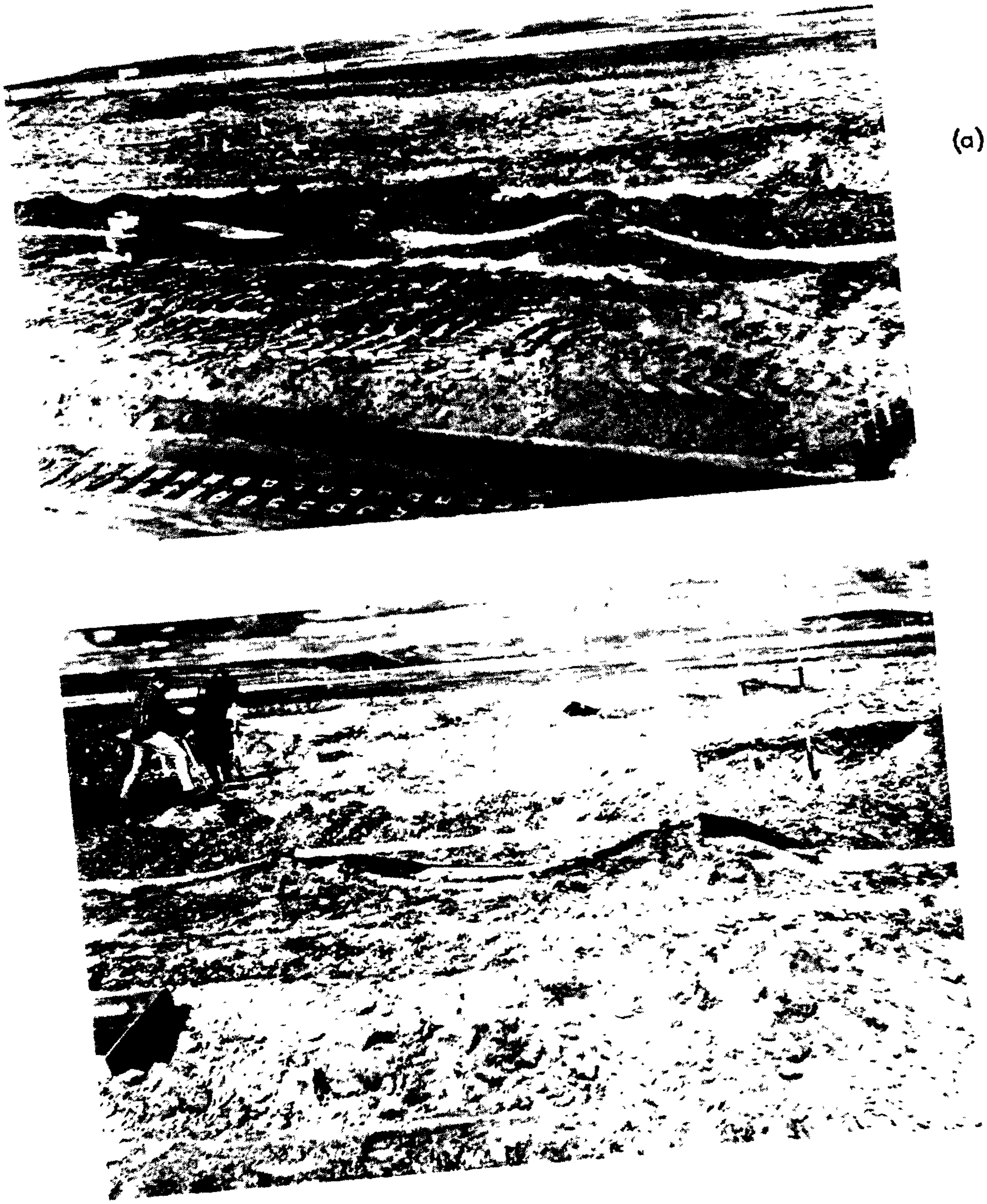


Figure 23. General view of cleared asphalt strip.



(a)

(b)

Figure 24. Side views of wave pattern in strips.

Figure 25. Sharp fold in asphalt.

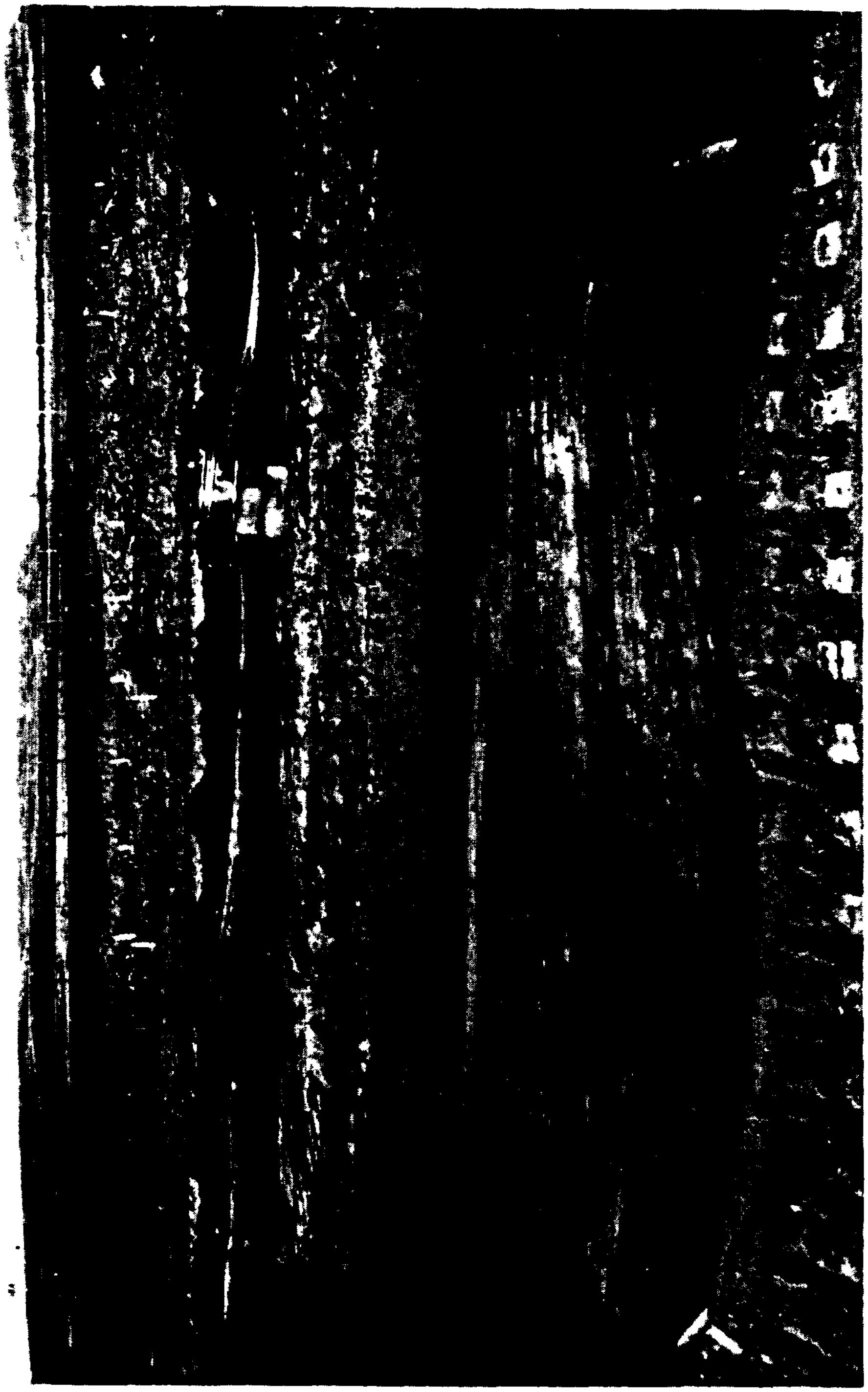


Figure 27. Wave pattern in uncoated surface.

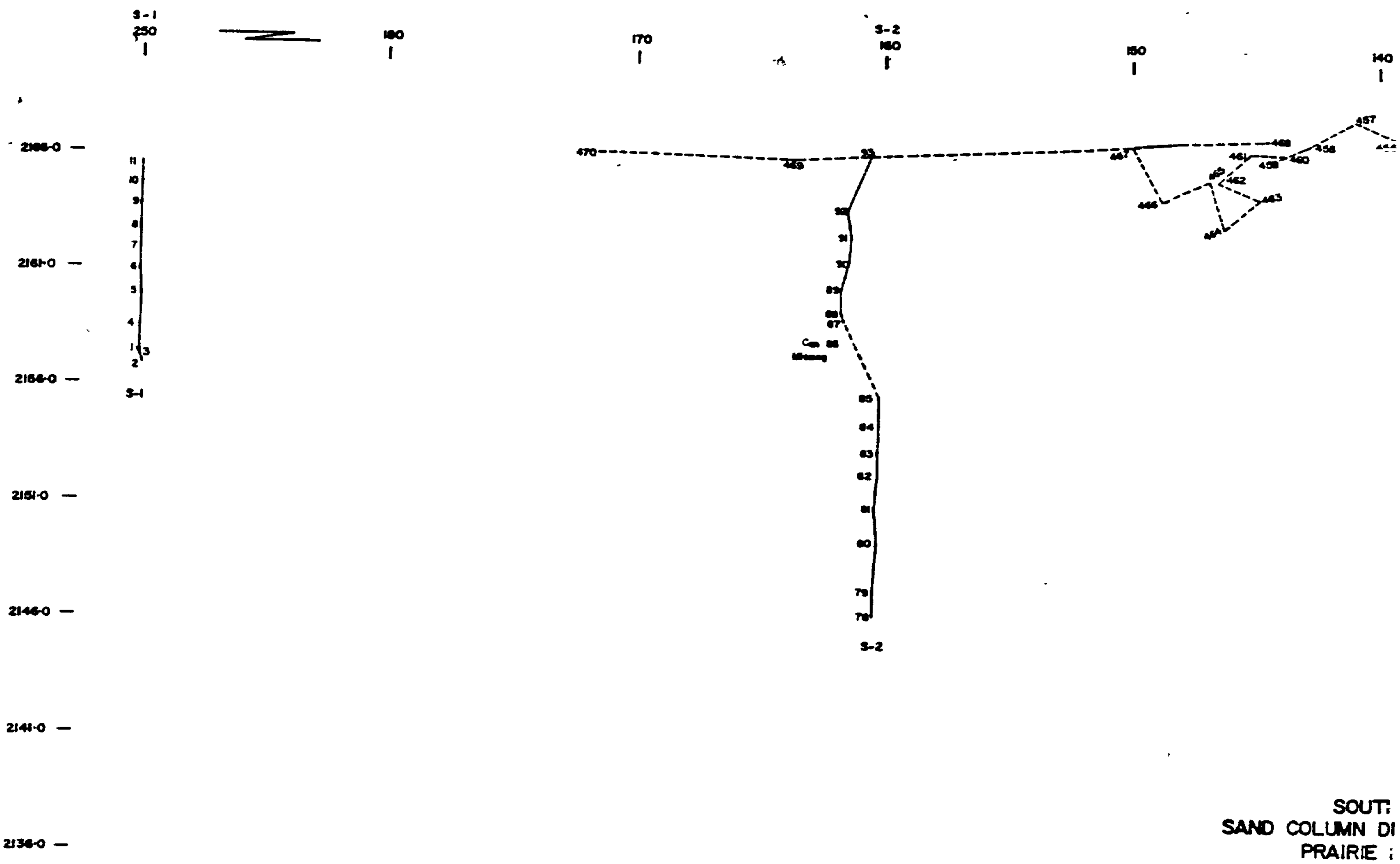
12

Figure 26. Overturned asphalt from sharp fold.

(a)

(b)

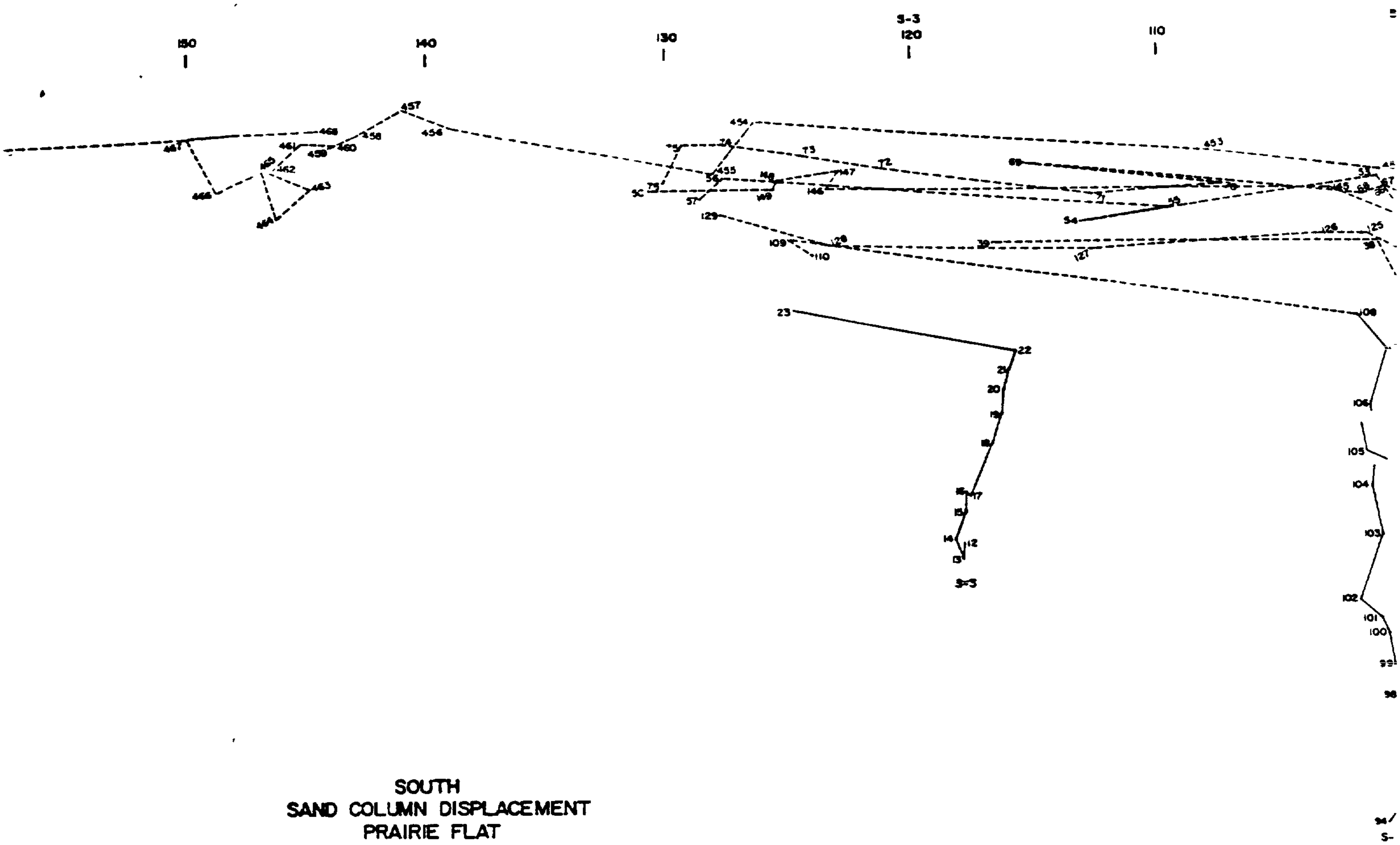
Figure 28. Broken strip in steep inner slope.



SOUT
SAND COLUMN DI
PRAIRIE
(500 To
23=Marker Co
Scale
0 Ft.

Fig. 29

FIG 29-A



SOUTH
SAND COLUMN DISPLACEMENT
PRAIRIE FLAT
(500 Tons)
23=Marker Can Number
Scale
0 Ft. 5

Fig. 29

FIG 29-S

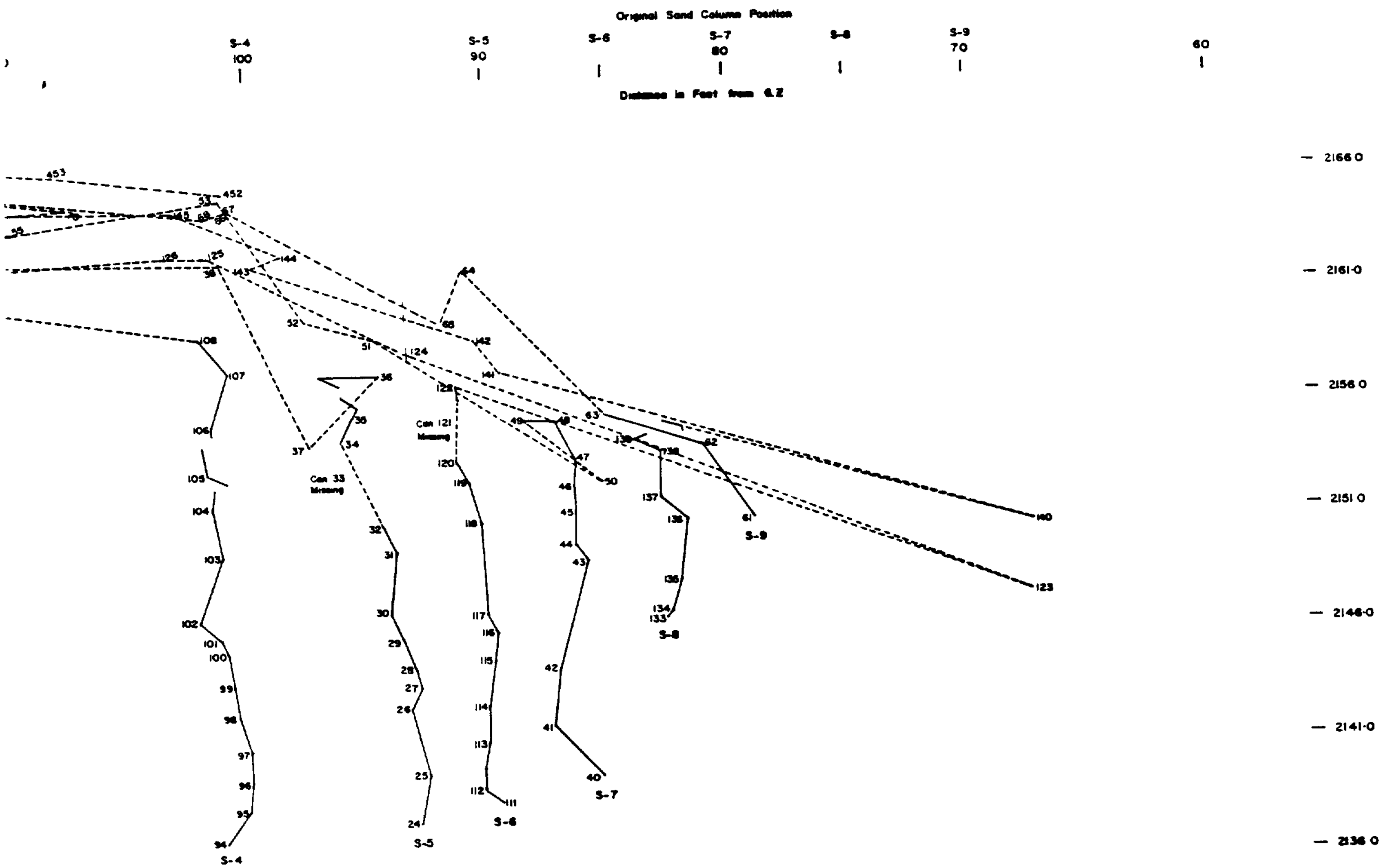


FIG 29-c

Figure 29. South sand column displacement.

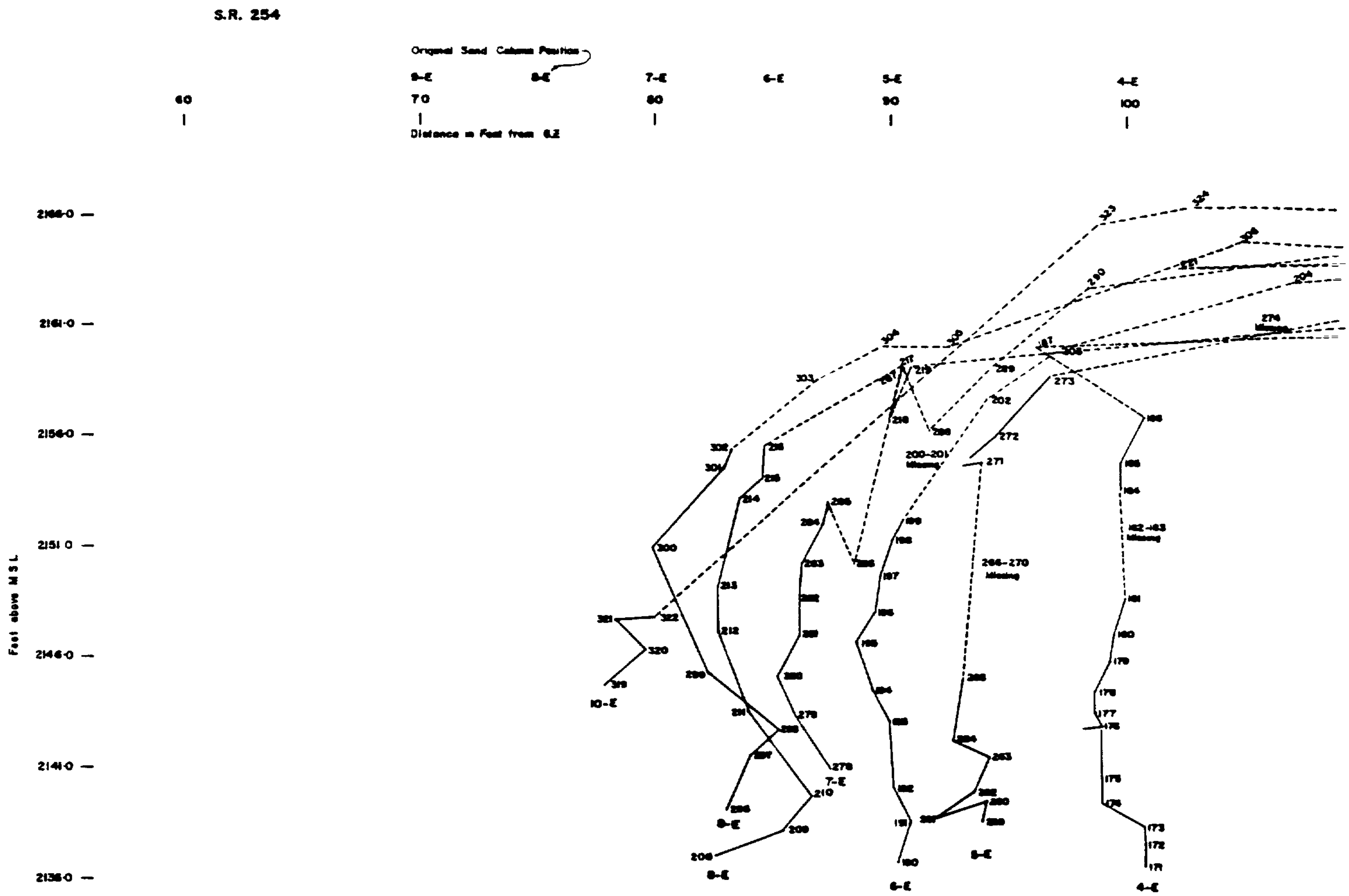


FIG. 30-A

Figure 30. East sand column displacement.

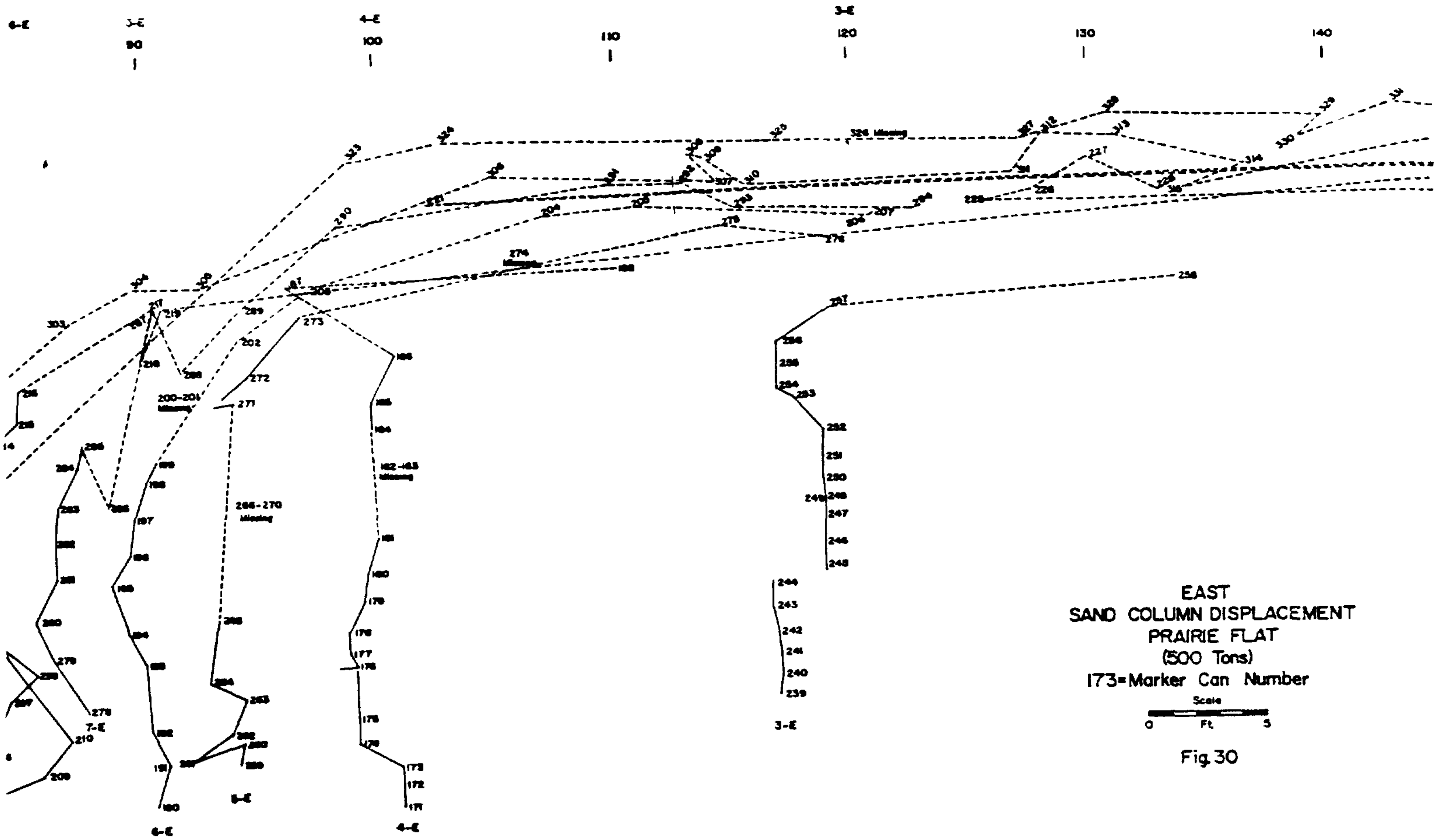


Fig. 30

FIG 30-B

ent.

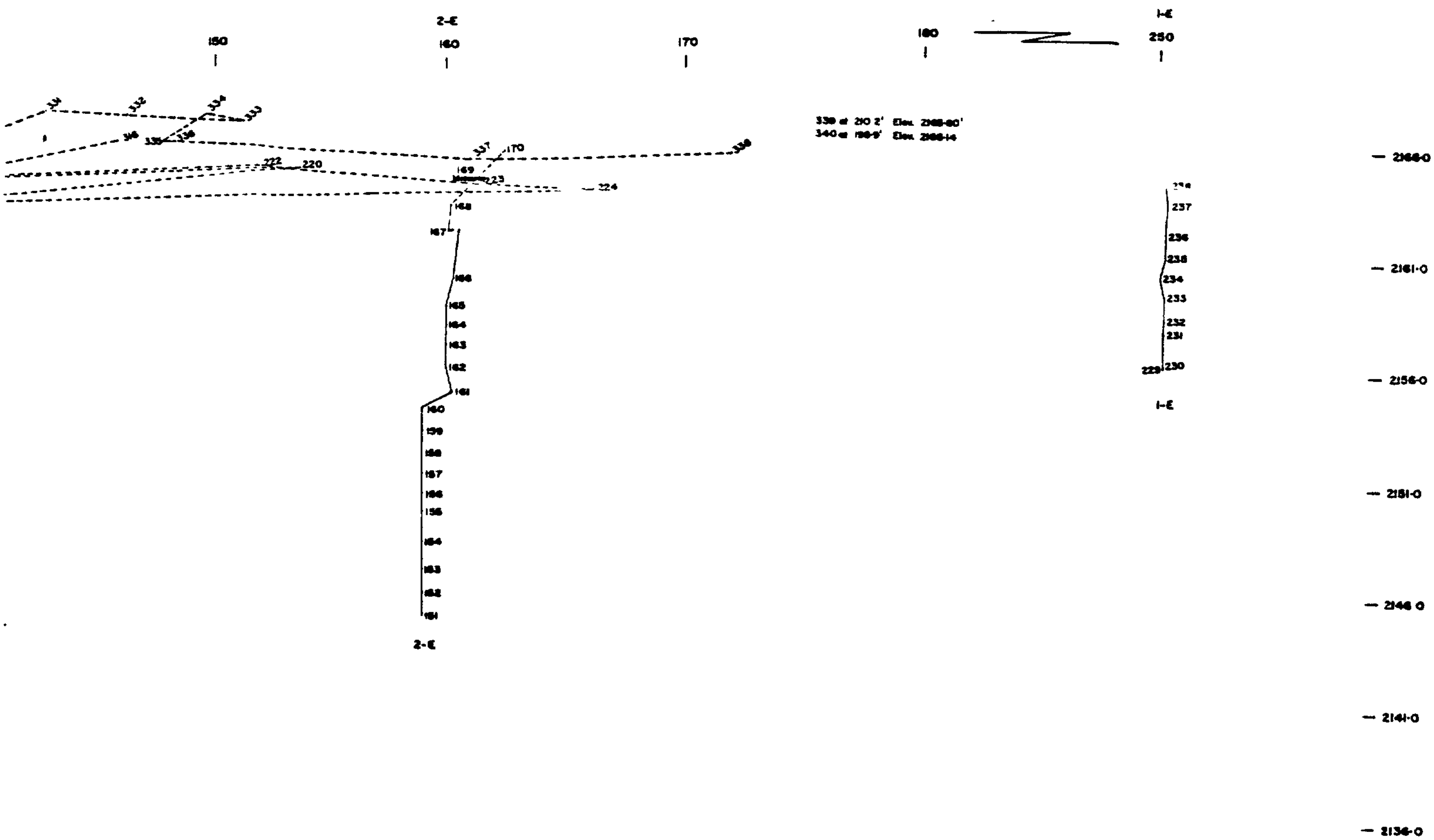


FIG 30-C

S.R. 254

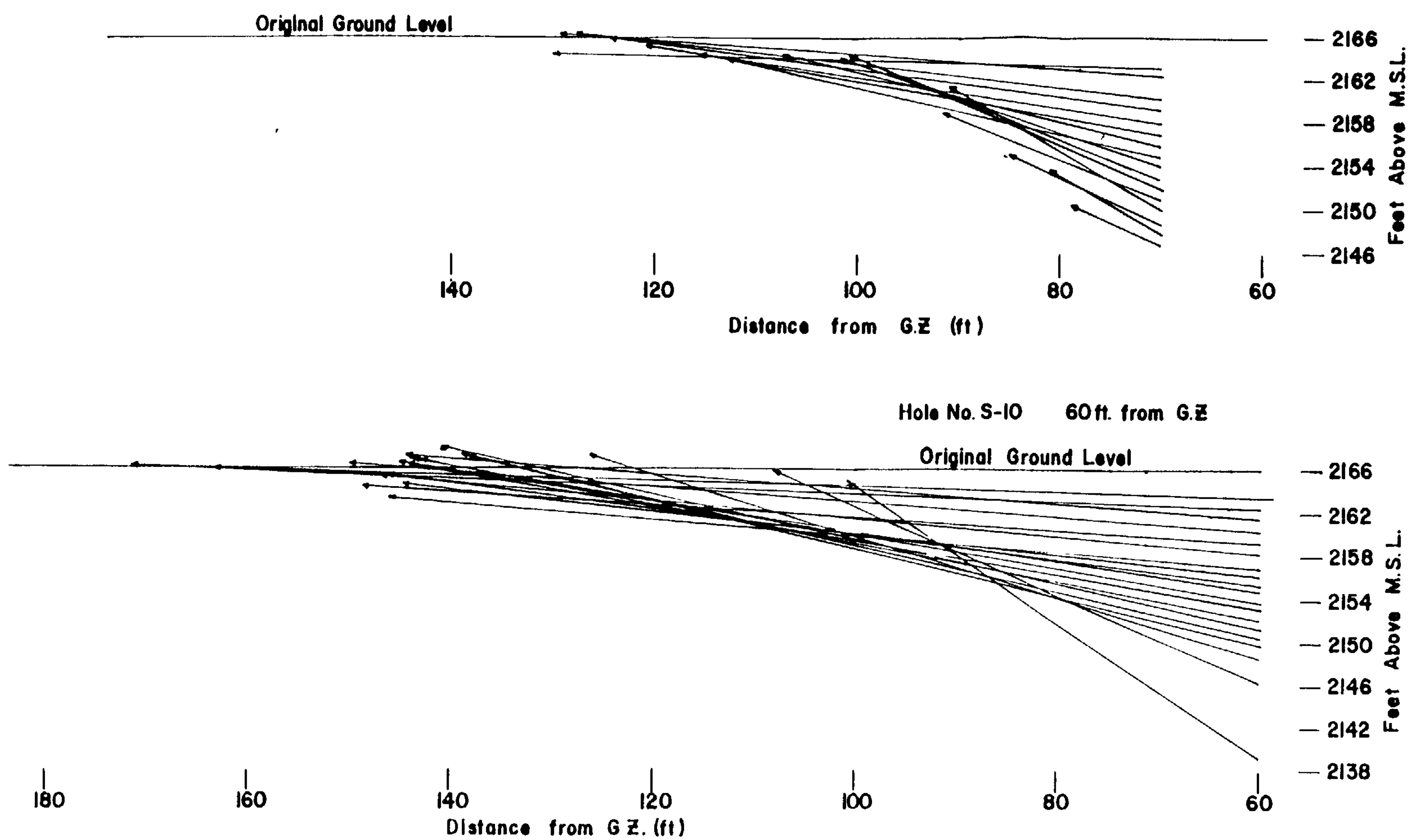


Figure 31. Displacement vector from adjacent columns.

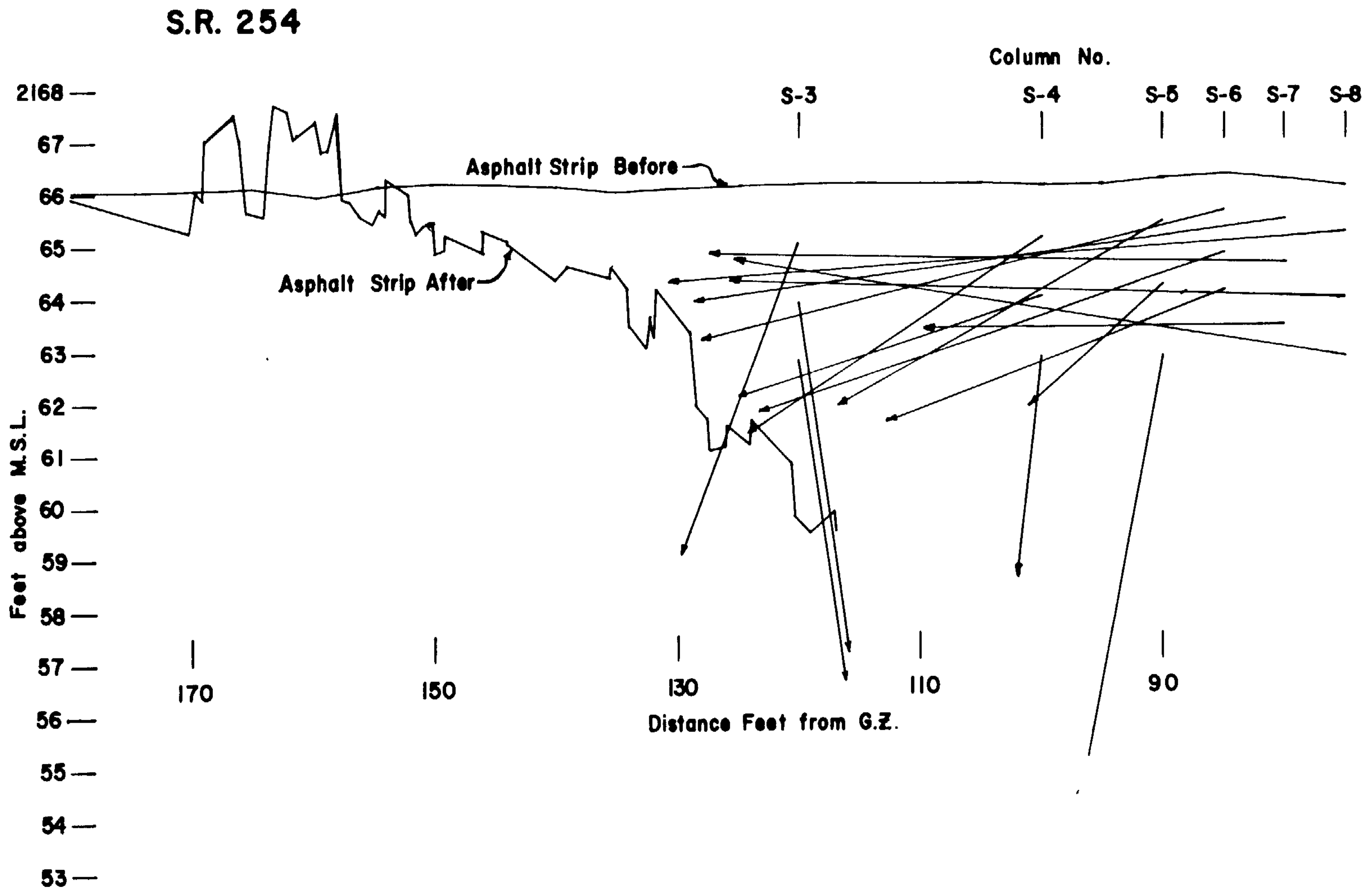


Figure 32. Correlation of asphalt and column markers.

Figure 33. Distorted core casing.

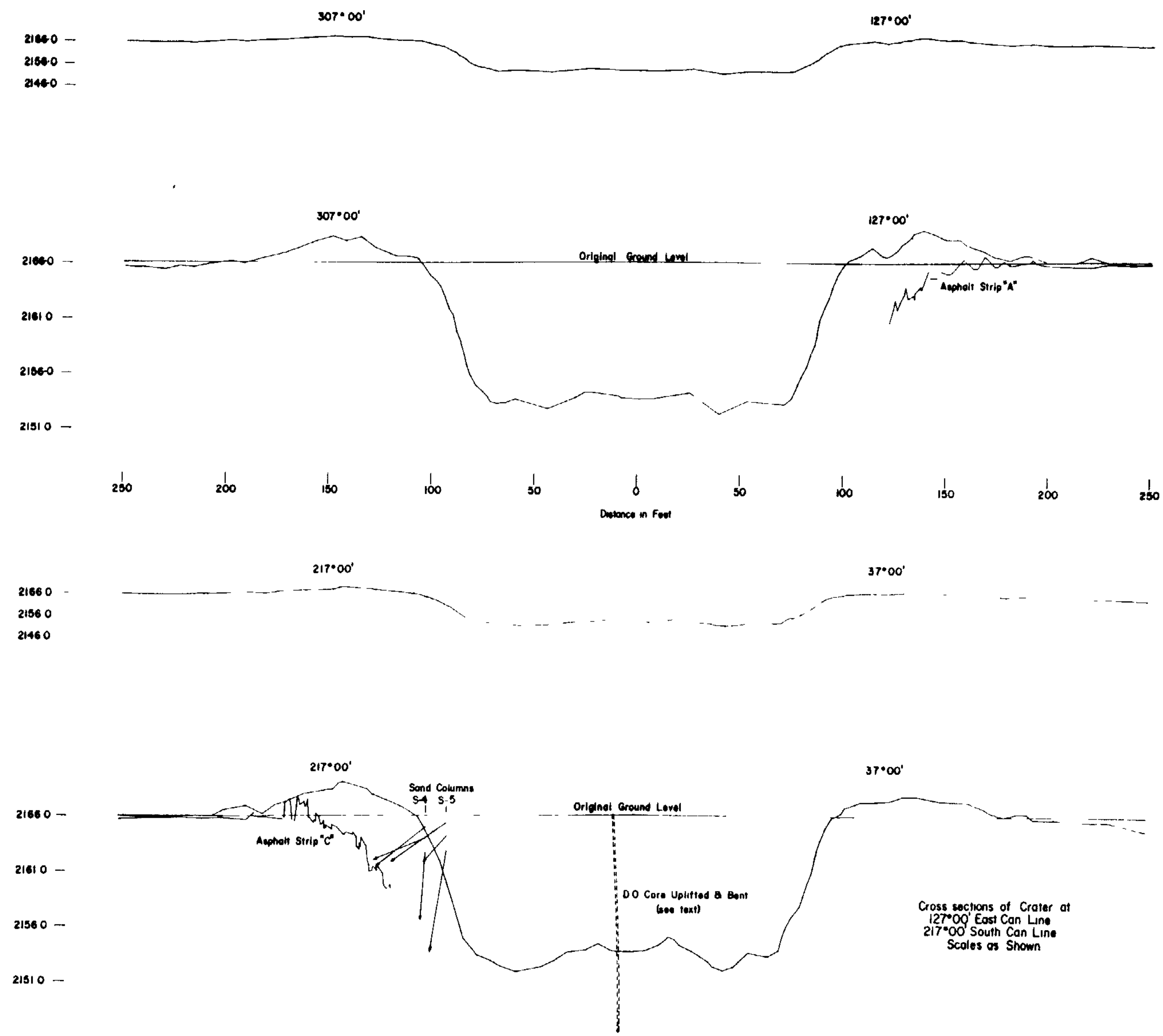


Figure 34. Gross sections of crater.

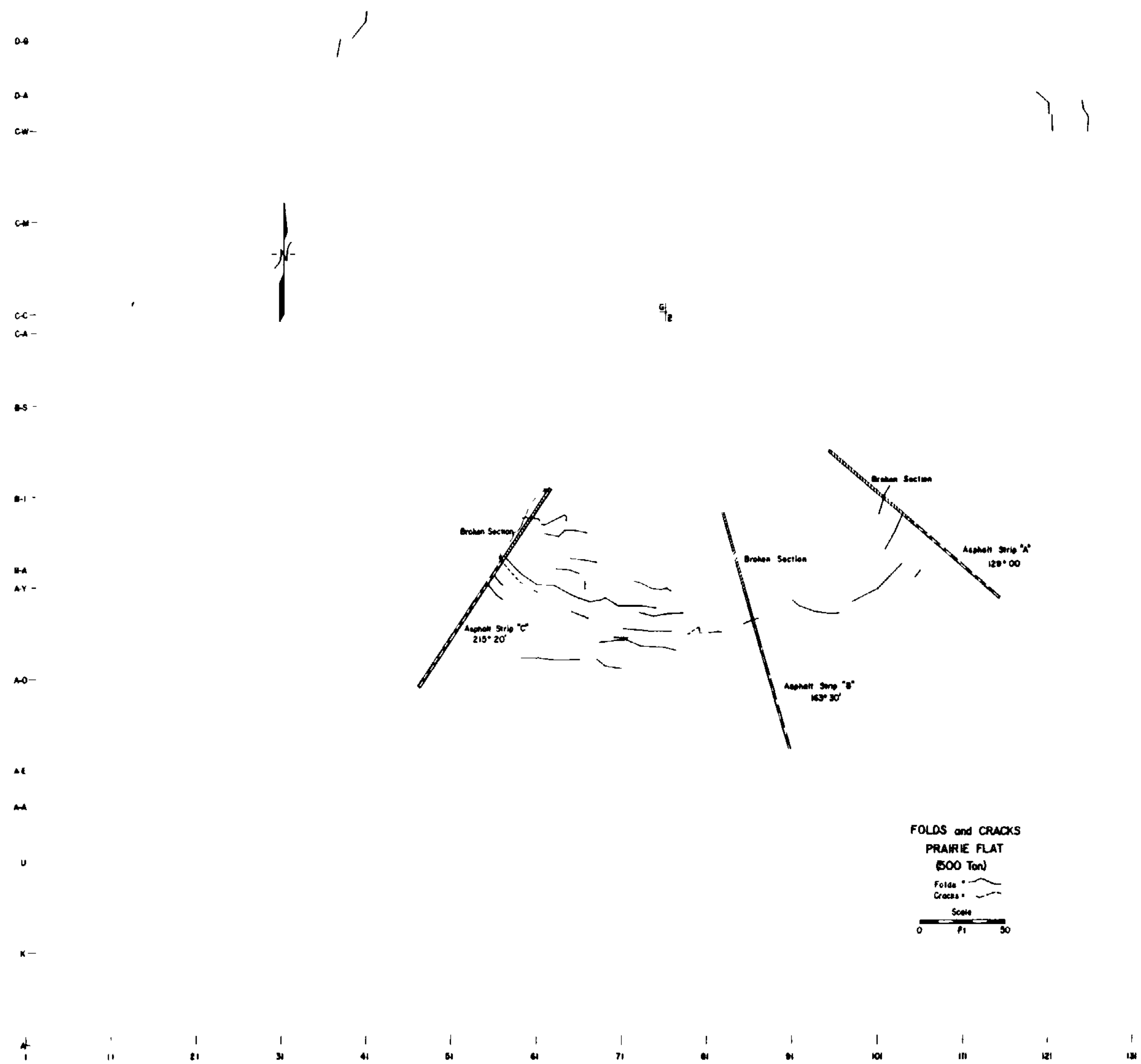


Figure 35. Folds and cracks, PRAIRIE FLAT.

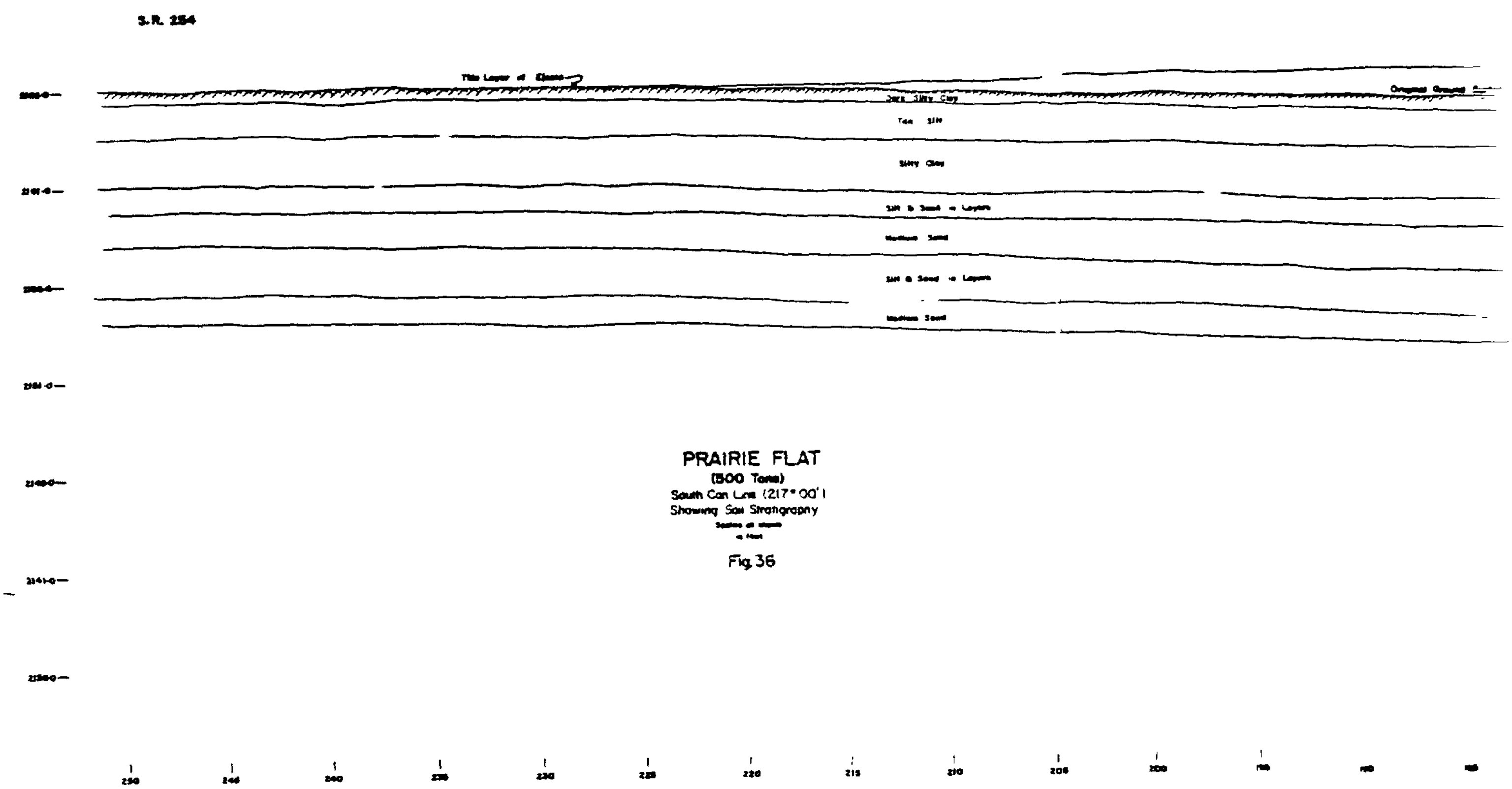
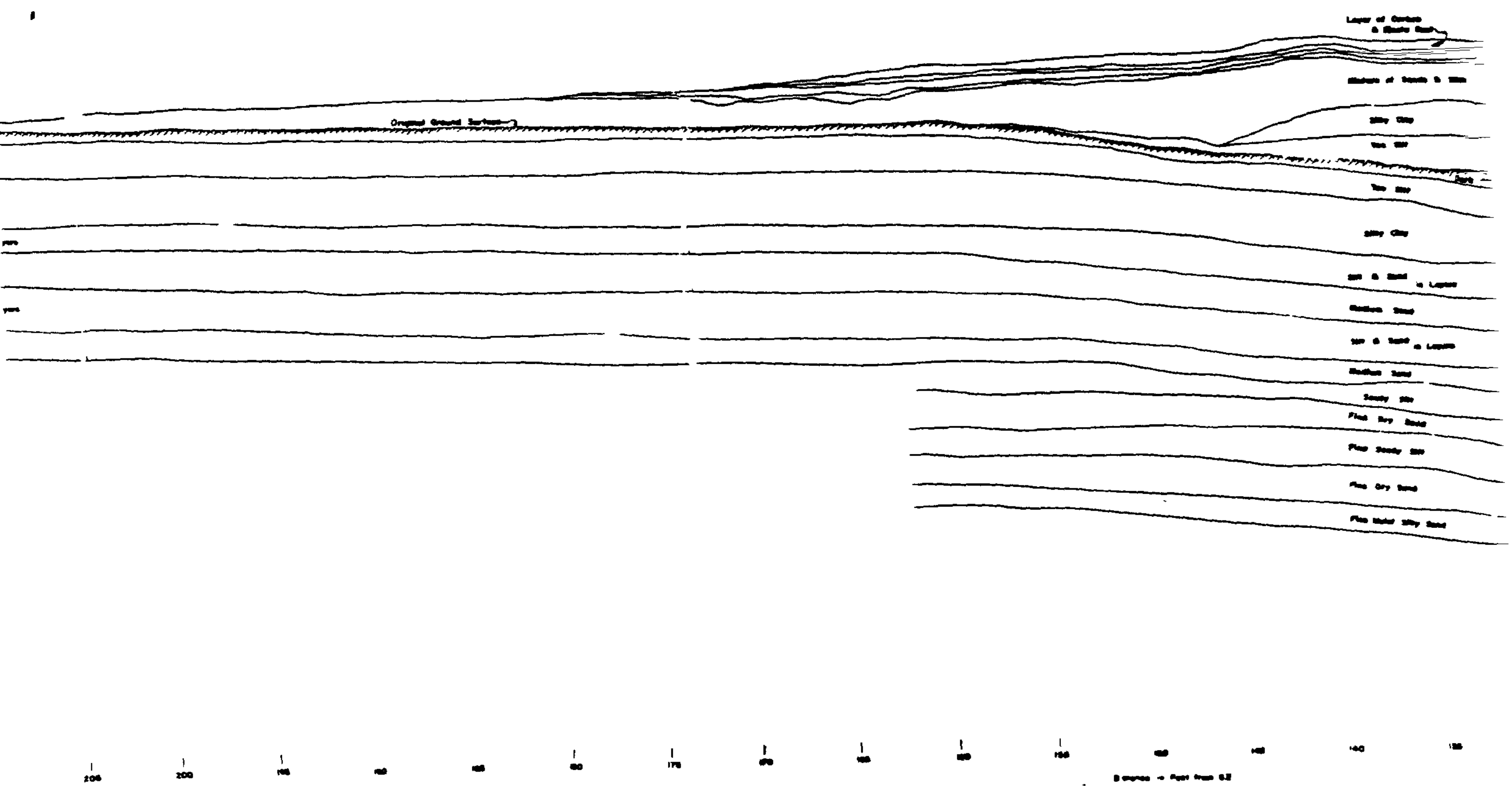


Figure 36. South can line showing soil stratigraphy.



Silty Clay
Silty Clay
Medium Sand
Medium Sand
Fine Dry Sand
Fine Sandy Silt
Fine Dry Sand
Fine Moist Silty Sand
205
200
175
140

FIG 36-3

ıy.

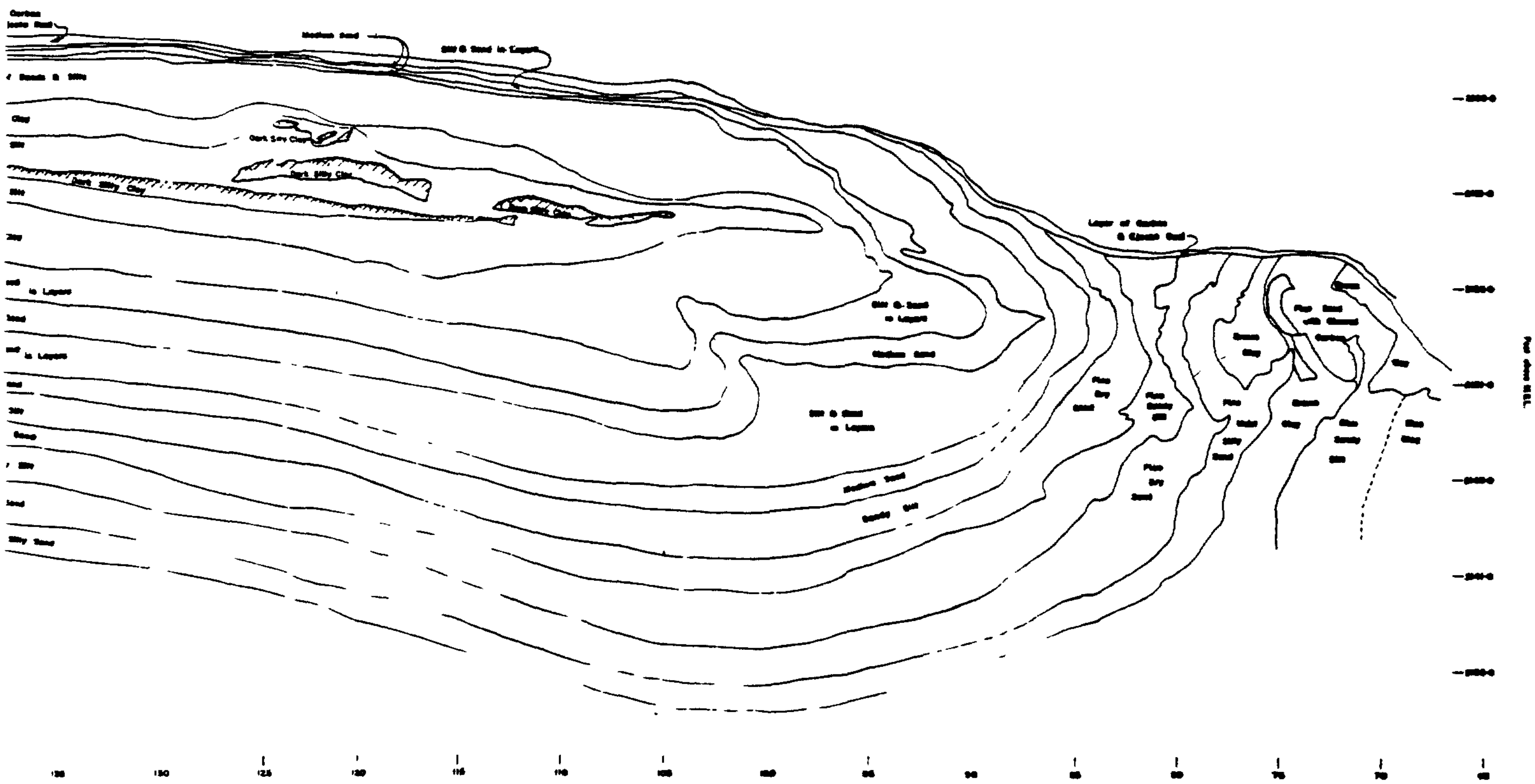


FIG 36-C

Figure 37. Hinge region of east line.

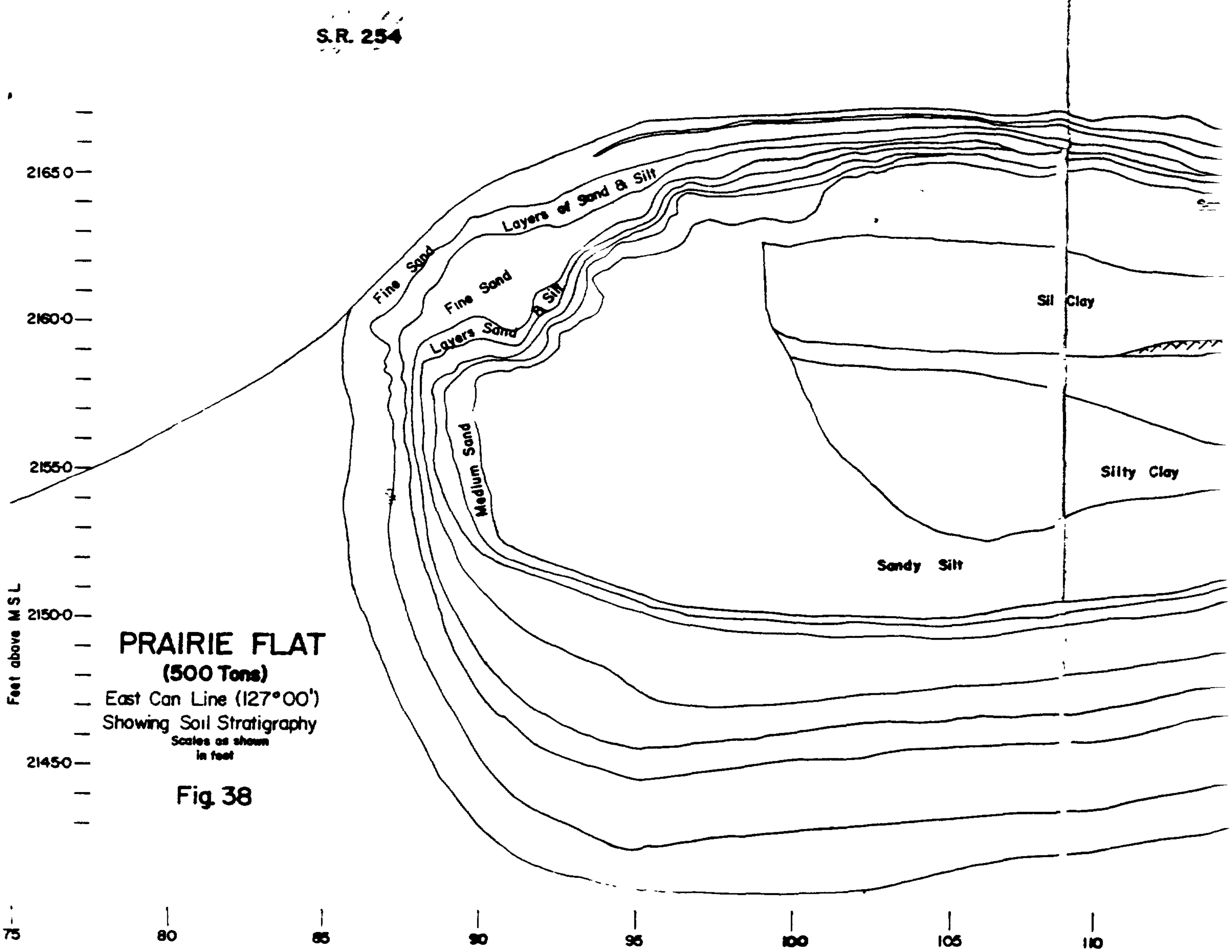
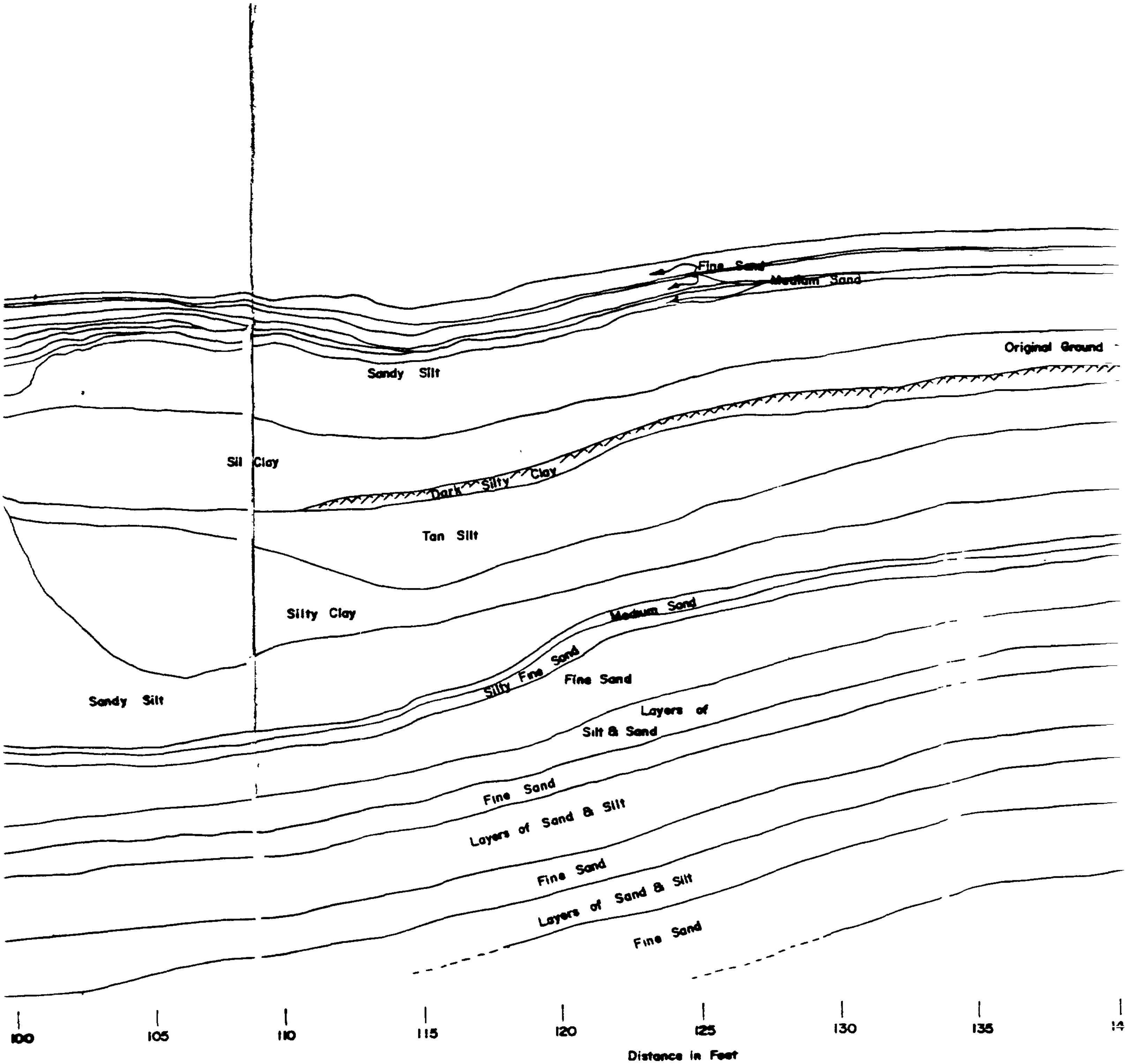
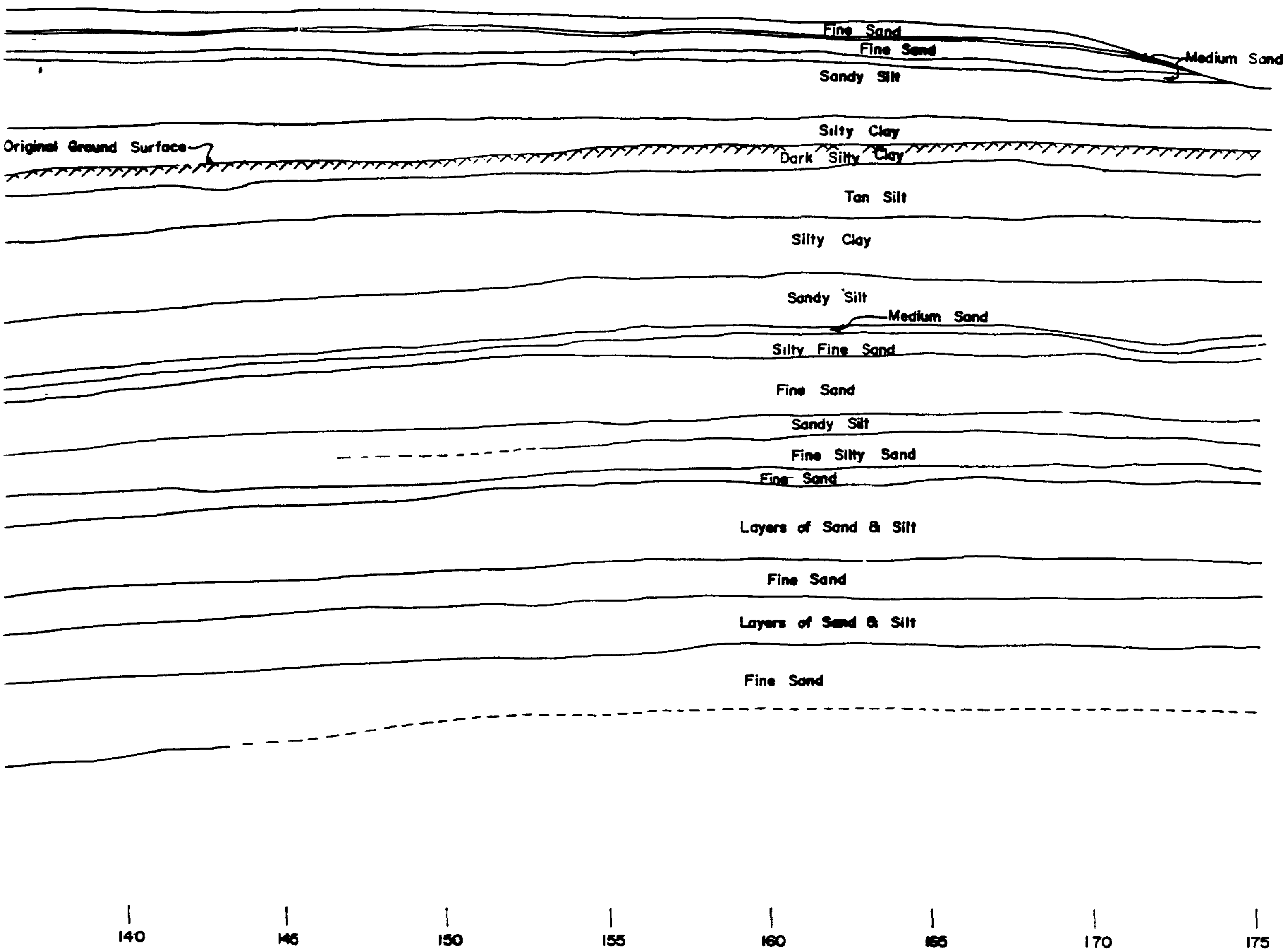


Figure 38. East can line showing soil stratigraphy.



ıtigraphy.

FIG 38-B



Fine Sand
Fine Sand
Medium Sand
Sandy Silt
Silty Clay
Original Ground Surface
Dark Silty Clay
Tan Silt
Silty Clay
Sandy Silt
Medium Sand
Silty Fine Sand
Fine Sand
Sandy Silt
Fine Silty Sand
Fine Sand
Layers of Sand & Silt
Fine Sand
Layers of Sand & Silt
Fine Sand
140
145
150
155
160
165
170
175

FIG - 38-C

DISCUSSION OF PRAIRIE FLAT RESULTS

GENERAL COMMENTS

In the preceding sections of this report, the experimental data obtained on the PRAIRIE FLAT crater have been presented with a minimum of discussion, though a few correlations and deductions have been made. In this section, these data are presented in a digest form, so that the overall interpretation becomes clear.

Cratering experiments have been carried out at Suffield almost continuously for the past decade, and there were a few earlier experiments which predated the TTCP organization. Over the years each new large crater has presented new problems, and helped to clarify problems which had arisen earlier. PRAIRIE FLAT was no exception, but partly due to the experience gained on the earlier shots, and partly due to the coherence of the data, this crater has probably advanced the understanding of the morphology of craters in alluvium to an exceptional extent. Though all the data obtained at Suffield, on PRAIRIE FLAT as on other trials, refer directly to craters in alluvium, it has become quite clear that many of the most interesting facets of the observed morphology can be correlated with similar features in craters produced by different mechanism and on different media.

The major features which have been observed on Suffield craters are: (1) central uplift structures, (2) downwarping of the rim material, sometimes combined with limited upthrusting, (3) a large degree of radial compression, (4) circumferential ring synclines and anticlines, both inside and outside the main crater excavation, (5) a circumferential and radial crack pattern, (6) emission of sand-laden water from the crack pattern, (7) an ejecta pattern which may or may not exhibit a second order ray structure, but which is composed primarily of a coherently overturned flap of material, and (8) a temporary elevation of the local water table.

All these features have not, in general, been found in association with any single crater before PRAIRIE FLAT. On the other hand, PRAIRIE FLAT exhibits all to some degree, and as a result of the PRAIRIE FLAT experience some of the features have been recognised as having existed on the earlier craters though they were not interpreted correctly during the relevant field investigations.

COMPARISON WITH 1961 CRATER DATA We discuss first, in this context, the question of the coherent overturning of a flap of material. Such overturning was not recognised at Suffield before PRAIRIE FLAT, but some suggestion of coherent flaps of limited extent have been made with regard to natural impact craters (for example, by Shoemaker with relation to the Barringer crater).

In the very incompetent material of the Suffield test sites, in which layers of free running sand alternate with soft clay-silts, any form of coherent motion of the surface layers as part of a cratering mechanism appears most improbable, and this lack of

2

plausibility possibly explains why it has taken a decade to recognise it. The simple fact is that it exists in clearly defined form on PRAIRIE FLAT, and we now recognise that a similar coherent flap probably existed at all the large scale craters. As no stratigraphic studies were made inside the blanket on the earlier shots, it may prove impossible in general to verify this, but in particular cases evidence has been found to confirm the statement. This is particularly true of the 1961 100-ton trial at Suffield, which we now discuss in this context.

The 1961 trial (which had no nickname) consisted of the detonation of 100 tons of TNT in a hemispherical configuration on the surface. The location of the test site, on the Watching Hill range, was several hundred yards removed from the PRAIRIE FLAT site, but in essentially similar geology.

The detonation produced a crater which filled rapidly with water — the first time this phenomenon had been observed at Suffield. The centre of the crater contained a small mound, which was not at the time recognised as being a structural uplift. In general, the crater was interpreted as being a perfectly normal crater, with a roughly paraboloidal excavation, uplifted rim, and nothing remarkable in the way of morphology. Examination of photographs taken at the time, in the light of the later trials, shows clearly however that there was, in fact, a circumferential crack, which in some locations allowed water to rise to the surface external to the crater. Thus, in retrospect, we recognise that this crater was the first one at Suffield in the now classic series of central uplift craters in alluvium. The crater is shown in Fig.39, which shows the water in the crater, minor ejection of water outside the crater, an indication of a circumferential crack, and the central uplift which we now presume to have been structural. The Suffield Crater Group assisted in the work on this crater, but prime responsibility for the study rested with the Waterways Experiment Station of the U.S. Army Corps of Engineers. Reports on the studies have been given by Waterways Experiment Station (1961) and Jones, Krohn, and Dewey (1961).

Subsequent to the PRAIRIE FLAT operation, we recalled that one of the British experiments on this early trial indicated quite clearly that the "ejecta blanket" on this crater was probably of the PRAIRIE FLAT type. We present here, as an illustration, certain data communicated to us by D. J. James, of the United Kingdom Atomic Energy Authority Atomic Weapons Research Establishment. These data refer to a marker installation composed of a system of interlocking rings, roughly 3 inches in diameter. This marker system was installed pre-shot along a diameter running through GZ, in a horizontal attitude at a depth of about 3 ft below the surface. (This would place the markers in the tan silt zone of PRAIRIE FLAT, and a similar material in the actual experiment concerned.) After the detonation, this marker system was excavated, and the locations of the "ejected", the distorted, and the undisturbed sections were surveyed. For our present purpose, we present by agreement with D. J. James only the sectional elevation along this marker line, along the two radii corresponding to the original pre-shot diameter. These sections are shown in Fig.40, replotted from a similar but more extensively detailed drawing provided by James.

In this figure, the similarity in the gross movement pattern to that found on PRAIRIE FLAT in the coherent overturning is evident, particularly in the upper figure (south radial line). Much more startling than this gross correlation, however, is the closely detailed agreement with the totality of PRAIRIE FLAT data. For the purposes of this discussion, the figures have been lettered A to H at specific locations which we now discuss in terms of PRAIRIE FLAT data.

We start on the south line, where at location A it is seen that there is a definite downwarping of the marker. Thus it seems clear that in this respect the 100-ton trial conformed to the pattern of SNOWBALL and PRAIRIE FLAT, with a general downwarping of the rim, even though local upthrusting may have occurred.

We note further that this marker system indicates first a generally smooth dip, as also shown by the asphalt on PRAIRIE FLAT. Quite abruptly, at point B in the diagram, this smooth dip is interrupted by a sharp fold in the marker pattern, which is then followed by a sine wave ripple, similar to that in the asphalt on PRAIRIE FLAT. In the 100-ton experiment, however, this wave pattern is closer in, relatively speaking, and part of a general uplift towards the hinge region, which was downwarped on PRAIRIE FLAT.

At point C, we reach the sharp hinge region, closely comparable to the situation on PRAIRIE FLAT and SNOWBALL. The material in the markers originally closer than this point to GZ are now found to be coherently disposed in what we must assume to be the so-called "ejecta" blanket between C and D.

Turning to the north section, we see that the same pattern is repeated, though with less coherence in the overturn. This lessened coherence is not surprising, as in this 100-ton experiment, as in SNOWBALL, the northern side of the crater lay in a different geology from the southern. The uniform lacustrine sediments were replaced by foreset beds of a shore or delta deposit, more coarse grained sands and gravels than silts. Nevertheless, at point E there is again a detectable downwarping, which continues to a wave pattern at F immediately ahead of either an uplift or the start of a hinge fold. Uplift is probably the best interpretation here.

At point G there is a sharp fold, with a tendency to produce an inverted stratigraphy. A photograph of this region (supplied by James) shows that the pattern here is remarkably similar to the pattern in PRAIRIE FLAT asphalt strip, shown earlier in Fig.25 (the asphalt fold and the marker fold are virtually identical, though the marker was at a depth of three feet. This tends to confirm that the folding in the asphalt is not merely a surface phenomenon depending upon the asphalt rigidity).

At point H in the diagram, we have a clear example of the formation of a thrust block inside the main hinge, exactly as found on PRAIRIE FLAT in a similar location. There is also a striking example of complex overturning, with three layers of the same "stratum" one above the other in the "blanket" region of the diagram.

Thus in all the features which we have thought to look for in this comparison of the 100-ton, hemispherical charge crater, and the PRAIRIE FLAT crater, we have found exact coincidence. We can only conclude that the morphology elucidated in PRAIRIE FLAT is not accidental or unique to PRAIRIE FLAT, but typical of craters produced by a near-surface detonation in alluvium.

COMPARISON WITH OTHER CRATERS

Comparison with SNOWBALL The SNOWBALL crater was produced in 1964, by the detonation of a hemispherical stack of TNT resting on the surface of the prairie, in geology very similar to that of PRAIRIE FLAT, but with the northern edge of the crater reaching into delta or shore deposits. Diehl and Jones (1967a and b) have described the overall pattern of the SNOWBALL crater, and also the profile and ejecta pattern. In addition, a comparison was made by Jones and Diehl (1965) between SNOWBALL and the Bosomtwe crater in Ghana.

In general, PRAIRIE FLAT conforms to the pattern of SNOWBALL, with the following differences in detail:

(1) The central uplift on SNOWBALL was rather more marked than in PRAIRIE FLAT, where the single central uplift was replaced by a pattern of concentric ridges. The difference, however, is more apparent than real, since excavation in SNOWBALL showed that there were incipient concentric ridges in that crater as well, the deep lying blue clay being found in a basically similar pattern of concentric folding. Detailed comparison of these central regions must await excavation of the centre of PRAIRIE FLAT.

(2) On SNOWBALL, the circumferential and radial fracture systems were a striking feature, further outlined by the ejection of sand and water. On PRAIRIE FLAT, the fractures did exist, but were not a marked feature and did not allow emission of water. Excavation tends to indicate that PRAIRIE FLAT represents an earlier stage in the formation of the circumferential cracks than did SNOWBALL. This is shown specifically by the pattern of displacement vectors derived from the sand column markers. In PRAIRIE FLAT, as shown in Fig.31, the residual displacement is uniformly outward, decreasing with depth. On SNOWBALL, on the other hand, <u>outside</u> the rim structure, but <u>inside</u> the major crack pattern, the displacement pattern in the tops of the columns was reversed, showing a residual displacement back towards the crater rim. It appears certain that this was the result of a relative slumping of the ground consequent upon the formation of the circumferential crack pattern. On PRAIRIE FLAT, this slumping did not occur. Consequently, the data from SNOWBALL and PRAIRIE FLAT are quite

consistent, and tend to show that the downwarping of the strata, evident in both craters (and, as discussed, also in the 1961 crater) is not the result of slumping, but a distinct feature of the morphology of craters produced in this way. The slumping is a distinctly secondary feature. Inside the rim, the movement pattern shown by the vectors is consistently outward.

Comparison with DISTANT PLAIN 6 The DISTANT PLAIN 6 crater, produced by the detonation of 100 tons of TNT in the same (spherical) configuration as PRAIRIE FLAT, has been described in detail by Diehl, Pinnell, and Jones (1968). It contained a distinct central uplift, and circumferential folds. However, this smaller crater did not appear to adhere closely to the minutae of the PRAIRIE FLAT morphology. The rim structure, at least on the one side excavated, possessed a distinct upthrust, with an anticlinal fold in the rim itself. While there may have been a uniform fold back into the ejecta blanket, this certainly was not recognised at the time. In retrospect, some of us feel that there was some evidence of this on the far side of the crater, away from the excavation, but at the present time it has not seemed to us to be possible to confirm this from the data now available. It is, however, conceivable that in due course a detailed study of the photogeology of this crater may resolve the problem, by showing concordance with the PRAIRIE FLAT data.

DISTANT PLAIN 6 was also highly significant in the presence of a zone of brilliantly white, pulverised sandstone, lithologically similar to the bedrock. Similar material was observed on PRAIRIE FLAT prior to the flooding of the crater, and it is presumed that the source of this material was similar in the two cases. Confirmation of the source will depend upon lithological comparison, and upon the data obtained when PRAIRIE FLAT is excavated in this region. For the moment, we must defer our conclusions, but we remark that a small zone of similar material was also found on SNOWBALL, but appeared to be relatively insignificant at the time.

Relevance to Natural Craters This report is not the place for a detailed comparison of PRAIRIE FLAT with natural craters, which really requires a separate study using all the data available from the 100-ton trial, SNOWBALL, DISTANT PLAIN 6, PRAIRIE FLAT and the data obtained at, for example, Flynn Creek, Barringer, Bosomtwe, West Clearwater, and many others. This is a study in its own right, which we expect to undertake in the near future.

For the moment, therefore, we only draw attention to the gross similarities which have been observed in the ring syncline structure, radial cracking, central uplifts, pattern after sedimentation and so on. Some such comparisons have been made by Jones and Diehl (1965), by Roddy (1966, 1968) with relation to SNOWBALL, and as we have seen PRAIRIE FLAT agrees in almost all particulars. In addition, attention is drawn to Hope (1968) who indicates in his translation of Sukhanov's (1968) paper on the mechanism of the lunar seas that there is a gross correlation between the PRAIRIE FLAT crater and the cirque of the lunar crater Archimedes. Many similar comparisons have been drawn to our attention but require considerable further study.

SUGGESTIONS FOR FURTHER WORK

Recent decisions of the Defence Research Board of Canada tend to indicate that the future work of the Suffield Crater Study Group will be severely limited and possibly terminated. Nevertheless, the following suggestions for future work, by this group or another, appear to have merit:

(1) The excavation of the central regions of PRAIRIE FLAT should be completed in 1969, and reported in that calendar year as an addendum to this report.

(2) A similar report should be prepared on the excavation of SNOWBALL. This has been hanging fire since 1966, due to the pressure of the work on the DISTANT PLAIN series and PRAIRIE FLAT. A great deal of stratigraphic data requires reduction and reporting, but it now appears that the delay, though fortuitious, will be beneficial since the gross morphology of such craters has now become clear.

(3) A detailed comparison should be made among the Suffield Craters and naturally occurring craters, preferably in close cooperation with the USGS Branch of Astrogeology, and the Dominion Observatory of the Energy, Mines and Resources Department of Canada.

(4) Any future large scale trial at Suffield (or in

suitable terrain elsewhere) should involve a minutely detailed sand column and marker study according to the technique of Jones and Diehl (1964), but this technique should also be expanded to incorporate a modification of the horizontal marker technique used by the British in the 1961 trial, which has now produced such striking confirmation of the present PRAIRIE FLAT results. Specifically, several radial lines of such horizontal markers should be used, both close to the surface and at moderate depth on several radii separated in azimuth by up to, say, 120° Such a study would enable us to determine the uniformity and extent of the coherent flap mechanism, and also decide among the two possible systems, i.e., a "petalling" process and a "roll back" process uniform in azimuth. (Extensive excavation at PRAIRIE FLAT in the future could solve this problem, but it seems unlikely that this work will be undertaken.)

(5) A detailed study is required of the mechanism of formation of the sine wave folds as shown in the asphalt strips. These appear to correlate well with natural features, but it is also clear that the pattern varies to some extent among the various craters. Suggestions have been made (e.g., by Diehl, Pinnell, and Jones, 1968) that the relative scale of these waves could give information on the height of burst of the cratering device. This still appears a valid suggestion. The suggestion made in the cited paper that these patterns are the surface manifestation of an interference phenomenon among horizontal layers seems somewhat

less valid to us now, in view of the PRAIRIE FLAT data on the radial movement of the asphalt strips. It appears more likely now that the wave pattern is the result of the gross radial movement and compression, i.e., a wrinkling effect. Several workers have preferred this explanation in the past (e.g., Baldwin, personal communication, and Dence, in discussion). The suggestion of a "frozen Rayleigh wave" type mechanism is still viewed by us with considerable reservation—it does not seem to fit the facts at all. There is certainly room for considerable work here.

(6) There appears to be room for more work on "Spackman's Tears", the fused silica spheroids found for the first time on PRAIRIE FLAT. Why were they not found before, in virtually identical experiments? All the Suffield Crater Group, as well as Roddy, Dence, and Beals—and several other geophysicists—studied the earlier craters, and on SNOWBALL we specifically looked for fused sands, but none was found.

(7) How much of the downwarping effect (in all the craters) and the slumping effect (in SNOWBALL) is due to the removal of material by water, the material being redeposited inside the crater? At the present time, it appears that this removal of underlying material has relatively little effect on the crater downwarp.

(8) Is the change between upthrust and downwarp purely incidental, depending upon the natural strengths of the material, or is it a function of scale? SNOWBALL and PRAIRIE FLAT are

virtually identical in the pattern of downwarping, though in SNOWBALL the pattern of downwarping was accentuated by slump, and the displacement pattern modified. In the 1961 crater, from a 100-ton hemisphere, showed a distinct downwarp, but a residual upthrust in the rim area itself. The spherical 100-ton shot of DISTANT PLAIN 6 produced upthrust, but no downwarp or marked fracturing. How much of this difference is due to the change in charge shape, height of burst, and how much is merely a variation in the residual strength of the ground at these scales?

(9) What is the precise mechanism of uplift? Is it a reflection phenomenon, would it occur in the absence of a water table, and what, if it exists at all, is the mechanism behind the specific uplift of material from the bedrock through the region surrounding the central core?

(10) The BTL markers discussed earlier in this report provide, in essence, an additional 500 to 600 displacement trajectories similar to those obtained from the sand columns. We have not discussed these trajectories, as we were obtaining the data for another organization. At a later stage, presumably, additional data will be available, and could be used to elucidate the fine detail of the mechanism by which the flap formation is initiated.

Figure 39. Aerial view of 100-ton crater (1961).

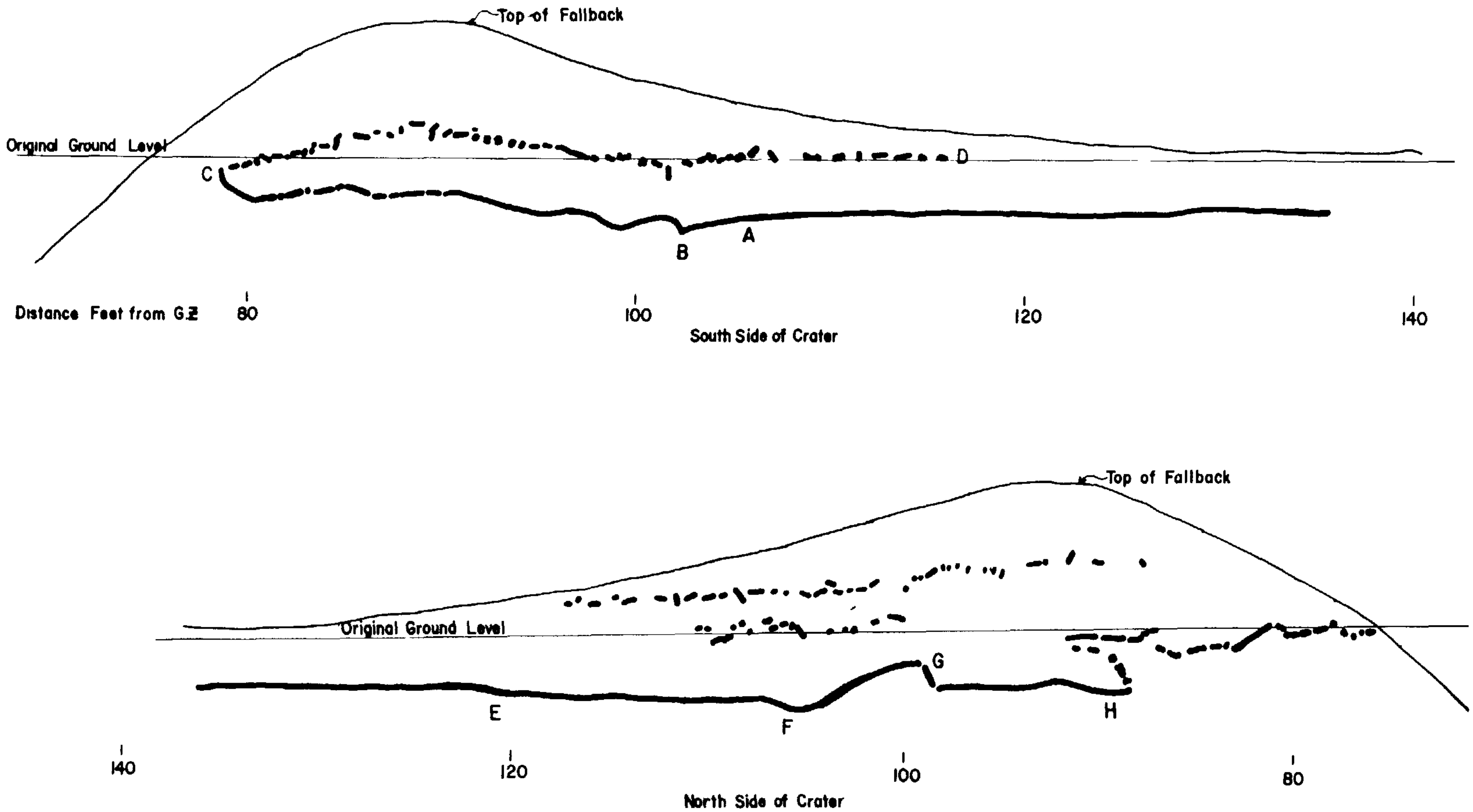
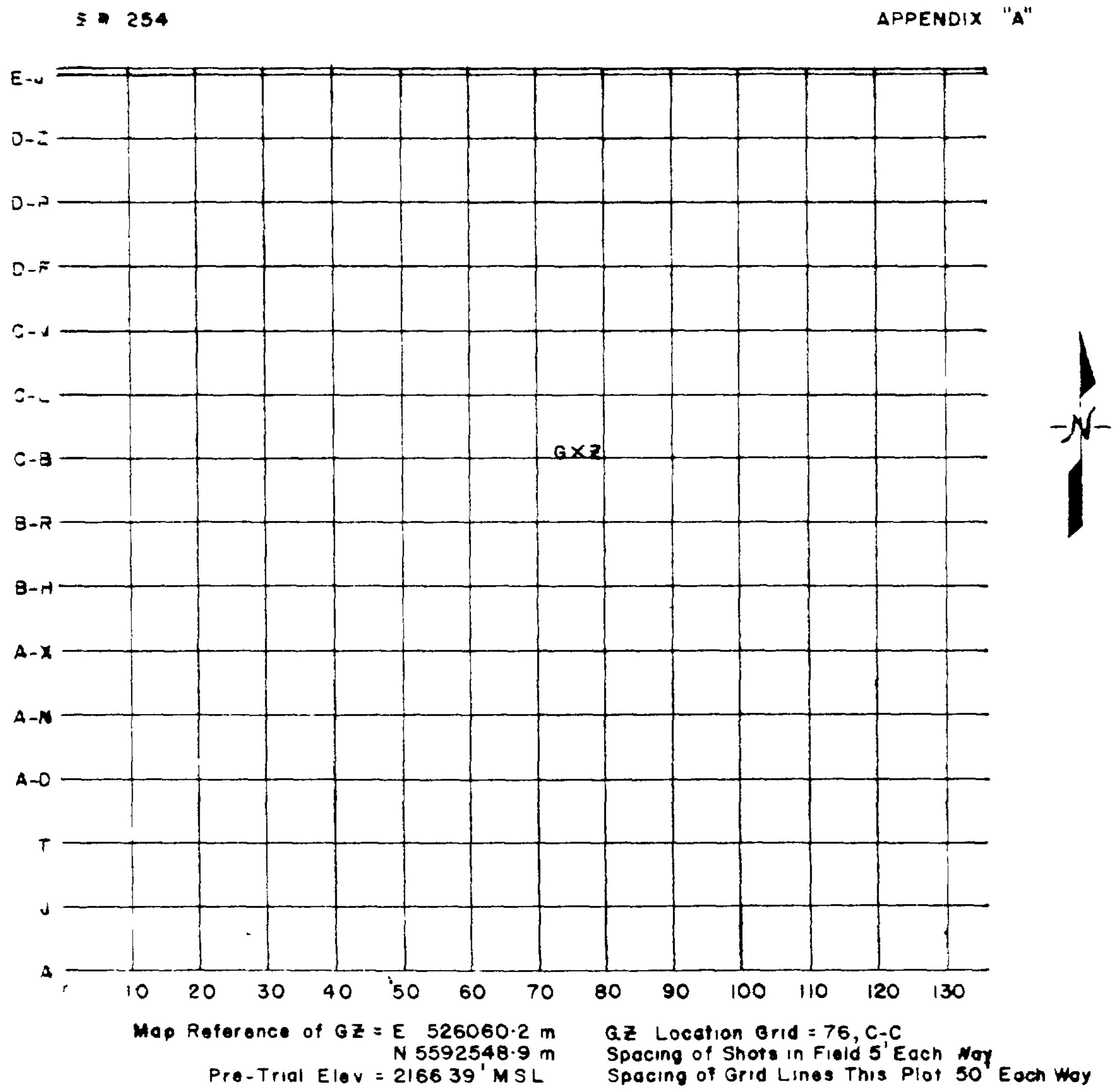


Figure 40. Section elevations through 1961 100-ton crater showing horizontal markers.

APPENDIX A

PRAIRIE FLAT POSTTRIAL SURVEY DATA



CODE OF POST TRIAL SURVEY
PRAIRIE FLAT
(500 Tons)

PRAIRIE FLAT POSTTRIAL SURVEY DATA

Grid Spacing 5 ft between Numbers and Letters

Grid Number	Grid Letter	Elevation
36	A	2165.6
41		65.7
46		66.0
51		65.9
56		66.1
61		66.2
66		66.1
71		66.2
76		66.2
81		67.2
86		66.3
36	F	2165.7
41		65.7
46		66.0
51		66.9
56		66.3
61		66.1
66		66.0
71		66.2
76		66.4
81		67.3
86		66.2
36	K	2165.7
41		65.7
46		66.3
51		66.6
56		66.0
61		66.3
66		66.1
71		66.1
76		66.4
81		66.6
86		66.3
51	N + 4 ft	2166.7
51	O + 2 ft	67.6
56	M + 3 ft	66.9
36	P	2165.9
41		65.9
46		66.4
51		67.2
56	P	2166.3
61		66.3
66		66.5
71		66.4
76		66.6
81		66.3
86		66.4
36	U	2165.9
41		65.8
46		66.1
51		66.6
56		66.3
61		66.2
66		66.4
71		66.4
76		66.7
81		66.5
86		66.5
36	Z	2165.9
41		65.9
46		66.2
51		66.5
56		66.3
61		66.0
66		67.0
71		66.3
76		66.1
81		66.2
86		66.3
36	AE	2165.7
41		65.8
46		66.3
51		66.1
56		66.2
61		65.9
66		66.3
71		66.1
76		66.2
81		66.3
86		66.4

Grid Number	Grid Letter	Elevation	Grid Number	Grid Letter	Elevation
61	AF + 2 ft	65.9	74	AO	2166.0
61	AG + 3 ft	66.6	75		66.1
61	AH + 4 ft	65.9	76		66.2
			77		66.6
			78		67.1
36	AJ	2165.7	79		67.2
41		65.7	80		67.9
46		66.0	81		67.1
51		66.3	82		67.1
56		66.4	83		66.7
61		66.0	84		66.6
66		65.9	85		66.4
71		66.1	86		66.4
76		66.2	87		66.6
81		66.3	88		66.6
86		66.4	89		66.3
			90		66.3
			91		66.2
36	AO	2165.8	92		66.2
37		65.7	93		66.2
38		65.9	94		66.2
39		65.8	95		66.2
40		65.7	96		66.2
41		65.7	97		66.2
42		65.7	98		66.3
43		65.7	99		66.3
44		65.7	100		66.3
45		65.7	101		66.3
46		65.9	102		66.2
47		65.7	103		66.2
48		65.7	104		66.3
49		65.8	105		66.1
50		65.8	106		66.2
51		65.8	107		66.1
52		66.0	108		66.2
53		66.3	109		66.1
54		66.3	110		66.2
55		66.4	111		66.2
56		66.7	112		66.3
57		66.6	113		66.4
58		66.0	114		66.4
59		66.2	115		66.7
60		66.3	116		66.7
61		66.0	121		66.6
62		66.0	126		66.6
63		66.0	131		66.7
64		66.1	136		66.8
65		66.2			
66		66.2			
67		66.6	36	AP	2165.9
68		66.4	37		65.7
69		66.3	38		66.1
70		66.7	39		65.8
71		66.3	40		65.7
72		66.1	41		65.5
73		66.0	42		65.7

Grid Number	Grid Letter	Elevation
43	AP	2165.7
44		65.8
45		65.7
46		65.7
47		65.8
48		65.8
49		65.7
50		65.8
51		65.9
52		66.3
53		66.3
54		66.1
55		66.9
56		67.0
57		67.1
58		67.1
59		66.7
60		66.4
61		66.0
62		66.0
63		66.9
64		66.0
65		66.0
66		66.4
67		70.1
68		66.4
69		66.7
70		66.5
71		66.3
72		66.0
73		66.4
74		66.2
75		66.3
76		66.4
77		67.1
78		67.3
79		67.2
80		67.4
81		67.8
82		67.6
83		67.1
84		67.1
85		67.0
86		66.5
87		66.7
88		66.7
89		66.6
90		66.4
91		66.4
92		66.2

Grid Number	Grid Letter	Elevatior
93	AP	2166.3
94		66.3
95		66.6
96		66.4
97		66.4
98		66.7
99		66.5
100		66.4
101		66.4
102		66.3
103		66.3
104		66.2
105		66.2
106		66.1
107		66.2
108		66.2
109		66.3
110		66.2
111		66.3
112		66.4
113		66.5
114		66.6
115		66.6
116		66.6
36	AQ	2165.7
37		65.8
38		65.9
39		65.9
40		65.7
41		65.7
42		65.7
43		65.6
44		65.8
45		65.8
46		65.7
47		65.8
48		65.8
49		65.8
50		65.9
51		66.1
52		66.6
53		66.3
54		66.5
55		66.7
56		67.3
57		67.0
58		67.3

Grid Number	Grid Letter	Elevation
59	AQ	2167.2
60		66.2
61		66.1
62		66.1
63		66.4
64		66.4
65		66.7
66		66.7
67		66.1
68		65.9
69		66.8
70		67.0
71		66.5
72		66.2
73		66.2
74		66.0
75		66.2
76		66.5
77		67.1
78		67.2
79		67.1
80		68.1
81		67.7
82		67.4
83		67.3
84		67.2
85		66.8
86		66.4
87		66.7
88		66.8
89		66.8
90		66.8
91		66.4
92		66.3
93		66.4
94		66.4
95		66.6
96		66.5
97		66.8
98		66.6
99		66.4
100		66.4
101		66.2
102		66.3
103		66.2
104		66.1
105		66.3
106		66.4
107		66.2
108		66.2
109		66.2
110		66.2

Grid Number	Grid Letter	Elevation
111	AQ	2166.3
112		66.4
113		66.5
114		66.5
115		66.5
116		66.7
36	AR	2165.6
37		65.7
38		65.8
39		66.1
40		65.9
41		65.8
42		65.6
43		65.7
44		65.7
45		65.7
46		65.8
47		65.8
48		65.8
49		65.8
50		65.9
51		66.1
52		66.1
53		66.1
54		66.8
55		66.9
56		66.9
57		66.7
58		66.6
59		66.5
60		66.4
61		66.7
62		66.3
63		66.7
64		66.9
65		66.2
66		66.5
67		66.8
68		66.2
69		66.7
70		66.2
71		66.1
72		66.4
73		66.0
74		66.0
75		66.4
76		66.1
77		66.3
78		67.2
79		67.4

Grid Number	Grid Letter	Elevation
80	AR	2167.6
81		66.9
82		67.0
83		67.4
84		67.4
85		67.3
86		67.9
87		66.7
88		66.8
89		66.7
90		66.8
91		66.8
92		66.6
93		66.6
94		66.4
95		66.4
96		66.5
97		66.8
98		66.8
99		66.5
100		66.4
101		66.3
102		66.1
103		66.1
104		66.0
105		66.1
106		66.1
107		66.4
108		66.2
109		66.2
110		66.3
111		66.4
112		66.5
113		66.6
114		66.6
115		66.7
116		66.8
36	AS	2165.5
37		65.7
38		65.7
39		65.8
40		65.7
41		65.6
42		65.7
43		65.6
44		65.9
45		65.8
46		66.0
47		66.0
48		65.9
49		66.0
50		65.9
51	AS	2166.1
52		66.0
53		66.2
54		66.6
55		66.4
56		67.1
57		66.6
58		66.6
59		66.7
60		66.7
61		67.0
62		66.8
63		66.4
64		66.4
65		66.2
66		67.3
67		67.0
68		67.2
69		67.2
70		67.1
71		66.5
72		66.2
73		66.4
74		66.9
75		66.6
76		66.4
77		66.7
78		66.8
79		66.6
80		66.8
81		66.7
82		66.6
83		67.2
84		67.6
85		67.3
86		67.4
87		67.1
88		66.7
89		66.5
90		66.6
91		66.6
92		65.5
93		65.5
94		65.4
95		65.4
96		66.5
97		66.6
98		66.5
99		66.6
100		66.3
101		66.3
102		66.3
103		66.2
104		66.2

Grid Number	Grid Letter	Elevation
105	AS	2166.0
106		65.9
107		66.1
108		66.4
109		66.6
110		66.4
111		66.5
112		66.7
113		67.0
114		66.9
115		67.0
116		67.0
36	AT	2165.5
37		65.6
38		65.7
39		65.7
40		65.7
41		65.7
42		65.7
43		65.7
44		65.7
45		66.1
46		66.1
47		65.9
48		66.1
49		65.9
50		65.9
51		66.0
52		66.0
53		66.2
54		66.0
55		66.6
56		66.6
57		66.9
58		66.8
59		66.9
60		67.0
61		66.9
62		66.9
63		66.4
64		66.2
65		66.5
66		66.6
67		66.5
68		66.6
69		67.4
70		67.3
71		67.0
72		67.3
73		66.9

Grid Number	Grid Letter	Elevation
74	AT	2167.1
75		67.1
76		67.1
77		67.1
78		67.5
79		66.9
80		67.4
81		67.2
82		67.1
83		67.2
84		67.4
85		67.5
86		67.1
87		66.9
88		66.5
89		66.5
90		66.4
91		66.2
92		66.4
93		66.3
94		66.4
95		66.7
96		66.4
97		66.6
98		66.2
99		66.5
100		66.8
101		66.4
102		66.2
103		66.2
104		66.2
105		66.0
106		66.0
107		66.5
108		66.3
109		66.4
110		66.8
111		67.1
112		67.4
113		67.6
114		67.5
115		67.0
116		67.0
121		67.0
126		66.9
131		66.8
136		66.8

Grid Number	Grid Letter	Elevation	Grid Number	Grid Letter	Elevation
36	AU	2165.5	86	AU	2168.2
37		65.7	87		67.3
38		65.7	88		66.5
39		65.7	89		66.7
40		65.7	90		66.6
41		65.6	91		66.3
42		65.7	92		66.5
43		65.7	93		66.4
44		65.6	94		66.4
45		65.8	95		66.5
46		66.0	96		66.9
47		65.9	97		66.6
48		66.0	98		66.6
49		66.0	99		66.2
50		66.0	100		66.4
51		66.0	101		66.3
52		66.2	102		66.4
53		66.2	103		66.5
54		66.0	104		66.3
55		66.5	105		66.4
56		66.6	106		66.3
57		66.9	107		66.8
58		66.6	108		66.7
59		66.9	109		66.8
60		66.7	110		66.9
61		66.9	111		67.0
62		67.0	112		67.2
63		67.6	113		67.2
64		66.3	114		66.9
65		66.4	115		67.1
66		66.3	116		67.5
67		66.8			
68		67.1			
69		67.3	36	AV	2165.6
70		67.3	37		65.8
71		66.9	38		65.6
72		66.9	39		65.7
73		66.7	40		65.8
74		66.6	41		65.7
75		67.1	42		65.8
76		67.2	43		65.9
77		67.7	44		65.8
78		67.7	45		65.9
79		67.7	46		65.9
80		67.4	47		65.9
81		67.2	48		66.1
82		67.8	49		66.0
83		67.5	50		66.0
84		67.7	51		66.0
85		67.8	52		66.3
			53		66.1

Grid Number	Grid Letter	Elevation
54	AV	2166.3
55		66.6
56		67.1
57		67.0
58		67.6
59		67.0
60		66.8
61		67.4
62		67.3
63		67.3
64		66.8
65		66.8
66		67.0
67		67.1
68		67.3
69		67.2
70		66.8
71		66.9
72		66.3
73		66.9
74		67.0
75		66.9
76		67.7
77		67.9
78		68.1
79		68.4
80		68.5
81		68.7
82		68.3
83		67.9
84		67.9
85		68.1
86		68.1
87		67.9
88		67.4
89		67.4
90		67.0
91		66.8
92		66.6
93		66.8
94		67.0
95		67.0
96		67.1
97		67.2
98		66.8
99		66.6
100		66.3
101		66.7
102		66.6
103		67.0
104		66.2

Grid Number	Grid Letter	Elevation
105	AV	67.1
106		67.1
107		66.7
108		67.0
109		66.7
110		66.6
111		67.0
112		67.2
113		67.1
114		67.0
115		66.6
116		67.0
36	AW	2165.6
37		65.7
38		65.7
39		65.8
40		65.8
41		65.9
42		65.9
43		66.0
44		65.9
45		66.2
46		65.9
47		65.8
48		65.9
49		66.2
50		66.4
51		66.2
52		66.5
53		66.2
54		66.6
55		66.8
56		67.0
57		66.8
58		67.3
59		67.2
60		67.1
61		67.6
62		67.2
63		67.1
64		67.5
65		67.2
66		67.5
67		67.7
68		68.0
69		67.3
70		67.1
71		67.6
72		67.1

Grid Number	Grid Letter	Elevation
73	AW	2167.4
74		67.4
75		67.6
76		68.0
77		68.4
78		68.3
79		68.8
80		68.7
81		68.8
82		69.2
83		68.9
84		68.6
85		68.4
86		68.4
87		68.3
88		68.0
89		67.6
90		67.1
91		67.1
92		66.8
93		66.6
94		67.1
95		67.3
96		66.8
97		67.1
98		67.1
99		67.3
100		67.1
101		66.9
102		66.4
103		66.4
104		66.8
105		67.1
106		66.9
107		66.8
108		66.5
109		66.4
110		66.6
111		66.6
112		66.8
113		66.6
114		66.5
115		66.5
116		66.6
36	AX	2165.6
37		65.7
38		65.7
39		65.7
40		65.8

Grid Number	Grid Letter	Elevation
41	AX	2165.8
42		66.0
43		66.1
44		66.5
45		66.2
46		65.9
47		66.0
48		65.8
49		66.1
50		66.0
51		66.6
52		66.8
53		66.5
54		66.7
55		66.0
56		66.5
57		66.8
58		67.8
59		67.6
60		67.6
61		67.9
62		67.9
63		67.5
64		67.8
65		68.0
66		68.5
67		68.5
68		68.3
69		67.9
70		67.4
71		67.3
72		67.5
73		67.5
74		67.3
75		67.7
76		67.9
77		68.3
78		69.2
79		68.9
80		68.3
81		69.0
82		69.3
83		68.4
84		69.1
85		69.2
86		68.4
87		68.5
88		67.7
89		67.1
90		66.6
91		66.8

Grid Number	Grid Letter	Elevation
92	AX	2167.0
93		67.1
94		66.9
95		67.1
96		67.0
97		67.0
98		67.3
99		67.6
100		67.8
101		67.7
102		66.4
103		66.7
104		66.5
105		66.6
106		67.1
107		66.8
108		66.4
109		66.3
110		66.4
111		66.7
112		66.6
113		66.7
114		66.7
115		66.8
116		66.5
36	AY	2165.7
37		65.7
38		65.7
39		65.8
40		65.7
41		65.9
42		66.1
43		66.1
44		66.3
45		66.4
46		66.2
47		65.9
48		66.1
49		66.2
50		66.2
51		66.4
52		66.6
53		66.9
54		66.7
55		66.8
56		66.9
57		67.2
58		67.6

Grid Number	Grid Letter	Elevation
59	AY	2167.8
60		68.2
61		68.3
62		68.2
63		67.9
64		68.0
65		68.6
66		68.5
67		67.9
68		67.4
69		67.8
70		67.9
71		67.4
72		67.8
73		67.6
74		67.4
75		67.6
76		67.5
77		68.1
78		68.2
79		68.0
80		68.6
81		68.7
82		69.2
83		68.4
84		69.4
85		69.0
86		68.5
87		68.3
88		67.8
89		67.3
90		66.7
91		67.2
92		67.8
93		67.8
94		67.0
95		67.4
96		67.2
97		67.3
98		67.3
99		67.3
100		67.4
101		67.7
102		67.4
103		67.0
104		66.9
105		66.4
106		66.8
107		66.5
108		66.6

16

Grid Number	Grid Letter	Elevation	Grid Number	Grid Letter	Elevation
109	AY	2166.5	66	AZ	2168.7
110		67.0	67		67.3
111		66.7	68		67.2
112		66.3	69		67.6
113		66.3	70		67.8
114		66.4	71		68.1
115		66.3	72		67.9
116		66.6	73		67.8
121		66.8	74		68.0
126		66.8	75		67.8
131		66.9	76		67.5
136		66.8	77		67.8
			78		68.6
			79		68.7
1	AZ	2165.2	80		68.3
6		65.1	81		68.6
11		65.2	82		69.0
16		65.2	83		69.6
21		65.4	84		69.9
26		65.4	85		69.4
31		65.3	86		68.5
36		65.7	87		68.0
37		65.7	88		68.1
38		65.8	89		67.8
39		65.8	90		67.6
40		65.7	91		67.5
41		65.8	92		67.5
42		66.0	93		67.0
43		66.0	94		67.5
44		65.9	95		67.9
45		66.2	96		68.0
46		66.5	97		67.5
47		66.5	98		67.2
48		66.0	99		67.6
49		66.2	100		67.6
50		66.4	101		67.6
51		66.7	102		67.7
52		66.7	103		67.2
53		66.6	104		67.3
54		66.2	105		66.5
55		66.4	106		67.3
56		67.2	107		67.5
57		67.2	108		67.3
58		67.4	109		67.0
59		67.6	110		67.9
60		68.3	111		66.8
61		69.0	112		66.6
62		68.5	113		66.5
63		68.1	114		66.5
64		68.6	115		66.4
65		68.1	116		66.6

Grid Number	Grid Letter	Elevation	Grid Number	Grid Letter	Elevation
36	BA	2165.6	86	BA	2169.2
37		65.8	87		68.4
38		65.7	88		68.5
39		65.8	89		68.4
40		65.8	90		67.7
41		65.8	91		67.4
42		66.0	92		68.1
43		66.0	93		68.0
44		66.1	94		68.3
45		66.2	95		68.3
46		66.2	96		68.4
47		66.3	97		67.9
48		66.1	98		67.8
49		66.3	99		67.9
50		66.3	100		67.6
51		66.3	101		67.4
52		66.7	102		67.5
53		66.4	103		67.6
54		66.6	104		67.2
55		67.0	105		66.8
56		67.3	106		67.1
57		67.2	107		66.5
58		68.0	108		67.6
59		68.3	109		67.0
60		69.2	110		67.1
61		69.5	111		66.9
62		68.4	112		67.1
63		68.0	113		66.4
64		68.3	114		66.2
65		68.0	115		66.4
66		68.7	116		66.5
67		68.5			
68		68.5			
69		67.8	36	BB	2165.7
70		68.4	37		65.7
71		68.3	38		65.8
72		68.2	39		65.8
73		67.9	40		65.8
74		68.0	41		65.9
75		68.0	42		65.8
76		67.9	43		66.1
77		68.5	44		66.7
78		68.5	45		66.1
79		68.8	46		66.1
80		69.1	47		66.3
81		69.0	48		66.3
82		68.6	49		66.5
83		69.8	50		66.1
84		69.5	51		66.6
85		69.4	52		66.3

Grid Number	Grid Letter	Elevation
53	BB	2166.6
54		67.0
55		67.2
56		67.4
57		67.7
58		68.6
59		68.9
60		69.0
61		68.9
62		68.6
63		68.3
64		68.7
65		69.3
66		69.2
67		68.9
68		69.2
69		68.1
70		68.3
71		68.7
72		68.7
73		68.3
74		68.8
75		68.6
76		69.3
77		69.4
78		69.0
79		69.4
80		68.4
81		68.9
82		69.1
83		69.0
84		69.2
85		69.3
86		68.9
87		69.0
88		68.5
89		68.6
90		67.9
91		68.1
92		68.5
93		68.4
94		68.9
95		68.8
96		68.6
97		68.0
98		68.2
99		68.0
100		67.3
101		67.4
102		67.4
103		67.3

Grid Number	Grid Letter	Elevation
104	BB	2167.5
105		67.3
106		66.7
107		66.7
108		67.6
109		66.6
110		66.6
111		67.0
112		66.6
113		66.5
114		66.3
115		66.2
116		66.4
36	BC	2165.8
37		65.8
38		65.8
39		65.9
40		66.0
41		65.9
42		66.0
43		66.0
44		66.1
45		66.1
46		66.1
47		66.2
48		66.6
49		66.6
50		65.9
51		66.4
52		66.4
53		66.6
54		67.0
55		67.5
56		67.7
57		68.2
58		68.6
59		68.6
60		68.7
61		68.7
62		68.5
63		68.8
64		68.7
65		69.1
66		69.0
67		68.7
68		68.6
69		68.0
70		68.1
71		67.1
72		68.1

Grid Number	Grid Letter	Elevation
73	BC	2167.6
74		67.4
75		67.5
76		68.5
77		68.5
78		68.3
79		67.9
80		68.0
81		68.0
82		68.9
83		68.8
84		69.2
85		69.1
86		69.3
87		69.2
88		69.1
89		69.3
90		68.8
91		68.1
92		68.2
93		68.3
94		68.8
95		69.1
96		68.7
97		68.7
98		68.6
99		68.2
100		67.8
101		67.4
102		66.9
103		67.1
104		67.1
105		67.4
106		67.1
107		67.0
108		66.8
109		66.7
110		66.5
111		66.3
112		66.3
113		66.6
114		66.6
115		66.4
116		66.5
36	BD	2165.8
37		65.8
38		65.9
39		66.0
40		65.9
41		66.0
42		66.1

Grid Number	Grid Letter	Elevation
43	BD	2166.1
44		66.2
45		66.2
46		66.3
47		66.2
48		66.4
49		66.3
50		66.8
51		66.8
52		66.8
53		66.7
54		66.9
55		67.6
56		68.6
57		68.3
58		68.3
59		68.1
60		68.3
61		68.7
62		68.9
63		69.0
64		68.7
65		67.8
66		68.4
67		68.0
68		67.9
69		67.5
70		67.0
71		66.7
72		67.5
73		67.1
74		66.6
75		66.5
76		66.6
77		67.0
78		66.8
79		67.4
80		67.3
81		67.7
82		68.0
83		68.2
84		68.4
85		69.3
86		69.4
87		69.3
88		69.2
89		69.5
90		69.0
91		69.1
92		68.5
93		68.5
94		68.3

Grid Number	Grid Letter	Elevation
95	BD	2168.9
96		68.4
97		68.7
98		68.5
99		68.1
100		67.5
101		67.3
102		67.4
103		66.8
104		67.3
105		67.8
106		67.2
107		66.7
108		66.5
109		66.5
110		66.6
111		66.5
112		66.6
113		66.6
114		66.7
115		66.6
116		66.4
121		66.4
126		66.8
131		67.0
136		66.7
1	BE	2165.4
6		65.6
11		65.4
16		65.7
21		65.6
26		65.9
31		65.5
36		65.9
37		65.9
38		65.9
39		66.1
40		66.0
41		65.9
42		66.3
43		66.1
44		66.0
45		66.4
46		66.3
47		66.4
48		66.5
49		66.5
50		66.3
51		67.1
52		67.1

Grid Number	Grid Letter	Elevation
53	BE	2166.7
54		67.5
55		68.7
56		68.4
57		68.3
58		68.4
59		68.5
60		69.3
61		69.1
62		68.8
63		68.7
64		69.0
65		68.4
66		68.2
67		67.4
68		66.7
69		66.6
70		67.2
71		66.5
72		66.9
73		66.6
74		66.6
75		66.9
76		67.0
77		67.4
78		67.2
79		67.9
80		67.7
81		68.0
82		68.0
83		67.8
84		68.4
85		67.8
86		68.6
87		68.8
88		69.1
89		69.1
90		69.3
91		69.2
92		69.0
93		68.9
94		68.5
95		68.7
96		68.3
97		68.6
98		68.9
99		68.6
100		67.8
101		67.3
102		66.7
103		67.0
104		67.1

Grid Number	Grid Letter	Elevation
105	BE	2167.3
106		66.9
107		66.8
108		66.7
109		66.4
110		66.7
111		66.6
112		66.6
113		66.9
114		66.7
115		66.7
116		66.4
36	BF	2166.1
37		66.2
38		66.1
39		66.0
40		67.1
41		67.2
42		66.0
43		66.1
44		66.0
45		66.2
46		66.3
47		66.6
48		66.7
49		67.1
50		67.0
51		67.1
52		67.2
53		67.2
54		68.4
55		68.4
56		68.6
57		68.4
58		68.4
59		69.1
60		69.0
61		68.7
62		68.4
63		68.6
64		68.8
65		67.6
66		67.5
67		66.8
68		66.6
69		66.8
70		67.2
71		66.8
72		67.0
73		66.9
74		67.6

Grid Number	Grid Letter	Elevation
75	BF	2166.9
76		67.0
77		67.6
78		67.7
79		67.8
80		68.0
81		68.0
82		68.3
83		67.8
84		67.9
85		68.1
86		67.7
87		67.6
88		68.3
89		68.4
90		68.9
91		69.2
92		69.4
93		69.4
94		68.8
95		69.1
96		68.9
97		68.2
98		68.7
99		68.6
100		68.1
101		67.0
102		66.9
103		67.1
104		66.8
105		66.8
106		67.1
107		67.0
108		66.8
109		66.7
110		66.5
111		66.7
112		66.7
113		66.7
114		66.5
115		66.3
116		66.3
36	BG	2166.9
37		66.5
38		66.4
39		66.2
40		66.5
41		66.7
42		66.3
43		66.0
44		65.9

Grid Number	Grid Letter	Elevation
45	BG	2166.0
46		66.4
47		67.0
48		67.0
49		66.9
50		67.5
51		67.2
52		67.0
53		67.5
54		68.3
55		68.2
56		68.9
57		69.1
58		69.2
59		69.0
60		68.9
61		68.6
62		69.5
63		68.2
64		68.1
65		67.7
66		67.7
67		67.8
68		66.6
69		66.7
70		66.5
71		67.0
72		67.2
73		67.2
74		67.1
75		67.2
76		67.4
77		67.6
78		68.3
79		68.4
80		67.7
81		68.2
82		68.2
83		67.9
84		67.7
85		68.0
86		67.4
87		67.3
88		67.5
89		67.8
90		68.1
91		68.6
92		69.4
93		68.9
94		68.6
95		69.2

Grid Number	Grid Letter	Elevation
96	BG	2169.6
97		68.6
98		68.4
99		68.5
100		68.2
101		67.6
102		67.6
103		66.9
104		66.8
105		66.7
106		67.2
107		66.8
108		66.8
109		67.0
110		66.8
111		66.8
112		66.4
113		66.3
114		66.2
115		66.3
116		66.2
36	BH	2166.6
37		66.8
38		67.1
39		67.1
40		67.2
41		67.4
42		66.9
43		66.3
44		66.3
45		66.2
46		66.7
47		67.0
48		67.2
49		67.2
50		67.9
51		67.2
52		67.1
53		67.5
54		67.6
55		68.5
56		69.2
57		68.8
58		68.9
59		68.9
60		68.9
61		68.7
62		68.6
63		68.2
64		67.9

Grid Number	Grid Letter	Elevation	Grid Number	Grid Letter	Elevation
65	BH	2167.5	36	BI	2166.4
66		67.3	37		66.3
67		67.3	38		66.8
68		67.2	39		67.2
69		66.5	40		67.6
70		66.5	41		67.3
71		66.9	42		67.0
72		66.8	43		66.9
73		67.2	44		66.2
74		67.7	45		66.7
75		68.0	46		67.2
76		68.0	47		67.3
77		68.2	48		67.8
78		67.8	49		67.6
79		67.7	50		68.1
80		67.5	51		67.7
81		67.9	52		67.2
82		67.6	53		67.6
83		67.8	54		69.0
84		67.5	55		68.8
85		67.2	56		68.6
86		66.9	57		68.3
87		67.2	58		67.8
88		67.7	59		67.1
89		67.7	60		67.6
90		67.9	61		67.5
91		67.9	62		67.7
92		68.6	63		67.7
93		68.9	64		67.4
94		69.3	65		67.0
95		69.6	66		66.9
96		69.7	67		67.0
97		68.6	68		66.6
98		68.4	69		65.9
99		68.4	70		65.9
100		68.1	71		65.8
101		67.5	72		65.3
102		67.6	73		65.9
103		67.2	74		65.8
104		67.0	75		66.4
105		66.7	76		66.4
106		66.9	77		66.5
107		66.3	78		66.4
108		66.9	79		66.7
109		66.8	80		66.3
110		66.7	81		66.5
111		66.5	82		66.8
112		66.5	83		66.6
113		66.4	84		66.4
114		66.3	85		67.1
115		66.2	86		67.0
116		66.4	87		67.3

Grid Number	Grid Letter	Elevation	Grid Number	Grid Letter	Elevation
88	BI	2167.4	46	BJ	2167.6
89		67.5	47		67.7
90		67.1	48		67.7
91		67.3	49		67.8
92		67.3	50		67.9
93		67.4	51		68.0
94		69.0	52		67.8
95		68.7	53		68.1
96		68.9	54		69.0
97		69.4	55		69.1
98		69.0	56		68.8
99		68.5	57		68.0
100		68.5	58		67.8
101		67.6	59		67.7
102		67.6	60		67.7
103		67.8	61		67.6
104		67.4	62		67.4
105		66.8	64		66.8
106		66.8	63		67.2
107		66.9	65		67.3
108		67.2	66		67.4
109		66.5	67		66.5
110		67.7	68		65.7
111		66.7	69		64.8
112		67.0	70		64.6
113		66.4	71		64.7
114		66.1	72		64.6
115		66.3	73		64.5
116		66.5	74		64.6
121		66.7	75		64.7
126		66.8	76		65.1
131		67.1	77		65.2
136		66.7	78		65.0
			79		65.1
1	BJ	2165.7	80		65.4
6		65.8	81		65.8
11		65.8	82		66.3
16		65.6	83		66.4
21		65.6	84		66.0
26		65.7	85		65.4
31		66.1	86		66.1
36		66.8	87		67.2
37		66.6	88		67.7
38		67.2	89		67.3
39		67.1	90		67.5
40		67.0	91		67.2
41		66.9	92		66.9
42		67.5	93		66.9
43		67.4	94		67.4
44		67.1	95		68.5
45		67.2	96		69.1

Grid Number	Grid Letter	Elevation
97	BJ	2169.1
98		69.1
99		68.8
100		68.6
101		68.7
102		68.5
103		68.3
104		67.8
105		67.2
106		67.0
107		66.6
108		67.0
109		67.0
110		66.3
111		66.5
112		66.9
113		66.4
114		66.5
115		66.8
116		66.8
36	BK	2166.9
37		66.8
38		66.6
39		67.0
40		67.4
41		67.3
42		67.6
43		67.0
44		67.3
45		67.0
46		67.8
47		67.9
48		67.8
49		68.3
50		68.8
51		68.2
52		68.1
53		69.1
54		69.1
55		69.4
56		68.3
57		67.6
58		67.2
59		67.5
60		67.4
61		67.1
62		67.0
63		66.7
64		66.7
65		66.8
66		66.3

Grid Number	Grid Letter	Elevation
67	BK	2165.7
68		63.8
69		63.8
70		63.2
71		63.0
72		62.9
73		62.4
74		61.8
75		61.6
76		61.9
77		62.3
78		62.5
79		63.1
80		64.0
81		64.5
82		64.7
83		65.1
84		65.1
85		65.0
86		65.5
87		66.6
88		68.7
89		66.6
90		66.7
91		67.0
92		66.8
93		66.8
94		67.0
95		68.2
96		69.0
97		69.2
98		69.0
99		68.8
100		68.3
101		68.7
102		69.0
103		68.5
104		68.0
105		67.7
106		66.9
107		66.6
108		67.0
109		66.6
110		66.5
111		66.6
112		66.7
113		66.3
114		66.5
115		66.9
116		66.6

Grid Number	Grid Letter	Elevation
36	BL	2166.5
37		66.8
38		66.5
39		67.2
40		67.0
41		66.7
42		66.0
43		67.4
44		67.9
45		68.0
46		68.5
47		68.3
48		68.2
49		68.0
50		68.1
51		68.5
52		68.6
53		69.1
54		69.1
55		68.4
56		68.0
57		67.8
58		67.1
59		67.1
60		66.6
61		67.0
62		66.5
63		66.1
64		66.0
65		65.5
66		64.5
67		63.9
68		63.1
69		60.7
70		60.8
71		60.5
72		59.6
73		59.6
74		59.1
75		58.2
76		58.2
77		58.7
78		59.0
79		60.0
80		60.8
81		61.6
82		62.5
83		62.9
84		64.1
85		64.9
86		65.1
87		66.3

Grid Number	Grid Letter	Elevation
88	BL	2166.3
89		66.5
90		66.5
91		66.5
92		66.9
93		66.9
94		66.9
95		67.0
96		67.7
97		69.4
98		69.3
99		69.0
100		68.3
101		68.2
102		68.5
103		68.7
104		68.5
105		68.1
106		67.1
107		67.3
108		67.0
109		67.1
110		66.9
111		67.0
112		67.0
113		66.6
114		66.3
115		66.5
116		66.7
36	BM	2166.1
37		66.0
38		66.2
39		66.3
40		66.9
41		66.6
42		67.0
43		67.1
44		67.8
45		68.3
46		68.7
47		68.2
48		68.4
49		68.1
50		68.4
51		68.8
52		69.0
53		69.1
54		68.6
55		68.2
56		68.0

Grid Number	Grid Letter	Elevation
57	BM	2167.6
58		67.4
59		67.1
60		66.5
61		66.3
62		65.8
63		64.8
64		64.2
65		63.6
66		62.6
67		61.8
68		60.7
69		59.2
70		58.4
71		56.9
72		55.8
73		55.3
74		55.5
75		55.2
76		55.6
77		56.2
78		56.5
79		57.3
80		57.7
81		58.6
82		59.6
83		61.3
84		62.2
85		63.4
86		66.4
87		65.3
88		65.5
89		66.1
90		66.5
91		66.5
92		66.7
93		67.0
94		67.6
95		67.2
96		67.6
97		68.6
98		69.8
99		69.3
100		69.5
101		69.0
102		68.4
103		68.8
104		69.2
105		68.6
106		67.3
107		67.3
108		67.2

Grid Number	Grid Letter	Elevation
109	BM	2167.1
110		66.7
111		67.0
112		67.2
113		66.8
114		66.6
115		66.3
116		66.4
36	BN	2166.2
37		66.0
38		66.2
39		66.4
40		66.6
41		66.3
42		66.7
43		67.1
44		68.2
45		68.7
46		68.7
47		66.3
48		68.5
49		68.7
50		69.2
51		69.0
52		69.0
53		68.6
54		68.5
55		68.6
56		67.6
57		67.5
58		67.5
59		67.3
60		67.1
61		66.7
62		65.5
63		63.7
64		62.9
65		61.8
66		60.5
67		58.9
68		57.7
69		56.1
70		55.1
71		53.9
72		53.3
73		53.9
74		54.0
75		53.5
76		54.3
77		54.7
78		54.6

Grid Number	Grid Letter	Elevation
79	BN	2154.9
80		55.6
81		55.9
82		56.3
83		57.3
84		58.5
85		60.6
86		62.3
87		63.9
88		64.6
89		65.2
90		66.5
91		66.9
92		67.1
93		67.5
94		67.4
95		66.9
96		67.4
97		68.9
98		69.2
99		69.2
100		69.3
101		68.4
102		68.2
103		68.4
104		68.6
105		68.5
106		67.5
107		67.1
108		67.0
109		66.9
110		66.7
111		66.9
112		66.8
113		66.9
114		66.5
115		66.5
116		66.6
121		66.6
126		66.4
131		66.4
136		66.3
1	BO	2165.4
6		65.6
11		65.7
16		65.7
21		66.1
26		65.5
31		65.5

Grid Number	Grid Letter	Elevation
36	BO	2166.0
37		66.0
38		66.2
39		66.4
40		66.1
41		66.4
42		66.4
43		66.8
44		68.2
45		66.9
46		68.4
47		66.4
48		67.3
49		68.4
50		68.1
51		69.0
52		69.0
53		69.1
54		68.2
55		68.8
56		67.4
57		67.2
58		66.9
59		66.8
60		66.2
61		66.0
62		
63		62.2
64		
65		59.7
66		
67		55.5
68		
69		54.3
70		
71		54.2
72		
73		54.3
74		
75		
76		
77		
78		
79		
80		
81		
82		
83		
84		
85		57.7
86		

Grid Number	Grid Letter	Elevation
87	BO	2161.9
88		
89		64.0
90		65.7
91		66.3
92		66.6
93		67.6
94		67.7
95		66.9
96		66.8
97		67.2
98		68.2
99		69.2
100		69.5
101		68.5
102		68.4
103		68.3
104		68.3
105		68.4
106		68.0
107		67.4
108		68.0
109		67.0
110		66.4
111		66.2
112		67.2
113		66.5
114		66.3
115		66.4
116		66.8
36	BP	2166.0
37		66.0
38		66.2
39		66.4
40		66.6
41		66.4
42		66.9
43		67.5
44		67.8
45		68.2
46		68.2
47		68.7
48		68.8
49		68.6
50		68.4
51		68.7
52		68.7
53		69.0
54		68.4
55		68.3
56		67.5

Grid Number	Grid Letter	Elevation
57	BP	2167.3
58		66.8
59		66.9
60		65.8
61		63.6
62		
63		61.1
64		
65		57.5
66		
67		54.0
68		
69		53.5
70		
71		53.7
72		
73		53.3
74		
75		
76		52.3
77		52.4
78		52.2
79		51.8
80		52.0
81		52.0
82		52.1
83		
84		
85		55.6
86		
87		59.2
88		
89		63.7
90		64.4
91		65.8
92		66.5
93		66.7
94		67.3
95		67.6
96		66.8
97		67.6
98		67.9
99		66.9
100		69.0
101		68.9
102		68.5
103		68.3
104		67.9
105		68.2
106		68.2
107		67.4
108		67.4
109		67.2

Grid Number	Grid Letter	Elevation
110	BP	2166.7
111		67.2
112		67.1
113		66.6
114		66.6
115		66.8
116		66.5
36	BQ	2166.2
37		66.2
38		66.2
39		65.8
40		66.2
41		66.4
42		66.9
43		66.8
44		67.8
45		67.9
46		68.2
47		68.4
48		68.6
49		68.8
50		68.4
51		68.6
52		68.7
53		68.9
54		68.3
55		68.5
56		67.6
57		67.9
58		66.8
59		65.4
60		63.6
61		59.4
62		
63		59.7
64		
65		55.0
66		
67		53.4
68		
69		
70		
71		
72		
73		
74		
75		
76		52.1
77		52.1
78		51.8
79		52.0

Grid Number	Grid Letter	Elevation
80	BQ	2152.2
81		52.2
82		52.5
83		52.2
84		51.7
85		53.1
86		
87		57.0
88		
89		60.7
90		63.3
91		65.0
92		66.1
93		66.9
94		66.8
95		66.8
96		67.1
97		67.7
98		67.9
99		68.0
100		69.0
101		68.7
102		68.6
103		68.2
104		68.2
105		68.0
106		68.0
107		67.7
108		67.2
109		66.9
110		67.0
111		67.2
112		67.5
113		67.1
114		66.9
115		66.9
116		66.5
36	BR	2166.4
37		66.2
38		66.4
39		66.0
40		66.2
41		66.7
42		67.2
43		67.3
44		68.0
45		68.1
46		68.5
47		69.1
48		68.5
49		69.0

Grid Number	Grid Letter	Elevation
50	BR	2168.7
51		69.1
52		69.0
53		68.4
54		68.5
55		68.6
56		67.6
57		67.6
58		66.3
59		64.8
60		62.9
61		61.3
62		
63		56.7
64		
65		54.4
66		
67		
68		
69		
70		
71		
72		
73		
74		
75		51.8
76		51.6
77		51.9
78		52.1
79		51.9
80		52.3
81		52.2
82		52.4
83		52.2
84		51.9
85		52.1
86		
87		55.2
88		
89		58.9
90		61.5
91		63.9
92		65.6
93		67.0
94		67.2
95		66.9
96		67.5
97		67.7
98		67.9
99		67.6
100		67.4
101		68.5

Grid Number	Grid Letter	Elevation
102	BR	2168.2
103		68.3
104		68.5
105		67.9
106		68.1
107		68.5
108		67.6
109		67.0
110		66.9
111		67.8
112		67.9
113		67.3
114		67.2
115		66.9
116		66.9
36	BS	2166.3
37		66.3
38		66.5
39		66.1
40		66.6
41		67.1
42		67.2
43		68.3
44		68.3
45		68.4
46		67.9
47		68.2
48		68.8
49		69.1
50		69.8
51		69.2
52		68.6
53		68.1
54		68.0
55		67.7
56		67.2
57		67.6
58		66.1
59		64.4
60		62.1
61		60.2
62		
63		55.3
64		
65		54.3
66		
67		
68		
69		
70		

Grid Number	Grid Letter	Elevation	Grid Number	Grid Letter	Elevation
71	BS		1	BT	2165.6
72			6		65.5
73			11		65.6
74			16		65.4
75		2152.2	21		65.6
76		51.5	26		65.4
77		51.9	31		66.1
78		51.8	36		66.5
79		52.4	37		66.5
80		52.1	38		66.3
81		51.5	39		66.5
82		51.7	40		67.0
83		52.5	41		67.9
84		52.4	42		67.2
85		52.0	43		68.4
86		52.2	44		68.2
87		53.8	45		68.0
88			46		67.3
89		56.8	47		67.8
90		60.0	48		69.0
91		62.5	49		69.3
92		63.6	50		69.0
93		66.4	51		68.6
94		67.2	52		68.2
95		67.1	53		67.6
96		67.2	54		67.4
97		67.5	55		67.3
98		67.5	56		66.9
99		67.5	57		66.4
100		67.2	58		65.6
101		68.5	59		63.6
102		68.8	60		60.1
103		68.5	61		57.6
104		68.4	62		
105		67.6	63		54.1
106		67.8	64		52.2
107		68.6	65		51.9
108		68.5	66		52.4
109		67.7	67		52.1
110		67.7	68		52.3
111		67.7	69		52.4
112		67.8	70		51.5
113		67.5	71		50.6
114		67.0	72		51.2
115		66.9	73		51.8
116		66.9	74		51.7
121		66.3	75		50.8
126		66.2	76		51.0
131		66.5	77		49.9
136		66.3	78		50.6

Grid Number	Grid Letter	Elevation
79	BT	2151.8
80		51.6
81		51.1
82		51.8
83		52.1
84		52.6
85		51.8
86		51.7
87		53.5
88		
89		55.1
90		57.0
91		59.5
92		61.5
93		65.7
94		66.1
95		67.2
96		66.9
97		66.4
98		67.0
99		66.7
100		66.6
101		67.7
102		68.4
103		67.9
104		67.7
105		67.1
106		67.7
107		68.0
108		67.8
109		67.1
110		67.1
111		67.1
112		66.6
113		66.4
114		66.2
115		66.1
116		65.8
36	BU	2166.6
37		66.6
38		66.7
39		66.7
40		67.1
41		66.9
42		67.2
43		68.9
44		68.6
45		67.9
46		67.5
47		67.9
48		68.6

Grid Number	Grid Letter	Elevation
49	BU	2169.1
50		69.2
51		68.6
52		67.9
53		67.7
54		67.3
55		67.3
56		66.8
57		66.3
58		65.1
59		62.6
60		59.8
61		56.9
62		
63		53.7
64		
65		
66		
67		
68		
69		
70		
71		
72		
73		
74		
75		
76		
77		
78		
79		
80		
81		
82		
83		
84		
85		
86		
87		
88		
89		53.3
90		55.4
91		57.2
92		61.0
93		64.7
94		66.2
95		66.6
96		66.3
97		66.5
98		67.0
99		67.2
100		66.9

Grid Number	Grid Letter	Elevation
101	BU	2167.6
102		68.8
103		68.3
104		67.5
105		67.2
106		67.5
107		67.8
108		67.5
109		66.7
110		67.2
111		66.7
112		66.2
113		66.4
114		66.1
115		66.0
116		65.4
36	BV	2166.1
37		66.2
38		66.6
39		66.6
40		67.1
41		67.4
42		67.1
43		67.6
44		68.7
45		69.1
46		68.2
47		68.2
48		68.8
49		69.6
50		69.1
51		68,6
52		67.1
53		67.4
54		67.7
55		67.9
56		66.8
57		65.8
58		63.7
59		61.7
60		58.7
61		56.3
62		54.7
63		53.2
64		53.4
65		53.2
66		52.8
67		53.2
68		53.0
69		52.5
70		52.4

Grid Number	Grid Letter	Elevation
71	BV	2152.5
72		52.8
73		52.9
74		52.7
75		52.2
76		52.3
77		52.1
78		52.1
79		52.4
80		52.2
81		53.1
82		52.3
83		53.2
84		53.7
85		53.7
86		53.3
87		53.8
88		52.3
89		53.8
90		55.0
91		56.0
92		59.6
93		63.7
94		64.6
95		66.4
96		66.5
97		67.0
98		66.4
99		67.0
100		67.0
101		67.7
102		68.5
103		68.1
104		67.7
105		66.7
106		67.4
107		68.2
108		68.1
109		66.6
110		66.7
111		66.3
112		66.3
113		65.9
114		65.7
115		65.8
116		65.6
36	BW	2166.3
37		66.4
38		66.5
39		66.7

Grid Number	Grid Letter	Elevation
40	BW	2166.9
41		67.2
42		67.4
43		67.8
44		68.6
45		68.6
46		68.8
47		68.7
48		69.0
49		69.0
50		68.7
51		68.3
52		67.5
53		68.9
54		68.4
55		68.3
56		66.8
57		65.6
58		63.6
59		61.0
60		58.6
61		55.6
62		
63		
64		
65		
66		
67		
68		
69		
70		
71		
72		
73		
74		
75		
76		
77		
78		
79		
80		
81		
82		
83		
84		
85		
86		
87		
88		
89		
90		54.7
91		55.6

Grid Number	Grid Letter	Elevation
92	BW	2158.4
93		62.7
94		65.3
95		66.4
96		66.7
97		66.5
98		66.2
99		66.7
100		67.1
101		67.2
102		67.4
103		68.4
104		68.1
105		67.0
106		67.5
107		68.4
108		68.3
109		66.7
110		66.2
111		66.6
112		65.7
113		65.9
114		65.9
115		65.6
116		65.6
36	BX	2166.7
37		66.3
38		66.7
39		66.4
40		66.7
41		67.4
42		67.8
43		68.1
44		68.2
45		68.6
46		68.8
47		68.9
48		69.4
49		69.2
50		68.5
51		68.7
52		68.5
53		69.0
54		68.5
55		68.1
56		66.5
57		65.5
58		63.4
59		60.0
60		57.1

Grid Number	Grid Letter	Elevation
61	BX	2153.5
62		52.9
63		52.9
64		52.9
65		52.8
66		53.0
67		52.6
68		52.4
69		52.3
70		53.2
71		53.3
72		53.8
73		53.5
74		53.7
75		53.8
76		54.0
77		54.3
78		54.4
79		55.0
80		53.6
81		53.3
82		52.5
83		52.3
84		51.7
85		53.1
86		54.1
87		53.1
88		53.2
89		52.7
90		53.6
91		54.8
92		57.3
93		61.8
94		64.1
95		65.6
96		66.6
97		66.4
98		66.6
99		67.0
100		67.3
101		67.5
102		68.0
103		68.6
104		68.1
105		67.7
106		67.8
107		68.3
108		67.7
109		67.1
110		66.3
111		66.1
112		65.8

Grid Number	Grid Letter	Elevation
113	BX	2166.5
114		66.2
115		65.6
116		65.2
121		66.3
126		66.5
131		66.4
136		66.1
1	BY	2165.5
6		65.5
11		65.5
16		65.6
21		65.5
26		66.2
31		65.7
36		66.3
37		66.2
38		66.5
39		66.8
40		66.8
41		67.1
42		67.7
43		68.2
44		68.6
45		68.8
46		69.3
47		69.3
48		69.0
49		69.0
50		69.0
51		68.6
52		68.8
53		68.8
54		69.1
55		67.9
56		67.6
57		65.9
58		64.4
59		62.4
60		58.3
61		55.7
62		54.8
63		
64		
65		
66		
67		
68		
69		
70		

Grid Number	Grid Letter	Elevation	Grid Number	Grid Letter	Elevation
71	BY		41	BZ	2167.1
72			42		67.0
73			43		68.3
74			44		69.0
75			45		68.8
76			46		68.9
77			47		69.1
78			48		68.9
79			49		68.9
80			50		67.6
81			51		67.7
82			52		68.6
83			53		68.4
84			54		67.8
85			55		67.5
86			56		66.2
87			57		64.3
88			58		61.1
89			59		57.1
90		2152.6	60		55.4
91		54.6	61		54.5
92		56.7	62		53.4
93		60.4	63		53.7
94		63.2	64		54.0
95		65.1	65		53.8
96		66.3	66		53.3
97		66.9	67		53.0
98		66.4	68		53.2
99		66.8	69		53.5
100		67.1	70		54.8
101		67.9	71		54.1
102		68.1	72		54.2
103		68.7	73		54.3
104		68.2	74		54.6
105		68.0	75		54.1
106		68.0	76		54.4
107		67.7	77		54.9
108		67.3	78		54.9
109		67.3	79		54.4
110		66.3	80		54.5
111		66.5	81		54.0
112		65.6	82		53.8
113		65.8	83		52.9
114		65.9	84		52.1
115		65.8	85		51.0
116		65.7	86		53.5
			86 + 2.5		54.1
36	BZ	2166.9	87		53.1
37		66.6	88		53.2
38		67.5	89		52.7
39		66.7	90		52.8
40		66.6	91		54.4

Grid Number	Grid Letter	Elevation
92	BZ	2156.5
93		60.1
94		63.1
95		65.2
96		66.9
97		66.9
98		67.0
99		66.4
100		66.8
101		67.4
102		67.8
103		68.4
104		68.3
105		68.1
106		68.0
107		67.4
108		67.2
109		66.7
110		66.1
111		66.5
112		66.3
113		65.6
114		65.7
115		65.9
116		65.8
36	CA	2166.5
37		66.8
38		67.2
39		66.9
40		66.8
41		67.5
42		67.6
43		68.3
44		68.2
45		68.7
46		68.4
47		68.4
48		68.6
49		68.8
50		67.7
51		68.0
52		67.9
53		67.7
54		67.5
55		67.1
56		65.4
57		63.6
58		60.7
59		57.3

Grid Number	Grid Letter	Elevation
60	CA	2155.2
61		54.2
62		
63		
64		
65		
66		
67		
68		
69		
70		
71		
72		
73		
74		
75		
76		
77		
78		
79		
80		
81		
82		
83		
84		
85		
86		
87		
88		
89		
90		53.2
91		54.2
92		56.2
93		60.5
94		62.8
95		65.5
96		66.9
97		66.9
98		66.7
99		66.4
100		67.1
101		67.7
102		68.1
103		68.5
104		68.6
105		67.9
106		67.3
107		67.0
108		67.4
109		66.8
110		66.4
111		66.4

Grid Number	Grid Letter	Elevation
112	CA	2166.9
113		65.7
114		65.9
115		65.7
116		65.8
36	CB	2166.3
37		67.0
38		67.2
39		66.9
40		67.0
41		67.6
42		67.8
43		68.0
44		68.4
45		68.4
46		68.8
47		69.2
48		68.8
49		68.4
50		68.2
51		68.3
52		68.1
53		68.5
54		67.8
55		67.5
56		65.6
57		64.1
58		60.7
59		57.8
60		55.6
61		54.3
62		53.2
63		53.4
64		53.4
65		53.3
66		53.1
67		53.0
68		53.3
69		53.6
70		54.1
71		54.6
72		53.1
73		54.6
74		54.1
75		53.9
76		53.9
77		53.9
78		54.0
79		54.2
80		54.3

Grid Number	Grid Letter	Elevation
81	CB	2154.0.
82		53.7
83		53.8.
84		51.9
85		52.1
86		52.7
87		53.3
88		53.0
89		52.7
90		53.3
91		54.4
92		56.1
93		59.8
94		63.2
95		65.1
96		66.8
97		67.1
98		67.1
99		66.2
100		66.4
101		67.7
102		68.7
103		68.7
104		68.3
105		68.0
106		67.6
107		67.7
108		67.2
109		66.5
110		66.3
111		66.7
112		66.9
113		65.7
114		66.0
115		66.1
116		66.0
36	CC	2166.3
37		66.5
38		66.6
39		67.1
40		67.6
41		67.6
42		68.0
43		67.9
44		68.2
45		68.8
46		68.8
47		68.8
48		69.3
49		68.7

Grid Number	Grid Letter	Elevation	Grid Number	Grid Letter	Elevation
50	CC	2168.0	102	CC	2168.2
51		68.0	103		68.5
52		67.8	104		68.4
53		68.2	105		67.9
54		67.4	106		67.7
55		68.3	107		67.5
56		65.9	108		67.2
57		64.0	109		66.7
58		60.6	110		66.4
59		57.9	111		66.9
60		55.6	112		67.0
61		54.4	113		66.1
62			114		65.8
63			115		66.1
64			116		65.9
65			121		66.0
66			126		66.4
67			131		66.3
68			136		66.3
69					
70					
71			1	CD	2165.6
72			6		65.5
73			11		65.4
74			16		65.4
75			21		65.6
76			26		65.7
77			31		65.5
78			36		66.5
79			37		66.8
80			38		66.6
81			39		67.2
82			40		67.6
83			41		68.0
84			42		67.6
85			43		68.0
86			44		68.3
87			45		68.3
88			46		68.4
89			47		68.6
90		53.3	48		68.9
91		54.9	49		68.6
92		56.5	50		67.9
93		59.8	51		67.5
94		63.3	52		67.7
95		65.4	53		68.1
96		66.8	54		67.2
97		66.8	55		66.9
98		66.8	56		66.1
99		66.2	57		64.1
100		66.0	58		60.9
101		66.8	59		58.3
			60		55.6

Grid Number	Grid Letter	Elevation	Grid Number	Grid Letter	Elevation
61	CD	2153.9	112	CD	2167.7
62		52.9	113		66.5
63		53.4	114		66.0
64		53.2	115		65.9
65		53.2	116		65.8
66		53.7			
67		52.8			
68		53.3	36	CE	2166.0
69		53.5	37		66.5
70		53.8	38		66.8
71		54.0	39		67.1
72		54.3	40		67.6
73		54.4	41		67.5
74		54.2	42		67.4
75		53.9	43		67.8
76		53.8	44		67.8
77		54.0	45		67.0
78		54.2	46		68.4
79		54.3	47		68.3
80		54.0	48		68.9
81		54.4	49		68.6
82		54.6	50		67.8
83		53.5	51		67.3
84		52.5	52		67.6
85		51.5	53		68.4
86		52.7	54		67.1
86 + 3.0		54.0	55		67.0
87		53.4	56		66.0
88		52.5	57		64.6
89		52.7	58		62.0
90		53.3	59		58.7
91		54.8	60		54.8
92		56.9	61		54.5
93		59.8	62		
94		63.3	63		
95		65.6	64		
96		66.5	65		
97		66.9	66		
98		66.8	67		
99		66.2	68		
100		66.3	69		
101		66.9	70		
102		68.1	71		
103		68.6	72		
104		68.6	73		
105		68.0	74		
106		67.7	75		
107		67.5	76		
108		67.4	77		
109		66.8	78		
110		66.7	79		
111		67.0	80		

Grid Number	Grid Letter	Elevation	Grid Number	Grid Letter	Elevation
81	CE		50	CF	2168.7
82			51		67.5
83			52		67.6
84			53		67.7
85			54		67.5
86			55		67.1
87			56		65.4
88			57		64.8
89			58		62.8
90		2153.7	59		60.0
91		55.0	60		55.9
92		56.8	61		54.3
93		60.0	62		52.9
94		63.5	63		53.7
95		65.5	64		53.5
96		66.5	65		53.4
97		66.9	66		53.4
98		66.9	67		53.2
99		67.0	68		53.2
100		66.6	69		53.4
101		67.4	70		53.7
102		68.4	71		54.1
103		68.5	72		54.5
104		68.8	73		54.5
105		68.5	74		54.3
106		68.4	75		54.2
107		67.6	76		54.1
108		67.1	77		54.9
109		66.4	78		55.2
110		66.9	79		54.6
111		67.4	80		54.2
112		67.6	81		54.4
113		67.0	82		53.9
114		65.8	83		53.1
115		65.9	84		52.3
116		65.9	85		52.3
			86		53.3
			87		53.0
36	CF	2165.9	88		52.9
37		66.2	89		52.9
38		67.1	90		54.0
39		67.4	91		55.2
40		67.3	92		56.9
41		67.0	93		60.3
42		67.9	94		64.5
43		67.8	95		66.1
44		67.8	96		67.4
45		68.2	97		67.5
46		68.5	98		67.1
47		68.3	99		67.1
48		68.8	100		66.7
49		69.4	101		67.2

Grid Number	Grid Letter	Elevation	Grid Number	Grid Letter	Elevation
102	CF	2167.7	71	CG	
103		68.6	72		
104		69.0	73		
105		68.8	74		
106		68.4	75		
107		67.4	76		
108		67.6	77		
109		67.2	78		
110		67.0	79		
111		67.4	80		
112		67.5	81		
113		67.4	82		
114		66.6	83		
115		66.0	84		
116		66.3	85		
			86		
			87		
36	CG	2166.2	88		
37		66.6	89		
38		66.7	90		2154.3
39		67.7	91		55.5
40		67.1	92		57.2
41		67.4	93		60.8
42		67.1	94		64.8
43		67.6	95		66.9
44		67.8	96		68.1
45		68.4	97		67.1
46		68.6	98		67.4
47		68.6	99		67.5
48		69.1	100		67.2
49		68.7	101		67.9
50		68.3	102		68.3
51		67.7	103		69.0
52		67.2	104		68.8
53		67.5	105		68.6
54		68.0	106		68.4
55		67.3	107		67.6
56		65.9	108		67.4
57		64.7	109		67.1
58		63.4	110		67.4
59		60.6	111		67.4
60		57.5	112		67.2
61		54.9	113		66.9
62			114		66.2
63			115		65.9
64			116		65.9
65					
66					
67			36	CH	2166.0
68			37		66.2
69			38		66.7
70			39		67.7

Grid Number	Grid Letter	Elevation
40	CH	2166.9
41		67.2
42		67.8
43		67.3
44		67.7
45		68.3
46		68.7
47		68.1
48		68.1
49		68.9
50		68.4
51		68.3
52		66.9
53		67.5
54		68.1
55		67.4
56		66.2
57		65.3
58		64.1
59		61.3
60		58.1
61		55.7
62		53.8
63		52.7
64		53.8
65		53.6
66		53.3
67		53.8
68		53.4
69		53.0
70		53.4
71		53.6
72		53.8
73		53.6
74		53.9
75		53.9
76		54.0
77		54.1
78		54.2
79		54.0
80		53.6
81		53.6
82		52.3
83		52.2
84		52.2
85		53.3
86		53.1
87		53.1
88		52.8
89		53.1
90		54.6
91		56.0

Grid Number	Grid Letter	Elevation
92	CH	2158.1
93		62.7
94		65.3
95		67.5
96		67.6
97		66.9
98		67.3
99		67.7
100		66.9
101		68.4
102		68.4
103		68.9
104		68.9
105		68.6
106		68.2
107		67.9
108		66.7
109		66.8
110		67.2
111		67.1
112		67.1
113		66.5
114		66.3
115		65.8
116		65.7
121		66.1
126		66.1
131		66.2
136		66.0
1	CI	2165.6
6		65.7
11		65.5
16		65.5
21		65.2
26		65.8
31		65.5
36		66.2
37		66.6
38		66.6
39		67.5
40		66.6
41		66.8
42		67.6
43		67.5
44		67.9
45		68.3
46		68.7
47		68.3
48		68.2
49		69.4

Grid Number	Grid Letter	Elevation
50	CI	2168.4
51		68.1
52		66.9
53		68.4
54		68.1
55		67.3
56		66.5
57		65.5
58		64.5
59		59.4
60		59.5
61		56.8
62		
63		
64		
65		
66		
67		
68		
69		
70		
71		
72		
73		
74		
75		
76		
77		
78		
79		
80		
81		
82		
83		
84		
85		
86		
87		
88		
89		
90		55.5
91		57.0
92		59.8
93		63.2
94		66.0
95		67.3
96		67.4
97		66.7
98		68.2
99		67.6
100		67.1
101		67.9

Grid Number	Grid Letter	Elevation
102	CI	2168.5
103		68.7
104		68.9
105		68.3
106		67.7
107		67.5
108		66.5
109		67.0
110		67.2
111		67.1
112		66.6
113		66.0
114		66.2
115		66.0
116		65.5
36	CJ	2166.3
37		66.9
38		66.9
39		67.0
40		66.9
41		67.0
42		67.3
43		67.9
44		67.4
45		67.9
46		68.5
47		68.5
48		67.7
49		69.4
50		68.2
51		68.2
52		67.5
53		67.1
54		67.0
55		66.9
56		66.5
57		66.7
58		65.4
59		63.2
60		60.9
61		58.4
62		55.2
63		53.3
64		52.8
65		53.2
66		53.8
67		53.5
68		53.7
69		53.8
70		52.7

Grid Number	Grid Letter	Elevation
71	CJ	2152.7
72		52.8
73		52.4
74		52.8
75		52.9
76		52.8
77		53.1
78		53.2
79		52.9
80		52.7
81		52.2
82		52.3
83		52.0
84		52.9
85		53.6
86		52.9
87		52.6
88		53.4
89		54.3
90		56.4
91		58.4
92		61.4
93		64.2
94		66.1
95		67.8
96		67.7
97		67.7
98		67.9
99		67.4
100		67.9
101		68.6
102		68.7
103		68.6
104		69.1
105		68.0
106		67.6
107		67.3
108		66.7
109		66.8
110		66.3
111		66.5
112		66.7
113		66.2
114		66.0
115		65.8
116		65.7
36	CK	2166.6
37		66.5
38		66.5
39		66.4
40		66.5

Grid Number	Grid Letter	Elevation
41	CK	2166.7
42		67.3
43		67.7
44		67.7
45		67.4
46		67.9
47		68.3
48		68.9
49		68.7
50		68.4
51		68.5
52		67.6
53		67.1
54		66.9
55		66.0
56		65.7
57		66.3
58		65.4
59		64.0
60		62.1
61		59.9
62		
63		54.2
64		
65		
66		
67		
68		
69		
70		
71		
72		
73		
74		
75		
76		
77		
78		
79		
80		
81		
82		
83		
84		
85		
86		
87		
88		
89		53.8
90		58.1
91		60.3
92		63.5

Grid Number	Grid Letter	Elevation
93	CK	2165.0
94		66.4
95		68.4
96		68.1
97		68.0
98		67.8
99		67.7
100		67.9
101		68.9
102		68.7
103		68.6
104		68.2
105		68.0
106		67.5
107		66.9
108		66.7
109		66.8
110		66.1
111		66.2
112		67.0
113		66.3
114		65.7
115		65.6
116		65.6
36	CL	2166.6
37		66.4
38		66.3
39		66.4
40		66.6
41		66.5
42		67.2
43		67.5
44		67.3
45		67.5
46		67.3
47		68.0
48		68.6
49		68.5
50		68.6
51		68.2
52		67.5
53		66.6
54		66.2
55		66.1
56		66.3
57		66.6
58		65.4
59		64.6
60		62.8
61		61.1

Grid Number	Grid Letter	Elevation
62	CL	21
63		2154.8
64		54.3
65		53.1
66		53.0
67		53.4
68		53.7
69		53.7
70		53.5
71		53.6
72		53.2
73		53.2
74		53.2
75		52.5
76		52.5
77		52.6
78		52.5
79		52.5
80		52.6
81		53.1
82		53.3
83		53.8
84		52.6
85		52.5
86		52.9
87		53.5
88		55.1
89		55.7
90		60.3
91		61.8
92		64.2
93		65.8
94		66.9
95		68.4
96		67.5
97		67.9
98		67.5
99		68.0
100		68.4
101		68.6
102		68.6
103		68.3
104		67.7
105		66.7
106		67.3
107		67.0
108		66.7
109		66.8
110		66.0
111		66.1
112		66.5
113		66.4
114		66.3

Grid Number	Grid Letter	Elevation
115	CL	2166.1
116		65.5
36	CM	2166.3
37		66.6
38		66.4
39		66.4
40		66.5
41		66.7
42		67.0
43		67.6
44		67.2
45		67.6
46		67.2
47		67.1
48		67.9
49		68.3
50		68.4
51		68.5
52		68.0
53		67.1
54		66.7
55		66.5
56		66.4
57		66.6
58		65.9
59		64.8
60		63.1
61		62.2
62		
63		55.9
64		
65		53.9
66		
67		53.4
68		
69		
70		
71		
72		
73		
74		
75		
76		
77		
78		
79		
80		
81		
82		
83		

Grid Number	Grid Letter	Elevation
84	CM	
85		
86		
87		2154.8
88		
89		57.2
90		61.2
91		63.1
92		65.3
93		66.6
94		67.2
95		68.2
96		68.1
97		67.5
98		67.8
99		67.8
100		68.6
101		69.1
102		68.5
103		68.1
104		67.7
105		67.5
106		67.2
107		66.9
108		66.6
109		66.6
110		65.8
111		65.9
112		65.8
113		65.5
114		65.8
115		65.7
116		65.5
121		66.1
126		65.8
131		66.1
136		65.9
1	CN	2165.5
6		65.5
11		65.6
16		65.5
21		65.4
26		65.3
31		65.6
36		66.5
37		66.8
38		66.5
39		66.6
40		66.6
41		66.8

Grid Number	Grid Letter	Elevation
42	CN	2167.0
43		67.0
44		67.1
45		67.4
46		67.6
47		67.5
48		67.8
49		68.5
50		68.6
51		68.7
52		67.9
53		67.5
54		66.7
55		67.8
56		66.5
57		66.4
58		66.3
59		65.3
60		64.0
61		62.5
62		
63		58.1
64		
65		55.7
66		55.4
67		54.0
68		53.6
69		53.2
70		53.5
71		53.6
72		53.2
73		53.1
74		53.4
75		54.5
76		53.5
77		53.4
78		53.2
79		54.1
80		52.9
81		53.0
82		52.9
83		52.6
84		53.5
85		53.6
86		
87		56.6
88		
89		59.1
90		63.2
91		65.3
92		66.7
93		66.8

Grid Number	Grid Letter	Elevation
94	CN	2167.4
95		68.1
96		67.9
97		68.1
98		67.9
99		68.3
100		69.1
101		68.7
102		68.2
103		67.7
104		66.4
105		67.3
106		67.4
107		66.9
108		66.7
109		66.2
110		66.4
111		66.3
112		65.9
113		65.3
114		65.9
115		65.5
116		65.3
36	CO	2166.4
37		66.8
38		66.8
39		66.8
40		67.0
41		67.3
42		66.8
43		66.7
44		67.1
45		67.2
46		68.8
47		67.4
48		67.6
49		68.0
50		68.5
51		68.2
52		67.9
53		67.3
54		66.8
55		66.9
56		66.6
57		66.7
58		67.0
59		65.6
60		64.7
61		63.7
62		

Grid Number	Grid Letter	Elevation	Grid Number	Grid Letter	Elevation
63	CO	2160.7	114	CO	2165.9
64			115		65.3
65		57.9	116		65.5
66					
67		55.2			
68			36	CP	2166.9
69		53.7	37		66.8
70			38		67.1
71			39		67.1
72			40		67.0
73			41		67.1
74			42		67.3
75			43		67.2
76			44		67.7
77			45		67.7
78			46		67.8
79			47		67.4
80			48		67.5
81			49		67.2
82			50		67.9
83		53.7	51		68.0
84			52		68.1
85		56.0	53		67.6
86			54		67.1
87		56.9	55		67.1
88			56		67.2
89		61.8	57		67.2
90		64.6	58		66.7
91		66.3	59		66.4
92		67.4	60		65.0
93		67.3	61		64.5
94		67.7	62		
95		68.5	63		62.2
96		69.0	64		
97		68.3	65		59.8
98		68.3	66		
99		69.2	67		57.2
100		69.3	68		55.4
101		68.8	69		54.4
102		68.3	70		53.6
103		67.5	71		53.4
104		67.5	72		52.8
105		67.4	73		53.0
106		67.6	74		52.9
107		67.1	75		52.9
108		66.5	76		53.0
109		66.5	77		52.8
110		66.4	78		53.1
111		65.7	79		53.4
112		65.8	80		53.5
113		65.2	81		53.9

Grid Number	Grid Letter	Elevation
82	CP	2153.8
83		55.3
84		55.9
85		57.1
86		
87		58.7
88		
89		63.7
90		65.9
91		67.2
92		67.0
93		67.0
94		67.7
95		68.4
96		68.4
97		68.6
98		69.1
99		69.1
100		69.3
101		68.8
102		68.2
103		67.9
104		67.7
105		68.3
106		67.5
107		67.1
108		66.4
109		65.6
110		65.8
111		65.5
112		65.9
113		66.2
114		66.0
115		65.7
116		65.4
36	CQ	2166.8
37		66.7
38		66.8
39		66.7
40		66.9
41		66.4
42		66.7
43		66.9
44		66.9
45		67.4
46		67.6
47		67.4
48		67.4
49		67.2
50		67.4

Grid Number	Grid Letter	Elevation
51	CQ	2167.6
52		68.5
53		68.2
54		67.8
55		67.8
56		67.0
57		66.7
58		66.5
59		66.6
60		65.6
61		65.2
62		
63		62.9
64		
65		61.2
66		
67		58.9
68		
69		55.8
70		
71		
72		
73		
74		
75		
76		
77		
78		
79		54.2
80		
81		55.0
82		
83		56.7
84		
85		59.6
86		
87		62.8
88		
89		65.4
90		66.4
91		66.8
92		67.2
93		68.3
94		68.6
95		68.8
96		68.3
97		68.2
98		69.0
99		69.1
100		69.1
101		68.5
102		67.9

Grid Number	Grid Letter	Elevation	Grid Number	Grid Letter	Elevation
103	CQ	2168.0	71	CR	2156.3
104		67.8	72		52.2
105		68.1	73		54.3
106		67.2	74		53.8
107		66.7	75		54.1
108		66.5	76		54.3
109		65.8	77		54.5
110		65.9	78		54.8
111		65.7	79		55.3
112		66.2	80		56.2
113		66.2	81		56.7
114		65.9	82		57.6
115		65.8	83		59.3
116		66.1	84		61.2
			85		62.3
			86		63.9
36	CR	2166.5	87		65.0
37		66.5	88		65.9
38		66.4	89		66.2
39		66.4	90		67.0
40		66.6	91		66.8
41		66.5	92		67.4
42		66.7	93		67.7
43		66.4	94		68.3
44		67.2	95		68.7
45		67.1	96		68.4
46		67.2	97		69.1
47		66.7	98		69.0
48		67.3	99		69.1
49		67.2	100		69.0
50		67.2	101		68.3
51		68.0	102		68.1
52		68.5	103		68.1
53		69.0	104		67.7
54		68.4	105		67.9
55		67.6	106		67.0
56		67.1	107		66.8
57		66.7	108		66.4
58		66.5	109		66.5
59		67.1	110		66.2
60		66.4	111		66.4
61		65.6	112		66.6
62		65.3	113		66.5
63		64.8	114		66.4
64		63.6	115		66.5
65		62.7	116		66.2
66		62.0	121		66.2
67		60.4	126		65.8
68		59.3	131		65.9
69		58.4	136		66.2
70		57.4			

Grid Number	Grid Letter	Elevation	Grid Number	Grid Letter	Elevation
1	CS	2165.4	80	CS	2158.8
6		65.5	81		60.4
11		65.7	82		61.0
16		65.5	83		62.3
21		65.6	84		63.4
26		65.6	85		64.8
31		65.4	86		65.9
36		66.6	87		65.8
37		66.5	88		66.3
38		66.3	89		67.1
39		66.6	90		67.9
40		66.6	91		67.8
41		66.4	92		68.1
42		66.5	93		67.9
43		66.6	94		68.0
44		66.8	95		68.4
45		67.4	96		68.3
46		66.1	97		68.2
47		66.5	98		68.3
48		66.8	99		68.6
49		66.4	100		68.5
50		67.7	101		67.8
51		67.6	102		67.8
52		68.1	103		67.7
53		68.5	104		68.0
54		68.4	105		67.4
55		67.9	106		67.1
56		67.0	107		67.0
57		67.3	108		66.8
58		67.4	109		66.7
59		67.0	110		66.2
60		66.8	111		66.2
61		66.0	112		66.1
62		66.5	113		66.2
63		66.1	114		66.2
64		65.3	115		66.4
65		64.3	116		66.0
66		63.5			
67		62.8			
68		61.8	36	CT	2166.2
69		61.0	37		66.6
70		59.6	38		66.4
71		59.9	39		66.4
72		58.6	40		66.5
73		57.3	41		66.3
74		56.5	42		66.2
75		55.8	43		66.4
76		56.1	44		66.4
77		56.0	45		66.4
78		56.8	46		66.6
79		58.1	47		66.3

Grid Number	Grid Letter	Elevation
48	CT	2166.7
49		67.8
50		67.9
51		68.3
52		68.0
53		68.1
54		68.2
55		68.0
56		67.4
57		67.0
58		67.1
59		67.3
60		66.8
61		66.4
62		66.3
63		66.5
64		66.2
65		65.7
66		65.3
67		64.6
68		63.9
69		63.2
70		62.8
71		62.2
72		61.7
73		60.7
74		60.2
75		60.1
76		59.7
77		59.8
78		60.1
79		60.6
80		60.9
81		62.1
82		63.5
83		64.7
84		66.4
85		66.5
86		66.6
87		67.0
88		67.1
89		67.3
90		68.2
91		67.7
92		67.7
93		67.7
94		67.5
95		67.7
96		68.4
97		68.6
98		68.8

Grid Number	Grid Letter	Elevation
99	CT	2169.5
100		68.6
101		68.1
102		68.2
103		68.4
104		67.6
105		67.3
106		67.5
107		67.5
108		67.1
109		67.1
110		66.6
111		66.5
112		66.3
113		66.7
114		66.4
115		66.5
116		66.3
36	CU	2166.5
37		66.3
38		66.5
39		66.1
40		66.2
41		66.3
42		66.0
43		66.1
44		66.1
45		66.2
46		66.9
47		66.9
48		67.0
49		67.7
50		67.4
51		67.4
52		68.5
53		67.6
54		68.0
55		67.6
56		67.0
57		67.0
58		67.1
59		67.0
60		67.0
61		66.7
62		66.4
63		66.5
64		67.2
65		66.8
66		66.3

Grid Number	Grid Letter	Elevation
67	CU	2165.6
68		65.1
69		64.8
70		64.2
71		63.9
72		63.9
73		63.5
74		63.0
75		62.8
76		62.7
77		62.7
78		63.0
79		63.4
80		63.4
81		64.3
82		65.4
83		65.7
84		66.2
85		67.4
86		67.9
87		66.8
88		67.2
89		67.3
90		67.8
91		67.8
92		67.4
93		66.9
94		68.0
95		68.1
96		68.1
97		68.6
98		68.6
99		68.7
100		68.3
101		68.2
102		68.2
103		68.5
104		67.6
105		67.2
106		67.8
107		67.7
108		66.9
109		66.5
110		66.3
111		66.4
112		66.8
113		66.6
114		66.4
115		66.2
116		65.9

Grid Number	Grid Letter	Elevation
36	CV	2166.4
37		66.3
38		66.1
39		66.2
40		66.1
41		65.9
42		66.1
43		65.9
44		66.4
45		66.4
46		66.3
47		67.2
48		67.1
49		67.5
50		67.5
51		68.2
52		68.4
53		67.9
54		67.8
55		67.9
56		67.2
57		67.1
58		66.8
59		66.7
60		67.3
61		66.7
62		66.4
63		66.3
64		67.0
65		67.7
66		66.6
67		66.6
68		66.4
69		66.0
70		65.8
71		65.7
72		65.9
73		65.5
74		65.5
75		65.1
76		65.1
77		64.5
78		64.9
79		65.3
80		64.9
81		65.2
82		65.7
83		66.3
84		66.8
85		67.8
86		67.4
87		67.1

Grid Number	Grid Letter	Elevation	Grid Number	Grid Letter	Elevation
88	CV	2167.6	57	CW	2167.4
89		67.2	58		67.4
90		67.5	59		67.2
91		67.6	60		67.2
92		67.1	61		66.7
93		67.0	62		66.3
94		67.6	63		66.7
95		68.1	64		66.5
96		68.3	65		67.3
97		68.9	66		67.1
98		68.6	67		66.4
99		68.5	68		66.4
100		68.4	69		66.8
101		68.1	70		66.4
102		68.0	71		66.9
103		68.1	72		66.7
104		67.7	73		66.7
105		67.6	74		66.5
106		67.8	75		66.6
107		67.6	76		66.3
108		67.3	77		65.8
109		67.2	78		66.2
110		66.2	79		66.5
111		66.5	80		66.3
112		66.5	81		65.4
113		66.4	82		66.2
114		66.4	83		66.6
115		66.0	84		66.9
116		65.9	85		67.5
			86		66.7
			87		67.2
36	CW	2166.3	88		67.7
37		66.1	89		67.7
38		66.0	90		67.6
39		66.2	91		67.6
40		66.0	92		67.4
41		65.9	93		67.6
42		66.1	94		68.1
43		66.0	95		68.4
44		66.0	96		67.9
45		66.6	97		68.4
46		66.3	98		68.6
47		67.0	99		68.3
48		67.1	100		68.3
49		67.0	101		68.1
50		67.6	102		68.0
51		67.7	103		68.2
52		67.3	104		67.5
53		67.7	105		67.3
54		67.5	106		67.4
55		67.6	107		67.5
56		67.1	108		66.9

Grid Number	Grid Letter	Elevation
109	CW	2166.9
110		66.5
111		66.7
112		66.5
113		65.8
114		66.1
115		65.8
116		65.8
121		65.9
126		65.9
131		66.3
136		66.1
1	CX	2165.5
6		65.5
11		65.5
16		65.6
21		65.6
26		65.5
31		65.6
36		66.2
37		66.0
38		65.9
39		66.0
40		65.9
41		65.9
42		65.9
43		66.0
44		66.1
45		66.2
46		66.5
47		66.7
48		66.8
49		67.2
50		67.4
51		67.1
52		66.9
53		67.5
54		67.4
55		67.6
56		66.8
57		67.2
58		67.4
59		67.4
60		67.6
61		67.2
62		67.0
63		66.6
64		66.7
65		66.8
66		67.3

Grid Number	Grid Letter	Elevation
67	CX	2167.4
68		67.0
69		66.9
70		67.0
71		67.1
72		67.8
73		67.5
74		67.3
75		67.5
76		67.5
77		67.0
78		67.3
79		68.0
80		67.2
81		67.3
82		66.4
83		67.0
84		67.3
85		67.0
86		66.7
87		67.2
88		67.7
89		68.2
90		68.0
91		68.0
92		68.0
93		68.2
94		68.3
95		68.0
96		67.9
97		67.6
98		67.8
99		68.3
100		68.0
101		67.8
102		67.9
103		67.9
104		67.4
105		67.2
106		67.2
107		67.0
108		66.9
109		66.2
110		65.9
111		66.3
112		66.2
113		65.9
114		66.0
115		65.8
116		65.9

Grid Number	Grid Letter	Elevation	Grid Number	Grid Letter	Elevation
36	CY	2165.8	88	CY	2167.7
37		66.5	89		68.2
38		65.8	90		68.5
39		65.9	91		68.3
40		65.9	92		68.1
41		65.9	93		67.9
42		66.0	94		67.8
43		66.1	95		67.7
44		66.2	96		67.4
45		66.3	97		67.3
46		66.2	98		67.6
47		66.8	99		67.0
48		66.7	100		67.4
49		66.4	101		67.6
50		67.2	102		67.9
51		67.0	103		67.6
52		67.0	104		67.6
53		67.2	105		67.4
54		67.4	106		67.3
55		67.6	107		67.1
56		67.1	108		66.9
57		67.4	109		66.5
58		67.4	110		66.5
59		67.8	111		66.5
60		68.3	112		66.4
61		67.4	113		66.3
62		67.2	114		66.2
63		67.3	115		65.9
64		67.0	116		66.0
65		67.0			
66		67.3			
67		68.1	36	CZ	2165.8
68		67.7	37		65.9
69		67.5	38		66.2
70		67.2	39		65.9
71		67.1	40		65.9
72		67.3	41		66.0
73		67.1	42		66.0
74		67.1	43		66.0
75		67.3	44		66.2
76		67.3	45		66.0
77		67.4	46		66.4
78		67.3	47		66.0
79		67.1	48		66.6
80		67.5	49		66.7
81		66.8	50		67.1
82		66.9	51		67.5
83		67.1	52		67.1
84		67.4	53		67.4
85		67.7	54		67.2
86		67.5	55		67.5
87		66.6	56		66.9

Grid Number	Grid Letter	Elevation
57	CZ	2167.1
58		66.9
59		67.2
60		68.2
61		67.9
62		67.9
63		67.6
64		67.2
65		67.4
66		67.3
67		67.2
68		67.7
69		68.5
70		67.5
71		67.0
72		66.9
73		66.8
74		66.7
75		66.9
76		67.4
77		67.1
78		66.6
79		66.5
80		67.4
81		67.0
82		67.2
83		66.9
84		67.5
85		67.4
86		66.9
87		67.9
88		67.7
89		68.1
90		68.0
91		68.5
92		68.2
93		67.9
94		67.8
95		68.2
96		67.7
97		67.2
98		67.2
99		66.9
100		67.2
101		67.0
102		67.2
103		67.1
104		67.3
105		66.9
106		67.1
107		66.9
108		67.0

Grid Number	Grid Letter	Elevation
109	CZ	2167.0
110		66.9
111		66.9
112		66.6
113		66.8
114		66.9
115		66.7
116		66.5
36	DA	2165.7
37		65.8
38		66.0
39		66.0
40		65.9
41		66.0
42		66.0
43		66.1
44		66.2
45		66.4
46		66.6
47		66.3
48		66.5
49		66.6
50		67.0
51		67.3
52		67.1
53		66.8
54		66.8
55		67.6
56		67.3
57		67.0
58		66.9
59		66.6
60		67.3
61		66.8
62		68.0
63		67.9
64		67.7
65		67.9
66		68.2
67		67.7
68		67.4
69		67.2
70		67.2
71		67.2
72		66.7
73		66.5
74		66.5
75		67.0
76		66.4
77		66.6

Grid Number	Grid Letter	Elevation	Grid Number	Grid Letter	Elevation
78	DA	2166.8	47	DB	2166.7
79		66.1	48		66.3
80		67.5	49		66.6
81		67.1	50		67.0
82		67.1	51		66.8
83		67.8	52		66.9
84		68.1	53		66.6
85		68.0	54		67.0
86		68.0	55		67.5
87		68.4	56		67.3
88		68.8	57		66.6
89		68.7	58		66.4
90		68.3	59		66.3
91		68.8	60		66.6
92		68.4	61		67.0
93		67.9	62		67.3
94		67.6	63		67.3
95		68.0	64		68.1
96		67.8	65		68.2
97		67.0	66		68.1
98		67.1	67		68.1
99		66.4	68		67.7
100		66.9	69		67.9
101		66.6	70		67.8
102		66.4	71		67.1
103		66.6	72		66.6
104		67.3	73		66.4
105		66.7	74		66.0
106		66.5	75		66.2
107		66.5	76		66.9
108		66.9	77		66.1
109		67.1	78		66.7
110		66.7	79		65.9
111		66.9	80		67.7
112		66.9	81		67.4
113		67.1	82		67.0
114		66.8	83		67.4
115		66.8	84		67.5
116		66.5	85		68.0
			86		68.4
			87		68.7
36	DB	2165.7	88		69.1
37		65.8	89		69.1
38		66.0	90		68.3
39		65.9	91		67.4
40		65.9	92		68.1
41		65.9	93		67.7
42		65.9	94		67.7
43		66.1	95		67.6
44		66.1	96		67.6
45		66.2	97		67.2
46		66.3	98		66.9

Grid Number	Grid Letter	Elevation
99	DB	2166.4
100		66.2
101		66.3
102		66.8
103		66.6
104		66.8
105		66.9
106		66.3
107		66.2
108		67.1
109		67.6
110		67.8
111		68.0
112		67.4
113		67.5
114		67.1
115		66.1
116		66.0
36	DC	2166.0
37		66.5
38		66.2
39		65.9
40		65.7
41		65.7
42		65.7
43		66.1
44		66.2
45		66.3
46		66.3
47		66.7
48		66.5
49		66.6
50		66.4
51		66.4
52		66.5
53		66.4
54		67.2
55		66.5
56		66.7
57		66.4
58		66.3
59		66.3
60		66.1
61		66.7
62		66.9
63		66.9
64		67.3
65		68.0
66		67.6
67		68.0

Grid Number	Grid Letter	Elevation
68	DC	2168.9
69		68.2
70		68.0
71		67.8
72		67.5
73		66.4
74		67.1
75		67.1
76		66.9
77		67.4
78		67.4
79		67.9
80		68.1
81		68.4
82		67.4
83		67.5
84		67.9
85		67.9
86		68.2
87		68.5
88		68.1
89		68.1
90		68.0
91		68.1
92		68.1
93		68.2
94		67.8
95		67.6
96		67.4
97		67.6
98		66.6
99		66.4
100		66.1
101		66.5
102		67.7
103		66.4
104		66.6
105		66.7
106		66.3
107		66.1
108		66.7
109		67.2
110		66.6
111		67.1
112		67.1
113		67.2
114		66.9
115		66.2
116		65.9

Grid Number	Grid Letter	Elevation
36	DD	2165.9
37		66.0
38		65.5
39		65.8
40		65.8
41		65.7
42		65.7
43		65.9
44		66.0
45		66.2
46		66.1
47		66.4
48		66.6
49		66.3
50		66.1
51		66.1
52		66.1
53		66.2
54		66.7
55		66.5
56		66.1
57		66.3
58		66.1
59		66.3
60		66.7
61		66.9
62		66.8
63		66.5
64		66.9
65		66.7
66		66.4
67		68.0
68		68.2
69		68.4
70		68.4
71		68.1
72		67.8
73		68.0
74		67.8
75		68.1
76		67.7
77		67.5
78		67.4
79		68.0
80		68.0
81		68.3
82		67.8
83		67.5
84		68.0
85		67.9
86		67.8
87		68.2

Grid Number	Grid Letter	Elevation
88	DD	2167.4
89		67.2
90		67.4
91		67.6
92		68.2
93		67.6
94		67.7
95		68.0
96		67.1
97		67.2
98		66.9
99		66.2
100		66.0
101		66.4
102		67.1
103		66.6
104		66.3
105		66.5
106		66.5
107		66.4
108		66.3
109		67.2
110		66.9
111		66.5
112		66.2
113		66.6
114		66.7
115		66.2
116		65.8
36	DE	2165.8
37		66.1
38		65.5
39		65.5
40		65.6
41		65.7
42		65.7
43		65.9
44		65.8
45		66.2
46		66.2
47		66.4
48		66.1
49		66.2
50		66.3
51		66.0
52		66.0
53		66.0
54		66.2
55		65.9
56		66.0

Grid Number	Grid Letter	Elevation	Grid Number	Grid Letter	Elevation
57	DE	2166.7	109	DE	2167.2
58		66.4	110		66.9
59		66.1	111		66.5
60		66.5	112		66.2
61		66.5	113		66.6
62		65.3	114		66.7
63		65.8	115		66.2
64		66.4	116		65.8
65		66.3			
66		66.7			
67		66.8	36	DF	2165.8
68		67.7	37		65.7
69		67.7	38		65.9
70		66.9	39		65.4
71		67.7	40		65.5
72		67.8	41		65.5
73		67.8	42		65.5
74		68.0	43		65.6
75		67.9	44		65.8
76		67.6	45		65.7
77		67.1	46		66.2
78		67.3	47		66.3
79		67.5	48		66.5
80		68.0	49		66.6
81		67.8	50		66.3
82		67.7	51		66.0
83		67.7	52		65.9
84		68.0	53		66.1
85		67.9	54		65.7
86		67.8	55		65.8
87		68.2	56		65.8
88		67.4	57		65.8
89		67.2	58		66.3
90		67.4	59		66.0
91		67.6	60		66.4
92		68.2	61		66.2
93		67.6	62		66.1
94		67.7	63		66.3
95		68.0	64		66.1
96		67.1	65		66.7
97		67.2	66		66.6
98		66.9	67		67.2
99		66.2	68		67.1
100		66.0	69		66.8
101		66.4	70		66.8
102		67.1	71		67.3
103		66.6	72		67.3
104		66.3	73		67.6
105		66.5	74		67.6
106		66.5	75		67.4
107		66.4	76		67.1
108		66.3	77		67.1

Grid Number	Grid Letter	Elevation
78	DF	2167.0
79		67.4
80		67.3
81		67.5
82		67.3
83		67.3
84		67.5
85		67.6
86		67.4
87		67.6
88		67.2
89		66.9
90		67.6
91		68.3
92		68.0
93		67.6
94		67.5
95		67.6
96		67.1
97		66.6
98		66.2
99		66.3
100		66.4
101		66.5
102		66.1
103		66.3
104		66.4
105		66.5
106		66.6
107		66.4
108		66.5
109		67.1
110		66.9
111		66.5
112		65.9
113		66.2
114		66.3
115		65.9
116		65.9
36	DG	2165.7
37		65.6
38		65.7
39		66.1
40		66.0
41		65.4
42		65.5
43		65.3
44		65.5
45		65.7
46		65.7

Grid Number	Grid Letter	Elevation
47	DG	2165.9
48		66.1
49		65.8
50		65.9
51		65.9
52		66.1
53		66.1
54		65.6
55		65.7
56		65.6
57		65.7
58		66.0
59		66.2
60		66.3
61		65.9
62		66.0
63		66.1
64		66.1
65		66.6
66		67.2
67		67.0
68		66.6
69		67.1
70		67.0
71		67.3
72		67.5
73		67.4
74		67.5
75		67.2
76		67.1
77		67.2
78		67.0
79		67.5
80		67.6
81		67.3
82		66.9
83		67.4
84		66.7
85		66.6
86		66.5
87		66.9
88		66.9
89		66.6
90		67.2
91		67.8
92		67.4
93		67.3
94		67.5
95		67.0
96		66.5
97		66.4
98		66.2

Grid Number	Grid Letter	Elevation
99	DG	2166.6
100		66.2
101		65.9
102		66.0
103		66.1
104		66.8
105		66.2
106		66.0
107		66.4
108		66.8
109		66.8
110		66.7
111		66.5
112		66.0
113		66.1
114		66.3
115		66.1
116		66.2
36	DH	2165.7
37		65.6
38		65.7
39		65.8
40		66.6
41		65.6
42		65.6
43		65.3
44		65.4
45		65.5
46		65.7
47		65.9
48		66.0
49		66.1
50		66.0
51		66.0
52		66.4
53		65.8
54		66.0
55		65.8
56		65.7
57		65.7
58		65.9
59		65.8
60		66.2
61		65.8
62		65.6
63		65.7
64		66.0
65		66.0
66		66.3
67		67.1

Grid Number	Grid Letter	Elevation
68	DH	2166.9
69		66.8
70		66.9
71		67.5
72		67.9
73		67.4
74		66.8
75		67.0
76		67.2
77		67.3
78		66.3
79		67.3
80		67.2
81		66.9
82		66.2
83		66.9
84		66.7
85		66.5
86		66.7
87		65.9
88		66.2
89		66.5
90		66.7
91		67.3
92		67.3
93		67.4
94		67.2
95		67.3
96		66.8
97		66.8
98		67.0
99		66.7
100		65.9
101		65.8
102		66.0
103		66.4
104		65.3
105		65.9
106		66.1
107		66.2
108		66.8
109		67.2
110		66.4
111		66.3
112		66.1
113		66.1
114		66.3
115		66.4
116		66.2

Grid Number	Grid Letter	Elevation	Grid Number	Grid Letter	Elevation
36	DI	2165.8	88	DI	2166.0
37		65.8	89		66.1
38		65.8	90		66.4
39		65.9	91		66.8
40		65.9	92		66.9
41		66.1	93		67.5
42		65.5	94		66.5
43		65.3	95		67.2
44		65.0	96		66.9
45		65.2	97		66.9
46		65.8	98		66.7
47		65.6	99		66.5
48		66.0	100		66.0
49		66.2	101		65.9
50		65.8	102		65.7
51		65.9	103		66.0
52		66.0	104		66.2
53		66.0	105		65.8
54		65.8	106		65.9
55		65.8	107		66.4
56		65.6	108		66.7
57		65.6	109		66.8
58		65.7	110		66.4
59		65.6	111		66.2
60		66.0	112		66.1
61		65.6	113		66.1
62		65.0	114		66.1
63		65.7	115		66.3
64		65.6	116		66.3
65		65.9			
66		66.4			
67		66.9	36	DJ	2165.9
68		66.8	37		65.8
69		66.5	38		65.9
70		66.7	39		65.9
71		66.9	40		65.9
72		67.4	41		66.1
73		67.5	42		65.9
74		66.9	43		65.5
75		66.8	44		65.5
76		67.0	45		65.2
77		67.0	46		66.0
78		67.7	47		65.9
79		67.0	48		65.6
80		66.9	49		65.6
81		67.0	50		65.8
82		66.6	51		66.0
83		66.5	52		66.0
84		66.3	53		65.9
85		66.4	54		65.8
86		65.9	55		65.7
87		66.3	56		65.7

Grid Number	Grid Letter	Elevation	Grid Number	Grid Letter	Elevation
57	DJ	2165.5	109	DJ	2166.4
58		65.6	110		66.5
59		65.4	111		66.1
60		65.5	112		66.1
61		65.6	113		66.2
62		65.4	114		66.1
63		65.5	115		66.4
64		66.1	116		66.5
65		66.0			
66		66.5			
67		66.7	36	DK	2165.8
68		66.9	37		65.9
69		66.8	38		65.7
70		67.0	39		65.7
71		66.9	40		65.7
72		67.1	41		66.0
73		67.1	42		65.9
74		67.0	43		65.7
75		66.8	44		65.7
76		67.1	45		65.6
77		66.7	46		65.7
78		67.0	47		66.0
79		67.1	48		66.0
80		66.9	49		65.7
81		66.9	50		65.7
82		66.2	51		65.8
83		66.0	52		65.9
84		66.1	53		65.8
85		65.7	54		65.8
86		65.5	55		65.8
87		66.1	56		65.6
88		65.9	57		65.4
89		66.2	58		65.5
90		66.2	59		65.5
91		66.7	60		65.5
92		66.6	61		65.5
93		67.2	62		65.5
94		66.7	63		65.7
95		66.8	64		65.7
96		66.7	65		65.9
97		66.8	66		66.0
98		66.2	67		66.2
99		66.0	68		66.7
100		66.6	69		66.7
101		65.7	70		66.9
102		65.7	71		66.9
103		65.9	72		67.0
104		66.1	73		67.0
105		66.1	74		66.9
106		66.3	75		67.1
107		66.5	76		67.2
108		66.7	77		67.2

Grid Number	Grid Letter	Elevation
78	DK	2166.9
79		66.4
80		66.2
81		66.3
82		66.3
83		65.9
84		66.0
85		65.6
86		65.7
87		66.1
88		65.7
89		65.6
90		65.7
91		66.2
92		66.3
93		66.2
94		66.7
95		66.3
96		66.5
97		66.5
98		66.8
99		66.0
100		65.8
101		65.6
102		65.6
103		65.7
104		66.1
105		66.0
106		66.0
107		66.1
108		66.5
109		66.3
110		66.3
111		66.3
112		66.0
113		66.1
114		66.0
115		66.2
116		66.3
36	DL	2166.0
37		65.9
38		65.8
39		65.8
40		65.9
41		65.8
42		65.8
43		65.8
44		65.8
45		65.8
46		65.5
47	DL	2165.5
48		65.4
49		65.3
50		65.6
51		65.7
52		65.7
53		65.6
54		65.7
55		65.7
56		65.5
57		65.4
58		65.4
59		65.5
60		65.3
61		65.4
62		65.2
63		65.6
64		65.9
65		65.8
66		66.0
67		66.2
68		66.1
69		66.5
70		66.8
71		66.4
72		67.4
73		67.1
74		66.8
75		67.1
76		67.3
77		67.1
78		66.7
79		66.5
80		66.2
81		66.2
82		66.1
83		66.0
84		65.9
85		65.7
86		65.6
87		65.6
88		65.7
89		65.7
90		66.1
91		65.9
92		66.0
93		65.9
94		67.1
95		66.5
96		66.7
97		66.7
98		66.7

Grid Number	Grid Letter	Elevation
99	DL	2166.0
100		65.9
101		66.0
102		65.6
103		65.6
104		66.1
105		65.9
106		65.8
107		66.3
108		66.3
109		66.4
110		66.5
111		66.4
112		66.4
113		66.0
114		66.1
115		66.1
116		66.2
36	DM	2165.8
37		65.9
38		66.0
39		65.9
40		65.8
41		65.8
42		65.9
43		65.8
44		65.8
45		65.8
46		65.7
47		65.6
48		65.4
49		65.2
50		65.3
51		65.5
52		65.7
53		65.5
54		65.6
55		65.5
56		65.3
57		65.4
58		65.4
59		65.3
60		65.4
61		65.4
62		65.2
63		65.7
64		65.5
65		65.9
66		66.0
67		66.0

Grid Number	Grid Letter	Elevation
68	DM	2165.9
69		65.8
70		66.5
71		66.9
72		66.7
73		66.9
74		67.0
75		67.8
76		67.2
77		67.0
78		66.7
79		66.6
80		66.1
81		66.3
82		66.1
83		65.9
84		66.0
85		66.0
86		65.7
87		65.7
88		65.5
89		65.8
90		65.8
91		65.5
92		66.0
93		66.3
94		66.8
95		66.9
96		66.6
97		66.5
98		66.4
99		66.2
100		65.8
101		65.9
102		65.7
103		65.8
104		65.9
105		65.8
106		66.0
107		66.1
108		66.2
109		66.3
110		66.2
111		66.3
112		66.3
113		66.1
114		66.0
115		66.0
116		66.0

Grid Number	Grid Letter	Elevation	Grid Number	Grid Letter	Elevation
36	DN	2165.9	88	DN	2165.7
37		65.9	89		65.6
38		65.9	90		65.5
39		65.9	91		65.7
40		65.9	92		65.7
41		65.9	93		66.5
42		65.9	94		66.6
43		65.9	95		66.5
44		66.0	96		66.8
45		65.9	97		66.6
46		65.6	98		66.3
47		65.5	99		66.3
48		65.4	100		65.8
49		65.1	101		65.7
50		65.3	102		65.7
51		65.4	103		65.5
52		65.3	104		65.8
53		65.5	105		65.8
54		65.6	106		65.9
55		65.5	107		66.1
56		65.3	108		66.0
57		65.4	109		66.2
58		65.4	110		66.2
59		65.4	111		66.2
60		65.3	112		66.2
61		65.3	113		66.3
62		65.5	114		66.0
63		65.7	115		66.0
64		65.5	116		66.0
65		65.7			
66		65.9			
67		66.0	36	DO	2165.8
68		65.9	37		65.8
69		66.3	38		65.8
70		66.9	39		65.7
71		67.2	40		65.8
72		66.9	41		65.8
73		66.0	42		65.9
74		66.4	43		65.9
75		67.1	44		66.0
76		67.6	45		65.8
77		67.3	46		65.5
78		66.9	47		65.4
79		66.6	48		65.3
80		66.6	49		65.1
81		66.5	50		65.2
82		66.2	51		65.2
83		66.1	52		65.0
84		66.0	53		65.3
85		65.7	54		65.3
86		65.3	55		65.4
87		65.2	56		65.3

Grid Number	Grid Letter	Elevation	Grid Number	Grid Letter	Elevation
57	DO	2165.4	109	DO	2166.2
58		65.4	110		66.2
59		65.4	111		66.1
60		65.3	112		66.1
61		65.3	113		66.3
62		65.4	114		66.1
63		65.8	115		66.1
64		65.5	116		65.9
65		65.8			
66		65.9			
67		66.3	36	DP	2165.7
68		66.2	37		65.7
69		66.4	38		65.7
70		66.7	39		65.7
71		67.6	40		65.7
72		66.8	41		65.6
73		66.3	42		65.8
74		66.9	43		65.7
75		67.1	44		65.8
76		67.1	45		65.7
77		67.1	46		65.5
78		66.7	47		65.5
79		66.4	48		65.3
80		66.6	49		65.2
81		66.7	50		65.2
82		65.8	51		65.1
83		65.7	52		65.0
84		66.7	53		65.1
85		66.1	54		65.3
86		65.4	55		65.3
87		65.7	56		65.6
88		65.6	57		65.5
89		65.2	58		65.4
90		65.4	59		65.5
91		65.7	60		65.3
92		65.9	61		65.4
93		66.2	62		65.6
94		66.5	63		65.6
95		66.5	64		65.5
96		66.7	65		66.1
97		66.2	66		66.0
98		66.4	67		65.9
99		66.3	68		66.1
100		66.0	69		66.2
101		65.8	70		66.5
102		65.7	71		66.5
103		65.5	72		67.4
104		65.3	73		66.6
105		65.6	74		66.4
106		65.8	75		66.5
107		65.9	76		66.7
108		66.1	77		66.7

Grid Number	Grid Letter	Elevation
78	DP	2166.1
79		66.4
80		66.7
81		66.5
82		66.4
83		65.9
84		65.6
85		65.8
86		65.9
87		66.2
88		65.9
89		66.4
90		65.8
91		65.8
92		65.9
93		65.8
94		66.5
95		66.8
96		66.7
97		65.8
98		65.9
99		66.2
100		65.9
101		65.6
102		65.7
103		65.5
104		65.4
105		65.7
106		66.0
107		65.9
108		66.2
109		66.0
110		66.0
111		66.0
112		66.1
113		66.2
114		66.3
115		66.0
116		65.9
36	DQ	2165.7
37		65.8
38		65.7
39		65.8
40		65.7
41		65.8
42		65.9
43		65.8
44		65.9
45		65.7
46		65.8
47	DQ	2165.7
48		65.6
49		65.4
50		65.1
51		64.9
52		64.9
53		65.0
54		65.0
55		65.6
56		65.4
57		65.6
58		65.4
59		65.5
60		65.6
61		65.4
62		65.7
63		65.6
64		65.8
65		65.9
66		66.0
67		66.0
68		66.1
69		66.0
70		66.2
71		67.1
72		66.1
73		66.2
74		66.3
75		66.9
76		66.8
77		66.6
78		66.2
79		66.1
80		66.3
81		66.8
82		66.1
83		65.9
84		65.8
85		66.1
86		66.1
87		66.1
88		66.7
89		65.2
90		65.3
91		65.9
92		65.8
93		65.8
94		66.2
95		66.4
96		66.5
97		66.3
98		66.4

Grid Number	Grid Letter	Elevation
99	DQ	2166.2
100		66.0
101		65.8
102		65.6
103		65.5
104		65.3
105		65.6
106		65.5
107		65.9
108		65.8
109		65.8
110		65.7
111		65.7
112		65.8
113		66.1
114		66.3
115		66.1
116		65.9
36	DV	2165.4
41		65.8
46		65.6
51		65.0
56		65.1
61		65.4
66		66.1
71		65.9
76		66.1
81		66.4
86		65.9
91		65.5
96		66.0
101		66.0
106		65.5
111		65.5
116		66.0
36	EA	2165.5
41		65.6
46		65.4
51		65.6
56		65.2
61		65.4
66		65.6
71		66.0
76		65.8
81		66.0
86		65.7
91		65.6
96		65.2
101	EA	2166.0
106		65.8
111		65.9
116		65.9
36	EF	2165.4
41		65.4
46		65.6
51		65.4
56		65.5
61		65.5
66		65.3
71		65.4
76		65.4
81		65.6
86		65.9
91		65.6
96		66.0
101		65.6
106		65.8
111		65.6
116		65.4
36	EK	2165.8
41		65.1
46		65.5
51		65.6
56		65.5
61		65.9
66		65.7
71		66.4
76		65.4
81		65.5
86		65.7
91		65.4
96		65.6
101		65.6
106		66.0
111		65.5
116		65.7

APPENDIX B

PRETRIAL AND POSTTRIAL SURVEY OF ASPHALT STRIPS

TABLE B1 PRETRIAL AND POSTTRIAL SURVEY OF ASPHALT STRIPS

Strip A Bearing 124°00'00"

Pretrial		Posttrial	
Distance from GZ	Elevation	Distance from GZ	Elevation
feet	feet	feet	feet
249.632	2166.66	250.0	2166.31
244.714	66.64	240.0	66.25
239.675	66.67	230.0	66.38
234.864	66.63	220.0	66.05
229.743	66.63	210.0	66.16
224.716	66.56	200.0	66.19
219.721	66.56	197.0	66.23
214.704	66.57	194.0	66.39
209.799	66.54	192.0	66.72
204.713	66.56	191.0	66.57
199.731	66.55	181.0	66.19
194.710	66.56	178.0	66.59
189.733	66.53	175.0	66.18
184.701	66.57	173.0	66.04
179.719	66.52	168.3	67.02
174.679	66.46	165.0	65.97
169.676	66.44	163.0	65.91
164.720	66.40	158.0	66.76
159.726	66.37	152.0	65.41
154.680	66.36	150.0	65.39
149.778	66.34	145.0	65.76
144.719	66.39	144.9	65.05
139.704	66.31	141.5	65.03
134.697	66.33	141.4	65.70
129.818	66.29	137.5	63.96
124.762	66.26	137.3	64.24
119.753	66.27	134.5	63.74
114.698	66.27	134.0	63.09
109.747	66.29	133.8	63.46
104.750	66.30	131.0	63.17
99.801	66.25	130.0	64.27
94.796	66.23	129.0	63.58
89.774	66.22	127.0	62.82
84.780	66.22	126.0	62.10
79.693	66.23	125.0	62.79
74.744	66.25	124.0	62.24
		122.0	60.94

TABLE B1 (cont'd.)

Strip B Bearing 163°30'00"

Pretrial		Posttrial	
Distance from GZ	Elevation	Distance from GZ	Elevation
feet	feet	feet	feet
249.813	2166.69	250.0	2166.35
244.753	66.69	230.0	66.15
239.777	66.56	220.0	66.05
234.580	66.58	210.0	65.97
229.779	66.54	200.0	66.12
224.826	66.41	190.0	66.16
219.857	66.43	182.0	65.92
214.789	66.39	179.0	65.95
209.814	66.34	178.0	66.51
204.812	66.39	177.0	67.24
199.862	66.40	176.0	66.86
194.837	66.41	175.0	66.18
189.857	66.41	174.0	65.75
184.748	66.31	170.0	65.71
179.760	66.38	162.0	66.03
174.684	66.38	161.7	66.20
169.828	66.41	160.0	66.05
164.834	66.38	159.5	66.18
159.927	66.37	158.5	65.79
154.890	66.37	157.0	65.88
149.854	66.41	156.0	66.17
145.046	66.45	155.0	66.20
139.784	66.55	153.5	66.41
134.872	66.51	152.0	66.20
129.862	66.32	151.5	65.89
124.881	66.26	150.0	65.70
119.887	66.34	149.7	65.47
114.867	66.27	149.0	65.43
109.883	66.22	145.0	65.05
104.889	66.32	143.5	64.87
99.911	66.28	143.3	64.52
94.885	66.27	142.0	64.36
89.888	66.23	141.0	64.38

TABLE B1 (cont'd.)

Strip B (cont'd.)

Pretrial Distance from GZ	Pretrial Elevation	Posttrial Distance from GZ	Posttrial Elevation
feet	feet	feet	feet
84.860	2166.30	135.0	2163.27
79.948	66.33	130.5	63.77
74.853	66.36	12[illegible].0	61.96
		127.5	61.64
		127.0	61.46
		124.0	60.75
		122.0	60.42
		120.5	61.38
		119.Q	59.64
		117.0	59.62
		116.5	60.09
		115.0	59.39
		114.0	59.24
		113.0	58.79
Strip C Bearing 215°20'00"			
249.394	2166.00	250.0	2165.71
244.928	66.00	220.0	65.89
239.931	65.98	210.0	65.79
234.919	65.97	200.0	65.80
229.929	65.98	190.0	65.65
224.904	65.96	187.0	65.68
219.949	65.97	184.0	66.27
214.909	65.97	183.9	65.99
209.913	66.01	1[illegible]0.0	65.91
204.901	66.03	170.0	65.73
199.917	65.99	169.5	66.05
194.922	66.00	169.0	65.89
189.976	66.01	168.8	67.07
184.933	66.06	1[illegible]6.4	67.52
179.902	66.06	166.0	66.95
174.904	66.05	165.5	65.69

TABLE B1 (cont'd.)

Strip C (cont'd.)

Pretrial Distance from GZ	Pretrial Elevation	Posttrial Distance from GZ	Posttrial Elevation
feet	feet	feet	feet
169.920	2166.07	164.0	2165.58
164.919	66.11	163.5	66.84
160.010	65.92	163.0	67.70
154.995	66.14	62.0	67.57
150.025	66.17	161.5	67.05
144.964	66.17	159.5	67.33
139.959	66.12	159.3	66.83
134.960	66.04	158.7	66.84
130.002	66.05	158.0	67.57
124.722	66.14	157.5	65.87
119.947	66.16	.57.0	65.34
114.989	66.16	156.0	65.52
109.974	66.13	155.0	65.40
104.996	66.12	154.5	65.63
99.993	66.13	154.0	65.58
94.996	66.14	153.9	66.25
89.984	66.24	152.0	65.97
84.993	66.36	151.9	65.51
79.999	66.24	151.5	65.23
74.973	66.10	151.0	65.33
		150.0	65.44
		149.9	64.84
		149.0	64.91
		148.9	65.19
		146.0	64.82
		145.8	65.22
		144.0	65.09
		43.9	65.01
		40.0	64.32
		139.0	64.59
		135.5	64.36
		135.3	64.57
		134.0	64.18

TABLE B1 (cont'd.)

Strip C (cont'd.)

Pretrial		Posttrial	
Distance from GZ	Elevation	Distance from GZ	Elevation
feet	feet	feet	feet
		133.9	2163.49
		132.5	63.00
		132.2	63.61
		132.0	63.25
		131.8	64.18
		129.0	63.36
		128.5	61.98
		127.5	61.63
		127.4	61.08
		126.0	61.15
		125.8	61.52
		124.0	61.16
		123.8	61.65
		120.5	60.80
		120.3	59.80
		119.0	59.47
		117.0	59.88
		116.9	59.54

TABLE B2 PRETRIAL AND POSTTRIAL SURVEY OF MARKER PINS IN ASPHALT STRIPS

Pretrial			Posttrial					
Distance from GZ	Bearing	Elevation	Bearing	Distance from GZ	Elevation	Difference in Elevation	Radial Displacement	Horizontal Displacement
feet		feet		feet	feet	feet	feet	feet
Asphalt Strip "A" Bearing 129°00'00"								
249.632	129°00'50"	2166.66	129°00'11"	250.249	2166.36	- 0.33	L 0.12	+ 0.62
249.607*	128°32'52"	66.68	128°32'52"	250.142	66.38	- 0.30	L 0.08	+ 0.54
244.714	129°00'20"	66.64	129°00'04"	245.327	66.35	- 0.29	L 0.05	+ 0.61
239.675	128°59'59"	66.67	129°00'39"	240.265	66.34	- 0.33	R 0.12	+ 0.59
234.864	129°02'32"	66.63	129°00'24"	235.306	66.31	- 0.32	L 0.37	+ 0.44
229.743	128°58'27"	66.63	128°56'46"	230.406	66.45	- 0.18	L 0.28	+ 0.66
229.631*	128°28'24"	66.58	128°19'34"	230.502	66.39	- 0.19	L 0.59	+ 0.87
224.716	129°00'42"	66.56	129°02'29"	225.311	66.12	- 0.44	R 0.37	+ 0.60
219.721	128°58'20"	66.56	128°58'07"	220.362	66.18	- 0.38	L 0.03	+ 0.64
214.704	129°00'03"	66.57	128°58'56"	215.310	66.25	- 0.32	L 0.18	+ 0.61
209.799	128°58'29"	66.54	128°59'23"	210.238	66.28	- 0.26	R 0.14	+ 0.49
209.593*	128°27'03"	66.53	128°25'22"	210.117	66.28	- 0.25	L 0.10	+ 0.52
204.713	129°02'04"	66.56	128°59'26"	205.288	66.41	- 0.15	L 0.40	+ 0.58
199.731	128°55'05"	66.55	128°58'50"	200.301	66.33	- 0.22	R 0.55	+ 0.57
194.710	129°01'25"	66.56	128°58'03"	195.364	66.50	- 0.06	L 0.48	+ 0.65
189.733	128°59'57"	66.53	128°53'11"	190.424	66.60	+ 0.07	L 0.94	+ 0.59
189.581*	128°22'23"	66.55	128°18'57"	190.104	66.38	- 0.17	L 0.19	+ 0.52
184.701	129°01'02"	66.57	129°00'41"	185.319	66.42	- 0.15	L 0.05	+ 0.62
179.719	129°11'11"	66.52	129°00'14"	180.404	66.55	+ 0.03	L 1.46	+ 0.68
Asphalt Strip "B" Bearing 163°30'00"								
249.813	163°31'20"	2166.69	163°30'43"	250.249	2166.39	- 0.30	L 0.05	+ 0.44
249.696*	163°02'11"	66.67	163°02'56"	250.123	66.33	- 0.34	R 0.05	+ 0.43
244.753	163°30'54"	66.69	163°30'34"	245.226	66.33	- 0.36	L 0.03	+ 0.47
239.777	163°31'28"	66.56	163°30'49"	240.211	66.24	- 0.32	L 0.05	+ 0.49
234.580	163°30'39"	66.58	163°31'30"	235.202	66.29	- 0.29	R 0.06	+ 0.62
229.779	163°31'22"	66.54	163°31'39"	230.199	66.24	- 0.30	R 0.02	+ 0.42
229.374*	163°15'57"	66.58	163°01'38"	230.057	66.27	- 0.31	L 0.95	+ 0.68
224.826	163°31'43"	66.41	163°16'15"	225.238	66.25	- 0.16	L 1.10	+ 0.41
219.857	163°30'43"	66.43	163°30'39"	220.249	66.19	- 0.24	0.00	+ 0.39
214.789	163°31'28"	66.39	163°31'30"	215.275	66.22	- 0.17	0.00	+ 0.49
209.814	163°30'59"	66.34	163°29'30"	210.263	66.13	- 0.21	L 0.10	+ 0.45
209.675*	162°58'47"	66.29	162°59'59"	210.000	65.94	- 0.35	R 0.07	+ 0.33
204.812	163°31'48"	66.39	163°32'50"	205.284	66.26	- 0.13	R 0.07	+ 0.47
199.862	163°32'02"	66.40	163°31'00"	200.294	66.28	- 0.12	L 0.07	+ 0.43
194.837	163°32'00"	66.41	163°32'53"	195.262	66.35	- 0.06	R 0.05	+ 0.43
189.857	163°32'30"	66.41	163°32'55"	190.340	66.25	- 0.16	R 0.03	+ 0.48
189.717*	162°55'55"	66.44	162°56'04"	190.138	66.30	- 0.14	R 0.01	+ 0.42
184.748	163°31'38"	66.31	162°56'04"	185.270	66.42	+ 0.04	L 2.08	+ 0.52

* indicates pins in ground alongside the asphalt.

TABLE B2 (cont'd.)

Pretrial			Posttrial					
Distance from GZ	Bearing	Elevation	Bearing	Distance from GZ	Elevation	Difference in Elevation	Radial Displacement	Horizontal Displacement
feet		feet		feet		feet	feet	feet
Asphalt Strip "C" Bearing 215°20'00"								
249.894	215°41'43"	2166.00	215°45'11"	250.231	2165.75	- 0.25	R 0.38	+ 0.34
249.871*	215°13'40"	65.97	215°13'25"	250.238	65.69	- 0.28	L 0.02	+ 0.37
244.928	215°42'53"	66.00	215°42'14"	245.342	65.73	- 0.27	L 0.07	+ 0.41
239.931	215°43'11"	65.91	215°42'08"	240.266	65.75	- 0.23	L 0.11	+ 0.33
234.919	215°43'51"	65.97	215°42'45"	235.360	65.71	- 0.26	L 0.11	+ 0.44
229.929	215°44'14"	65.98	215°44'01"	230.310	65.79	- 0.19	L 0.02	+ 0.38
229.873*	215°13'36"	66.01	215°13'21"	230.256	65.80	- 0.21	L 0.02	+ 0.38
224.904	215°44'15"	65.96	215°44'33"	225.314	65.87	- 0.09	R 0.03	+ 0.41
219.949	215°44'23"	65.97	215°44'24"	220.364	65.96	- 0.01	0.00	+ 0.42
214.909	215°44'22"	65.97	215°45'04"	215.562	65.89	- 0.08	R 0.07	+ 0.65
209.913	215°43'55"	66.01	215°43'13"	210.386	65.89	- 0.12	L 0.06	+ 0.47
209.812*	215°11'26"	65.99	215°10'16"	210.250	65.83	- 0.16	L 0.07	+ 0.44
204.901	215°42'33"	66.03	215°41'27"	205.385	65.99	- 0.04	L 0.10	+ 0.48
199.917	215°40'42"	65.99	215°40'24"	200.496	65.94	- 0.05	L 0.03	+ 0.58
194.927	215°42'02"	66.00	215°39'33"	195.550	65.90	- 0.10	L 0.21	+ 0.63
189.976	215°41'19"	66.01	215°39'29"	190.579	65.77	- 0.24	L 0.15	+ 0.60
189.927*	215°03'56"	66.04	215°03'32"	190.539	65.83	- 0.21	L 0.02	+ 0.61
184.933	215°42'14"	66.06	215°41'06"	185.587	66.29	+ 0.23	L 0.09	+ 0.65
179.902	215°43'20"	66.06	215°42'31"	180.748	66.11	+ 0.05	L 0.06	+ 0.85
174.904	215°41'56"	66.05	215°41'16"	175.774	65.91	- 0.14	L 0.05	+ 0.87
169.920	215°41'54"	66.07	215°41'09"	170.671	65.92	- 0.15	L 0.06	+ 0.75
169.869*	215°01'08"	66.09	215°00'32"	170.600	65.88	- 0.21	L 0.03	+ 0.73

* indicates pins in ground alongside the asphalt.

APPENDIX C

PRE- AND POST-SHOT SURVEY OF BTL MARKERS

PRAIRIE FLAT 1968

Pre-Shot and Post-Shot Location of BTL Marker Cans

Hole No. A-7 Bearing = 124°00'00"
Distance from GZ = 7.0 ft. Surface Elevation = 2166.20 ft.

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth beneath Ejecta (in.)
1	10.21	7.0	19.83			
2	9.77	"	19.34			
3	9.20	"	18.84			
4	9.29	"	18.35			
5	9.20	"	17.85			
6	10.21	"	17.43			
7	10.00	"	16.94			
8	10.02	"	16.40			
9	9.61	"	15.91			
10	9.26	"	15.38			
11	9.37	"	14.95			
12	9.17	"	14.41			
13	9.88	"	13.90			
14	9.90	"	13.25			
15	9.11	"	12.70			
16	9.10	"	12.23			
17	9.09	"	11.68			
18	9.00	"	11.04			
19	9.53	"	10.65			
20	9.68	"	10.17			
21	9.69	"	9.75			
22	9.37	"	9.26			
23	9.08	"	8.67			
24	9.77	"	8.19			
25	9.40	"	7.79			
26	9.30	"	7.23			
27	9.18	"	6.74			
28	9.33	"	6.23			
29	9.02	"	5.81			
30	9.12	"	5.27			
31	9.39	"	4.77			
32	9.38	"	4.28			
33	9.09	"	3.79			
34	9.32	"	3.27			
35	8.73	"	2.83			
36	9.32	"	2.32			
37	9.28	"	1.55			
38	9.29	"	1.01			
39	9.21	"	0.54			

Hole No. A-15 Bearing = 124°00'00"

Distance from GZ = 15.0 ft. Surface Elevation = 2166.20 ft.

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
40	9.43	15.0	19.33			
41	9.10	"	18.66			
42	9.12	"	18.21			
43	8.97	"	17.69			
44	8.63	"	17.15			
45	8.89	"	16.69			
46	9.15	"	16.12			
47	8.68	"	15.64			
48	8.89	"	15.12			
49	8.93	"	14.56			
50	9.59	"	13.99			
51	9.18	"	13.56			
52	9.02	"	12.99			
53	8.61	"	12.51			
54	9.36	"	12.04			
55	8.99	"	11.60			
56	8.99	"	11.15			
57	9.18	"	10.71			
58	9.21	"	10.23			
59	9.08	"	9.70			
60	8.74	"	9.30			
61	8.68	"	8.75			
62	8.89	"	8.20			
63	8.60	"	7.68			
64	8.28	"	7.18			
65	8.18	"	6.65			
66	8.35	"	6.08			
67	8.23	"	5.58			
68	8.01	"	5.14			
69	8.49	"	4.64			
70	8.45	"	4.20			
71	8.88	"	3.80			
72	9.00	"	3.28			
73	8.15	"	2.90			
74	8.53	"	2.32			
75	9.83	"	1.87			
76	9.82	"	1.33			
77	9.58	"	0.77			
78	9.50	"	0.11			

Hole No. A-25 — Bearing = 124°00'00"

Distance from GZ = 25.0 ft. — Surface Elevation = 2166.08 ft.

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
79	10.00	25.0	19.38			
80	9.68	"	19.12			
81	10.26	"	18.46			
82	8.95	"	17.67			
83	10.28	"	17.04			
84	10.50	"	16.40			
85	9.52	"	15.84			
86	10.37	"	15.27			
87	10.42	"	14.69			
88	10.19	"	14.09			
89	10.12	"	13.56			
90	10.10	"	12.93			
91	10.10	"	12.37			
92	10.60	"	11.74			
93	10.59	"	11.31			
94	10.17	"	10.78			
95	10.61	"	10.25			
96	10.32	"	9.75			
97	10.09	"	9.22			
98	10.23	"	8.75			
99	10.65	"	8.29			
100	10.12	"	7.76			
101	10.40	"	7.31			
102	9.75	"	6.92	196.4	193°28'20"	2
103	9.83	"	6.38			
104	10.18	"	5.86			
105	9.90	"	5.44			
106	10.28	"	4.89			
107	10.22	"	4.22			
108	10.40	"	3.87			
109	10.18	"	3.32	286.7	125°48'54"	Surface
110	10.42	"	2.86			
111	10.65	"	2.49			
112	10.24	"	1.87	113.1	88°59'17"	Surface
113	10.68	"	1.20			
114	10.25	"	0.86			
115	10.50	"	0.37	653.9	115°46'28"	Surface

Hole No. A-35 | Bearing = 124°00'00"

Distance from GZ = 35.0 ft. | Surface Elevation = 2166.19 ft.

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
116	10.25	35.0	19.57			
117	10.32	"	19.10			
118	10.18	"	18.57			
119	10.20	"	17.95			
120	9.80	"	17.30			
121	9.76	"	16.96			
122	10.12	"	16.48			
123	10.61	"	16.07			
124	10.20	"	15.71			
125	10.46	"	15.30			
126	10.58	"	14.81			
127	9.93	"	14.33	178.6	120°54'30"	Surface
128	10.41	"	13.78	171.3	122°27'56"	13
129	10.32	"	13.30	168.9	121°25'26"	13
130	10.59	"	12.75			
131	10.05	"	12.25			
132	10.53	"	11.74	170.4	122°47'39"	13
133	10.41	"	11.17			
134	10.08	"	10.64			
135	10.62	"	10.34			
136	10.48	"	9.97			
137	10.30	"	9.44			
138	9.85	"	9.16			
139	10.20	"	8.62			
140	10.20	"	8.13			
141	10.23	"	7.96			
142	10.13	"	7.59			
143	10.07	"	7.16			
144	9.91	"	6.65			
145	10.12	"	6.25			
146	10.08	"	5.71			
147	9.58	"	5.37			
148	10.00	"	4.98			
149	10.50	"	4.59			
150	9.30	"	4.14			
151	9.53	"	3.80			
152	10.27	"	3.26			
153	9.27	"	2.73			
154	10.12	"	2.38	333.2	120°03'03"	Surface
155	10.53	"	1.79			
156	10.31	"	1.26	485.2	115°24'28"	Surface
157	9.68	"	0.86			
158	9.31	"	0.45			

Hole No. A-45 Bearing = 124°00'00"

Distance from GZ = 45.0 ft. Surface Elevation = 2166.20 ft.

PRETRIAL				POST TRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
159	10.07	45.0	19.77			
160	10.32	"	19.27			
161	10.40	"	18.77			
162	10.29	"	18.27			
163	10.35	"	17.71			
164	10.24	"	17.06			
165	10.27	"	16.10	128.9	125°13'58"	24
166	10.20	"	15.66			
167	10.30	"	15.28			
168	10.17	"	14.80			
169	10.28	"	14.32			
170	10.23	"	13.86			
171	10.05	"	13.38			
172	10.48	"	12.92			
173	10.49	"	12.51			
174	10.21	"	12.07			
175	9.68	"	11.58			
176	10.53	"	11.13			
177	10.04	"	10.79			
178	10.45	"	10.48			
179	10.80	"	9.88			
180	10.37	"	9.40			
181	10.65	"	8.93			
182	10.72	"	8.50			
183	10.57	"	8.00			
184	10.70	"	7.55			
185	10.60	"	7.02	295.0	120°00'18"	Surface
186	10.18	"	6.57			
187	10.10	"	6.15			
188	10.40	"	5.65	284.4	121°03'58"	Surface
189	10.60	"	5.13			
190	10.32	"	4.65			
191	10.08	"	4.18			
192	10.15	"	3.73			
193	10.25	"	3.39			
194	10.29	"	3.00			
195	10.37	"	2.50			
196	10.12	"	2.07			
197	10.22	"	1.32	268.5	130°09'48"	Surface
198	10.48	"	0.93			
199	10.51	"	0.48	445.5	114°26'25"	Surface

Hole No. A-55 Bearing = 124°00'00"

Distance from GZ = 55.0 ft. Surface Elevation = 2166.24 ft.

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
200	10.31	55.0	20.45			
201	10.14	"	20.01			
202	10.27	"	19.48			
203	10.12	"	18.90			
204	10.34	"	18.34			
205	10.52	"	17.81	136.9	126°19'14"	72
206	10.08	"	17.24			
207	10.52	"	16.61	140.7	126°43'01"	24
208	10.13	"	15.96			
209	10.22	"	15.40	141.2	126°53'01"	36
210	10.08	"	14.89			
211	10.80	"	14.35	153.1	125°34'40"	12
212	10.23	"	13.89			
213	10.40	"	13.38			
214	10.30	"	12.91	155.8	126°07'54"	24
215	10.69	"	12.38			
216	9.95	"	11.87	153.6	125°53'20"	24
217	10.35	"	11.44			
218	10.38	"	11.07			
219	10.52	"	10.69	172.3	126°36'43"	Surface
220	10.32	"	10.29	153.7	123°41'45"	13
221	10.27	"	9.87			
222	10.28	"	9.49	152.0	123°17'49"	25
223	10.25	"	9.08	161.5	122°20'48"	15
224	10.44	"	8.71	166.1	123°26'46"	12
225	10.26	"	8.19	162.5	122°42'54"	9
226	10.18	"	7.71			
227	10.30	"	7.03	174.5	122°36'08"	Surface
228	10.52	"	6.28			
229	10.31	"	5.91	175.0	123°48'18"	4
230	10.23	"	5.48	175.7	124°07'50"	4
231	10.17	"	5.04	176.5	123°48'12"	6
232	10.28	"	4.49	196.2	123°24'11"	3
233	10.17	"	4.08			
234	10.07	"	3.61			
235	10.24	"	3.16	228.6	123°14'45"	2
236	10.34	"	2.58			
237	10.30	"	2.07			
238	10.36	"	1.58			
239	10.13	"	1.14			
240	10.41	"	0.52			

Hole No. A-65 Bearing = 124°00'00"

Distance from GZ = 65.0 ft. Surface Elevation = 2166.54 ft.

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
241	10.30	65.0	20.00			
242	10.19	"	19.27			
243	10.30	"	18.92			
244	10.26	"	18.50			
245	10.11	"	18.08	90.6	132°37'45"	9
246	10.53	"	17.63			
247	10.42	"	17.21			
248	10.64	"	16.85			
249	10.30	"	16.36	98.7	123°08'35"	36
250	10.50	"	15.91	97.7	123°04'00"	24
251	10.20	"	15.51			
252	10.33	"	15.12			
253	10.10	"	14.68			
254	10.31	"	14.23	116.5	123°36'21"	24
255	10.41	"	13.80	122.2	126°10'32"	24
256	10.18	"	13.35	121.8	124°17'10"	24
257	10.29	"	12.88	131.9	124°59'12"	48
258	10.03	"	12.26			
259	10.37	"	11.83			
260	10.00	"	11.28			
261	10.27	"	10.97			
262	10.43	"	10.31			
263	10.45	"	9.98	127.1	126°12'18"	36
264	9.88	"	9.51	127.6	126°12'36"	36
265	10.51	"	9.04			
266	9.63	"	8.63	132.5	127°08'38"	24
267	9.94	"	8.15	132.7	127°05'58"	24
268	10.50	"	7.72	148.8	125°20'32"	12
269	9.91	"	7.33	144.3	124°50'09"	24
270	9.94	"	6.86			
271	9.66	"	6.46	148.2	124°11'57"	36
272	9.72	"	6.05	148.3	124°09'05"	30
273	9.73	"	5.59	145.6	125°49'30"	24
274	9.98	"	5.14	145.0	125°48'27"	24
275	8.84	"	4.67	143.0	124°42'35"	36
276	10.13	"	4.20	153.6	126°25'51"	24
277	10.12	"	3.75	149.3	124°10'31"	24
278	9.69	"	3.36	147.6	124°07'55"	36
279	10.28	"	2.62			
280	10.02	"	1.96	217.7	122°38'14"	11
281	10.25	"	1.31			
282	9.90	"	0.97			
283	10.72	"	0.64			

Hole No. A-75 | Bearing = 124°00'00"

Distance from GZ = 75.0 ft. | Surface Elevation= 2166.09 ft.

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
404	9.67	75.0	9.93	96.1	127°44'10"	40
405	9.64	"	9.36	97.1	125°23'48"	26
406	9.69	"	8.67	99.2	124°20'14"	24
407	10.10	"	8.20			
408	9.55	"	7.59	106.9	123°39'08"	24
409	8.99	"	6.94			
410	9.58	"	6.37			24
411	9.92	"	6.00	110.7	123°50'40"	24
412	8.77	"	5.56	116.2	128°02'07"	36
413	8.69	"	5.10	120.3	126°08'37"	42
414	9.17	"	4.59	122.3	125°14'21"	36
415	9.13	"	4.09	110.3	123°18'26"	72
416	9.41	"	3.63	124.1	122°58'05"	48
417	9.63	"	3.10	112.1	122°53'04"	48
418	8.70	"	2.62			
419	9.20	"	2.17	127.0	125°56'07"	48
420	9.19	"	1.58	130.6	125°04'40"	24
421	8.88	"	0.95			
422	9.21	"	0.58	129.5	126°11'03"	25

Hole No. B-15 Bearing = 148°00'00"

Distance from GZ = 15.0 ft. Surface Elevation = 2166.16 ft.

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
284	10.28	15.0	19.41			
285	10.03	"	18.83			
286	9.90	"	18.26			
287	10.50	"	17.70			
288	10.43	"	17.02			
289	9.92	"	16.43			
290	10.30	"	16.00			
291	10.37	"	15.63			
292	10.28	"	15.21			
293	10.32	"	14.67			
294	10.10	"	14.20			
295	10.40	"	13.73			
296	9.88	"	13.32			
297	10.25	"	12.87			
298	10.32	"	12.46			
299	10.30	"	12.04			
300	10.44	"	11.61			
301	10.31	"	11.11			
302	10.13	"	10.79			
303	10.28	"	10.55			
304	9.37	"	10.19			
305	9.62	"	9.81			
306	9.70	"	9.33			
307	9.83	"	8.86			
308	10.10	"	8.44			
309	10.10	"	7.93			
310	9.93	"	7.53			
311	10.25	"	7.03			
312	10.15	"	6.58			
313	10.38	"	6.09			
314	10.20	"	5.63			
315	10.10	"	5.14			
316	9.80	"	4.78			
317	10.01	"	4.37			
318	9.65	"	3.93			
319	10.11	"	3.39			
320	9.50	"	2.91			
321	10.32	"	2.40			
322	10.41	"	1.87	205.9	134°52'49"	Surface
323	9.91	"	1.39			
324	10.33	"	0.95			
325	10.37	"	0.43			

Hole No. B-25 Bearing = 148°00'00"

Distance from GZ = 25.0 ft. Surface Elevation= 2166.14 ft.

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
464	9.63	25.0	19.49			
465	10.00	"	19.17			
466	9.92	"	18.62			
467	9.73	"	18.11			
468	9.72	"	17.58			
469	10.30	"	16.89			9
470	10.02	"	16.26			18
471	9.44	"	15.73			
472	9.90	"	15.28			
473	10.20	"	14.71			
474	9.99	"	14.18			
475	9.97	"	13.65			
476	9.83	"	13.20			
477	10.15	"	12.69			
478	9.33	"	12.14			
479	9.88	"	11.74			
480	10.02	"	11.30			
481	10.37	"	10.88			
482	10.02	"	10.57			
483	9.92	"	10.07			
484	9.71	"	9.47			
485	10.11	"	9.03			
486	10.31	"	8.53			
487	10.47	"	8.08			
488	10.19	"	7.58			
489	10.10	"	7.03			
490	9.85	"	6.47			
491	10.22	"	6.12			
492	9.68	"	5.64			
493	9.92	"	5.15	216.7	142°14'34"	½
494	10.25	"	4.68	219.1	144°13'40"	Surface
495	10.30	"	4.05	250.1	145°43'57"	Surface
496	10.20	"	3.57			
497	9.95	"	3.14			
498	9.93	"	2.67			
499	10.10	"	2.22	450.3	140°57'12"	Surface
500	10.02	"	1.69			
501	10.03	"	1.23			
502	10.28	"	0.86			

Hole No. B-35 — Bearing = 148°00'00"

Distance from GZ = 35.0 ft. — Surface Elevation = 2166.16 ft.

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
503	9.70	35.0	19.58			
504	10.21	"	19.11			
505	10.04	"	18.53			
506	9.87	"	18.02			
507	9.90	"	17.28			
508	10.05	"	16.64			
509	9.74	"	16.05			
510	9.79	"	15.61			
511	10.00	"	15.07			
512	9.72	"	14.52			
513	9.98	"	13.89			
514	9.28	"	13.18			
515	9.80	"	12.66	174.4	145°49'07"	24
516	10.08	"	12.22	157.0	142°28'09"	25
517	10.11	"	11.75	167.2	143°50'33"	28
518	9.43	"	11.52			
519	9.90	"	11.10	175.0	144°13'35"	17
520	10.00	"	10.90	176.2	145°04'33"	Surface
521	9.72	"	10.20	204.0	139°59'48"	Surface
522	9.63	"	9.96	183.9	143°18'02"	5
523	10.10	"	9.41	180.6	144°02'02"	6
524	9.55	"	9.04			
525	9.98	"	8.44	190.5	143°38'18"	1
526	10.13	"	8.02	217.7	138°55'05"	6
527	9.38	"	7.56	211.8	139°13'22"	3
528	10.03	"	7.15			
529	9.74	"	6.68			
530	9.71	"	6.25	212.2	136°27'02"	5
531	9.90	"	5.87			
532	9.70	"	5.21			
533	10.13	"	4.91	276.8	136°43'41"	Surface
534	9.69	"	4.34			
535	10.03	"	3.82	222.3	143°11'15"	4
536	10.10	"	3.38	246.2	148°00'04"	Surface
537	9.79	"	2.81			
538	9.68	"	2.20			
539	9.68	"	1.38	665.6	112°47'00"	Surface
540	10.38	"	0.77	597.2	101°14'57"	Surface

Hole No. B-45 Bearing = 148°00'00"

Distance from GZ = 45.0 ft. Surface Elevation = 2166.13 ft.

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
541	9.90	45.0	19.45			
542	9.73	"	19.01			
543	9.88	"	18.58			
544	9.31	"	18.16	121.3	148°17'18"	22
545	9.91	"	17.63	137.3	145°08'58"	4
546	9.82	"	17.11	142.9	144°10'18"	4
547	10.18	"	16.66	149.8	147°33'18"	Surface
548	10.18	"	16.23			
549	9.15	"	15.72	153.1	143°25'01"	9
550	9.00	"	15.32			
551	9.00	"	14.86			
552	8.20	"	14.44			
553	9.52	"	13.99			
554	9.32	"	13.55	174.8	145°07'46"	16
555	9.17	"	13.01	182.1	144°05'44"	10
556	9.30	"	12.48	194.5	146°27'55"	6
557	9.53	"	12.03	181.9	143°54'44"	10
558	9.32	"	11.52	182.2	143°45'48"	10
559	9.80	"	11.05			
560	9.29	"	10.79	184.0	145°54'48"	6
561	9.77	"	10.16			
562	9.68	"	9.64	182.3	143°25'58"	11
563	9.32	"	9.15			
564	9.00	"	8.76			
565	9.22	"	8.43	191.8	143°41'06"	3
566	9.02	"	7.55	200.7	143°33'38"	Surface
567	9.20	"	7.15	206.9	142°33'03"	4
568	8.71	"	6.78	209.9	142°24'58"	6
569	8.90	"	6.32	218.6	143°32'34"	Surface
570	9.30	"	5.82	209.8	143°22'35"	4
571	9.00	"	5.32	215.6	144°00'20"	Surface
572	9.50	"	4.94	216.7	141°31'21"	3
573	9.09	"	4.50	208.6	143°37'29"	4
574	9.14	"	4.02	246.0	190°17'56"	Surface
575	9.07	"	3.63	209.6	143°36'19"	4
576	9.39	"	3.08	201.8	143°56'46"	1
577	9.10	"	2.62	200.8	144°01'52"	3
578	9.01	"	2.21	190.6	143°12'36"	8
579	9.20	"	1.74	241.5	148°35'42"	Surface
580	9.32	"	1.32	251.2	145°56'05"	Surface
581	9.39	"	0.93	240.6	143°35'21"	Surface

Hole No. B-55 Bearing = 148°00'00"

Distance From GZ = 55.0 ft. Surface Elevation = 2166.15 ft.

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
621	9.42	55.0	20.32	100.3	148°07'58"	6
622	9.68	"	20.02			
623	9.73	"	19.35	117.7	147°51'49"	12
624	9.40	"	18.90			
625	9.63	"	18.44	122.7	147°03'20"	19
626	9.97	"	17.96	116.1	144°00'21"	48
627	8.92	"	17.22	116.1	141°58'12"	24
628	9.98	"	16.53	113.1	144°57'26"	27
629	9.42	"	15.98	137.9	143°25'27"	36
630	9.59	"	15.49	137.2	147°21'21"	23
631	9.58	"	15.06			
632	9.85	"	14.72			
633	9.61	"	14.19	151.8	140°03'41"	37
634	9.43	"	13.62	142.4	144°39'05"	20
635	9.65	"	13.30			
636	8.98	"	12.76			
637	9.52	"	12.30	141.2	145°00'34"	15
638	9.54	"	11.72			
639	9.59	"	11.19	153.0	143°50'22"	17
640	9.60	"	10.73			
641	9.40	"	10.27			
642	9.30	"	9.64			
643	10.22	"	9.14			
644	9.53	"	8.63			
645	9.48	"	8.01			
646	9.20	"	7.54			
647	8.90	"	7.03	153.6	145°03'23"	33
648	9.63	"	6.50	156.3	144°22'50"	27
649	9.72	"	6.27			
650	9.25	"	5.95	166.0	144°48'50"	24
651	9.42	"	5.39			
652	9.14	"	4.82			
653	9.22	"	4.34	151.0	143°50'11"	6
654	9.22	"	3.85			
655	9.40	"	3.22	156.6	144°11'08"	25
656	9.92	"	2.83			
657	9.43	"	2.20			
658	9.61	"	1.75			
659	9.42	"	1.35	153.4	145°37'52"	15
660	9.23	"	0.74	165.1	145°05'01"	30

Hole No. B-65 Bearing = 148°00'00"

Distance from GZ = 65.0 ft. Surface Elevation = 2166.20 ft.

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
661	9.13	65.0	20.55			
662	9.00	"	20.01			
663	8.93	"	19.59			
664	8.72	"	19.10			
665	9.03	"	18.58	88.1	149°54'56"	13
666	9.09	"	18.04	89.1	149°42'36"	13
667	8.93	"	17.47	90.0	149°30'18"	12
668	9.20	"	16.93	90.4	149°25'38"	11
669	8.93	"	16.45	91.2	149°16'18"	13
670	8.88	"	15.94	94.7	149°50'09"	12
671	9.00	"	15.40	105.0	159°47'42"	12
672	9.00	"	14.89	97.5	149°16'34"	12
673	9.27	"	14.36			
674	9.40	"	13.85	101.0	149°47'59"	24
675	9.22	"	13.35	110.8	149°37'09"	28
676	8.92	"	12.69	117.7	149°25'19"	17
677	8.20	"	12.20	119.8	148°32'15"	19
678	9.68	"	11.76	119.6	148°34'18"	21
679	8.31	"	11.59	120.4	148°25'27"	24
680	8.55	"	11.09	121.3	148°16'24"	27
681	9.32	"	10.56	120.6	148°24'06"	27
682	9.25	"	10.11	123.4	148°25'52"	35
683	9.22	"	9.66	125.1	148°37'52"	25
684	9.32	"	9.08	124.3	147°46'53"	25
685	9.03	"	8.62	124.9	148°40'72"	33
686	9.12	"	8.07	124.4	147°46'44"	34
687	9.63	"	7.52	126.7	147°53'22"	24
688	9.30	"	6.85	131.2	147°38'50"	33
689	9.53	"	6.31			
690	8.70	"	5.85	135.3	147°50'35"	29
691	9.00	"	5.39	132.9	147°17'12"	24
692	9.12	"	4.88	133.1	146°43'31"	29
693	9.18	"	4.46			
694	9.12	"	3.98	136.2	147°35'18"	35
695	9.13	"	3.55	138.1	144°34'16"	36
696	9.28	"	3.19	139.3	146°02'53"	34
697	9.30	"	2.76			
698	9.28	"	2.10	145.2	144°12'51"	35
699	9.30	"	1.51			
700	9.19	"	0.78			

Hole No. B-75 Bearing = 148°00'00"

Distance from GZ = 75.0 ft. Surface Elevation = 2166.29 ft.

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
927	8.22	75.0	8.65			
928	8.82	"	8.26			
929	9.40	"	7.79			
930	8.82	"	7.45			
931	8.78	"	6.44	110.8	146°53'21"	40
932	9.52	"	5.97	114.3	148°58'34"	46
933	9.09	"	5.43	95.9	149°35'02"	46
934	8.02	"	4.75			
935	8.75	"	4.13	95.2	151°00'22"	42
936	8.63	"	3.71			
937	8.93	"	3.10			
938	8.78	"	2.41	144.3	147°51'03"	36
939	9.28	"	2.17	136.6	147°43'31"	48
940	8.62	"	1.43			
941	8.32	"	0.94			
942	8.30	"	0.53	135.1	147°30'46"	45

Hole No. C-15 Bearing = 171°40'00"

Distance from GZ = 15.0 ft. Surface Elevation = 2166.24 ft.

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
326	10.43	15.0	20.12			
327	10.23	"	19.72			
328	10.13	"	19.35			
329	9.78	"	18.87			
330	10.21	"	18.14			
331	10.17	"	17.46			
332	10.11	"	16.96			
333	9.81	"	16.36			
334	10.21	"	15.88			
335	10.36	"	15.17			
336	10.31	"	14.56			
337	10.69	"	14.15			
338	10.48	"	13.71			
339	9.96	"	13.28			
340	10.52	"	12.71			
341	10.32	"	12.07			
342	10.02	"	11.31			
343	10.18	"	10.77			
344	10.32	"	10.21			
345	10.10	"	9.75			
346	10.23	"	9.16			
347	10.48	"	8.77			
348	10.03	"	8.14			
349	10.28	"	7.58			
350	10.37	"	6.91			
351	9.61	"	6.38			
352	10.28	"	5.91			
353	9.91	"	5.39			
354	10.43	"	4.96			
355	10.28	"	4.36			
356	10.10	"	3.76			
357	10.02	"	3.34			
358	10.12	"	2.89			
359	10.20	"	2.46			
360	9.75	"	1.89	171.3	187°32'48"	10
361	9.35	"	1.38			
362	9.41	"	0.79			

Hole No. C-25 Bearing = 171°40'00"

Distance from GZ = 25.0 ft. Surface Elevation = 2166.14 ft.

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
701	8.71	25.0	20.43			
702	9.00	"	19.94			
703	9.10	"	19.45			
704	9.05	"	18.93			
705	8.49	"	18.37			
706	8.62	"	17.92			
707	9.40	"	17.35			
708	9.93	"	17.00			
709	9.00	"	16.63			
710	9.34	"	16.20			
711	9.15	"	15.69			
712	8.64	"	15.22			
713	9.02	"	14.62			
714	8.97	"	14.27			
715	9.00	"	13.83			
716	9.02	"	13.34			
717	8.33	"	12.79			
718	9.39	"	12.31			
719	8.98	"	11.88			
720	9.52	"	11.46			
721	9.22	"	11.02			
722	8.49	"	10.57			
723	8.14	"	10.22			
724	8.44	"	9.59			
725	8.53	"	9.26			
726	7.92	"	8.77			
727	8.98	"	8.32			
728	9.09	"	7.82			
729	9.00	"	7.41			
730	8.59	"	6.91			
731	8.62	"	6.50	119.7	186°58'54"	57
732	8.90	"	6.05			
733	8.90	"	5.53			
734	8.88	"	5.14			
735	9.00	"	4.66			
736	8.97	"	4.30			
737	8.92	"	3.90			
738	8.70	"	3.62			
739	9.13	"	3.11			
740	8.97	"	2.71			
741	8.70	"	2.15			
742	8.71	"	1.63	607.4	185°39'12"	Surface
743	8.92	"	1.09			
744	8.81	"	0.51			

Hole No. C-35 Bearing = 171°40'00"

Distance from GZ = 35.0 ft. Surface Elevation = 2166.11 ft.

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
745	8.70	35.0	20.70			
746	9.14	"	20.18			
747	8.95	"	19.79			
748	9.32	"	19.31			
749	8.80	"	18.80			
750	9.02	"	18.30			
751	8.49	"	17.74			
752	9.05	"	17.21			
753	9.12	"	16.65			
754	8.94	"	16.17			
755	8.58	"	15.67			
756	9.18	"	15.14			
757	9.21	"	14.52	191.2	172°05'48"	13
758	8.61	"	14.01	197.4	172°22'26"	24
759	9.08	"	13.35	210.5	171°20'29"	14
760	8.78	"	12.84	182.7	173°00'18"	Surface
761	9.13	"	12.35	177.4	169°26'34"	5
762	9.43	"	11.93	192.1	171°35'24"	18
763	8.68	"	11.50	194.3	170°50'24"	14
764	8.64	"	11.17			
765	9.10	"	10.76	211.5	174°46'01"	Surface
766	9.52	"	10.33	221.8	174°29'55"	7
767	9.05	"	9.93	221.2	174°13'14"	4
768	9.32	"	9.56			
769	9.13	"	9.28			
770	9.09	"	8.90	252.0	175°48'18"	Surface
771	9.23	"	8.40			
772	8.62	"	7.83			
773	9.35	"	7.42			
774	8.60	"	6.93			
775	8.82	"	6.49			
776	8.81	"	6.09			8
777	8.87	"	5.56			
778	9.08	"	5.10			4
779	8.74	"	4.56	263.9	189°33'08"	2
780	8.87	"	4.12			4
781	9.12	"	3.73	330.9	186°45'51"	2
782	9.17	"	3.30	299.9	189°39'16"	2
783	8.89	"	2.85	270.6	187°46'54"	Surface
784	9.10	"	2.50			
785	8.62	"	2.03			
786	9.23	"	1.58	307.6	183°45'07"	Surface
787	8.27	"	1.15			
788	8.26	"	0.63			

Hole No. C-45 Bearing = 171°40'00"

Distance from GZ = 45.0 ft. Surface Elevation = 2166.16 ft.

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
789	8.37	45.0	21.01			
790	8.50	"	20.49			
791	8.53	"	20.08			
792	8.00	"	19.53			
793	8.32	"	19.01			
794	8.28	"	18.55	121.9	171°09'03"	2
795	8.22	"	18.08	134.6	171°53'11"	Surface
796	8.65	"	17.54	145.9	171°28'47"	38
797	8.60	"	16.90	150.6	169°25"41"	36
798	8.57	"	16.36	152.3	172°18'04"	4
799	8.64	"	15.76			
800	3.77	"	15.20	137.7	174°16'22"	24
801	8.78	"	14.63			
802	8.93	"	14.13	168.3	171°24'01"	12
803	8.51	"	13.59			
804	8.38	"	13.07	199.3	172°43'14"	Surface
805	8.79	"	12.47			
806	8.73	"	11.94			
807	8.40	"	11.44			
808	8.79	"	10.93	223.9	173°44'16"	3
809	9.03	"	10.55	157.2	171°52'03"	24
810	8.88	"	10.14	224.9	174°18'22"	14
811	9.53	"	9.64	229.5	174°13'07"	12
812	8.71	"	9.29	228.7	174°14'22"	9
813	8.62	"	8.86	226.1	174°35'31"	4
814	8.30	"	8.38	230.1	174°15'24"	9
815	8.81	"	7.90			
816	8.72	"	7.49			
817	8.70	"	6.92	227.9	174°16'59"	16
818	8.22	"	6.51	241.5	174°44'38"	4
819	8.53	"	6.11	239.2	175°03'52"	6
820	8.61	"	5.62	240.2	174°57'55"	11
821	8.21	"	4.98	243.7	174°26'12	15
822	7.96	"	4.38	243.1	174°38'39"	13
823	8.10	"	3.83	242.2	174°30'48"	15
824	8.33	"	3.22	243.6	173°55'20"	Surface
825	8.48	"	2.81			
826	8.80	"	2.35	251.1	176°05'59"	8
827	8.65	"	1.84			
828	8.64	"	1.33	261.9	175°49'16"	3
829	8.62	"	0.70			

Hole No. C-55 Bearing = 171°40'00"

Distance from GZ = 55.0 ft. Surface Elevation = 2166.19 ft.

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
830	8.40	55.0	20.43	96.1	171°32'16"	30
831	8.52	"	19.97			
832	8.40	"	19.48			
833	8.59	"	18.96	121.5	171°42'45"	8
834	8.28	"	18.46	134.0	170°07'05"	36
835	8.63	"	17.93	132.0	171°43'12"	53
836	8.24	"	17.29	134.3	171°30'56"	48
837	8.73	"	16.74			
838	8.68	"	16.25			
839	8.72	"	15.72	139.7	171°53'15"	62
840	8.91	"	15.12	139.9	171°09'20"	41
841	8.50	"	14.62	135.2	171°37'05"	37
842	8.29	"	14.01	144.2	172°03'07"	34
843	8.32	"	13.39	144.2	171°31'26"	36
844	8.51	"	12.78	144.2	172°03'07"	34
845	8.63	"	12.19	151.3	169°23'42"	26
846	8.73	"	11.54	151.3	169°23'42"	26
847	8.71	"	10.92	153.4	169°11'43"	31
848	8.76	"	10.46			
849	8.60	"	9.89	148.0	169°22'08"	32
850	8.61	"	9.40	152.4	169°13'24"	20
851	8.68	"	8.87			
852	8.29	"	8.39			
853	8.47	"	7.87	156.0	170°47'42"	29
854	8.70	"	7.38			
855	8.49	"	6.89			
856	8.62	"	6.41	99.1	179°57'30"	28
857	8.41	"	6.01	167.6	172°21'59"	26
858	8.49	"	5.58	162.3	173°23'48"	28
859	8.52	"	5.13	173.5	171°04'56"	15
860	8.60	"	4.67	168.0	173°01'52"	19
861	8.65	"	4.18	173.6	171°19'00"	15
862	8.25	"	3.88	186.9	173°32'15"	16
863	8.93	"	3.43	187.6	174°08'51"	18
864	8.68	"	2.94	194.4	173°19'25"	16
865	8.56	"	2.64			
866	8.69	"	2.18			
867	8.63	"	1.69	195.7	173°57'19"	17
868	8.30	"	1.27			
869	8.80	"	0.78	227.1	171°57'44"	16

Hole No. C-65 Bearing = 171°40'00"

Distance from GZ = 65.0 ft. Surface Elevation = 2166.32 ft.

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
870	8.55	65.0	19.98			
871	8.42	"	19.57			
872	8.25	"	18.94	81.5	169°02'46"	36
873	8.91	"	18.36			
874	8.72	"	17.82	89.6	171°36'40"	36
875	8.61	"	17.24			
876	8.52	"	16.64			
877	8.48	"	16.04	96.0	171°34'06"	30
878	8.17	"	15.54			
879	8.64	"	15.01	98.8	168°47'44"	
880	8.30	"	14.45	112.3	171°12'12"	8
881	8.25	"	13.79	114.0	171°51'22"	72
882	8.22	"	13.09	115.2	170°44'43"	26
883	8.38	"	12.50			
884	8.56	"	12.04	121.2	171°20'52"	12
885	8.57	"	11.35	125.3	171°19'37"	36
886	8.70	"	11.16	122.0	171°36'48"	36
887	8.60	"	10.67	121.5	171°53'08"	32
888	8.60	"	10.16	125.4	171°46'28"	25
889	8.47	"	9.67	122.2	171°58'38"	29
890	8.72	"	9.14	127.7	171°30'28"	37
891	8.73	"	8.62	128.9	171°30'10"	46
892	8.19	"	8.22			
893	8.17	"	7.74	129.2	171°22'10"	24
894	8.60	"	7.27	130.9	171°43'38"	39
895	8.35	"	6.80	134.9	172°20'39"	54
896	8.54	"	6.36	136.2	172°11'39"	51
897	8.36	"	6.00	136.2	172°05'05"	50
898	8.62	"	5.53	136.8	172°23'33"	52
899	8.47	"	5.06	134.4	171°37'45"	55
900	8.51	"	4.65	135.0	172°11'32"	60
901	8.81	"	3.99	136.5	171°35'21"	53
902	8.92	"	3.56	140.0	170°47'35"	62
903	8.69	"	3.21	139.8	170°37'50"	59
904	8.38	"	2.81	139.3	171°52'25"	52
905	8.80	"	2.35	142.1	170°28'09"	40
906	8.73	"	1.90			
907	9.21	"	1.33	141.6	171°55'08"	
908	8.73	"	0.84	156.9	173°14'29"	28

Hole No. C-75 Bearing = 171°40'00"

Distance from GZ = 75.0 ft. Surface Elevation = 2166.27 ft.

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
909	8.48	75.0	9.90	95.0	168°58'51"	33
910	8.70	"	8.92	100.2	172°33'12"	33
911	8.80	"	8.63	101.6	173°23'27"	29
912	8.55	"	8.34	100.7	172°18'42"	29
913	8.85	"	7.85	99.8	171°15'11"	20
914	8.73	"	7.42	97.7	169°16'20"	18
915	8.90	"	6.83	102.5	171°27'30"	19
916	9.28	"	6.10			
917	9.05	"	5.51	118.0	171°26'52"	2
918	8.64	"	4.77	120.4	171°25'34"	30
919	9.09	"	4.28	120.5	170°59'50"	36
920	8.88	"	3.74	122.1	172°06'34"	48
921	8.53	"	3.25	124.5	171°15'25"	52
922	9.14	"	2.60	124.8	171°52'43"	49
923	8.97	"	1.80	129.0	171°02'17"	51
924	8.80	"	1.51			
925	8.57	"	1.05	132.5	170°51'02"	60
926	8.88	"	0.58	134.7	172°23'24"	58

Hole No. D-7 — Bearing = 193°00'00"

Distance from GZ = 7.0 ft. — Surface Elevation = 2166.17 ft.

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
363	9.77	7.0	19.55			
364	9.30	"	19.14			
365	8.60	"	18.61			
366	9.72	"	18.05			
367	8.89	"	17.60			
S-1	12.78	"	17.16			
368	10.03	"	16.92			
X-351	75.69	"	16.71			
369	9.77	"	16.52			
370	8.92	"	16.30			
371	9.40	"	15.79			
372	10.04	"	15.09			
373	9.43	"	14.66			
S-2	12.75	"	14.15			
374	10.00	"	13.99			
X-352	72.73	"	13.79			
375	9.05	"	13.60			
376	9.59	"	13.08			
377	10.02	"	12.62			
378	9.42	"	12.12			
379	9.78	"	11.59			
S-3	12.71	"	11.46			
380	9.71	"	11.28			
X-353	75.13	"	11.11			
381	9.09	"	10.89			
382	8.41	"	10.50			
383	9.60	"	10.00			
384	9.55	"	9.57			
385	9.20	"	9.11			
S-4	12.73	"	8.47			
386	9.64	"	8.29			
X-354	74.64	"	8.13			
387	9.83	"	7.94			
388	9.22	"	7.78			
389	9.62	"	7.22			
390	9.30	"	6.66			
391	9.27	"	6.37			
S-5	12.77	"	5.99			
392	9.42	"	5.60			
X-355	73.49	"	5.43			
393	9.47	"	5.23			
394	10.12	"	4.77	18.5	166°59'50"	Surface
395	9.73	"	4.39			
396	9.88	"	4.01			
397	9.49	"	3.71			

Hole No. D-7 (continued)

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
398	9.34	7.0	3.39			
S-6	12.74	"	3.06			
399	9.80	"	2.87			
X-356	72.93	"	2.70			
400	9.72	"	2.47			
401	9.60	"	1.63			
402	9.43	"	1.13			
403	9.34	"	0.59	113.8	207°01'27"	Surface

Hole No. D-15 Bearing = 193°00'00"

Distance from GZ = 15.0 ft. Surface Elevation = 2166.21 ft.

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
582	9.62	15.0	19.69			
583	9.69	"	19.35			
584	9.38	"	18.91			
585	9.37	"	18.53			
586	10.00	"	17.83			
S-7	12.73	"	17.71			
587	9.89	"	17.39			
X-357	73.01	"	17.13			
588	10.12	"	16.94			
589	9.64	"	16.44			
590	9.39	"	16.02			
591	9.51	"	15.53			
592	9.38	"	15.08			
S-8	12.82	"	14.87			
593	9.60	"	14.63			
X-358	73.63	"	14.37			
594	9.72	"	14.16			
595	9.79	"	13.74			
596	9.52	"	13.15			
597	10.04	"	12.70			
598	9.65	"	12.16			
S-9	12.76	"	11.91			
599	9.30	"	11.64			
X-359	73.87	"	11.50			
600	9.87	"	11.30			
601	9.52	"	10.73			
602	10.00	"	10.25			
603	9.89	"	9.77			
604	9.97	"	9.23			
S-10	12.73	"	8.89			
605	9.58	"	8.65			
X-360	72.51	"	8.41			
606	9.62	"	8.16			
607	9.62	"	7.73			
608	9.32	"	7.13			
609	9.43	"	6.66			
610	9.67	"	6.13			
S-11	12.78	"	5.81			
611	10.29	"	5.56			
X-361	73.71	"	5.29			
612	9.63	"	5.04			
613	9.89	"	4.58			
614	9.98	"	4.13			
615	9.58	"	3.73			
616	9.55	"	3.33			
S-12	12.72	"	3.04			
617	9.72	"	2.80			
X-362	74.88	"	2.52			
618	9.82	"	2.25			
619	9.93	"	1.64			
620	9.82	"	0.94			

Hole No. D-25 | Bearing = 193°00'00"

Distance from GZ = 25.0 ft. | Surface Elevation = 2166.30 ft.

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
943	8.70	25.0	19.80			
944	8.40	"	18.97			
945	8.88	"	18.13			
946	9.08	"	17.67			
947	8.40	"	17.01			
S-13	12.72	"	16.68			
948	8.64	"	16.45			
X-363	72.20	"	15.87			
949	8.70	"	15.67			
950	9.41	"	15.23			
951	9.51	"	14.87			
952	9.21	"	14.33			
953	9.44	"	13.89			
S-14	12.71	"	13.62			
954	9.35	"	13.31			
X-364	74.52	"	13.04			
955	9.09	"	12.82			
956	9.08	"	12.48			
957	9.18	"	12.09			
958	8.70	"	11.58			
959	8.70	"	11.19			
S-15	12.81	"	11.00			
960	9.13	"	10.82			
X-365	72.99	"	10.66			
961	9.28	"	10.36			
962	8.83	"	10.02			
963	8.88	"	9.55			
964	8.72	"	8.99			
965	8.55	"	8.37			
S-16	12.71	"	7.74			
966	8.66	"	7.59			
X-366	74.29	"	7.41			
967	8.65	"	7.16			
968	8.61	"	6.69			
969	9.38	"	6.20			
970	8.92	"	5.72	343.2	198°18'18"	2
971	9.00	"	5.29			
S-17	12.73	"	5.03			
972	9.00	"	4.89			
X-367	73.60	"	4.66			
973	9.15	"	4.45			
974	9.15	"	4.02			
975	8.29	"	3.43			
976	8.60	"	2.43*			
977	8.42	"	3.05*			
S-18	12.74	"	2.20			
978	8.70	"	2.01			
X-368	74.06	"	1.77			
979	8.78	"	1.55			
980	8.97	"	0.93			

*976 and 977 dropped in wrong order

Hole No. D-35 | Bearing = 193°00'00"

Distance from GZ = 35.0 ft. | Surface Elevation = 2166.22 ft.

PRETRIAL				POST TRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
981	8.57	35.0	19.30			
982	8.61	"	18.77			
983	8.95	"	18.21			
984	8.71	"	17.74			
985	8.64	"	17.13			
S-19	12.78	"	16.75			
986	8.62	"	16.61			
X-369	73.13	"	16.32			
987	8.68	"	16.05	186.1	195°48'35"	4
988	8.90	"	15.49	120.0	192°51'49"	48
989	8.48	"	14.94	196.3	193°39'45"	3
990	8.68	"	14.33			
991	8.80	"	13.67			
S-20	12.72	"	13.04	184.9	196°08'53"	4
992	8.88	"	12.73			
X-370	74.29	"	12.57	208.8	194°11'48"	4
993	8.52	"	12.35			
994	8.82	"	11.82			
995	8.50	"	11.51			
996	8.59	"	11.19			
997	8.60	"	10.74			
S-21	12.73	"	10.62			
998	8.59	"	10.38			
X-371	73.53	"	10.18			
999	8.52	"	9.97	344.1	195°35'20"	3½
1000	8.62	"	9.53			
1001	8.49	"	9.11			
1002	8.69	"	8.67			
1003	8.63	"	8.33	367.5	194°26'24"	4½
S-22	12.71	"	7.97	390.1	195°14'27"	1
1004	8.49	"	7.81	379.4	195°38'57"	3
X-372	74.09	"	7.72			
1005	8.38	"	7.42	391.4	194°21'18"	Surface
1006	8.58	"	6.98			
1007	8.40	"	6.61	388.6	194°12'56"	7
1008	8.42	"	6.24	392.5	194°44'46"	5
1009	8.58	"	5.95	390.6	193°51'47"	7
S-23	12.80	"	5.82			
1010	8.30	"	5.61	395.1	195°24'01"	1
X-373	73.21	"	5.42	391.8	194°13'30"	8
1011	8.52	"	5.24			
1012	8.34	"	4.81	395.8	196°21'21"	3
1013	8.83	"	4.55	393.9	195°02'40"	4
1014	8.62	"	4.23			

Hole No. D-35 (Continued)

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
1015	8.38	35.0	3.80			
S-24	12.76	"	3.68	384.8	196°03'32"	5
1016	8.51	"	3.42			
X-374	74.42	"	3.22			
1017	8.53	"	3.05			
1018	8.60	"	2.63	391.9	194°34'30"	5
1019	8.86	"	2.14	365.2	193°14'55"	3
1020	8.63	"	1.60	390.7	193°46'26"	Surface
1021	8.40	"	1.16	406.5	199°22'53"	1
1022	8.53	"	0.62			

Hole No. D-45 Bearing = 193°00'00"

Distance from GZ = 45.0 ft. Surface Elevation = 2166.14 ft.

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
1023	8.32	45.0	19.92			
1024	8.62	"	19.45			
1025	8.32	"	19.02			
S-25	12.71	"	18.81	91.0	193°17'50"	4
1026	8.35	"	18.62	92.3	195°18'27"	9
X-375	72.88	"	18.44			
1027	8.35	"	18.26			
1028	8.42	"	17.98	116.7	193°10'30"	19
1029	8.41	"	17.63	135.8	193°01'49"	25
S-26	12.72	"	17.42	135.0	193°03'59"	22
1030	8.60	"	17.25	147.7	192°39'05"	12
X-376	74.24	"	17.02	149.9	194°09'22"	Surface
1031	8.23	"	16.79	149.9	193°58'12"	Surface
1032	8.63	"	16.36	185.5	194°53'19"	7
1033	8.68	"	15.96			
S-27	12.80	"	15.72	182.6	193°05'11"	4
1034	8.62	"	15.51			
X-377	72.68	"	15.30	184.1	193°45'59"	Surface
1035	8.11	"	15.08			
1036	8.22	"	14.69	180.8	195°22'16"	9
1037	8.42	"	14.31			
S-28	11.82	"	14.15			
1038	8.20	"	13.83			
X-378	74.11	"	13.54	177.8	194°52'38"	4
1039	8.20	"	13.25	191.8	195°11'17"	$4\frac{1}{2}$
1040	8.24	"	12.77			
1041	8.36	"	12.27			
S-29	12.72	"	12.06			
1042	8.75	"	11.77			
X-379	75.83	"	11.55			
1043	8.31	"	11.30			
1044	8.37	"	10.77			
1045	8.14	"	10.39			
S-30	12.75	"	10.23			
1046	8.32	"	10.03			
X-380	74.32	"	9.87	240.9	194°38'08"	Surface
1047	8.58	"	9.40			
1048	8.27	"	8.81			
1049	8.58	"	8.38			
S-31	12.80	"	8.13			
1050	8.50	"	7.92			
X-381	75.39	"	7.68	288.4	197°06'35"	Surface
1051	8.80	"	7.38	278.8	194°33'21"	1
1052	8.69	"	6.87			

Hole No. D-45 (continued).

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
1053	8.28	45.0	6.46			
S-32	12.73	"	6.29			
1054	8.11	"	6.08			
X-382	75.22	"	5.87	353.5	196°09'23"	5
1055	8.25	"	5.31			
1056	8.10	"	4.76			
1057	8.41	"	4.28			
S-33	12.81	"	4.02			
1058	8.67	"	3.83			
X-383	74.33	"	3.60	392.5	195°58'24"	4
1059	8.38	"	3.10			
1060	8.10	"	2.57	414.1	195°45'06"	½
1061	8.40	"	2.06			
1062	8.37	"	1.42	390.3	199°53'29"	1
1063	8.83	"	0.96	383.9	201°04"31"	1
1064	9.03	"	0.66			

Hole No. D-55 Bearing = 193°00'00"

Distance from GZ = 55.0 ft. Surface Elevation = 2166.17 ft.

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
1065	8.72	55.0	19.82			
1066	9.90	"	19.53			
1067	8.95	"	18.71	119.1	193°08'02"	37
S-34	12.73	"	18.20			
1068	9.56	"	18.07	125.5	193°03'37"	33
X-384	75.45	"	17.74	127.4	193°40'12"	43
1069	9.08	"	17.52	127.0	191°06'02"	32
1070	10.11	"	17.00			
1071	9.64	"	16.48			
S-35	12.83	"	16.16	141.0	192°26'01"	22
1072	9.61	"	15.92	140.9	192°55'14"	23
X-385	76.28	"	15.67	141.2	192°44'25"	22
1073	9.46	"	15.39	140.4	193°30'45"	12
1074	10.10	"	15.11			
1075	9.57	"	14.49	145.8	192°39'08"	14
S-36	12.78	"	14.19	145.4	192°28'01"	16
1076	9.21	"	13.91	147.9	192°40'50"	12
X-386	75.88	"	13.62	146.8	193°08'17"	12
1077	9.30	"	13.42	146.5	193°02'57"	12
1078	9.48	"	12.89	146.1	192°36'53"	18
1079	8.82	"	12.42	147.6	193°21'56"	12
S-37	12.86	"	12.12			
1080	9.11	"	11.74	162.7	192°03'38"	4
X-387	73.88	"	11.60	345.4	205°45'39"	Surface
1081	8.90	"	11.29	170.4	192°19'54"	16
1082	9.29	"	10.85	169.6	191°18'01"	18
1083	9.70	"	10.39			
S-38	12.81	"	10.10			
1084	9.98	"	9.85			
X-388	73.91	"	9.53	156.1	194°23'04"	12
1085	9.13	"	9.28			
1086	8.60	"	8.80			
1087	9.95	"	8.41			
S-39	12.83	"	8.15			
1088	9.44	"	7.91	161.3	194°06'02"	20
X-389	76.68	"	7.71	159.3	194°47'07"	36
1089	8.83	"	7.40	159.4	194°37'10"	25
1090	9.04	"	7.05	182.5	195°37'37"	4
1091	9.22	"	6.65	194.4	194°32'49"	2
S-40	12.88	"	6.35	198.4	194°18'05"	3
1092	9.06	"	6.01	197.4	193°57'43"	2
X-390	73.28	"	5.79	194.8	193°58'42"	2
1093	9.72	"	5.53	192.7	193°32'38"	7
1094	8.91	"	5.03	191.6	193°42'03"	5

Hole No. D-55 (continued)

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
1095	9.24	55.0	4.45	192.6	193°27'14"	7
S-41	12.87	"	4.09	193.0	193°42'31"	7
1096	9.02	"	3.78			
X-391	73.72	"	3.43	310.3	193°15'45"	Surface
1097	9.05	"	2.62			
1098	9.28	"	2.62			
1099	8.80	"	2.27			
1100	8.83	"	1.61			
1101	8.98	"	1.01			

Hole No. D-65 Bearing = 193°00'00"

Distance from GZ = 65.0 ft. Surface Elevation = 2166.18 ft.

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
1102	8.30	65.0	19.73			
1103	8.90	"	19.16			
1104	8.74	"	18.48	92.4	195°06'04"	16
1105	9.25	"	17.90			
1106	8.89	"	17.38	106.5	197°03'15"	55
S-42	12.88	"	17.05	90.5	193°42'53"	18
1107	8.89	"	16.70	91.9	194°35'14"	24
X-392	75.34	"	16.33	87.5	190°00'02"	25
1108	9.32	"	16.09	101.1	193°40'44"	26
1109	8.67	"	15.52			
1110	8.75	"	14.99			
1111	9.48	"	14.42			
1112	8.80	"	13.90	117.3	193°30'03"	36
S-43	12.80	"	13.35			20
1113	8.77	"	12.89	119.6	193°08'38"	13
X-393	74.92	"	12.59	124.6	192°54'02"	36
1114	9.12	"	12.27			
1115	8.90	"	11.85	126.2	191°47'33"	25
1116	9.25	"	11.38	124.6	192°42'30"	33
1117	8.73	"	11.01	126.4	192°08'42"	22
1118	8.78	"	10.65	126.5	192°00'14"	23
S-44	12.87	"	10.38	126.2	191°48'14"	21
1119	9.32	"	10.18	126.2	191°52'56"	24
X-394	75.50	"	9.95	126.3	193°19'22"	14
1120	9.18	"	9.60	128.4	193°22'04"	14
1121	8.92	"	9.21	129.0	193°22'42"	17
1122	8.78	"	8.40	131.7	193°23'24"	17
1123	8.58	"	7.95	130.7	193°45'30"	25
1124	8.58	"	7.29	136.2	193°25'23"	37
S-45	12.82	"	6.77	146.7	193°14'06"	24
1125	8.94	"	6.41	141.1	193°09'54"	22
X-395	74.11	"	6.21	140.9	193°19'21"	26
1126	9.18	"	5.96	140.8	193°35'14"	26
1127	9.04	"	5.39			
1128	9.03	"	4.77	140.5	193°18'35"	31
1129	8.89	"	4.29	141.0	193°05'00"	32
1130	8.64	"	3.62	141.1	192°38'45"	34
S-46	12.82	"	3.25	174.2	194°29'37"	Surface
1131	9.18	"	2.97	174.3	194°12'48"	9
X-396	76.30	"	2.67	169.2	194°51'49"	16
1132	9.68	"	2.47	161.4	193°07'44"	16
1133	9.08	"	2.01	169.8	194°10'08"	18
1134	8.70	"	1.68	171.0	193°03'55	9
S-47	12.87	"	1.45			
1135	8.85	"	1.17			
X-397	75.13	"	0.91	182.6	191°45'46"	Surface
1136	9.89	"	0.62			

Hole No. D-75 Bearing = 193°00'00"

Distance from GZ = 75.0 ft. Surface Elevation = 2166.30 ft.

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
1137	8.90	75.0	9.68	97.3	196°16'48"	45
1138	8.66	"	9.32	100.4	194°17'08"	42
1139	9.68	"	8.99			
1140	9.61	"	8.59	102.1	193°02'42"	24
1141	8.75	"	8.25	101.0	193°27'26"	45
S-48	12.80	"	8.00	101.7	192°34'41"	56
1142	9.21	"	7.77	103.1	192°48'27"	41
X-398	76.82	"	7.57	104.5	192°22'44"	38
1143	9.04	"	7.31	107.4	192°34'15"	56
1144	8.93	"	6.89	104.1	190°57'39"	48
1145	9.28	"	6.36	114.6	193°01'17"	31
1146	8.95	"	5.99	114.9	192°39'56"	29
1147	9.07	"	5.66	119.5	192°25'03"	29
S-49	12.77	"	5.41	118.7	192°10'11"	40
1148	8.83	"	5.19	119.5	192°22'41"	30
X-399	73.68	"	4.92	118.7	192°22'41"	40
1149	8.40	"	4.70	118.7	192°14'34"	40
1150	9.31	"	4.28	123.9	192°59'18"	45
1151	8.92	"	3.81	123.7	192°35'44"	45
1152	8.68	"	3.46			
1153	8.89	"	3.08	124.0	191°42'11"	57
S-50	12.83	"	2.75	127.1	193°34'51"	48
1154	8.99	"	2.41			
X-400	74.65	"	2.12	124.8	192°54'23"	45
1155	9.10	"	1.86	130.7	192°31'06"	41
1156	8.80	"	1.33	129.5	192°36'40"	43
1157	9.00	"	0.93			

Hole No. E-15 Bearing = 215°20'00"

Distance from GZ = 15.0 ft. Surface Elevation= 2166.17 ft.

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
423	9.45	15.0	19.74			
424	9.12	"	19.18			
425	9.48	"	18.76			
426	9.20	"	18.31			
427	9.57	"	17.83			
428	9.09	"	17.25			
429	9.08	"	16.86			
430	9.29	"	16.45			
431	9.21	"	15.85			
432	9.10	"	15.16			
433	8.72	"	14.66			
434	8.68	"	14.16			
435	9.14	"	13.71			
436	9.67	"	13.40			
437	9.12	"	12.78			
438	9.65	"	12.40			
439	9.23	"	11.93			
440	9.64	"	11.55			
441	9.13	"	11.17			
442	9.08	"	10.66			
443	9.92	"	10.13			
444	9.63	"	9.68			
445	9.43	"	9.00			
446	9.41	"	8.37			
447	9.90	"	7.85			
448	10.12	"	7.49			
449	9.83	"	7.06			
450	9.27	"	6.66			
451	10.09	"	6.14			
452	9.80	"	5.77			
453	10.21	"	5.25			
454	9.55	"	4.82			
455	10.18	"	4.37			
456	9.48	"	3.95			
457	10.03	"	3.37			
458	10.30	"	2.92			
459	9.62	"	2.51			
460	10.08	"	2.03			
461	9.60	"	1.55			
462	10.33	"	1.01			
463	10.30	"	0.49	456.5	224°58'17"	Surface

Hole No. E-25 Bearing = 215°20'00"

Distance from GZ = 25.0 ft. Surface Elevation = 2166.27 ft.

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
1158	8.88	25.0	19.92			
1159	9.14	"	19.34			
1160	9.46	"	18.73			
1161	8.76	"	18.16			
1162	8.80	"	17.95			
1163	9.03	"	16.79			
1164	8.11	"	16.05			
1165	7.93	"	15.69			
1166	8.32	"	15.19			
1167	7.91	"	14.68			
1168	8.62	"	14.15			
1169	8.14	"	13.42			
1170	8.22	"	12.90			
1171	8.39	"	12.25			
1172	8.33	"	11.74			
1173	8.37	"	11.42			
1174	8.83	"	10.75			
1175	8.90	"	10.45			
1176	9.01	"	9.88			
1177	8.33	"	9.29			
1178	8.31	"	8.74			
1179	8.44	"	8.12			
1180	8.30	"	7.62	197.7	214°29'01"	4
1181	8.39	"	7.01	202.9	214°23'41"	4
1182	8.40	"	6.47	292.3	217°39'55"	Surface
1183	8.44	"	6.34			
1184	8.09	"	5.87	311.9	210°57'52"	Surface
1185	8.15	"	5.35	321.8	210°45'01"	Surface
1186	8.02	"	4.91	155.7	191°17'25"	12
1187	8.13	"	4.32			
1188	8.32	"	3.84	302.4	215°04'05"	Surface
1189	8.23	"	3.33	322.5	204°44'38"	Surface
1190	7.96	"	2.82			
1191	8.24	"	2.47	294.6	205°31'18"	4
1192	8.42	"	1.89	383.8	199°06'56"	2
1193	8.38	"	1.48			
1194	8.18	"	1.01	385.3	194°14'27"	5
1195	8.77	"	0.64	517.9	196°21'39"	Surface

Hole No. E-35 Bearing = 215°20'00"

Distance from GZ = 35.0 ft. Surface Elevation = 2166.22 ft.

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
1196	8.31	35.0	20.08			
1197	8.26	"	19.46			
1198	8.51	"	18.88			
1199	8.48	"	18.52			
1200	8.60	"	17.67			
1201	8.44	"	17.13			
1202	8.88	"	16.53			
1203	8.64	"	16.03			
1204	8.51	"	15.51			
1205	8.77	"	14.81	113.3	216°26'48"	2
1206	9.10	"	14.25			
1207	8.54	"	13.56	208.5	211°01'26"	6
1208	8.48	"	12.91	208.4	211°10'13"	2
1209	8.98	"	12.23	220.2	212°20'56"	2
1210	8.82	"	11.66	217.0	211°59'08"	3
1211	8.69	"	11.27	218.8	210°41'27"	4
1212	8.60	"	10.98			
1213	8.37	"	10.47	247.1	208°09'51"	3
1214	8.91	"	10.06	353.8	218°02'09"	Surface
1215	8.96	"	9.48	281.3	207°10'49"	2
1216	8.78	"	9.08	293.9	207°35'32"	2
1217	8.72	"	8.65	318.2	205°44'34"	6
1218	8.44	"	8.28			
1219	8.69	"	7.93			
1220	8.70	"	7.32			
1221	8.62	"	6.94			
1222	8.57	"	6.52			
1223	8.43	"	5.99			
1224	8.65	"	5.54			
1225	8.71	"	5.05	398.7	199°30/20"	Surface
1226	8.61	"	4.63	397.8	199°53'10"	Surface
1227	8.66	"	4.20	395.0	200°27'49"	1
1228	8.32	"	3.64			
1229	9.82	"	3.29	389.2	200°55'50"	1
1230	10.12	"	2.82	388.3	200°22'35"	½
1231	10.01	"	2.33	346.7	141°26'51"	1
1232	10.05	"	1.74	393.5	201°23'52"	1
1233	9.35	"	1.27	365.4	199°47'16"	Surface
1234	10.11	"	0.89	395.7	200°57'50"	1
1235	9.92	"	0.56	374.4	198°34'53"	3

Hole No. E-45 Bearing = 215°20'00"

Distance from GZ = 45.0 ft. Surface Elevation = 2166.11 ft.

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
1236	9.77	45.0	19.85			
1237	9.83	"	19.55	82.1	217°19'37"	Surface
1238	9.10	"	19.08	130.9	215°15'35"	Surface
1239	9.95	"	18.58	135.1	215°20'10"	Surface
1240	9.64	"	18.07			
1241	9.70	"	17.47	157.7	215°34'29"	Surface
1242	9.61	"	16.80	176.1	214°33'12"	1
1243	10.00	"	16.32	170.8	215°03'45"	6
1244	10.03	"	15.84	177.1	214°39'39"	4
1245	10.00	"	15.40			
1246	9.80	"	14.77	180.3	212°27'25"	9
1247	9.68	"	14.04			5
1248	9.47	"	13.47			
1249	9.01	"	13.11			
1250	9.31	"	12.72			
1251	10.13	"	12.40			
1252	9.28	"	12.06	235.3	208°17'00"	5½
1253	10.06	"	11.46	244.8	209°18'41"	Surface
1254	9.73	"	11.14	242.3	208°13'13"	Surface
1255	10.11	"	10.73			
1256	8.74	"	10.28	276.1	207°32'28"	2
1257	9.31	"	9.85			
1258	10.10	"	9.44	285.0	207°51'19"	1½
1259	9.82	"	8.97	285.8	207°46'50"	1
1260	9.70	"	8.61	276.9	207°37'50"	Surface
1261	9.82	"	8.20	289.8	208°46'50"	2
1262	9.70	"	7.49	291.7	206°13'42"	5
1263	9.32	"	6.96			
1264	9.85	"	6.46	288.4	205°42'16"	2
1265	9.23	"	5.87	278.2	207°55'17"	2
1266	10.08	"	5.39	280.7	208°03'18"	2
1267	10.28	"	4.78	261.4	207°59'41"	1½
1268	10.02	"	4.34	273.3	207°11'40"	2
1269	8.31	"	3.81	272.5	207°22'33"	Surface
1270	8.87	"	3.31	267.7	206°57'22"	Surface
1271	9.00	"	2.85	265.4	208°16'34"	2
1272	9.42	"	2.42	265.8	207°52'26"	2
1273	8.53	"	2.07	249.4	207°04'45"	Surface
1274	9.01	"	1.59			
1275	8.89	"	1.18			
1276	9.03	"	0.77	296.9	208°46'45"	½
1277	8.78	"	0.39	319.4	204°17'06"	2½

Hole No. E-55 Bearing = 215°20'00"

Distance from GZ = 55.0 ft. Surface Elevation = 2166.07 ft.

PRETRIAL				TRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
1278	8.60	55.0	19.12	126.9	215°51'10"	64
1279	8.51	"	18.61			
1280	9.02	"	17.90			
1281	9.14	"	17.26			
1282	9.03	"	16.81	141.0	216°36'04:	12
1283	9.01	"	16.37			
1284	9.50	"	15.80	146.5	215°12'23"	2
1285	8.11	"	15.38	148.5	214°54'22"	36
1286	9.02	"	14.78			
1287	9.90	"	14.28	146.4	217°24'08"	30
1288	9.66	"	13.44	144.2	215°28'20"	36
1289	9.15	"	12.89			
1290	9.13	"	12.34	168.5	195°14'11"	16
1291	9.46	"	11.78	152.7	214°13'45"	17
1292	9.00	"	11.38	150.9	213°47'14"	36
1293	9.48	"	11.01	152.7	213°34'03"	36
1294	8.37	"	10.61	153.5	214°26'30"	18
1295	9.94	"	10.26	146.0	214°05'46"	2
1296	9.69	"	9.71			
1297	9.89	"	9.12			
1298	8.90	"	8.46	154.1	214°30'10"	18
1299	10.10	"	8.01	170.4	213°26'38"	7
1300	9.38	"	7.46	193.2	213°16'08"	36
1301	9.40	"	6.[illegible]7	176.6	213°42'26"	Surface
1302	9.28	"	6.33	171.7	213°12'50"	11
1303	9.85	"	5.80			
1304	9.37	"	5.29	170.2	211°42'22"	13
1305	9.40	"	4.83	177.6	211°31'29"	10
1306	9.50	"	4.39	181.0	211°25'47"	9
1307	9.07	"	3.97			
1308	9.73	"	3.55	182.9	210°49'53"	9
1309	9.90	"	3.07	181.5	210°09'31"	16
1310	9.12	"	2.74	179.3	212°51'28"	16
1311	8.85	"	2.32	181.2	210°06'31"	14
1312	8.80	"	2.00	198.1	210°06'01"	4½
1313	10.20	"	1.56	196.6	210°17'40"	5
1314	8.79	"	1.22			
1315	9.13	"	0.79	196.8	210°07'36"	4½
1316	8.97	"	0.35			

Hole No. E-65 Bearing = 215°20'00"

Distance from GZ = 65.0 ft. Surface Elevation = 2166.15 ft.

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
1317	10.05	65.0	19.99			
1318	9.45	"	19.51	92.9	216°01'57"	8
1319	9.02	"	19.10	92.8	216°09'47"	6
1320	10.01	"	18.60			
1321	8.59	"	18.13			
1322	8.86	"	17.65			
1323	8.72	"	17.14			
1324	8.58	"	16.76			
1325	8.70	"	16.36	110.5	213°55'09"	27
1326	8.77	"	15.95			
1327	8.91	"	15.52			
1328	8.82	"	15.11	116.2	214°57'58"	26
1329	8.50	"	14.68	117.8	214°35'11"	22
1330	8.43	"	14.10	119.1	215°51'19"	22
1331	8.73	"	13.68			
1332	9.01	"	13.11	121.8	215°57'30"	21
1333	9.10	"	12.83	121.1	216°05'20"	22
1334	8.81	"	12.36	121.9	215°59'50"	2
1335	9.10	"	11.95	127.1	215°51'36"	18
1336	8.78	"	11.65	127.6	215°46'55"	17
1337	8.45	"	11.23	126.8	214°37'00"	52
1338	8.47	"	10.99	129.1	216°18'22"	32
1339	8.22	"	10.54	136.6	215°23'20"	12
1340	8.62	"	9.90	138.4	215°49'09"	48
1341	9.03	"	9.45	137.8	215°10'18"	6
1342	8.42	"	8.89	136.4	215°11'59"	36
1343	8.92	"	8.45			
1344	8.94	"	8.00			
1345	8.63	"	7.59			
1346	8.82	"	7.14			
1347	8.70	"	6.64	140.0	215°41'49"	48
1348	8.76	"	6.24	141.3	215°33'04"	48
1349	8.88	"	5.91	141.5	215°59'41"	36
1350	8.50	"	5.34	140.8	215°57'49"	36
1351	8.69	"	4.77	142.5	215°37'20"	18
1352	8.64	"	4.17			
1353	8.90	"	3.72	141.9	215°57'46"	48
1354	8.75	"	3.22			
1355	8.51	"	2.93	140.4	217°29'44"	36
1356	8.68	"	2.41	138.7	215°35'50"	48
1357	8.57	"	1.72			
1358	8.84	"	1.38			
1359	8.65	"	0.67			

Hole No. E-75 Bearing = 215°20'00"

Distance from GZ = 75.0 ft. Surface Elevation = 2165.99 ft.

PRETRIAL				POSTTRIAL		
Can No.	Weight (gms)	Distance from GZ (ft)	Depth (ft)	Distance from GZ (ft)	Bearing	Depth Beneath Ejecta (in)
1360	8.58	75.0	10.88	90.5	216°53'42"	12
1361	8.59	"	10.46			
1362	8.40	"	10.00	91.6	216°39'46"	21
1363	8.54	"	9.63	92.6	216°40'42"	22
1364	8.72	"	9.22			
1365	8.48	"	8.76	97.5	217°16'05"	48
1366	8.72	"	8.24			
1367	8.76	"	7.68			
1368	8.30	"	7.19			
1369	8.61	"	6.72	105.1	214°15'12"	24
1370	8.12	"	6.07	113.0	213°34'08"	44
1371	8.57	"	5.73	121.5	213°25'14"	48
1372	8.77	"	5.28	120.6	213°14'32"	47
1373	8.43	"	4.93	117.5	214°07'04"	42
1374	8.59	"	4.53	118.0	214°27'48"	42
1375	8.92	"	4.09	122.1	216°13'24"	24
1376	8.58	"	3.55	123.2	213°25'32"	40
1377	8.81	"	3.19	123.6	213°37'14"	38
1378	8.92	"	2.70	124.1	213°17'23"	44
1379	8.52	"	2.15	127.3	215°49'54"	53
1380	8.51	"	1.55	130.5	217°21'24"	62
1381	8.95	"	0.84	123.5	213°27'35"	26
1382	8.61	"	0.33	146.2	216°40'49"	44

APPENDIX D

DETAILS OF SAND COLUMN MARKER CANS

Hole No. S-1 Bearing 217°00'00"

Distance from GZ = 250.0 feet Surface Elevation = 2166.07 feet

PRETRIAL				POSTTRIAL	
Can No.	Weight	Distance from GZ	Depth	Distance from GZ	Depth
	grams	feet	feet	feet	feet
1	73.08	250.0	10.40	249.9	8.67
2	71.91	"	9.55	249.8	9.09
3	74.51	"	8.57	249.9	8.84
4	74.73	"	7.53	249.8	7.69
5	74.53	"	5.99	249.9	6.16
6	69.97	"	5.09	250.0	5.26
7	70.47	"	4.02	250.0	4.19
8	69.05	"	3.12	250.0	3.39
9	70.04	"	2.10	249.9	2.39
10	68.02	"	1.19	249.9	1.44
11	68.62	"	0.24	249.9	0.41
Hole No. S-2 Bearing 217°00'00"					
Distance from GZ = 160.0 feet			Surface Elevation = 2166.03 feet		
78	73.01	160.0	19.33	160.0	19.80
79	72.71	"	17.88	160.0	18.50
80	72.65	"	15.99	160.0	16.60
81	68.56	"	14.40	160.0	15.00
82	66.46	"	13.12	160.0	13.86
83	68.40	"	11.91	160.0	12.66
84	68.92	"	11.00	160.0	11.56
85	70.40	"	9.65	160.0	10.16
86	69.52	"	8.83	--	--
87	71.00	"	7.46	161.4	8.02
88	68.90	"	6.24	161.4	6.50
89	71.02	"	5.21	161.4	5.50
90	72.42	"	4.17	161.2	4.40
91	67.81	"	3.04	161.2	3.39
92	69.75	"	1.95	161.4	2.20
93	73.77	"	0.64	160.2	+0.1

Hole No. S-3 Bearing 217°00'00"

Distance from GZ = 120.0 feet Surface Elevation = 2166.05 ft

PRETRIAL				POSTTRIAL	
Can No.	Weight	Distance from GZ	Depth	Distance from GZ	Depth
	grams	feet	feet	feet	feet
12	68.40	120.0	19.95	118.0	18.33
13	68.38	"	11.69	118.3	17.73
14	68.59	"	10.88	118.3	16.93
15	66.70	"	9.99	118.0	15.93
16	73.35	"	8.97	118.0	15.03
17	74.12	"	8.01	117.7	15.18
18	74.37	"	6.78	117.1	12.88
19	72.60	"	5.30	116.5	11.55
20	74.22	"	4.30	116.4	10.53
21	74.75	"	3.26	116.2	9.64
22	73.33	"	2.21	115.9	8.87
23	73.89	"	1.08	123.7	7.0
Hole No. S-4		Bearing 217°00'00"			
Distance from GZ = 100.0 feet			Surface	Elevation = 2166.03 feet	
94	72.03	100.0	19.11	101.1	29.57
95	71.90	"	18.30	100.2	28.07
96	74.90	"	16.93	100.0	26.80
97	73.40	"	15.70	100.0	25.50
98	72.42	"	14.28	100.3	23.90
99	72.65	"	13.20	100.6	22.60
100	71.23	"	12.17	100.9	21.30
101	67.90	"	11.13	101.0	20.58
102	69.33	"	10.01	102.0	19.88
103	68.95	"	8.91	101.1	16.89
104	72.71	"	7.66	101.6	14.89
105	70.57	"	6.50	101.8	13.19
106	69.34	"	5.31	101.5	11.09
107	72.12	"	4.24	100.7	8.8
108	71.49	"	3.18	102.0	7.4
109	69.20	"	2.03	124.8	3.9
110	69.81	"	0.91	123.9	4.5

Hole No. S-5 Bearing 217°00'00"

Distance from GZ = 90.0 feet Surface Elevation = 2166.24 feet

PRETRIAL				POSTTRIAL	
Can No.	Weight	Distance from GZ	Depth	Distance from GZ	Depth
	grams	feet	feet	feet	feet
24	74.37	90.0	18.08	93.0	28.77
25	74.70	"	17.05	92.5	26.87
26	73.18	"	15.90	93.2	24.87
27	72.99	"	14.75	92.8	22.94
28	73.44	"	14.03	93.0	22.04
29	73.38	"	13.06	93.6	20.84
30	73.19	"	12.17	94.0	19.74
31	66.23	"	10.80	93.8	17.05
32	68.90	"	9.71	94.2	16.05
33	69.97	"	8.61	—	—
34	68.61	"	7.16	96.0	12.23
35	68.39	"	5.98	95.5	11.13
36	68.49	"	4.67	94.4	9.4
37	66.60	"	3.38	97.3	12.5
38	69.77	"	2.03	101.0	4.3
39	68.40	"	0.89	116.9	4.1
Hole No. S-6		Bearing 217°00'00"			
Distance from GZ = 85.0 feet			Surface Elevation = 2166.24 feet		
111	72.97	85.0	19.72	89.5	28.07
112	71.69	"	18.52	90.2	27.52
113	73.10	"	17.28	90.0	25.47
114	74.21	"	16.15	90.0	23.87
115	71.02	"	14.99	89.7	21.87
116	70.15	"	13.75	89.6	20.62
117	68.72	"	12.87	90.0	19.67
118	69.71	"	11.78	90.0	15.79
119	68.38	"	10.48	90.6	14.05
120	73.12	"	9.76	91.2	13.15
121	68.59	"	9.06	—	—
122	67.57	"	7.02	91.2	9.71
123	68.68	"	6.14	67.4	18.84
124	68.78	"	5.23	93.1	8.43
125	68.29	"	4.19	101.6	4.04
126	68.93	"	3.10	103.3	3.24
127	67.11	"	2.13	112.6	4.64
128	71.60	"	1.40	123.3	4.44
129	73.31	"	0.64	127.7	3.04

Hole No. S-7 Bearing 217°00'00"

Distance from GZ = 800 feet Surface Elevation = 2166.01 feet

PRETRIAL				POSTTRIAL	
Can No.	Weight	Distance from GZ	Depth	Distance from GZ	Depth
	grams	feet	feet	feet	feet
40	69.32	80.0	19.44	85.3	26.68
41	68.70	"	18.64	87.0	24.48
42	68.57	"	17.06	87.0	21.98
43	68.37	"	16.06	85.8	17.37
44	68.20	"	15.01	86.3	16.57
45	66.78	"	13.67	86.3	15.07
46	72.80	"	12.73	86.4	14.05
47	73.13	"	11.61	86.3	12.94
48	68.75	"	10.59	87.1	11.19
49	67.33	"	9.61	88.4	11.11
50	70.56	"	8.50	85.4	13.81
51	67.85	"	7.19	94.6	7.41
52	72.23	"	5.93	97.3	6.61
53	72.02	"	5.03	110.1	1.31
54	74.23	"	3.84	113.2	3.21
55	73.53	"	2.56	109.5	4.21
56	72.82	"	1.38	127.8	1.61
57	72.39	"	0.53	128.5	2.01

Hole No. S-8 Bearing 217°00'00"

Distance from GZ = 75.0 feet Surface Elevation = 2166.06 feet

PRETRIAL				POSTTRIAL	
Can No.	Weight	Distance from GZ	Depth	Distance from GZ	Depth
	grams	feet	feet	feet	feet
130	74.69	75.0	23.06	---	---
131	69.55	"	21.90	---	---
132	70.95	"	20.81	---	---
133	73.32	"	19.80	82.6	19.88
134	72.01	"	18.54	82.4	19.53
135	72.10	"	17.42	82.0	18.21
136	73.40	"	16.32	81.7	15.60
137	73.58	"	15.23	82.8	14.59
138	73.80	"	14.40	82.8	12.08
139	73.38	"	13.42	83.8	12.58
140	69.33	"	12.57	69.3	15.56
141	67.46	"	11.79	89.4	8.96
142	70.37	"	10.44	90.4	7.56
143	70.22	"	9.24	99.7	4.26
144	68.09	"	7.98	98.4	3.86
145	66.58	"	6.63	103.1	1.76
146	69.25	"	5.21	123.3	1.56
147	68.36	"	4.15	122.9	0.96
148	69.13	"	3.18	125.4	1.26
149	74.00	"	2.08	125.5	1.76
150	71.30	"	0.85	130.6	1.76

Hole No. S-9 Bearing 217°00'00"

Distance from GZ = 70.0 feet Surface Elevation = 2166.06 feet

PRETRIAL				POSTTRIAL	
Can No.	Weight	Distance from GZ	Depth	Distance from GZ	Depth
	grams	feet	feet	feet	feet
58	69.00	70.0	22.82	—	—
59	68.76	"	21.57	—	—
60	67.86	"	20.18	found in trench	
61	68.80	"	19.05	78.9	15.48
62	67.57	"	18.03	80.9	12.28
63	67.39	"	17.07	85.1	10.96
64	68.39	"	15.81	90.9	4.56
65	66.80	"	14.84	91.8	6.96
66	70.67	"	13.87	100.7	1.76
67	68.43	"	12.98	100.9	1.86
68	72.40	"	12.03	101.7	2.06
69	71.71	"	10.98	115.4	0.66
70	72.91	"	9.99	107.3	1.56
71	71.93	"	8.88	112.7	2.06
72	68.02	"	8.02	121.1	0.86
73	70.14	"	6.57	124.3	0.16
74	70.28	"	5.69	127.7	+ 0.44
75	70.50	"	4.54	129.3	+ 0.24
76	71.71	"	2.51	130.1	1.46
77	71.58	"	0.69	—	—

Hole No. S-10 Bearing 217°00'00"

Distance from GZ = 60.0 feet Surface Elevation = 2166.05 feet

PRETRIAL				POSTTRIAL	
Can No.	Weight	Distance from GZ	Depth	Distance from GZ	Depth
	grams	feet	feet	feet	feet
449	72.20	60.0	31.01	—	—
450	70.17	"	30.23	—	—
451	69.73	"	29.30	—	—
452	71.28	"	26.86	100.9	1.05
453	69.30	"	19.71	108.0	0.15
454	72.63	"	17.32	126.2	+ 1.25
455	68.91	"	16.15	128.1	1.05
456	68.98	"	15.44	138.9	+ 1.35
457	71.69	"	14.71	140.9	+ 2.05
458	66.10	"	13.78	142.9	+ 0.95
459	70.15	"	12.83	144.1	+ 0.35
460	68.12	"	12.15	143.7	+ 0.95
461	69.12	"	11.27	145.0	+ 0.55
462	72.13	"	10.59	146.4	0.65
463	70.53	"	9.80	144.7	1.35
464	72.02	"	9.15	146.1	2.55
465	72.38	"	7.77	146.7	0.65
466	70.32	"	6.71	148.6	1.65
467	70.83	"	5.69	149.9	+ 0.35
468	67.50	"	4.36	144.2	+ 1.15
469	72.19	"	3.54	171.6	+ 0.25
470	71.27	"	2.60	163.2	+ 0.05
471	70.58	"	1.47	—	—
472	66.82	"	0.72	—	—

30

Hole No. S-11 Bearing 217°00'00"

Distance from GZ = 40.0 feet Surface Elevation = 2166.12 feet

PRETRIAL				POSTTRIAL	
Can No.	Weight	Distance from GZ	Depth	Distance from GZ	Depth
	grams	feet	feet	feet	feet
364	70.53	40.0	28.82	--	--
365	73.69	"	28.40	--	--
366	72.80	"	27.26	--	--
367	72.08	"	25.86	--	--
368	71.80	"	24.58	851.3	
369	72.28	"	23.48	--	--
370	71.57	"	22.08	65.7	
371	69.80	"	20.81	--	--
372	69.82	"	19.77	--	--
373	70.70	"	18.47	--	--
374	71.72	"	17.11	--	--
375	70.10	"	15.92	--	--
376	72.71	"	14.53	149.9	
377	71.52	"	13.15	184.1	
378	69.92	"	11.75	159.3	
379	69.02	"	10.86	305.6	
380	68.49	"	9.70	240.9	
381	71.32	"	8.86	288.4	
382	69.90	"	7.74	349.1	
383	70.93	"	6.53	349.0	
384	70.30	"	5.40	356.3	
385	71.32	"	4.20	346.8	
386	73.45	"	3.27	359.7	
387	73.80	"	1.87	345.4	
388	72.95	"	0.89	328.0	

Hole No. S-12 Bearing 217°00'00"

Distance from GZ = 30.0 feet Surface Elevation = 2166.34 feet

PRETRIAL				POSTTRIAL	
Can No.	Weight	Distance from GZ	Depth	Distance from GZ	Depth
	grams	feet	feet	feet	feet
763	72.42	30.0	40.08	--	--
764	73.05	"	34.68	--	--
765	71.60	"	34.18	--	--
766	70.90	"	32.98	--	--
767	72.50	"	31.18	--	--
768	70.20	"	29.58	--	--
769	72.22	"	28.68	--	--
770	70.13	"	27.98	--	--
771	72.00	"	27.68	--	--
772	71.26	"	26.58	--	--
773	70.40	"	25.98	--	--
774	70.45	"	24.58	--	--
775	70.30	"	22.78	--	--
776	70.91	"	21.88	--	--
777	70.28	"	20.78	--	--
778	69.33	"	19.78	--	--
779	69.12	"	19.18	--	--
780	69.70	"	17.48	--	--
781	70.23	"	16.28	281.5	
782	72.40	"	14.98	--	--
783	72.02	"	13.28	--	--
784	70.48	"	12.08	--	--
785	70.63	"	10.98	117.2	
786	72.53	"	10.28	307.6	
787	70.71	"	9.08	143.8	
788	72.40	"	8.18	233.1	
789	69.44	"	7.08	--	--
790	71.62	"	6.08	332.2	
791	70.44	"	5.08	--	--
792	70.95	"	3.98	--	--
793	71.02	"	3.18	376.8	
794	70.46	"	2.28	--	--
795	69.10	"	1.08	--	--

Hole No. S-13 Bearing 217°00'00"

Distance from GZ = 20.0 feet Surface Elevation = 2166.56 feet

PRETRIAL				POSTTRIAL	
Can No.	Weight	Distance from GZ	Depth	Distance from GZ	Depth
	grams	feet	feet	feet	feet
796	70.20	20.0	40.20		
797	68.53	"	37.00		
798	71.12	"	36.00		
799	70.37	"	34.80		
800	69.50	"	33.80		
801	71.53	"	31.50		
802	72.82	"	30.10		
803	71.23	"	29.40		
804	72.48	"	28.00		
805	71.70	"	26.90		
806	71.73	"	25.10		
807	73.38	"	24.40		
808	72.22	"	23.70		
809	72.93	"	23.10		
810	69.46	"	21.60		
811	71.65	"	20.10		
812	68.90	"	19.30		
813	68.92	"	18.00		
814	70.03	"	17.00		
815	72.63	"	15.60		
816	71.22	"	14.50		
817	69.90	"	13.40		
818	71.68	"	12.40		
819	68.88	"	11.40		
820	68.12	"	10.40		
821	70.58	"	9.50		
822	72.42	"	8.50		
823	73.40	"	7.60		
824	72.32	"	6.55		
825	73.40	"	5.40		
826	73.55	"	3.90		
827	73.33	"	2.90		
828	71.00	"	1.80		
829	73.18	"	1.00		

Hole No. S-14 Bearing 217°00'00"

Distance from GZ = 10.0 feet Surface Elevation = 2166.31 feet

PRETRIAL				POSTTRIAL	
Can No.	Weight	Distance from GZ	Depth	Distance from GZ	Depth
	grams	feet	feet	feet	feet
715	70.32	10.0	61.79		
716	71.83	"	60.89		
717	72.00	"	59.79		
718	72.09	"	59.19		
719	71.32	"	57.59		
720	71.93	"	56.29		
721	69.99	"	55.09		
722	71.10	"	52.49		
723	70.88	"	48.79		
724	70.63	"	46.99		
725	71.28	"	45.19		
726	69.47	"	43.79		
727	72.23	"	41.19		
728	72.24	"	40.49		
729	71.00	"	39.49		
730	70.28	"	38.59		
731	70.96	"	37.69		
732	70.33	"	35.19		
733	71.58	"	32.69		
734	71.58	"	31.69		
735	70.21	"	29.49		
736	71.03	"	28.39		
737	70.97	"	27.29		
738	70.72	"	25.69		
739	70.62	"	24.79		
740	71.21	"	23.99		
741	71.73	"	22.79		
742	71.28	"	21.59		
743	70.97	"	20.89		
744	71.08	"	19.89		
745	71.88	"	19.19		
746	70.45	"	17.59		
747	70.93	"	16.29		
748	71.78	"	14.99		
749	72.63	"	14.19		
750	70.67	"	13.49		

Hole No. S-14 (cont'd)

PRETRIAL				POSTTRIAL	
Can No.	Weight	Distance from GZ	Depth	Distance from GZ	Depth
	grams	feet	feet	feet	feet
751	70.69	10.0	12.69		
752	71.87	"	11.69		
753	71.36	"	10.69		
754	71.72	"	9.99		
755	69.05	"	9.19		
757	70.58	"	8.29		
758	72.23	"	7.39		
756	72.50	"	6.59		
759	70.56	"	5.49		
760	71.40	"	4.59		
761	71.35	"	3.09		
762	69.50	"	1.99		

Hole No. S-15 Bearing 217°00'00"

Distance from GZ = 5.0 feet Surface Elevation = 2166.23 feet

PRETRIAL				POSTTRIAL	
Can No.	Weight	Distance from GZ	Depth	Distance from GZ	Depth
	grams	feet	feet	feet	feet
663	69.02	5.0	62.23		
664	72.00	"	60.93		
665	71.70	"	60.23		
666	70.03	"	59.23		
667	71.55	"	--		
668	70.68	"	57.73		
669	70.90	"	54.83		
670	73.81	"	52.43		
671	71.76	"	51.53		
672	71.38	"	49.13		
673	70.88	"	44.53		
674	72.82	"	43.53		
675	71.68	"	42.33		
676	72.70	"	41.13		
677	71.10	"	40.13		
678	70.03	"	38.33		
679	70.60	"	37.73		
680	70.72	"	36.53		
681	72.17	"	35.43		
682	70.70	"	34.03		
683	72.63	"	32.73		
684	72.47	"	31.33		
685	71.47	"	30.33		
686	71.48	"	28.73		
687	71.80	"	27.73		
688	71.58	"	26.83		
689	71.60	"	25.73		
690	69.83	"	24.83		
691	72.70	"	23.53		
692	71.50	"	22.83		
693	68.42	"	21.73		
694	70.72	"	20.73		
695	69.51	"	20.03		

0

Hole No. S-15 (cont'd.)

PRETRIAL				POSTTRIAL	
Can No.	Weight	Distance from GZ	Depth	Distance from GZ	Depth
	grams	feet	feet	feet	feet
696	69.38	5.0	19.03		
697	70.10	"	18.03		
698	70.15	"	16.83		
699	71.33	"	15.93		
700	71.38	"	14.43		
701	70.29	"	13.53		
702	71.33	"	12.83		
703	71.09	"	12.03		
704	70.62	"	11.33		
705	71.80	"	10.63		
706	71.57	"	9.73		
707	71.42	"	8.33		
708	70.92	"	7.03		
709	71.73	"	6.33		
710	71.76	"	5.33		
711	70.79	"	4.13		
712	71.45	"	3.23		
713	71.50	"	2.23		
714	70.40	"	1.23		

Hole No. E-1 Bearing 127°00'00"

Distance from GZ = 250.0 feet Surface Elevation = 2166.70 feet

PRETRIAL				POSTTRIAL	
Can No.	Weight	Distance from GZ	Depth	Distance from GZ	Depth
	grams	feet	feet	feet	feet
229	71.70	250.0	10.26	250.3	10.42
230	70.98	"	9.93	250.3	10.42
231	72.74	"	8.65	250.3	8.92
232	69.00	"	7.92	250.3	8.32
233	70.27	"	6.85	250.3	7.22
234	71.23	"	6.03	250.1	6.42
235	69.77	"	5.28	250.3	5.52
236	72.72	"	4.23	250.3	4.57
237	67.17	"	2.68	250.4	3.12
238	71.89	"	0.88	250.3	1.22

Hole No. E-2 Bearing 127°00'00"

Distance from GZ = 160.0 feet Surface Elevation 2166.30 feet

Can No.	Weight	Distance from GZ	Depth	Distance from GZ	Depth
151	73.00	160.0	20.02	159.0	20.88
152	68.03	"	19.17	159.0	19.88
153	71.88	"	17.98	159.0	18.78
154	71.77	"	16.82	159.0	17.52
155	72.09	"	15.43	159.0	16.18
156	71.12	"	14.72	159.0	15.38
157	70.50	"	13.76	159.0	14.48
158	72.40	"	12.97	159.0	13.58
159	72.93	"	11.96	159.0	12.58
160	73.70	"	10.98	159.0	11.58
161	69.90	"	9.95	160.2	10.83
162	68.39	"	9.06	160.0	9.73
163	70.35	"	8.06	160.0	8.73
164	70.12	"	7.08	160.0	7.83
165	73.10	"	6.25	160.0	6.93
166	69.36	"	5.35	160.3	5.73
167	72.12	"	4.30	160.1	3.63
168	71.28	"	2.94	160.2	2.43
169	72.97	"	1.92	--	--
170	73.52	"	0.83	162.4	+ 0.5

Hole No. E-3 Bearing 127°00'00"

Distance from GZ = 120.0 feet Surface Elevation = 2166.31 feet

PRETRIAL				POSTTRIAL	
Can No.	Weight	Distance from GZ	Depth	Distance from GZ	Depth
	grams	feet	feet	feet	feet
239	75.49	120.0	20.04	117.0	25.02
240	69.69	"	19.07	117.1	24.12
241	69.12	"	17.93	117.1	23.12
242	69.19	"	16.92	116.9	21.92
243	70.40	"	15.97	116.7	21.01
244	70.70	"	14.92	116.7	20.02
245	67.28	"	14.16	119.0	19.12
246	71.02	"	13.13	119.0	18.12
247	71.61	"	12.01	119.0	16.92
248	72.10	"	11.24	119.0	16.07
249	73.50	"	10.28	119.0	16.18
250	73.00	"	9.44	118.9	15.28
251	72.90	"	8.46	118.9	14.28
252	72.84	"	7.56	118.9	14.11
253	72.27	"	6.34	117.6	12.61
254	73.30	"	4.69	116.9	11.28
255	71.97	"	3.56	116.9	10.15
256	72.10	"	2.67	116.9	9.18
257	72.33	"	1.44	119.2	7.58
258	70.08	"	0.56	133.7	3.21

Hole No. E-4 Bearing 127°00'00"

Distance from GZ = 100.0 feet Surface Elevation = 2166.27 feet

PRETRIAL				POSTTRIAL	
Can No.	Weight	Distance from GZ	Depth	Distance from GZ	Depth
	grams	feet	feet	feet	feet
171	71.95	100.0	19.83	100.75	29.83
172	69.78	"	18.95	100.75	28.73
173	73.69	"	18.01	100.75	28.06
174	74.35	"	17.15	98.9	26.87
175	71.89	"	16.11	98.9	25.77
176	71.88	"	14.96	98.9	23.47
177	71.80	"	13.78	98.6	22.87
178	72.89	"	12.96	98.6	21.87
179	72.62	"	11.86	99.2	20.57
180	71.01	"	10.95	99.4	19.27
181	69.48	"	9.78	99.9	17.67
182	68.70	"	8.90	--	--
183	70.28	"	7.67	--	--
184	69.15	"	6.57	99.7	12.75
185	69.92	"	5.53	99.7	11.55
186	68.90	"	4.59	100.7	9.45
187	71.82	"	3.40	96.1	6.27
188	70.48	"	2.31	110.8	5.57
189	68.90	"	0.96	119.3	--

Hole No. E-5 Bearing 127°00'00"

Distance from GZ = 90.0 feet Surface Elevation = 2166.21 feet

PRETRIAL				POSTTRIAL	
Can No.	Weight	Distance from GZ	Depth	Distance from GZ	Depth
	grams	feet	feet	feet	feet
259	69.10	90.0	19.73	93.8	27.70
260	70.08	"	19.00	94.0	26.80
261	71.37	"	18.11	91.9	27.51
262	71.40	"	16.68	93.5	26.31
263	71.88	"	15.29	94.1	24.81
264	73.03	"	14.12	92.6	24.02
265	70.44	"	12.92	93.0	21.22
266	73.58	"	11.68	Wall caved in - found in trench	
267	71.98	"	10.85	" " " " "	
268	71.99	"	9.86	" " " " "	
269	72.93	"	8.99	" " " " "	
270	71.33	"	7.98	" " " " "	
271	68.97	"	7.00	93.8	11.43
272	72.29	"	6.13	94.4	10.28
273	68.93	"	5.02	96.7	7.61
274	73.75	"	3.88	Missing	--
275	70.57	"	2.63	114.5	3.71
276	69.50	"	1.21	119.0	4.31
277	69.52	"	0.56	Missing	--

Hole No. E-6 Bearing 127°00'00"

Distance from GZ = 85.0 feet Surface Elevation = 2166.29 feet

PRETRIAL				POSTTRIAL	
Can No.	Weight	Distance from GZ	Depth	Distance from GZ	Depth
	grams	feet	feet	feet	feet
190	70.06	85.0	20.31	90.3	29.59
191	71.80	"	19.16	90.8	27.79
192	70.30	"	17.82	90.1	26.20
193	73.21	"	16.44	89.9	23.25
194	72.92	"	15.29	89.2	21.84
195	72.88	"	14.20	88.5	19.64
196	72.58	"	12.90	89.3	18.28
197	71.88	"	11.78	89.5	16.61
198	72.43	"	10.74	90.0	15.00
199	73.17	"	9.71	90.5	14.08
200	71.81	"	8.69	--	--
201	70.50	"	7.60	--	--
202	70.00	"	6.56	94.9	8.69
203	70.85	"	5.10	97.0	6.49
204	69.81	"	4.10	107.6	3.29
205	70.81	"	3.24	110.7	2.89
206	69.21	"	2.29	120.9	3.39
207	69.43	"	1.10	121.1	3.29

Hole No. E-7 Bearing 127°00'00"

Distance from GZ = 80.0 feet Surface Elevation = 2166.20 feet

PRETRIAL				POSTTRIAL	
Can No.	Weight	Distance from GZ	Depth	Distance from GZ	Depth
	grams	feet	feet	feet	feet
278	69.38	80.0	19.60	87.4	25.21
279	69.70	"	18.59	86.0	22.98
280	69.49	"	17.37	85.2	21.11
281	70.15	"	16.26	86.1	19.24
282	71.88	"	15.07	86.1	17.54
283	68.50	"	13.84	86.2	15.99
284	70.44	"	12.55	87.1	14.19
285	74.00	"	11.62	87.3	13.21
286	72.60	"	10.78	88.4	16.10
287	68.52	"	9.95	90.5	7.10
288	69.10	"	8.91	91.6	10.00
289	69.80	"	8.00	94.1	7.20
290	68.07	"	6.46	98.2	3.60
291	73.29	"	5.25	109.7	1.90
292	72.33	"	4.14	112.9	1.60
293	72.99	"	3.08	115.6	4.00
294	72.38	"	1.88	122.8	3.00
295	71.82	"	0.49	--	--

Hole No. E-8 Bearing 127°00'00"

Distance from GZ = 75.0 feet Surface Elevation = 2166.23 feet

PRETRIAL				POSTTRIAL	
Can No.	Weight	Distance from GZ	Depth	Distance from GZ	Depth
	grams	feet	feet	feet	feet
208	67.48	75.0	24.40	82.5	29.23
209	69.13	"	22.77	85.4	28.04
210	70.00	"	21.56	86.6	26.54
211	72.10	"	20.65	83.9	22.70
212	68.90	"	19.45	82.6	19.11
213	68.87	"	16.91	82.6	17.11
214	70.00	"	15.95	83.5	13.07
215	69.96	"	14.84	84.5	12.16
216	69.52	"	13.31	84.6	10.73
217	70.12	"	12.37	90.5	7.13
218	69.52	"	11.60	89.9	9.53
219	68.72	"	10.88	90.8	7.13
220	69.20	"	10.11	153.7	0.73
221	70.20	"	9.16	102.1	2.63
222	72.74	"	8.28	152.0	0.73
223	70.91	"	6.79	161.5	1.43
224	73.32	"	5.45	166.1	1.63
225	73.08	"	4.36	125.8	2.73
226	68.60	"	3.26	127.7	2.23
227	72.42	"	2.24	130.0	0.93
228	73.40	"	1.28	133.1	2.23

Hole No. E-9 Bearing 127°00'00"

Distance from GZ = 70.0 feet Surface Elevation = 2166.28 feet

PRETRIAL				POSTTRIAL	
Can No.	Weight	Distance from GZ	Depth	Distance from GZ	Depth
	grams	feet	feet	feet	feet
296	72.93	70.0	23.55	83.0	27.19
297	69.72	"	23.05	84.0	24.74
298	72.40	"	21.77	85.2	23.64
299	72.35	"	20.67	82.2	21.00
300	69.81	"	19.71	79.8	15.38
301	73.39	"	18.60	82.9	11.74
302	73.05	"	17.25	83.2	10.96
303	69.39	"	16.15	86.9	7.78
304	70.52	"	14.75	89.5	6.28
305	69.90	"	13.41	92.4	6.28
306	70.30	"	12.21	104.8	1.48
307	67.70	"	11.23	114.3	1.78
308	70.42	"	10.31	113.1	0.58
309	67.33	"	9.47	113.9	0.78
310	70.25	"	8.16	115.6	1.98
311	68.68	"	6.99	126.9	1.48
312	72.65	"	6.12	128.1	+ 0.25
313	71.45	"	4.91	131.2	+ 0.25
314	73.07	"	3.02	136.7	1.08
315	72.40	"	1.93	134.1	2.18
316	70.60	"	0.89	146.0	+ 0.42

Hole No. E-10 Bearing $127^{\circ}00'00''$

Distance from GZ = 60.0 feet Surface Elevation = 2166.14 feet

PRETRIAL				POSTTRIAL	
Can No.	Weight	Distance from GZ	Depth	Distance from GZ	Depth
	grams	feet	feet	feet	feet
317	70.02	60.0	27.59	--	--
318	71.41	"	25.97	--	--
319	69.15	"	24.77	77.7	21.48
320	68.48	"	23.27	79.5	19.93
321	71.12	"	22.06	78.2	18.53
322	73.20	"	21.23	79.9	18.44
323	71.09	"	19.96	98.6	0.64
324	72.81	"	18.88	102.7	+ 0.25
325	73.61	"	17.52	116.7	+ 0.16
326	71.13	"	16.29	108.13	--
327	70.62	"	15.19	127.2	+ 0.16
328	71.69	"	13.77	130.8	+ 1.36
329	71.82	"	12.48	139.9	+ 1.26
330	71.22	"	11.62	138.9	+ 0.26
331	70.42	"	11.02	142.8	+ 1.86
332	70.78	"	9.97	146.3	+ 1.66
333	71.82	"	9.11	151.2	+ 1.36
334	73.43	"	8.08	149.6	+ 0.36
335	70.84	"	5.91	147.8	+ 0.46
336	71.55	"	5.18	148.3	+ 0.46
337	70.65	"	4.28	161.1	+ 0.24
338	71.12	"	3.27	171.9	0.00
339	70.03	"	2.01	210.2	0.34
340	68.90	"	1.06	196.9	0.00

32

HOLE NO. E-11 Bearing 127°00'00"

Distance from GZ = 40.0 feet Surface Elevation = 2166.25 feet

PRETRIAL				POSTTRIAL	
Can No.	Weight	Distance from GZ	Depth	Distance from GZ	Depth
	grams	feet	feet	feet	feet
341	72.28	40.0	25.79	--	--
342	71.12	"	24.45	--	--
343	72.13	"	23.24	--	--
344	72.93	"	21.86	--	--
345	71.58	"	21.51	--	--
346	71.46	"	20.38	--	--
347	69.95	"	19.08	--	--
348	72.22	"	17.86	--	--
349	73.62	"	16.43	--	--
350	72.02	"	15.12	--	--
351	70.69	"	13.78	165.9	+ 0.35
352	69.90	"	12.46	190.8	+ 0.65
353	70.00	"	11.49	217.0	+ 0.45
354	72.22	"	10.37	269.1	0.35
355	69.73	"	9.66	334.0	0.35
356	69.83	"	9.13	--	--
357	71.58	"	7.52	--	--
358	70.90	"	6.23	320.6	0.35
359	71.41	"	5.29	322.0	0.35
360	69.40	"	3.72	323.9	0.35
361	70.00	"	2.48	362.6	0.35
362	72.20	"	1.23	352.0	0.35
363	68.53	"	0.62	557.1	0.35

HOLE NO. E-12 Bearing 127°00'00"

Distance from GZ = 30.0 feet Surface Elevation = 2166.00 feet

	PRETRIAL			POSTTRIAL	
Can No.	Weight	Distance from GZ	Depth	Distance from GZ	Depth
	grams	feet	feet	feet	feet
389	72.25	30.0	35.08	--	--
390	71.60	"	34.59	--	--
391	69.43	"	30.98	--	--
392	71.72	"	28.81	--	--
393	66.50	"	27.92	--	--
394	70.55	"	26.65	--	--
395	70.20	"	25.38	--	--
396	68.52	"	23.87	--	--
397	68.80	"	22.32	--	--
398	68.10	"	21.25	--	--
399	69.09	"	20.27	--	--
400	69.28	"	19.49	--	--
401	71.00	"	18.25	--	--
402	72.20	"	17.21	--	--
403	70.30	"	16.14	--	--
404	67.98	"	15.65	--	--
405	71.78	"	13.26	--	--
406	69.80	"	11.93	--	--
407	70.75	"	10.76	--	--
408	69.48	"	9.83	107.2	S
409	70.92	"	9.46	120.0	0.2
410	68.85	"	7.25	143.2	0.8
411	70.45	"	5.37	--	--
412	71.82	"	4.64	--	--
413	67.49	"	3.94	337.3	S
414	73.18	"	2.92	829.8	S
415	73.40	"	2.04	--	--
416	70.90	"	0.95	818.3	S

Hole No. E-13 Bearing 127°00'00"

Distance from GZ = 20.0 feet Surface Elevation = 2166.20 feet

	PRETRIAL			POSTTRIAL	
Can No.	Weight	Distance from GZ	Depth	Distance from GZ	Depth
	grams	feet	feet	feet	feet
417	68.40	20.0	39.03	--	--
418	68.60	"	37.15	--	--
419	69.03	"	35.50	--	--
420	68.50	"	33.64	--	--
421	72.40	"	33.12	--	--
422	70.60	"	31.76	--	--
423	71.18	"	29.46	--	--
424	71.09	"	28.58	--	--
425	71.15	"	28.30	--	--
426	71.71	"	26.95	--	--
427	71.72	"	25.62	--	--
428	68.60	"	24.96	--	--
429	70.27	"	23.66	--	--
430	72.59	"	21.32	--	--
431	72.32	"	20.01	--	--
432	67.32	"	18.84	--	--
433	69.10	"	17.56	--	--
434	68.82	"	16.30	--	--
435	68.80	"	14.98	--	--
436	69.69	"	13.58	--	--
437	69.11	"	12.43	--	--
438	68.95	"	10.82	--	--
439	69.12	"	9.98	--	--
440	69.52	"	8.77	--	--
441	71.38	"	7.47	--	--
442	72.68	"	6.76	--	--
443	73.12	"	5.46	--	--
444	68.02	"	4.30	--	--
445	72.22	"	2.99	347.8	--
446	71.97	"	1.79	855.4	--
447	71.45	"	1.00	749.9	--

Hole No. E-14 Bearing 127°00'00"

Distance from GZ = 10.0 feet Surface Elevation = 2166.23 feet

PRETRIAL				POSTTRIAL	
Can No.	Weight	Distance from GZ	Depth	Distance from GZ	Depth
	grams	feet	feet	feet	feet
473	68.02	10.0	60.60	--	--
474	71.60	"	59.20	--	--
475	69.00	"	58.00	--	--
476	67.70	"	56.70	--	--
477	68.30	"	55.70	--	--
478	69.42	"	54.30	--	--
479	71.50	"	52.70	--	--
480	70.20	"	52.05	--	--
481	72.50	"	49.65	--	--
482	70.43	"	49.25	--	--
483	74.83	"	--	--	--
484	67.76	"	--	--	--
485	72.66	"	49.00	--	--
486	70.32	"	48.50	--	--
487	68.40	"	47.10	--	--
488	72.14	"	46.20	--	--
489	71.52	"	44.40	--	--
490	73.40	"	43.90	--	--
491	71.08	"	42.20	--	--
492	68.60	"	40.80	--	--
493	72.48	"	39.90	--	--
494	70.81	"	39.70	--	--
497	70.12	"	38.30	--	--
498	68.90	"	37.40	--	--
499	67.77	"	36.00	--	--
500	67.73	"	35.00	--	--
501	73.40	"	34.00	--	--
502	71.60	"	33.30	--	--
503	68.49	"	32.10	--	--
504	72.69	"	31.00	--	--
505	74.78	"	30.30	--	--
506	73.70	"	30.02	11.6	23.91
507	71.48	"	28.99	10.8	24.77
508	70.98	"	27.80	--	--

Hole No. E-14 (cont'd.)

PRETRIAL				POSTTRIAL	
Can No.	Weight	Distance from GZ	Depth	Distance from GZ	Depth
	grams	feet	feet	feet	feet
509	71.12	10.0	27.04	--	--
510	70.85	"	26.01	12.0	23.36
511	72.10	"	24.37	11.8	22.50
512	71.98	"	23.83	11.6	21.56
513	73.87	"	23.07	--	--
514	74.95	"	22.23	--	--
515	70.88	"	21.28	--	--
516	70.72	"	20.16	15.6	15.54
517	72.23	"	19.31	--	--
518	70.55	"	18.80	--	--
519	71.25	"	17.84	--	--
520	67.60	"	17.04	15.0	19.78
521	65.65	"	16.23	--	--
522	71.39	"	15.17	19.5	19.50
523	71.70	"	14.25	--	--
524	73.02	"	13.47	--	--
525	72.02	"	12.52	--	--
526	70.70	"	11.72	--	--
527	74.30	"	10.98	--	--
528	69.93	"	9.62	--	--
529	69.48	"	8.75	--	--
530	68.10	"	6.98	--	--
531	69.63	"	6.18	--	--
532	70.08	"	5.01	--	--
533	70.13	"	4.05	--	--
534	70.90	"	3.10	--	--
535	71.55	"	1.99	--	--
536	72.95	"	1.27	--	--
537	70.72	"	0.60	--	--

Hole No. E-15 Bearing 127°00'00"

Distance from GZ = 5.0 feet Surface Elevation = 2166.28 feet

PRETRIAL				POSTTRIAL	
Can No.	Weight	Distance from GZ	Depth	Distance from GZ	Depth
	grams	feet	feet	feet	feet
604	68.77	5.0	62.35	--	--
605	74.01	"	60.85	--	--
606	72.55	"	60.35	--	--
607	71.35	"	58.65	--	--
608	69.72	"	57.75	--	--
609	68.99	"	56.85	--	--
610	72.48	"	55.25	--	--
611	69.42	"	54.35	--	--
612	72.61	"	53.80	--	--
613	73.09	"	52.45	--	--
614	70.77	"	51.55	--	--
615	70.48	"	50.15	--	--
616	71.03	"	48.55	--	--
617	71.09	"	47.85	--	--
618	68.73	"	46.85	--	--
619	70.58	"	45.65	--	--
620	69.98	"	44.65	--	--
621	69.01	"	43.75	--	--
622	71.41	"	42.75	--	--
623	72.08	"	41.95	--	--
624	70.65	"	40.55	--	--
625	73.52	"	39.75	--	--
626	71.70	"	39.15	--	--
627	72.72	"	38.55	--	--
628	72.19	"	37.25	--	--
629	72.00	"	35.75	--	--
630	71.08	"	34.95	--	--
631	70.24	"	33.35	--	--
632	71.48	"	32.55	--	--
633	72.73	"	31.85	--	--
634	73.25	"	29.85	--	--
635	70.32	"	28.95	--	--
636	70.65	"	27.95	--	--

Hole No. E-15 (cont'd.)

PRETRIAL				POSTTRIAL	
Can No.	Weight	Distance from GZ	Depth	Distance from GZ	Depth
	grams	feet	feet	feet	feet
637	69.92	5.0	26.55	--	--
638	70.76	"	25.55	--	--
639	70.72	"	24.55	--	--
640	71.52	"	23.45	--	--
641	71.18	"	22.45	--	--
642	69.67	"	21.55	--	--
643	71.99	"	20.45	--	--
644	70.10	"	19.45	6.6	16.90
645	71.58	"	18.45	--	--
646	72.56	"	17.45	--	--
647	70.08	"	16.55	--	--
648	70.77	"	15.45	6.6	19.23
649	72.61	"	14.45	--	--
650	71.73	"	13.55	--	--
651	69.73	"	12.55	--	--
652	71.18	"	11.55	--	--
653	70.90	"	10.75	--	--
654	71.60	"	10.05	--	--
655	70.48	"	8.75	--	--
656	71.71	"	7.55	--	--
657	71.17	"	6.50	--	--
658	69.77	"	5.35	--	--
659	69.28	"	4.45	--	--
660	70.90	"	3.55	--	--
661	71.87	"	2.35	--	--
662	70.39	"	1.35	--	--

Hole No. Ground Zero   Bearing 37°00'00"

Distance from GZ = 1.5 feet   Surface Elevation = 2166.31 feet

PRETRIAL				POSTTRIAL	
Can No.	Weight	Distance from GZ	Depth	Distance from GZ	Depth
	grams	feet	feet	feet	feet
538	72.12	1.5	67.28	--	--
539	69.73	"	66.78	--	--
540	70.98	"	65.48	--	--
541	70.67	"	64.48	--	--
542	70.32	"	63.58	--	--
543	71.11	"	61.78	--	--
544	68.82	"	60.98	--	--
545	70.88	"	59.88	--	--
546	70.69	"	57.68	--	--
547	70.62	"	57.08	--	--
548	70.59	"	56.38	--	--
549	68.75	"	54.38	--	--
550	73.39	"	53.48	--	--
551	73.12	"	52.58	--	--
552	72.52	"	51.48	--	--
553	72.22	"	49.98	--	--
554	71.68	"	48.93	--	--
555	70.30	"	48.18	--	--
556	72.93	"	46.93	--	--
557	71.96	"	45.78	--	--
558	70.12	"	44.78	--	--
559	72.68	"	44.08	--	--
560	70.20	"	43.08	--	--
561	70.60	"	42.23	--	--
562	71.40	"	41.38	--	--
563	70.62	"	40.68	--	--
564	70.47	"	39.18	--	--
565	71.25	"	38.18	--	--
566	68.48	"	36.83	--	--
567	72.93	"	36.18	--	--
568	69.40	"	--	--	--
569	71.98	"	35.38	--	--
570	72.33	"	34.08	--	--

3

Hole No. Ground Zero (cont'd.)

	PRETRIAL			POSTTRIAL	
Can No.	Weight	Distance from GZ	Depth	Distance from GZ	Depth
	grams	feet	feet	feet	feet
571	72.48	1.5	33.18	--	--
572	70.93	"	30.88	--	--
573	71.28	"	29.78	--	--
574	71.42	"	28.88	--	--
575	72.82	"	--	--	--
576	71.67	"	28.08	--	--
577	70.32	"	26.58	--	--
578	70.30	"	--	--	--
579	67.52	"	24.98	--	--
580	72.00	"	24.18	--	--
581	69.92	"	23.28	--	--
582	70.52	"	22.18	--	--
583	70.90	"	20.98	--	--
584	72.40	"	19.53	--	--
585	71.55	"	18.11	--	--
586	71.88	"	17.25	--	--
587	71.47	"	16.57	--	--
588	72.58	"	15.61	--	--
589	71.62	"	14.58	--	--
590	70.82	"	13.44	--	--
591	70.40	"	12.43	--	--
592	72.00	"	11.49	--	--
593	70.08	"	10.80	--	--
594	72.27	"	10.01	--	--
595	70.86	"	8.78	--	--
596	71.89	"	7.91	--	--
597	70.90	"	6.83	--	--
598	72.88	"	5.91	--	--
599	68.33	"	4.97	--	--
600	69.05	"	4.03	--	--
601	71.65	"	2.73	--	--
602	71.25	"	2.05	--	--
603	73.41	"	1.16	--	--

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13 ABSTRACT

This report gives the full details of the experimental procedures used and the data obtained during the study of the crater produced by the detonation of 500 tons of TNT in a spherical configuration tangential to the surface of undisturbed lacustrine sands and silts. The overall programme associated with this detonation has been nicknamed PRAIRIE FLAT.

It is shown that all the data obtained from a variety of nominally independent projects are internally consistent, and also exhibit a marked consistency with data obtained in earlier trials. It is shown that the ejecta blanket consists of a coherently overturned flap of the upper few feet of sediment, combined with thrust blocks on the inside of the hinge region of this flap. In addition, it is shown that there is a general tendency towards downwarping of the strata under the rim, despite occasional local upthrusts. The crater exhibits a symmetrical pattern of ring folding, and circumferential cracks both inside and outside the main crater. The central regions of the crater have not been excavated, due to the continued presence of water and wet sedimentary deposits brought in by the water. Comments are made upon long range fallout of tagged particles and on the relatively close range fallout of spheroids composed of fused sands and silts. Full data are provided on the movement of marked elements of the ground, by the modified sand column technique and by an extension of this technique to provide greater numbers of markers. Detailed topographic survey data are presented in tabular and graphical form.

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