

AD-A112 987

FUGRO NATIONAL INC LONG BEACH CA
PRELIMINARY GEOTECHNICAL INVESTIGATION PROPOSED OPERATIONAL BAS--ETC(U)
FEB 81
FN-TR-44-VOL-2

F/S 8/13

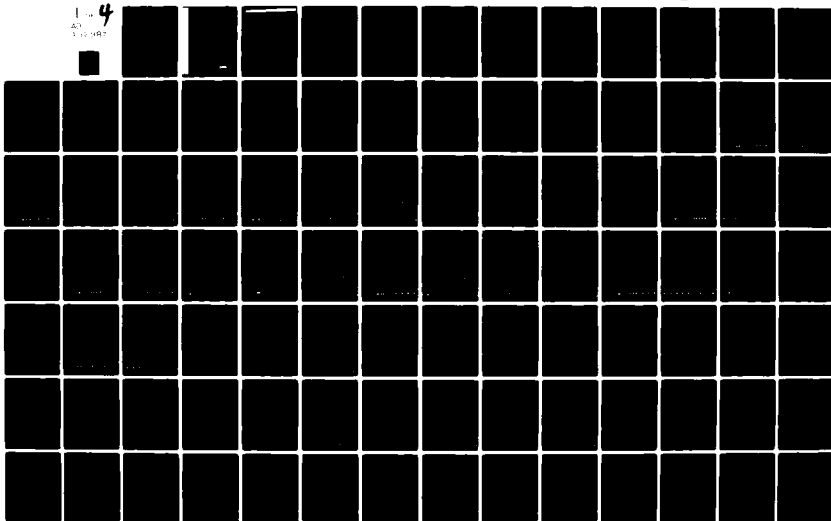
F04704-80-C-0006

NL

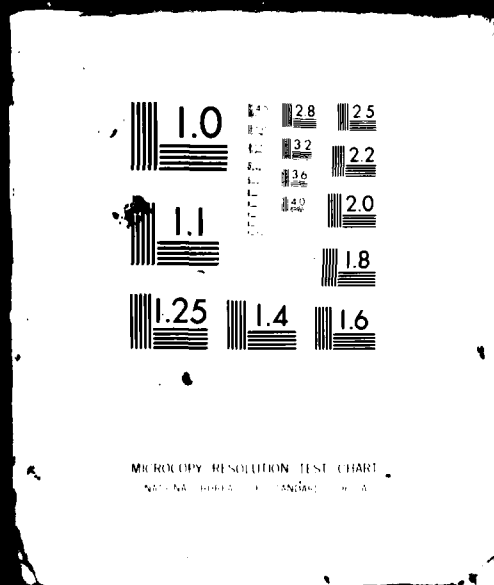
UNCLASSIFIED

1
AD
3 10 1987

4



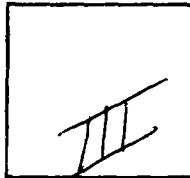
1 OF 4
AD-
A112987



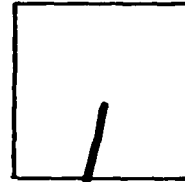
PHOTOGRAPH THIS SHEET

AD-A222 987

DTIC ACCESSION NUMBER



LEVEL



INVENTORY

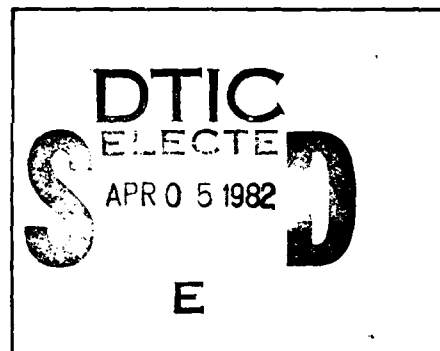
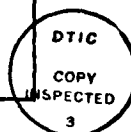
FN-TR-44-II
DOCUMENT IDENTIFICATION

This document has been approved
for public release and sale; its
distribution is unlimited.

DISTRIBUTION STATEMENT

ACCESSION FOR	
NTIS	GRA&I ☒
DTIC	TAB ☐
UNANNOUNCED	☐
JUSTIFICATION	
BY	
DISTRIBUTION /	
AVAILABILITY CODES	
DIST	AVAIL AND/OR SPECIAL
A	

DISTRIBUTION STAMP



DATE ACCESSIONED

DATE RECEIVED IN DTIC

PHOTOGRAPH THIS SHEET AND RETURN TO DTIC-DDA-2

**MX SITING INVESTIGATION
GEOTECHNICAL EVALUATION**

AD A112987

**PRELIMINARY GEOTECHNICAL
INVESTIGATION
PROPOSED OPERATIONAL BASE SITE
MILFORD, UTAH**

VOLUME II - GEOTECHNICAL DATA

**PREPARED FOR
BALLISTIC MISSILE OFFICE (BMO)
NORTON AIR FORCE BASE, CALIFORNIA**

FUGRO
INTERNATIONAL, INC.
Consulting Engineers and Geotechnical

FN-TR-44

MX SITING INVESTIGATION
GEOTECHNICAL EVALUATION

PRELIMINARY GEOTECHNICAL INVESTIGATION
PROPOSED OPERATIONAL BASE SITE
MILFORD, UTAH

VOLUME II. - GEOTECHNICAL DATA

Prepared for:

U.S. Department of the Air Force
Ballistic Missile Office
Norton Air Force Base, California 92409

Prepared by:

Fugro National, Inc.
3777 Long Beach Boulevard
Long Beach, California 90807

DTIC
ELECT
S APR 5 1982

20 February 1981

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER FN-TR-44-II	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Preliminary Geotechnical Investigation proposed Operational Base Site, Milford, Utah Volume II, Geotechnical Data		5. TYPE OF REPORT & PERIOD COVERED Final
7. AUTHOR(s) Fugro National		6. PERFORMING ORG. REPORT NUMBER FN-TR-44
9. PERFORMING ORGANIZATION NAME AND ADDRESS Enter Western Inc (formerly Fugro National) PO Box 7765 San Bruno CA 94067		8. CONTRACT OR GRANT NUMBER(s) F04704-80-C-0006
11. CONTROLLING OFFICE NAME AND ADDRESS U.S. Department of the Air Force Space and Missile Systems Center Vandenberg AFB CA 94937 (571750)		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS 64312 F
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		12. REPORT DATE 20 Feb 81
		13. NUMBER OF PAGES
		15. SECURITY CLASS. (of this report)
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Distribution Unlimited		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report) Distribution Unlimited		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Explanation for: Boring, Trench, Test Pit Logs, Laboratory test results, Cone penetrometer, seismic-refraction data, Electrical Resistivity data, 2-30, California bearing ratio		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report contains maps of boring, Trench and test pit logs locations. Seismic-refraction data and electrical resistivity data for the Milford, Utah operating base location described in Volume I of this report.		

FOREWORD

This volume of geotechnical data was compiled for the Department of the Air Force, Ballistic Missile Office (BMO), in compliance with Contract No. F04704-80-C-0006, CDRL Item 004A6. It contains the field data and laboratory test results from the investigation of the proposed Operational Base Site, Milford, Utah. A synthesis of these data is available in Volume I.

The data in each section of this volume are preceded by an explanation of the format and terms used in the compilation.

TABLE OF CONTENTS

	<u>Page</u>
FOREWORD	i
1.0 <u>ACTIVITY LOCATION MAP</u>	In Pocket
2.0 <u>EXPLANATION OF BORING, TRENCH, AND TEST PIT LOGS</u>	1
3.0 <u>EXPLANATION OF TRENCH LOGS</u>	24
4.0 <u>EXPLANATION OF TEST PIT LOGS</u>	57
5.0 <u>EXPLANATION OF LABORATORY TEST RESULTS</u>	112
6.0 <u>EXPLANATION OF CONE PENETROMETER TEST RESULTS</u>	155
7.0 <u>EXPLANATION OF SEISMIC-REFRACTION DATA</u>	182
8.0 <u>EXPLANATION OF ELECTRICAL RESISTIVITY DATA</u>	195

LIST OF FIGURES

Figure
No.

2.0 EXPLANATION OF BORING, TRENCH,
AND TEST PIT LOGS

II-2-1	Log of Boring MD-B-1, Operational Base Site, Milford, Utah	7
II-2-2	Log of Boring MD-B-2, Operational Base Site, Milford, Utah	8
II-2-3	Log of Boring MD-B-3, Operational Base Site, Milford, Utah	9
II-2-4	Log of Boring MD-B-4, Operational Base Site, Milford, Utah	10
II-2-5	Log of Boring MD-B-5, Operational Base Site, Milford, Utah	11
II-2-6	Log of Boring MD-B-6, Operational Base Site, Milford, Utah	12
II-2-7	Log of Boring MD-B-7, Operational Base Site, Milford, Utah	13
II-2-8	Log of Boring MD-B-8, Operational Base Site, Milford, Utah	14
II-2-9	Log of Boring MD-B-9, Operational Base Site, Milford, Utah	15
II-2-10	Log of Boring MD-B-10, Operational Base Site, Milford, Utah	16

TABLE OF CONTENTS (Cont.)LIST OF FIGURES (Cont.)

<u>Figure No.</u>		<u>Page</u>
II-2-11	Log of Boring MD-B-11, Operational Base Site, Milford, Utah	17
II-2-12	Log of Boring MD-B-12, Operational Base Site, Milford, Utah	18
II-2-13	Log of Boring MD-B-13, Operational Base Site, Milford, Utah	19
II-2-14	Log of Boring MD-B-14, Operational Base Site, Milford, Utah	20
II-2-15	Log of Boring MD-B-15, Operational Base Site, Milford, Utah	21
II-2-16	Log of Boring BL-B-7, Operational Base Site, Milford, Utah	22
II-2-17	Log of Boring BL-B-10, Operational Base Site, Milford, Utah	23
 <u>3.0 EXPLANATION OF TRENCH LOGS</u>		
II-3-1	Log of Trench MD-T-1, Operational Base Site, Milford, Utah	25
II-3-2	Log of Trench MD-T-2, Operational Base Site, Milford, Utah	26
II-3-3	Log of Trench MD-T-3, Operational Base Site, Milford, Utah	27
II-3-4	Log of Trench MD-T-4, Operational Base Site, Milford, Utah	28
II-3-5	Log of Trench MD-T-5, Operational Base Site, Milford, Utah	29
II-3-6	Log of Trench MD-T-6, Operational Base Site, Milford, Utah	30
II-3-7	Log of Trench MD-T-7, Operational Base Site, Milford, Utah	31
II-3-8	Log of Trench MD-T-8, Operational Base Site, Milford, Utah	32
II-3-9	Log of Trench MD-T-9, Operational Base Site, Milford, Utah	33
II-3-10	Log of Trench MD-T-10, Operational Base site, Milford, Utah	34
II-3-11	Log of Trench MD-T-11, Operational Base Site, Milford, Utah	35
II-3-12	Log of Trench MD-T-12, Operational Base Site, Milford, Utah	36
II-3-13	Log of Trench MD-T-13, Operational Base Site, Milford, Utah	37
II-3-14	Log of Trench MD-T-14, Operational Base Site, Milford, Utah	38

TABLE OF CONTENTS (Cont.)LIST OF FIGURES (Cont.)

<u>Figure No.</u>		<u>Page</u>
II-3-15	Log of Trench MD-T-15, Operational Base Site, Milford, Utah	39
II-3-16	Log of Trench MD-T-16, Operational Base Site, Milford, Utah	40
II-3-17	Log of Trench MD-T-17, Operational Base Site, Milford, Utah	41
II-3-18	Log of Trench MD-T-18, Operational Base Site, Milford, Utah	42
II-3-19	Log of Trench MD-T-19, Operational Base Site, Milford, Utah	43
II-3-20	Log of Trench MD-T-20, Operational Base Site, Milford, Utah	44
II-3-21	Log of Trench BL-T-13, Operational Base Site, Milford, Utah	45
II-3-22	Log of Trench BL-T-14, Operational Base Site, Milford, Utah	46
II-3-23	Log of Trench BL-T-15, Operational Base Site, Milford, Utah	47
II-3-24	Log of Trench BL-T-16, Operational Base Site, Milford, Utah	48
II-3-25	Log of Trench BL-T-17, Operational Base Site, Milford, Utah	49
II-3-26	Log of Trench BL-T-18, Operational Base Site, Milford, Utah	50
II-3-27	Log of Trench BL-T-19, Operational Base Site, Milford, Utah	51
II-3-28	Log of Trench BL-T-20, Operational Base Site, Milford, Utah	52
II-3-29	Log of Trench BL-T-21, Operational Base Site, Milford, Utah	53
II-3-30	Log of Trench BL-T-22, Operational Base Site, Milford, Utah	54
II-3-31	Log of Trench BL-T-23, Operational Base Site, Milford, Utah	55
II-3-32	Log of Trench BL-T-24, Operational Base Site, Milford, Utah	56

4.0 EXPLANATION OF TEST PIT LOGS

II-4-1	Log of Test Pit MD-P-1, Operational Base Site, Milford, Utah	58
II-4-2	Log of Test Pit MD-P-2, Operational Base Site, Milford, Utah	59
II-4-3	Log of Test Pit MD-P-3, Operational Base Site, Milford, Utah	60
II-4-4	Log of Test Pit MD-P-4, Operational Base Site, Milford, Utah	61

TABLE OF CONTENTS (Cont.)LIST OF FIGURES (Cont.)

<u>Figure No.</u>		<u>Page</u>
II-4-5	Log of Test Pit MD-P-5, Operational Base Site, Milford, Utah	62
II-4-6	Log of Test Pit MD-P-6, Operational Base Site, Milford, Utah	63
II-4-7	Log of Test Pit MD-P-7, Operational Base Site, Milford, Utah	64
II-4-8	Log of Test Pit MD-P-8, Operational Base Site, Milford, Utah	65
II-4-9	Log of Test Pit MD-P-9, Operational Base Site, Milford, Utah	66
II-4-10	Log of Test Pit MD-P-10, Operational Base Site, Milford, Utah	67
II-4-11	Log of Test Pit MD-P-11, Operational Base Site, Milford, Utah	68
II-4-12	Log of Test Pit MD-P-12, Operational Base Site, Milford, Utah	69
II-4-13	Log of Test Pit MD-P-13, Operational Base Site, Milford, Utah	70
II-4-14	Log of Test Pit MD-P-14, Operational Base Site, Milford, Utah	71
II-4-15	Log of Test Pit MD-P-15, Operational Base Site, Milford, Utah	72
II-4-16	Log of Test Pit MD-P-16, Operational Base Site, Milford, Utah	73
II-4-17	Log of Test Pit MD-P-17, Operational Base Site, Milford, Utah	74
II-4-18	Log of Test Pit MD-P-18, Operational Base Site, Milford, Utah	75
II-4-19	Log of Test Pit MD-P-19, Operational Base Site, Milford, Utah	76
II-4-20	Log of Test Pit MD-P-20, Operational Base Site, Milford, Utah	77
II-4-21	Log of Test Pit MD-P-21, Operational Base Site, Milford, Utah	78
II-4-22	Log of Test Pit MD-P-22, Operational Base Site, Milford, Utah	79
II-4-23	Log of Test Pit MD-P-23, Operational Base Site, Milford, Utah	80
II-4-24	Log of Test Pit MD-P-24, Operational Base Site, Milford, Utah	81
II-4-25	Log of Test Pit MD-P-25, Operational Base Site, Milford, Utah	82
II-4-26	Log of Test Pit MD-P-26, Operational Base Site, Milford, Utah	83
II-4-27	Log of Test Pit MD-P-27, Operational Base Site, Milford, Utah	84

TABLE OF CONTENTS (Cont.)LIST OF FIGURES (Cont.)

<u>Figure No.</u>		<u>Page</u>
II-4-28	Log of Test Pit MD-P-28, Operational Base Site, Milford, Utah	85
II-4-29	Log of Test Pit MD-P-29, Operational Base Site, Milford, Utah	86
II-4-30	Log of Test Pit MD-P-30, Operational Base Site, Milford, Utah	87
II-4-31	Log of Test Pit MD-P-31, Operational Base Site, Milford, Utah	88
II-4-32	Log of Test Pit MD-P-32, Operational Base Site, Milford, Utah	89
II-4-33	Log of Test Pit MD-P-33, Operational Base Site, Milford, Utah	90
II-4-34	Log of Test Pit MD-P-34, Operational Base Site, Milford, Utah	91
II-4-35	Log of Test Pit MD-P-35, Operational Base Site, Milford, Utah	92
II-4-36	Log of Test Pit MD-P-36, Operational Base Site, Milford, Utah	93
II-4-37	Log of Test Pit MD-P-37, Operational Base Site, Milford, Utah	94
II-4-38	Log of Test Pit MD-P-38, Operational Base Site, Milford, Utah	95
II-4-39	Log of Test Pit MD-P-39, Operational Base Site, Milford, Utah	96
II-4-40	Log of Test Pit MD-P-40, Operational Base Site, Milford, Utah	97
II-4-41	Log of Test Pit MD-P-41, Operational Base Site, Milford, Utah	98
II-4-42	Log of Test Pit MD-P-42, Operational Base Site, Milford, Utah	99
II-4-43	Log of Test Pit MD-P-43, Operational Base Site, Milford, Utah	100
II-4-44	Log of Test Pit MD-P-44, Operational Base Site, Milford, Utah	101
II-4-45	Log of Test Pit MD-P-45, Operational Base Site, Milford, Utah	102
II-4-46	Log of Test Pit MD-P-46, Operational Base Site, Milford, Utah	103
II-4-47	Log of Test Pit MD-P-47, Operational Base Site, Milford, Utah	104
II-4-48	Log of Test Pit BL-P-15, Operational Base Site, Milford, Utah	105
II-4-49	Log of Test Pit BL-P-16, Operational Base Site, Milford, Utah	106
II-4-50	Log of Test Pit BL-P-17, Operational Base Site, Milford, Utah	107

TABLE OF CONTENTS (Cont.)LIST OF FIGURES (Cont.)

<u>Figure No.</u>		<u>Page</u>
II-4-51	Log of Test Pit BL-P-18, Operational Base Site, Milford, Utah	108
II-4-52	Log of Test Pit BL-P-19, Operational Base Site, Milford, Utah	109
II-4-53	Log of Test Pit BL-P-20, Operational Base Site, Milford, Utah	110
II-4-54	Log of Test Pit BL-P-21, Operational Base Site, Milford, Utah	111

5.0 EXPLANATION OF LABORATORY TEST RESULTS

II-5-1	Summary of Triaxial Compression Test Results, Operational Base Site, Milford, Utah	128
II-5-2	Summary of Direct Shear Test Results, Operational Base Site, Milford, Utah	130-134
II-5-3	Consolidation Test Results, Operational Base Site, Milford, Utah	135-144
II-5-4	Grain Size Curves, CBR Test, Operational Base Site, Milford, Utah	146-148
II-5-5	California Bearing Ratio (CBR) Curves, Operational Base Site, Milford, Utah	149-151

6.0 EXPLANATION OF CONE PENETROMETER
TEST RESULTS

II-6-1	Cone Penetrometer Test MD-C-1, 2 & 3 (through MD-C-66 & 67 and BL-C-27, 28 & 29 through BL-C-45 & 46) Operational Base Site, Milford, Utah	157-181

7.0 EXPLANATION OF SEISMIC REFRACTION DATA

II-7-1	Seismic Refraction Line MD-S-1, Time Distance Data and Velocity Profile, Operational Base Site, Milford, Utah	184
II-7-2	Seismic Refraction Line MD-S-2, Time Distance Data and Velocity Profile, Operational Base Site, Milford, Utah	185
II-7-3	Seismic Refraction Line MD-S-3, Time Operational Base Site, Milford, Utah	186
II-7-4	Seismic Refraction Line MD-S-4, Time Distance Data and Velocity Profile, Operational Base Site, Milford, Utah	187
II-7-5	Seismic Refraction Line MD-S-5, Time Distance Data and Velocity Profile, Operational Base Site, Milford, Utah	188

TABLE OF CONTENTS (Cont.)LIST OF FIGURES (Cont.)

<u>Figure No.</u>		<u>Page</u>
II-7-6	Seismic Refraction Line MD-S-6, Time Distance Data and Velocity Profile, Operational Base Site, Milford, Utah	189
II-7-7	Seismic Refraction Line MD-S-7, Time Distance Data and Velocity Profile, Operational Base Site, Milford, Utah	190
II-7-8	Seismic Refraction Line MD-S-8, Time Distance Data and Velocity Profile, Operational Base Site, Milford, Utah	191
II-7-9	Seismic Refraction Line MD-S-9, Time Distance Data and Velocity Profile, Operational Base Site, Milford, Utah	192
II-7-10	Seismic Refraction Line BL-S-2, Time Distance Data and Velocity Profile, Operational Base Site, Milford, Utah	193

8.0 EXPLANATION OF ELECTRICAL
RESISTIVITY DATA

II-8-1	Resistivity Sounding MD-R-1, Sounding Curve and Interpretation, Operational Base Site, Milford, Utah	196
II-8-2	Resistivity Sounding MD-R-2, Sounding Curve and Interpretation, Operational Base Site, Milford, Utah	197
II-8-3	Resistivity Sounding MD-R-3, Sounding Curve and Interpretation, Operational Base Site, Milford, Utah	198
II-8-4	Resistivity Sounding MD-R-4, Sounding Curve and Interpretation, Operational Base Site, Milford, Utah	199
II-8-5	Resistivity Sounding MD-R-5, Sounding Curve and Interpretation, Operational Base Site, Milford, Utah	200
II-8-6	Resistivity Sounding MD-R-6, Sounding Curve and Interpretation, Operational Base Site, Milford, Utah	201
II-8-7	Resistivity Sounding MD-R-7, Sounding Curve and Interpretation, Operational Base Site, Milford, Utah	202
II-8-8	Resistivity Sounding MD-R-8, Sounding Curve and Interpretation, Operational Base Site, Milford, Utah	203
II-8-9	Resistivity Sounding MD-R-9, Sounding Curve and Interpretation, Operational Base Site, Milford, Utah	204

TABLE OF CONTENTS (Cont.)LIST OF FIGURES (Cont.)

<u>Figure No.</u>		<u>Page</u>
II-8-10	Resistivity Sounding MD-R-10, Sounding Curve and Interpretation, Operational Base Site, Milford, Utah	205
II-8-11	Resistivity Sounding MD-R-11, Sounding Curve and Interpretation, Operational Base Site, Milford, Utah	206
II-8-12	Resistivity Sounding BL-R-2, Sounding Curve and Interpretation, Operational Base Site, Milford, Utah	207

LIST OF TABLESTable No.

2.0 EXPLANATION OF BORING, TRENCH,
AND TEST PIT LOGS

II-2-1	Unified Soil Classification System	3

5.0 EXPLANATION OF LABORATORY TEST RESULTS

II-5-1	Summary of Laboratory Test Results, Operational Base Site, Milford, Utah	118-127
II-5-2	Summary of Unconfined Compression Test Results, Operational Base Site, Milford, Utah	129
II-5-3	Summary of Chemical Test Results, Operational Base Site, Milford, Utah	145
II-5-4	California Bearing Ratio (CBR) Test Results, Operational Base Site, Milford, Utah	152-154

7.0 EXPLANATION OF SEISMIC-REFRACTION DATA

II-7-1	Shallow Seismic Refraction Velocity Profile, Operational Base Site, Milford, Utah	194

SECTION 2.0
EXPLANATION OF BORING, TRENCH,
AND TEST PIT LOGS

2.0 EXPLANATIONS OF BORING, TRENCH, AND TEST PIT LOGS

All data from borings, trenches, and test pits are presented on standard Fugro National logs in Sections 2.0, 3.0, and 4.0. Explanations of the column headings on the logs are as follows:

A. Designations - Borings, trenches, and test pits are identified as follows:

MD-B-1 or BL-B-1

MD or BL - abbreviation for the site (e.g., MD-Milford and BL-Beryl)

B - abbreviation for activity (e.g., B-boring, T-trench, P-test pit)

1 - number of activity

All of the engineering activities for Option 1 OBTS are designated by BL (e.g., Beryl).

B. Sample Type - Different sampling techniques were used and the symbols are explained at the bottom of the boring logs. For details of sampling techniques, see Section A4.0 of Appendix in Volume I. Horizontal lines, to scale, indicate the depth where sampling was attempted.

C. Percent Recovery - The numbers shown represent the ratio (in percent) of the soil sample recovered in the sampler to the full penetration of the sampler.

D. N Value - Corresponds to standard penetration resistance which is the number of blows required to drive a standard split-spoon sampler for the second and third of three 6-inch (15-cm) increments with a 140-pound (63.5-kg) hammer falling 30 inches (76 cm) (ASTM D 1586-67).

- E. Depth - Corresponds to depth below ground surface in meters and feet.
- F. Lithology - Graphic representation of the soil and rock types.
- G. USCS - Unified Soil Classification System symbols (see Table II-2-1 for complete details).
- H. Soil Description - Except in cases where samples were classified based on laboratory test data, the descriptions are based on visual classification. The procedures outlined in ASTM D 2487-69, Classification of Soils for Engineering Purposes, and D 2488-69, Description of Soils (Visual-Manual Procedure), were followed. Solid lines across the column indicate known change in strata at the depth shown.

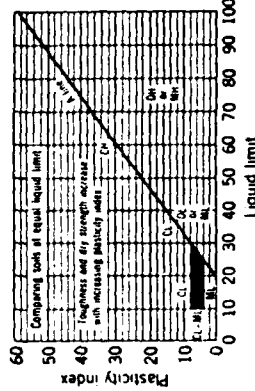
Definitions of some of the terms and criteria to describe soils and conditions encountered during the exploration follow.

Gradation : A coarse-grained soil is well graded if it has a wide range in grain size and substantial amounts of most intermediate particle sizes.

Poorly graded indicates that the soil consists predominantly of one size (uniformly graded) or has a wide range of sizes with some intermediate sizes obviously missing (gap-graded).

Moisture :	Dry	- no feel of moisture
	Slightly Moist	- much less than normal moisture
	Moist	- normal moisture for soil
	Very Moist	- much greater than normal moisture
	Wet	- for soils below the water table

Field Identification Procedures (Excluding particle size larger than 3 in. and basins fractions on estimated weight)				Group Symbols		Typical Names		Information Required for Describing Soils		Laboratory Classification Criteria	
Coarse-grained soils More than half of coarse fraction is larger than No. 200 sieve size	Sands More than half of coarse fraction is smaller than No. 4 sieve size	Gravels More than half of coarse fraction is larger than No. 4 sieve size	Clean sands (little or no fines)	Wide range in grain size and substantial amounts of all intermediate particle sizes	GW	Well graded sands, gravelly sands, little or no fines	Give typical name; indicate approximate percentage of sand, gravel, and silt; maximum size, fineness, surface condition, and hardness of the coarse fraction; local or geologic name; and symbols in parentheses.	[Determine percentages of gravel and sand from grain size analysis]	[Determine percentages of gravel and sand from grain size analysis]	[Determine percentages of gravel and sand from grain size analysis]	[Determine percentages of gravel and sand from grain size analysis]
Fine-grained soils More than half of material is finer than No. 200 sieve size	Silt and clay Liquid limit less than 50	Silt and clay Liquid limit greater than 50	Silt and clay Liquid limit less than 50	None to slight	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands with slight plasticity	Give typical name; indicate degree of plasticity; amount and maximum size of coarse grains; colour in wet condition; odour if any; local or geologic name; and other pertinent descriptive information, and symbol in parentheses.	[Use grain size curve in identifying the fractions as given under field identification]	[Use grain size curve in identifying the fractions as given under field identification]	[Use grain size curve in identifying the fractions as given under field identification]	[Use grain size curve in identifying the fractions as given under field identification]
Highly Organic Soils	Silt and clay Liquid limit greater than 50	Silt and clay Liquid limit greater than 50	Silt and clay Liquid limit greater than 50	None to slight	MH	Inorganic silts, micaceous or silty silts, elastic silts	Give typical name; indicate degree of plasticity; amount and maximum size of coarse grains; colour in wet condition; odour if any; local or geologic name; and other pertinent descriptive information, and symbol in parentheses.	[Use grain size curve in identifying the fractions as given under field identification]	[Use grain size curve in identifying the fractions as given under field identification]	[Use grain size curve in identifying the fractions as given under field identification]	[Use grain size curve in identifying the fractions as given under field identification]



Plasticity chart
for laboratory classification of fine grained soils

From Wagner, 1937.
A boundary classification. Soils possessing characteristics of two groups are designated by combinations of group symbols. For example GW-GC, well graded gravel-sand mixture with clay binder.

Field Identification Procedure for Fine Grained Soils at Fractions
Dry Strength (Cohesive characteristics)
After removing particles larger than No. 40 sieve size, prepare a pat of soil to the consistency of putty, adding water if necessary. Allow the pat to break and crumble between the fingers. Then test its strength by squeezing it between the fingers. The strength is rated as follows:
High dry strength is characteristic of clays of the CH group. A typical inorganic silt possesses only very slight dry strength. Silty fine sands and silts have about the same slight dry strength, but can be distinguished by the feel when powdering the dried specimen. Fine sand feels gritty whereas a typical silt has the smooth feel of flour.

These procedures are to be performed on the minus No. 40 sieve size particles, approximately 1/2 in. For field classification purposes, kneading is not intended.

After removing particles larger than No. 40 sieve size, prepare a pat of moist soil with a volume of about one-half cubic inch. Add enough water if necessary to make the soil soft but not sticky.

Place the pat in the open palm of one hand and shake horizontally, striking vigorously against the other hand several times. A dry specimen which changes to a lively consistency and becomes glossy. When the sample is squeezed between the fingers, the water and silt disappear from the surface, the pat stiffens and finally it cracks or crumbles. The rapidity of appearance of water during shaking and of its disappearance during squeezing are noted.

Very fine clean sands give the quickest and most distinct reaction whereas a plastic clay has no reaction. Inorganic silt, such as a typical rock flour, show a moderately quick reaction.

After removing particles larger than the No. 40 sieve size, a specimen of soil about one-half cubic inch in size, is moulded to the consistency of putty. If too dry, water must be added and, if sticky, the specimen should be spread out in a thin layer and allowed to lose some moisture by evaporation. Then the specimen is rolled by hand on a smooth surface to a diameter of 1/4 in. The thread is then folded and re-rolled repeatedly. During this manipulation the moisture content is gradually reduced and the specimen stiffens, finally loses its plasticity, and crumbles when the plastic limit is reached.

A slight heading action continued until the lump crumbles. The tauter the thread near the plastic limit and the stiffer the lump when it finally crumbles, the more potent is the colloidal clay fraction in the soil. Weakest of the thread at the plastic limit and quick loss of coherence of the lump below the plastic limit indicate either inorganic clays or organic clays such as loess-type clays and organic clays.

Highly organic clays have a very weak and spongy feel at the plastic limit.

UNIFIED SOIL CLASSIFICATION SYSTEM OPERATIONAL BASE SITE MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

TABLE
II-2-1

UGRO NATIONAL, INC.

Consistency: Consistency descriptions of coarse-grained soils (GW, GP, GM, GC, SW, SP, SM, SC) are as follows.

<u>Consistency</u>	<u>N Value (ASTM D 1586-67)</u>
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	>50

Consistency descriptions of fine-grained soils (ML, CL, MH, CH,) are as follows:

<u>Consistency</u>	<u>Shear Strength (ksf) (kN/m²)</u>		<u>Field Guide</u>
Very Soft	0.25	12	Sample with height equal to twice the diameter, sags under own weight
Soft	0.25- 0.50	12 - 24	Can be squeezed between thumb and forefinger
Firm	0.50- 1.00	24- 48	Can be molded easily with fingers
Stiff	1.00- 2.00	48- 96	Can be imprinted with slight pressure from fingers
Very Stiff	2.00- 4.00	96- 192	Can be imprinted with considerable pressure from fingers
Hard	over 4.00	over 192	Cannot be imprinted by fingers

Grain Shape: Angular - particles have sharp edges and relatively plane sides with unpolished surfaces.

Plasticity : Plasticity index is the range of water content, expressed as a percentage of the weight of the oven-dried soil, through which the soil

is plastic. It is defined as the liquid limit minus the plastic limit. Descriptive ranges used on the logs include:

Nonplastic	(PI, 0 - 4)
Slightly Plastic	(PI, 4 - 15)
Medium Plastic	(PI, 15 - 30)
Highly Plastic	(PI, >30)

**Cobbles and
Boulders**

: A cobble is a rock fragment, usually rounded by weathering or abrasion, with an average diameter ranging between 3 and 12 inches (8 and 30 cm).

A boulder is a rock fragment, usually rounded by weathering or abrasion, with an average diameter of 12 inches (30 cm) or more.

- I. Remarks - This column was provided on boring and trench logs for comments regarding drilling difficulty, number and size of cobbles or boulders encountered, loss of drilling fluid in the boring, trench wall stability, and other conditions encountered during drilling and excavations.
- J. Dry Density and Moisture Content - The boring logs include a graphical display of laboratory test results for dry density (ASTM D 2937-71) in pounds per cubic foot and kilograms per cubic meter and moisture content (ASTM D 2216-71) in percent from representative samples taken during drilling. The symbols are explained at the bottom of the boring logs.
- K. Sieve Analysis - The numbers represent the percentage by dry weight (ASTM D 422-63) of each of the following soil components:
- GR - Gravel, rock particles that will pass a 3-inch (76-mm) sieve and are retained on No. 4 (4.75 mm) sieve.

SA - Sand, soil particles passing No. 4 sieve and retained on No. 200 (0.075 mm) sieve.

FI - Fines, silt or clay, soil particles passing No. 200 sieve.

L. Atterberg Limits (LL and PI) -

LL - Liquid Limit, the water content corresponding to the arbitrary limit between the liquid and plastic states of consistency of a soil (ASTM D 423-66).

PL - Plastic Limit, the water content corresponding to an arbitrary limit between the plastic and the semisolid state of consistency of a soil (ASTM D 424-59).

PI - Plasticity Index, numerical difference between the liquid limit (LL) and the plastic limit (PL) indicating the range of moisture content within which a soil-water mixture is plastic.

NP - Nonplastic.

M. Miscellaneous Information -

Elevations - indicated elevations on the logs are estimated from topographic maps of the study area, within an accuracy of half the contour interval.

Surficial
Geologic Unit - indicates the surficial geologic unit in which the activity is located.

Date Drilled - indicates the period from beginning to completion of the activity.

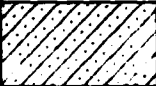
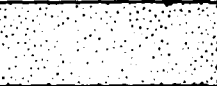
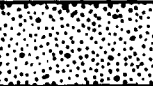
Drilling
Method - signifies the type of drilling procedure used such as rotary wash.

Hole Diameter - nominal size of boring drilled.

Water Level - indicates depth from ground surface to water table where encountered.

Trench Length - length at ground surface of final trench excavation.

Trench
Orientation - bearing of longitudinal trench centerline.

SAMPLE TYPE	% RECOVERY	N VALUE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	SOIL DESCRIPTION	REMARKS	▲(pcf)										SIEVE ANALYSIS				
									80	90	100	110	120	130	140	GR	SA	FI	LL	PI			
	87	23	0	0		SC	CLAYEY SAND, light brown to brown, fine to coarse, poorly graded, loose to dense, subangular to subrounded, calcareous; little to some non to slightly plastic clay.	cimentation	●	●	●	●	●	●	●	3	81	16					
	60	51																					
	100	43																					
	53	16																					
	100	28	3	10		SP-SM	GRAVELLY SAND, brown, fine to coarse, well to poorly graded, dense to very dense, subangular to subrounded, calcareous; little to some fine to coarse gravel; trace non-to slightly plastic silt.		●	●	●	●	●	●	●	25	68	7					
	100		6	20																			
	100		9	30																			
	100		12	40																			
	100		15	50		SM-SW	SILTY SAND, brown, fine to medium, well-to poorly graded, very dense, subangular to subrounded, calcareous; little slightly plastic silt; sand (SW-SM) (49.0' - 50.2').		●	●	●	●	●	●	●	28	64	8					
	83		18	60																			
TOTAL DEPTH 50.2' (15.3m)																							

-21 70-
-24 80-
-27 90-
-30 100-
-33 110

1400 1800 2200
▲ (kg/m³)

EXPLANATION

- FUGRO DRIVE SAMPLE
- BULK SAMPLE
- PITCHER TUBE SAMPLE
- STANDARD PENETRATION TEST SAMPLE
- ▨ CORE SAMPLE
- N - STANDARD PENETRATION RESISTANCE
- ▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)
- - MOISTURE CONTENT (ASTM: D-2216-71)
- NR - NO RECOVERY

BORING DETAILS

ELEVATION : 5230' (1594m)
SURFICIAL GEOLOGIC UNIT : A5i
DATE DRILLED : 4-5 November 1980
DRILLING METHOD : Rotary Wash
HOLE DIAMETER : 4 7/8" (124mm)
WATER LEVEL : Not Encountered

LOG OF BORING MD-B-1
OPERATIONAL BASE SITE
MILFORD, UTAH

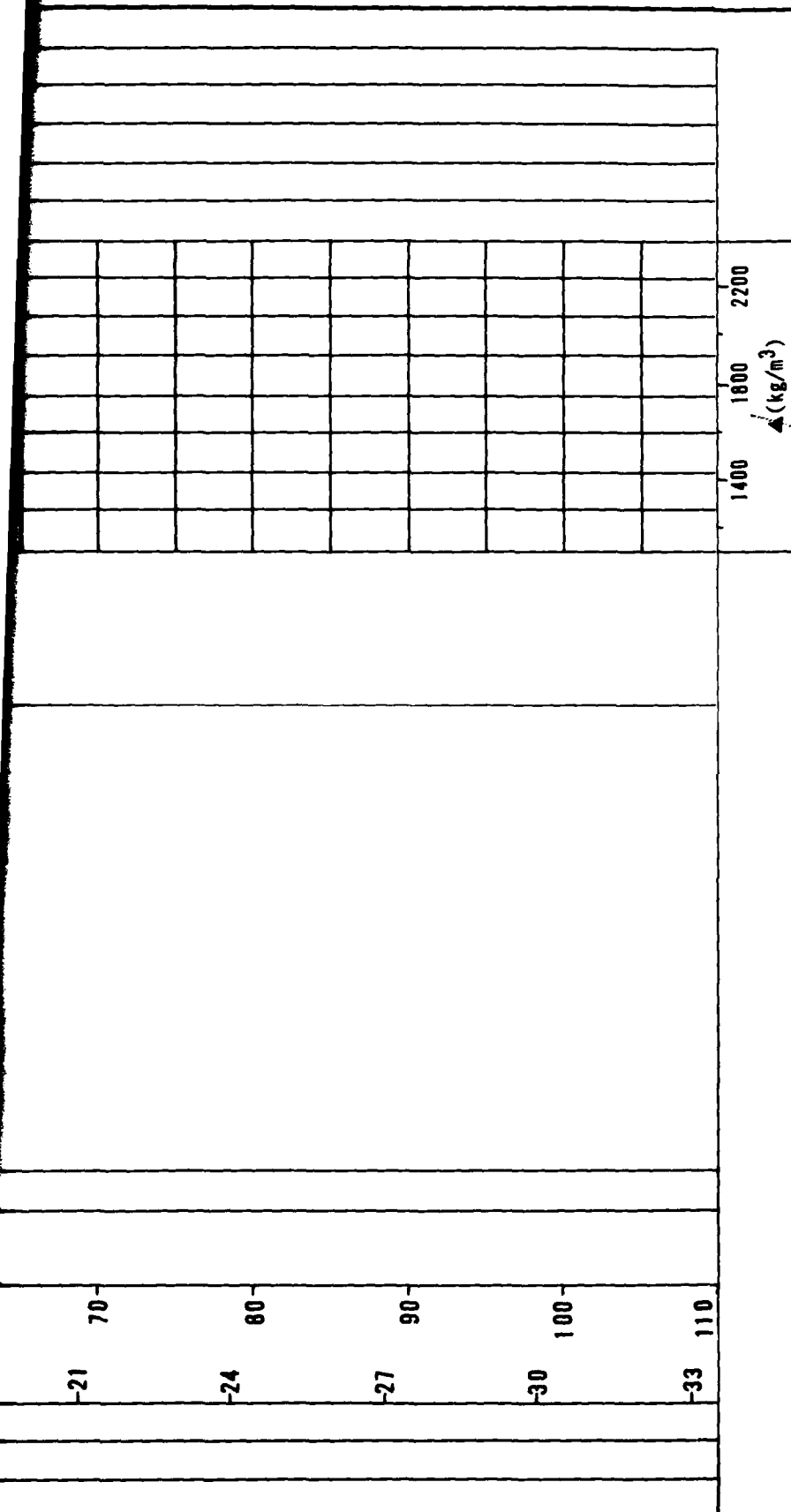
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
II-2-1

FUGRO NATIONAL, INC.

AP

[illegible]



EXPLANATION

■ FUGRO DRIVE SAMPLE

□ BULK SAMPLE

■ PITCHER TUBE SAMPLE

□ STANDARD PENETRATION TEST SAMPLE

▨ CORE SAMPLE

N - STANDARD PENETRATION RESISTANCE

▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)

● - MOISTURE CONTENT (ASTM: D-2216-71)

NR - NO RECOVERY

BORING DETAILS

ELEVATION : 5300' (1615m)
 SURFICIAL GEOLOGIC UNIT : A5i
 DATE DRILLED : 10 November 1980
 DRILLING METHOD : Rotary Wash
 HOLE DIAMETER : 4 7/8" (124mm)
 WATER LEVEL : Not Encountered

LOG OF BORING MD-B-2
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE BMO

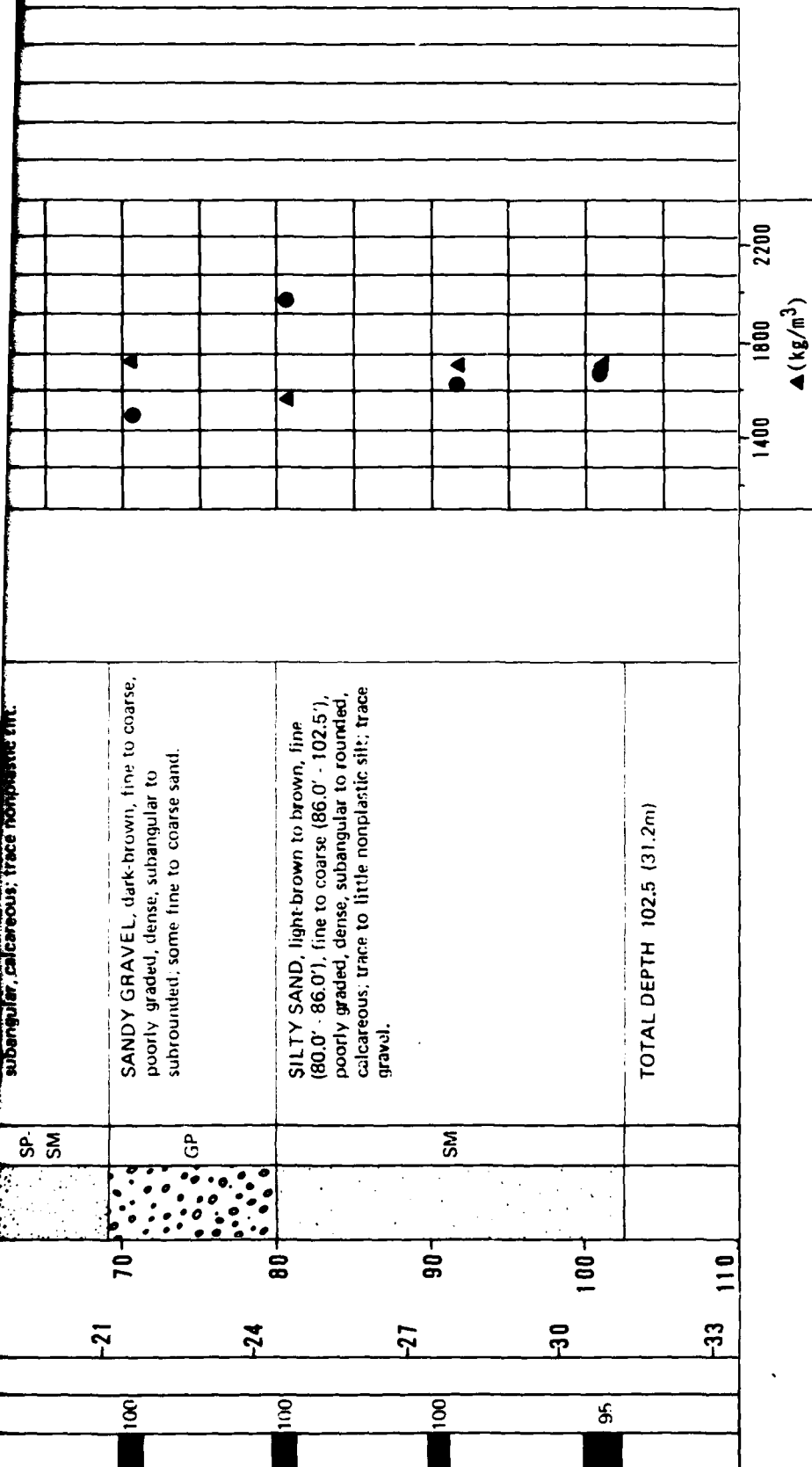
FIGURE
 II-2-2

FUGRO NATIONAL INC

APC

SAMPLE TYPE	% RECOVERY	N VALUE	DEPTH		LITHOLOGY	USCS	SOIL DESCRIPTION	REMARKS	▲(pcf)										SIEVE ANALYSIS			
			METERS	FEET					80	90	100	110	120	130	140	GR	SA	FI	LL	PI		
	96	0	0	0		CH	CLAY, dark-brown, soft to stiff, medium plastic, calcareous.	▲ 573									0	1	99	50	22	
	93	6																				
	67	19				MH	CLAYEY SILT, brown, stiff, medium plastic, calcareous.	▲	▲								0	3	97	61	26	
	67	8																				
	67		3	10		CH	CLAY, brown, stiff, medium plastic, calcareous.	▲	▲	▲							0	1	99	56	30	
	100																					
	100						SILTY SAND, brown to dark brown, fine to medium, poorly graded, dense, subangular to subrounded, calcareous; some nonplastic silt.		▲								0	62	38		NP	
	100		6	20																		
	93					SM			▲													
	87		9	30					▲	▲							0	67	33			
									▲	▲							0	75	25			
	93						CLAYEY SILT, SANDY SILT and SANDY CLAY, light-brown to brown, stiff slightly to medium plastic, calcareous; trace to some fine subangular to subrounded sand.		▲	▲							0	5	95	46	18	
	91		12	40		ML																
	100					CL			▲	▲							0	46	54	34	13	
	100		15	50																		
	100					ML			▲	▲							0	28	72	33	6	
	100		18	60		SP, SM	SAND, brown, fine, poorly graded, dense, subangular, calcareous; trace nonplastic silt.		▲	▲							0	88	12			

subangular, calcareous; trace nonplastic silt



EXPLANATION

■ FUGRO DRIVE SAMPLE

□ BULK SAMPLE

■ PITCHER TUBE SAMPLE

□ STANDARD PENETRATION TEST SAMPLE

▨ CORE SAMPLE

N - STANDARD PENETRATION RESISTANCE

▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)

● - MOISTURE CONTENT (ASTM: D-2216-71)

NR - NO RECOVERY

BORING DETAILS

ELEVATION

: 5100' (1554m)

SURFICIAL GEOLOGIC UNIT : A1/A40

DATE DRILLED : 11 November 1980

DRILLING METHOD : Rotary wash

HOLE DIAMETER : 4 7/8" (124mm)

WATER LEVEL : Not Encountered

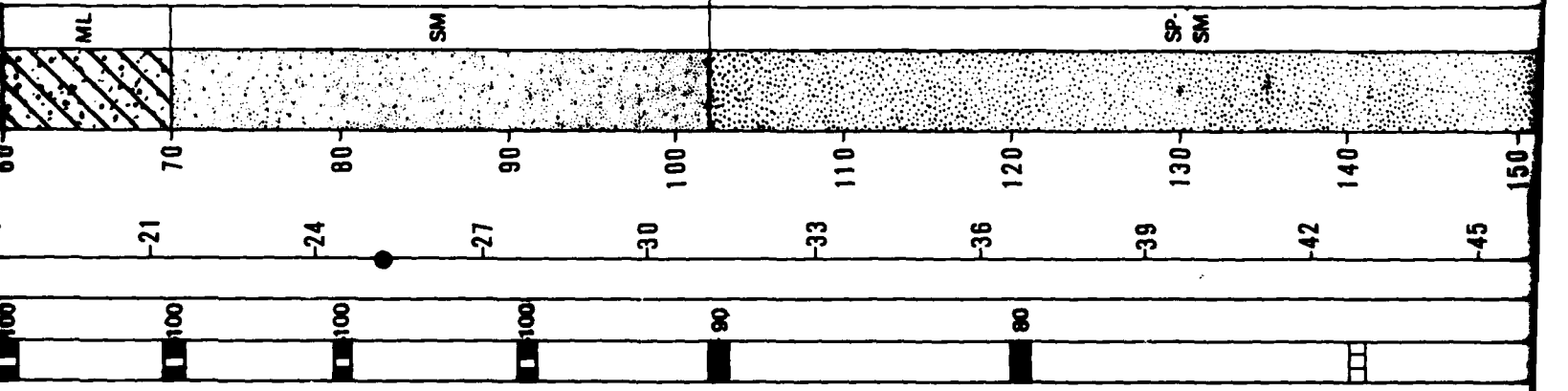
LOG OF BORING MD-B-3
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FUGRO NATIONAL, INC.

FIG
II-2

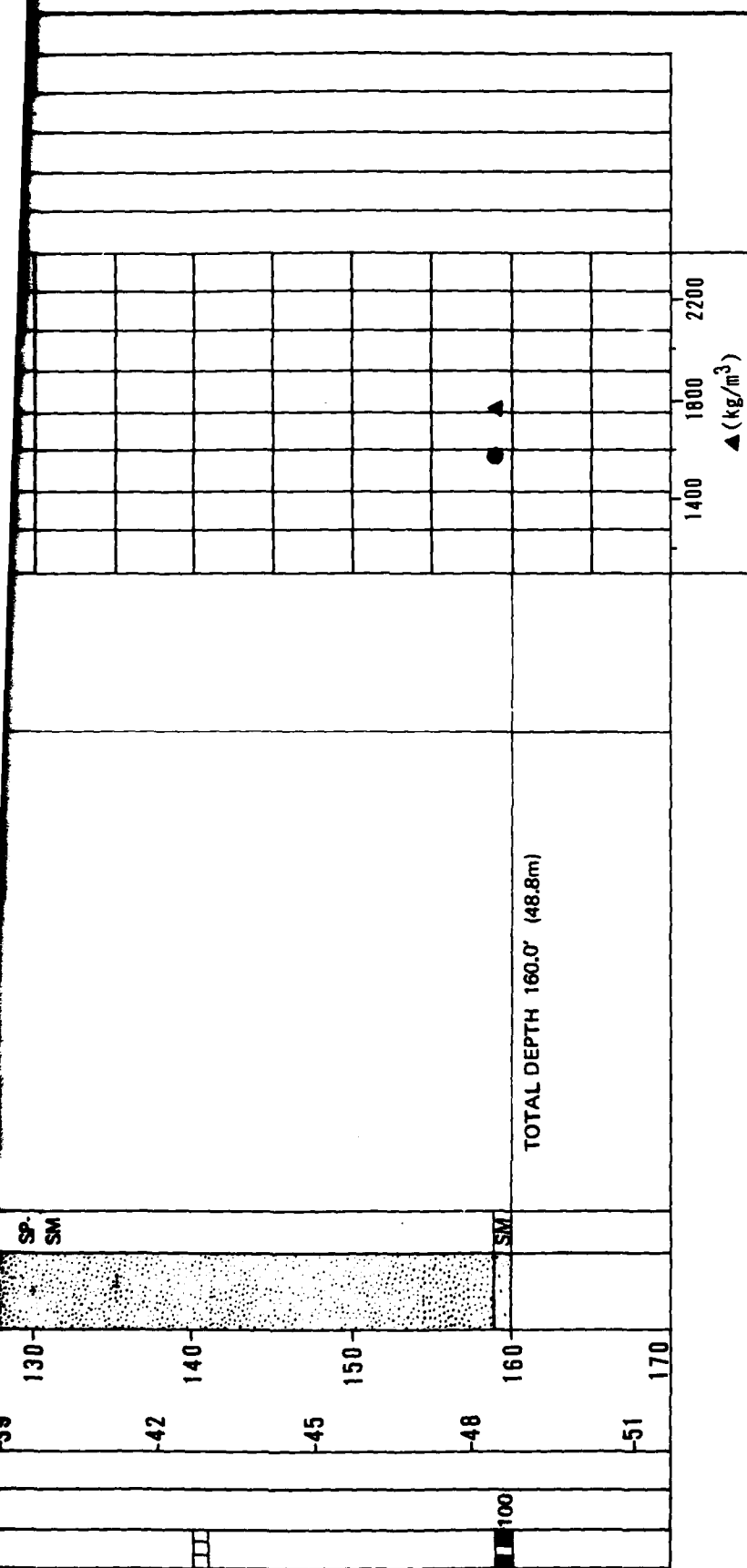
SAMPLE TYPE	% RECOVERY	N VALUE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS											
									▲ (pcf)					● (%)					GR SA FI LL PI	
									80	90	100	110	120	130	140					
	87		0	0		SM	SILTY SAND, light-brown to brown, fine to coarse, poorly graded, loose to dense, subangular to subrounded, calcareous; some slightly plastic silt; trace fine to coarse gravel; gravelly sand (5.8' - 9.0').													
	80					SP-SM														
	100		3	10		SM														
	96					ML	Interbedded layers of SILTY SAND and SANDY SILT: SILTY SAND (SM): brown, fine to coarse, poorly graded, dense, subangular to subrounded, calcareous; little to some non-to slightly plastic silt; trace fine to coarse gravel; sandy gravel (51.0' - 60.0').									8	37	57		
	100		6	20													25	55	20	NP
	100		9	30		SM	SANDY SILT (ML): brown, dense, nonplastic, calcareous; some fine to coarse subangular to subrounded sand; trace fine gravel.													
	100		12	40													12	69	19	
	87		15	50																
	100					GP-GM														
	100		18	60													0	42	58	



GRAVELLY SAND, brown, fine to coarse, poorly graded, dense, subangular to subrounded, calcareous; some fine gravel; some nonplastic silt; silty sand (159.0' - 160.0').

9 55 36

23 72 5



A5I

EXPLANATION

- FUGRO DRIVE SAMPLE
- BULK SAMPLE
- PITCHER TUBE SAMPLE
- STANDARD PENETRATION TEST SAMPLE
- ▨ CORE SAMPLE
- N - STANDARD PENETRATION RESISTANCE
- ▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)
- - MOISTURE CONTENT (ASTM: D-2216-71)
- NR - NO RECOVERY

BORING DETAILS

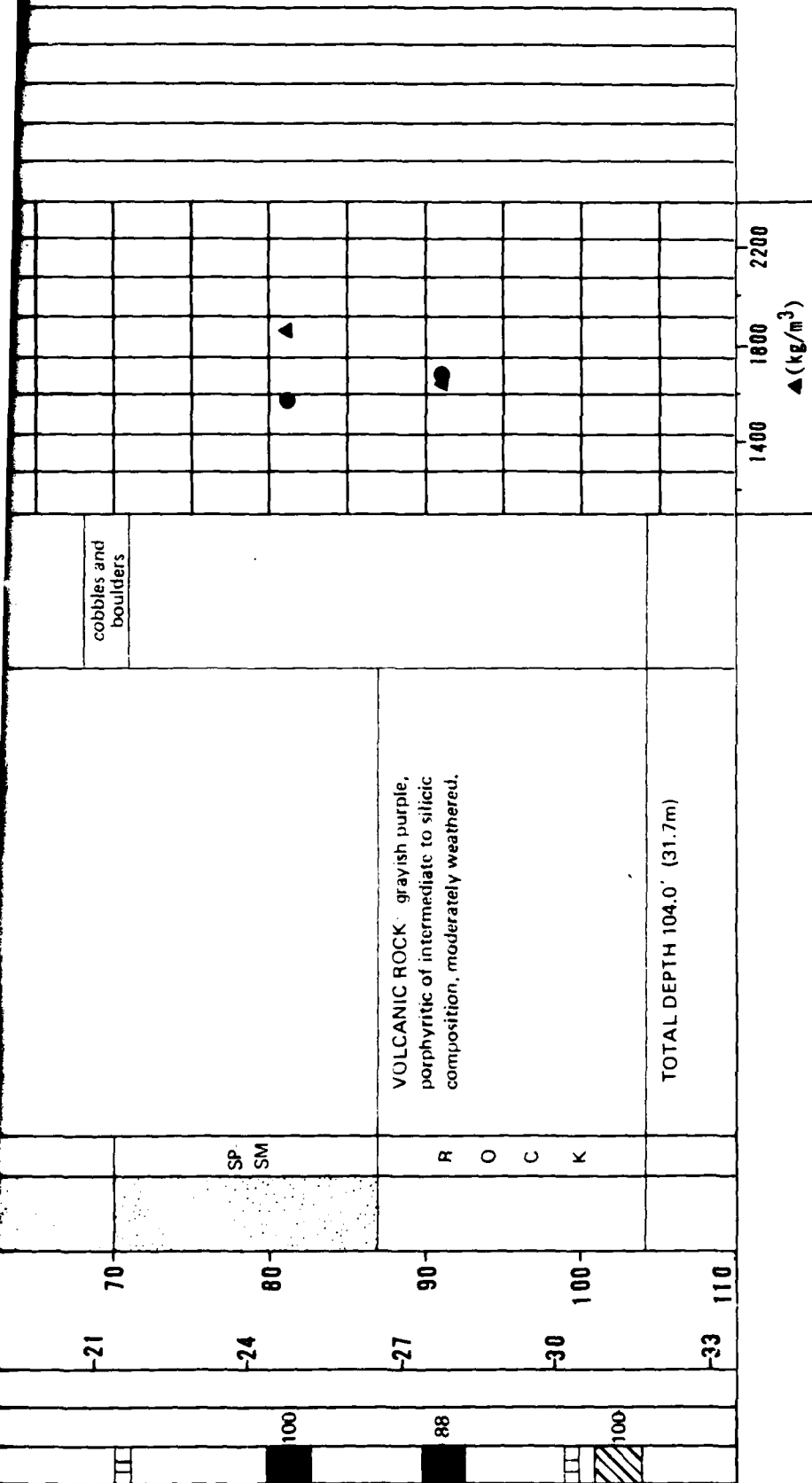
- ELEVATION : 5190 (1582m)
- SURFICIAL GEOLOGIC UNIT : A5I
- DATE DRILLED : 12 November 1980
- DRILLING METHOD : Rotary Wash
- HOLE DIAMETER : 4 7/8" (124mm)
- WATER LEVEL : Not Encountered

LOG OF BORING MD-B-4 OPERATIONAL BASE SITE MILFORD, UTAH	
MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - DMO	FIGURE II-2-4
FUGRO NATIONAL, INC.	

SAMPLE TYPE	% RECOVERY	N VALUE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	SOIL DESCRIPTION	REMARKS	▲(pcf)												SIEVE ANALYSIS					
									80	90	100	110	120	130	140	GR	SA	FI	LL	PI						
	100		0	0		SM	Interbedded layers of GRAVELLY SAND and SILTY SAND: GRAVELLY SAND (SW-SM, SP-SM): light-brown to dark-brown, fine to coarse, well-to poorly graded, dense to very dense, subangular to subrounded, calcareous; little to some fine to coarse gravel; trace non-to slightly plastic silt.		●	▲																
	100								●	▲																
	100					SW-SM			●	▲																
	95		3	10					●	▲																
						SM				▲																
	87								●	▲																
										▲																
	100		6	20		SP-SM			●	▲																
										▲																
	100		9	30		SW-SM			●	▲																
										▲																
	100								●	▲																
						SP-SM			●	▲																
	100		12	40					●	▲																
										▲																
	100								●	▲																
										▲																
						SM																				
										▲																
	87		18	60					●	▲																

boulder

cobbles and



EXPLANATION

■ FUGRO DRIVE SAMPLE

□ BULK SAMPLE

■ PITCHER TUBE SAMPLE

□ STANDARD PENETRATION TEST SAMPLE

▨ CORE SAMPLE

N - STANDARD PENETRATION RESISTANCE

▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)

● - MOISTURE CONTENT (ASTM: D-2216-71)

NR - NO RECOVERY

BORING DETAILS

ELEVATION : 5280' (1587m)

SURFICIAL GEOLOGIC UNIT : A5i

DATE DRILLED : 17 November 1980

DRILLING METHOD : Rotary Wash

HOLE DIAMETER : 4 7/8" (124mm)

WATER LEVEL : Not Encountered

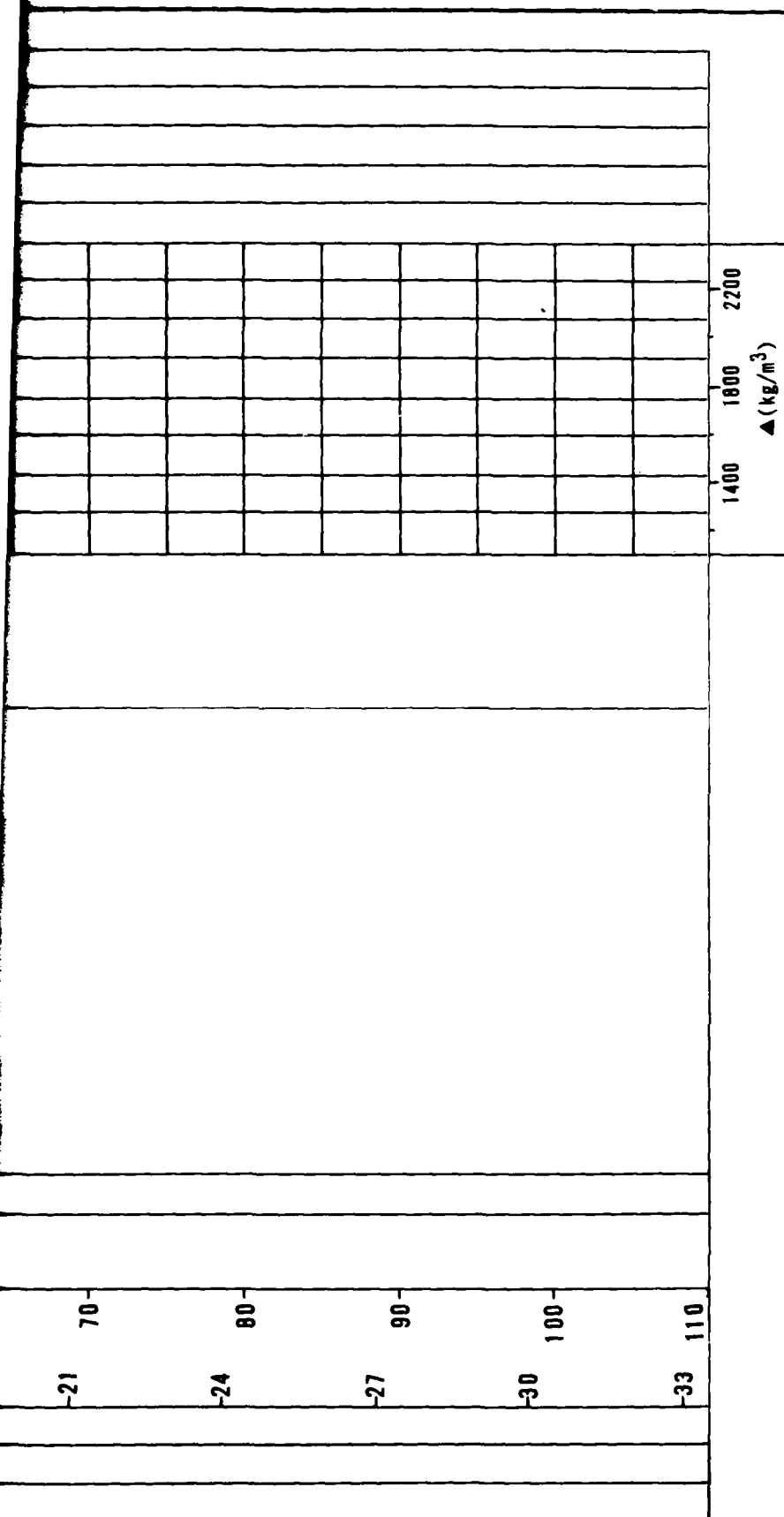
LOG OF BORING MD-B-5
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
II-2

FUGRO NATIONAL, INC.

SAMPLE TYPE	% RECOVERY	N VALUE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	SOIL DESCRIPTION	REMARKS	▲(pcf)										SIEVE ANALYSIS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
									80	90	100	110	120	130	140	GR	SA	FI	LL	PI																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
	90	11	0	0		SM	Interbedded layers of GRAVELLY SAND and SANDY SILT: GRAVELLY SAND (SW-SM, SP-SM, SM): light brown to brown, fine to coarse, well-to poorly graded, loose to very dense, subangular to subrounded, calcareous; little to some fine to coarse gravel; trace to little non-to slightly plastic silt; silty sand (0.0' - 2.5'). SANDY SILT (ML): brown, stiff, slightly plastic, calcareous; some fine to medium sand.		●	▲																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		

**EXPLANATION**

■ FUGRO DRIVE SAMPLE

□ BULK SAMPLE

■ PITCHER TUBE SAMPLE

□ STANDARD PENETRATION TEST SAMPLE

▨ CORE SAMPLE

N - STANDARD PENETRATION RESISTANCE

▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)

● - MOISTURE CONTENT (ASTM: D-2216-71)

NR - NO RECOVERY

BORING DETAILS

ELEVATION : 5200' (1585m)
 SURFICIAL GEOLOGIC UNIT: A5i
 DATE DRILLED : 18 November 1980
 DRILLING METHOD : Rotary Wash
 HOLE DIAMETER : 4 7/8" (124mm)
 WATER LEVEL : Not Encountered

LOG OF BORING MD-B-6
 OPERATIONAL BASE SITE
 MILFORD, UTAH

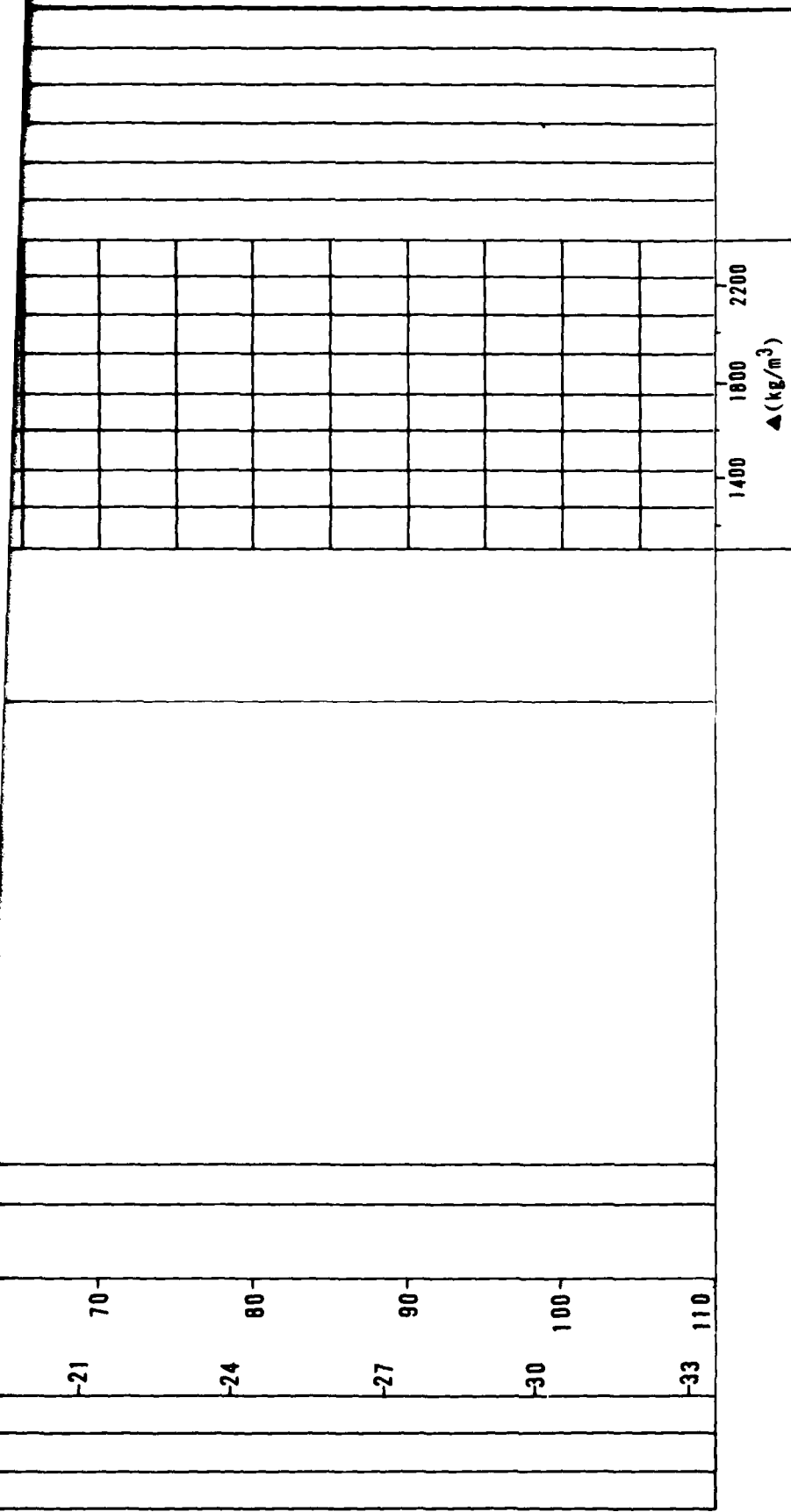
MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
 II-2-6

FUGRO NATIONAL, INC.

AFV

SAMPLE TYPE	% RECOVERY	N VALUE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	SOIL DESCRIPTION	REMARKS	▲(pcf)													SIEVE ANALYSIS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
									80	90	100	110	120	130	140	GR	SA	FI	LL	PI																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
	100		0	0		SC	Interbedded layers of SANDY GRAVEL and CLAYEY SAND: SANDY GRAVEL (GP): light-brown, fine to coarse, poorly graded, dense, subangular to subrounded, calcareous; some fine to coarse sand.	cimentation throughout	●	▲																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					</



EXPLANATION

- FUGRO DRIVE SAMPLE
- BULK SAMPLE
- PITCHER TUBE SAMPLE
- STANDARD PENETRATION TEST SAMPLE
- ▨ CORE SAMPLE
- N - STANDARD PENETRATION RESISTANCE
- ▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)
- - MOISTURE CONTENT (ASTM: D-2216-71)
- NR - NO RECOVERY

BORING DETAILS

ELEVATION : 5160' (1573m)
 SURFICIAL GEOLOGIC UNIT : A5i
 DATE DRILLED : 18 November 1980
 DRILLING METHOD : Rotary Wash
 HOLE DIAMETER : 4 7/8" (124mm)
 WATER LEVEL : Not Encountered

LOG OF BORING MD-B-7
 OPERATIONAL BASE SITE
 MILFORD, UTAH

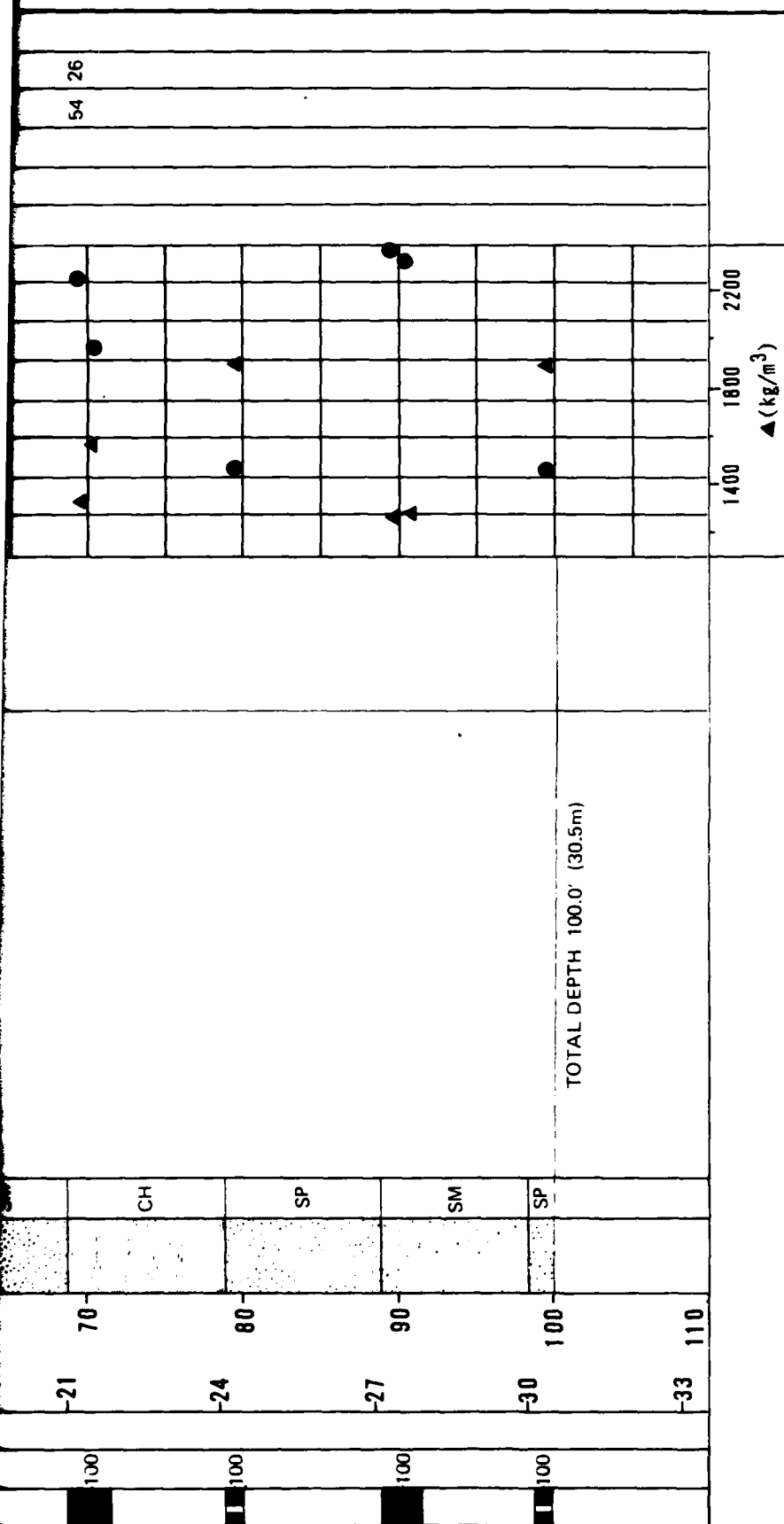
MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
 II-2-7

FUGRO NATIONAL, INC.

SAMPLE TYPE	% RECOVERY	N VALUE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	SOIL DESCRIPTION	REMARKS	▲(pcf)													SIEVE ANALYSIS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
									80	90	100	110	120	130	140	GR	SA	FI	LL	PI																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	100		0	0		SM	GRAVELLY SAND, light brown to brown, fine to coarse, poorly graded, loose to very dense, subangular to subrounded, calcareous; some fine to coarse gravel, trace to some slightly plastic silt.	cimentation	●	▲																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									

SAMPLE TYPE	% RECOVERY	N VALUE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	SOIL DESCRIPTION	REMARKS	▲(pcf)											SIEVE ANALYSIS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
									80	90	100	110	120	130	140	GR	SA	FI	LL	PI																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	100		0	0		SC	Interbedded layers of SAND and FINES: SAND: GRAVELLY SAND (SP, SP-SM): light-brown, fine to coarse, poorly graded, dense, subangular to subrounded; trace to some fine to coarse gravel; trace nonplastic silt; sand (SP-SM) (59.0' - 69.0').		▲	●																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							</



EXPLANATION

■ FUGRO DRIVE SAMPLE

□ BULK SAMPLE

■ PITCHER TUBE SAMPLE

□ STANDARD PENETRATION TEST SAMPLE

▨ CORE SAMPLE

N - STANDARD PENETRATION RESISTANCE

▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)

● - MOISTURE CONTENT (ASTM: D-2216-71)

NR - NO RECOVERY

BORING DETAILS

ELEVATION

: 5020' (1508m)

SURFICIAL GEOLOGIC UNIT : A5y/A40

DATE DRILLED : 19 - 20 November 1980

DRILLING METHOD : Rotary Wash

HOLE DIAMETER : 4 7/8" (124mm)

WATER LEVEL : Not Encountered

LOG OF BORING MD-B-9
OPERATIONAL BASE SITE
MILFORD, UTAH

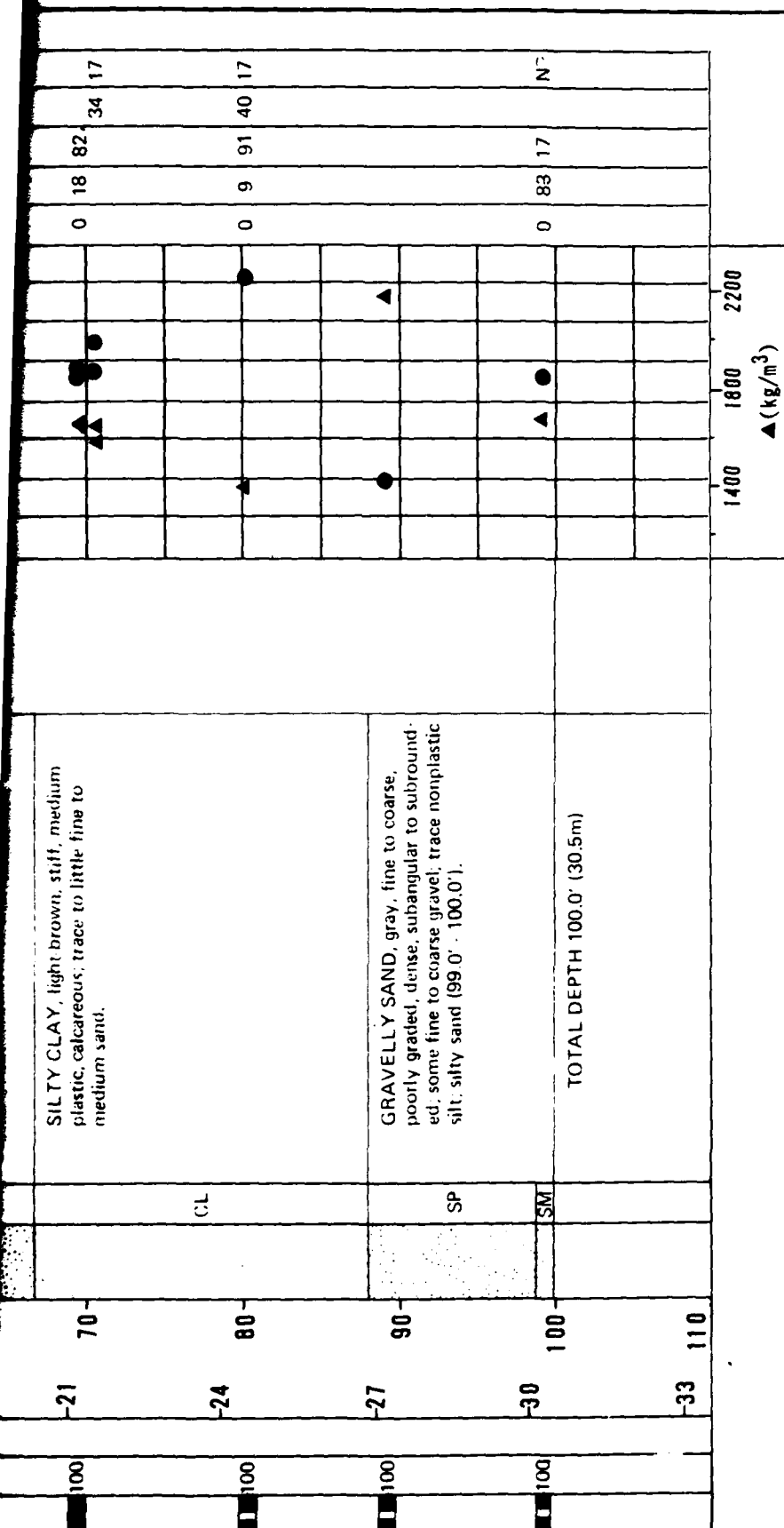
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE BMO

FIGURE
II-2-9

FUGRO NATIONAL, INC.

AFV-6

SAMPLE TYPE	% RECOVERY	N VALUE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	SOIL DESCRIPTION	REMARKS	▲ (pcf)											SIEVE ANALYSIS		
									80	90	100	110	120	130	140	GR	SA	FI	LL	PI		
	100	41	0	0			Interbedded layers of GRAVELLY SAND and SILTY SAND.		●	▲												
	100	43				SM	GRAVELLY SAND (SW-SM, SP-SM): brown to dark-brown, fine to coarse, well-to poorly graded, dense, subangular to subrounded, calcareous, some fine to coarse gravel, trace nonplastic silt; sandy gravel (15.0' - 20.0').		●	▲						11	69	20				
	100	25	3	10		SP-SM			●	▲												
	100	64				GP-GM			●	▲						52	40	8				
	73		6	20		SM	SILTY SAND (SM): light-brown to dark-brown, fine to coarse, poorly graded, loose to dense, subangular to subrounded, calcareous, little to some slightly plastic silt; trace fine gravel, clayey sand (39.0' - 43.0').		●	▲												
	100					SW-SM			●	▲						31	59	10				
	100		9	30		SM			●	▲												
	91					SC			●	▲						4	53	43	30	13		
	100		12	40		ML	SANDY SILT, brown, stiff, slightly plastic, calcareous, some fine subangular to subrounded sand.		●	▲												
	100						SILTY SAND, dark brown to gray, fine to medium, poorly graded, dense, subangular to subrounded, some non-to slightly plastic silt, alternating layers of silty clay and silty sand (50.0' - 60.0'); sand (60.0' - 67.0').		●	▲												
	91		15	50		SM			●	▲												
	100		18	60		SP-SM			●	▲						1	94	5				
	100		21				SILTY CLAY, light brown, stiff, medium plastic, calcareous; trace to little fine to		●	▲						0	18	82	24	17		



EXPLANATION

FUGRO DRIVE SAMPLE

BULK SAMPLE

PITCHER TUBE SAMPLE

STANDARD PENETRATION TEST SAMPLE

CORE SAMPLE

N - STANDARD PENETRATION RESISTANCE

▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)

● - MOISTURE CONTENT (ASTM: D-2216-71)

NR - NO RECOVERY

BORING DETAILS

ELEVATION

SURFICIAL GEOLOGIC UNIT : A5i/A40

DATE DRILLED : 20 November 1980

DRILLING METHOD : Rotary Wash

HOLE DIAMETER : 4 7/8" 124mm

WATER LEVEL : Not Encountered

LOG OF BORING MD-B-10
OPERATIONAL BASE SITE
MILFORD, UTAH

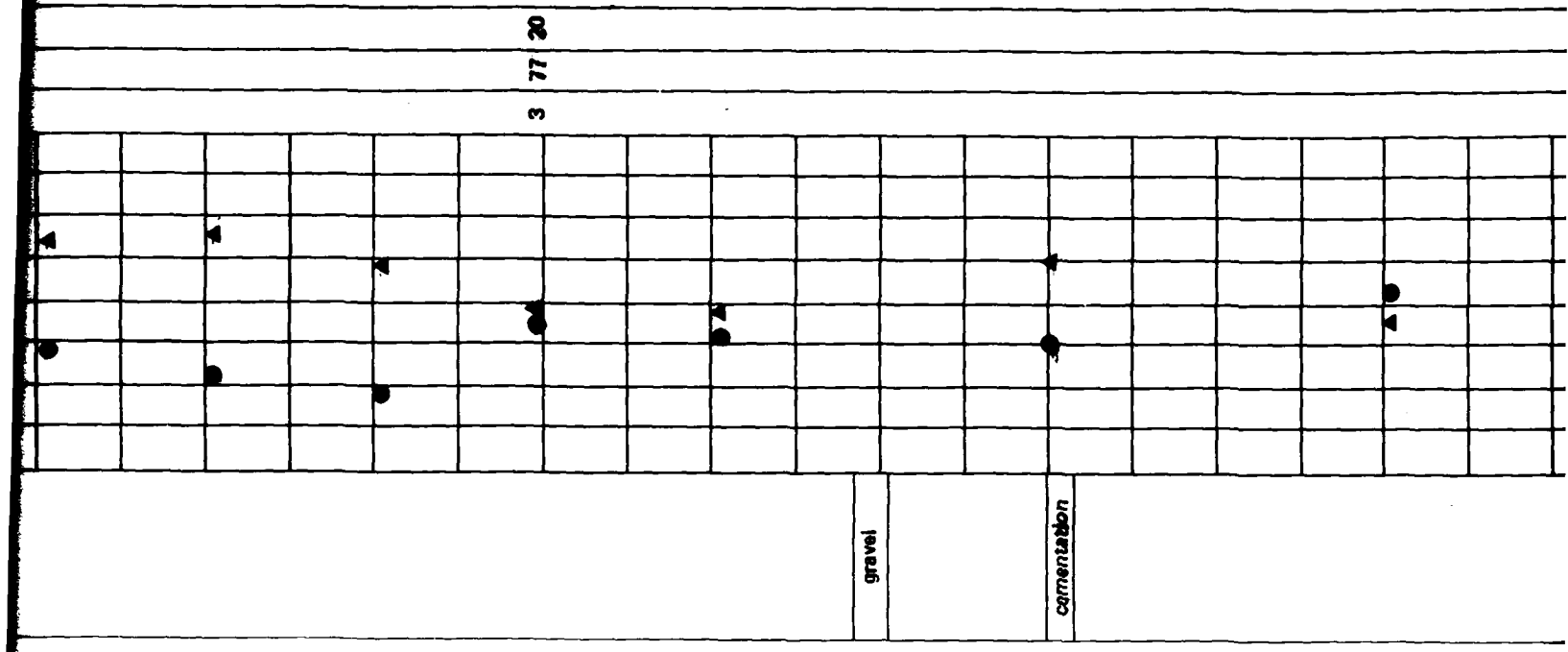
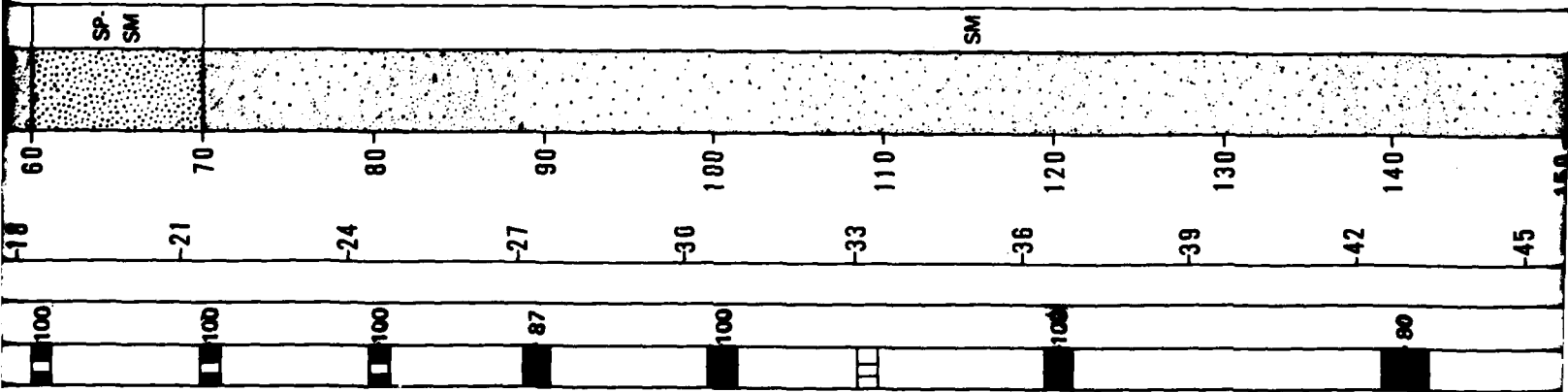
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
II-2-10

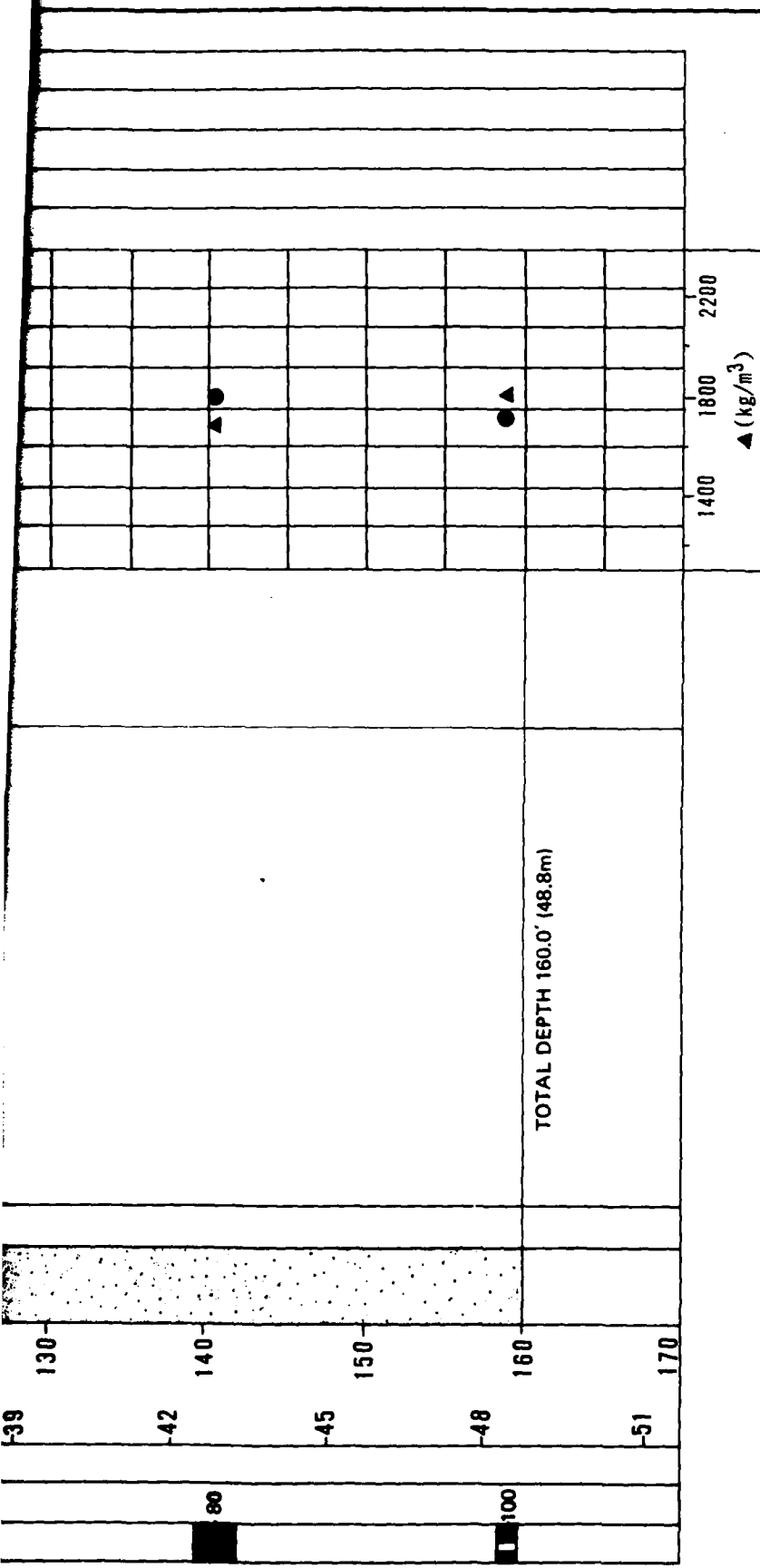
FUGRO NATIONAL, INC.

AFV-

SAMPLE TYPE	% RECOVERY	N VALUE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	SOIL DESCRIPTION	REMARKS
■	90	0	0	0	SM	SP	Interbedded layers of GRAVELLY SAND and SILTY SAND: GRAVELLY SAND (SP, SP-SM): dark-gray to dark-brown, fine to coarse, poorly graded, medium-dense to very dense, subangular to subrounded, calcareous; some fine to coarse gravel; trace nonplastic silt.	
■	100	-3	10	20	SP	SM	SILTY SAND (SM): light-brown to brown, fine to coarse, poorly graded, loose to very dense, subangular to subrounded, calcareous; little to some non-to slightly plastic silt; trace fine gravel.	
■	100	-6	20	30	SM			
■	92	-9	30	40	SM			
■	100	-12	40	50	SP, SM			
■	84	-15	50	60	SM			
■	100	-18	60		SP, SM			
■	100							



2



EXPLANATION

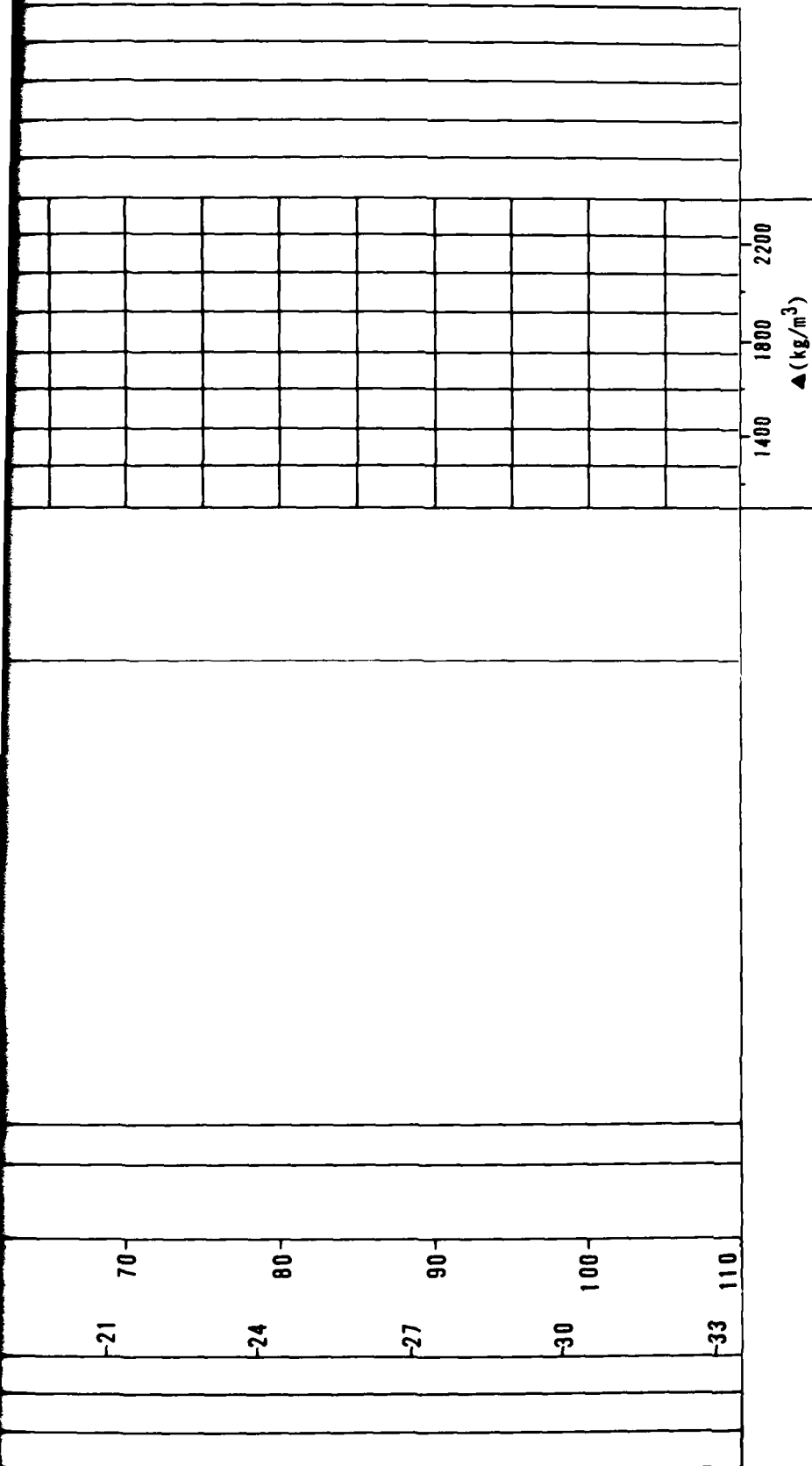
- FUGRO DRIVE SAMPLE
- BULK SAMPLE
- PITCHER TUBE SAMPLE
- STANDARD PENETRATION TEST SAMPLE
- ▨ CORE SAMPLE
- N - STANDARD PENETRATION RESISTANCE
- ▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)
- - MOISTURE CONTENT (ASTM: D-2216-71)
- NR - NO RECOVERY

BORING DETAILS

ELEVATION : 5100' (1532m)
 SURFICIAL GEOLOGIC UNIT : A5i /A5y
 DATE DRILLED : 21 November 1980
 DRILLING METHOD : Rotary Wash
 HOLE DIAMETER : 4-7/8" (124mm)
 WATER LEVEL : 105' (32m)

LOG OF BORING MD-B-11 OPERATIONAL BASE SITE MILFORD, UTAH	
MX SITING INVESTIGATION DEPARTMENT OF THE AIR FORCE - DMO	FIGURE II-2-11
FUGRO NATIONAL, INC.	

SAMPLE TYPE	% RECOVERY	N VALUE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	SOIL DESCRIPTION	REMARKS	▲(pcf)													SIEVE ANALYSIS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
									80	90	100	110	120	130	140	GR	SA	FI	LL	PI																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
	33		0	0			Interbedded layers of GRAVELLY SAND and SILTY SAND: GRAVELLY SAND (SW SM, SP-SM, SP): light-brown to brown, fine to coarse, well-to poorly graded, dense, subangular to subrounded, calcareous; trace to some fine to coarse gravel; trace non-to slightly plastic silt; sand (10.0' - 15.0'). SILTY SAND (SM): light to dark-brown, fine to coarse, poorly graded, loose to dense, subangular to subrounded, calcareous, little to some non-to slightly plastic silt.		●	▲																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															</



EXPLANATION

■ FUGRO DRIVE SAMPLE

□ BULK SAMPLE

■ PITCHER TUBE SAMPLE

□ STANDARD PENETRATION TEST SAMPLE

▨ CORE SAMPLE

N - STANDARD PENETRATION RESISTANCE

▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)

● - MOISTURE CONTENT (ASTM: D-2216-71)

NR - NO RECOVERY

BORING DETAILS

ELEVATION : 5300' (1593m)
 SURFICIAL GEOLOGIC UNIT : A5i
 DATE DRILLED : 22 November 1980
 DRILLING METHOD : Rotary Wash
 HOLE DIAMETER : 4 7/8" (124mm)
 WATER LEVEL : Not Encountered

LOG OF BORING MD-B-12
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

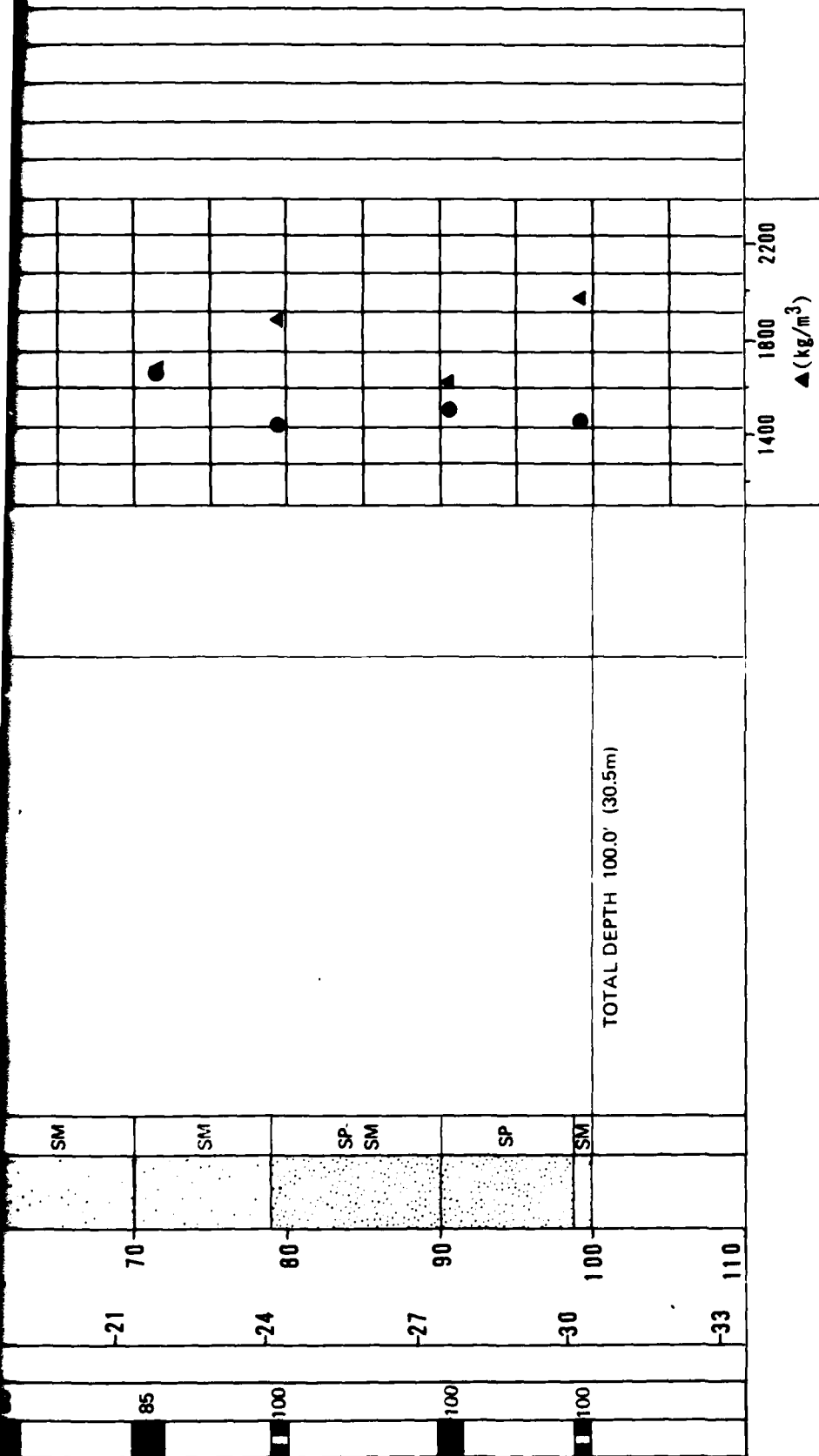
FIGURE

II-2-6

FUGRO NATIONAL, INC.

2

SAMPLE TYPE	% RECOVERY	N VALUE	DEPTH		LITHOLOGY	USCS	SOIL DESCRIPTION	REMARKS	▲(pcf)													SIEVE ANALYSIS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
			METERS	FEET					80	90	100	110	120	130	140	GR	SA	FI	LL	PI																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
	96		0	0		SM	Alternating layers of GRAVELLY SAND and SILTY SAND: GRAVELLY SAND (SP, SW-SM, SP-SM, SM): light-brown to dark-brown, fine to coarse, well-sorted to poorly graded, dense, subangular to subrounded calcareous; little to some fine to coarse gravel; trace to little non-to slightly plastic silt. SILTY SAND (SM) (0.0'-3.0', 10.0'-15.0', 38.0'-43.0', 49.0'-60.0', 70.0'-79.0', 99.0'-100.0'): light-brown to dark-brown, fine to coarse, poorly graded, loose to dense, subangular to subrounded, calcareous; little to some non-to slightly plastic silt; none to trace gravel.	cimentation	●	▲																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																



EXPLANATION

- FUGRO DRIVE SAMPLE
- BULK SAMPLE
- PITCHER TUBE SAMPLE
- STANDARD PENETRATION TEST SAMPLE
- ▨ CORE SAMPLE
- N - STANDARD PENETRATION RESISTANCE
- ▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)
- - MOISTURE CONTENT (ASTM: D-2216-71)
- NR - NO RECOVERY

BORING DETAILS

ELEVATION : 5250' (1575m)
 SURFICIAL GEOLOGIC UNIT : A1
 DATE DRILLED : 22 November 1980
 DRILLING METHOD : Rotary Wash
 HOLE DIAMETER : 4 7/8" (124mm)
 WATER LEVEL : Not Encountered

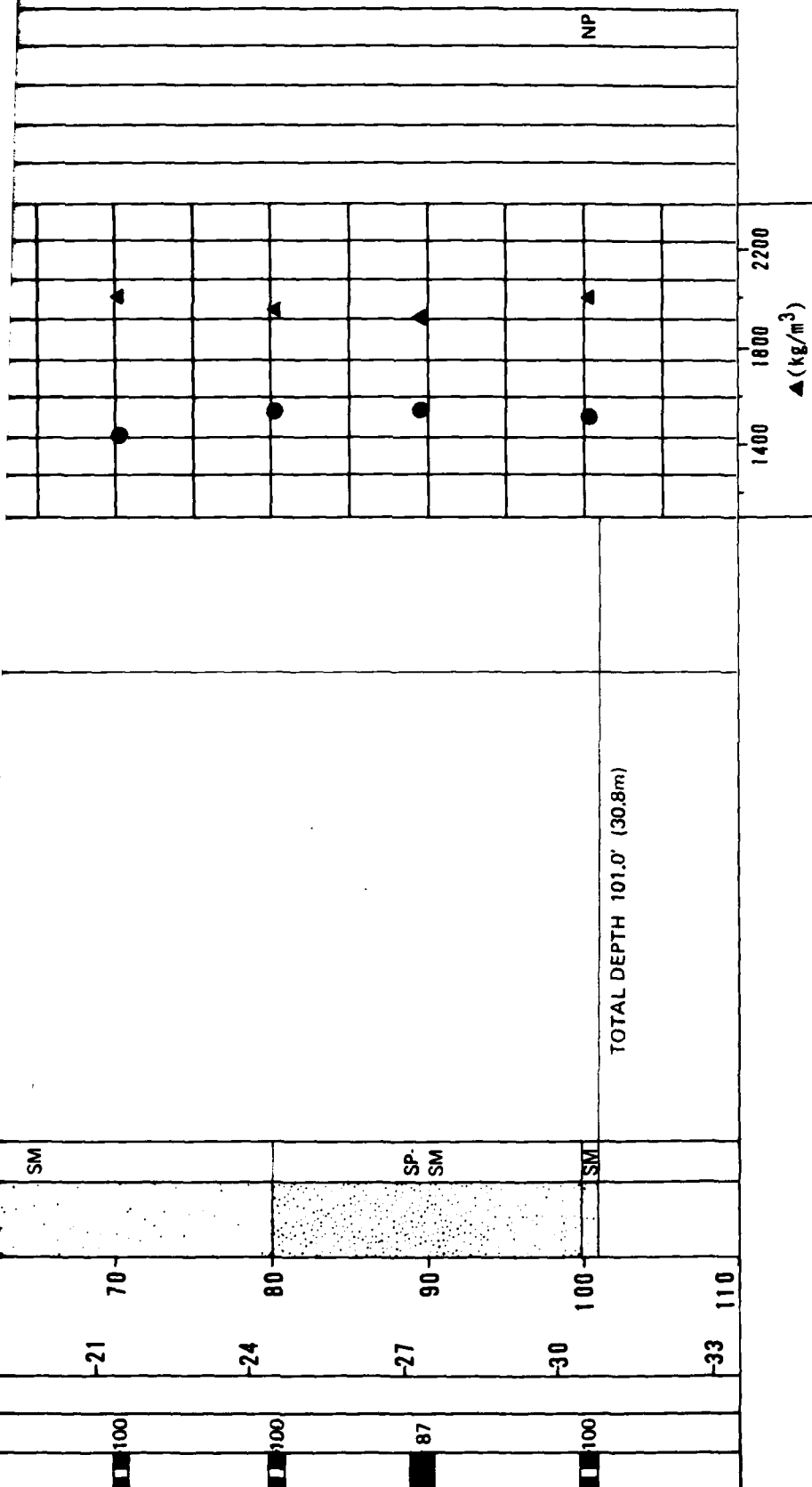
LOG OF BORING MD-B-13
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FIG
II-2

FUGRO NATIONAL, INC.

SAMPLE TYPE	% RECOVERY	N VALUE	DEPTH METERS	DEPTH FEET	LITHOLOGY	USCS	SOIL DESCRIPTION	REMARKS	▲ (pcf)										SIEVE ANALYSIS			
									80	90	100	110	120	130	140	GR	SA	FI	LL	PI		
	100		0	0		SM	Interbedded layers of GRAVEL, SAND, and FINES:	↑	●		▲											
	100					SP-SM	GRAVEL:	↓	●		▲											
	100		3	10		CL	SANDY GRAVEL (GM): red-brown, fine to coarse, poorly graded, dense, subangular to subrounded, calcareous; some fine to coarse sand; little nonplastic silt.		●								3	35	62	31	9	
	80						SAND:	cobble	●				▲									NP
	80		6	20		SM	SAND (SP-SM): red-brown, fine to coarse, poorly graded, medium dense to dense, subangular to subrounded; trace non-to slightly plastic silt.		●				▲									
	100		9	30		GM	SILTY SAND (SM): red-brown, fine to coarse, poorly graded, loose to very dense, subangular to subrounded calcareous; trace to some non-to slightly plastic silt; trace to some fine to coarse gravel; gravelly sand (50.0' - 80.0').		●								45	42	13			
	100						FINES:		●				▲									
	100		12	40		SM	SANDY SILTY (ML): red-brown, stiff non-plastic; some fine to coarse subangular to subrounded sand; trace fine gravel.	↑	●													
	100					ML	SANDY CLAY (CL): orange-brown, stiff slightly plastic, calcareous; some fine to coarse subangular to subrounded sand.	↓	●								8	40	52			NP
	100		15	50					●								37	47	16			
	50		18	60		SM			●													
	100																					



EXPLANATION

■ FUGRO DRIVE SAMPLE

□ BULK SAMPLE

■ PITCHER TUBE SAMPLE

□ STANDARD PENETRATION TEST SAMPLE

▨ CORE SAMPLE

N - STANDARD PENETRATION RESISTANCE

▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)

● - MOISTURE CONTENT (ASTM: D-2216-71)

NR - NO RECOVERY

BORING DETAILS

ELEVATION : 5160' (1573m)
 SURFICIAL GEOLOGIC UNIT : A5y
 DATE DRILLED : 24 November 1980
 DRILLING METHOD : Rotary Wash
 HOLE DIAMETER : 4 7/8" (124mm)
 WATER LEVEL : 90' (27m)

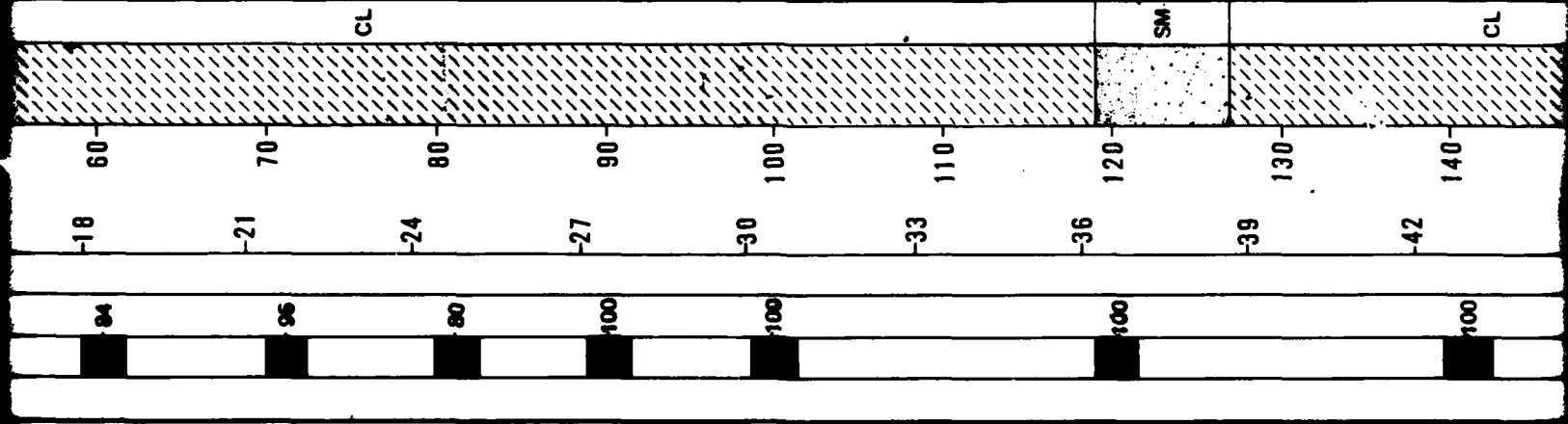
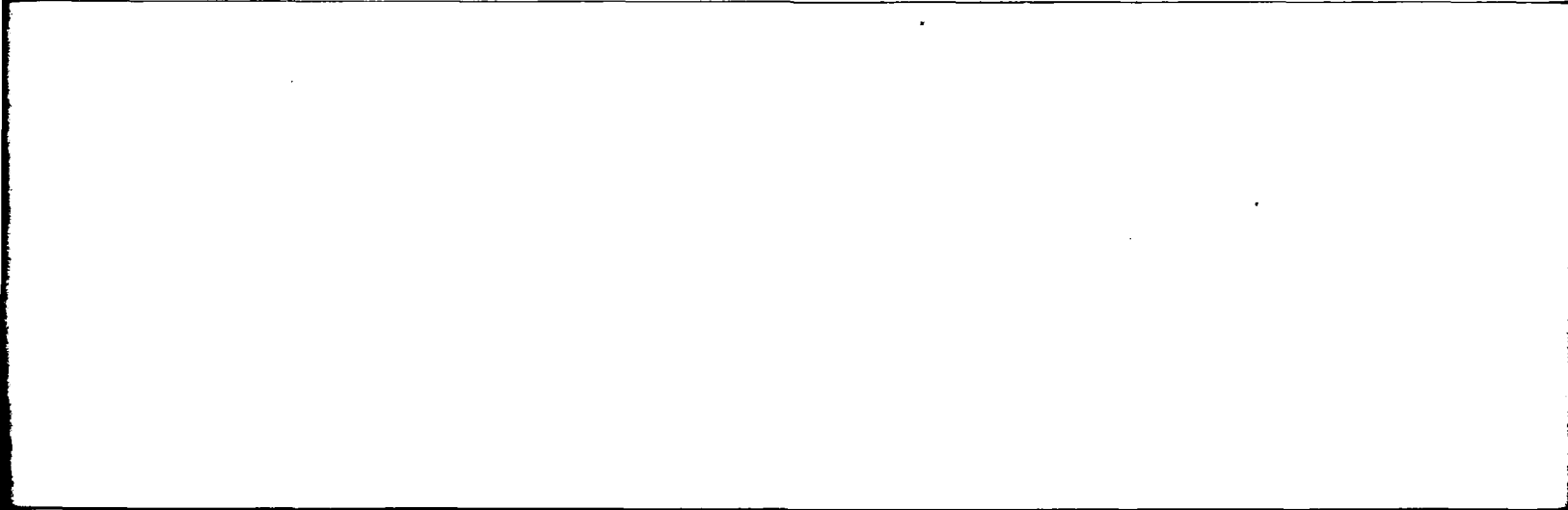
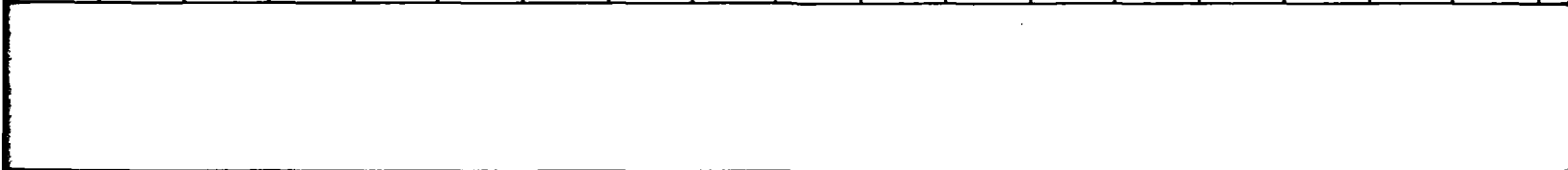
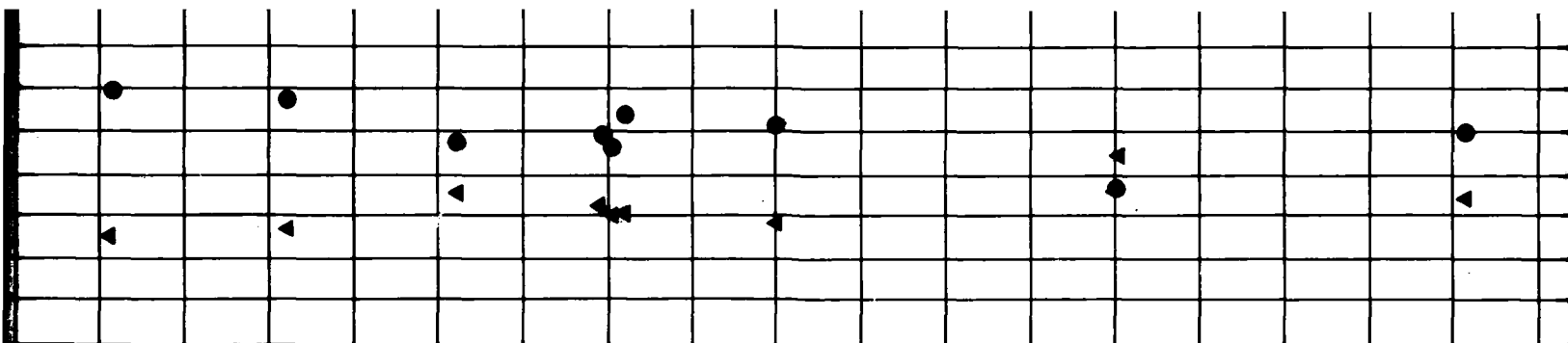
LOG OF BORING MD-B-14
 OPERATIONAL BASE SITE
 MILFORD, UTAH

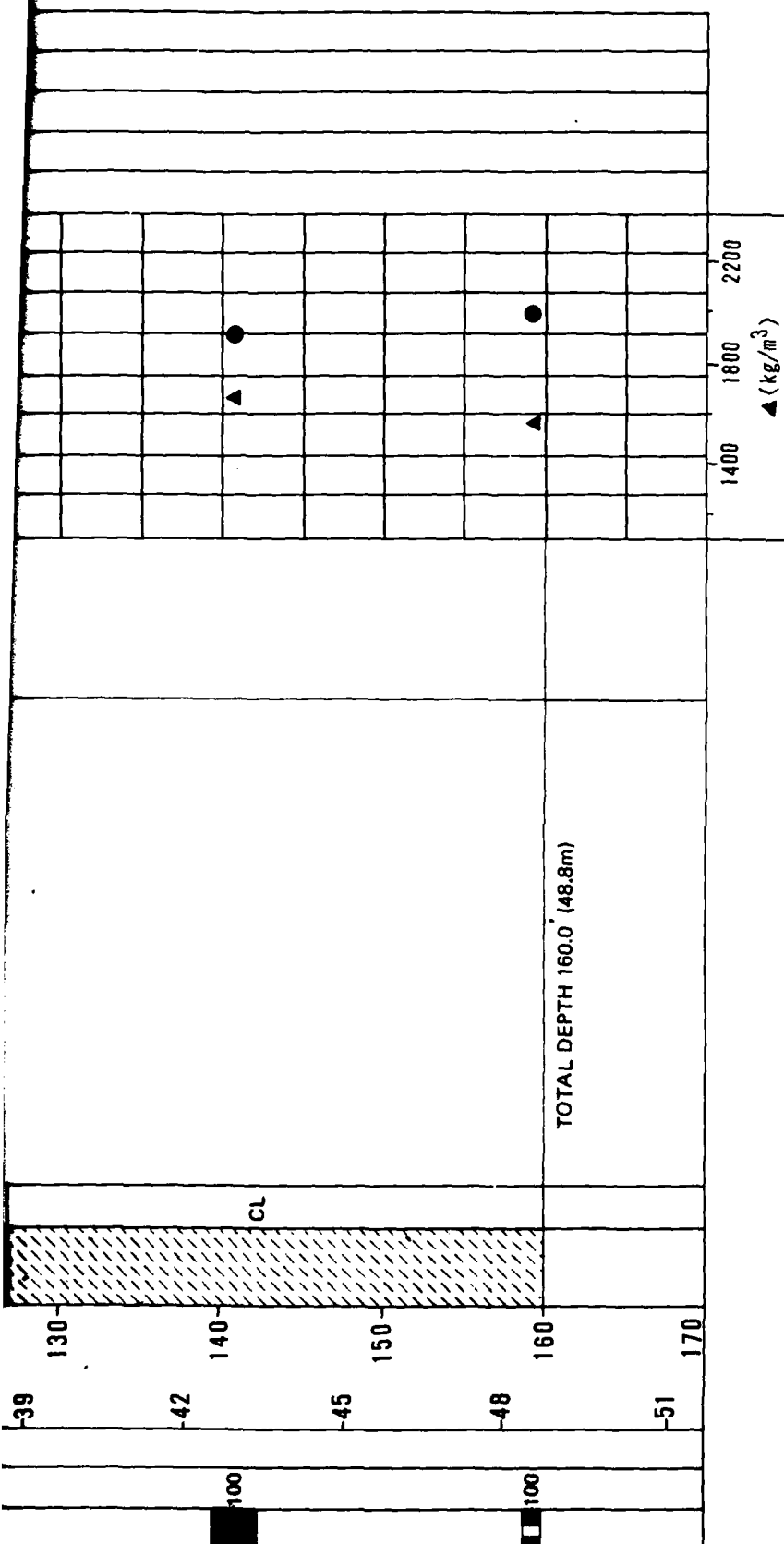
MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
 II-2-

FUGRO NATIONAL, INC.

[illegible]





LOG OF BORING MD-B-15
OPERATIONAL BASE SITE
MILFORD, UTAH

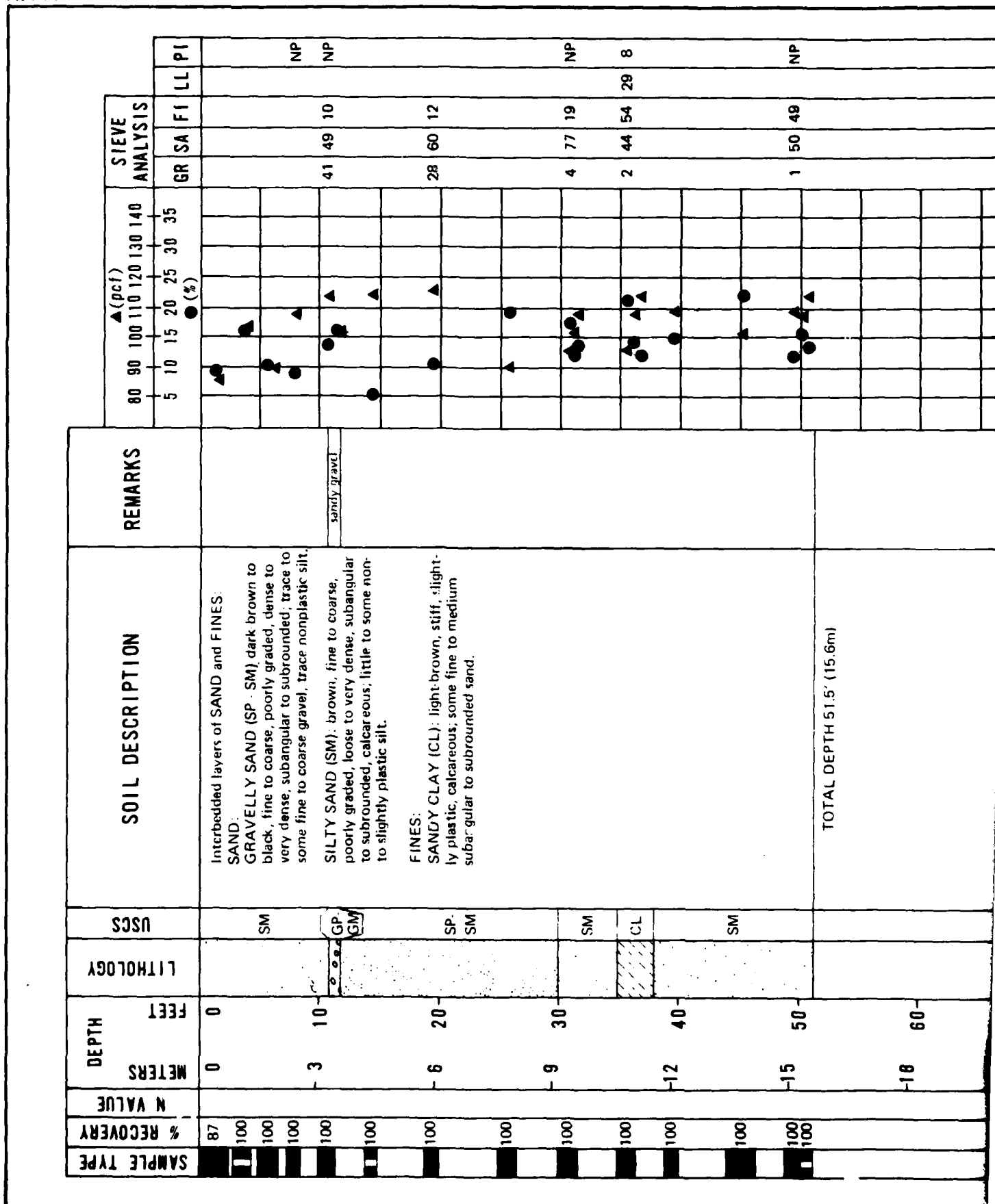
MX SITING INVESTIGATION

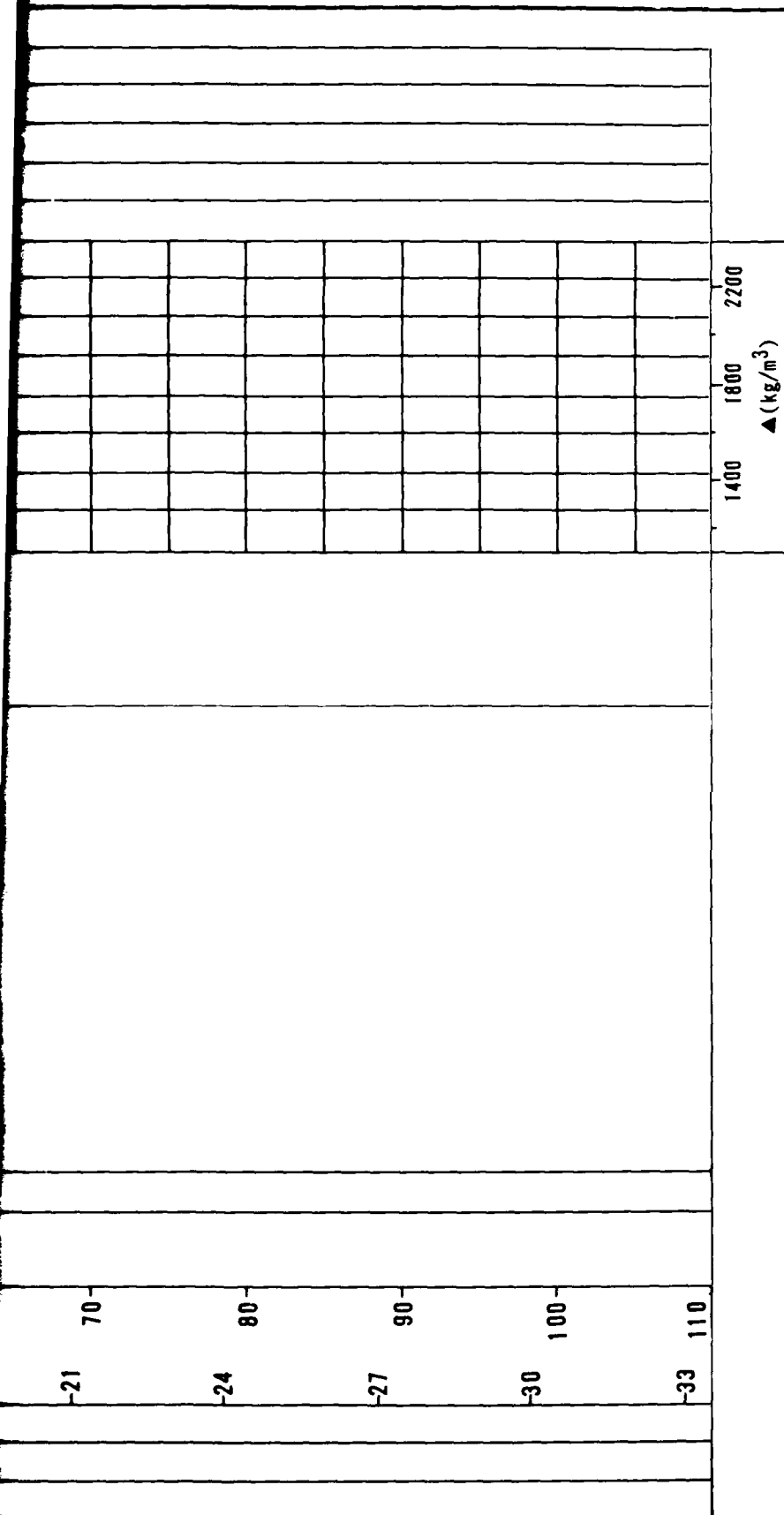
DEPARTMENT OF THE AIR FORCE - BMO

FIGURE

II-2-15

FUGRO NATIONAL, INC.





EXPLANATION

■ FUGRO DRIVE SAMPLE

□ BULK SAMPLE

■ PITCHER TUBE SAMPLE

□ STANDARD PENETRATION TEST SAMPLE

▨ CORE SAMPLE

N - STANDARD PENETRATION RESISTANCE

▲ - DRY UNIT WEIGHT (ASTM: D-2937-71)

● - MOISTURE CONTENT (ASTM: D-2216-71)

NR - NO RECOVERY

BORING DETAILS

ELEVATION : 5200' (1585m)
 SURFICIAL GEOLOGIC UNIT : A5i
 DATE DRILLED : 4 November 1980
 DRILLING METHOD : Rotary Wash
 HOLE DIAMETER : 4 7/8" (124 mm)
 WATER LEVEL : Not Encountered

LOG OF BORING BL-B-7
 OPERATIONAL BASE SITE
 MILFORD, UTAH

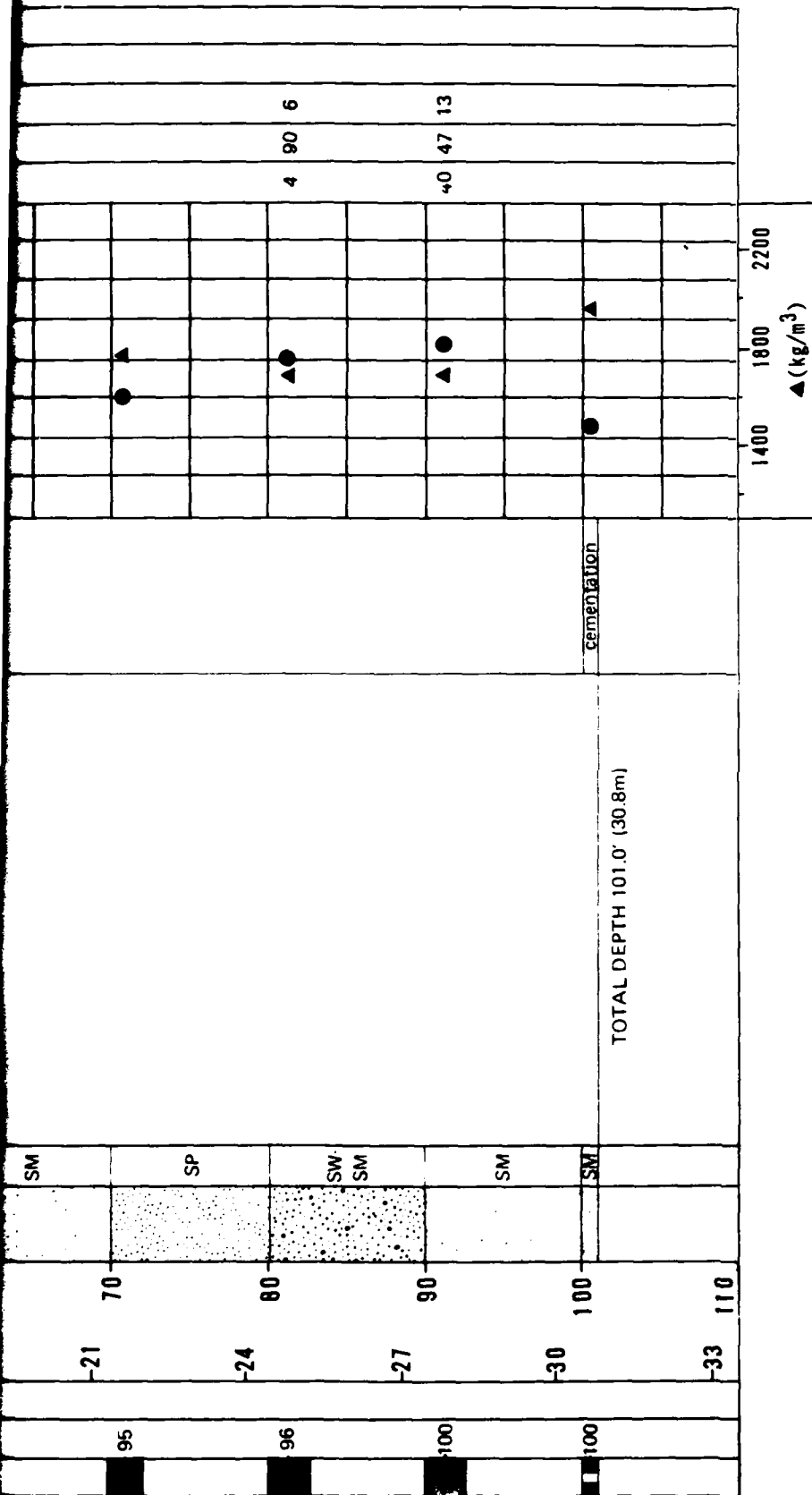
MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
 II-2-16

FUGRO NATIONAL, INC.

AFV-

SAMPLE TYPE	% RECOVERY	N VALUE	METERS	DEPTH FEET	LITHOLOGY	USCS	SOIL DESCRIPTION	REMARKS
	75	0	0	0			Interbedded layers of GRAVELLY SAND and SILTY SAND:	
	100	-3	10	10		SM	GRAVELLY SAND (SP, SP-SM, SW-SM, SM) : light brown, fine to coarse, well-to poorly graded, dense to very dense, subangular to subrounded, trace to some fine to coarse gravel, trace to little non to slightly plastic silt.	
	80	-6	20	20		SP	SILTY SAND (SM) (0.0' - 10.0'; 40.0' - 45.0' and 100.0' - 101.0') : brown to dark brown, fine to coarse, poorly graded, loose to dense, subangular to subrounded, calcareous, little to some nonplastic silt; none to little fine to coarse gravel.	
	100	-9	30	30		SP		
	100	-12	40	40		SM		
	95	-15	50	50		SP		
	100	-18	60	60		SM		
	100	-21	70	70		SM		

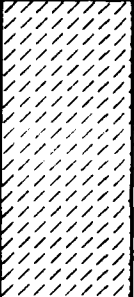
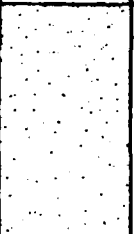
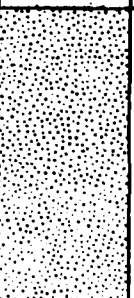


SECTION 3.0
EXPLANATION OF
TRENCH LOGS

3.0 EXPLANATION OF TRENCH LOGS

See Section 2.0, "Boring Logs", for explanations.

FN-TR-44

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS																
							GR	SA	FI	LL	PI												
	0		CL	firm	SILTY CLAY, brown, moist, medium plastic, calcareous; stage III caliche (2.5'-5.0').	vertical walls stable	1	85	14														
	2																						
	4			stiff																			
	6																						
	8		SM	medium dense	SILTY SAND, light-brown, fine to medium, poorly graded, slightly moist, subangular to subrounded, calcareous; little nonplastic silt; stage II caliche (5.0'-9.0').																		
	10																						
	12																						
	14																						
	16		SP	medium dense	SAND, light gray-brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous.																		
	18																						
	20																						
	22																						
	24					TOTAL DEPTH 14.0' (4.3m)																	
	26																						
	28																						
	30																						

TRENCH DETAILS

SURFACE ELEVATION : 5080' (1548m)
 DATE EXCAVATED : 4 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT: A1/A4o
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : N-S

**LOG OF TRENCH MD-T-1
 OPERATIONAL BASE SITE
 MILFORD, UTAH**

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 000

FIGURE
 II-3-1

FUGRO NATIONAL INC.

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0				CLAYEY SAND, brown, fine to medium, poorly graded, moist, subangular to sub-rounded, calcareous; some slightly plastic clay; stage II caliche (3.5'-5.0').	vertical walls stable	1	89	30		
	2										
	4		SC	medium dense							
	6										
	8										
	10		CH	firm	CLAY, brown, moist, medium plastic, calcareous.					55	30
	12		ML	firm	SANDY SILT, brown, moist, nonplastic, calcareous, some fine subangular to sub-rounded sand.		0	45	55	NP	
	14				TOTAL DEPTH 14.0' (4.3m)						
	16										
	18										
	20										

TRENCH DETAILS

SURFACE ELEVATION : 5085' (1550m)
 DATE EXCAVATED : 4 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT: A1/A4o
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH MD-T-2
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DOD

FIGURE
 II-3-2

FUGRO NATIONAL INC.

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0				CLAYEY SILT, dark-brown, slightly moist, medium plastic, calcareous; stage I caliche (1.0'-3.0').	vertical walls stable	0	1	99	49	18
	2										
	4		ML	firm							
	6										
	8										
	10		SM	dense	SILTY SAND, light-brown, fine, poorly graded, slightly moist, subangular to sub-rounded; calcareous; some slightly plastic silt; stage II caliche (7.0'-10.5').		0	68	32		
	12										
	14		CL	firm	CLAY, dark gray-brown, slightly moist, medium plastic, calcareous; trace fine sand; stage I caliche (10.5'-12.5').						
	16										
	18		SM	dense	SILTY SAND, light-brown, fine to medium, poorly graded, slightly moist, subangular to subrounded, calcareous; some nonplastic silt; stage II caliche (12.5'-14.0').						
	20				TOTAL DEPTH 14.0' (4.3m)						

TRENCH DETAILS

SURFACE ELEVATION : 5075' (1547m)
 DATE EXCAVATED : 4 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT: A1/A4o
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH MD-T-3
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 0000

FIGURE
 II-3-3

FUGRO NATIONAL INC.

20 FEB 81

02AF-37

FN-TR-44

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0				SILTY SAND, light-brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some nonplastic silt; stage II caliche (1.5'-5.0').	vertical walls stable					
	2										
	1		SM	dense							
	4										
	6										
	2				SAND, dark-brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; trace gravel; interbedded lenses of silty sand throughout.	vertical walls stable					
	8										
	3		SP	medium dense							
	10										
	12										
	4		SM	medium dense	SILTY SAND, brown, fine to medium, poorly graded, dry, subangular to subrounded, calcareous; some nonplastic silt.	vertical walls stable					
	14										
	5										
	16										
	18										
	6										
	20				TOTAL DEPTH 14.0' (4.3m)						

TRENCH DETAILS

SURFACE ELEVATION : 5280' (1609m)
 DATE EXCAVATED : 5 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT: A51
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH MD-T-4
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMR

FIGURE
 II-3-4

FUGRO NATIONAL, INC.

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0				SILTY SAND, light-brown, fine to coarse, poorly graded, dry, subangular to sub-rounded, calcareous; some nonplastic silt; trace fine gravel; stage II caliche (2.0'-5.0'); occasional boulders to 16" size.	vertical walls stable	10	68	22		
	2										
	4										
	6										
	8				SAND, light-brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; trace nonplastic silt; trace gravel.						
	10										
	12				TOTAL DEPTH 9.0' (2.7m)	boulders at 9.0' exceeded capacity of case 580C backhoe					
	14										
	16										
	18										
	20										

TRENCH DETAILS

SURFACE ELEVATION : 5350' (1631m)
 DATE EXCAVATED : 5 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT: A51
 TRENCH LENGTH : 12.0' (3.7m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH MD-T-5
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 900

FIGURE
 II-3-5

FUGRO NATIONAL, INC.

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0				SILTY SAND, light-brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some slightly plastic silt; little fine to coarse gravel; stage I caliche (0.0'-14.0').	vertical walls stable	17	64	28		NP
	2		SM	medium dense							
	4				SANDY GRAVEL, light-brown, fine to coarse, well-graded, dry, subangular to subrounded, calcareous; some fine to coarse sand; trace silt.		56	37	7		
	6		GW-GM	dense medium							
	8				CLAYEY SAND, light-brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; little medium plastic clay.	vertical walls stable				36	17
	10		SC	medium dense							
	12				SILTY SAND, light-brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; little slightly plastic silt; little fine to coarse gravel.						
	14		SM	medium dense							
	14				TOTAL DEPTH 14.0' (4.3m)						
	16										
	18										
	20										

TRENCH DETAILS

SURFACE ELEVATION : 5080' (1548m)
 DATE EXCAVATED : 10 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT : A5y
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH MD-T-8
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 000

FIGURE
 II-3-6

FUGRO NATIONAL, INC.

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0				CLAYEY SILT, brown, slightly moist, medium plastic, calcareous; trace fine subangular to subrounded sand; stage I caliche (0.0'-4.0').	vertical walls stable					
	2		ML	firm			7	6	94		
	4				GRAVELLY SAND, light brown, fine to coarse, poorly graded, dry, subangular to subrounded; calcareous; some fine to coarse gravel; little slightly plastic clay; stage II caliche (4.0'-14.0').						
	8										
	10		SC	dense							
	12										
	14				TOTAL DEPTH 14.0' (4.3m)						
	16										
	18										
	20										

TRENCH DETAILS

SURFACE ELEVATION : 5085' (1550m)
 DATE EXCAVATED : 11 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT: A40/A5y
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : N-S

**LOG OF TRENCH MD-T-7
 OPERATIONAL BASE SITE
 MILFORD, UTAH**

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 880

FIGURE
 II-3-7

UGRO NATIONAL, INC.

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		SM	dense	GRAVELLY SAND, light brown, fine to coarse, poorly graded, slightly moist, sub-angular to subrounded, calcareous; some fine to coarse gravel; little slightly plastic silt-clay; stage II caliche (1.0' - 4.0'); stage III caliche (4.0' - 4.5'); trace cobbles to 8" size.	vertical walls stable	34	47	19		
	2					TOTAL DEPTH 4.5' (1.4m)	cementation at 4.5' exceeded capacity of Case 580C backhoe					
	4											
	6											
	8											
	10											
	12											
	14											
	16											
	18											
	20											

TRENCH DETAILS

SURFACE ELEVATION : 5500' (1676m)
 DATE EXCAVATED : 11 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT: A54
 TRENCH LENGTH : 12.0' (3.7m)
 TRENCH ORIENTATION : N-S

LOG OF TRENCH MD-T-8
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
 II-3-8

FUGRO NATIONAL, INC.

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0				SANDY SILT, light brown, slightly moist, medium plastic, calcareous; trace fine sub-angular to subrounded sand; stage I caliche (2.0'-4.0').	vertical walls stable	0	12	88	70	21
	2			MH	firm							
	4					CLAY, light olive to black, moist to dry, highly plastic, calcareous; stage I caliche (6.0'-10.0').		0	2	98	79	44
	8			CH	firm							
	10					SILTY SAND, light brown, fine, poorly graded, dry, subangular to subrounded, calcareous; little nonplastic silt.						
	12			SM	medium dense							
	14					TOTAL DEPTH 14.0' (4.3m)						
	16											
	18											
	20											

TRENCH DETAILS

SURFACE ELEVATION : 4990' (1521m)
 DATE EXCAVATED : 12 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT : A4a/A1
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH MD-T-9
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 080

FIGURE
 II-3-9

FUGRO NATIONAL INC.

20 FEB 81

USAF-37

TRENCH DETAILS

FUGRO NATIONAL, INC.

FN-TR-44

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0		SM	medium dense	SILTY SAND, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some slightly plastic silt; some fine to coarse gravel; stage I caliche (1.0'-3.0').	vertical walls stable	29	39	32		
	2										
	4		SC	dense	CLAYEY SAND, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some slightly plastic clay; little fine gravel; stage II caliche (3.0'-5.0').		14	41	45		
	8		GP	very dense	SANDY GRAVEL, yellow brown, fine to coarse, poorly graded, dry, subangular, calcareous; little fine to coarse subangular to subrounded sand; stage III caliche (5.0'-14.0').	vertical walls stable					
	10										
	12										
	14				TOTAL DEPTH 14.0' (4.3m)						
	16										
	18										
	20										

TRENCH DETAILS

SURFACE ELEVATION : 5400' (1646m)
 DATE EXCAVATED : 13 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT: A5i
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH MD-T-11
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
 II-3-11

FUGRO NATIONAL, INC.

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		GC	medium dense	SANDY GRAVEL, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; little to some fine to coarse sand; little slightly plastic clay; silty sand (4.0'-5.0'); stage I caliche (1.0'-4.0'); stage II caliche (5.0'-14.0'); trace cobbles to 10" size	vertical walls stable	60	26	15		
	2											
	4							12	51	27	22	1
	6											
	8			GC	dense			63	18	19		
	10											
	12											
	14											
	16					TOTAL DEPTH 14.0' (4.3m)						
	18											
	20											

TRENCH DETAILS

SURFACE ELEVATION : 5160' (1573m)
 DATE EXCAVATED : 14 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT : A5v
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : N-S

LOG OF TRENCH MD-T-12
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
 II-3-12

FUGRO NATIONAL, INC.

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0		GW-GM	dense	SANDY GRAVEL, light brown, fine to coarse, well to poorly graded, moist to dry, subangular to subrounded, calcareous; little to some fine to coarse sand; trace slightly plastic silt; stage II caliche (1.0'-10.5'); little cobbles to 12" size.	vertical wells stable	74	18	8		
	2										
	4										
	6										
	8		GP	very dense							
	10										
	12										
	14										
	16				TOTAL DEPTH 10.5' (3.2m)	cementation at 10.5' exceeded capacity of Case 580C backhoe					
	18										
	20										

TRENCH DETAILS

SURFACE ELEVATION : 5280' (1609m)
 DATE EXCAVATED : 14 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT: A51/A5y
 TRENCH LENGTH : 13.0' (4.0m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH MD-T-13
 OPERATIONAL BASE SITE
 MILFORD, UTAH

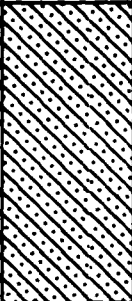
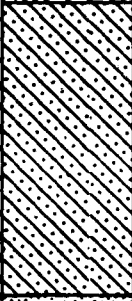
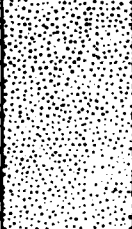
MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 900

FIGURE
 II-3-13

FUGRO NATIONAL, INC.

20 FEB 81

USAF-37

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS										
							GR	SA	FI	LL	PI						
	0		SC	medium dense	CLAYEY SAND, light brown to brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some slightly plastic clay; stage II caliche (1.0'-14.0').	vertical walls stable											
	2																
	4			dense													
	6																
	8		SC	dense	GRAVELLY SAND, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; little to some fine to coarse gravel; little medium plastic clay to trace nonplastic silt.												
	10																
	12																
	14																
	16		SP-SM	medium dense	TOTAL DEPTH 14.0' (4.3m)												
	18																
	20																
	22																

TRENCH DETAILS

SURFACE ELEVATION : 5110' (1558m)
DATE EXCAVATED : 15 NOVEMBER 1980
SURFICIAL GEOLOGIC UNIT: A5i
TRENCH LENGTH : 14.0' (4.3m)
TRENCH ORIENTATION : N-S

**LOG OF TRENCH MD-T-14
OPERATIONAL BASE SITE
MILFORD, UTAH**

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - 0000

FIGURE
II-3-14

FUGRO NATIONAL, INC.

FN-TR-44

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0										
	0										
	2		SM	medium dense	SILTY SAND, brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; some slightly plastic silt; stage I caliche (1.0'-2.0').		2	64	34		
	1			dense	GRAVELLY SAND, brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some fine to coarse gravel; trace slightly plastic silt; stage II caliche (2.0'-14.0').						
	4			medium dense							
	6			medium dense							
	8		SM	dense							
	10			medium dense							
	12			medium dense							
	14				TOTAL DEPTH 14.0' (4.3m)						
	16										
	18										
	20										

TRENCH DETAILS

SURFACE ELEVATION : 5160' (1573m)
 DATE EXCAVATED : 15 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT : A3
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : N-S

**LOG OF TRENCH MD-T-15
 OPERATIONAL BASE SITE
 MILFORD, UTAH**

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DDD

FIGURE
 II-3-15

FUGRO NATIONAL INC.

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0				Interbedded layers of SANDY GRAVEL and GRAVELLY SAND: SANDY GRAVEL (GP-GM): light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some fine to coarse sand; trace nonplastic silt. GRAVELLY SAND (SM, SP): light brown, fine to coarse, poorly graded, dry to slightly moist, subangular to subrounded, calcareous; some fine to coarse gravel; trace to little nonplastic silt; stage II caliche (1.0'-14.0').	vertical walls stable	27	67	16		
	2			SM	dense							
	4			GP-GM	dense			55	38	7		
	6			SP	medium dense							
	8					SILTY SAND, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some nonplastic silt; trace fine gravel.	vertical walls stable	10	58	32		
	10			SM	dense							
	12											
	14					TOTAL DEPTH 14.0' (4.3m)						
	16											
	18											
	20											

TRENCH DETAILS

SURFACE ELEVATION : 5340' (1628m)
 DATE EXCAVATED : 16 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT : ASH
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH MD-T-16
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 000

FIGURE
 II-3-16

USRO NATIONAL INC.

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0				CLAYEY SAND, light brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; some medium plastic clay; trace fine gravel; stage II caliche (1.0'-14.0').	vertical walls stable	5	85	30	39	18
	2		SC	dense							
	4										
	6										
	8		SM	dense	GRAVELLY SAND, light brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; little to some fine to coarse gravel; trace nonplastic silt to little slightly plastic silt.	vertical walls stable	37	46	17		
	10										
	12										
	14		SP	medium dense							
	16				TOTAL DEPTH 14.0' (4.3m)						
	18										
	20										

TRENCH DETAILS

SURFACE ELEVATION : 5340' (1628m)
 DATE EXCAVATED : 17 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT: A5i
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH MD-T-17
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 000

FIGURE
 II-3-17

FUGRO NATIONAL INC.

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0		SM	medium dense	SILTY SAND, light brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; some slightly plastic silt; trace fine gravel; stage II caliche (1.0'-6.0').	vertical walls stable	6	67	27		
	2		SC	dense							
	4		SP	medium dense							
	6				GRAVELLY SAND, light brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; little to some fine to coarse gravel; little slightly plastic clay to trace nonplastic silt; stage I caliche (6.0'-14.0').					36	13
	8										
	10		SP-SM	medium dense							
	12										
	14				TOTAL DEPTH 14.0' (4.3m)						
	16										
	18										
	20										

TRENCH DETAILS

SURFACE ELEVATION : 5170' (1576m)
 DATE EXCAVATED : 18 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT: ASH
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH MD-T-18
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 800

FIGURE
 II-3-18

FURRO NATIONAL, INC.

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0				SILTY SAND, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some slightly plastic silt; little fine gravel; stage II caliche (1.0'-9.0'); stage III caliche (9.0').	vertical walls stable	10	44	46	37	6
	2											
	4											
	6											
	8											
	10											
	12											
	14											
	16											
	18											
	20											
	3	10				TOTAL DEPTH 9.0' (2.7m)	cementation at 9.0' exceeded capacity of Case 580C backhoe					
	12											
	14											
	16											
	18											
	20											

TRENCH DETAILS

SURFACE ELEVATION : 5350' (1631m)
 DATE EXCAVATED : 18 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT: A54
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : N-S

LOG OF TRENCH MD-T-19
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DOD

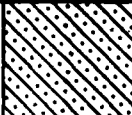
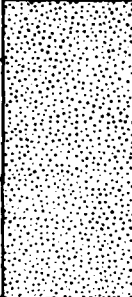
FIGURE
 II-3-19

FURRO NATIONAL, INC.

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		SC	dense	CLAYEY SAND, light brown, fine to coarse, poorly graded, moist, subangular to sub-rounded, calcareous; some medium plastic clay; trace fine gravel; stage II caliche (1.0'-14.0'); occasional cobbles to 12" size.	vertical walls stable	9	44	47		
	2											
	1			GW	dense	SANDY GRAVEL, light brown, fine to coarse, well graded, moist, subangular to sub-rounded, calcareous; some fine to coarse sand.		61	37	2		
	4											
	6											
	8											
	2			SP	dense	GRAVELLY SAND, light brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; some fine to coarse gravel.						
	10											
	12											
	14											
	4					TOTAL DEPTH 14.0' (4.3m)						
	18											
	5											
	18											
	8											
	20											

TRENCH DETAILS

SURFACE ELEVATION : 5500' (1676m)
 DATE EXCAVATED : 19 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT: A5H
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : N-S

LOG OF TRENCH MD-T-20
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DDD

FIGURE
 II-3-20

FUGRO NATIONAL, INC.

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0										
	2		ML	stiff	SANDY SILT, brown, dry, medium plastic; calcareous; some fine to coarse subangular to subrounded sand; stage II caliche (2.5'-10.0').						
	4		SM	dense	SILTY SAND, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; little nonplastic silt.						
	8		SP-SM	dense	SAND, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; trace nonplastic silt.	vertical walls stable					
	10										
	12										
	14				TOTAL DEPTH 14.0' (4.3m)						
	18										
	20										

TRENCH DETAILS

SURFACE ELEVATION : 5420' (1652m)
 DATE EXCAVATED : 31 OCTOBER 1980
 SURFICIAL GEOLOGIC UNIT : ASH
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH BL-T-13
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 0000

FIGURE
 II-3-21

FUGRO NATIONAL, INC.

20 FEB 81

USAF-37

TRENCH DETAILS

LOG OF TRENCH BL-T-14
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DND

FIGURE
II-3-22

FUGRO NATIONAL, INC.

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		SM	dense	GRAVELLY SAND, brown to light brown, fine to coarse, poorly graded, dry, subangular calcareous; some fine to coarse gravel; little slightly plastic silt; stage III caliche (1.0'-3.5'); stage IV caliche (3.5'-4.0'); occasional cobbles to 6" size.	vertical walls stable	36	51	13		
		2										
	1											
	4											
					very dense	TOTAL DEPTH 4.0' (1.2m)	cementation at 4.0' exceeded capacity of Case 580C backhoe					
	8											
	2											
	8											
	3	10										
	12											
	4											
	14											
	5	16										
	18											
	6	20										

TRENCH DETAILS

SURFACE ELEVATION : 5520' (1682m)
 DATE EXCAVATED : 1 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT: A51
 TRENCH LENGTH : 10.0' (3.0m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH BL-T-15
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 0000

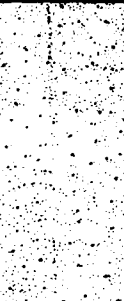
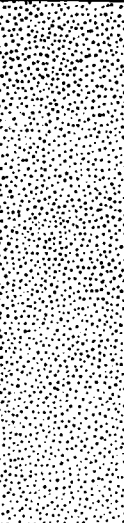
FIGURE
 II-3-23

FUGRO NATIONAL INC.

20 FEB 81

USAF-

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		SM	medium dense	SILTY SAND, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some nonplastic silt; stage II caliche (1.0'-5.0').	vertical walls stable					
		2										
	1	4										
		6		SP	medium dense	GRAVELLY SAND, dark brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some fine to coarse gravel.						
	2	8										
	3	10										
		12				TOTAL DEPTH 14.0' (4.3m)						
	4	14										
	5	18										
		18										
	6	20										

TRENCH DETAILS

SURFACE ELEVATION : 5375' (1638m)
 DATE EXCAVATED : 1 NOVEMBER 1990
 SURFICIAL GEOLOGIC UNIT: ASH
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : N-S

LOG OF TRENCH BL-T-16
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 800

FIGURE
 II-3-24

FUGRO NATIONAL, INC.

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0	[Hatched Pattern]	CL	firm	SILTY CLAY, brown to dark gray, very moist to saturated, slightly plastic, calcareous.	vertical walls stable	0	3	97	26	10
	2											
	4											
	6											
	8											
	10											
	12											
	14											
	16											
	18											
	20					TOTAL DEPTH 10.0' (3.0m)	excavation terminated due to water level at 5.0'					

TRENCH DETAILS

SURFACE ELEVATION : 5080' (1548m)
 DATE EXCAVATED : 2 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT : A1/A2L
 TRENCH LENGTH : 12.0 (3.7m)
 TRENCH ORIENTATION : E-W

**LOG OF TRENCH BL-T-17
 OPERATIONAL BASE SITE
 MILFORD, UTAH**

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 800

FIGURE
 II-3-25

FUGRO NATIONAL, INC.

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0				SILT, brown to dark olive-gray, moist to saturated, medium plastic, calcareous; stage I caliche (1.0'-2.0'); stage III caliche (2.0'-5.0').	vertical walls stable	0	38	62	59	19
	2				firm							
1	4			MM	stiff							
2	6											
	8				firm							
3	10					TOTAL DEPTH 10.0' (3.0m)	terminated due to water level at 7.5'					
	12											
4	14											
	16											
5	18											
	20											

TRENCH DETAILS

SURFACE ELEVATION : 5090' (1561m)
 DATE EXCAVATED : 2 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT : A4o
 TRENCH LENGTH : 12.0' (3.7m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH BL-T-18
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 800

FIGURE
 II-3-26

FUGRO NATIONAL, INC.

20 FEB 81

USAF-57

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0				SILTY SAND, light brown, fine to medium, poorly graded, moist, subangular to sub-rounded, calcareous; some slightly plastic silt; stage II caliche (1.0'-3.0').	↑	0	54	46		
	2			SM	medium dense							
	1					CLAY, light brown, moist, highly plastic, calcareous.	vertical walls stable					
	4											
	6											
	8											
	2											
	6											
	8											
	10			CH	firm						67	35
	3											
	12											
	4											
	14											
						TOTAL DEPTH 14.0' (4.3m)						
	5											
	18											
	6											
	20											

TRENCH DETAILS

SURFACE ELEVATION : 5105' (1556m)
 DATE EXCAVATED : 2 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT : A5y/A4o
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH BL-T-19
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 000

FIGURE
 II-3-27

FUGRO NATIONAL, INC.

20 FEB 81

USAF-81

FN-TR-44

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0				SANDY SILT, light brown, moist, nonplastic, calcareous; little fine subrounded sand.	vertical wells stable	0	20	80		NP
	2										
	4										
	6										
	8				SAND, brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; trace gravel; trace nonplastic silt.		7	87	6		
	10										
	12										
	14				TOTAL DEPTH 14.0' (4.3m)						
	16										
	18										
	20										

TRENCH DETAILS

SURFACE ELEVATION : 5140' (1567m)
 DATE EXCAVATED : 2 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT : A5y
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : N-S

LOG OF TRENCH BL-T-20
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 000

FIGURE
 II-3-28

FUGRO NATIONAL INC.

USAF

20 FEB 81

FN-TR-44

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0				SILTY CLAY, brown, moist, medium plastic, calcareous; trace fine sand.	vertical walls stable					
	2		CL	firm							
	4				SILT, light brown, dry, slightly plastic, calcareous; trace fine subrounded sand.		0	8	92	30	6
	8		ML	firm							
	10										
	12		SM	medium dense	SILTY SAND, brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some nonplastic silt.						
	14				TOTAL DEPTH 14.0' (4.3m)						
	18										
	20										

TRENCH DETAILS

SURFACE ELEVATION : 5145' (1568m)
 DATE EXCAVATED : 2 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT : A5y/A4o
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : N-S

LOG OF TRENCH BL-T-21
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 000

FIGURE
 II-3-29

UGRO NATIONAL INC.

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0				Interbedded layers of SILTY SAND and SANDY SILT:	vertical wells stable					
		2				SILTY SAND (SM): brown to light brown, fine to coarse, poorly graded, slightly moist, sub-angular to subrounded, calcareous; little to some nonplastic silt; trace fine to coarse gravel; stage II caliche (1.0'-5.0').		5	73	22		
	1			SM	medium dense							
	4					SANDY SILT (ML): light brown, slightly moist slightly plastic, calcareous; some fine to medium subangular to subrounded sand.						
	2											
	6			ML	stiff							
	10											
	12			SM	medium dense			7	77	16		
	14					TOTAL DEPTH 14.0' (4.3m)						
	16											
	18											
	20											

TRENCH DETAILS

SURFACE ELEVATION : 5180' (1579m)
 DATE EXCAVATED : 2 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT : A51
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH BL-T-22
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 800

FIGURE
 II-3-30

FUGRO NATIONAL INC.

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0				SILTY SAND, brown, fine to coarse, poorly graded, slightly moist, subangular to sub-rounded, calcareous; some nonplastic silt; stage II caliche (2.0'-5.0').	vertical wells stable					
	2										
	4										
	6										
	8										
	10										
	12										
	14										
	16										
	18										
	20										
	22										
	24										
	26										
	28										
					TOTAL DEPTH 14.0' (4.3m)						

TRENCH DETAILS

SURFACE ELEVATION : 5200' (1585m)
 DATE EXCAVATED : 2 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT: A51
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH BL-T-23
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 800

FIGURE
 II-3-31

FUGRO NATIONAL INC.

20 FEB 81

USAF-37

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0				SILTY SAND-CLAYEY SAND, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some slightly plastic silt-clay; stage I caliche (1.5'-5.0').	vertical walls stable	1	49	50	26	7
	2											
	1			SM-SC	firm							
	4											
	6					GRAVELLY SAND, brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some gravel.						
	2											
	8											
	3			SP	medium dense							
	10											
	12					SANDY SILT, light brown, dry, slightly plastic, calcareous; some fine subangular to subrounded sand.						
	4			ML	firm							
	14					TOTAL DEPTH 14.0' (4.3m)						
	16											
	5											
	18											
	20											
	6											

TRENCH DETAILS

SURFACE ELEVATION : 5175' (1577m)
 DATE EXCAVATED : 3 NOVEMBER 1980
 SURFICIAL GEOLOGIC UNIT: A6y
 TRENCH LENGTH : 14.0' (4.3m)
 TRENCH ORIENTATION : E-W

LOG OF TRENCH BL-T-24
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 000

FIGURE
 II-3-32

FUGRO NATIONAL INC.

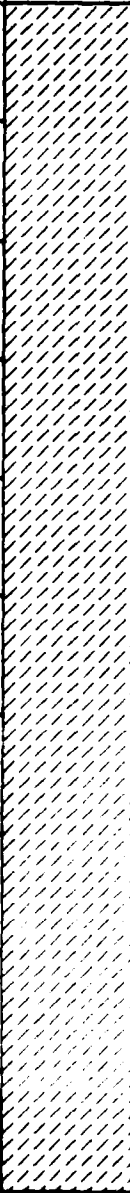
20 FEB 81

USAF-37

SECTION 4.0
EXPLANATION OF
TEST PIT LOGS

4.0 EXPLANATION OF TEST PIT LOGS

See Section 2.0, "Boring Logs", for explanations.

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS							
	METERS	FEET						GR	SA	FI	LL	PI			
	0	0				SANDY CLAY, light brown, slightly moist, slightly plastic, calcareous; trace fine to medium subangular to subrounded sand.	 vertical walls stable								
	1														
	2														
	3														
1	4														
	5														
	6														
2	7														
	8														
	9														
3	10														
TOTAL DEPTH 10.0' (3.0m)															

SURFACE ELEVATION: 5095' (1553m)
SURFICIAL GEOLOGIC UNIT: A5y

LOG OF TEST PIT MD-P-2
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-4-2

FUGRO NATIONAL INC.

20 FEB 81

USAF-21

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS													
	METERS	FEET						GR	SA	FI	LL	PI									
	0	0				CLAY, brown, moist, medium plastic, calcareous.															
		1																			
		2																			
		3																			
1		4																			
		5																			
		6																			
2		7																			
		8																			
		9																			
3		10																			
TOTAL DEPTH 10.0' (3.0m)																					

SURFACE ELEVATION: 5100' (1554m)
SURFICIAL GEOLOGIC UNIT: A1/A4o

LOG OF TEST PIT MD-P-3
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-4-3

FUGRO NATIONAL, INC.

20 FEB 81

USAF-2

AD-A112 987

FUGRO NATIONAL INC LONG BEACH CA
PRELIMINARY GEOTECHNICAL INVESTIGATION PROPOSED OPERATIONAL BAS--ETC(U)
FEB 81
FN-TR-44-VOL-2

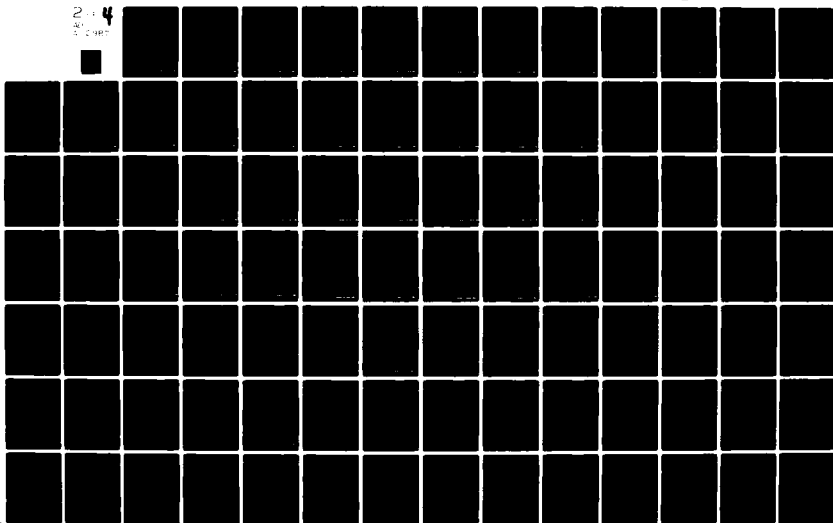
F/S 8/13

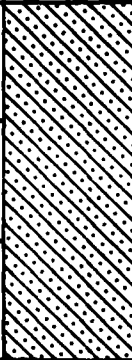
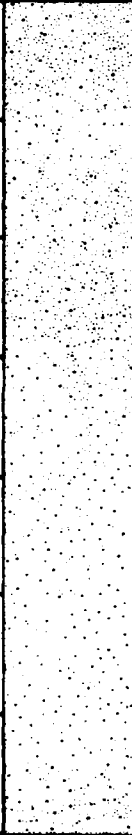
F04704-80-C-0006

NL

UNCLASSIFIED

2 4
0 0000



BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS												
	METERS	FEET						GR	SA	FI	LL	PI								
	0	0		SC	dense	CLAYEY SAND, light brown, fine to coarse, poorly graded, dry, subangular to sub-rounded, calcareous; some slightly plastic clay; little fine to coarse gravel; stage III caliche (1.0'-4.0').	vertical well stable	15	60	25	38	14								
	1	1																		
	2	2																		
	3	3		SM	dense	SILTY SAND, light brown, fine to medium, poorly graded, dry to moist, subangular to subrounded, calcareous; some nonplastic silt.		1	54	45										
-1	4	4																		
	5	5																		
	6	6																		
	7	7			medium dense															
-2	8	8																		
	9	9																		
	10	10																		
						TOTAL DEPTH 10.0' (3.0m)														

SURFACE ELEVATION: 5230' (1594m)
SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT MD-P-4
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-4-4

FUGRO NATIONAL, INC.

20 FEB 81

USAF-21

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		SM	medium dense	SILTY SAND, light brown, fine to coarse, poorly graded, dry, subangular, calcareous; some nonplastic silt; trace fine gravel.	vertical walls stable					
		1										
		2										
		3		SP-SM	dense	GRAVELLY SAND, light gray-brown, fine to coarse, poorly graded, dry, subangular, calcareous; trace fine gravel; trace non-plastic silt; stage III caliche (3.0'-8.0').						
	1											
		4										
		5										
		6										
	2											
		7										
		8										
		9				TOTAL DEPTH 8.0' (2.4m)	cementation at 8.0' exceeded capacity of Case 580C backhoe					
	3	10										

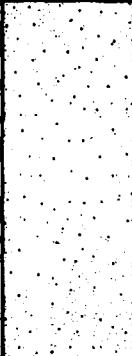
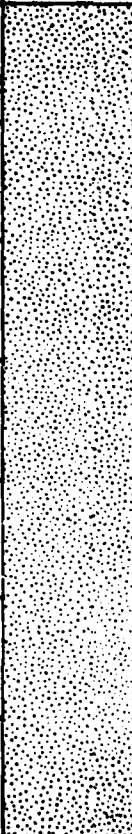
SURFACE ELEVATION: 5360' (1634m)
SURFICIAL GEOLOGIC UNIT: ASI

LOG OF TEST PIT MD-P-5
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-4-5

TUBRO NATIONAL, INC.

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		SM	medium dense	SILTY SAND, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; little slightly plastic silt; trace fine to coarse gravel; stage I caliche (1.0'-10.0'); occasional cobbles and boulders to 15" size.	↑ vertical walls stable. ↓	42	49	9		
	1											
	2											
	3		SP-SM	medium dense	GRAVELLY SAND, light brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; some fine to coarse gravel; trace silt.							
1	4											
	5											
	6											
2	7											
	8											
	9											
3	10	TOTAL DEPTH 10.0' (3.0m)										

SURFACE ELEVATION: 5160' (1573m)
SURFICIAL GEOLOGIC UNIT: A5y

LOG OF TEST PIT MD-P-6
OPERATIONAL BASE SITE
MILFORD, UTAH

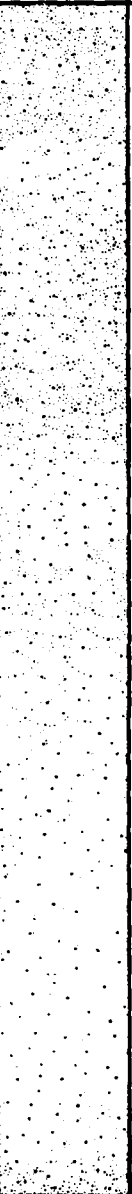
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DND

FIGURE
II-4-6

FUGRO NATIONAL INC.

20 FEB 81

USAF-21

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						BR	SA	FI	LL	PI
	0	0		SM	medium dense	SILTY SAND, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; little slightly plastic silt; little fine to coarse gravel; gravelly sand (4.0'-5.0').	vertical walls stable.					
	1	1										
	2	2										
	3	3										
	4	4										
	5	5										
	6	6										
	7	7										
	8	8										
	9	9										
	10	10				TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5190' (1582m)
SURFICIAL GEOLOGIC UNIT: A5y

LOG OF TEST PIT MD-P-7
OPERATIONAL BASE SITE
MILFORD, UTAH

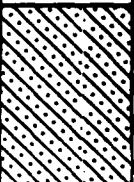
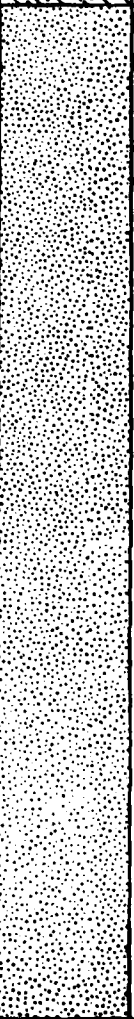
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DND

FIGURE
II-4-7

URS NATIONAL INC.

20 FEB 91

USAF-21

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		SC	medium dense	CLAYEY SAND, brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some slightly plastic clay; trace fine gravel; stage I caliche (0.5'-1.5'); occasional cobbles to 10" size.	↑	12	58	30		
	1											
	2			SP-SM	dense	GRAVELLY SAND, light brown, fine to coarse, poorly graded, dry to slightly moist, subangular to subrounded, calcareous; some fine to coarse gravel; trace nonplastic silt; stage II caliche (1.5'-10.0').	vertical walls stable ↓					
	3											
	4											
	5											
	6											
	7											
	8											
	9											
	10											
						TOTAL DEPTH 10.0' (3.0m)						

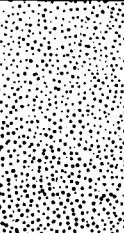
SURFACE ELEVATION: 5320' (1622m)
SURFICIAL GEOLOGIC UNIT: A1

LOG OF TEST PIT MD-P-8
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DND

FIGURE
II-4-8

FUGRO NATIONAL INC.

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS										
	METERS	FEET						GR	SA	FI	LL	PI						
	0	0				SILTY SAND, brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some medium plastic silt; stage I caliche (2.0'-10.0').	vertical walls stable											
		1																
		2																
		3																
1		4																
		5																
		6																
		7																
2		8				GRAVELLY SAND, brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; little fine to coarse gravel.												
		9																
		10																
3		10				TOTAL DEPTH 10.0' (3.0m)												

SURFACE ELEVATION: 5420' (1652m)
SURFICIAL GEOLOGIC UNIT: A1

LOG OF TEST PIT MD-P-9
OPERATIONAL BASE SITE
MILFORD, UTAH

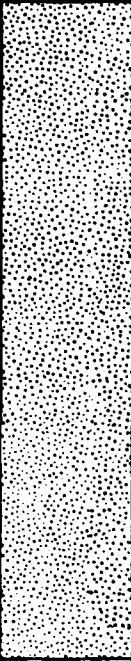
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DND

FIGURE
II-4-9

FUSCO NATIONAL, INC.

20 FEB 81

USAF-21

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS						
	METERS	FEET						GR	SA	FI	LL	PI		
	0	0		SM	medium dense	SILTY SAND, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; little slightly plastic silt; trace fine gravel; stage I caliche (1.0'-2.0').	vertical walls stable							
		1												
		2												
		3		SP-SM	GRAVELLY SAND, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some fine to coarse gravel; trace to some slightly plastic silt; stage II caliche (2.0'-8.0'); stage III caliche (8.0'-8.0'); stage II caliche (8.0'-10.0').									
	1													
		4												
		5												
		6												
	2													
		7												
		8												
		9	SM	dense	TOTAL DEPTH 10.0 (3.0m)			28	50	22				
	3	10												

SURFACE ELEVATION: 5380' (1634m)
SURFICIAL GEOLOGIC UNIT: A5i/A5y

LOG OF TEST PIT MD-P-10
OPERATIONAL BASE SITE
MILFORD, UTAH

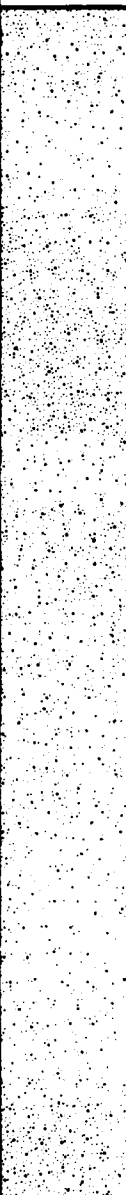
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-4-10

FUGRO NATIONAL INC.

20 FEB 81

USAF-21

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		SM	dense	GRAVELLY SAND, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some fine to coarse gravel; little slightly plastic silt; stage II caliche (1.0'-10.0'); trace cobbles to 12" size.	↑ 					

SURFACE ELEVATION: 5300' (1615m)
SURFICIAL GEOLOGIC UNIT: A51

LOG OF TEST PIT MD-P-11
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DND

FIGURE
II-4-11

FUBRO NATIONAL INC.

20 FEB 81

USAF-21

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		CL	firm	CLAY, brown, slightly moist, medium plastic, calcareous; trace fine subangular to subrounded sand; stage I caliche (2.0'-10.0').	vertical walls stable					
	1	1									30	19
	2	2										
	3	3		SC	medium dense	CLAYEY SAND, dark brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some medium plastic clay; trace fine gravel.	vertical walls stable					
	4	4										
	5	5										
	6	6										
	7	7										
	8	8										
	9	9										
	10	10										
						TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5010' (1527m)
SURFICIAL GEOLOGIC UNIT: A1/A4o

LOG OF TEST PIT MD-P-12
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

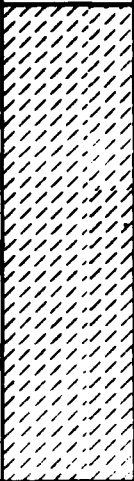
FIGURE
II-4-12

FUGRO NATIONAL, INC.

20 FEB 81

USAF-21

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						BR	SA	FI	LL	PI
	0	0		CL	firm	CLAY, brown, slightly moist, medium plastic, calcareous; trace fine subangular to subrounded sand; stage I caliche (2.0'-10.0').	↑ <					

SURFACE ELEVATION: 5010' (1527m)
SURFICIAL GEOLOGIC UNIT: A1/A3

LOG OF TEST PIT MD-P-13
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-4-13

FUSRO NATIONAL INC.

20 FEB 81

USAF-21

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS								
	METERS	FEET						GR	SA	FI	LL	PI				
	0	0		CL	firm	SILTY CLAY, brown, slightly moist, slightly plastic, calcareous; trace fine subangular to subrounded sand; stage I caliche (2.0'-10.0').	vertical wells stable									
		1														
		2														
		3														
	1	4		SC	dense	CLAYEY SAND, light brown, fine to coarse, poorly graded, subangular to subrounded, calcareous; some medium plastic clay; little fine gravel.										
		5														
		6														
		7														
	2	8														
		9														
		10														
	3					TOTAL DEPTH 10.0' (3.0m)										

SURFACE ELEVATION: 4990' (1521m)
 SURFICIAL GEOLOGIC UNIT: A4o.A1

LOG OF TEST PIT MD-P-14
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DND

FIGURE
II-4-14

FUGRO NATIONAL INC.

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		SC	medium dense	CLAYEY SAND, light brown, fine, poorly graded, slightly moist, subangular to sub-rounded, calcareous; some slightly plastic clay.	vertical walls stable					
		1										
		2										
		3										
	1			SM	loose	SILTY SAND, light brown, fine, poorly graded, dry, subangular to subrounded, calcareous; some nonplastic silt.	vertical walls caving					
		4										
		5										
		6										
	2											
		7										
		8										
		9										
	3											
		10				TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5000' (1524m)
 SURFICIAL GEOLOGIC UNIT: A4o/A1

LOG OF TEST PIT MD-P-15
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
 II-4-15

FUGRO NATIONAL, INC.

20 FEB 81

USAF-21

FN-TR-44

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0		SM	medium dense	Interbedded layers of SANDY GRAVEL and GRAVELLY SAND:	vertical walls stable					
	1				SANDY GRAVEL (GW-GM): light brown, fine to coarse, well graded, dry, subangular to subrounded, calcareous; some fine to coarse sand; trace slightly plastic silt; stage II caliche (2.0'-4.0').						
	2		GW-GM	dense	GRAVELLY SAND (SM, SC): light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; little to some fine to coarse gravel; little to some slightly plastic clay and silt; stage I caliche (4.0'-10.0').		46	43	11		
	3										
1	4										
	5		SC	medium dense							
	6										
2	7										
	8		SM	dense							
	9										
3	10						32	45	23		
					TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5120' (1561m)
SURFICIAL GEOLOGIC UNIT: A5y/A5i

LOG OF TEST PIT MD-P-16
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-4-16

FUGRO NATIONAL INC.

20 FEB 81

USAF-21

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0				GRAVELLY SAND, light brown, fine to coarse, poorly graded, dry to slightly moist, subangular to subrounded, calcareous; some fine to coarse gravel; trace to little slightly plastic silt; stage II caliche (1.0'-8.0').	vertical walls stable					
		1										
		2		SM	dense							
		3										
	1	4										
		5										
		6		SW-SM	medium dense							
		7										
	2	8				SILTY SAND, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some slightly plastic silt.						
		9		SM	medium dense							
	3	10				TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5200' (1585m)
SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT MD-P-17
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-4-17

VERO NATIONAL INC.

20 FEB 81

USAF-21

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		SP	medium dense	GRAVELLY SAND, light brown, fine to coarse, poorly graded, dry, subangular to sub-rounded, calcareous; some fine to coarse gravel; trace slightly plastic clay and silt; stage I caliche (1.0'-9.0'); stage II caliche (9.0'-10.0').	vertical walls stable					
		1										
		2										
		3										
	1	4										
		5										
		6										
	2	7										
		8		SP-SC	dense							
		9										
	3	10										
						TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5380' (1640m)
 SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT MD-P-18
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
 II - 4 - 18

FURRO NATIONAL INC.

20 FEB 81

USAF-21

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0				GRAVELLY SAND, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; little fine to coarse gravel; little slightly plastic silt; stage I caliche (1.0'-3.0').	vertical wells unstable					
	1			SM	loose							
	2											
	3											
	1					SANDY GRAVEL, dark brown, fine to coarse, poorly graded, dry, subangular, calcareous; little medium to coarse subangular to subrounded sand; trace medium plastic clay; stage II caliche (3.0'-10.0').	vertical wells stable	74	19	7		
	4											
	5											
	6			GP-GC	dense							
	7											
	8											
	9											
	10											
						TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5400' (1646m)
SURFICIAL GEOLOGIC UNIT: A51

LOG OF TEST PIT MD-P-19
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - MIO

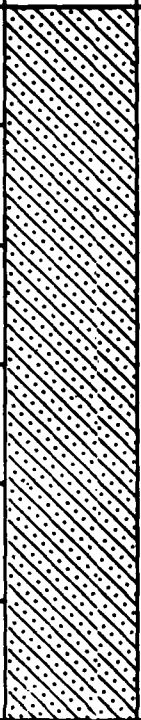
FIGURE
II-4-19

FURRO NATIONAL INC.

20 FEB 81

USAF-21

FN-TR-44

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0		SC	medium dense	CLAYEY SAND, light brown, fine to coarse, poorly graded, slightly moist to moist, subangular to subrounded, calcareous; some fine to coarse gravel; little to some medium plastic clay; stage II caliche (2.0'-10.0'); trace cobbles to 12" size (3.5'-6.0').	vertical walls stable					
	1						27	44	29		
	2										
	3										
	4										
	5		GC	dense	SANDY GRAVEL, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some fine to coarse sand; little medium plastic clay.						
	6										
	7										
	8										
	9										
	10						54	31	15		
					TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5160' (1573m)
SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT MD-P-20
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DND

FIGURE
II - 4 - 20

FUGRO NATIONAL INC.

20 FEB 81

USAF-21

FN-TR-44

DULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						BR	SA	FI	LL	PI
	0	0				SILTY SAND, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some slightly plastic silt; stage I caliche (1.0'-4.0').	vertical walls stable					
		1						4	55	41		
		2		SM	medium dense							
		3										
	1											
		4				SANDY GRAVEL, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some fine to coarse sand; trace to little slightly plastic silt; stage II caliche (4.0'-10.0'); trace cobbles to 12" size.	vertical walls stable					
		5		GM	dense			57	25	18		
		6										
		7										
	2											
		8										
		9		GP	dense							
		10										
	3											
		10				TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5050' (1539m)
 SURFICIAL GEOLOGIC UNIT: A5y

LOG OF TEST PIT MD-P-21
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
 II-4-21

FURRO NATIONAL, INC.

20 FEB 81

USAF-21

FN-TR-44

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0		GP-GM	medium dense	SANDY GRAVEL, light brown, fine to coarse, poorly graded, dry to slightly moist, sub-angular to subrounded, calcareous; some fine to coarse sand; trace slightly plastic silt; stage I caliche (1.0'-8.0'); trace cobbles to 9" size.	vertical walls stable					
	1										
	2										
	3										
	4										
	5										
	6										
	7										
	8										
	9										
	10										
					TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5080' (1542m)
SURFICIAL GEOLOGIC UNIT: A5y

LOG OF TEST PIT MD-P-22
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DND

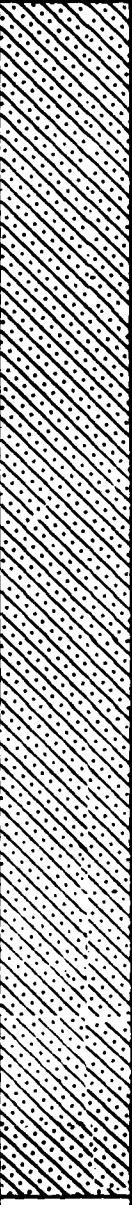
FIGURE
II - 4 - 22

FUGRO NATIONAL INC.

20 FEB 81

USAF-21

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0				GRAVELLY SAND, light brown, fine to coarse, poorly graded, moist to slightly moist, subangular to subrounded, calcareous; some fine to coarse gravel; little slightly plastic clay; stage II caliche (1.0'-4.0' and 7.5'-10.0'); stage I caliche (4.0'-7.5').	vertical walls stable					
		1										
		2										
		3										
		4										
		5										
		6										
		7										
		8										
		9										
		10										
						TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5030' (1511m)
SURFICIAL GEOLOGIC UNIT: A51

LOG OF TEST PIT MD-P-23
OPERATIONAL BASE SITE
MILFORD, UTAH

MX TING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - 000

FIGURE
II-4-23

FURD NATIONAL INC.

20 FEB 81

USAP

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		SC	medium dense	CLAYEY SAND, brown, fine to medium, poorly graded, moist, subangular to sub-rounded, calcareous; some medium plastic clay.	↑					
	1	1										
	2	2										
	3	3										
	4	4		CL-ML	firm	SILTY CLAY-CLAYEY SILT, brown, moist, slightly plastic, calcareous; trace fine sub-angular to sub-rounded sand.	vertical walls stable ↓					
	5	5										
	6	6										
	7	7										
	8	8										
	9	9										
	10	10										
						TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5020' (1508m)
 SURFICIAL GEOLOGIC UNIT: A5y/A4o

LOG OF TEST PIT MD-P-24
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - 000

FIGURE
 II - 4 - 24

FURRO NATIONAL INC.

20 FEB 81

USAF-

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0				SILTY SAND, brown, fine, poorly graded, moist, subangular to subrounded, calcareous; some nonplastic silt.						
		1		SM	medium dense			0	56	44		NP
		2										
		3										
	1					SANDY CLAY, brown, moist, medium plastic, calcareous; little fine sand.						
		4										
		5		CL	firm		vertical walls stable					
		6										
	2											
		7				CLAYEY SAND, light brown, fine, poorly graded, moist, subangular to subrounded, calcareous; some medium plastic clay.		0	67	33		
		8		SC	dense							
		9										
	3											
		10				TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5020' (1508m)
 SURFICIAL GEOLOGIC UNIT: A5y/A4o

LOG OF TEST PIT MD-P-25
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

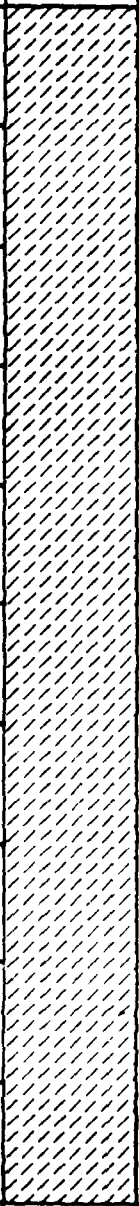
FIGURE
 II - 4 - 25

FURRO NATIONAL, INC.

20 FEB 81

USAF-2

FN-TR-44

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0				CLAY, brown, moist, slightly plastic, calcareous; trace fine subangular to sub-rounded sand.	vertical walls stable					
	1									31	14
	2										
	3										
1	4			firm							
	5		CL								
	6										
2	7			stiff							
	8										
	9			hard							
3	10										
					TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5010' (1506m)
SURFICIAL GEOLOGIC UNIT: A5y/A4o

LOG OF TEST PIT MD-P-26
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II - 4 - 26

FORD NATIONAL INC.

20 FEB 81

USAF-21

FN-TR-44

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0				Interbedded layers of SANDY GRAVEL and SILTY SAND:						
	1		SM	medium dense	SANDY GRAVEL (GW-GM): light brown, fine to coarse, well graded, dry, subangular to subrounded, calcareous; some fine to coarse sand; trace silt; stage II caliche (1.0'-2.5').		3	65	32		
	2		GW-GM	medium dense	SILTY SAND (SM): light brown, fine to coarse, poorly graded, slightly moist to moist, subangular to subrounded, calcareous; little to some nonplastic silt; trace to little fine to coarse gravel; stage I caliche (2.5'-10.0').		52	40	8		
	3										
	4										
	5										
	6		SM	medium dense			4	69	27		
	7										
	8										
	9										
	10				TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5040' (1514m)
SURFICIAL GEOLOGIC UNIT: A5i/A4o

LOG OF TEST PIT MD-P-27
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-4-27

FLURO NATIONAL, INC.

20 FEB 81

USAF-21

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		SM	medium dense	GRAVELLY SAND, brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; little fine to coarse gravel; little nonplastic silt.	vertical walls stable					
	1					SANDY GRAVEL, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some fine to coarse sand; stage II caliche (1.0'-10.0').						
	2			GP	medium dense							
	3											
	4											
	5											
	6					CLAYEY SAND, brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some slightly plastic clay; trace fine gravel.						
	7			SC	medium dense			5	58	37		
	8											
	9											
	10											
						TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5100' (1532m)
SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT MD-P-28
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-4-28

FUGRO NATIONAL, INC.

20 FEB 81

USAF-21

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							BR	SA	FI	LL	PI
	0				SILTY SAND, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some nonplastic silt; trace fine gravel; stage I caliche (1.0' - 6.0').						
	1										
	2										
	3		SM	medium dense		vertical walls stable					
	4										
	5										
	6										
	7		SP	loose	GRAVELLY SAND, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some fine to coarse gravel.	vertical walls caving					
	8										
	9		SC	loose	CLAYEY SAND, brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; some medium plastic clay.						
	10				TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5100' (1532m)
SURFICIAL GEOLOGIC UNIT: A5/A5y

LOG OF TEST PIT MD-P-29
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

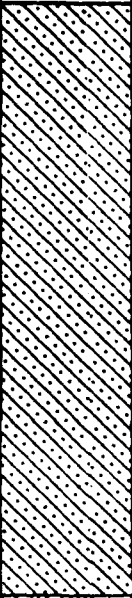
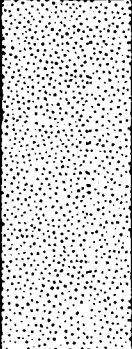
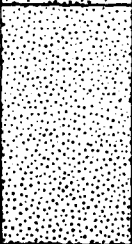
FIGURE
II - 4 - 29

FUGRO NATIONAL INC.

20 FEB 81

USAF-21

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		SC	dense	GRAVELLY SAND, light brown, fine to coarse, poorly graded, slightly moist to moist, subangular to subrounded, calcareous; little to some fine to coarse gravel; trace to little slightly to medium plastic clay; stage II caliche (1.0'-5.0'); stage I caliche (5.0'-10.0').	↑ vertical walls stable					
	1	1										
	2	2										
	3	3										
	4	4										
	5	5		SP-SC	dense		↑					
	6	6										
	7	7										
	8	8		SP	loose		↑					
	9	9										
	10	10				TOTAL DEPTH 10.0' (3.0m)	↑					

SURFACE ELEVATION: 5160' (1550m)
SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT MD-P-30
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II - 4 - 30

FUGRO NATIONAL INC.

20 FEB 81

USAF-21

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0				GRAVELLY SAND, light brown, fine to coarse, poorly to well graded, slightly moist to moist, subangular to subrounded, calcareous; some fine to coarse gravel; trace slightly plastic clay; stage II caliche (1.0'-4.5'); stage I caliche (4.5'-10.0').						
	1										
	2		SP-SC	dense							
	3										
	4										
	5					vertical walls stable					
	6		SW	medium dense							
	7										
	8										
	9		SW-SC	dense							
	10										
					TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5280' (1587m)
SURFICIAL GEOLOGIC UNIT: A51

LOG OF TEST PIT MD-P-31
OPERATIONAL BASE SITE
MILFORD, UTAH

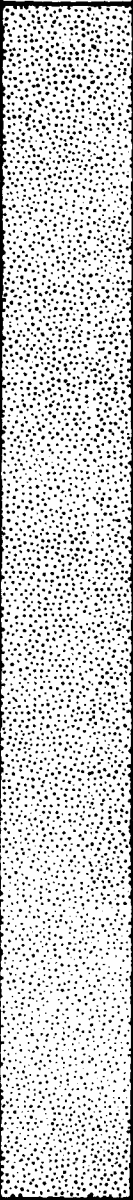
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DND

FIGURE
II-4-31

FUGRO NATIONAL INC.

20 FEB 81

USAF

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0				GRAVELLY SAND, light brown to brown, fine to coarse, poorly graded, dry to slightly moist, subangular to subrounded, calcareous; some fine to coarse gravel; trace nonplastic silt; stage II caliche (1.0'-10.0').	vertical walls stable					
		1										
		2										
		3										
	1											
		4			dense							
		5		SP-SM								
		6										
	2											
		7			medium dense							
		8										
		9			dense							
	3											
		10										
						TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5440' (1635m)
SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT MD-P-32
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-4-32

FUGRO NATIONAL INC.

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		GP-GM	dense	SANDY GRAVEL, gray, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some fine to coarse sand; trace silt; stage II caliche (1.0'-6.0').	vertical walls stable					
		1						52	40	8		
		2										
		3		SM	dense	SILTY SAND, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some nonplastic silt; some fine to coarse gravel; stage III caliche (6.0'-7.0').	vertical walls stable					
	1											
		4						22	45	33		
		5										
		6										
	2											
		7			very dense	TOTAL DEPTH 7.0' (2.1m)	cementation at 7.0' exceeded capacity of Case 580C backhoe					
		8										
		9										
	3	10										

SURFACE ELEVATION: 5440' (1635m)
SURFICIAL GEOLOGIC UNIT: A51

LOG OF TEST PIT MD-P-33
OPERATIONAL BASE SITE
MILFORD, UTAH

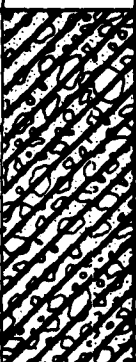
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMD

FIGURE
II-4-33

FUGRO NATIONAL, INC.

20 FEB 81

USAF-

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		GC	dense	CLAYEY GRAVEL, light brown, fine to coarse, poorly graded, slightly moist, sub-angular to subrounded, calcareous; some medium plastic clay; some fine to coarse sand; stage II caliche (1.0'-10.0').	↑ 					

SURFACE ELEVATION: 5340' (1606m)
SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT MD-P-34
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-4-34

FUGRO NATIONAL, INC.

20 FEB 81

USAF-2

FN-TR-44

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0				SILTY SAND, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some slightly plastic silt; stage II caliche (1.0'-3.0').	vertical walls stable					
	1		SM	dense			4	67	29		
	2										
	3			dense	GRAVELLY SAND, light brown, fine to coarse, well graded, slightly moist, subangular to subrounded, calcareous; little fine gravel; trace silt; stage I caliche (3.0'-10.0').	sloughing	20	72	8		
	4										
	5			loose							
	6										
	7		SW-SM								
	8			dense		vertical walls stable					
	9										
	10				TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5200' (1562m)
SURFICIAL GEOLOGIC UNIT: A5i/A5v

LOG OF TEST PIT MD-P-35
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - ONO

FIGURE
II - 4 - 38

UGRO NATIONAL INC.

20 FEB 81

USAF-

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		SP-SM	dense	GRAVELLY SAND, light brown, fine to coarse, poorly graded, slightly moist to moist; subangular to subrounded, calcareous; some fine to coarse gravel; trace nonplastic silt to medium plastic clay; stage II caliche (1.0'-10.0').	↑					
		1										
		2										
		3										
	1			SP-SC	dense		vertical walls stable					
		4										
		5										
		6										
	2			SP-SC	dense							
		7										
		8										
		9										
	3						↓					
		10										
						TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5200' (1562m)
SURFICIAL GEOLOGIC UNIT: A5i/A5y

LOG OF TEST PIT MD-P-36
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-4-36

FUGRO NATIONAL INC.

20 FEB 81

USAF

FN-TR-44

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0				Interbedded layers of SANDY GRAVEL and GRAVELLY SAND:						
	1		SP	loose	SANDY GRAVEL (GP): light brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; some fine to coarse sand.	vertical walls unstable					
	2				GRAVELLY SAND (SP): gray to light brown fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; little to some fine to coarse gravel; stage I caliche (1.0'-10.0').						
	3										
	4						61	35	4		
	5		GP	medium dense		vertical walls stable					
	6										
	7										
	8										
	9		SP	medium dense							
	10				TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5200' (1562m)
SURFICIAL GEOLOGIC UNIT: A5i/A5y

LOG OF TEST PIT MD-P-37
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - 000

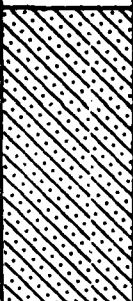
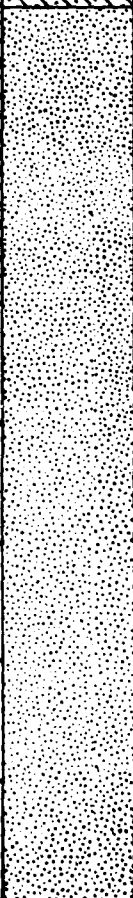
FIGURE
II - 4 - 37

FUORD NATIONAL INC.

20 FEB 81

USAF

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		SC	dense	CLAYEY SAND, light brown, fine to coarse, poorly graded, moist, subangular to sub-rounded, calcareous; some medium plastic clay, stage II caliche (1.0'-2.0'); stage I caliche (2.0'-10.0').	vertical walls stable					
	1	1						4	57	39		
	2	2										
	3	3		SP	medium dense	GRAVELLY SAND, gray, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; some fine to coarse gravel.						
	4	4										
	5	5										
	6	6										
	7	7										
	8	8										
	9	9										
	10	10										
						TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5240' (1575m)
SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT MD-P-38
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II - 4 - 38

FURD NATIONAL INC.

20 FEB 81

USAF-2

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0				SILTY SAND, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some slightly plastic silt; trace fine gravel; stage II caliche (1.0'-10.0').	vertical walls stable					
		1						7	62	31		
		2		SM	medium dense							
		3										
	1	4				GRAVELLY SAND, light brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; trace to some fine to coarse gravel; trace nonplastic silt to little medium plastic clay.						
		5										
		6										
	2	7		SP-SM	medium dense							
		8										
		9										
	3	10		SC	dense							
						TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5300' (1593m)
 SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT MD-P-39
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - ONO

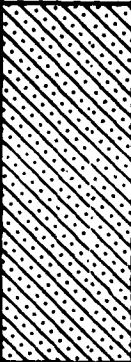
FIGURE
 II-4-39

FUGRO NATIONAL, INC.

20 FEB 81

USAF-8

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS								
	METERS	FEET						GR	SA	FI	LL	PI				
	0	0			SC	GRAVELLY SAND, light brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; little to some fine to coarse gravel; little medium plastic clay and slightly plastic silt; stage II caliche (1.0'-10.0').	vertical walls stable									
		1						25	61	14						
		2														
		3		SM	dense											
	1															
		4														
		5														
		6														
	2			SM	dense			SILTY SAND, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; little slightly plastic silt; trace fine gravel.								
		7														
		8														
		9														
	3															
		10				TOTAL DEPTH 10.0' (3.0m)										

SURFACE ELEVATION: 5185' (1552m)
SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT MD-P40
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

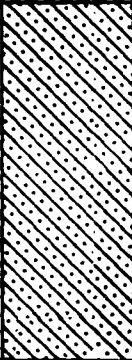
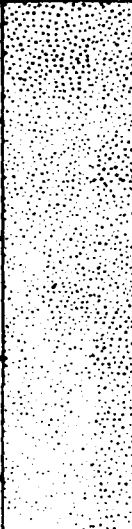
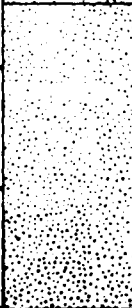
FIGURE
II-4-40

FUGRO NATIONAL INC.

20 FEB 81

USAF-2

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		SC	dense	CLAYEY SAND, light brown, fine to coarse, poorly graded, moist, subangular to sub-rounded, calcareous; some medium plastic clay; stage II caliche (1.0'-10.0').	↑	1	70	29		
		1										
		2										
		3		SP-SC	dense	GRAVELLY SAND, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some fine to coarse gravel; trace medium plastic clay to slightly plastic silt.	vertical wells stable					
	1											
		4										
		5										
		6		SP-SM	dense		↓					
	2											
		7										
		8										
		9										
	3											
		10				TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5110' (1535m)
 SURFICIAL GEOLOGIC UNIT: A5i/A4a

LOG OF TEST PIT MD-P41
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
 II - 4 - 41

FUGRO NATIONAL INC.

20 FEB 81

USAF-3

FN-TR-44

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							BR	SA	FI	LL	PI
	0										
	1										
	2										
	3		SM	medium dense							
	4										
	5										
	6										
	7										
	8		GW-GM	dense							
	9										
	10										
					TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5210' (1568m)
SURFICIAL GEOLOGIC UNIT: A1

LOG OF TEST PIT MD-P-42
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE

II - 4 - 42

FUGRO NATIONAL INC.

USAF-

20 FEB 81

FN-TR-44

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0				SILTY SAND, light brown, fine to coarse, poorly graded, moist, subangular to sub-rounded, calcareous; little slightly plastic silt; trace fine to coarse gravel; stage I caliche (1.0'-2.0'); stage II caliche (2.0'-10.0').	vertical wells stable					
	1			medium dense							
	2										
	3		SM								
	4			dense							
	5				GRAVELLY SAND, light brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; some fine to coarse gravel.						
	6										
	7										
	8		SP	medium dense							
	9										
	10				TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5250' (1575m)
SURFICIAL GEOLOGIC UNIT: A1

LOG OF TEST PIT MD-P-43
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

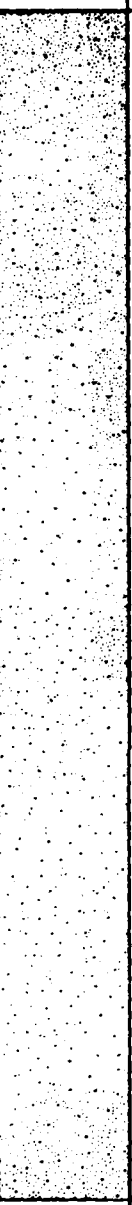
FIGURE
II - 4 - 43

FUGRO NATIONAL INC.

USAP

20 FEB 81

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0				GRAVELLY SAND, light brown, fine to coarse, poorly graded, slightly moist, sub-angular to subrounded, calcareous; little fine to coarse gravel; little nonplastic silt; stage I caliche (1.0'-2.5'); stage II caliche (2.5'-10.0'); occasional cobbles to 12" size.	↑ vertical walls stable ↓					
		1			medium dense							
		2										
		3										
1												
		4										
		5		SM								
		6										
2					dense							
		7										
		8										
		9										
3												
	10					TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5300' (1593m)
SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT MD-P-44
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-4-44

FUSRO NATIONAL INC.

20 FEB 81

USAF-6

FN-TR-44

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0										
	1		SM	medium dense	SILTY SAND, light brown, fine to coarse, poorly graded, moist, subangular to sub-rounded, calcareous; little slightly plastic silt; trace fine gravel; stage II caliche (1.0'-10.0').						
	2										
	3				GRAVELLY SAND, light brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; some fine to coarse gravel.						
	4										
	5					vertical walls stable					
	6		SP	medium dense							
	7										
	8										
	9										
	10										
					TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5330' (1602m)
SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT MD-P-45
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DND

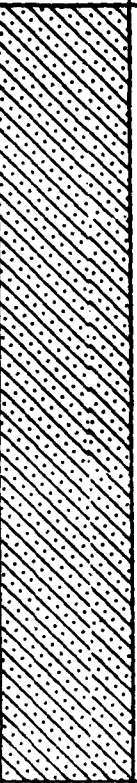
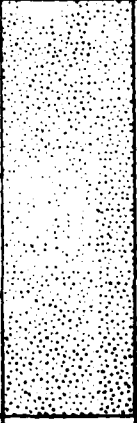
FIGURE
II-4-45

FLURO NATIONAL INC.

20 FEB 81

USAF-27

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0				GRAVELLY SAND, light brown, fine to coarse, poorly graded, moist, subangular to subrounded, calcareous; some fine to coarse gravel; little medium plastic clay to trace silt; stage II caliche (1.0'-6.5'); stage I caliche (6.5'-10.0').	vertical well stable					
	1	1						34	46	20		
	2	2										
	3	3										
	4	4										
	5	5		SC	dense							
	6	6										
	7	7										
	8	8										
	9	9										
	10	10										
						TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5450' (1638m)
 SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT MD-P-46
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - ONO

FIGURE
 II - 4 - 46

FUGRO NATIONAL INC.

20 FEB 81

USAF-2

FN-TR-44

BULK SAMPLE	DEPTH METERS FEET	LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
							GR	SA	FI	LL	PI
	0										
	1		GP-GM	medium dense	SANDY GRAVEL, light brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; some fine to coarse sand; trace nonplastic silt; stage I caliche (1.0'-10.0'); occasional cobbles to 6" size.		66	27	7		
	2										
	3										
	4		SM	medium dense	GRAVELLY SAND, light brown to gray, fine to coarse, poorly graded, slightly moist to moist, subangular to subrounded, calcareous; little to some fine to coarse gravel; occasional to little slightly plastic silt.						
	5										
	6										
	7										
	8		SP	medium dense							
	9										
	10										
					TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5350' (1608m)
SURFICIAL GEOLOGIC UNIT: A5y

LOG OF TEST PIT MD-P-47
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-4-47

FUGRO NATIONAL INC.

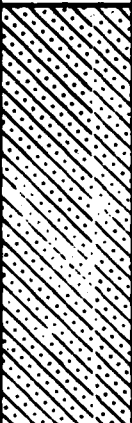
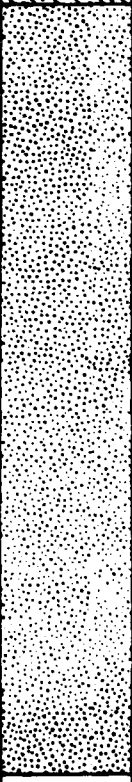
20 FEB 81

USAF-2

SURFACE ELEVATION: 5340' (1628m)
SURFICIAL GEOLOGIC UNIT: A5i

FUGRO NATIONAL, INC.

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		SC	dense	CLAYEY SAND, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some slightly plastic clay; stage III caliche (1.0'-3.5').	vertical well stable					
		1										
		2										
		3										
	1			SP	dense	GRAVELLY SAND, dark brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some fine to coarse gravel.						
		4										
		5										
		6										
	2											
		7										
		8										
		9										
	3											
		10										
						TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5480' (1670m)
SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT BL-P-16
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

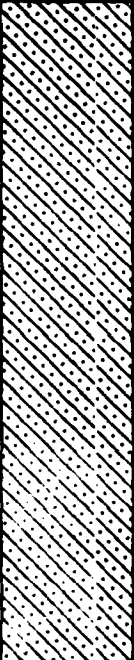
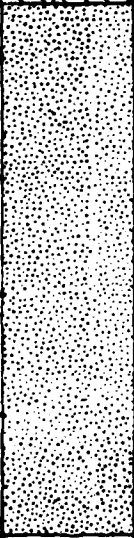
FIGURE
II-4-49

FUORD NATIONAL, INC.

20 FEB 81

USAF-21

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		SC	dense	CLAYEY SAND, brown, fine to coarse, poorly graded, slightly moist, angular to subangular, calcareous; some medium plastic clay; little fine gravel; stage III caliche (1.0'-2.5'); trace cobbles to 6" size.	↑ vertical walls stable ↓	13	53	34		
		1										
		2										
		3										
		4										
	1			SP	medium dense	GRAVELLY SAND, dark brown, fine to coarse, poorly graded, dry, angular to subangular, calcareous; some fine to coarse gravel; trace cobbles to 10" size.	↑ vertical walls unstable ↓					
		5										
		6										
		7										
		8										
	2											
		9										
		10										
	3					TOTAL DEPTH 10.0 (3.0m)						
		10										

SURFACE ELEVATION: 5600' (1707m)
SURFICIAL GEOLOGIC UNIT: A6i

LOG OF TEST PIT BL-P-17
OPERATIONAL BASE SITE
MILFORD, UTAH

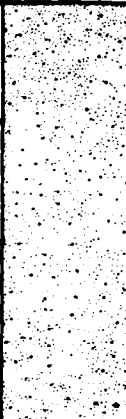
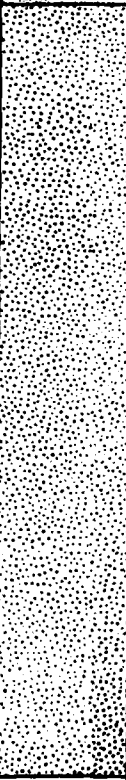
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-4-50

FUGRO NATIONAL INC.

20 FEB 81

USAF-21

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		SM	medium dense	SILTY SAND, brown, fine to coarse, poorly graded, slightly moist, subangular to sub-rounded, calcareous; some nonplastic silt.	 vertical walls stable					
	1											
	2											
	3			SP	dense	GRAVELLY SAND, dark brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some fine gravel; stage III caliche (3.5'-6.0').						
	4											
	5											
	6											
	7											
	8											
	9											
	10											
						TOTAL DEPTH 10.0' (3.0m)						

SURFACE ELEVATION: 5350' (1631m)
SURFICIAL GEOLOGIC UNIT: ASi

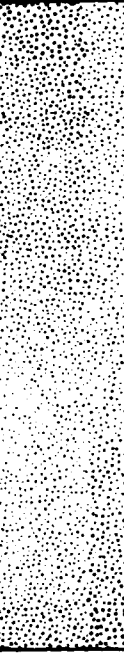
LOG OF TEST PIT BL-P-18
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-4-51

USARO NATIONAL INC.

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		SC	dense	CLAYEY SAND, brown, fine to coarse, poorly graded, slightly moist, subangular to subrounded, calcareous; little slightly plastic clay; stage II caliche (1.5'-4.5').	vertical walls stable					
	1	1										
	2	2										
	3	3										
	4	4										
	5	5		SP	GRAVELLY SAND, dark brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; some fine to coarse subangular gravel; occasional cobbles to 6" size.							
	6	6										
	7	7										
	8	8										
	9	9										
	10	10										
	TOTAL DEPTH 10.0' (3.0m)											

SURFACE ELEVATION: 5300' (1615m)
SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT BL-P-19
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - 280

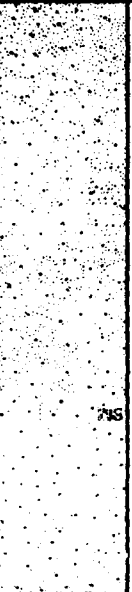
FIGURE
II-4-52

FUGRO NATIONAL INC.

20 FEB 81

USAF-21

FN-TR-44

BULK SAMPLE	DEPTH		LITHOLOGY	USCS	CONSISTENCY	SOIL DESCRIPTION	REMARKS	SIEVE ANALYSIS				
	METERS	FEET						GR	SA	FI	LL	PI
	0	0		SM	medium dense	SILTY SAND, light brown, fine to coarse, poorly graded, dry, subangular to subrounded, calcareous; little nonplastic silt; trace gravel.	vertical walls stable					
		1										
		2										
		3										
		4										
	1	5				TOTAL DEPTH 5.0' (1.5m)	rock at 5.0' exceeded capacity of case 580 C backhoe					
		6										
		7										
		8										
		9										
		10										

SURFACE ELEVATION: 5440' (1658m)
SURFICIAL GEOLOGIC UNIT: A5i

LOG OF TEST PIT BL-P-20
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DND

FIGURE
II-4-53

FUGRO NATIONAL INC.

20 FEB 81

USAF-21

SURFACE ELEVATION: 5200' (1584m)
SURFICIAL GEOLOGIC UNIT: A5i

FURRO NATIONAL, INC.

SECTION 5.0

EXPLANATION OF
LABORATORY TEST RESULTS

5.0 EXPLANATION OF LABORATORY TEST RESULTS

Laboratory test results are presented in this section. Table II-5-1 contains a summary of laboratory test results. This table contains results of sieve analysis; plasticity data; in-situ dry unit weight, moisture content, degree of saturation, and void ratio for drive and Pitcher samples; results of compaction tests; and specific gravity of solids. Other tests such as triaxial compression, unconfined compression, direct shear, consolidation, chemical, and California Bearing Ratio (CBR) are indicated on the table. Tables II-5-2 through II-5-4 and Figures II-5-1 through II-5-5 present results of triaxial compression, unconfined compression, direct shear, consolidation, chemical, and CBR tests.

All tests were performed in general accordance with the American Society for Testing and Materials (ASTM) procedures. The following list presents the ASTM designations for the tests performed during the investigation.

<u>Type of Test</u>	<u>ASTM Designations</u>
Particle Size Analysis	D 422-63
Liquid Limit	D 423-66
Plastic Limit	D 424-59
Unit Weight	D 2937-71
Moisture Content	D 2216-71
Compaction	D 1557-70
Specific Gravity of Solids	D 854-58
Triaxial	D 2850-70
Unconfined Compression	D 2166-66
Direct Shear	D 3080-72
Consolidation	D 2435-70
Test for Alkalinity (pH)	D 1067-70
Water Soluble Sodium	D 1428-64
Water Soluble Chloride	D 512-67
Water Soluble Sulphate	D 516-68
Water Soluble Calcium	D 511-72
Calcium Carbonate	D 1126-67
California Bearing Ratio (CBR)	D 1883-73

Explanation for the tables and figures presented in this section are as follows:

- A. Activity Number - Boring, trench, or test pit sample designation.
- B. Sample Number - Prefix indicates the type of sample; explanation is at the bottom of the table.
- C. Sample Interval - This is the depth range measured from ground surface over which the sample was obtained.
- D. Percent Finer by Weight - Presents the results of laboratory particle-size analysis (ASTM D 422-63) performed on representative soil samples at the depth indicated. The numbers represent the percent (by dry weight) of the total sample weight passing through each sieve size indicated.
- E. Atterberg Limits (ASTM D 423-66 and D 424-59) -
 - LL - Liquid Limit, the water content (as percent of soil dry weight) corresponding to the arbitrary limit between the liquid and plastic states of consistency of a soil (ASTM D 423-66).
 - PL - Plastic Limit, the water content corresponding to an arbitrary limit between the plastic and the semisolid state of consistency of a soil (ASTM D 424-59).
 - PI - Plasticity Index, numerical difference between the liquid limit (LL) and the plastic limit (PL) indicating the range of moisture content within which a soil-water mixture is plastic.
 - NP - Nonplastic.
- F. USCS - Unified Soil Classification Symbols are given here; see Table II-2-1 in Section 2.0, "Boring Logs", for complete details of USC system.

G. In Situ - Presents results of tests on drive and Pitcher samples.

Dry Unit Weight - indicates dry unit weight of soil determined as per ASTM D 2937-71.

Moisture Content - weight of water reported in percent of dry weight of soil sample (ASTM D 2216-71).

Saturation - the degree of saturation in a soil sample is defined as the ratio (in percent) of the volume of water to the volume of all voids in the soil.

Void Ratio - the numerical ratio of the volume of voids to the volume of solids in a soil specimen.

H. Compacted - Indicates results of laboratory maximum dry density and optimum moisture content test as per ASTM D 1557-70.

I. Specific Gravity of Solids (ASTM D 854-58) - Indicates the ratio of 1) the weight in air of a given volume of soil solids at a stated temperature, to 2) the weight in air of an equal volume of distilled water at a stated temperature.

J. Triaxial - The triaxial compression tests were performed in accordance with the procedures of ASTM D 2850-70. The following explanations and definitions apply.

Triaxial Compression Test - a cylindrical specimen of soil is surrounded by a fluid in a pressure chamber and subjected to an isotropic pressure. An additional compressive load is then applied, directed along the axis of the specimen called the axial load.

Consolidated-Drained (CD) Test - a triaxial compression test in which the soil was first consolidated under an all-around confining stress (test chamber pressure) and was then compressed (and hence sheared) by increasing the vertical stress. "Drained" indicates that excess pore water

pressure generated by strains is permitted to dissipate by the free movement of pore water during consolidation and compression.

Consolidated-Undrained (CU) Test - a triaxial compression test in which essentially complete consolidation under the confining (chamber) pressure is followed by a shear test at constant water content.

Confining Pressure (σ_3) - the isotropic chamber pressure applied to the soil specimen during consolidation and compression.

Maximum Deviator Stress ($\sigma_1 - \sigma_3$) - the difference between the major and minor principal stresses in the specimen at failure. The major principal stress on the specimen is equal to the unit axial load plus the chamber pressure, and the minor principal stress on the specimen is equal to the chamber pressure.

Strain Rate - axial strain, ϵ , at a given stress level is defined as the ratio of the change in length (ΔL) of the specimen to the original length of the specimen (L_0). The rate of strain was controlled during the test so that this ratio increased at equal increments for each minute of testing.

Back Pressure - pressure in excess of atmospheric applied to the pore water of a soil sample. Back pressure is usually applied to 1) increase saturation of the sample, or 2) simulate the actual in situ pressure regime.

- K. Unconfined Compression - Test procedures were as described in ASTM D 2166-66. Unconfined compressive strength is defined as the load per unit area at which an unconfined prismatic or cylindrical specimen of soil will fail in a simple compression test. In these methods, unconfined compressive strength is taken as the maximum load attained per unit area or the load per unit area at 20 percent axial strain, whichever occurred first during the performance of a test.
- L. Direct Shear - The procedures of ASTM D 3080-72 were followed for direct shear testing. In this test, soil under an

applied normal load is stressed to failure by moving one section of the soil container (shear box) relative to the other section. Normal stress is the value of load per unit area acting perpendicular to the plane of shearing. Maximum shear strength is defined as the maximum resistance (ksf) of a soil to shearing (tangential) stresses.

- M. Consolidation (ASTM D 2435-70) - A consolidation test is a test in which a cylindrical soil specimen is laterally confined in a ring and compressed between porous plates. The term "consolidation", as used here, indicates the gradual reduction in volume of the soil mass resulting from an increase in compressive stress (axial load per unit area).
- N. Chemical - The chemical tests performed on soil samples included: pH; water soluble sodium, chloride, sulphate, calcium; and calcium carbonate content. pH is an index of the acidity or alkalinity of a soil in terms of the logarithm of the reciprocal of the hydrogen ion concentration. ASTM test procedure designations for these chemical tests are included in the list on the first page of these Explanations.
- O. CBR - California Bearing Ratio (CBR) is the ratio (in percent) of the resistance to penetration developed by a sub-grade soil to that developed by a standard crushed-rock base material. The procedures for conducting a CBR test were as outlined in ASTM D 1883-73. The materials tested

for CBR were also analyzed for particle-size distribution (ASTM D 422-63) and compaction characteristics (ASTM D 1557-70). The term "percentage of maximum density" indicates the ratio (as a percentage) of the compacted sample dry unit weight to maximum dry density obtained in the laboratory from ASTM D 1557-70, "Moisture-Density Relations of Soils Using 10-Pound (4.5-kg) Hammer and 18-inch (457-mm) Drop."

ACTIVITY NUMBER	SAMPLE NUMBER (a)	SAMPLE INTERVAL		PERCENT FINER BY WEIGHT										
				STANDARD SIEVE OPENING						U S STANDARD SIEVE				
				BLDRS	COBBLES		GRAVEL			SAND				
		FEET	METERS	24"	12"	6"	3"	1½"	¾"	3/8"	4	10	40	100
MD-B-1	D-2	1.7 - 2.5	0.52 - 0.76											
	D-4	4.2 - 5.0	1.28 - 1.52							100	97	90	51	23
	D-7	8.2 - 9.0	2.50 - 2.74											
	D-9	15.2 - 16.0	4.63 - 4.88					100	91	86	75	62	29	11
	D-11	22.2 - 23.0	6.77 - 7.01						100	93	85	68	26	12
	D-12	28.2 - 29.0	8.60 - 8.84											
	D-13	32.2 - 33.0	9.81 - 10.06											
	D-14	37.2 - 38.0	11.34 - 11.58					100	90	82	72	60	27	12
	D-15	41.2 - 42.0	12.56 - 12.80											
	D-16	45.2 - 46.0	13.78 - 14.02											
	P-17	49.6 - 50.2	15.12 - 15.30								100	97	45	14
	P-17	49.6 - 50.2	15.12 - 15.30											
MD-B-2	D-2	1.5 - 2.3	0.46 - 0.70											
	D-3	3.7 - 4.5	1.13 - 1.37						100	78	65	51	30	18
	D-4	6.2 - 7.0	1.89 - 2.13						100	87	75	63	48	35
	D-5	10.2 - 11.0	3.11 - 3.35											
	D-6	15.2 - 16.0	4.63 - 4.88											
	D-7	20.2 - 21.0	6.16 - 6.40											
	D-8	25.2 - 26.0	7.68 - 7.92					100	98	94	81	63	23	13
	D-9	30.2 - 31.0	9.20 - 9.45											
	D-10	35.2 - 36.0	10.73 - 10.97											
	D-11	40.2 - 41.0	12.25 - 12.50					100	92	86	82	77	56	39
D-13	50.2 - 51.0	15.30 - 15.54												
MD-B-3	P-1	1.7 - 2.5	0.52 - 0.76											100
	P-4	6.2 - 7.0	1.89 - 2.13										100	98
	P-4	6.2 - 7.0	1.89 - 2.13											
	P-7	10.5 - 11.1	3.20 - 3.38											
	P-7	10.5 - 11.1	3.20 - 3.38											100
	P-7	11.1 - 11.7	3.38 - 3.57											
	P-8	15.0 - 15.8	4.57 - 4.82								100	98	93	72
	P-9	19.5 - 20.3	5.94 - 6.19											
	P-10	24.1 - 24.9	7.35 - 7.59											
	P-10	24.9 - 25.5	7.59 - 7.77											
	P-11	29.7 - 30.5	9.05 - 9.30									100	60	36
	P-11	29.7 - 30.5	9.05 - 9.30									100	78	36
	P-12	36.2 - 36.8	11.03 - 11.22											
	P-12	36.2 - 36.8	11.03 - 11.22									100	97	90
	P-13	40.2 - 41.0	12.25 - 12.50											
	P-13	41.0 - 41.8	12.50 - 12.74											
P-14	45.0 - 45.8	13.72 - 13.96												
P-14	45.0 - 45.8	13.72 - 13.96										100	80	

NOTES:

(a) Sample types

SS - Standard split spoon

P - Pitcher

D - Fugro Drive

B, b - Bulk

(b) NP - Not Plastic

(c) USCS - Unified Soil Classification System

(d) * Indicates that test has been performed
and results are included in this report

											SC	107.2	1717	8.9	42.3	0.57	
10	97	90	51	23	16						SC	103.1	1650	10.8	46.1	0.63	
											SC	113.5	1818	4.7	26.0	0.49	
6	75	62	29	11	7						SP-SM	117.8	1887	9.5	59.9	0.43	
3	85	68	26	12	9						SW-SM	112.5	1802	6.4	34.9	0.50	
											SW-SM	110.4	1767	5.6	28.7	0.53	
											SW-SM	111.7	1789	4.9	28.8	0.51	
2	72	60	27	12	8						SP-SM	118.6	1900	8.9	57.0	0.42	
											SP-SM	109.7	1757	5.6	28.0	0.54	
											SM	109.	1754	17.8	89.2	0.54	
	100	97	45	14	9						SW-SM	109.6	1756	11.1	55.8	0.54	
											SW-SM	103.0	1650	7.9	33.4	0.64	
											SM	89.8	1439	7.5	23.1	0.88	
78	65	51	30	18	13					NP	SM	116.3	1863	4.9	29.9	0.45	
87	75	63	49	35	28			22	18	4	SM-SQ	114.7	1837	7.9	45.2	0.47	
										NP	SM	103.9	1664	5.1	22.1	0.62	
											SP	110.6	1772	8.0	41.6	0.52	
											SM	110.8	1775	9.9	51.2	0.52	
94	61	63	23	13	10						SW-SM	111.1	1780	8.4	43.9	0.52	
											SM	117.9	1889	7.0	43.9	0.43	
											SP	117.2	1878	9.3	57.5	0.44	
86	82	77	56	39	31						SM	112.8	1807	10.3	63.0	0.49	
											SP	113.8	1823	10.3	58.1	0.48	
				100	99			50	28	22	CH	57.3	918	18.6	25.9	1.94	
				100	98	97		61	35	26	MH	79.2	1269	22.4	53.8	1.13	
											MH	93.1	1491	22.0	73.4	0.81	
											CH	114.7	1837	10.6	60.9	0.47	
				100	99			56	26	30	CH	83.8	1342	27.0	72.0	1.01	
											CH	94.4	1512	22.1	76.1	0.78	
	100	98	93	72	38					NP	SM	105.0	1682	8.7	38.7	0.61	
											SM	95.7	1533	11.5	40.8	0.76	
											SM	106.9	1713	13.9	65.1	0.58	
											SM	106.6	1708	18.9	88.1	0.58	
		100	60	38	33						SM	98.7	1581	13.4	51.4	0.71	
		100	78	39	35						SM	103.0	1650	11.6	49.0	0.64	
											ML	102.5	1642	22.9	96.6	0.64	
		100	97	96	95	52	20	46	28	18	ML	85.3	1367	32.1	88.9	0.97	
								31	19	12	CL	92.4	1480	21.5	70.6	0.82	
											CL	99.3	1591	24.9	96.7	0.70	
											CL	100.1	1604	22.8	90.1	1.00	

28.0	0.54											
89.2	0.54											
55.8	0.54											
33.4	0.64							*				
23.1	0.88											
29.9	0.45											
45.2	0.47						*					
22.1	0.62									*		
41.6	0.52											
51.2	0.52											
43.9	0.52							*				
43.9	0.43											
57.5	0.44											
63.0	0.49							*				
58.1	0.48											
25.9	1.94											
53.8	1.13											
73.4	0.81						*					
60.9	0.47								*			
72.0	1.01					*					*	
76.1	0.78					*						
38.7	0.61											
40.8	0.76											
65.1	0.58											
88.1	0.58											
51.4	0.71							*				
49.0	0.64											
66.6	0.84								*			

ACTIVITY NUMBER	SAMPLE NUMBER (a)	SAMPLE INTERVAL		PERCENT FINER BY WEIGHT										
				STANDARD SIEVE OPENING							U S STANDARD SIEVE NO.			
				BLORS.	COBBLES		GRAVEL			SAND				
		FEET	METERS	24"	12"	6"	3"	1½"	3/4"	3/8"	4	10	40	100
MD-B-3	P-15	50.2 - 50.7	15.30 - 15.45											
	P-15	50.8 - 51.6	15.48 - 15.73									100	92	83
	P-15	51.6 - 52.5	15.73 - 16.00											
	P-16	60.0 - 60.8	18.29 - 18.53									100	95	41
	P-16	60.8 - 61.5	18.53 - 18.75											
	P-17	70.0 - 70.8	21.34 - 21.58											
	P-18	80.0 - 80.8	24.38 - 24.63											
	P-19	91.0 - 91.8	27.74 - 27.98											
	P-20	100.6 - 101.4	30.66 - 30.91											
MD-B-4	P-1	1.0 - 1.5	0.30 - 0.46											
	P-2	3.5 - 4.3	1.07 - 1.31											
	D-3	6.2 - 7.0	1.89 - 2.13											
	P-4	9.0 - 9.8	2.74 - 2.99											
	P-5	15.1 - 16.0	4.60 - 4.88						100	98	94	88	79	68
	P-5	16.0 - 17.0	4.88 - 5.18						100	95	81	68	53	34
	P-6	20.3 - 21.6	6.34 - 6.58					100	95	92	75	60	45	29
	D-7	25.2 - 26.0	7.68 - 7.92											
	P-8	29.8 - 30.6	9.08 - 9.33											
	D-9	35.2 - 36.0	10.73 - 10.97						100	97	88	77	45	26
	D-10	40.2 - 41.0	12.25 - 12.50											
	P-11	45.3 - 46.1	13.81 - 14.05											
	D-12	51.2 - 52.0	15.61 - 15.85											
	D-13	60.2 - 61.0	18.35 - 18.59								100	99	90	71
	D-14	70.2 - 71.0	21.40 - 21.64						100	97	91	82	65	48
	D-15	80.2 - 81.0	24.44 - 24.69											
	D-16	91.2 - 92.0	27.80 - 28.04											
	P-17	102.1 - 103.0	31.12 - 31.39											
	P-18	120.3 - 121.1	36.67 - 36.91						100	97	77	60	28	7
	D-20	159.2 - 160.0	48.52 - 48.77											
MD-B-5	D-1	0.2 - 1.0	0.06 - 0.30											
	D-2	3.2 - 4.0	0.98 - 1.22											
	D-3	6.2 - 7.0	1.89 - 2.13						100	96	82	56	20	11
	P-4	10.9 - 11.7	3.32 - 3.57							100	99	96	63	31
	P-5	15.2 - 16.0	4.63 - 4.88											
	P-6	20.2 - 21.0	6.16 - 6.40					100	89	68	58	45	19	10
	D-7	25.2 - 26.0	7.68 - 7.92					100	92	71	56	39	17	11
	D-8	30.2 - 31.0	9.20 - 9.45											
	D-9	35.2 - 36.0	10.73 - 10.97											
	D-10	40.2 - 41.0	12.25 - 12.50											
	P-11	45.0 - 45.8	13.72 - 13.96											
	P-13	60.2 - 61.0	18.35 - 18.59											

NOTES:

(a) Sample types

SS - Standard split spoon

P - Pitcher

D - Fugro Drive

B, b - Bulk

(b) NP - Not Plastic

(c) USCS - Unified Soil Classification System

(d) * Indicates that test has been performed
and results are included in this report

BY WEIGHT							ATTERBERG LIMITS (b)			USCS (c)	IN-SITU				COMPACTED			SPECIFIC GRAVITY OF SOLIDS	
U S STANDARD SIEVE NO.				PARTICLE SIZE (mm)							DRY UNIT WEIGHT		MOISTURE CONTENT (%)	SATURATION (%)	VOID RATIO	MAXIMUM DRY DENSITY			OPTIMUM MOISTURE (%)
SAND				SILT OR CLAY							(pcf)	(kg/m³)				(pcf)	(kg/m³)		
4	10	40	100	200	.005	.001	LL	PL	PI										
										ML	85.6	1371	35.0	101.5	0.90				
	100	92	83	72	26	7	33	27	6	ML	88.5	1418	29.3	87.6	0.84			2.61	
										ML	91.2	1461	28.2	93.2	0.79				
	100	95	41	12						SP-SM	112.4	1801	16.9	92.0	0.50				
										SP-SM	103.9	1665	21.1	91.7	0.62				
										GP	109.6	1756	12.0	60.3	0.54				
										SM	97.5	1562	26.6	98.7	0.73				
										SM	106.7	1709	16.4	76.7	0.58				
										SM	105.8	1695	16.7	76.1	0.59				
										SM	94.5	1514	12.3	42.3	0.78				
										SM	86.7	1389	18.9	54.1	0.94				
										SP-SM	106.7	1709	4.6	21.6	0.58				
										SM	86.0	1378	12.5	35.3	0.96				
94	88	79	68	57						ML	109.1	1748	5.8	28.8	0.55				
81	68	53	34	25						SM	109.2	1749	9.1	45.3	0.54				
75	60	45	29	20					NP	SM	112.4	1801	9.2	49.9	0.50				
										SM	110.2	1765	5.9	29.9	0.53				
										SM	105.4	1689	15.4	69.5	0.60				
88	77	45	26	19						SM	112.9	1809	5.2	28.6	0.49				
										SM	113.2	1813	8.1	47.8	0.49				
									NP	SM	104.9	1680	14.7	65.7	0.61				
										GP-GM	117.8	1887	7.8	49.2	0.43				
100	99	90	71	58						ML	104.8	1679	12.1	53.7	0.61				
91	82	65	48	36						SM	110.5	1770	9.6	49.7	0.52				
										SM	115.3	1847	14.0	81.8	0.46				
										SM	111.3	1783	11.0	57.6	0.51				
										SP-SM	121.2	1942	9.4	65.0	0.39				
77	60	28	7	5						SP-SM	123.4	1977	13.2	97.3	0.37				
										SM	111.5	1786	14.1	74.4	0.51				
										SM	110.5	1770	8.7	44.7	0.52				
										SM	106.5	1706	12.5	58.0	0.58				
82	56	20	11	6						SW-SM	104.5	1674	7.6	33.8	0.61				
99	96	63	31	22						SM	110.3	1767	15.3	78.2	0.53				
										SM	108.9	1745	11.8	58.2	0.55				
58	45	19	10	8						SP-SM	109.7	1757	9.2	46.6	0.54				
56	39	17	11	8						SW-SM	119.5	1914	4.3	28.6	0.41				
										SP-SM	110.5	1770	9.1	47.0	0.53				
										SP-SM	120.3	1927	8.8	59.4	0.40				
										SP-SM	121.6	1948	9.4	66.0	0.39				
										SM	108.6	1740	17.6	85.9	1.55				
										SM	114.7	1837	14.1	81.4	0.45				

ORG (b)	USCS (c)	IN-SITU					COMPACTED			SPECIFIC GRAVITY OF SOLIDS	TRIAxIAL (d)	UNCONFINED COMPRESSION	DIRECT SHEAR	CONSOLIDATION	CHEMICAL	CBR
		DRY UNIT WEIGHT		MOISTURE CONTENT (%)	SATURATION (%)	VOID RATIO	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)							
		(pcf)	(kg/m³)				(pcf)	(kg/m³)								
	ML	85.6	1371	35.0	101.5	0.90						*				
6	ML	88.5	1418	29.3	87.6	0.84				2.61						
	ML	91.2	1461	28.2	93.2	0.79										
	SP-SM	112.4	1801	16.9	92.0	0.50										
	SP-SM	103.9	1665	21.1	91.7	0.62										
	GP	109.6	1756	12.0	60.3	0.54										
	SM	97.5	1562	26.6	98.7	0.73										
	SM	106.7	1709	16.4	76.7	0.58										
	SM	105.8	1695	16.7	76.1	0.59										
	SM	94.5	1514	12.3	42.3	0.78										
	SM	86.7	1389	18.9	54.1	0.94										
	SP-SM	106.7	1709	4.6	21.6	0.58										
	SM	86.0	1378	12.5	35.3	0.96										
	ML	109.1	1748	5.8	28.8	0.55										
	SM	109.2	1749	9.1	45.3	0.54										
NP	SM	112.4	1801	9.2	49.9	0.50										
	SM	110.2	1765	5.9	29.9	0.53										
	SM	105.4	1689	15.4	69.5	0.60										
	SM	112.9	1809	5.2	28.6	0.49							*			
	SM	113.2	1813	8.1	47.8	0.49										
NP	SM	104.9	1680	14.7	65.7	0.61										
	GP-GM	117.8	1887	7.8	49.2	0.43										
	ML	104.8	1679	12.1	53.7	0.61							*			
	SM	110.5	1770	9.6	49.7	0.52										
	SM	115.3	1847	14.0	81.8	0.46										
	SM	111.3	1783	11.0	57.6	0.51										
	SP-SM	121.2	1942	9.4	65.0	0.39										
	SP-SM	123.4	1977	13.2	97.3	0.37										
	SM	111.5	1786	14.1	74.4	0.51										
	SM	110.5	1770	8.7	44.7	0.52										
	SM	106.5	1706	12.5	58.0	0.58										
	SW-SM	104.5	1674	7.6	33.8	0.61										
	SM	110.3	1767	15.3	78.2	0.53										
	SM	108.9	1745	11.8	58.2	0.55										
	SP-SM	109.7	1757	9.2	46.6	0.54										
	SW-SM	119.5	1914	4.3	28.6	0.41										
	SP-SM	110.5	1770	9.1	47.0	0.53										
	SP-SM	120.3	1927	8.8	59.4	0.40										
	SP-SM	121.6	1948	9.4	66.0	0.39										
	SM	108.6	1740	17.6	85.9	1.55										
	SM	114.7	1837	14.1	81.4	0.45										

SUMMARY OF LABORATORY TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DND

TABLE
II - 5 - 1
2 OF 10

FURRO NATIONAL INC.

ACTIVITY NUMBER	SAMPLE NUMBER (a)	SAMPLE INTERVAL		PERCENT FINER BY WEIGHT										
				STANDARD SIEVE OPENING							U S STANDARD SIEVE #			
				BLDRS.	COBBLES		GRAVEL				SAND			
		FEET	METERS	24"	12"	6"	3"	1½"	3/4"	3/8"	4	10	40	100
MD-B-5	P-15	80.8 - 81.6	24.63 - 24.87											
	P-16	90.3 - 91.1	27.52 - 27.77											
MD-B-6	D-2	1.7 - 2.5	0.52 - 0.76											
	D-4	4.2 - 5.0	1.28 - 1.52						100	91	80	62	33	18
	D-6	7.7 - 8.5	2.35 - 2.59											
	D-8	16.2 - 17.0	4.94 - 5.18					100	87	71	57	39	20	12
	P-9	21.0 - 21.7	6.40 - 6.61							100	99	98	93	85
	P-9	21.0 - 21.7	6.40 - 6.61											
	P-10	28.1 - 28.7	8.56 - 8.75											
	D-11	34.2 - 35.0	10.42 - 10.67											
	D-12	39.2 - 40.0	11.95 - 12.19					100	90	76	60	46	28	19
	D-13	44.2 - 45.0	13.47 - 13.72											
	D-14	49.2 - 50.0	15.00 - 15.24											
MD-B-7	D-1	0.7 - 1.5	0.21 - 0.46											
	D-2	3.7 - 4.5	1.13 - 1.37					100	84	78	71	66	56	47
	D-3	6.2 - 7.0	1.89 - 2.13											
	D-4	10.2 - 11.0	3.11 - 3.35											
	D-5	15.2 - 16.0	4.63 - 4.88											
	D-6	20.2 - 21.0	6.16 - 6.40											
	D-7	25.2 - 26.0	7.68 - 7.92					100	82	68	56	45	26	16
	D-8	30.2 - 31.0	9.20 - 9.45											
	D-9	35.2 - 36.0	10.73 - 10.97											
	D-10	40.7 - 41.5	12.41 - 12.65											
	D-11	45.2 - 46.0	13.78 - 14.02											
	D-12	50.2 - 51.0	15.30 - 15.55					100	88	75	56	40	20	12
MD-B-8	D-1	0.2 - 1.0	0.06 - 0.30											
	D-2	3.2 - 4.0	0.98 - 1.22					100	94	77	67	59	52	41
	D-3	6.2 - 7.0	1.89 - 2.13											
	D-4	10.2 - 11.0	3.11 - 3.35						100	85	69	54	36	28
	D-5	15.2 - 16.0	4.63 - 4.88											
	D-6	20.2 - 21.0	6.16 - 6.40											
	D-7	25.2 - 26.0	7.68 - 7.92											
	D-10	40.2 - 41.0	12.25 - 12.50											
	D-12	50.7 - 51.5	15.45 - 15.70					100	97	77	66	57	47	36
MD-B-9	P-1	0.8 - 1.6	0.24 - 0.49											
	P-2	3.0 - 4.0	0.91 - 1.22											
	P-3	6.0 - 6.6	1.83 - 2.01									100	99	96
	P-4	10.0 - 11.0	3.05 - 3.35									100	99	73
	P-4	10.0 - 11.0	3.05 - 3.35											

NOTES:

(a) Sample types

SS - Standard split spoon

P - Pitcher

D - Fugro Drive

B, b - Bulk

(b) NP - Not Plastic

(c) USCS - Unified Soil Classification System

(d) * Indicates that test has been performed
and results are included in this report

FINER BY WEIGHT								ATTERBERG LIMITS (b)			USCS (c)	IN-SITU					COMPACTED			SPECIFIC GRAVITY OF SOLIDS
U S STANDARD SIEVE NO.						PARTICLE SIZE (mm)						DRY UNIT WEIGHT		MOISTURE CONTENT (%)	SATURATION (%)	VOID RATIO	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)	
	SAND					SILT OR CLAY		(pcf)	(kg/m ³)	(pcf)		(kg/m ³)	(pcf)				(kg/m ³)			
7/8"	4	10	40	100	200	.005	.001	LL	PL	PI										
											SP-SM	114.0	1826	13.2	74.3	0.48				
											Rock	103.8	1663	17.1	74.0	0.62				
											SM	109.1	1748	7.2	35.7	0.54				
91	80	62	33	18	12						SW-SM	109.7	1757	12.5	63.2	0.54				
											SW-SM	113.9	1825	6.4	36.4	0.48				
71	57	39	20	12	9						SW-SM	118.1	1892	6.7	42.4	0.43				
100	99	98	93	85	70						ML	103.7	1661	17.5	75.6	0.63				
											ML	104.7	1677	18.7	83.1	0.61				
											SP-SM	111.0	1778	7.1	37.1	0.52				
											SP-SM	119.6	1916	6.2	40.9	0.41				
76	60	46	28	19	14						SM	125.5	2011	7.3	57.7	0.34				
											SM	120.5	1930	6.8	46.0	0.40				
											SP-SM	122.7	1966	7.3	52.6	0.37				
											SC	104.4	1672	10.3	45.5	0.61				
78	71	66	56	47	38			31	19	12	SC	118.9	1905	7.8	50.6	0.42				
											SC	126.3	2023	5.8	47.1	0.33				
											GP	117.3	1879	6.4	39.8	0.44				
											GP	121.5	1946	4.6	32.0	0.39				
											GP	128.3	2055	2.9	25.1	0.31				
68	56	45	26	16	11						SP-SM	125.9	2017	6.2	49.1	0.34				
											SP-SM	123.3	1975	7.0	51.9	0.37				
											SP	124.2	1990	7.6	57.3	0.36				
											SP	115.9	1857	14.1	84.0	0.45				
											SW-SM	127.6	2044	9.5	80.4	0.32				
75	56	40	20	12	9						SW-SM	129.5	2075	7.9	71.3	0.30				
											SM	88.2	1413	7.2	21.4	0.91				
77	67	59	52	41	28						SM	107.2	1717	8.2	38.7	0.57				
											SP-SM	111.2	1781	12.5	65.5	0.52				
85	69	54	36	28	22						SM	112.2	1797	10.3	55.7	0.50				
											SP-SM	131.3	2103	4.5	43.2	0.28				
											SP-SM	127.2	2038	4.6	38.7	0.33				
											SP-SM	128.1	2052	6.5	56.0	0.32				
											SP-SM	135.6	2172	6.8	75.4	0.24				
77	66	57	47	36	26						SM	132.2	2118	7.4	72.9	0.28				
											SC	81.7	1309	8.7	22.1	1.06				
											SC	105.7	1693	14.6	66.3	0.59				
		100	99	95	85					NP	ML	111.4	1785	17.1	90.5	0.51			2.7	
		100	99	73	50						SM	101.1	1620	11.4	46.1	0.67				
											SM			14.4						

PI	USCS (c)	IN-SITU					COMPACTED			SPECIFIC GRAVITY OF SOLIDS	TRIAxIAL (d)	UNCONFINED COMPRESSION	DIRECT SHEAR	CONSOLIDATION	CHEMICAL	CBR
		DRY UNIT WEIGHT		MOISTURE CONTENT (%)	SATURATION (%)	VOID RATIO	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)							
		(pcf)	(kg/m³)				(pcf)	(kg/m³)								
	SP-SM	114.0	1826	13.2	74.3	0.48										
	Rock	103.8	1663	17.1	74.0	0.62										
	SM	109.1	1748	7.2	35.7	0.54									*	
	SW-SM	109.7	1757	12.5	63.2	0.54										
	SW-SM	113.9	1825	6.4	36.4	0.48										
	SW-SM	118.1	1892	6.7	42.4	0.43										
	ML	103.7	1661	17.5	75.6	0.63										
	ML	104.7	1677	18.7	83.1	0.61										
	SP-SM	111.0	1778	7.1	37.1	0.52										
	SP-SM	119.6	1916	6.2	40.9	0.41										
	SM	125.5	2011	7.3	57.7	0.34										
	SM	120.5	1930	6.8	46.0	0.40										
	SP-SM	122.7	1966	7.3	52.6	0.37										
	SC	104.4	1672	10.3	45.5	0.61										
12	SC	118.9	1905	7.8	50.6	0.42						*				
	SC	126.3	2023	5.8	47.1	0.33										
	GP	117.3	1879	6.4	39.8	0.44									*	
	GP	121.5	1946	4.6	32.0	0.39										
	GP	128.3	2055	2.9	25.1	0.31										
	SP-SM	125.9	2017	6.2	49.1	0.34										
	SP-SM	123.3	1975	7.0	51.9	0.37										
	SP	124.2	1990	7.6	57.3	0.36										
	SP	115.9	1857	14.1	84.0	0.45										
	SW-SM	127.6	2044	9.5	80.4	0.32										
	SW-SM	129.5	2075	7.9	71.3	0.30										
	SM	88.2	1413	7.2	21.4	0.91										
	SM	107.2	1717	8.2	38.7	0.57										
	SP-SM	111.2	1781	12.5	65.5	0.52										
	SM	112.2	1797	10.3	55.7	0.50										
	SP-SM	131.3	2103	4.5	43.2	0.28										
	SP-SM	127.2	2038	4.6	38.7	0.33									*	
	SP-SM	128.1	2052	6.5	56.0	0.32										
	SP-SM	135.6	2172	6.8	75.4	0.24										
	SM	132.2	2118	7.4	72.9	0.28										
	SC	81.7	1309	8.7	22.1	1.06										
	SC	105.7	1693	14.6	66.3	0.59										
NP	ML	111.4	1785	17.1	90.5	0.51				2.73				*		
	SM	101.1	1620	11.4	46.1	0.67						*				
	SM			14.4												

SUMMARY OF LABORATORY TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

TABLE
II-5-1
3 OF 10

FUGRO NATIONAL INC.

ACTIVITY NUMBER	SAMPLE NUMBER (a)	SAMPLE INTERVAL		PERCENT FINER BY WEIGHT										
				STANDARD SIEVE OPENING						U S STANDARD SIEVE				
				BLDRS.	COBBLES		GRAVEL			SAND				
		FEET	METERS	24"	12"	6"	3"	1½"	3/4"	3/8"	4	10	40	100
MD-B-9	P-5	16.0 - 16.6	4.88 - 5.06											
	D-6	20.2 - 21.0	6.16 - 6.40						100	99	98	96	92	75
	P-7	25.0 - 25.6	7.62 - 7.80											
	P-8	31.0 - 31.6	9.45 - 9.63											
	P-8	31.6 - 32.2	9.63 - 9.81							100	99	97	94	92
	P-8	32.2 - 32.8	9.81 - 10.00											
	P-8	32.8 - 33.4	10.00 - 10.18											
	P-9	35.0 - 37.5	10.67 - 11.43									100	95	89
	P-9	36.6 - 37.5	11.16 - 11.43											
	P-10	40.8 - 41.6	12.44 - 12.68											
	P-11	45.6 - 46.3	13.90 - 14.11											
	P-12	50.8 - 51.6	15.48 - 15.73								100	99	95	57
	P-12	51.6 - 52.5	15.73 - 16.00											
	P-13	59.0 - 59.8	17.98 - 18.23											
	P-14	69.0 - 69.8	21.03 - 21.28											
	MD-B-10	P-14	70.6 - 71.5	21.52 - 21.79										
P-15		79.2 - 80.0	24.14 - 24.38											
P-16		89.0 - 89.8	27.13 - 27.37											
P-16		90.6 - 91.5	27.61 - 27.89											
D-17		99.1 - 99.9	30.21 - 30.45											
D-1		0.5 - 1.3	0.15 - 0.40											
D-4		5.2 - 6.0	1.58 - 1.83						100	97	89	74	46	28
D-7		10.2 - 11.0	3.11 - 3.35											
D-8		15.2 - 16.0	4.63 - 4.88					100	76	59	48	38	22	11
P-9		20.4 - 21.5	6.22 - 6.55											
D-10		25.2 - 26.0	7.68 - 7.92					100	96	85	69	53	29	15
P-11		29.8 - 30.6	9.08 - 9.33											
P-12		34.2 - 34.8	10.42 - 10.61						100	99	96	92	81	62
P-12		34.8 - 35.4	10.61 - 10.79											
P-12	35.5 - 35.7	10.82 - 10.88												
P-13	39.0 - 39.8	11.89 - 12.13												
D-14	44.2 - 45.0	13.47 - 13.72												
P-15	49.2 - 50.0	15.00 - 15.24												
P-15	50.8 - 51.2	15.48 - 15.61												
D-16	60.2 - 61.0	18.35 - 18.59							100	99	98	93	17	
P-17	69.1 - 69.6	21.06 - 21.21								100	98	98	99	
P-17	69.7 - 70.2	21.24 - 21.40												
P-17	70.3 - 70.8	21.43 - 21.58												
P-17	70.8 - 71.4	21.58 - 21.76												
D-18	80.2 - 81.0	24.44 - 24.69										100	98	99
D-19	89.2 - 90.0	27.19 - 27.43												
D-20	99.2 - 100.0	30.22 - 30.48											100	3

NOTES:

(a) Sample types

SS - Standard split spoon

P - Pitcher

D - Fugro Drive

B,b - Bulk

(b) NP - Not Plastic

(c) USCS - Unified Soil Classification System

(d) * Indicates that test has been performed
and results are included in this report

	SM	102.8	1647	23.1
	SP-SM	119.1	1908	16.2
26	CH	83.2	1333	35.6
	CH	99.6	1596	26.0
	SP	119.5	1914	11.3
	SM	79.3	1270	38.7
	SM	80.6	1291	37.1
	SP	119.3	1911	11.8
	SM	96.8	1551	6.2
	SM	108.4	1737	11.1
	SP-SM	116.9	1873	4.9
	GP-GM	126.3	2023	6.3
	SM	98.3	1575	15.5
	SW-SM	111.2	1781	10.1
	SM	124.9	2001	4.3
13	SC	103.2	1653	18.4
	SC	98.9	1584	19.3
	SC	112.8	1807	13.6

110.5	1770	19.4	99.7	0.52								
96.4	1544	25.8	93.2	0.75								
105.1	1683	21.9	98.3	0.60								
102.8	1647	23.1	97.7	0.64							*	
119.1	1908	16.2	100.0	0.41								
83.2	1333	35.6	93.7	1.03								
99.6	1596	26.0	100.0	0.69								
119.5	1914	11.3	74.7	0.41								
79.3	1270	38.7	92.8	1.12								
80.6	1291	37.1	92.0	1.09								
119.3	1911	11.8	77.2	0.41								
96.8	1551	6.2	22.6	0.74								
108.4	1737	11.1	54.0	0.55								
116.9	1873	4.9	30.3	0.44								
126.3	2023	6.3	51.1	0.33								
98.3	1575	15.5	58.6	0.71								
111.2	1781	10.1	52.8	0.52							*	
124.9	2001	4.3	33.4	0.35								
103.2	1653	18.4	78.5	0.63				*				
98.9	1584	19.3	74.2	0.70				*				
112.8	1807	13.6	74.9	0.49								*
107.9	1729	15.5	74.6	0.56								
99.2	1589	25.9	99.9	0.70								
105.7	1693	19.8	90.1	0.59								
102.9	1648	22.9	97.1	0.64								
106.8	1711	20.1	93.8	0.58							*	
101.0	1618	23.6	95.3	0.67				*				
99.9	1600	23.8	93.4	0.69				*				
100.1	1604	23.2	91.7	0.69				*				
99.4	1592	26.4	103.3	0.69								*
86.5	1386	34.7	99.0	0.95					*			
134.0	2147	8.7	91.8	0.26								
104.4	1672	22.5	98.8	0.61								

ACTIVITY NUMBER	SAMPLE NUMBER (a)	SAMPLE INTERVAL		PERCENT FINER BY WEIGHT										
				STANDARD SIEVE OPENING						U S STANDARD SIEVE NO.				
				BLDRS.	COBBLES		GRAVEL				SAND			
		FEET	METERS	24"	12"	6"	3"	1½"	¾"	3/8"	4	10	40	100
MD-B-11	P-1	1.0 - 1.8	0.30 - 0.55											
	D-2	3.7 - 4.5	1.13 - 1.37						100	93	80	66	18	5
	D-3	6.2 - 7.0	1.89 - 2.13											
	D-4	10.7 - 11.5	3.26 - 3.51											
	D-5	15.2 - 16.0	4.63 - 4.88											
	P-6	20.2 - 21.0	6.16 - 6.40											
	P-7	24.0 - 24.8	7.32 - 7.56						100	98	96	91	71	34
	P-8	29.0 - 31.1	8.84 - 9.48											
	P-9	35.4 - 36.2	10.79 - 11.03											
	P-10	40.0 - 40.8	12.19 - 12.44											
	D-11	45.1 - 45.9	13.75 - 13.99											
	P-12	50.2 - 50.5	15.30 - 15.39									100	99	67
	P-12	50.5 - 51.0	15.39 - 15.54											
	D-13	60.2 - 61.0	18.35 - 18.59											
	D-14	70.2 - 71.0	21.40 - 21.64											
	D-15	80.2 - 81.0	24.44 - 24.69											
	P-16	89.2 - 90.0	27.19 - 27.43							100	97	90	69	37
	P-17	100.0 - 100.8	30.48 - 30.72											
	P-19	120.0 - 120.8	36.58 - 36.82											
	P-20	140.5 - 141.3	42.82 - 43.07											
	D-21	159.2 - 160.0	48.52 - 48.77											
MD-B-12	P-1	0.5 - 1.3	0.15 - 0.40											
	P-2	3.3 - 4.1	1.01 - 1.25											
	P-2	4.1 - 4.9	1.25 - 1.49											
	D-3	6.7 - 7.5	2.04 - 2.29											
	D-4	10.2 - 11.0	3.11 - 3.35							100	95	81	36	18
	D-5	15.2 - 16.0	4.63 - 4.88											
	D-6	20.2 - 21.0	6.16 - 6.40											
	D-7	25.2 - 26.0	7.68 - 7.92					100	93	87	69	46	18	10
	D-8	30.2 - 31.0	9.20 - 9.45											
	D-9	35.2 - 36.0	10.73 - 10.97											
	D-10	40.2 - 41.0	12.25 - 12.50											
	D-11	45.2 - 46.0	13.78 - 14.02											
MD-B-13	D-12	50.2 - 51.0	15.30 - 15.54											
	P-1	0.9 - 1.7	0.27 - 0.52											
	D-2	3.7 - 4.5	1.13 - 1.37											
	P-3	6.5 - 7.3	1.98 - 2.23						100	93	81	73	56	28
	P-4	10.1 - 10.9	3.08 - 3.32								100	98	79	47
	D-5	15.2 - 16.0	4.63 - 4.88											
	D-6	20.2 - 21.0	6.16 - 6.40											
	P-8	30.2 - 31.0	9.20 - 9.45											

NOTES:

(a) Sample types

SS - Standard split spoon

P - Pitcher

D - Fugro Drive

B, b - Bulk

(b) NP - Not Plastic

(c) USCS - Unified Soil Classification System

(d) * Indicates that test has been performed
and results are included in this report

					SM
					SP
					SP
					SP
					SM
					SM
					SM
					SM
					SP-SM
					SM
					SM
					SP-SM
					SM
					SM
					SM
					SM
					SM
					SM
					SM
					SM
					SM
					SM
					SM
				NP	SW-SM
					SP-SM
					SM
					SW-SM

TERBERG PTS (b)		USCS (c)	IN-SITU					COMPACTED			SPECIFIC GRAVITY OF SOLIDS	TRIAXIAL (d)	UNCONFINED COMPRESSION	DIRECT SHEAR	CONSOLIDATION	CHEMICAL	CBR
			DRY UNIT WEIGHT		MOISTURE CONTENT (%)	SATURATION (%)	VOID RATIO	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)							
			(pcf)	(kg/m ³)				(pcf)	(kg/m ³)								
		SM	96.1	1540	4.9	17.4	0.75										
		SP	109.0	1746	8.0	39.7	0.55										
		SP	115.2	1846	6.2	36.3	0.46										
		SP	116.7	1870	7.0	42.6	0.44										
		SP	122.7	1966	6.2	45.3	0.37									*	
		SM	113.1	1812	13.1	68.6	0.51										
		SM	102.7	1645	8.1	34.1	0.64										
		SM	112.8	1807	7.7	42.4	0.49										
		SM	113.3	1815	12.1	67.0	0.49										
		SM	100.1	1604	16.5	65.3	0.68										
		SP-SM	113.8	1823	11.0	61.9	0.48										
		SM	100.3	1607	27.6	100.0	0.68										
		SM	114.9	1841	11.3	65.4	0.47										
		SP-SM	121.9	1953	12.7	89.8	0.38										
		SM	122.3	1954	10.1	72.3	0.38										
		SM	115.9	1857	7.4	43.8	0.45										
		SM	105.1	1684	17.3	77.8	0.60										
		SM	107.4	1721	15.4	73.1	0.57										
		SM	117.9	1889	13.9	87.3	0.43										
		SM	104.1	1668	21.1	92.1	0.62										
		SM	112.4	1801	18.3	99.3	0.50										
		SM	96.8	1551	5.5	19.9	0.74										
		SM	94.7	1517	13.8	48.0	0.78										
		SM	109.3	1751	11.6	58.1	0.54										
		SM	117.3	1879	7.1	43.7	0.44									*	
	NP	SW-SM	102.9	1648	8.2	34.8	0.64						*				
		SP-SM	113.1	1812	5.9	32.3	0.49										
		SM	118.9	1905	10.7	69.4	0.42										
		SW-SM	112.2	1797	7.2	38.7	0.50							*			
		SP-SM	112.8	1807	12.6	68.7	0.49										
		SP-SM	121.1	1940	7.0	48.3	0.39										
		SP	115.8	1855	7.7	45.6	0.46										
		SM	95.2	1525	17.1	60.1	0.77										
		SM	121.6	1948	8.9	62.4	0.39										
		SM	96.4	1544	9.2	33.4	0.75										
		SP-SM	116.3	1863	6.0	35.9	0.45										
		SM	101.2	1621	9.4	38.2	0.67										
		SM	106.5	1706	9.4	44.0	0.58							*			
		SP	114.9	1841	5.4	31.2	0.47									*	
		SP	113.9	1825	5.4	30.8	0.48										
		SP	109.7	1757	6.5	33.0	0.54										

SUMMARY OF LABORATORY TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - 000

TABLE
II-5-1
5 OF 10

FURRO NATIONAL INC.

AFV-01

ACTIVITY NUMBER	SAMPLE NUMBER (a)	SAMPLE INTERVAL		PERCENT FINER BY WEIGHT										
				STANDARD SIEVE OPENING						U S STANDARD SIEVE				
				BLDRS.	COBBLES		GRAVEL			SAND				
		FEET	METERS	24"	12"	8"	3"	1½"	3/4"	3/8"	4	10	40	100
MD-B-13	D-9	35.2 - 36.0	10.73 - 10.97											
	P-10	40.2 - 40.8	12.25 - 12.44							100	97	83	59	46
	P-10	40.2 - 40.8	12.25 - 12.44											
	D-11	45.2 - 46.0	13.78 - 14.02					100	97	78	62	44	23	13
	P-12	50.0 - 50.8	15.24 - 15.48											
	P-13	60.0 - 62.5	18.29 - 19.05						100	92	76	57	26	18
	P-13	60.5 - 61.3	18.44 - 18.68											
	P-13	61.3 - 62.1	18.68 - 18.93											
	P-14	71.1 - 72.0	21.67 - 21.95											
	D-15	79.2 - 80.0	24.14 - 24.38											
	P-16	90.0 - 90.8	27.43 - 27.68											
	D-17	99.2 - 100.0	30.24 - 30.48											
MD-B-14	D-1	0.2 - 1.0	0.06 - 0.30											
	D-2	3.2 - 4.0	0.98 - 1.22											
	D-3	6.2 - 7.0	1.89 - 2.13											
	D-4	10.2 - 11.0	3.11 - 3.35							100	97	93	78	67
	D-5	15.2 - 16.0	4.63 - 4.88											
	P-6	20.0 - 21.6	6.10 - 6.58											
	D-7	25.2 - 26.0	7.68 - 7.92				100	72	68	60	55	45	27	17
	D-8	30.2 - 31.0	9.20 - 9.45											
	D-9	35.2 - 36.0	10.73 - 10.97											
	D-10	40.2 - 41.0	12.25 - 12.50											
	D-11	45.2 - 46.0	13.78 - 14.02						100	98	92	85	71	60
	D-12	50.0 - 50.9	15.24 - 15.51					100	88	76	63	51	31	20
	P-13	58.0 - 58.5	17.68 - 17.83											
	D-14	59.2 - 60.0	18.04 - 18.29											
	D-15	70.2 - 71.0	21.40 - 21.64											
	D-16	80.2 - 81.0	24.44 - 24.69											
	P-17	89.0 - 89.8	27.13 - 27.37											
	D-18	100.2 - 101.0	30.54 - 30.78											
MD-B-15	P-1	0.0 - 0.8	0.00 - 0.24											
	P-1	1.6 - 2.5	0.49 - 0.76											
	P-2	3.8 - 4.5	1.16 - 1.37											
	P-3	6.0 - 6.8	1.83 - 2.07											
	D-4	10.2 - 11.0	3.11 - 3.35							100	97	79	20	6
	P-5	15.3 - 16.1	4.66 - 4.91											
	P-6	19.0 - 19.8	5.79 - 6.04											
	P-7	24.2 - 24.8	7.38 - 7.56											10
	P-7	24.8 - 25.4	7.56 - 7.74											
	P-7	25.4 - 26.0	7.74 - 7.92											
	P-7	26.0 - 26.5	7.92 - 8.08											

NOTES:

(a) Sample types

SS - Standard split spoon

P - Pitcher

D - Fugro Drive

B,b - Bulk

(b) NP - Not Plastic

(c) USCS - Unified Soil Classification System

(d) * Indicates that test has been performed
and results are included in this report

												SM	106.1	1700	16.9	77.9	0.59		
												SP-SM	117.9	1889	10.2	64.0	0.43		
												SP	101.2	1621	12.1	49.3	0.66		
												SM	122.2	1958	10.8	77.0	0.38		
												SM	103.5	1658	7.9	33.9	0.63		
												SM	109.1	1748	6.6	32.8	0.54		
												SP-SM	118.2	1894	6.9	43.6	0.43		
	100	97	93	78	67	62			31	22	9	CL	104.3	1671	17.6	77.4	0.62		
											NP	SM	126.2	2022	11.7	94.6	0.34		
												SM	120.2	1926	12.4	83.2	0.40		
68	60	55	45	27	17	13						GM	95.3	1527	9.0	31.8	0.77		
												GM	120.9	1937	13.4	92.3	0.39		
												SM	116.9	1873	6.8	41.8	0.44		
												SM	122.0	1954	7.5	52.8	0.38		
100	98	92	85	71	60	52					NP	ML	107.5	1722	10.4	49.3	0.57		
88	76	63	51	31	20	16						SM	128.0	2051	8.9	76.4	0.32		
												SM	134.4	2153	7.5	80.2	0.25		
												SM	120.7	1934	8.6	58.3	0.40		
												SM	124.5	1994	10.1	77.2	0.35		
												SP-SM	121.6	1948	13.4	93.9	0.39		
												SP-SM	120.0	1922	13.4	89.6	0.40		
											NP	SM	124.6	1996	12.3	94.2	0.35		
												CH	90.9	1456	20.8	66.0	0.85		

0.43						
0.31						
0.42						
0.35						
0.72						
0.47						
0.64						*
0.38						*
0.59						
0.43						
0.66						
0.38						
0.63						
0.54						
0.43						
0.62						*
0.34						
0.40						
0.77						
0.39						
0.44						
0.38						
0.57						*
0.32						
0.25						
0.40						
0.35						
0.39						
0.40						
0.35						
0.85						
0.71						

ACTIVITY NUMBER	SAMPLE NUMBER (a)	SAMPLE INTERVAL		PERCENT FINER BY WEIGHT										
				STANDARD SIEVE OPENING							U S STANDARD SIEVE			
				BLDRS.	COBBLES		GRAVEL			SAND				
		FEET	METERS	24"	12"	6"	3"	1½"	3/4"	3/8"	4	10	40	100
MD-B-15	P-8	29.0 - 29.7	8.84 - 9.05											
	D-9	35.2 - 36.0	10.73 - 10.97											
	P-10	40.5 - 41.3	12.34 - 12.59										100	99
	P-10	40.5 - 41.3	12.34 - 12.59											
	D-11	44.2 - 43.0	13.47 - 13.11											
	P-12	50.8 - 51.5	15.48 - 15.70											
	P-13	60.0 - 60.6	18.29 - 18.47											
	P-14	70.1 - 70.9	21.37 - 21.61											
	P-15	80.5 - 81.3	24.54 - 24.78											
	P-16	89.0 - 89.6	27.13 - 27.31											
	P-16	90.8 - 91.5	27.68 - 27.89											100
	P-16	90.6 - 90.7	27.61 - 27.65											
	P-17	100.6 - 101.5	30.66 - 30.94											
	P-18	119.0 - 119.8	36.27 - 36.52								100	98	82	57
	P-19	140.8 - 141.6	42.92 - 43.16											
	D-20	159.2 - 160.0	48.52 - 48.77											
BL-B-7	P-1	0.8 - 1.6	0.24 - 0.49											
	D-2	3.7 - 4.5	1.13 - 1.37											
	P-3	5.0 - 5.8	1.52 - 1.77											
	P-4	7.8 - 8.6	2.38 - 2.62											
	P-5	10.8 - 11.0	3.29 - 3.35				100	90	79	69	59	48	26	13
	P-5	11.0 - 11.8	3.35 - 3.60											
	D-6	14.2 - 15.0	4.33 - 4.57											
	D-7	19.2 - 20.0	5.85 - 6.10				100	84	84	78	72	61	35	16
	P-8	25.0 - 25.7	7.62 - 7.83											
	P-9	30.0 - 30.8	9.14 - 9.39											
	P-9	30.0 - 30.8	9.14 - 9.39							100	96	74	45	26
	P-9	30.8 - 31.5	9.39 - 9.60											
	P-10	35.0 - 35.7	10.67 - 10.88						100	99	98	97	84	66
	P-10	35.7 - 36.3	10.88 - 11.06											
	P-10	36.3 - 36.6	11.06 - 11.16											
	P-11	39.0 - 39.6	11.89 - 12.07											
	P-12	45.2 - 45.8	13.78 - 13.96											
	P-13	49.0 - 49.7	14.94 - 15.15							100	99	97	88	66
P-13	49.7 - 50.5	15.15 - 15.39												
D-14	50.7 - 51.5	15.45 - 15.70												
BL-B-10	P-1	0.5 - 1.2	0.15 - 0.37											
	D-2	3.2 - 4.0	0.98 - 1.22					100	90	87	81	68	46	30
	P-3	6.5 - 7.7	1.98 - 2.35							100	96	86	53	36
	P-3	7.7 - 8.5	2.35 - 2.59											
	D-4	10.2 - 11.0	3.11 - 3.35						100	91	73	52	24	13

NOTES:

(a) Sample types

SS - Standard split spoon

P - Pitcher

D - Fugro Drive

B, b - Bulk

(b) NP - Not Plastic

(c) USCS - Unified Soil Classification System

(d) * Indicates that test has been performed
and results are included in this report

PERCENT FINER BY WEIGHT										ATTERBERG LIMITS (b)			USCS (c)	IN-SITU				COMPACTED		
OPENING		U S STANDARD SIEVE NO.				PARTICLE SIZE (mm)		DRY UNIT WEIGHT						MOISTURE CONTENT (%)	SATURATION (%)	VOID RATIO	MAXIMUM DRY DENSITY			
GRAVEL		SAND				SILT OR CLAY		(pcf)	(kg/m ³)	(pcf)	(kg/m ³)									
4"	3/4"	3/8"	4	10	40	100	200					.005		.001	LL	PL	PI	(pcf)	(kg/m ³)	
													SM	88.2	1413	37.5	100.0	0.91		
													CL	99.3	1591	26.6	100.0	0.70		
					100	99	98	59	32	42	19	23	CL	105.5	1690	21.1	95.5	0.60		
													CL	102.9	1648	22.4	94.7	0.64		
													CL	102.2	1637	25.9	100.0	0.65		
													CL	89.8	1439	31.4	96.8	0.88		
													CL	95.3	1527	29.5	100.0	0.77		
													CL	96.1	1540	28.2	100.0	0.75		
													CL	104.6	1676	23.9	100.0	0.61		
													CL	101.8	1631	24.7	101.8	0.66		
						100	95	50	31	41	16	25	CL	100.3	1607	23.8	94.3	0.68		
													CL	99.6	1596	26.3	102.9	0.69		
													CL	98.1	1572	25.9	97.5	0.72		
			100	98	82	57	40					NP	SM	114.0	1826	17.9	101.5	0.48		
													CL	103.9	1664	24.4	100.0	0.62		
													CL	98.1	1572	27.2	100.0	0.72		
													SM	86.8	1391	8.4	24.0	0.94		
													SM	102.6	1644	16.4	68.8	0.64		
													SM	89.9	1440	10.1	31.2	0.87		
												NP	SM	109.2	1749	7.8	38.9	0.54		
00	79	69	59	48	26	13	10					NP	GP-GM	113.1	1812	13.6	75.3	0.49		
													SP-SM	110.9	1777	15.6	80.9	0.52		
													SP-SM	114.2	1829	5.3	30.3	0.48		
4	84	78	72	61	35	16	12						SP-SM	114.4	1833	9.4	53.8	0.47		
													SP-SM	89.4	1432	17.6	53.8	0.89		
													SM	92.9	1488	15.9	52.6	0.81		
		100	96	74	45	26	19	5	2			NP	SM	99.9	1600	12.1	47.7	0.69		
													SM	104.9	1680	12.9	57.7	0.61		
	100	96	98	97	84	65	54			29	21	8	CL	94.5	1514	20.8	71.8	0.78		
													CL	106.7	1709	12.9	60.1	0.58		
													CL	111.1	1780	11.3	58.7	0.52		
													SM	108.2	1733	14.5	70.6	0.56		
													SM	98.9	1584	22.3	85.5	0.70		
		100	99	97	88	66	49					NP	SM	107.2	1717	11.8	55.7	0.57		
													SM	104.5	1674	13.7	60.3	0.61		
													SM	110.9	1777	13.0	67.8	0.52		
													SM	101.7	1629	7.2	29.7	0.66		
00	90	87	81	68	46	30	25						SM	109.3	1751	9.9	49.5	0.54		
		100	96	86	53	35	29						SM	95.7	1533	17.6	62.6	0.76		

PITTSBURGH TESTS (b)		USCS (c)	IN-SITU					COMPACTED			SPECIFIC GRAVITY OF SOLIDS	TRIAXIAL (d)	UNCONFINED COMPRESSION	DIRECT SHEAR	CONSOLIDATION	CHEMICAL	CBR
			DRY UNIT WEIGHT		MOISTURE CONTENT (%)	SATURATION (%)	VOID RATIO	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)							
			(pcf)	(kg/m ³)				(pcf)	(kg/m ³)								
		SM	88.2	1413	37.5	100.0	0.91										
19	23	CL	99.3	1591	26.6	100.0	0.70										
		CL	105.5	1690	21.1	95.5	0.60										
		CL	102.9	1648	22.4	94.7	0.64										
		CL	102.2	1637	25.9	100.0	0.65										
		CL	89.8	1439	31.4	96.8	0.88										
		CL	95.3	1527	29.5	100.0	0.77										
		CL	96.1	1540	28.2	100.0	0.75										
		CL	104.6	1676	23.9	100.0	0.61										
		CL	101.8	1631	24.7	101.8	0.66										
16	25	CL	100.3	1607	23.8	94.3	0.68										
		CL	99.6	1596	26.3	102.9	0.69										
		CL	98.1	1572	25.9	97.5	0.72										
	NP	SM	114.0	1826	17.9	101.5	0.48										
		CL	103.9	1664	24.4	100.0	0.62										
		CL	98.1	1572	27.2	100.0	0.72										
		SM	86.8	1391	8.4	24.0	0.94										
		SM	102.6	1644	16.4	68.8	0.64										
		SM	89.9	1440	10.1	31.2	0.87										
	NP	SM	109.2	1749	7.8	38.9	0.54										
	NP	GP-GM	113.1	1812	13.6	75.3	0.49										
		SP-SM	110.9	1777	15.6	80.9	0.52										
		SP-SM	114.2	1829	5.3	30.3	0.48										
		SP-SM	114.4	1833	9.4	53.8	0.47										
		SP-SM	89.4	1432	17.6	53.8	0.89										
		SM	92.9	1488	15.9	52.6	0.81										
	NP	SM	99.9	1600	12.1	47.7	0.69										
		SM	104.9	1680	12.9	57.7	0.61										
21	8	CL	94.5	1514	20.8	71.8	0.78										
		CL	106.7	1709	12.9	60.1	0.58										
		CL	111.1	1780	11.3	58.7	0.52										
		SM	108.2	1733	14.5	70.6	0.56										
		SM	98.9	1584	22.3	85.5	0.70										
	NP	SM	107.2	1717	11.8	55.7	0.57										
		SM	104.5	1674	13.7	60.3	0.61										
		SM	110.9	1777	13.0	67.8	0.52										
		SM	101.7	1629	7.2	29.7	0.66										
		SM	109.3	1751	9.9	49.5	0.54										
		SM	95.7	1533	17.6	62.6	0.76										
		SM	98.1	1572	13.2	49.7	0.72										
	NP	SW-SM	113.7	1821	5.6	31.1	0.48										

SUMMARY OF LABORATORY TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - 000

TABLE
II - 5 - 1
7 OF 10

FUGRO NATIONAL INC.

ACTIVITY NUMBER	SAMPLE NUMBER (a)	SAMPLE INTERVAL		PERCENT FINER BY WEIGHT										
				STANDARD SIEVE OPENING							U S STANDARD SIEVE			
				BLDRS.	COBBLES		GRAVEL				SAND			
		FEET	METERS	24"	12"	6"	3"	1½"	¾"	3/8"	4	10	40	100
BL-B-10	D-5	15.2 - 16.0	4.63 - 4.88											
	D-6	20.2 - 21.0	6.16 - 6.40											
	P-7	25.0 - 25.6	7.62 - 7.80											
	D-8	30.2 - 31.0	9.20 - 9.45											
	D-9	35.2 - 36.0	10.73 - 10.97					100	96	89	79	66	26	16
	D-10	40.2 - 41.0	12.25 - 12.50											
	P-11	46.6 - 47.1	14.20 - 14.36											
	D-12	50.2 - 51.0	15.30 - 15.54											
	D-13	60.2 - 61.0	18.35 - 18.59											
	P-14	70.8 - 71.4	21.58 - 21.76											
	P-15	81.8 - 82.5	24.93 - 25.15							100	96	72	16	8
	P-16	90.9 - 91.8	27.71 - 27.98					100	79	69	60	49	24	15
	D-17	100.2 - 101.0	30.54 - 30.78											
MD-T-1	b-2	6.0 - 7.0	1.83 - 2.13							100	99	97	84	2
MD-T-2	B-1	0.5 - 2.0	0.15 - 0.61							100	99	96	80	5
	b-2	10.0 - 11.0	3.05 - 3.35											
	b-3	12.0 - 13.0	3.66 - 3.96									100	97	7
MD-T-3	B-1	0.5 - 2.0	0.15 - 0.61											10
	b-2	8.0 - 9.0	2.44 - 2.74									100	98	4
MD-T-5	B-1	0.5 - 2.0	0.15 - 0.61					100	98	96	90	81	48	3
MD-T-6	B-1	0.5 - 2.0	0.15 - 0.61					100	97	89	83	75	59	3
	b-2	4.0 - 5.0	1.22 - 1.52				100	89	81	58	44	32	17	1
	b-3	8.0 - 9.0	2.44 - 2.74											
MD-T-7	B-1	0.5 - 2.0	0.15 - 0.61									100	99	9
MD-T-8	B-1	0.5 - 2.0	0.15 - 0.61				100	95	89	77	66	55	33	2
MD-T-9	B-1	0.5 - 2.0	0.15 - 0.61									100	97	8
	b-2	5.0 - 6.0	1.52 - 1.83									100	99	8
MD-T-10	B-1	0.5 - 2.0	0.15 - 0.61				100	85	69	50	41	33	24	1
	b-2	5.5 - 6.5	1.68 - 1.98					100	85	71	58	46	30	2
MD-T-11	B-1	0.5 - 2.0	0.15 - 0.61					100	92	80	71	58	43	3
	b-2	3.0 - 4.0	0.91 - 1.22						100	93	86	76	61	6
MD-T-12	B-1	0.5 - 2.0	0.15 - 0.61				100	76	58	47	40	36	30	2
	b-2	4.0 - 5.0	1.22 - 1.52					100	96	93	88	84	76	6
	b-3	8.0 - 9.0	2.44 - 2.74				100	69	46	40	37	33	28	3
MD-T-13	B-1	0.5 - 2.0	0.15 - 0.61				100	73	52	34	26	22	17	3
MD-T-14	B-1	0.5 - 2.0	0.15 - 0.61								100	96	81	3
MD-T-15	B-1	0.5 - 2.0	0.15 - 0.61						100	99	98	93	77	3
MD-T-16	B-1	0.5 - 2.0	0.15 - 0.61					100	89	81	73	60	31	3
	b-2	4.0 - 5.0	1.22 - 1.52				100	81	61	51	45	38	22	3
	b-4	9.0 - 10.0	2.74 - 3.05					100	97	96	90	75	49	3
MD-T-17	B-1	0.5 - 2.0	0.15 - 0.61						100	98	95	89	67	3
	b-2	5.0 - 6.0	1.52 - 1.83					100	86	72	63	54	37	3

NOTES:

(a) Sample types

SS - Standard split spoon

P - Pitcher

D - Fugro Drive

B, b - Bulk

(b) NP - Not Plastic

(c) USCS - Unified Soil Classification System

(d) * Indicates that test has been performed
and results are included in this report

PERCENT FINER BY WEIGHT									ATTEBERG LIMITS (b)			USCS (c)	IN-SITU					COMPACTED		
NO.		U S STANDARD SIEVE NO.				PARTICLE SIZE (mm)							DRY UNIT WEIGHT		MOISTURE CONTENT (%)	SATURATION (%)	VOID RATIO	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE
REL		SAND				SILT OR CLAY			LL	PL	PI	(pcf)	(kg/m³)							
3/4"	3/8"	4	10	40	100	200	.005	.001												
												SP	109.8	1759	8.5	43.1	0.53			
												SP-SM	115.3	1847	10.0	58.7	0.46			
												SP	107.8	1727	13.1	63.0	0.56			
												SP	113.6	1820	10.7	59.6	0.48			
96	89	79	66	26	16	13						SM	116.8	1871	10.3	63.0	0.44			
												SM	106.9	1713	14.1	66.2	0.58			
												SP-SM	112.0	1794	13.9	74.3	0.50			
												SP-SM	110.6	1772	9.6	49.7	0.52			
												SM	113.5	1818	7.7	43.1	0.48			
												SP	110.1	1764	14.7	75.0	0.53			
	100	96	72	16	8	6						SW-SM	104.8	1679	19.4	86.3	0.61			
79	69	60	49	24	15	13						SM	105.6	1692	21.7	98.6	0.60			
												SM	121.0	1938	10.9	75.7	0.39			
	100	99	97	84	20	14						SM								
	100	99	96	80	50	30						SC								
										55	25	30	CH							
			100	97	75	55						NP	ML							
					100	99				49	32	18	ML							
			100	98	44	32							SM							
98	96	90	81	48	31	22							SM					125.0	2003	10.2
97	89	83	75	59	39	29						NP	SM					125.0	2003	11.6
81	58	44	32	17	9	7							GW-GM							
										35	18	17	SC							
			100	99	96	94							CL							
89	77	66	55	33	23	19							SM							
			100	97	91	88	17	4		70	49	21	MH					69.1	1107	49.4
			100	99	98	98	58	34		79	35	44	CH							
69	50	41	33	24	17	13							GM							
85	71	58	46	30	20	15							SM							
92	80	71	58	43	35	32							SM							
100	93	86	76	61	52	45							SC							
58	47	40	36	30	21	15							GC					137.0	2195	7.0
96	93	88	84	76	59	37				22	21	1	SM							
46	40	37	33	28	23	19							GC							
52	34	26	22	17	12	8							GW-GM							
		100	96	81	52	38				28	17	11	SC					116.0	1858	15.0
100	99	98	93	77	56	34							SM					126.9	2033	10.0
89	81	73	60	31	20	16							SM							
61	51	45	38	22	10	7							GP-GM							
97	96	90	75	49	37	32							SM							
100	98	95	89	67	41	30				39	21	18	SC					112.0	1794	17.0
86	72	63	54	37	24	17							SM							

System

performed
this report

2

PI	USCS (c)	IN-SITU					COMPACTED			SPECIFIC GRAVITY OF SOLIDS	TRIAXIAL (d)	UNCONFINED COMPRESSION	DIRECT SHEAR	CONSOLIDATION	CHEMICAL	CBR
		DRY UNIT WEIGHT		MOISTURE CONTENT (%)	SATURATION (%)	VOID RATIO	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)							
		(pcf)	(kg/m³)				(pcf)	(kg/m³)								
	SP	109.8	1759	8.5	43.1	0.53										
	SP-SM	115.3	1847	10.0	58.7	0.46										
	SP	107.8	1727	13.1	63.0	0.56										
	SP	113.6	1820	10.7	59.6	0.48										
	SM	116.8	1871	10.3	63.0	0.44										
	SM	106.9	1713	14.1	66.2	0.58										
	SP-SM	112.0	1794	13.9	74.3	0.50										
	SP-SM	110.6	1772	9.6	49.7	0.52										
	SM	113.5	1818	7.7	43.1	0.48										
	SP	110.1	1764	14.7	75.0	0.53										
	SW-SM	104.8	1679	19.4	86.3	0.61										
	SM	105.6	1692	21.7	98.6	0.60										
	SM	121.0	1938	10.9	75.7	0.39										
	SM															
	SC															
30	CH															
NP	ML															
18	ML															
	SM															
	SM						125.0	2003	10.7							*
NP	SM						125.0	2003	11.0							*
	GW-GM															
17	SC															
	CL															
	SM															
21	MH						69.1	1107	49.8							*
44	CH															
	GM															
	SM															
	SM															
	SC															
	GC						137.0	2195	7.0							*
1	SM															
	GC															
	GW-GM															
11	SC						116.0	1858	15.5							*
	SM						126.9	2033	10.2							*
	SM															
	GP-GM															
	SM															
18	SC						112.0	1794	17.2							*
	SM															

SUMMARY OF LABORATORY TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - 000

TABLE
II - 5 1
8 OF 10

FUGRO NATIONAL, INC.

AFV-01

ACTIVITY NUMBER	SAMPLE NUMBER (a)	SAMPLE INTERVAL		PERCENT FINER BY WEIGHT										
				STANDARD SIEVE OPENING							U S STANDARD SIEVE			
		FEET	METERS	BLDRS.	COBBLES		GRAVEL				SAND			
24"	12"			6"	3"	1½"	3/4"	3/8"	4	10	40	100		
MD T-18	B-1	0.5 - 2.0	0.15 - 0.61						100	98	94	87	66	41
	b-2	2.5 - 3.5	0.76 - 1.07											
MD-T-19	B-1	0.5 - 2.0	0.15 - 0.61						100	94	90	83	69	55
MD-T-20	B-1	0.5 - 2.0	0.15 - 0.61					100	98	95	91	85	71	55
	b-2	4.0 - 5.0	1.22 - 1.52				100	87	74	54	39	23	8	3
BL-T-14	B-1	0.5 - 2.0	0.15 - 0.61				100	88	60	41	30	22	12	8
BL-T-15	B-1	0.5 - 2.0	0.15 - 0.61					100	96	73	64	52	28	16
BL-T-17	B-1	0.5 - 2.0	0.15 - 0.61										100	99
BL-T-18	B-1	0.5 - 2.0	0.15 - 0.61									100	90	70
BL-T-19	B-1	0.5 - 2.0	0.15 - 0.61									100	87	58
	b-3	7.0 - 8.0	2.13 - 2.44											
BL-T-20	B-1	0.5 - 2.0	0.15 - 0.61									100	99	94
	b-2	7.0 - 8.0	2.13 - 2.44						100	96	93	87	54	13
BL-T-21	b-2	4.0 - 5.0	1.22 - 1.52										100	98
BL-T-22	B-1	0.5 - 2.0	0.15 - 0.61						100	97	95	90	67	37
	b-3	11.0 - 12.0	3.35 - 3.66					100	96	94	93	91	66	23
BL-T-24	B-1	0.5 - 2.0	0.15 - 0.61							100	99	94	78	57
MD-P-1	B-1	0.5 - 2.0	0.15 - 0.61									100	98	89
	b-2	6.0 - 7.0	1.83 - 2.13								100	99	85	29
MD-P-2	b-1	0.5 - 2.0	0.15 - 0.61											
MD-P-4	B-1	0.5 - 2.0	0.15 - 0.61					100	94	91	85	78	56	34
	b-2	6.0 - 7.0	1.83 - 2.13							100	99	97	85	62
MD-P-6	b-2	4.0 - 5.0	1.22 - 1.52				100	87	81	70	58	46	26	13
MD-P-8	b-1	0.5 - 1.5	0.15 - 0.46						100	97	88	76	52	37
MD-P-10	b-3	8.0 - 9.0	2.44 - 2.74					100	92	81	72	63	37	26
MD-P-12	b-1	0.5 - 2.0	0.15 - 0.61											
MD-P-13	b-1	0.5 - 2.0	0.15 - 0.61											
MD-P-14	b-1	0.5 - 2.0	0.15 - 0.61											
MD-P-16	b-2	2.0 - 3.0	0.61 - 0.91					100	85	67	54	43	24	15
	b-4	9.0 - 10.0	2.44 - 3.05					100	88	78	68	58	46	31
MD-P-19	b-2	4.0 - 5.0	1.22 - 1.52				100	90	56	40	26	17	10	8
MD-P-20	b-1	0.5 - 2.0	0.15 - 0.61					100	88	81	73	65	53	36
	b-3	8.0 - 9.0	2.44 - 2.74				100	91	66	56	46	38	25	15
MD-P-21	b-1	0.5 - 2.0	0.15 - 0.61						100	99	96	93	86	67
	b-2	4.0 - 5.0	1.22 - 1.52			100	80	60	52	46	43	39	33	26
MD-P-24	b-2	5.0 - 6.0	1.52 - 1.83										100	96
MD-P-25	b-1	0.5 - 2.0	0.15 - 0.61									100	99	71
	b-3	7.0 - 8.0	2.13 - 2.44										100	46
MD-P-26	b-1	0.5 - 2.0	0.15 - 0.61											
MD-P-27	b-1	0.5 - 1.0	0.15 - 0.30							100	97	90	75	46
	b-2	1.0 - 2.0	0.30 - 0.61					100	91	67	48	33	21	12

NOTES:

(a) Sample types

SS - Standard split spoon

P - Pitcher

D - Fugro Drive

D.b - Bulk

NP - Not Plastic

(c) USCS - Unified Soil Classification System

(d) * Indicates that test has been performed
and results are included in this report

	59	40	19	MH			
				SM			
	67	32	35	CH			
10			NP	ML			
				SP-SM			
	30	24	6	ML			
				SM			
				SM			
	26	19	7	SM - SC			
21	61	29	32	CH			
				SM			
	32	17	15	CL			
	36	22	14	SC			
				SM			
				SP-SM			
				SC			
				SM			
	30	11	19	CL			
	42	22	20	CL			
	29	18	11	CL			
				GW-GM			
				SM			
				GP-GC			

NO (b)	USCS (c)	IN-SITU					COMPACTED			SPECIFIC GRAVITY OF SOLIDS	TRIAxIAL (d)	UNCONFINED COMPRESSION	DIRECT SHEAR	CONSOLIDATION	CHEMICAL	CBR
		DRY UNIT WEIGHT		MOISTURE CONTENT (%)	SATURATION (%)	VOID RATIO	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)							
		(pcf)	(kg/m³)				(pcf)	(kg/m³)								
PI																
	SM															
13	SC															
6	SM															
	SC															
	GW															
	GP-GM															
	SM															
10	CL									2.72					*	
19	MH															
	SM															
35	CH															
NP	ML															
	SP-SM															
6	ML															
	SM															
	SM															
7	SM - SC															
32	CH							102.0	1634	23.0						*
	SM															
15	CL															
14	SC							122.5	1962	11.1						*
	SM															
	SP-SM															
	SC															
	SM															
19	CL															
20	CL															
11	CL															
	GW-GM															
	SM															
	GP-GC															
	SC															
	GC															
	SM															
	GM															
7	CL-ML															
NP	SM															
	SC															
14	CL															
	SM															
	GW-GM															

SUMMARY OF LABORATORY TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - 000

TABLE
II - 5 - 1
9 OF 10

FURRO NATIONAL, INC.

AFV-01

[illegible]

NOTES:

- (a) Sample types**

SS - Standard split spoon

P - Pitcher

D - Fugro Drive

B, b - Bulk

- (b) NP - Not Plastic

(c) JSCS - In the case of the JSCS, the system is a...

(1) * NOISES IN THE AIR: NOISE POLLUTION

000 9SUN 63 1 4 02 00000 00 00 0 -000-1

[illegible]

SYMBOL	BORING NO.	SAMPLE NO.	SAMPLE INTERVAL		SOIL TYPE	TYPE OF TEST	DRY DENSITY		MOISTURE CONTENT (%)	CONFINING PRESSURE (σ_3)		MAXIMUM DEVIATOR STRESS ($\sigma_1 - \sigma_3$)		STRESS RA
			FEET	METERS			pcf	kg/m ³		ksf	kN/m ²	ksf	kN/m ²	
	MD-B-3	P-7	10.5 - 11.1	3.20 - 3.38	CH	CD	83.8	1342	27.0	1.0	48	7.0	335	0
		P-7	11.1 - 11.7	3.38 - 3.57	CH	CD	94.4	1512	22.1	4.0	192	15.3	733	0
	MD-B-9	P-8	31.6 - 32.2	9.63 - 9.81	CH	CD	82.4	1320	34.1	1.6	77	6.7	321	0
		P-8	32.2 - 32.8	9.81 - 10.00	CH	CD	81.5	1306	35.5	3.0	144	9.0	431	0
		P-8	32.8 - 33.4	10.00 - 10.18	CH	CD	93.5	1498	26.5	6.0	287	15.8	757	0
7/	MD-B-10	P-12	34.2 - 34.8	10.42 - 10.61	SC	CD	103.2	1653	18.4	1.7	81	6.1	292	0
		P-12	34.8 - 35.4	10.61 - 10.79	SC	CD	98.9	1584	19.3	7.1	340	19.9	953	0
□	MD-B-10	P-17	69.1 - 69.6	21.06 - 21.21	CL	CD	101.0	1618	23.6	3.5	168	9.4	450	0
		P-17	69.7 - 70.2	21.24 - 21.46	CL	CD	99.9	1600	23.8	7.0	335	12.8	613	0
		P-17	70.3 - 70.8	21.43 - 21.58	CL	CD	100.1	1604	23.2	14.0	670	16.6	795	0
●	MD-B-15	P-7	25.4 - 26.0	7.74 - 7.92	ML	CD	99.3	1590	25.4	1.2	57	3.1	148	0
		P-7	24.8 - 25.4	7.56 - 7.74	ML	CD	91.2	1461	27.3	2.4	115	4.1	196	0
		P-7	24.2 - 24.8	7.38 - 7.56	ML	CD	93.1	1491	27.3	5.0	239	6.0	287	0
▲	MD-B-15	P-16	89.0 - 89.6	27.13 - 27.31	CL	CD	101.8	1631	24.7	3.0	144	6.0	287	0
		P-16	90.8 - 91.5	27.68 - 27.89	CL	CD	100.3	1607	23.8	12.1	579	12.7	608	0
▼	BL-B-7	P-10	35.0 - 35.7	10.67 - 10.88	CL	CD	94.5	1514	20.8	1.7	81	6.2	297	0
		P-10	35.7 - 36.3	10.88 - 11.06	CL	CD	106.7	1709	12.9	6.0	287	19.7	943	0

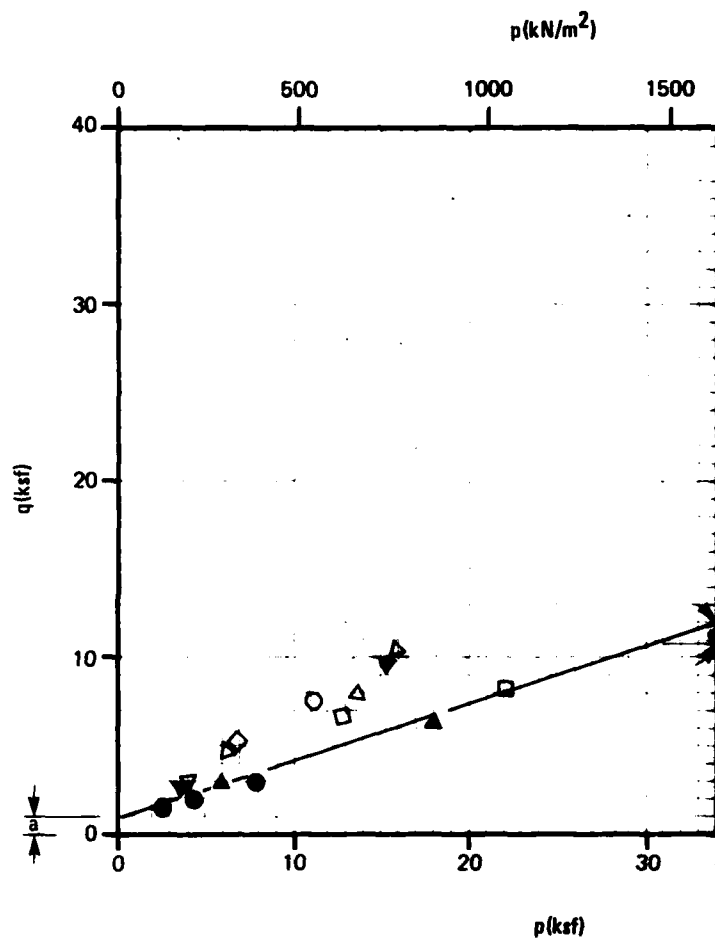
$$\text{NOTES: } p = \frac{\sigma_1 + \sigma_3}{2}, \quad q = \frac{\sigma_1 - \sigma_3}{2}$$

$$c = \frac{s}{\cos \phi}, \quad \phi = \sin^{-1} (\tan \alpha)$$

#	DENSITY kg/m ³	MOISTURE CONTENT (%)	CONFINING PRESSURE(σ_3)		MAXIMUM DEVIATOR STRESS($\sigma_1 - \sigma_3$)		STRAIN RATE (% min.)	COHESION (C)		FRICTION ANGLE (ϕ) DEGREES
			ksf	kN/m ²	ksf	kN/m ²		ksf	kN/m ²	
8	1342	27.0	1.0	48	7.0	335	0.05	1.2	57	35°
4	1512	22.1	4.0	192	15.3	733	0.05			
4	1320	34.1	1.6	77	6.7	321	0.05			
5	1306	35.5	3.0	144	9.0	431	0.04	1.0	48	30°
5	1498	26.5	6.0	287	15.8	757	0.05			
2	1653	18.4	1.7	81	6.1	292	0.05	0.5	24	34°
9	1584	19.3	7.1	340	19.9	963	0.05			
0	1618	23.6	3.5	168	9.4	450	0.07			
9	1600	23.8	7.0	335	12.8	613	0.07	1.3	62	15°
1	1604	23.2	14.0	670	16.6	795	0.07			
3	1590	25.4	1.2	57	3.1	148	0.07			
2	1461	27.3	2.4	115	4.1	196	0.07	0.8	38	16°
1	1491	27.3	5.0	239	6.0	287	0.07			
8	1631	24.7	3.0	144	6.0	287	0.05	1.5	72	15°
3	1607	23.8	12.1	579	12.7	608	0.05			
5	1514	20.8	1.7	81	6.2	297	0.05			
7	1709	12.9	6.0	287	19.7	943	0.05	0.3	14	37.5°

$$q = \frac{\sigma_1 - \sigma_3}{2}$$

$$\phi = \sin^{-1}(\tan \alpha)$$



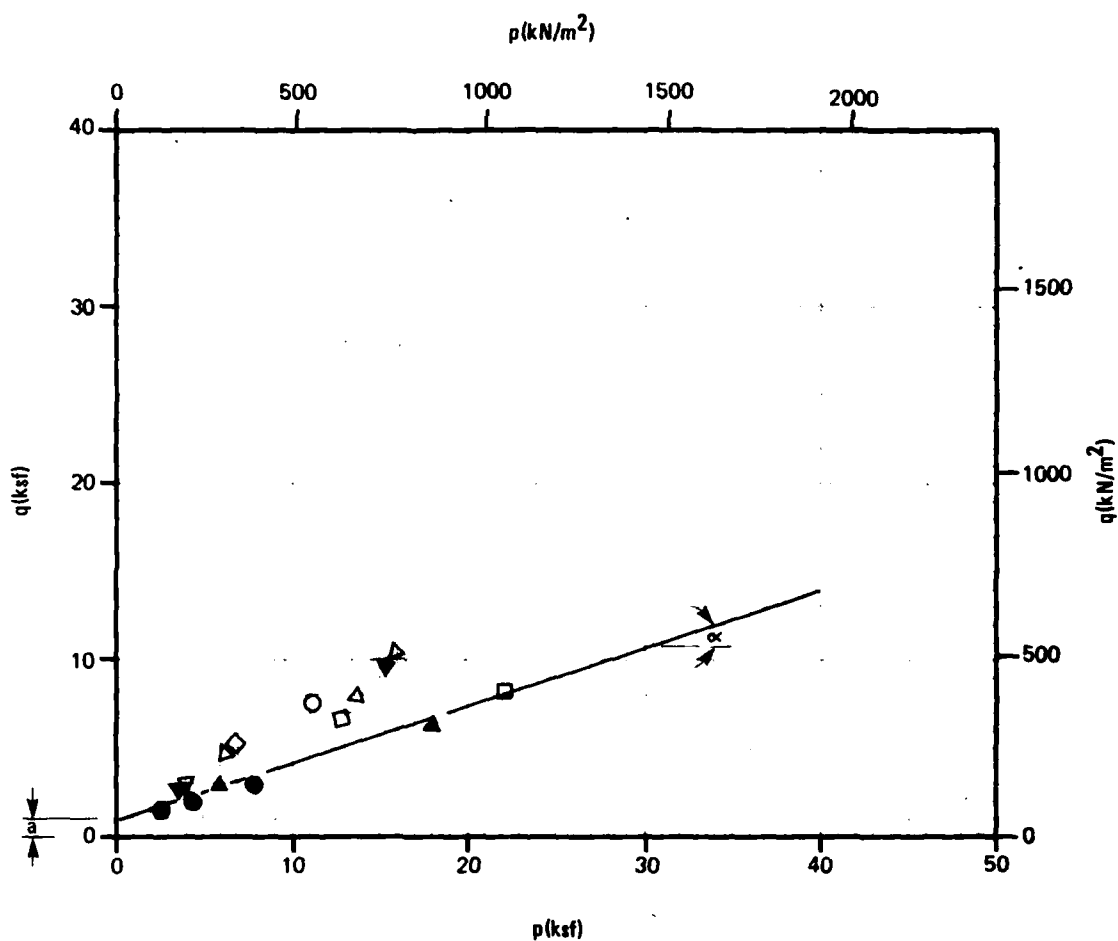
SUN

DEPART

FUE

2

	STRAIN RATE (% min.)	COHESION (C)		FRICTION ANGLE (ϕ) DEGREES
		ksf	kN/m ²	
2	0.05	1.2	57	35°
3	0.05			
4	0.05			
7	0.04	1.0	48	30°
7	0.05			
2	0.05	0.5	24	34°
3	0.05			
0	0.07			
3	0.07	1.3	62	15°
5	0.07			
8	0.07			
8	0.07	0.8	38	16°
7	0.07			
7	0.05	1.5	72	15°
8	0.05			
7	0.05	0.3	14	37.5°
43	0.05			



SUMMARY OF TRIAXIAL COMPRESSION
TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SMO

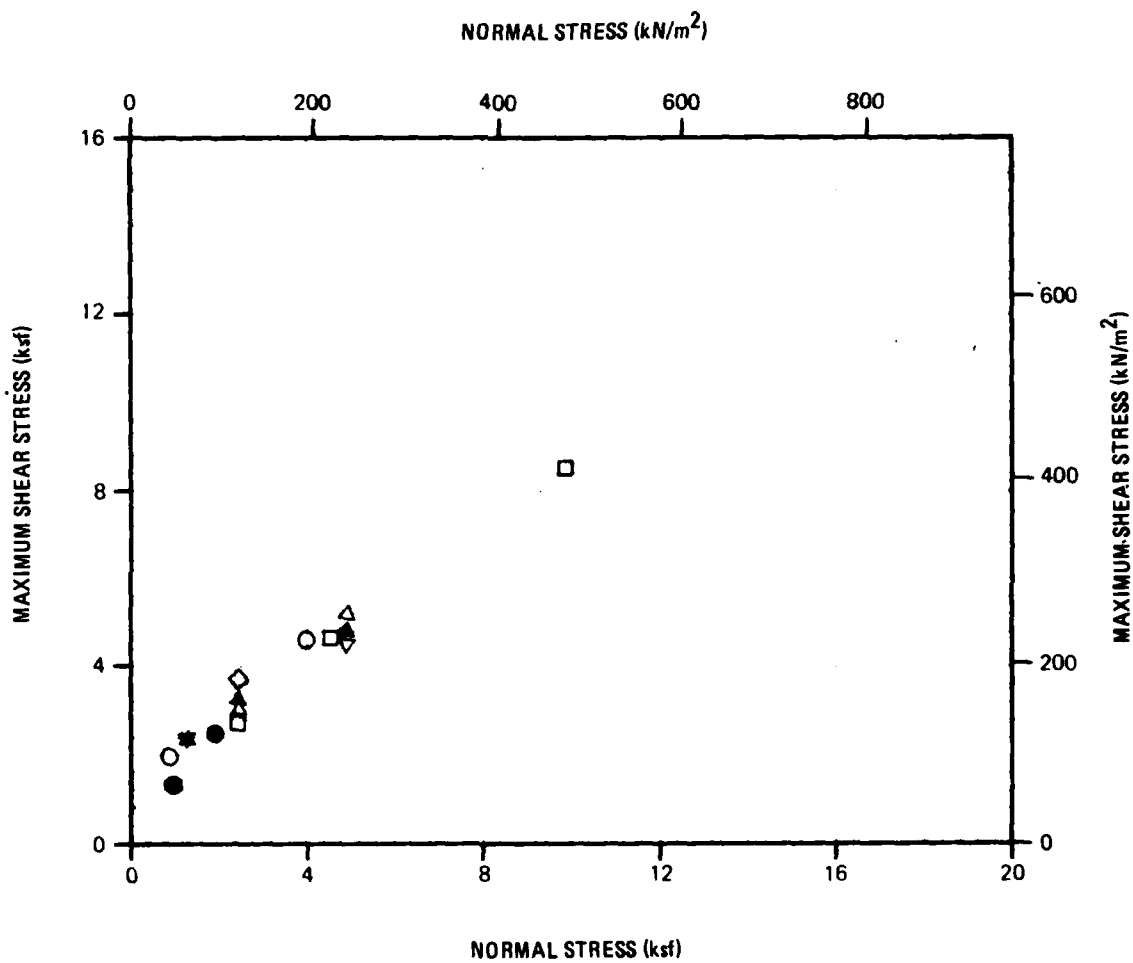
FIGURE
II-5-1

FUGRO NATIONAL, INC.

○ □ ◇ △ ▽ - Tested at natural moisture content

●, ■, ◆, ▲ – Tested in soaked condition

○, □, △, ▽, ◇ Tested at natural moisture content
●, ▲ Tested in soaked condition



SUMMARY OF DIRECT SHEAR TEST RESULTS

OPERATIONAL BASE SITE

MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
II-5-2
2 of 5

FUGRO NATIONAL, INC.

AD-A112 987

FUGRO NATIONAL INC LONG BEACH CA

F/G 8/13

PRELIMINARY GEOTECHNICAL INVESTIGATION PROPOSED OPERATIONAL BAS--ETC(U)

FEB 81

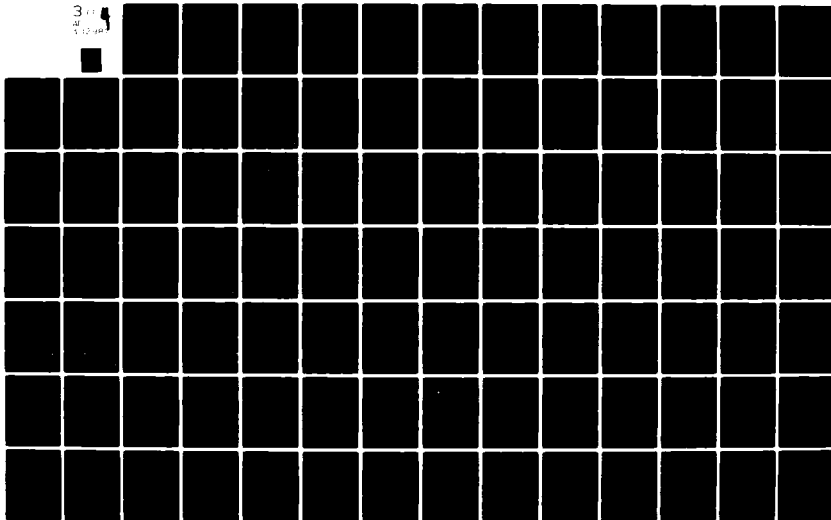
F04704-80-C-0006

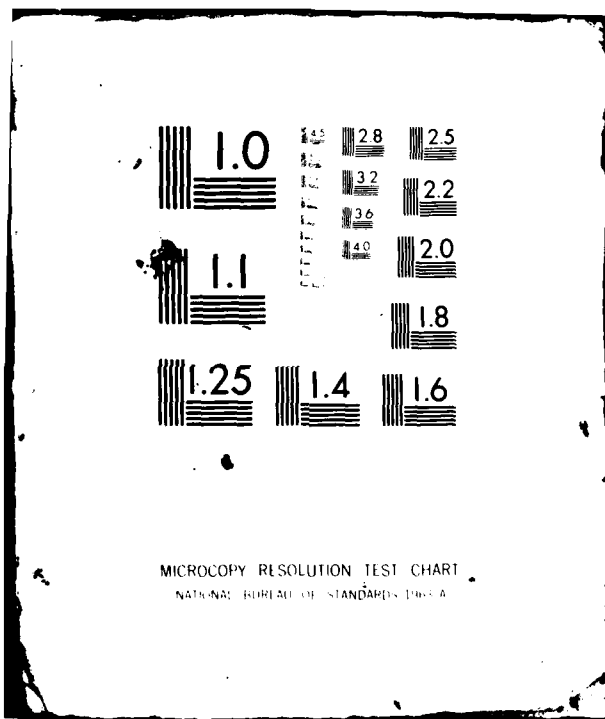
UNCLASSIFIED

FN-TR-44-VOL-2

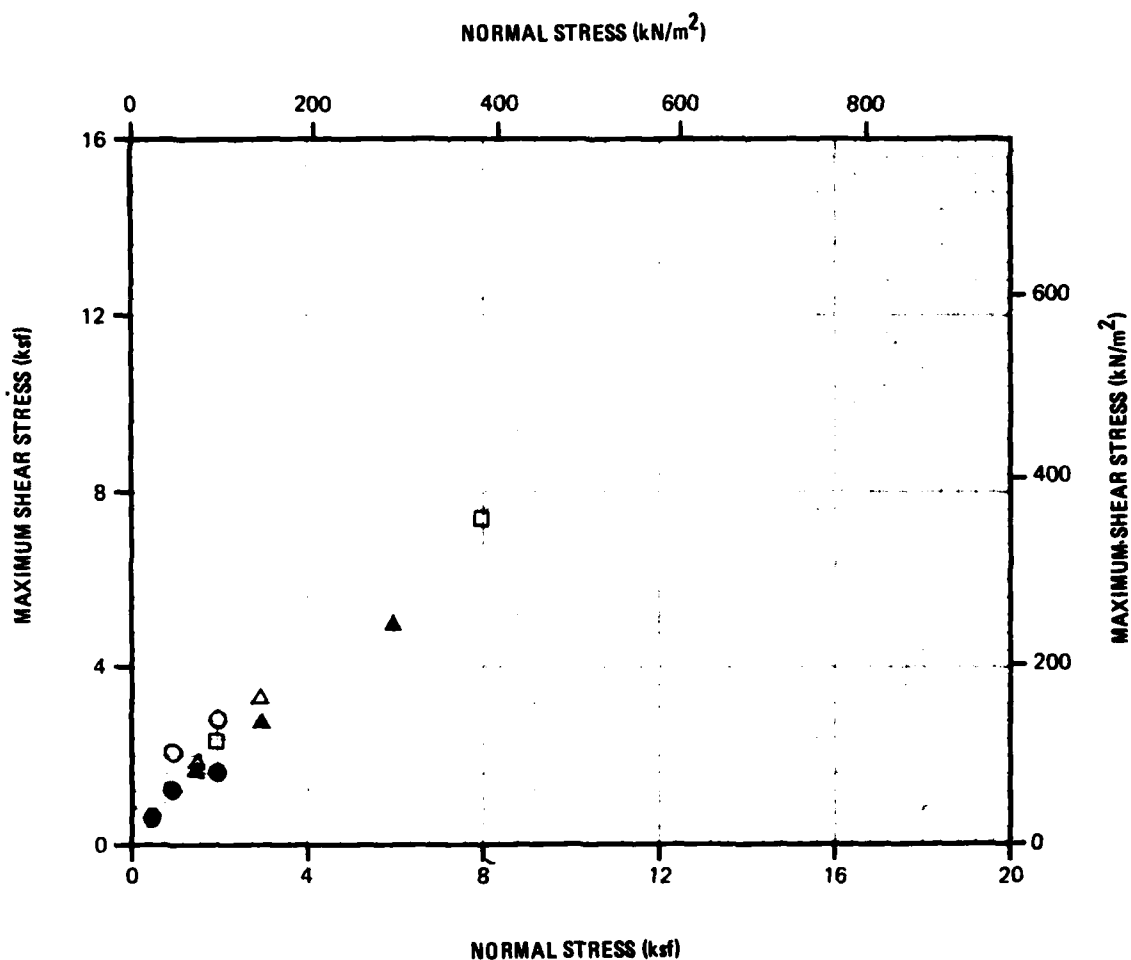
NL

3 of 4
W
112-987





●, ▲ - Tested in soaked condition



SUMMARY OF DIRECT SHEAR TEST RESULTS

OPERATIONAL BASE SITE

MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
II-5-2
3 of 5

FUGRO NATIONAL, INC.

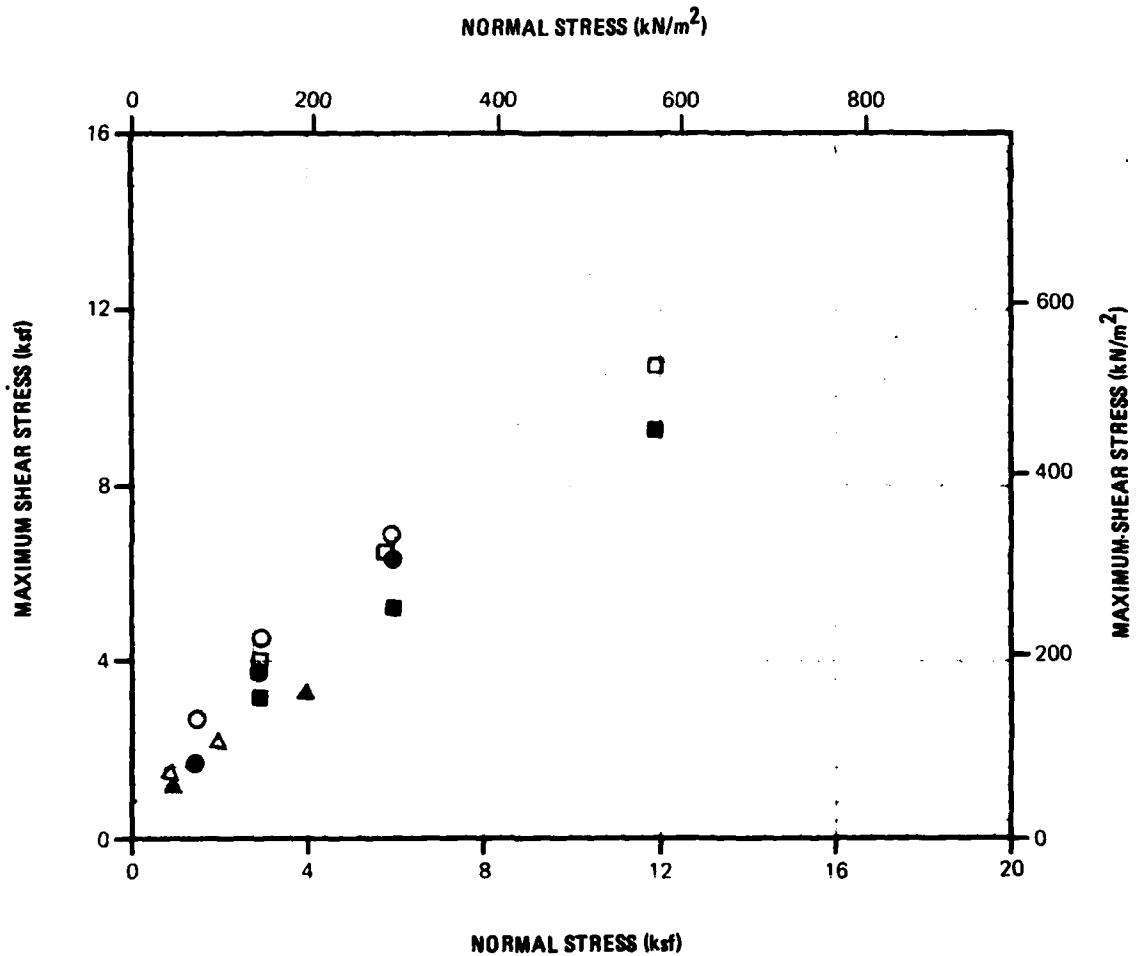
2

○, □, △, ▽ - Tested at natural moisture content

●, ▲ - Tested in soaked condition

○, □, Δ - Tested at natural moisture content

●, ■, ▲ ~ Tested in soaked condition



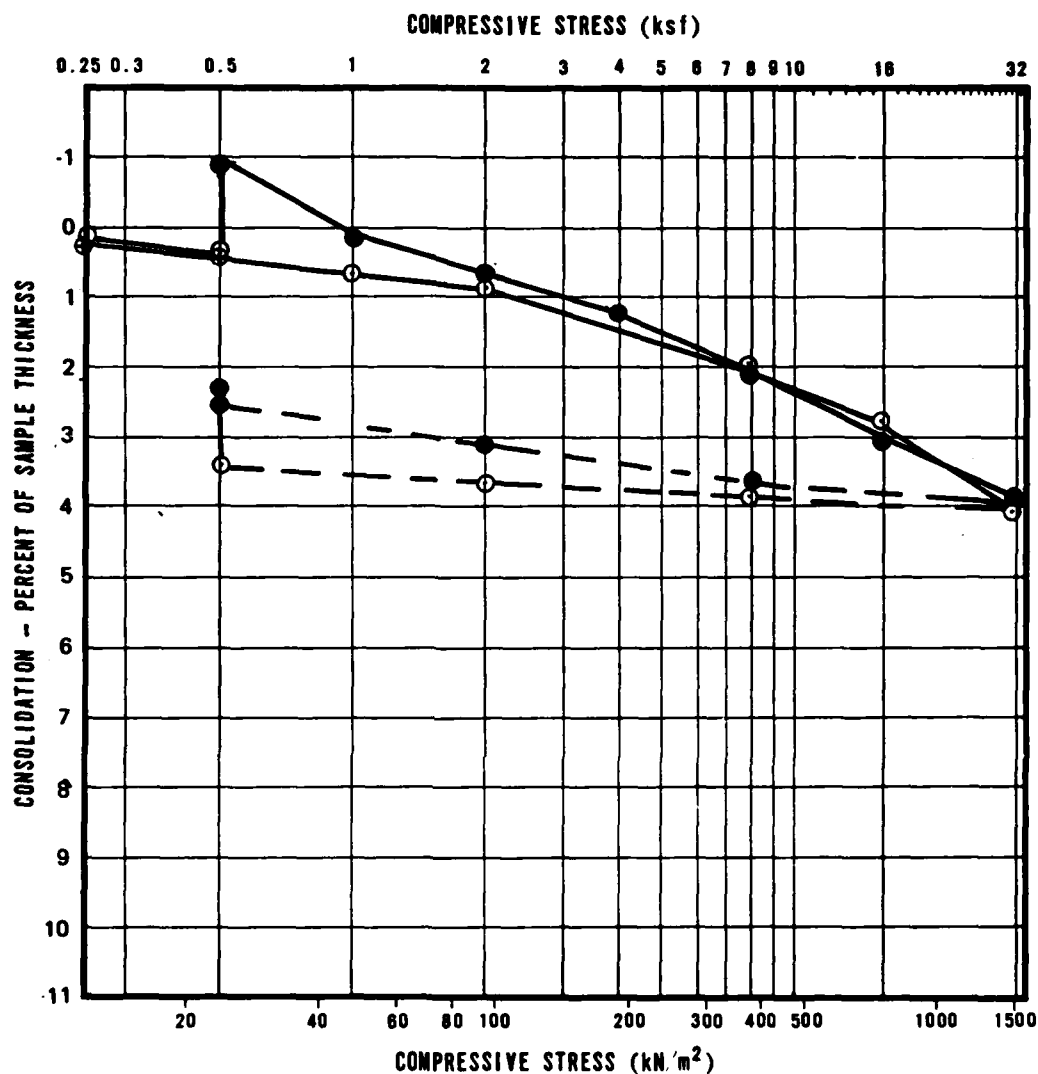
SUMMARY OF DIRECT SHEAR TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
II-5-2
5 of 5

FUGRO NATIONAL, INC.

2



SYMBOL	BORING NO.	SAMPLE NO.	SAMPLE INTERVAL		SOIL TYPE	INITIAL DRY DENSITY		INITIAL MOISTURE CONTENT (%)	INITIAL VOID RATIO	INITIAL DEGREE OF SATURATION (%)
			FEET	METERS		pcf	kg/m³			
○,●	MD-B-3	P-7	10.5 - 11.1	3.20 - 3.38	CH	114.7	1837	10.6	0.47	60.9
⊙,●	MD-B-3	P-7	10.5 - 11.1	3.20 - 3.38	CH	115.8	1855	10.4	0.45	65.4

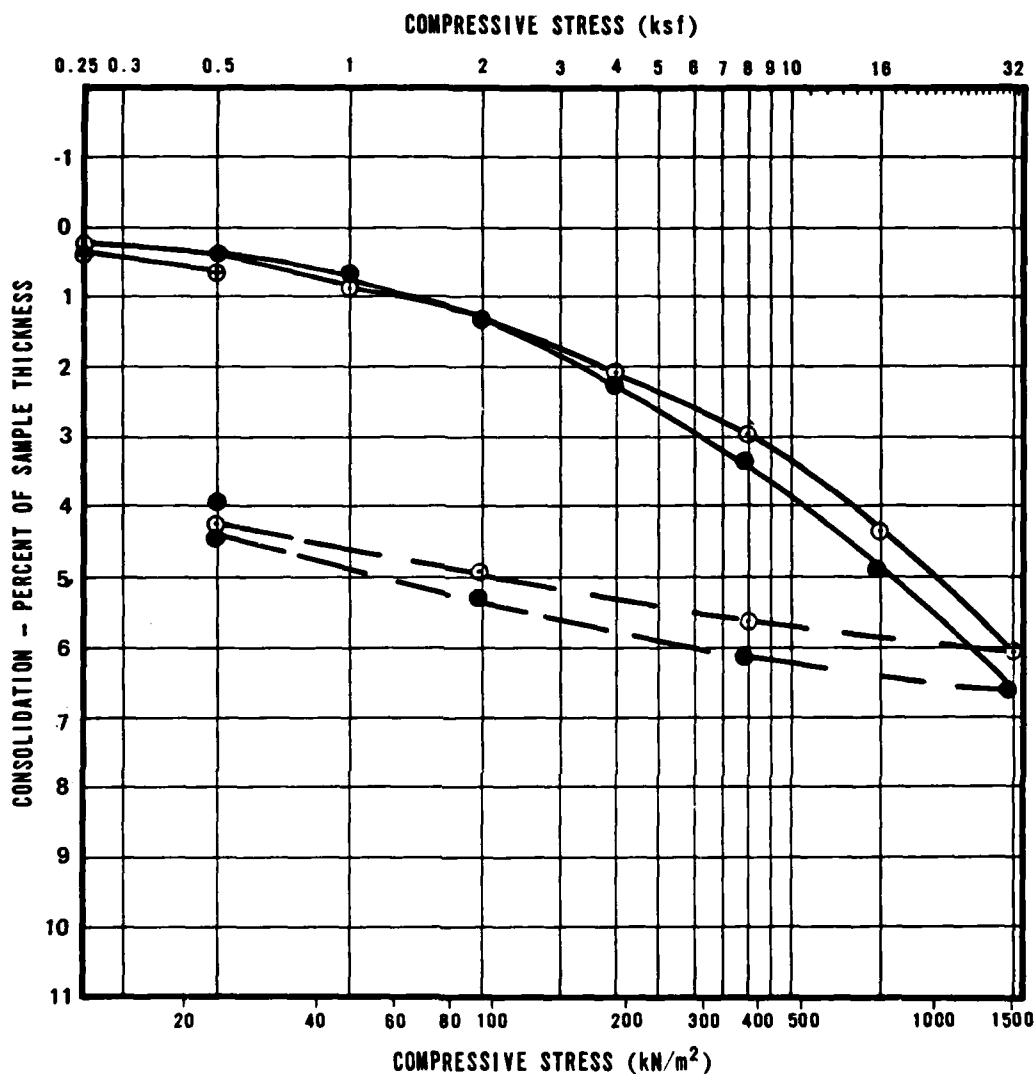
⊙,○ AT FIELD MOISTURE
 ● AFTER ADDITION OF WATER
 — COMPRESSION
 - - - REBOUND

CONSOLIDATION TEST RESULTS
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
 II-5-3
 1 OF 10

FUGRO NATIONAL, INC.



SYMBOL	BORING NO.	SAMPLE NO.	SAMPLE INTERVAL		SOIL TYPE	INITIAL DRY DENSITY		INITIAL MOISTURE CONTENT (%)	INITIAL VOID RATIO	INITIAL DEGREE OF SATURATION (%)
			FEET	METERS		pcf	kg/m ³			
○, ●	MD-B-3	P-12	36.2 - 36.8	11.03 - 11.22	ML	102.5	1642	22.9	0.64	96.6
●, ●	MD-B-3	P-12	36.2 - 36.8	11.03 - 11.22	ML	104.7	1677	21.7	0.62	97.2

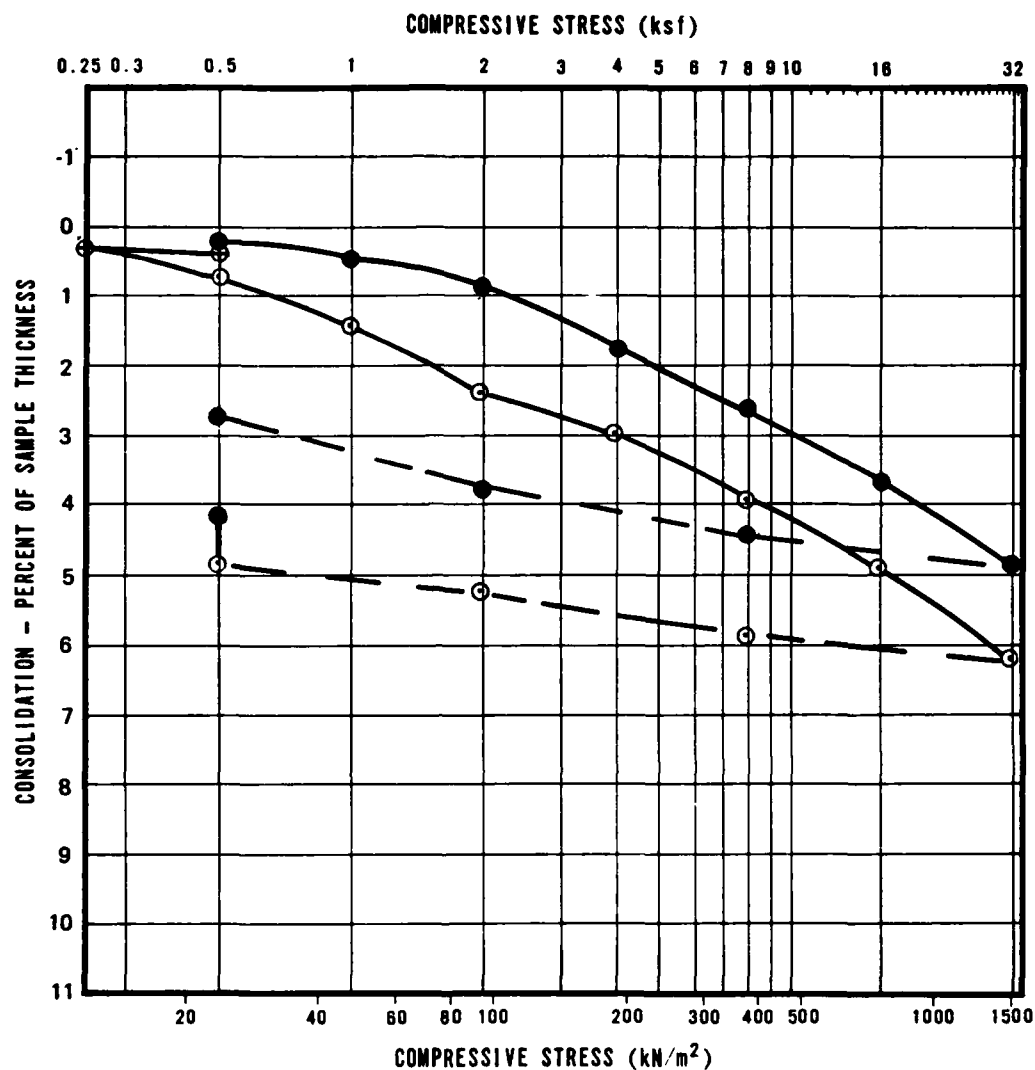
⊕, ○ AT FIELD MOISTURE
 ● AFTER ADDITION OF WATER
 — COMPRESSION
 - - - REBOUND

CONSOLIDATION TEST RESULTS
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
 II-5-3
 2 OF 10

FUGRO NATIONAL, INC.



SYMBOL	BORING NO.	SAMPLE NO.	SAMPLE INTERVAL		SOIL TYPE	INITIAL DRY DENSITY		INITIAL MOISTURE CONTENT (%)	INITIAL VOID RATIO	INITIAL DEGREE OF SATURATION (%)
			FEET	METERS		pcf	kg/m ³			
○, ●	MD-B-9	P-3	6.0 - 6.6	1.83 - 2.01	ML	111.4	1785	17.1	0.51	90.5
⊕, ●	MD-B-9	P-3	6.0 - 6.6	1.83 - 2.01	ML	111.7	1789	16.1	0.51	87.3

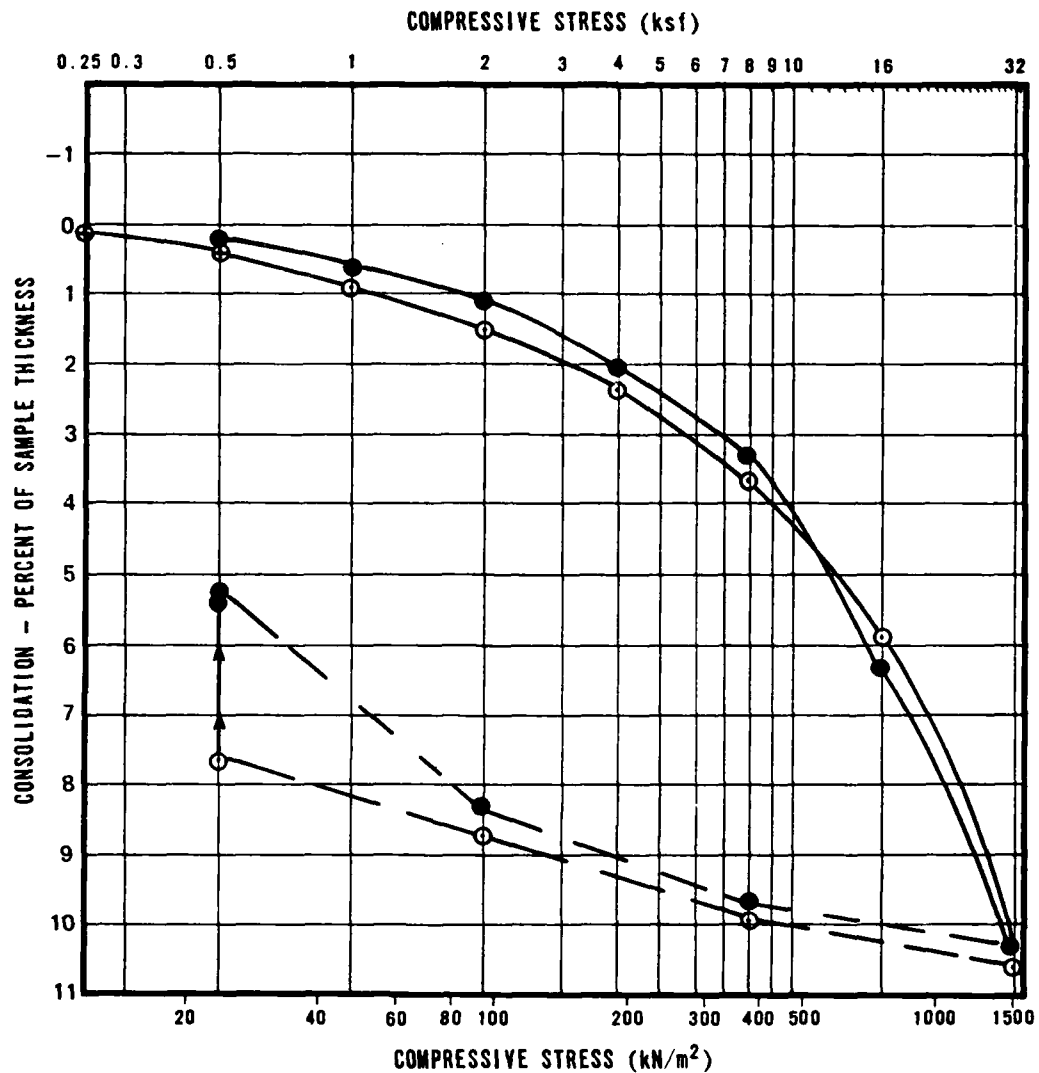
⊕, ○ AT FIELD MOISTURE
 ● AFTER ADDITION OF WATER
 — COMPRESSION
 - - - REBOUND

**CONSOLIDATION TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH**

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
II-5-3
3 OF 10

UGRO NATIONAL, INC.



SYMBOL	BORING NO.	SAMPLE NO.	SAMPLE INTERVAL		SOIL TYPE	INITIAL DRY DENSITY		INITIAL MOISTURE CONTENT (%)	INITIAL VOID RATIO	INITIAL DEGREE OF SATURATION (%)
			FEET	METERS		pcf	kg/m ³			
○, ●	MD-B-9	P-8	31.0 - 31.6	9.45 - 9.63	CH	91.4	1464	30.2	0.84	97.1
⊕, ●	MD-B-9	P-8	31.0 - 31.6	9.45 - 9.63	CH	90.1	1443	31.5	0.87	96.8

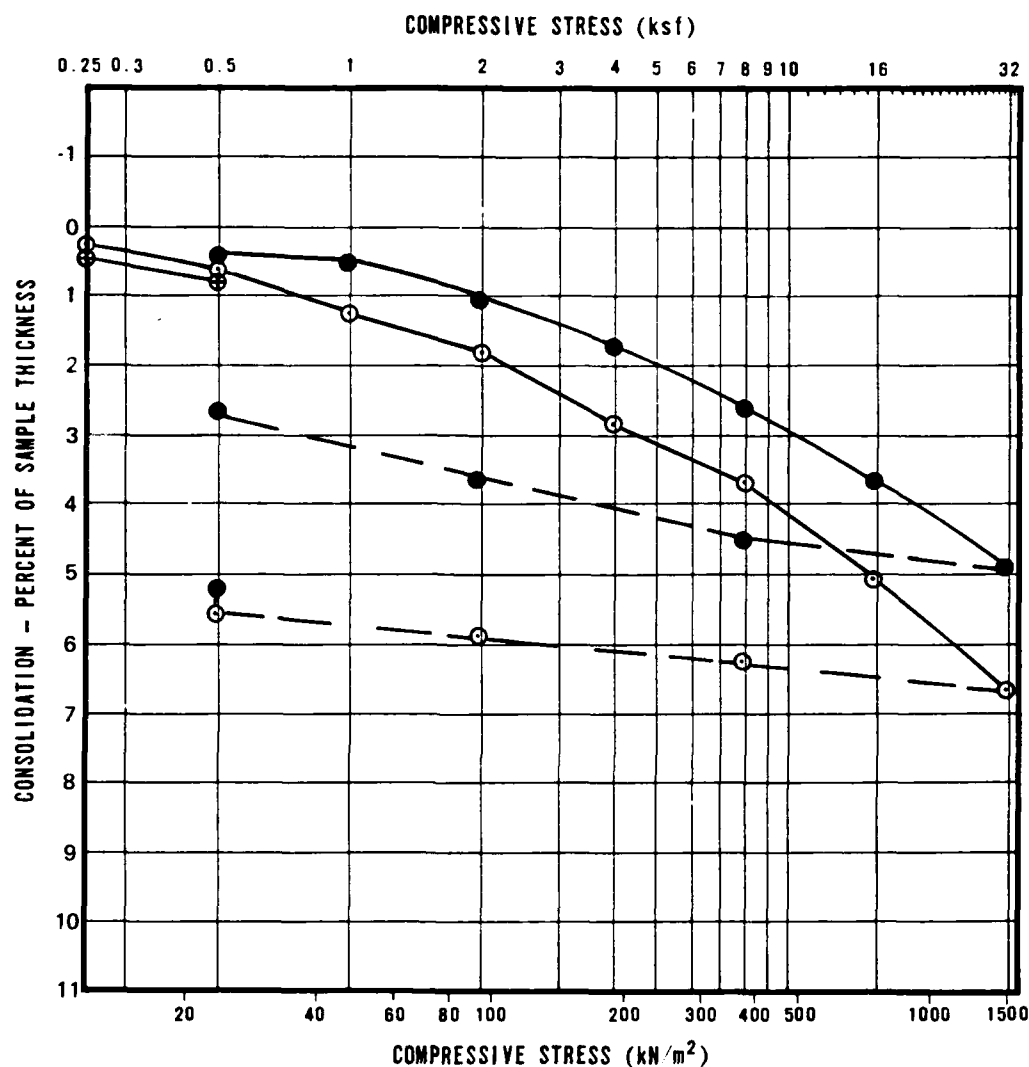
⊕, ○ AT FIELD MOISTURE
 ● AFTER ADDITION OF WATER
 — COMPRESSION
 - - - REFUND

CONSOLIDATION TEST RESULTS
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
 II-5-3
 4 OF 10

FUGRO NATIONAL, INC.



SYMBOL	BORING NO.	SAMPLE NO.	SAMPLE INTERVAL		SOIL TYPE	INITIAL DRY DENSITY		INITIAL MOISTURE CONTENT (%)	INITIAL VOID RATIO	INITIAL DEGREE OF SATURATION (%)
			FEET	METERS		pcf	kg/m ³			
○, ●	MD-B-10	P-12	35.5 - 35.7	10.82 - 10.88	SC	112.8	1807	13.6	0.49	74.9
⊕, ●	MD-B-10	P-12	35.5 - 35.7	10.82 - 10.88	SC	115.0	1842	14.3	0.47	90.1

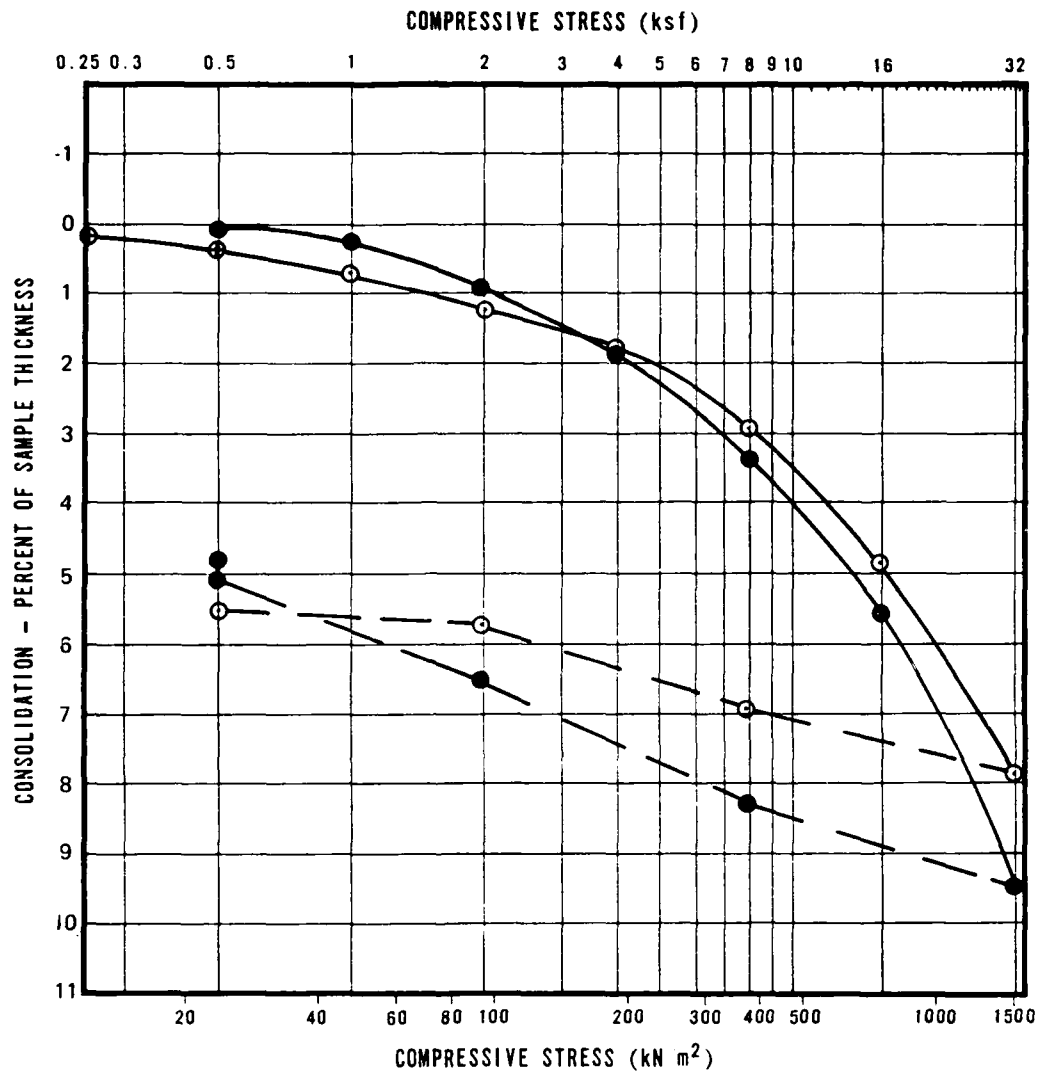
⊕, ○ AT FIELD MOISTURE
 ● AFTER ADDITION OF WATER
 — COMPRESSION
 - - - REBOUND

CONSOLIDATION TEST RESULTS
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
 II-5-3
 5 OF 10

FUGRO NATIONAL, INC.



SYMBOL	BORING NO.	SAMPLE NO.	SAMPLE INTERVAL		SOIL TYPE	INITIAL DRY DENSITY		INITIAL MOISTURE CONTENT (%)	INITIAL VOID RATIO	INITIAL DEGREE OF SATURATION (%)
			FEET	METERS		pcf	kg m^{-3}			
○, ●	MD-B-10	P-17	70.8 - 71.4	21.58 - 21.76	CL	99.4	1592	26.4	0.69	103.3
⊕, ●	MD-B-10	P-17	70.8 - 71.4	21.58 - 21.76	CL	96.9	1552	28.3	0.71	96.2

⊕, ○ AT FIELD MOISTURE
 ● AFTER ADDITION OF WATER
 — COMPRESSION
 - - - REBOUND

CONSOLIDATION TEST RESULTS
 OPERATIONAL BASE SITE
 MILFORD, UTAH

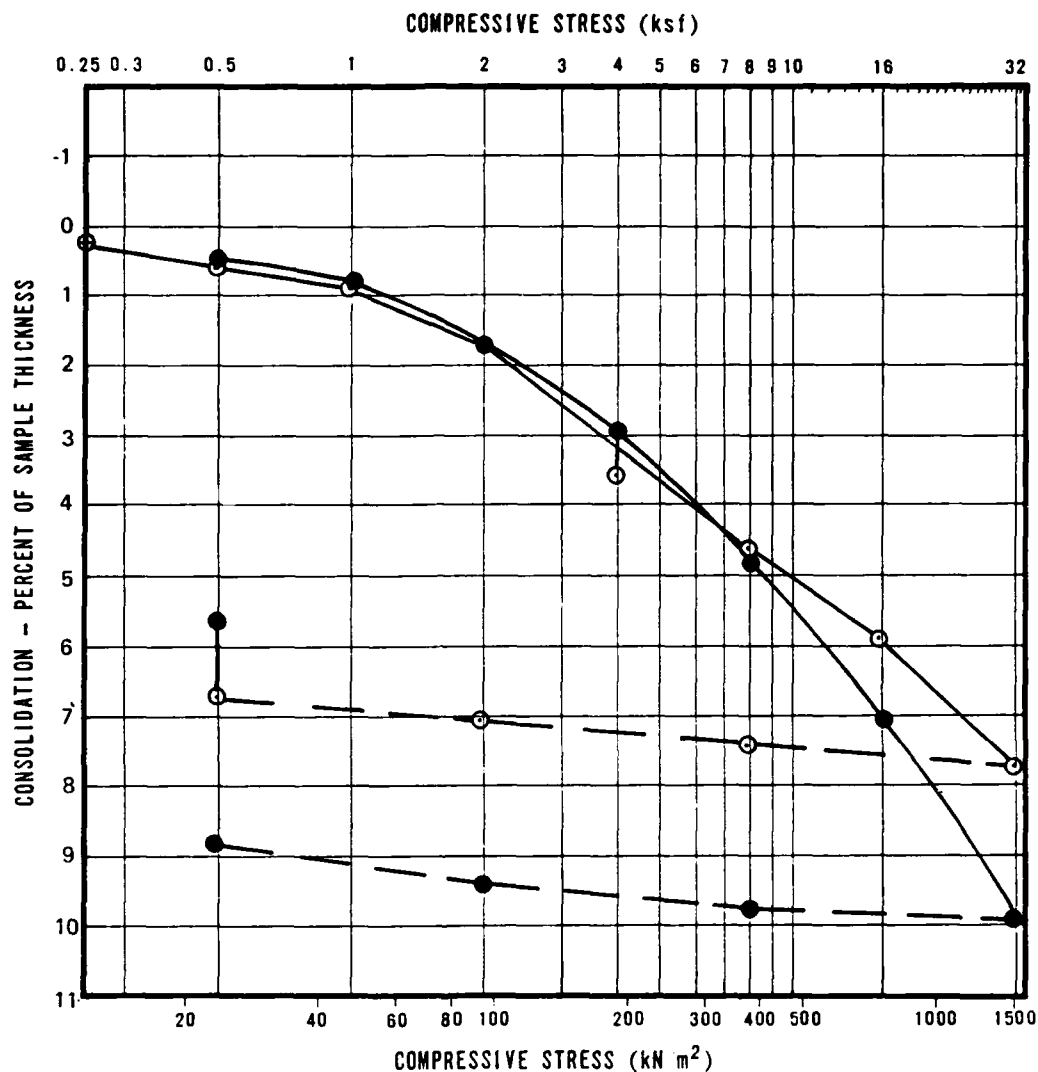
MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE BMO

FIGURE
 II-5-3
 6 OF 10

UGRO NATIONAL, INC.

20 FEB 81

USAF-09



SYMBOL	BORING NO.	SAMPLE NO.	SAMPLE INTERVAL		SOIL TYPE	INITIAL DRY DENSITY		INITIAL MOISTURE CONTENT (%)	INITIAL VOID RATIO	INITIAL DEGREE OF SATURATION (%)
			FEET	METERS		pcf	kg m ³			
○, ●	MD-8-13	P-10	40.2 - 40.8	12.25 - 12.44	SM	118.7	1902	11.3	0.42	88.7
⊕, ●	MD-8-13	P-10	40.2 - 40.8	12.25 - 12.44	SM	111.9	1792	9.8	0.47	61.9

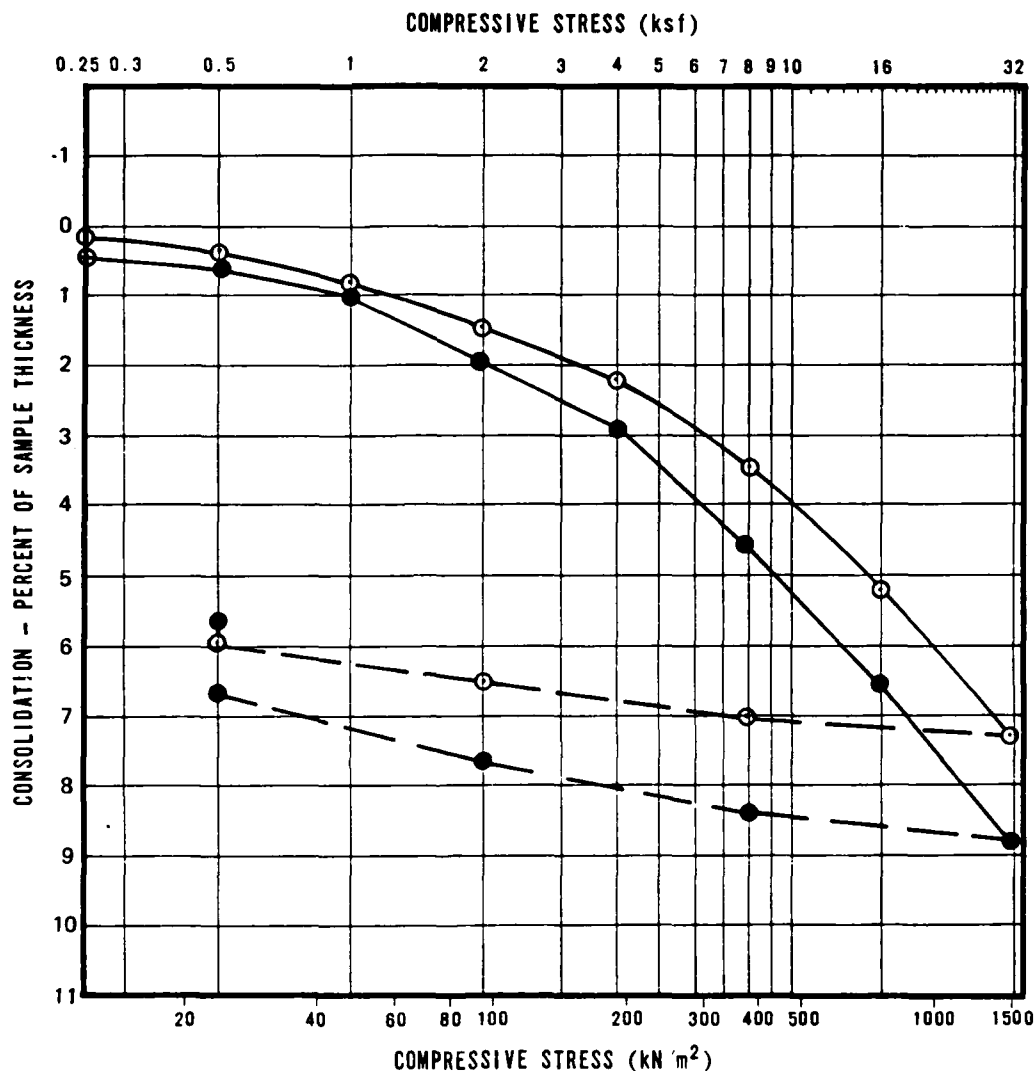
⊕, ○ AT FIELD MOISTURE
 ● AFTER ADDITION OF WATER
 — COMPRESSION
 - - - REBOUND

CONSOLIDATION TEST RESULTS
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE BMO

FIGURE
 II-5-3
 7 OF 10

FUGRO NATIONAL, INC.



SYMBOL	BORING NO.	SAMPLE NO.	SAMPLE INTERVAL		SOIL TYPE	INITIAL DRY DENSITY		INITIAL MOISTURE CONTENT (%)	INITIAL VOID RATIO	INITIAL DEGREE OF SATURATION (%)
			FEET	METERS		pcf	kg m³			
○, ●	MD-B-15	P-7	26.0 - 26.5	7.92 - 8.08	ML	97.2	1557	24.8	0.73	91.7
⊕, ●	MD-B-15	P-7	26.0 - 26.5	7.92 - 8.08	ML	97.5	1562	27.9	0.73	95.4

⊕, ○ AT FIELD MOISTURE
 ● AFTER ADDITION OF WATER
 — COMPRESSION
 - - - REBOUND

CONSOLIDATION TEST RESULTS
 OPERATIONAL BASE SITE
 MILFORD, UTAH

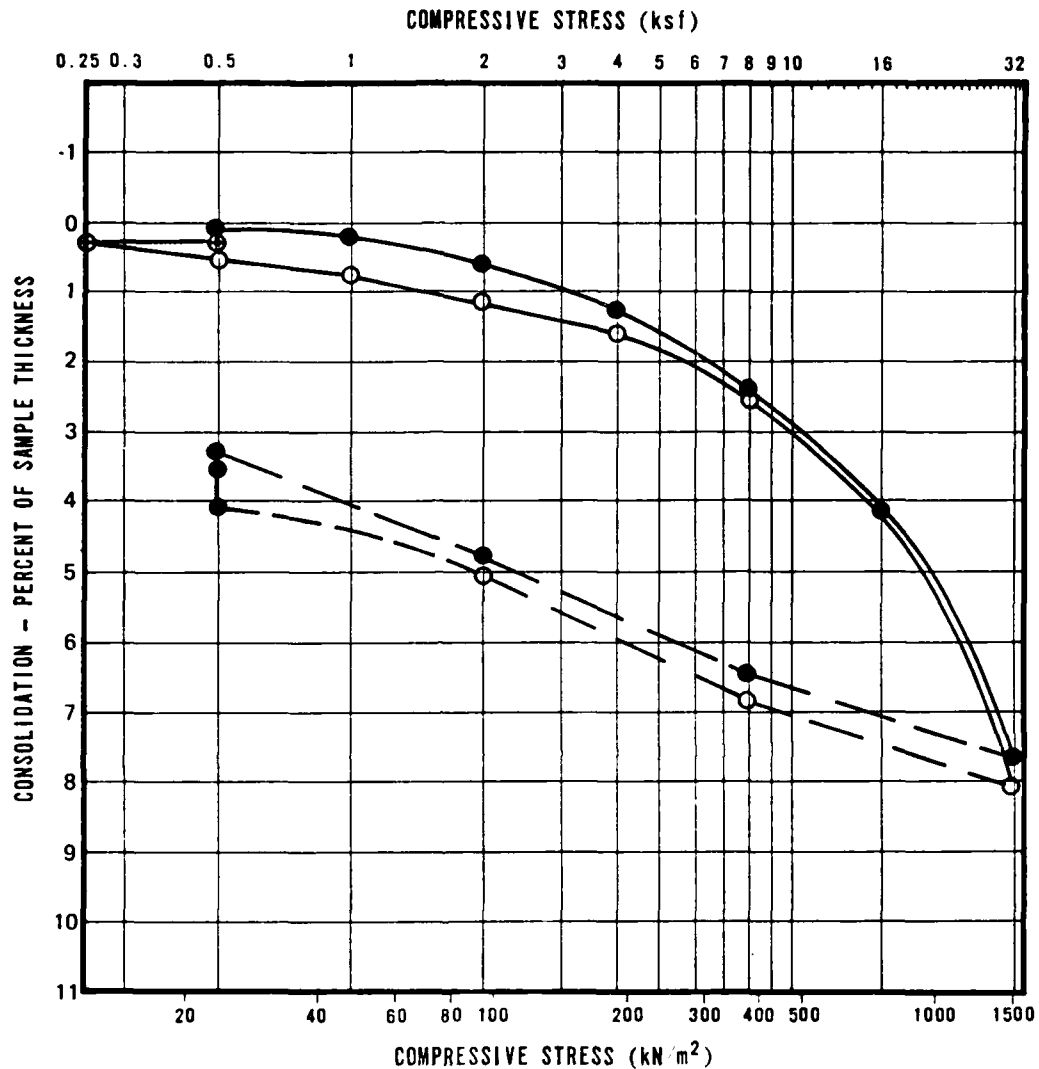
WX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE SMO

FIGURE
 II-5-3
 8 OF 10

FUGRO NATIONAL, INC.

20 FEB 81

USAF-08



SYMBOL	BORING NO.	SAMPLE NO.	SAMPLE INTERVAL		SOIL TYPE	INITIAL DRY DENSITY		INITIAL MOISTURE CONTENT (%)	INITIAL VOID RATIO	INITIAL DEGREE OF SATURATION (%)
			FEET	METERS		pcf	kg m^{-3}			
○ ●	MD-B-15	P-16	90.6 - 90.7	27.61 - 27.65	CL	99.6	1596	26.3	0.69	102.9
⊕ ●	MD-B-15	P-16	90.6 - 90.7	27.61 - 27.65	CL	102.4	1640	24.1	0.65	96.3

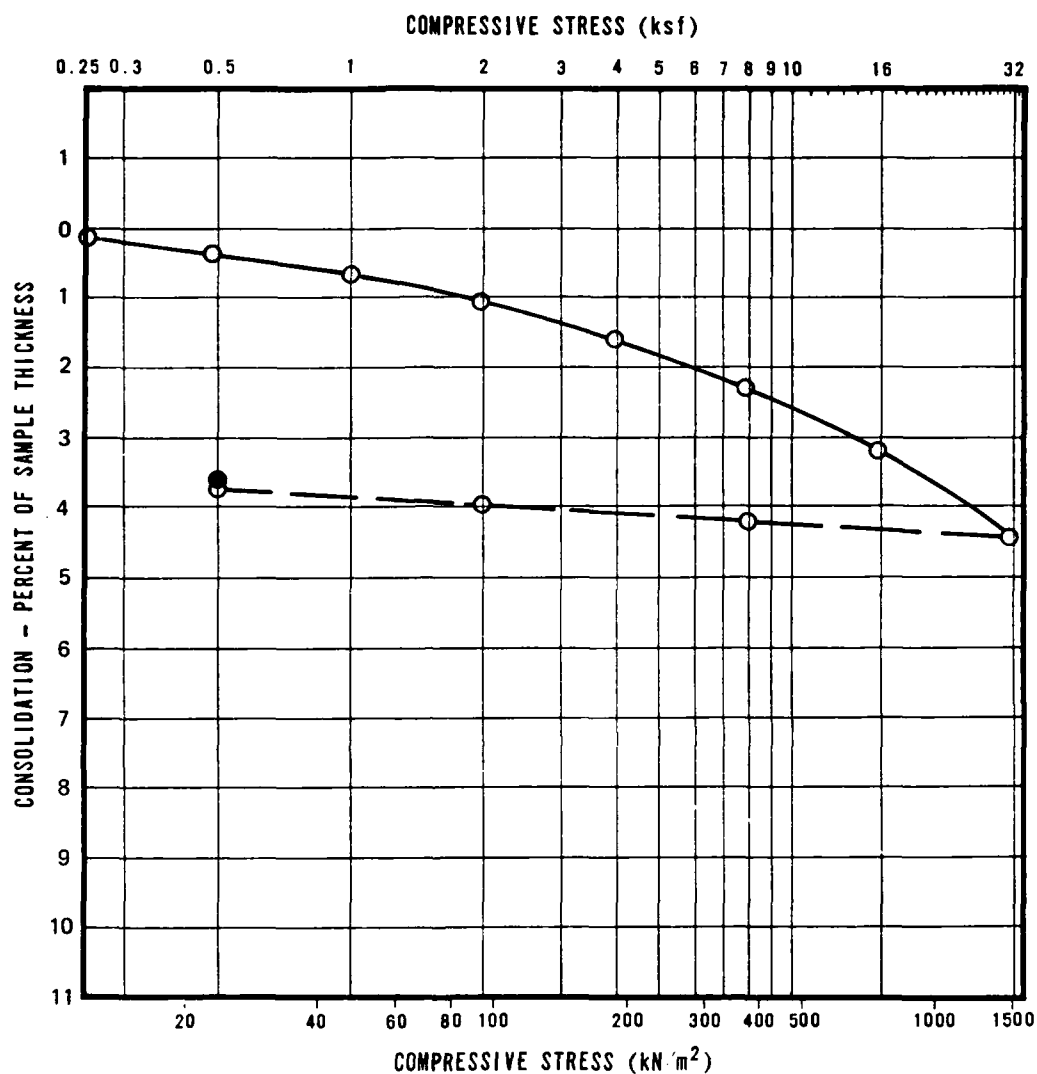
⊕ ○ AT FIELD MOISTURE
 ● AFTER ADDITION OF WATER
 — COMPRESSION
 - - - REBOUND

CONSOLIDATION TEST RESULTS
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE BMO

FIGURE
 II-5-3
 9 OF 10

UGRO NATIONAL, INC.



SYMBOL	BORING NO.	SAMPLE NO.	SAMPLE INTERVAL		SOIL TYPE	INITIAL DRY DENSITY		INITIAL MOISTURE CONTENT (%)	INITIAL VOID RATIO	INITIAL DEGREE OF SATURATION (%)
			FEET	METERS		pcf	kg m ³			
○, ●	BL-3-7	P-10	36.3 - 36.5	11.06 - 11.15	CL	111.1	1780	11.3	0.52	58.7

- AT FIELD MOISTURE
 ● AFTER ADDITION OF WATER
 — COMPRESSION
 - - - REBOUND

CONSOLIDATION TEST RESULTS
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE BMO

FIGURE
 II-5-3
 10 OF 10

FUGRO NATIONAL, INC.

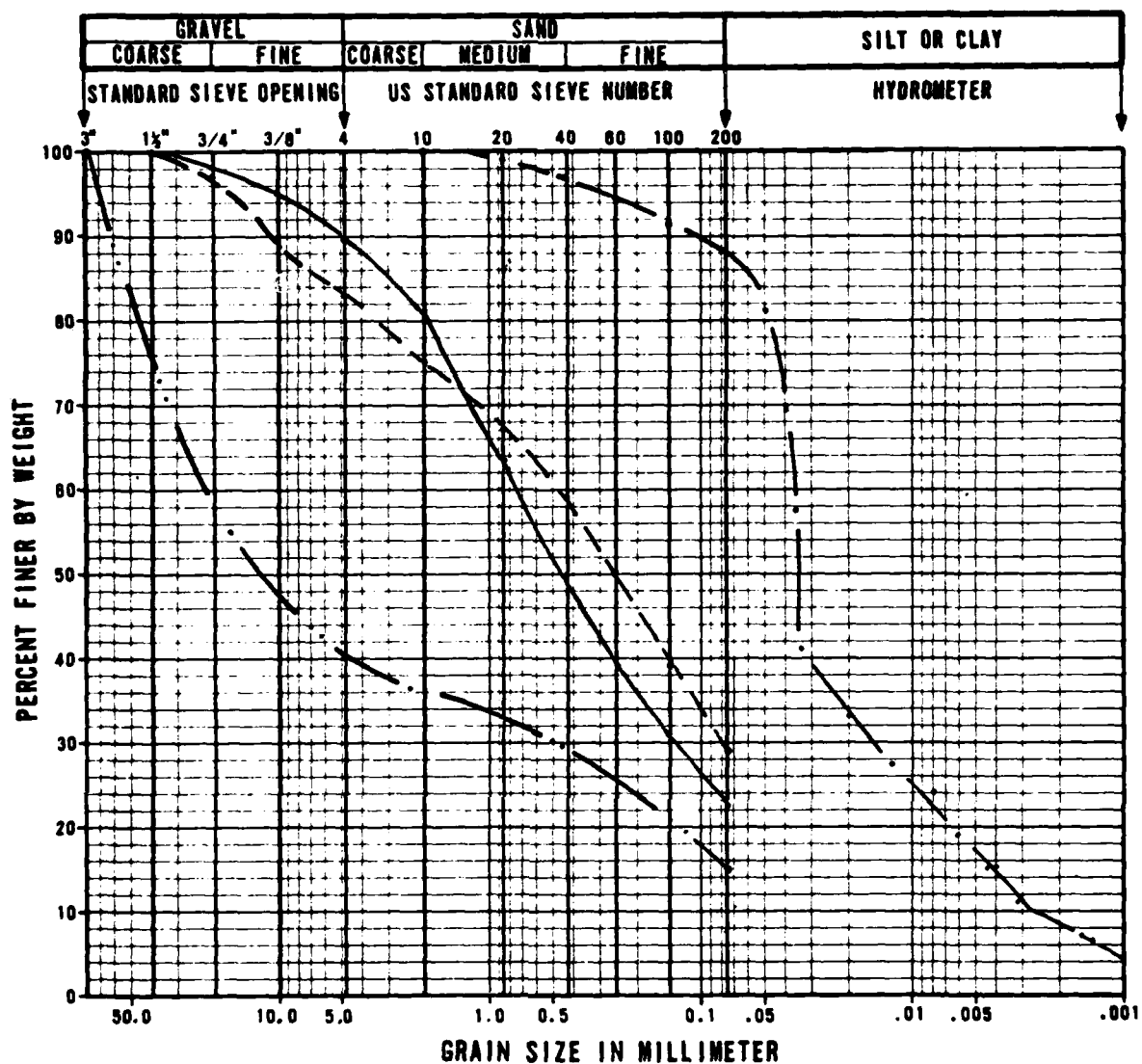
ACTIVITY NO.	SAMPLE NO.	SAMPLE INTERVAL		SOIL TYPE	pH	WATER SOLUBLE				CALCIUM CARBONATE
		FEET	METERS			SODIUM mg/kg	CHLORIDE mg/kg	SULPHATE mg/kg	CALCIUM mg/kg	
MD-B-1	D-2	1.7 - 2.5	0.52 - 0.76	SM	8.5	231	344	48	76	337
	D-11	22.2 - 23.0	6.77 - 7.01	SW-SM	8.3	89	247	42	92	410
MD-B-2	D-5	10.2 - 11.0	3.11 - 3.35	SM	9.0	984	470	188	30	191
MD-B-3	P-7	10.5 - 11.1	3.20 - 3.38	CH	7.9	4365	6660	714	706	4240
MD-B-4	D-14	70.2 - 71.0	21.40 - 21.64	SM	9.1	268	55	37	75	319
MD-B-6	D-2	1.7 - 2.5	0.52 - 0.76	SM	8.9	111	40	5	68	272
MD-B-7	D-4	10.2 - 11.0	3.11 - 3.35	GP	9.7	495	177	117	35	183
MD-B-8	D-6	20.2 - 21.0	6.16 - 6.40	SP-SM	8.2	443	520	875	169	874
MD-B-9	P-12	50.0 - 52.5	15.24 - 16.00	SM	8.9	100	56	49	133	370
	P-14	69.0 - 71.5	21.03 - 21.79	CH	8.8	175	56	75	95	341
MD-B-11	D-5	15.2 - 16.0	4.63 - 4.88	SP	8.6	178	146	206	98	326
MD-B-12	D-3	6.7 - 7.5	2.04 - 2.29	SM	8.6	732	488	133	73	259
MD-B-13	D-5	15.2 - 16.0	4.63 - 4.88	SP	9.0	807	357	62	39	167
MD-B-15	P-12	50.0 - 51.0	15.24 - 15.54	CL	8.3	5010	2750	1395	112	664
BL-B-7	D-7	19.1 - 19.9	5.82 - 6.07	SP-SM	8.4	193	291	1440	95	368
BL-B-10	D-9	35.2 - 36.0	10.73 - 10.97	SM	8.6	96	92	37	48	261
BL-T-10	B-2	4.0 - 5.0	1.22 - 1.52	GP-GM	9.0	32	26	48	65	289
BL-T-17	B-1	0.5 - 2.0	0.15 - 0.61	CL	8.2	1780	261	157	2420	7175

SUMMARY OF CHEMICAL TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

TABLE
II-5-3

FUGRO NATIONAL, INC.



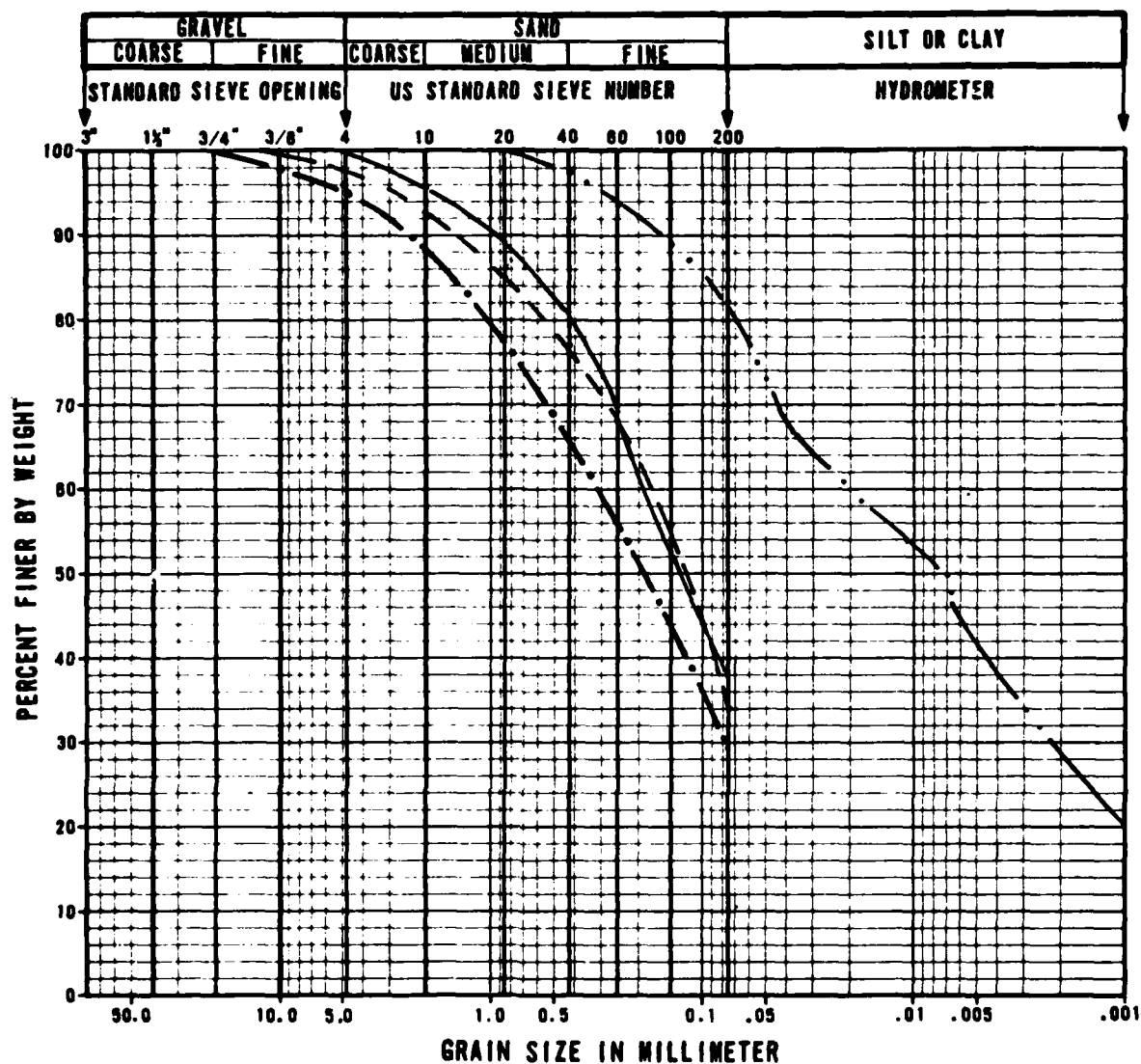
SYMBOL	COMPOSITE SAMPLE NUMBER	ACTIVITY NUMBER	SAMPLE INTERVAL		SOIL TYPE
			FEET	METERS	
—	A	MD-T-5	0.5 - 2.0	0.15 - 0.61	SM
- -	B	MD-T-6	0.5 - 2.0	0.15 - 0.61	SM
- . -	C	MD-T-9	0.5 - 2.0	0.15 - 0.61	MH
- - -	D	MD-T-12	0.5 - 2.0	0.15 - 0.61	GC

GRAIN SIZE CURVES, CBR TESTS
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-5-4
1 OF 3

FUGRO NATIONAL, INC.



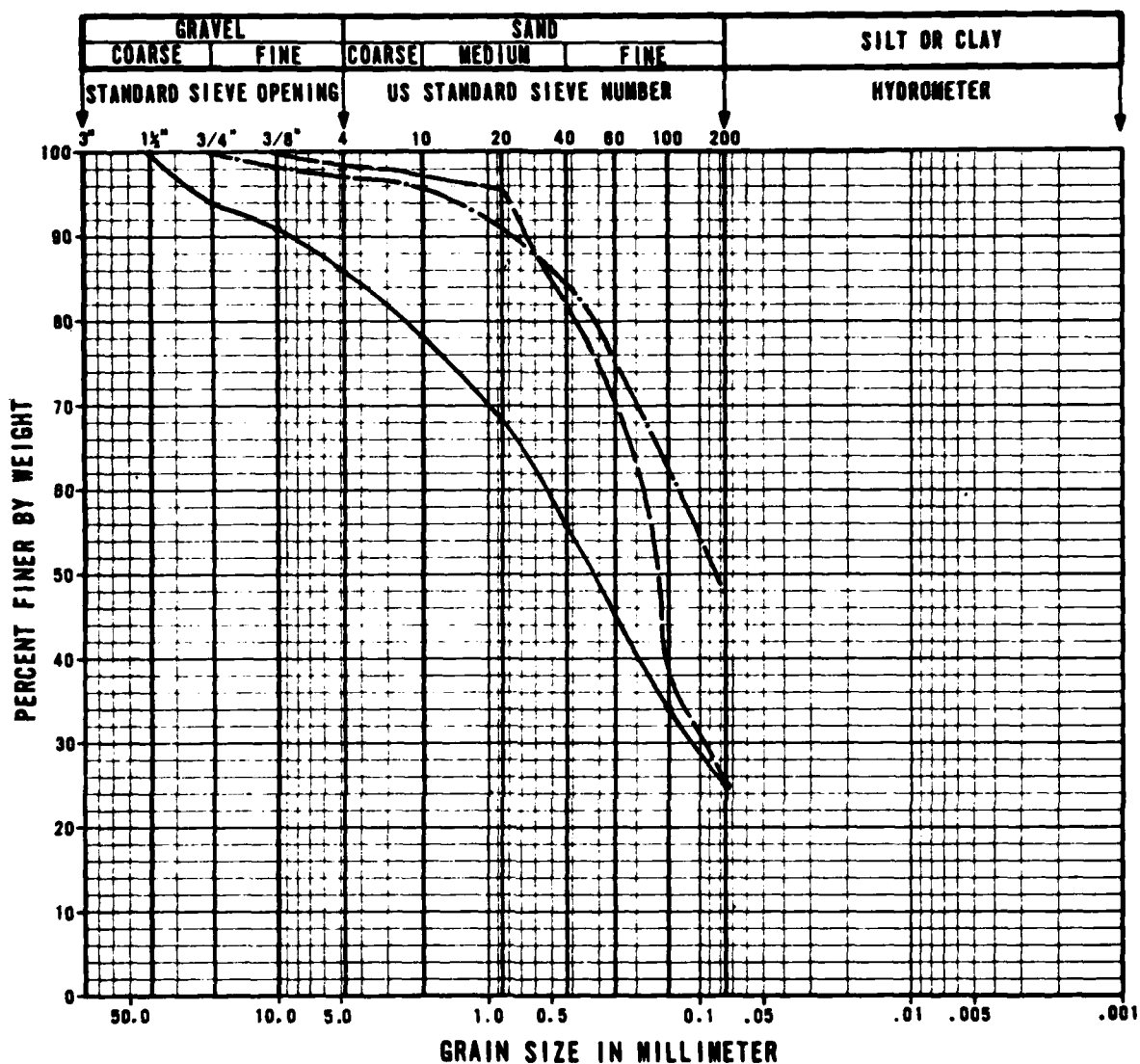
SYMBOL	COMPOSITE SAMPLE NUMBER	ACTIVITY NUMBER	SAMPLE INTERVAL		SOIL TYPE
			FEET	METERS	
—	E	MD-T-14	0.5 - 2.0	0.15 - 0.61	SC
- -	F	MD-T-15	0.5 - 2.0	0.15 - 0.61	SM
- . -	G	MD-T-17	0.5 - 2.0	0.15 - 0.61	SC
- . . -	H	MD-P-1	0.5 - 2.0	0.15 - 0.61	CH

GRAIN SIZE CURVES, CBR TESTS
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DND

FIGURE
II-5-4
2 OF 3

FUGRO NATIONAL, INC.



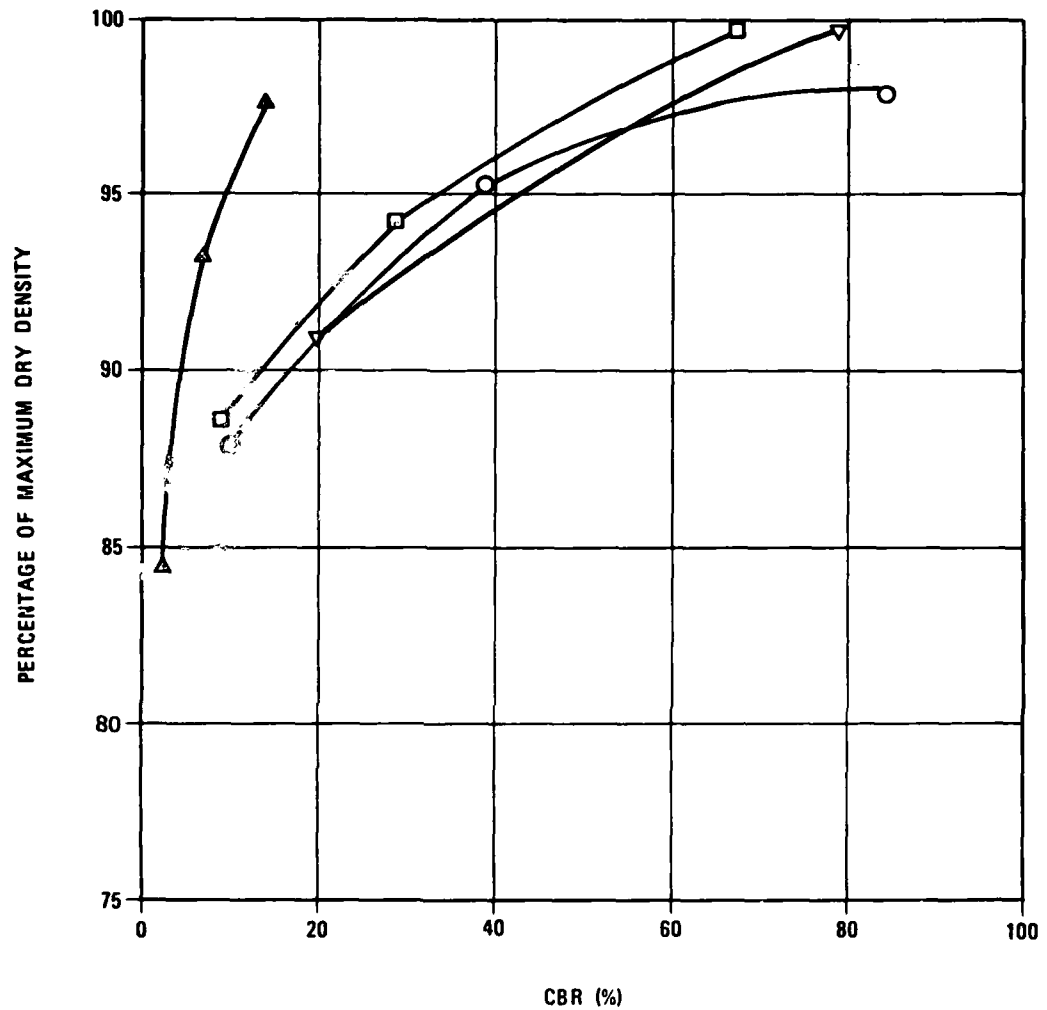
SYMBOL	COMPOSITE SAMPLE NUMBER	ACTIVITY NUMBER	SAMPLE INTERVAL		SOIL TYPE
			FEET	METERS	
—	I	MD-P-4	0.5 - 2.0	0.15 - 0.61	SC
- - -	J	BL-P-15	0.5 - 2.0	0.15 - 0.61	SM
- · -	K	BL-P-21	0.5 - 2.0	0.15 - 0.61	SM

GRAIN-SIZE CURVES, CBR TESTS
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-5-4
3 OF 3

FUGRO NATIONAL, INC.



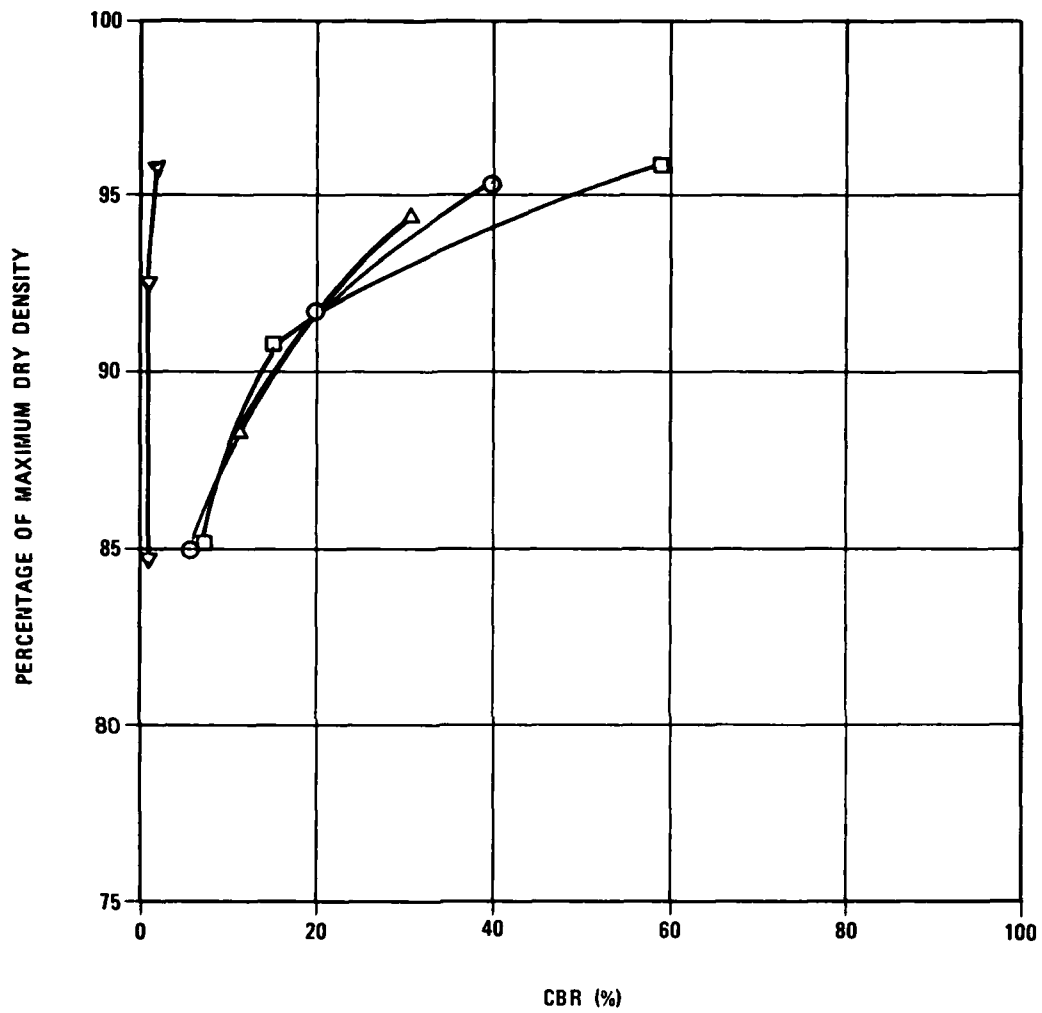
SYMBOL	COMPOSITE SAMPLE NUMBER	SOIL TYPE
○	A	SM
□	B	SM
△	C	MH
▽	D	GC

CALIFORNIA BEARING RATIO (CBR) CURVES
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
II-5-5
1 OF 3

FUGRO NATIONAL, INC.



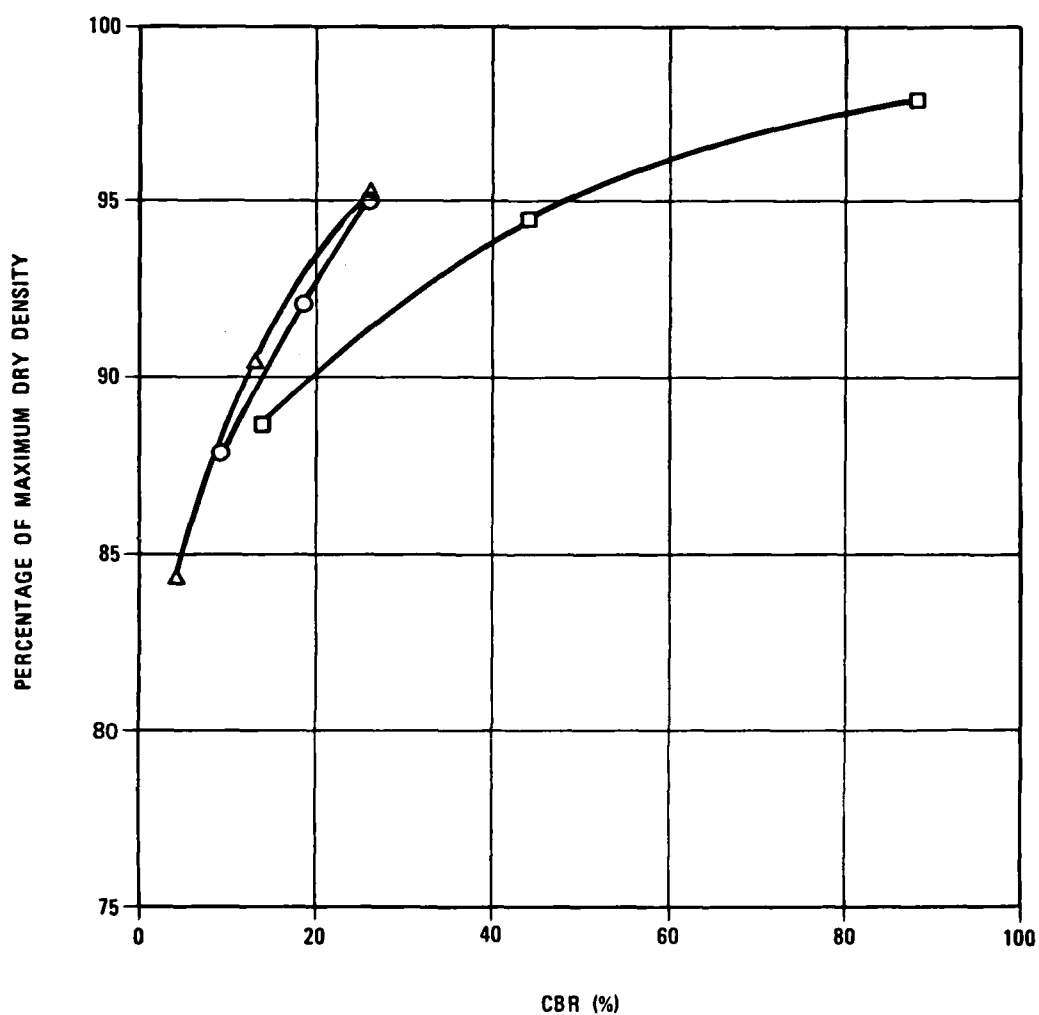
SYMBOL	COMPOSITE SAMPLE NUMBER	SOIL TYPE
○	E	SC
□	F	SM
△	G	SC
▽	H	CH

CALIFORNIA BEARING RATIO (CBR) CURVES
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
II-5-5
2 OF 3

FUGRO NATIONAL, INC.



SYMBOL	COMPOSITE SAMPLE NUMBER	SOIL TYPE
○	I	SC
□	J	SM
△	K	SM

CALIFORNIA BEARING RATIO (CBR) CURVES
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
II-5-5
3 OF 3

FUGRO NATIONAL, INC.

COMPOSITE SAMPLE NUMBER	SOIL TYPE	PERCENT PASSING #200	ATTERBERG LIMITS		SPECIFIC GRAVITY	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)	COMPACTED DRY DENSITY		COMPACTED MOISTURE (%)	PERCENT OF MAXIMUM DRY DENSITY	CBR (%)
			LL	PI		pcf	kg/m ³		pcf	kg/m ³			
A	SM	22				125.0	2003	10.7	122.7	1966	11.4	98.2	84
									119.0	1906	10.2	95.2	39
									110.4	1769	10.9	88.3	10
B	SM	29		NP		125.0	2003	11.0	124.5	1994	11.1	99.6	67
									117.8	1887	11.2	94.2	29
									110.7	1773	12.2	88.6	9
C	MH	88	70	21		69.1	1107	49.8	67.4	1080	51.1	97.5	14
									64.4	1032	51.0	93.2	7
									58.7	940	51.1	84.5	3
D	GC	15				137.0	2195	7.0	136.7	2190	6.2	99.8	79
									124.6	1996	6.7	90.9	20

CALIFORNIA BEARING RATIO (CBR)
TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

TABLE
II-5-4
1 OF 3

FUGRO NATIONAL, INC.

COMPOSITE SAMPLE NUMBER	SOIL TYPE	PERCENT PASSING #200	ATTERBERG LIMITS		SPECIFIC GRAVITY	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)	COMPACTED DRY DENSITY		COMPACTED MOISTURE (%)	PERCENT OF MAXIMUM DRY DENSITY	CBR (%)
			LL	PI		pcf	kg/m ³		pcf	kg/m ³			
E	SC	38	28	11		116.0	1858	15.5	110.4	1769	15.9	95.2	40
									106.2	1701	15.5	91.6	20
									98.6	1580	15.5	85.0	6
F	SM	34				126.9	2033	10.2	121.7	1950	10.8	95.9	59
									115.1	1844	9.7	90.7	15
									108.0	1730	10.6	85.1	7
G	SC	30	39	18		112.0	1794	17.2	105.7	1693	17.1	94.4	31
									98.9	1584	17.2	88.3	11
H	CH	82	61	32		102.0	1634	23.0	97.6	1564	22.5	95.7	2
									94.3	1511	22.5	92.5	1
									86.4	1384	22.4	84.7	1

CALIFORNIA BEARING RATIO (CBR)
TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

TABLE
II-5-4
2 OF 3

TUBRO NATIONAL, INC.

COMPOSITE SAMPLE NUMBER	SOIL TYPE	PERCENT PASSING #200	ATTERBERG LIMITS		SPECIFIC GRAVITY	MAXIMUM DRY DENSITY		OPTIMUM MOISTURE (%)	COMPACTED DRY DENSITY		COMPACTED MOISTURE (%)	PERCENT OF MAXIMUM DRY DENSITY	CBR (%)
			LL	PI		pcf	kg/m ³		pcf	kg/m ³			
I	SC	25	36	14		122.5	1962	11.1	116.4	1865	11.7	95.0	26
									112.7	1805	11.3	92.0	19
									107.8	1727	11.0	88.0	10
J	SM	25				125.0	2003	10.9	122.2	1958	11.1	97.8	87
									118.3	1895	11.1	94.6	43
									110.7	1773	11.1	88.6	14
K	SM	48				122.5	1962	11.5	116.8	1871	11.6	95.3	26
									110.8	1775	11.9	90.4	13
									103.2	1653	12.3	84.2	4

CALIFORNIA BEARING RATIO (CBR)
TEST RESULTS
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

TABLE
II-5-4
3 OF 3

FUGRO NATIONAL, INC.

SECTION 6.0

EXPLANATION OF
CONE PENETROMETER TEST RESULTS

SECTION 1.0
ACTIVITY LOCATION MAP
(IN POCKET)

6.0 EXPLANATION OF CONE PENETROMETER TEST RESULTS

The results of all cone penetrometer tests are presented in this section. Explanations of the test results are as follows:

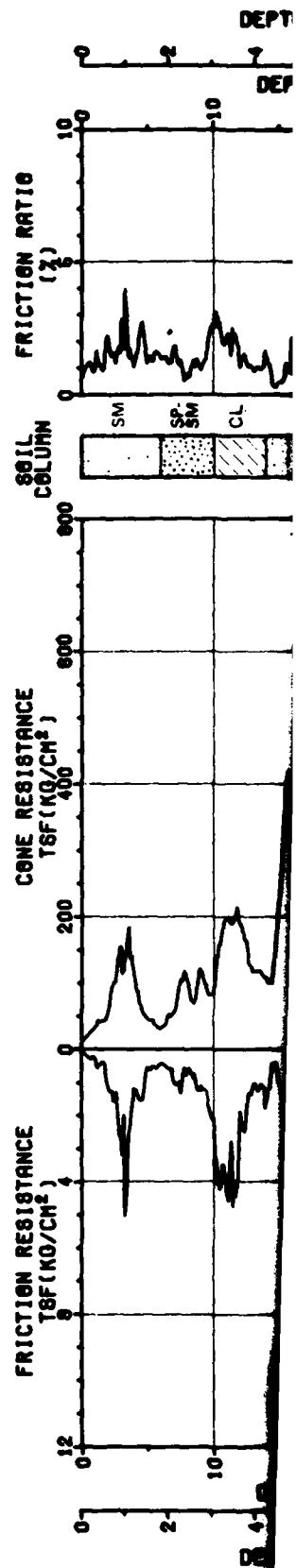
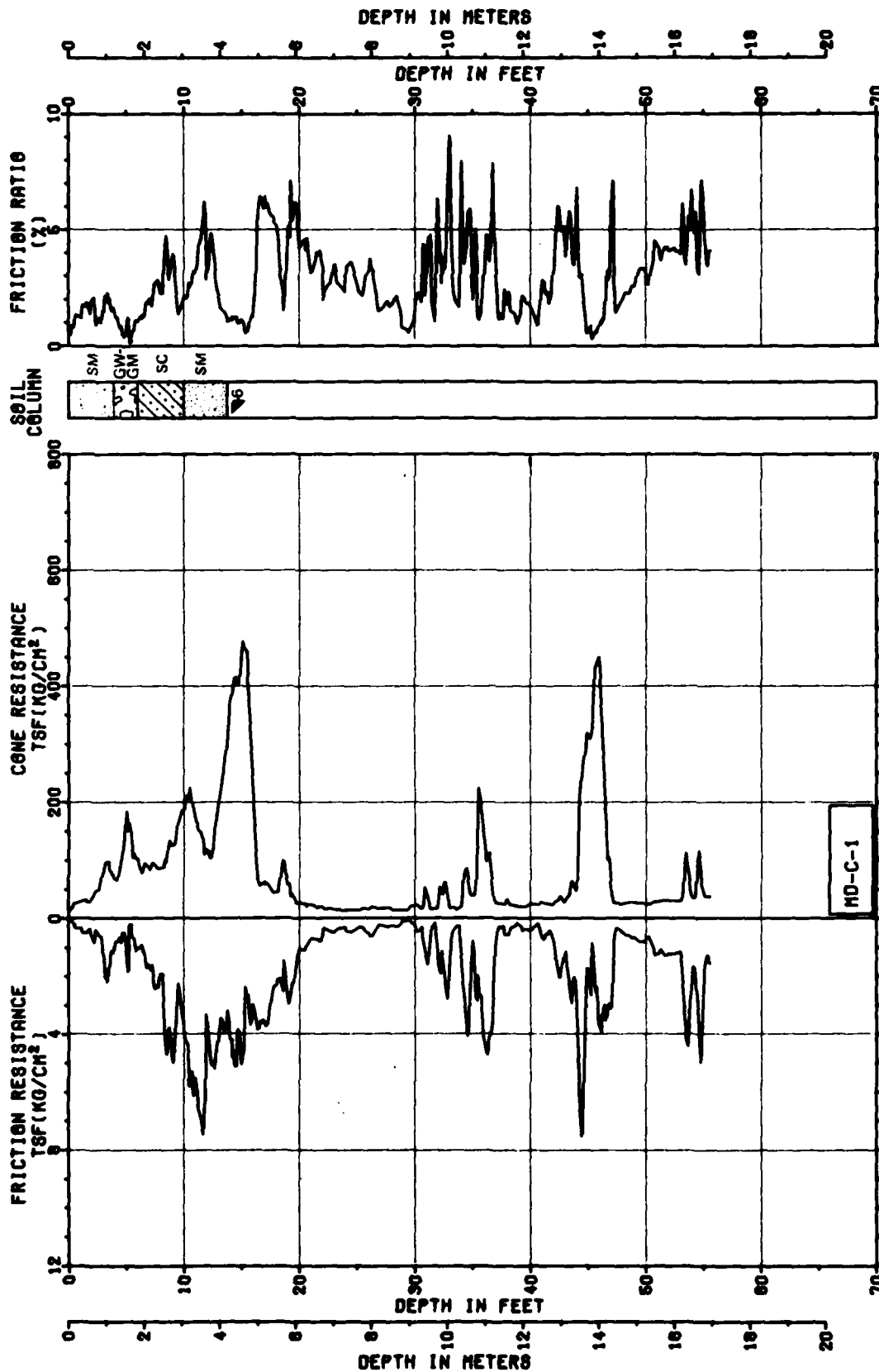
- A. Friction Resistance - The resistance to penetration developed by the friction sleeve, equal to the vertical force applied to the sleeve divided by its surface area. This resistance is the sum of friction and adhesion.
- B. Cone Resistance - The resistance to penetration developed by the cone, equal to the vertical force applied to the cone, divided by its horizontally projected area.
- C. Friction Ratio - The ratio of friction resistance to cone resistance.
- D. Designation - Each cone penetrometer test is identified by a number: for example MD-C-1 or BL-C-1.

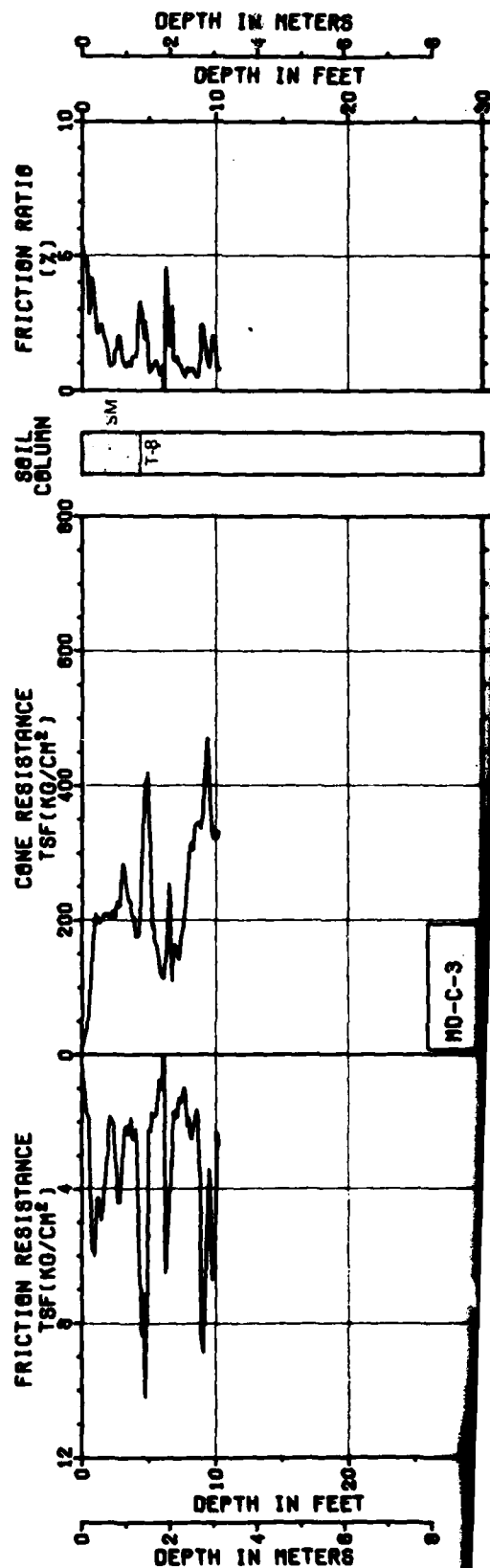
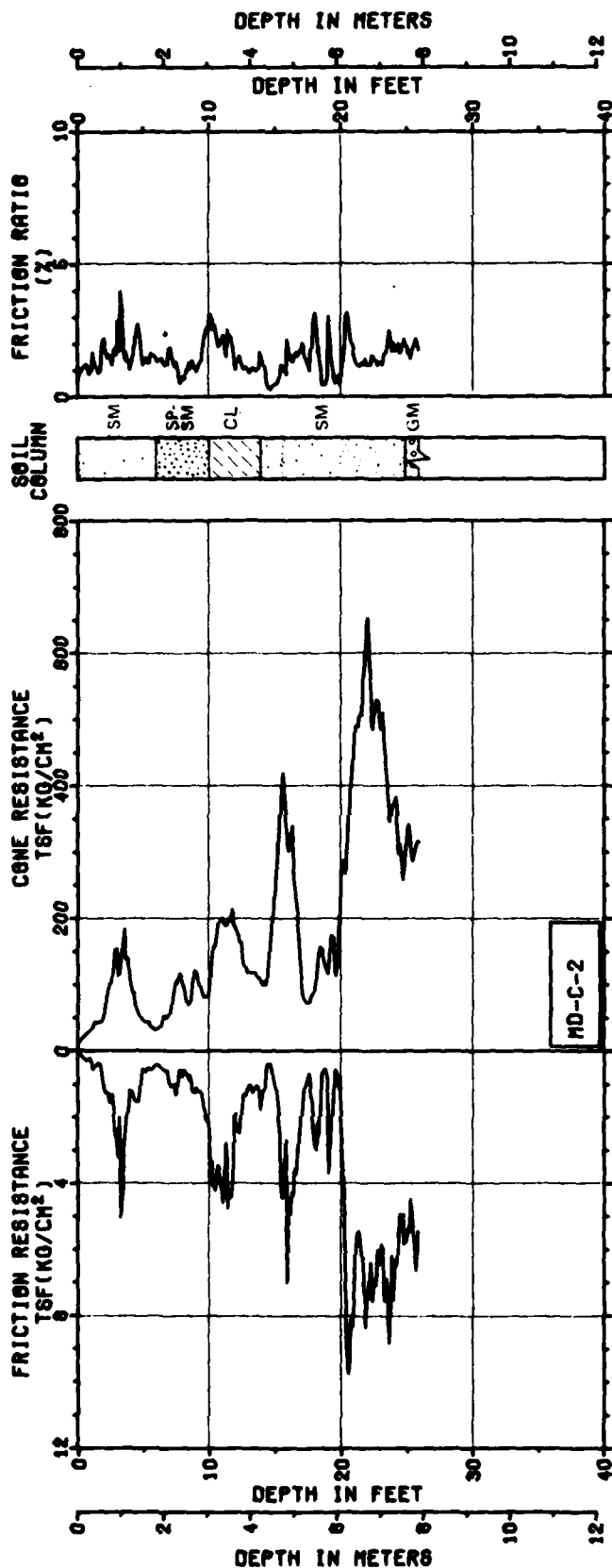
MD or BL - abbreviation for the site (e.g., MD-Milford and BL-Beryl)
C - abbreviation for the CPT
1 - number of the test

All of the engineering activities for Option 1 OBTS are designated by BL (e.g., Beryl).

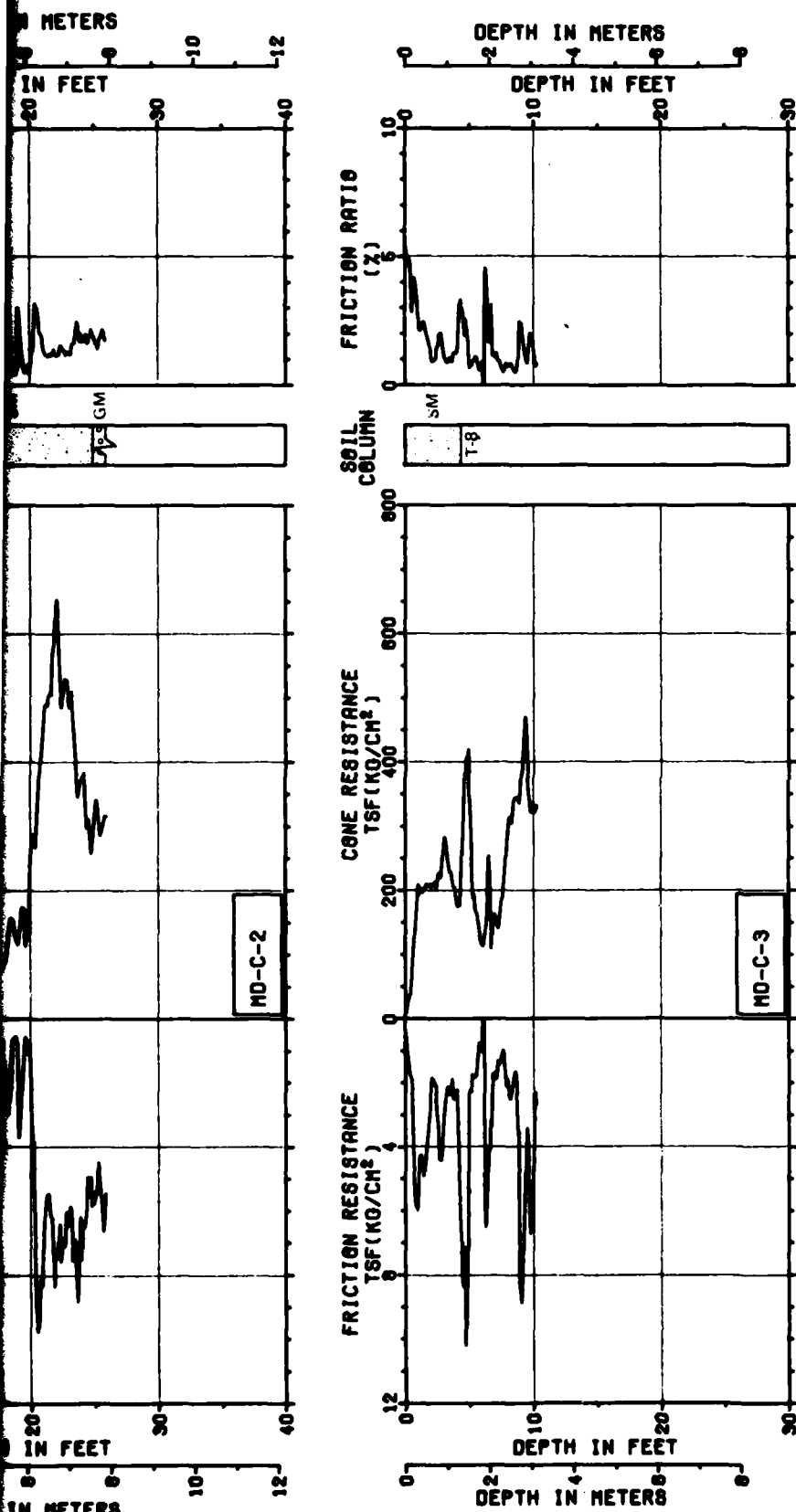
- E. Soil Column - A graphical presentation of the soil type versus depth at each cone penetrometer test location where either a boring, trench, or test pit was performed. The Unified Soil Classification Symbol for each different soil type is listed immediately to the right of the soil column.

Immediately below the soil column, the activity number for the corresponding boring, trench, or test pit at each CPT location is given.





2

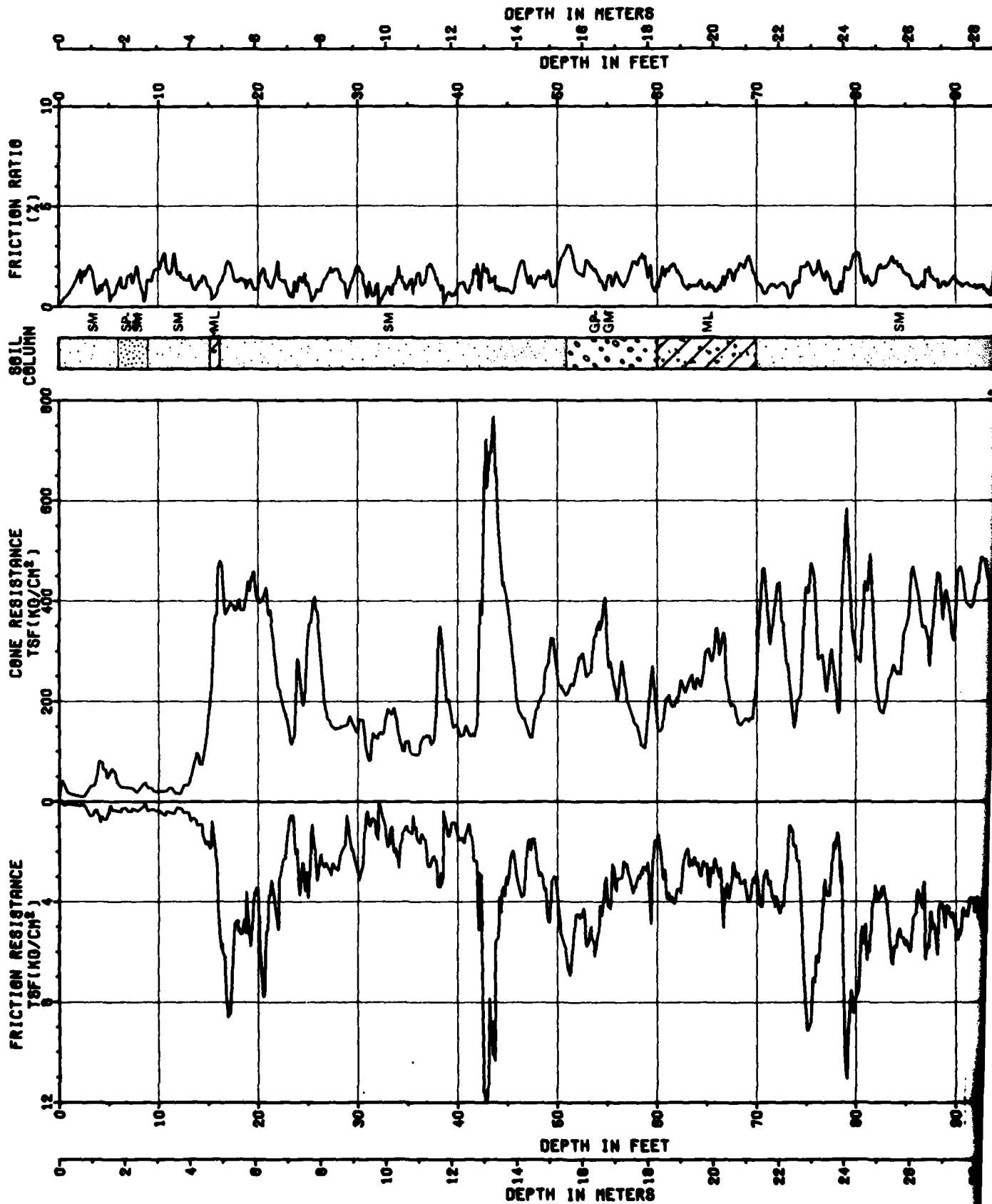


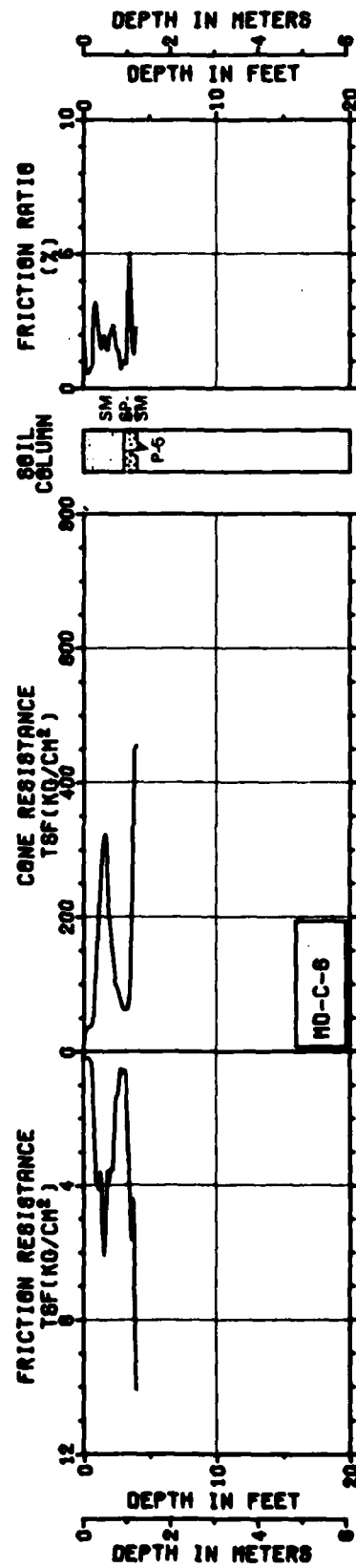
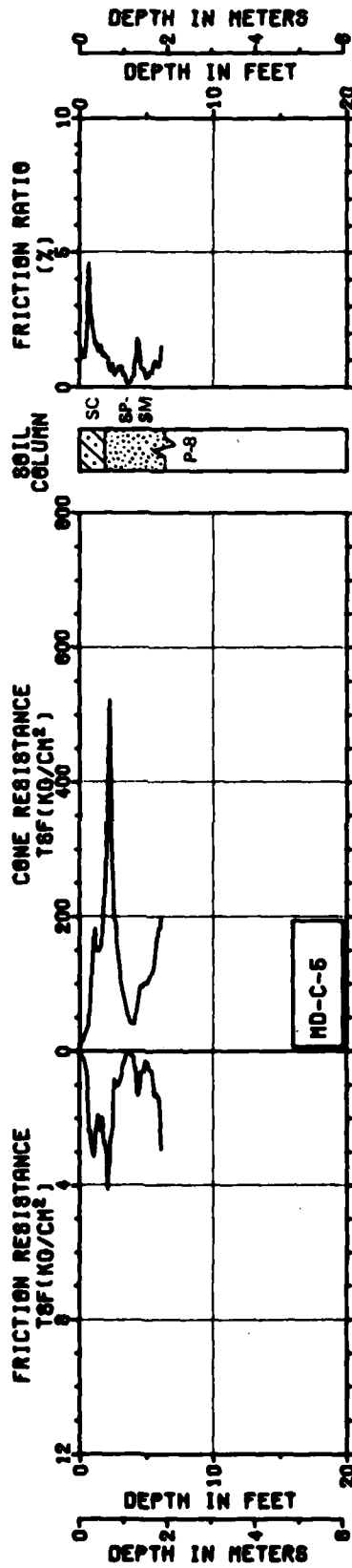
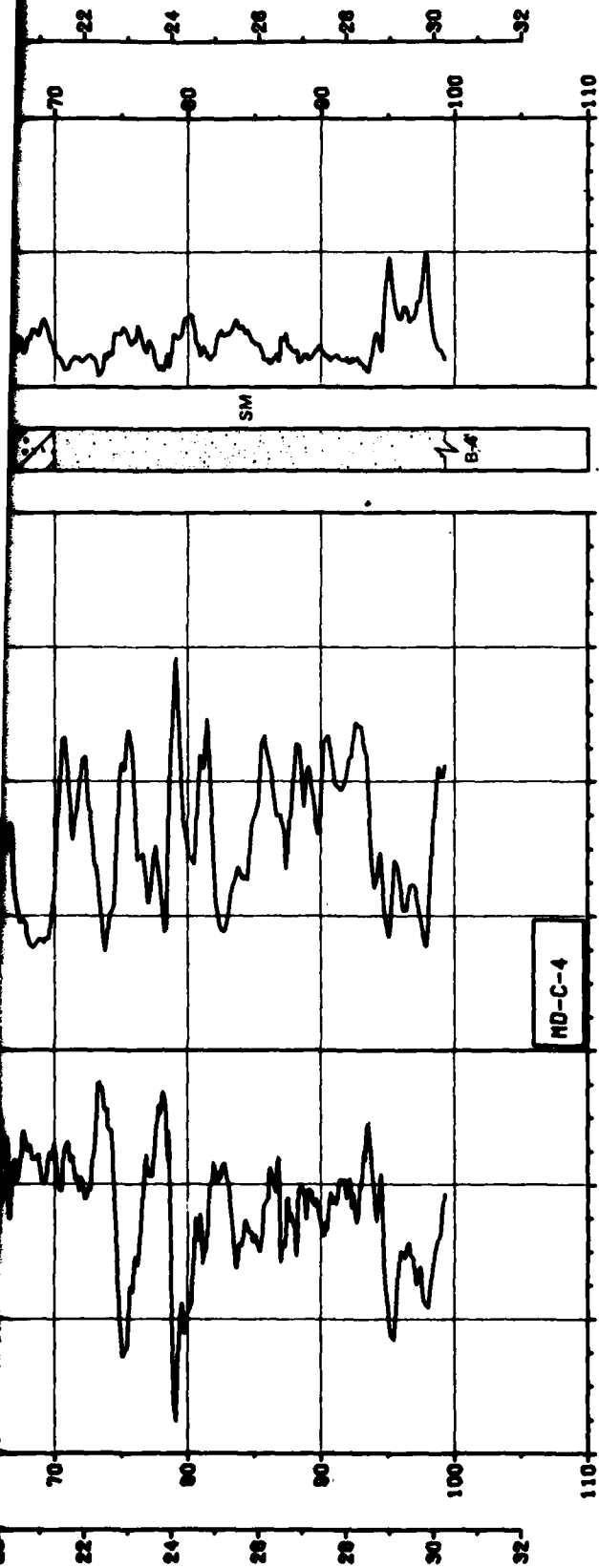
CONE PENETROMETER TEST MD-C-1, 2 & 3
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

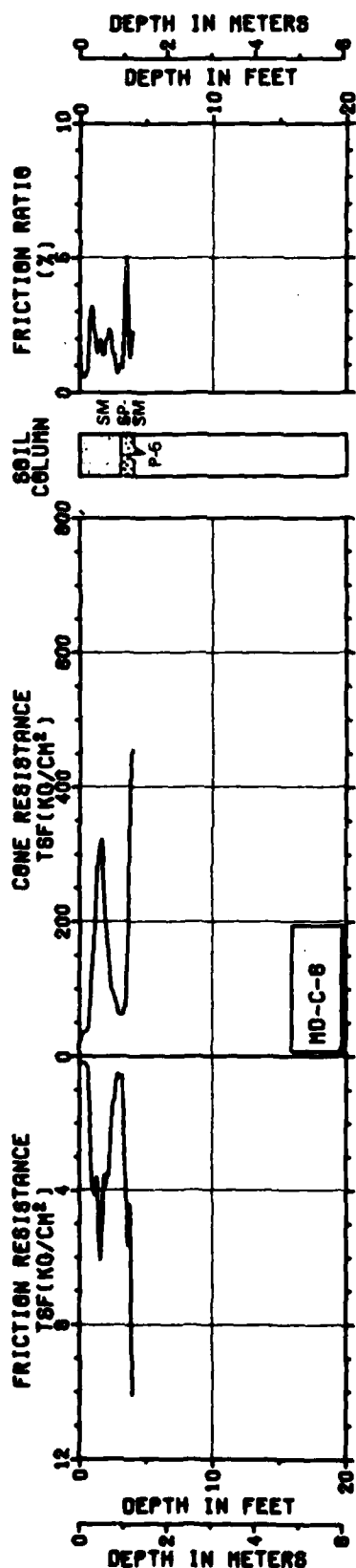
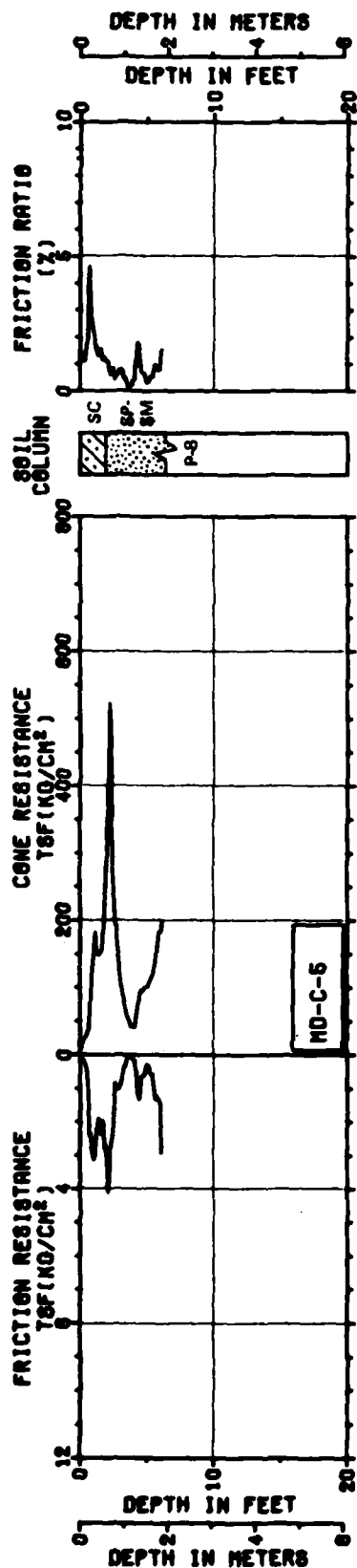
FIGURE
II-6-1
1 OF 25

FUGRO NATIONAL, INC.





2

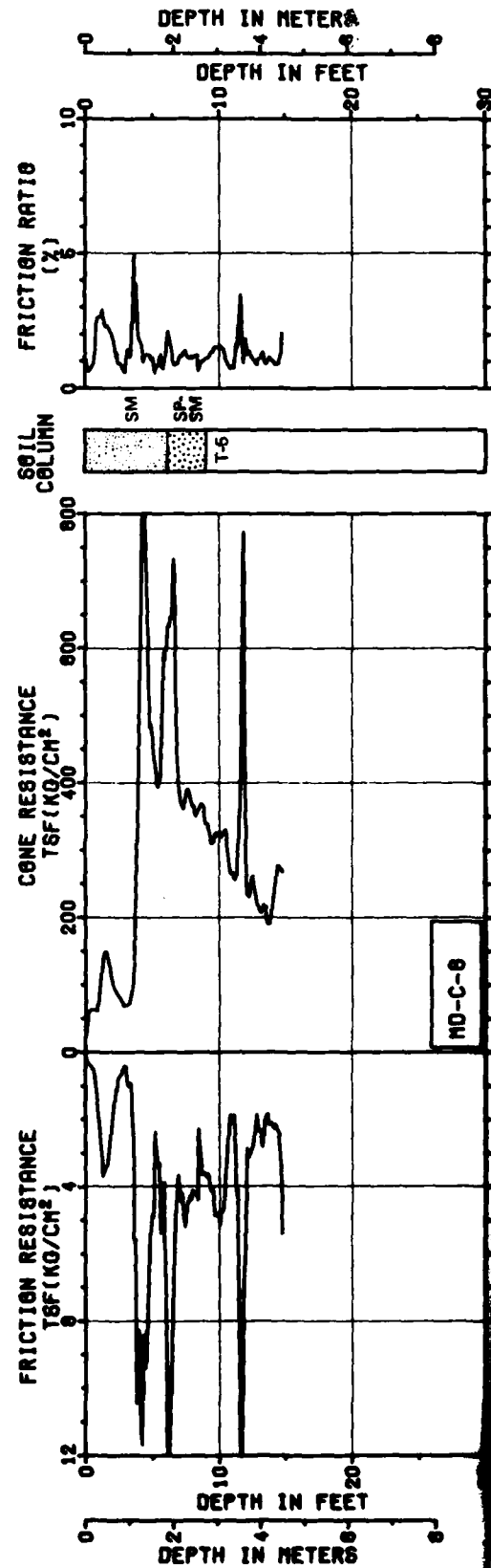
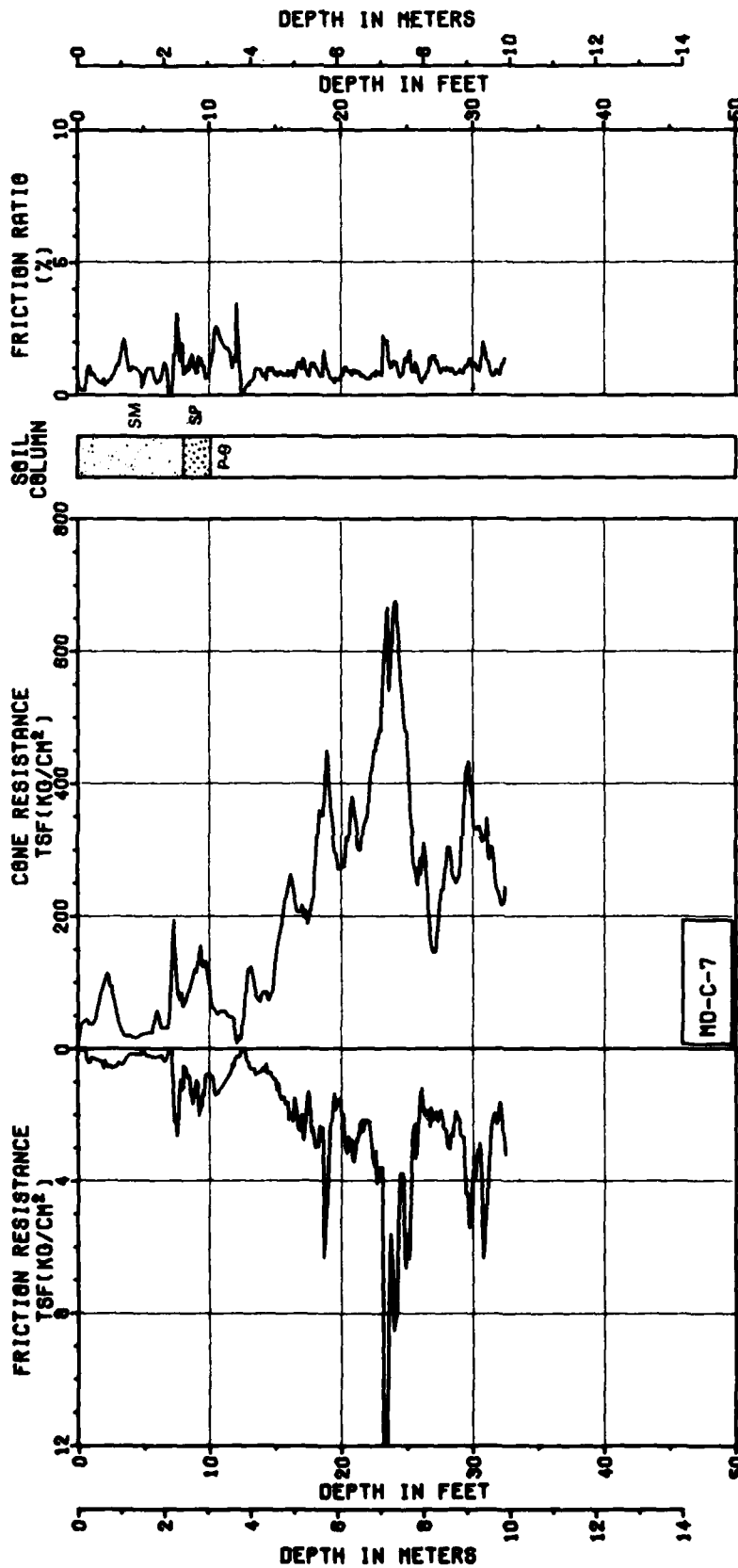


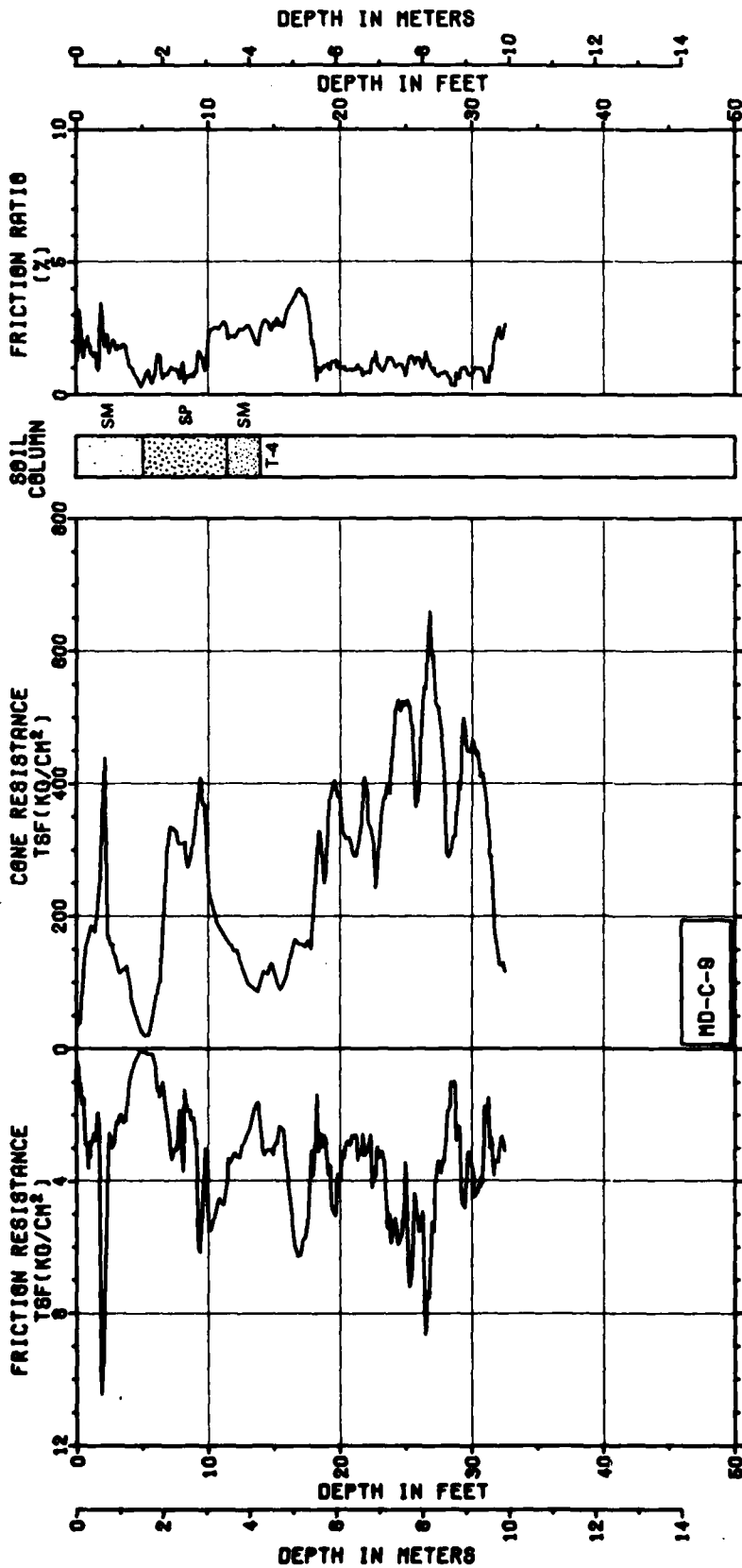
CONE PENETROMETER TEST MD-C-4, 5 & 6
OPERATIONAL BASE SITE
MURFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SMO

FIGURE
II-6-1
100%

FUGRO NATIONAL, INC.



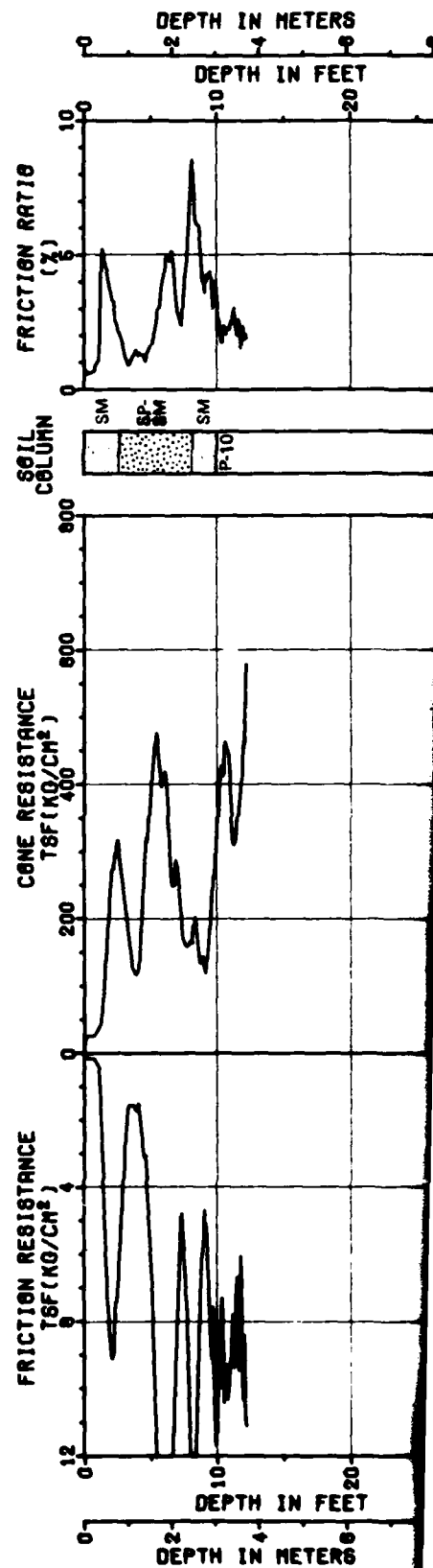
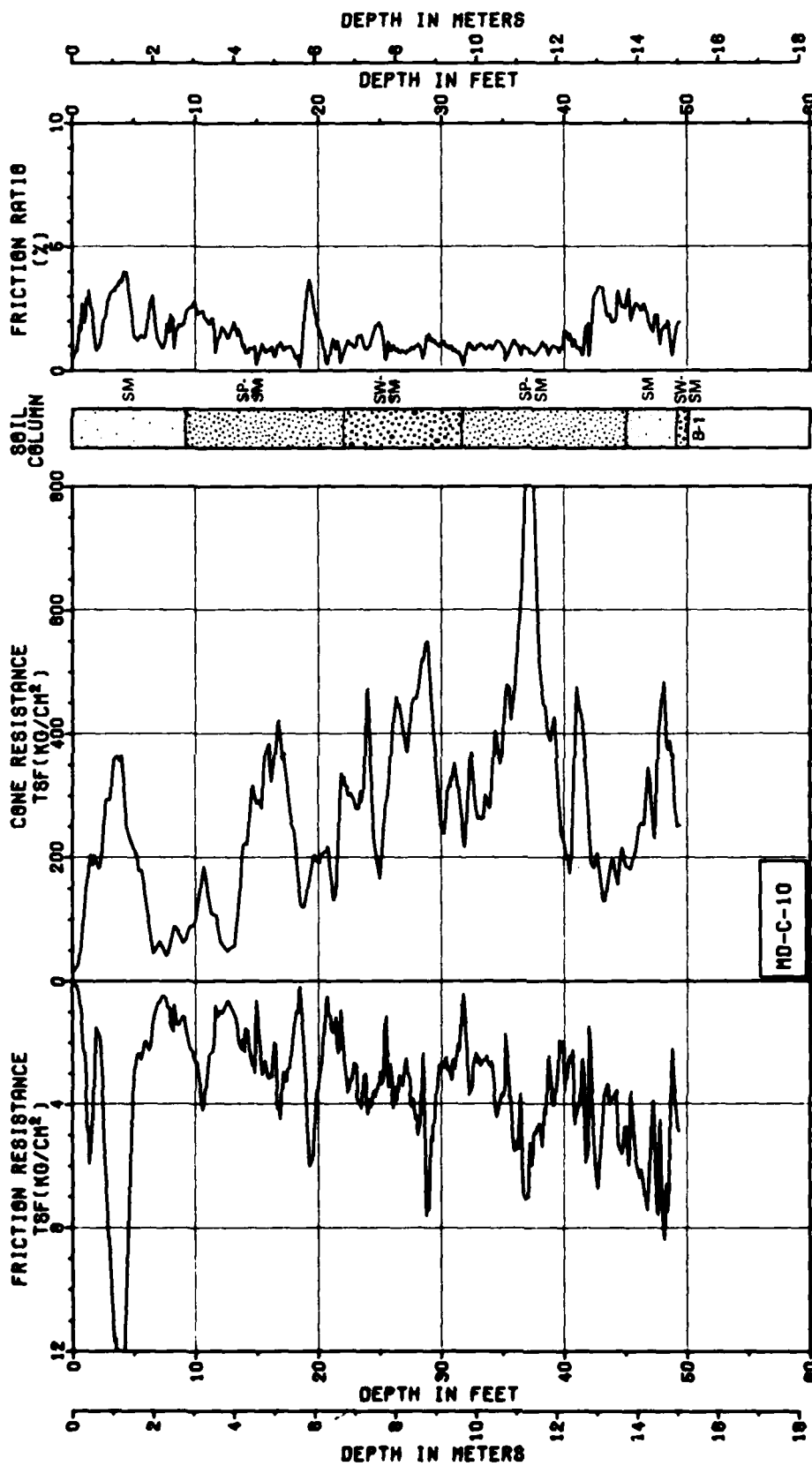


CONE PENETROMETER TEST MD-C-7, 8 & 9
OPERATIONAL BASE SITE
MILFORD, UTAH

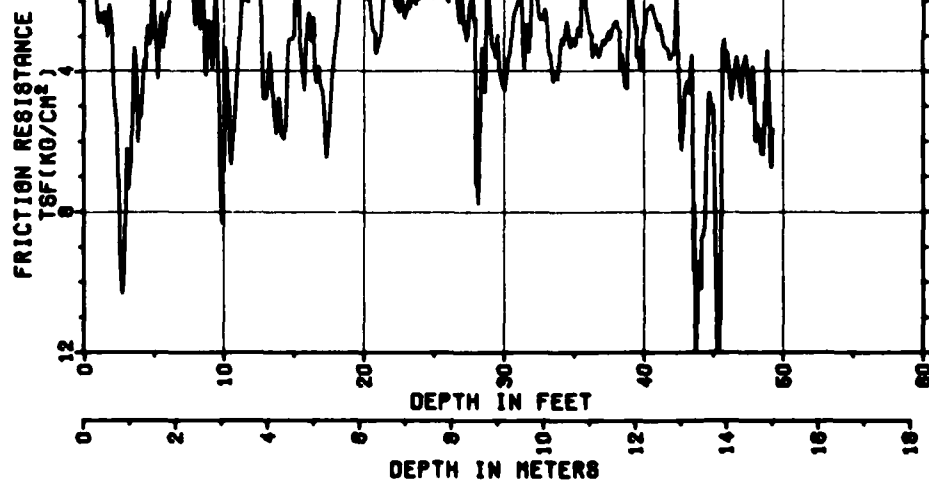
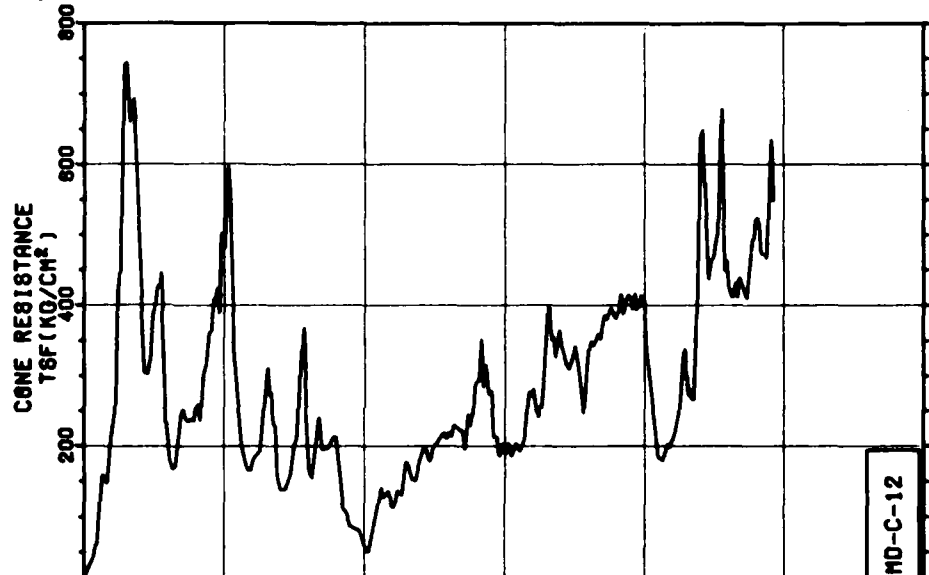
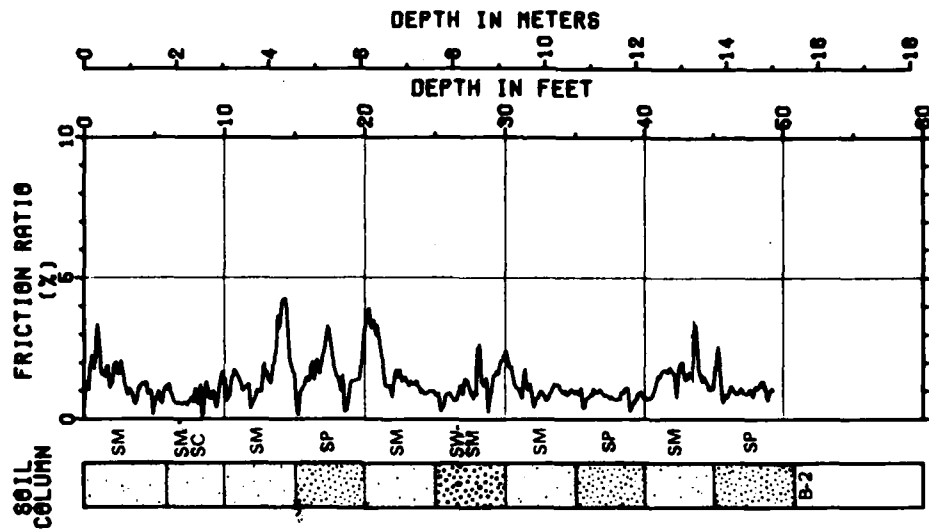
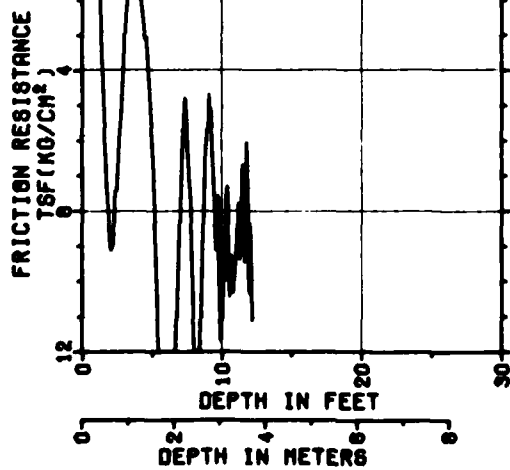
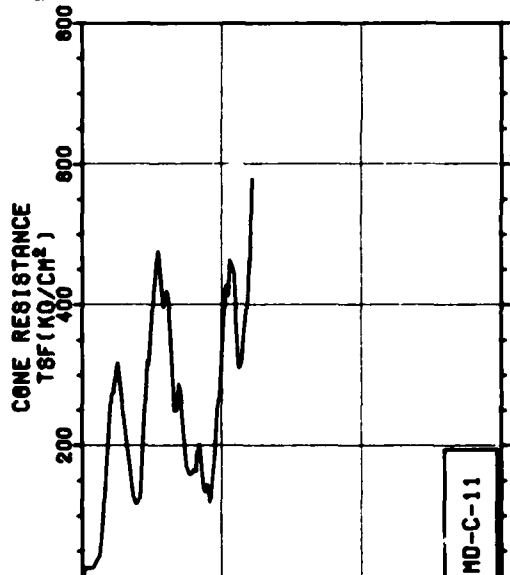
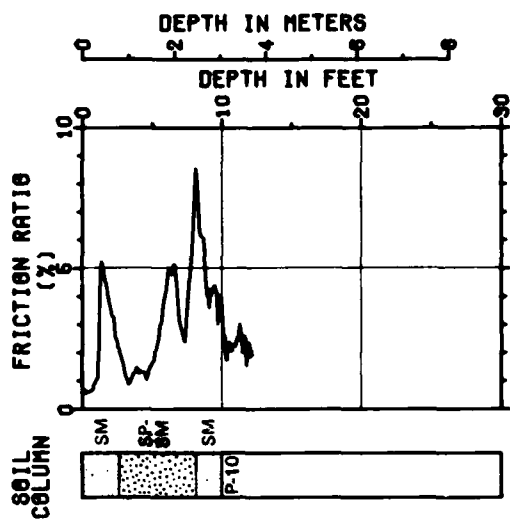
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SMO

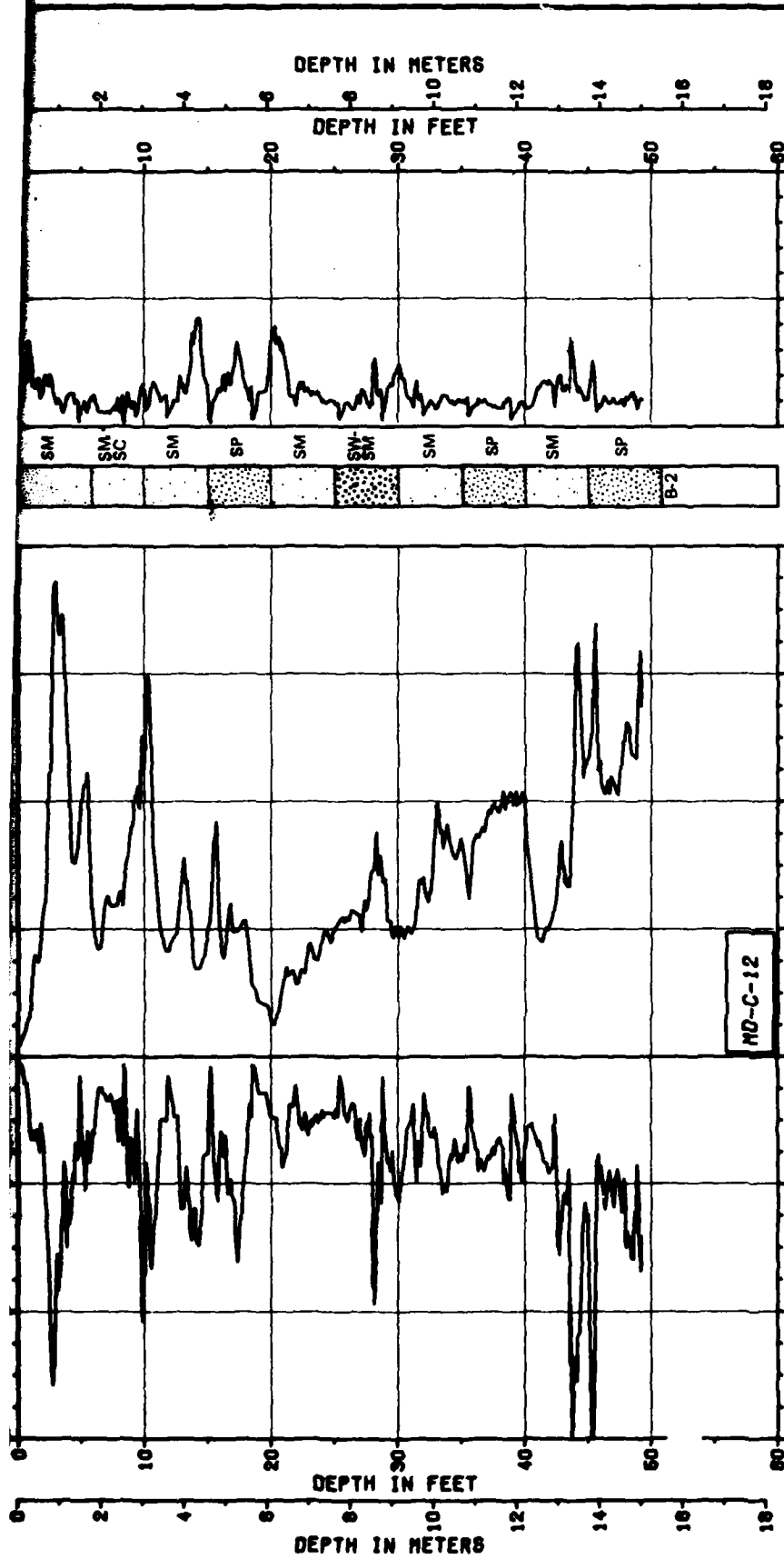
FIGURE
II-6
307

FUGRO NATIONAL, INC.



MD-C-10



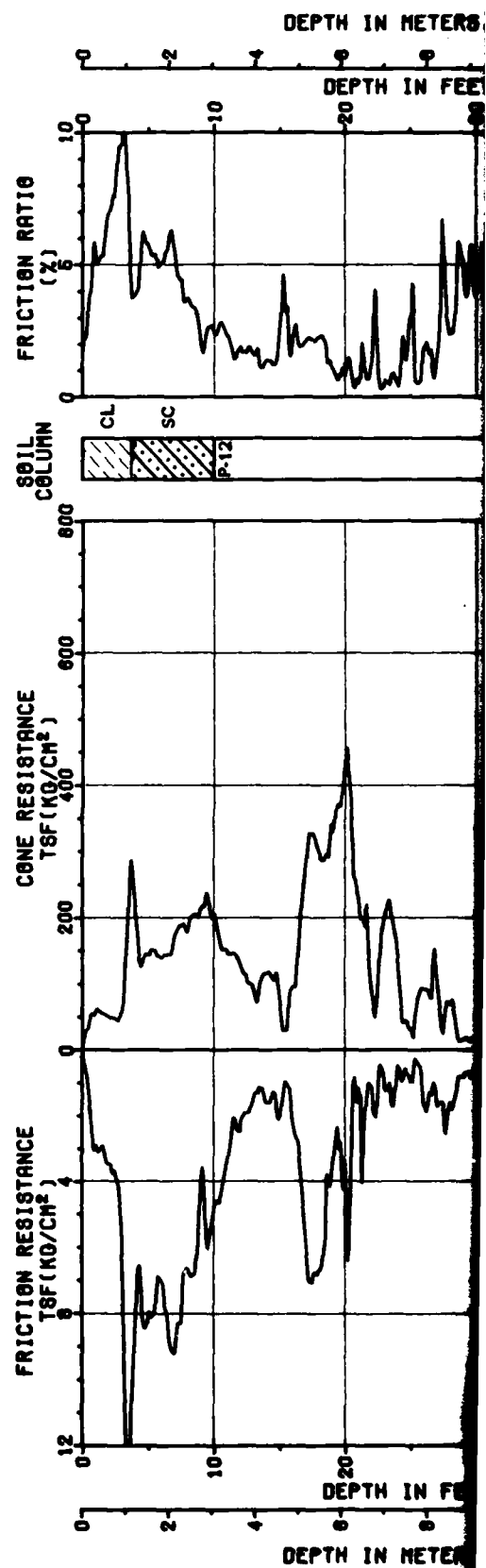
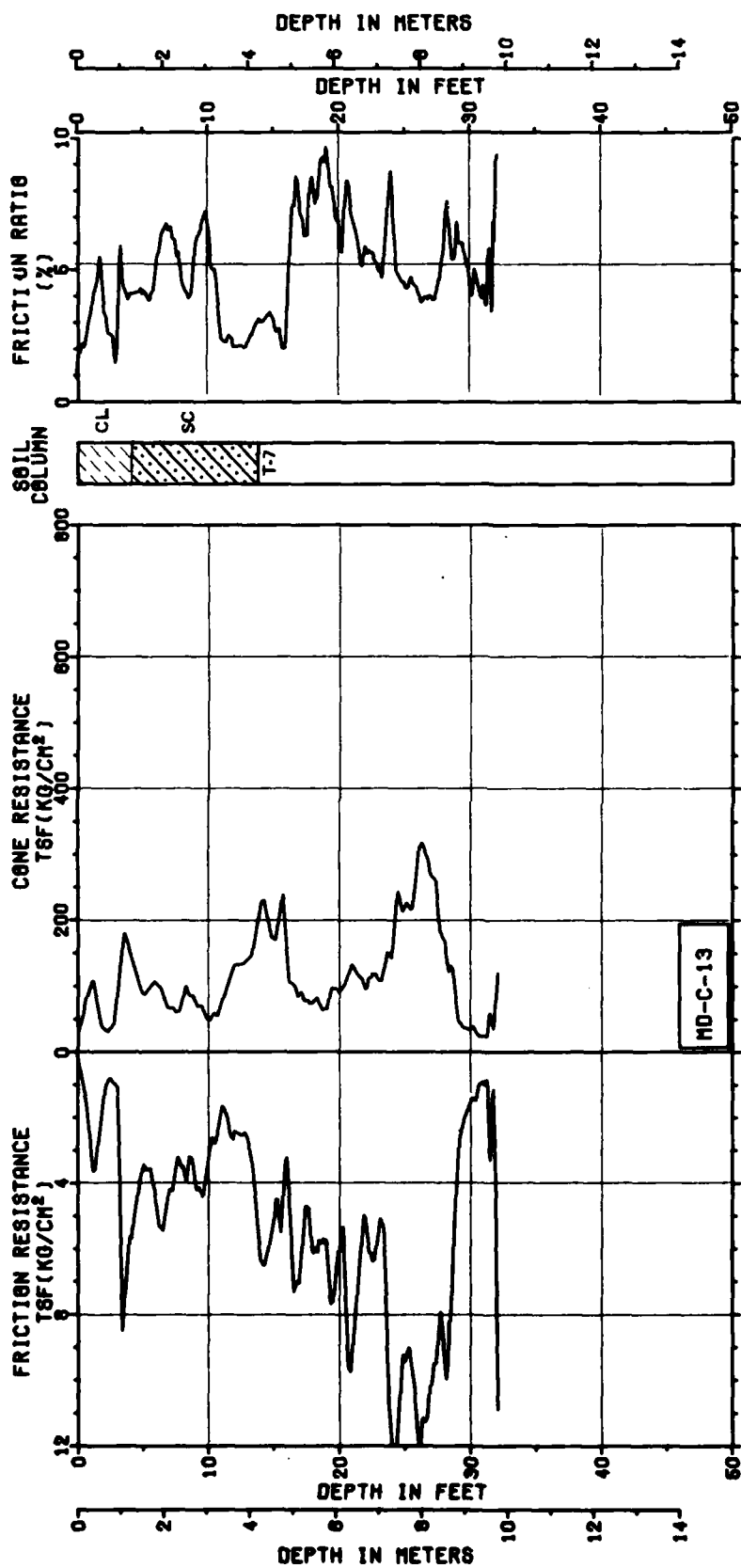


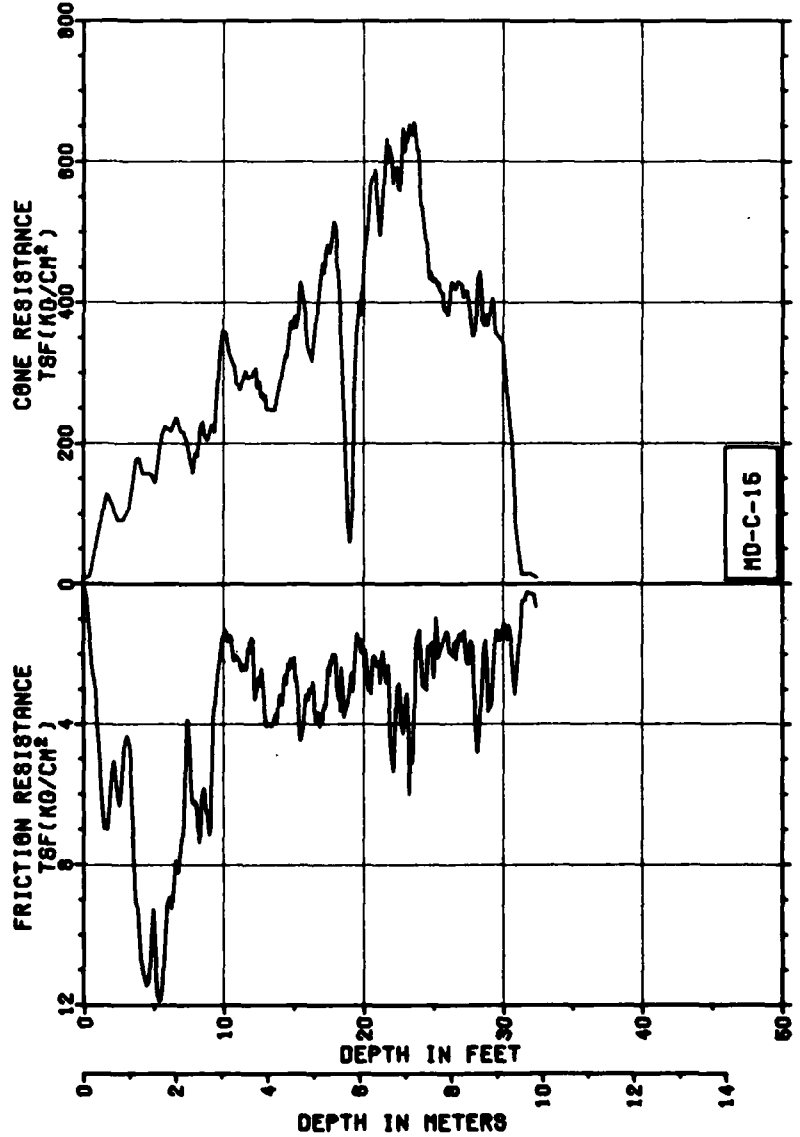
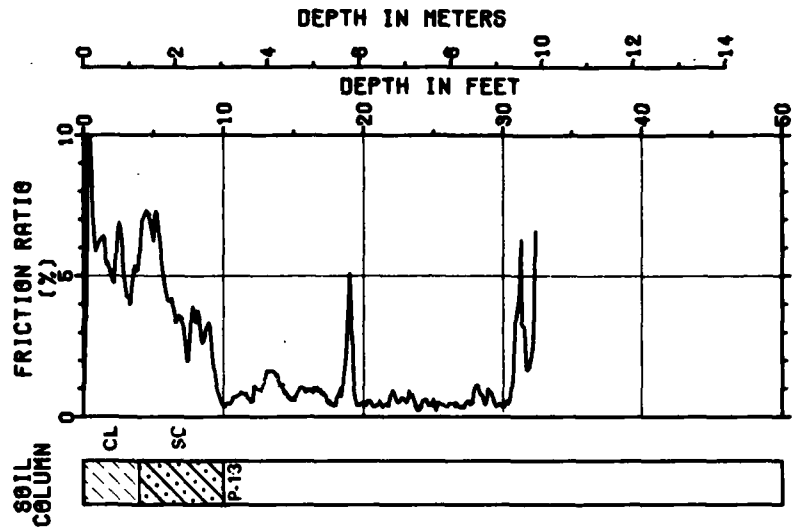
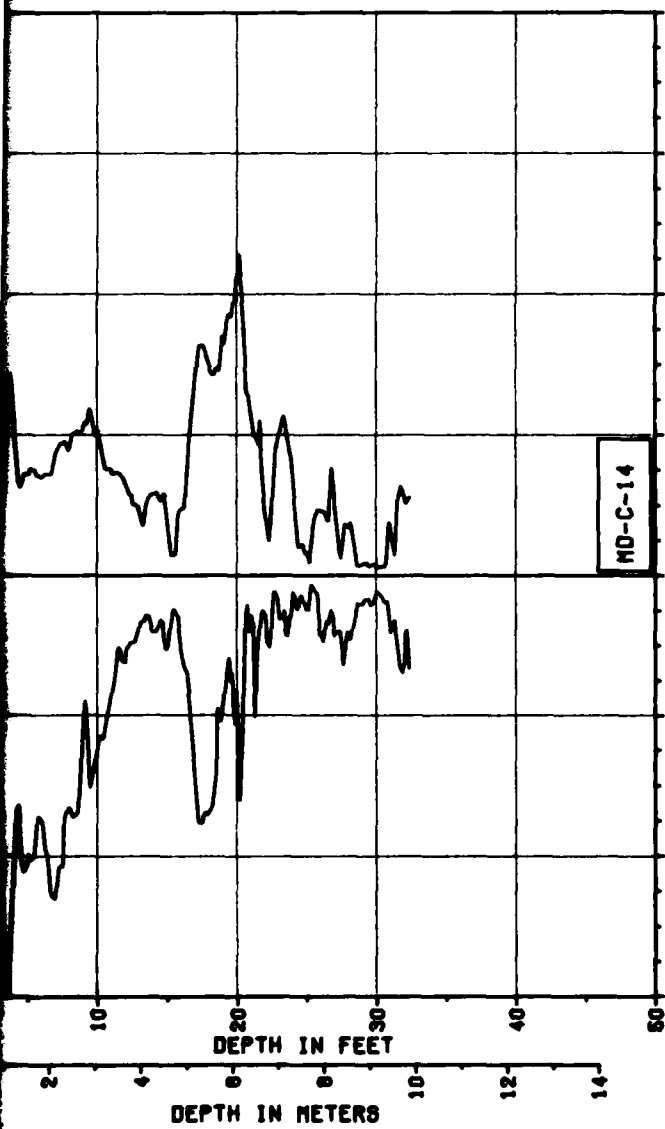
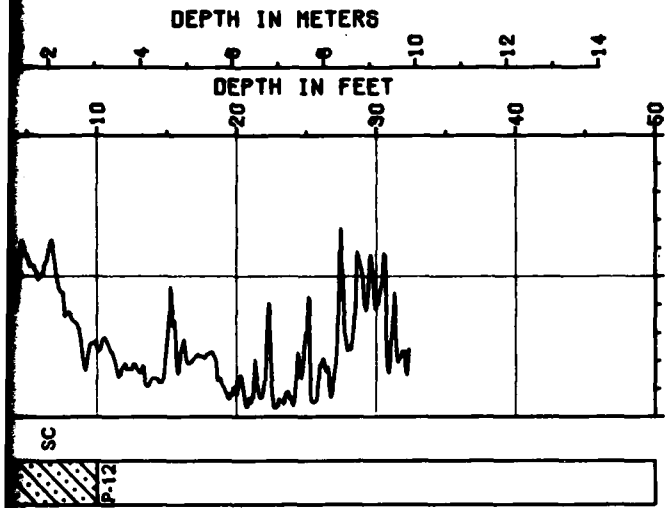
CONE PENETROMETER TEST MD-C-10, 11 & 12
OPERATIONAL BASE SITE
MILFORD, UTAH

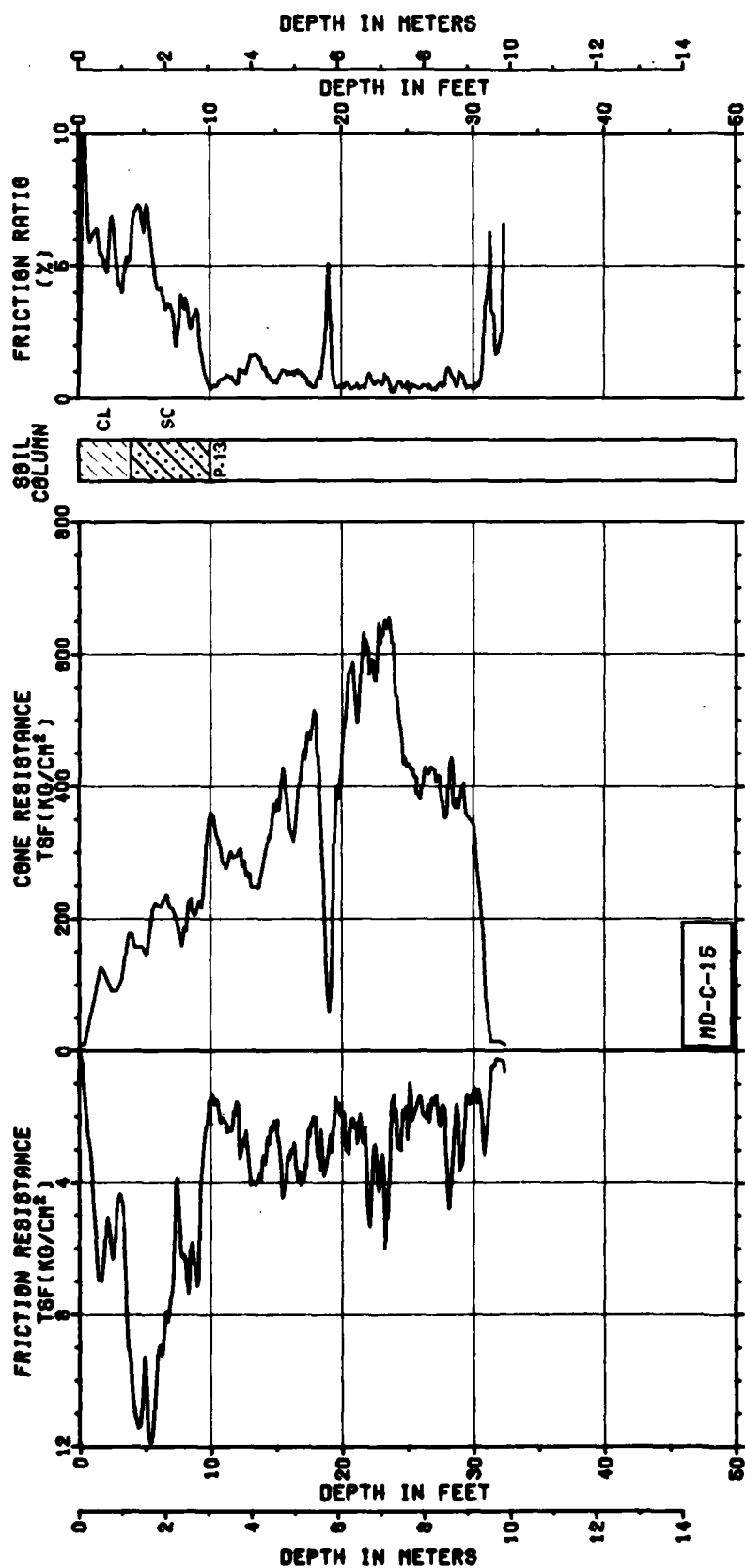
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SMO

FIGURE
II-6-1
40P 25

UGRO NATIONAL, INC.





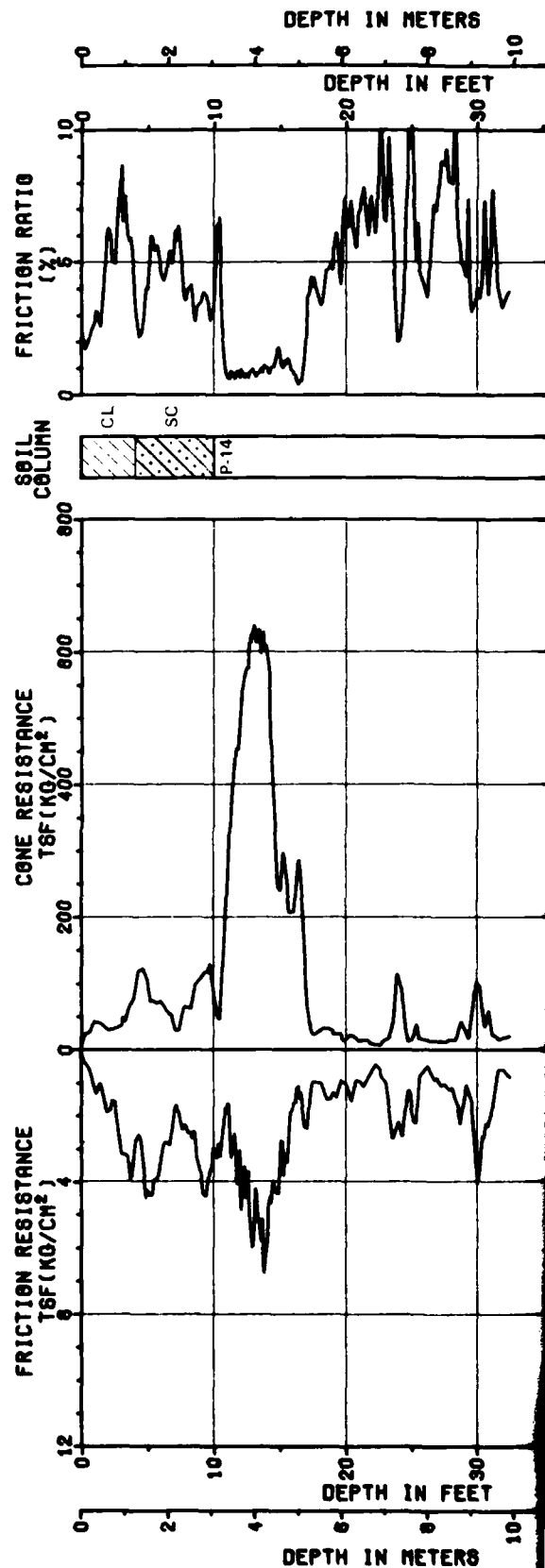
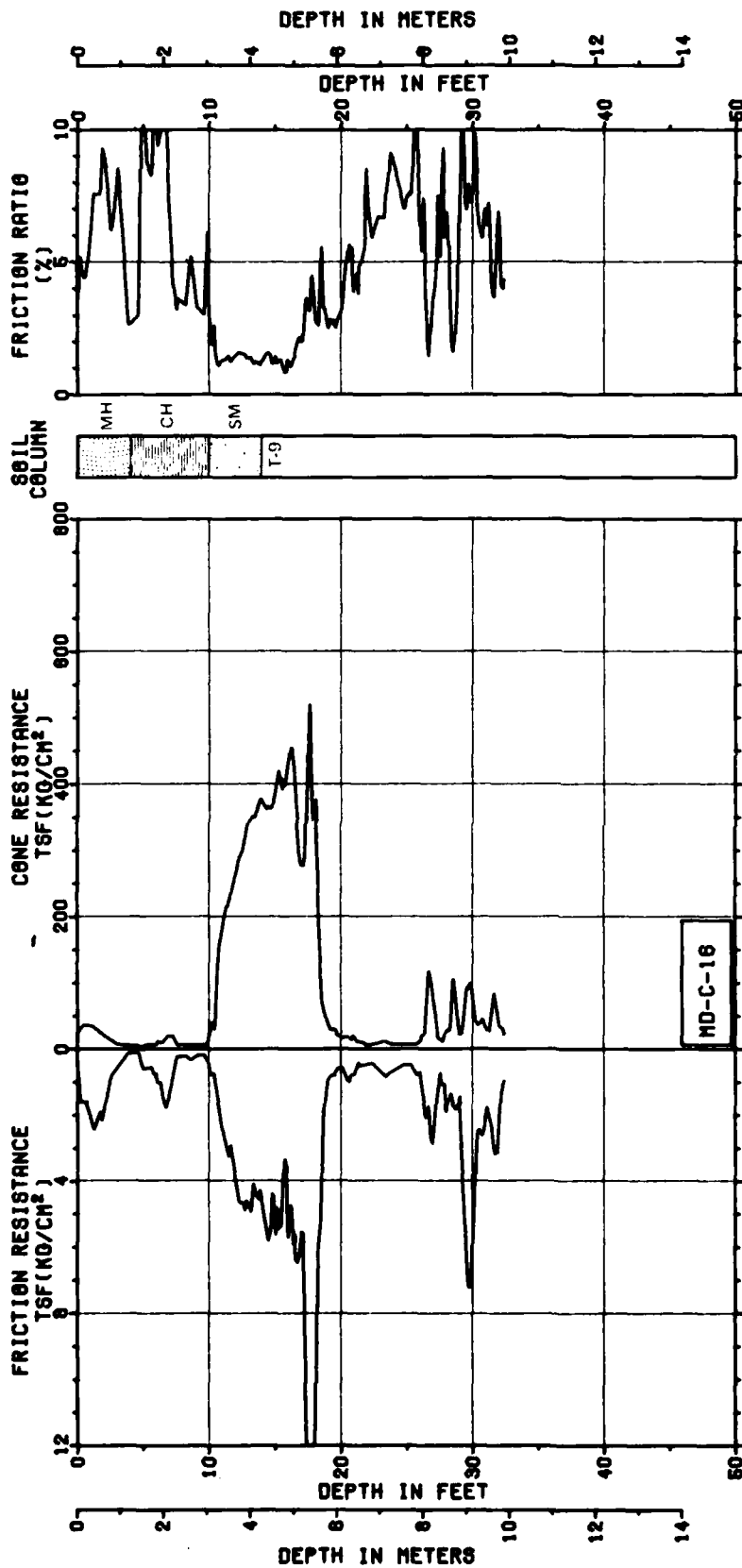


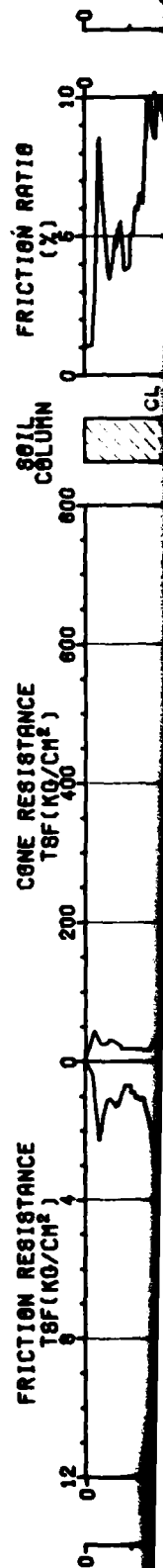
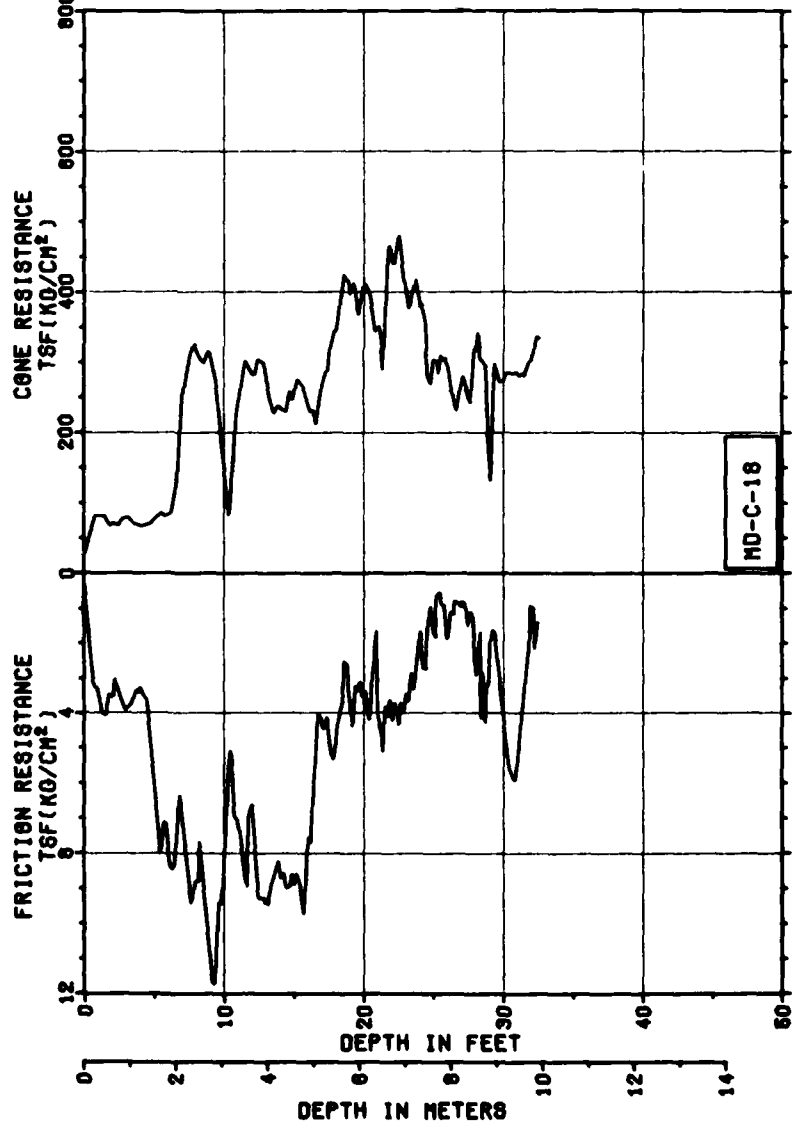
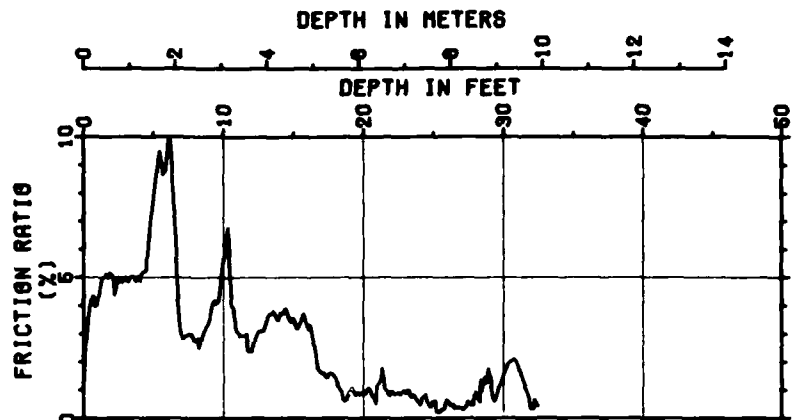
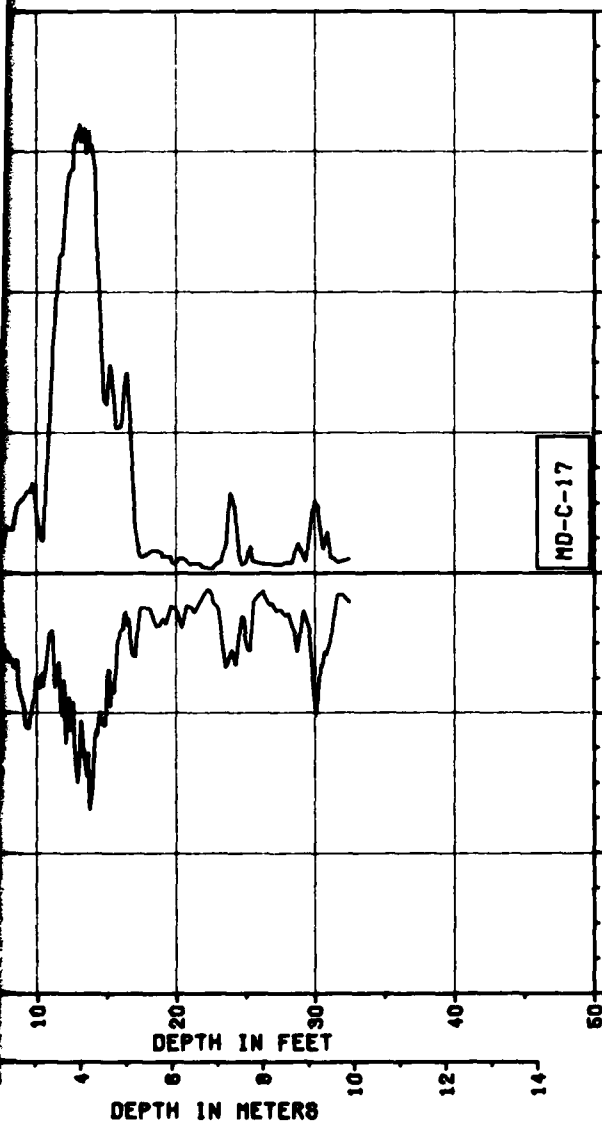
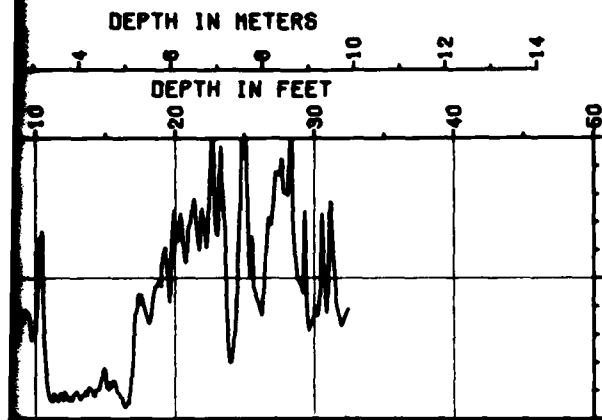
CONE PENETROMETER TEST MD-C-13, 14 & 15
OPERATIONAL BASE CENS
MEPORD, USAM

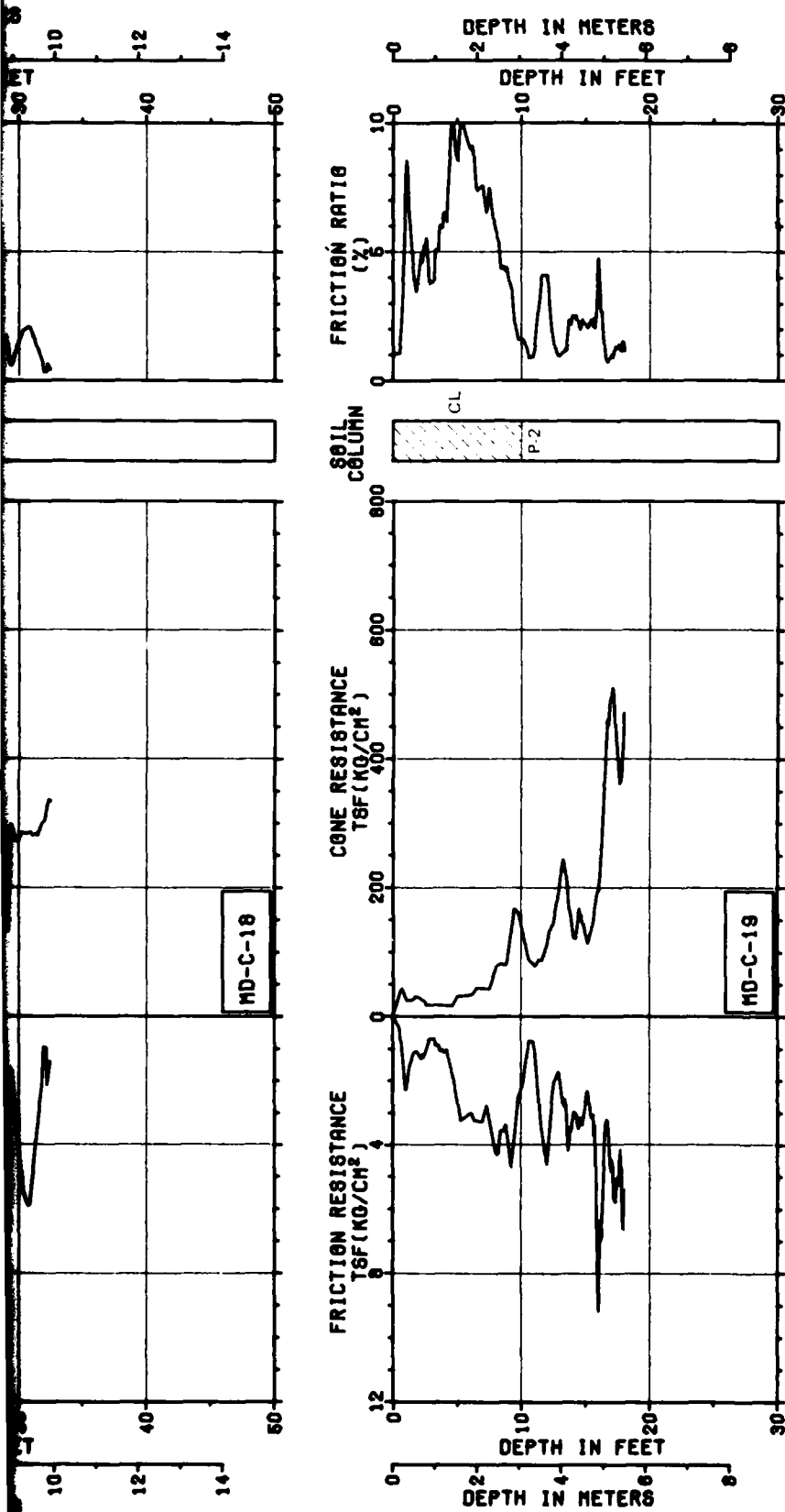
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
II-1
1 OF 2

FUGRO NATIONAL, INC.





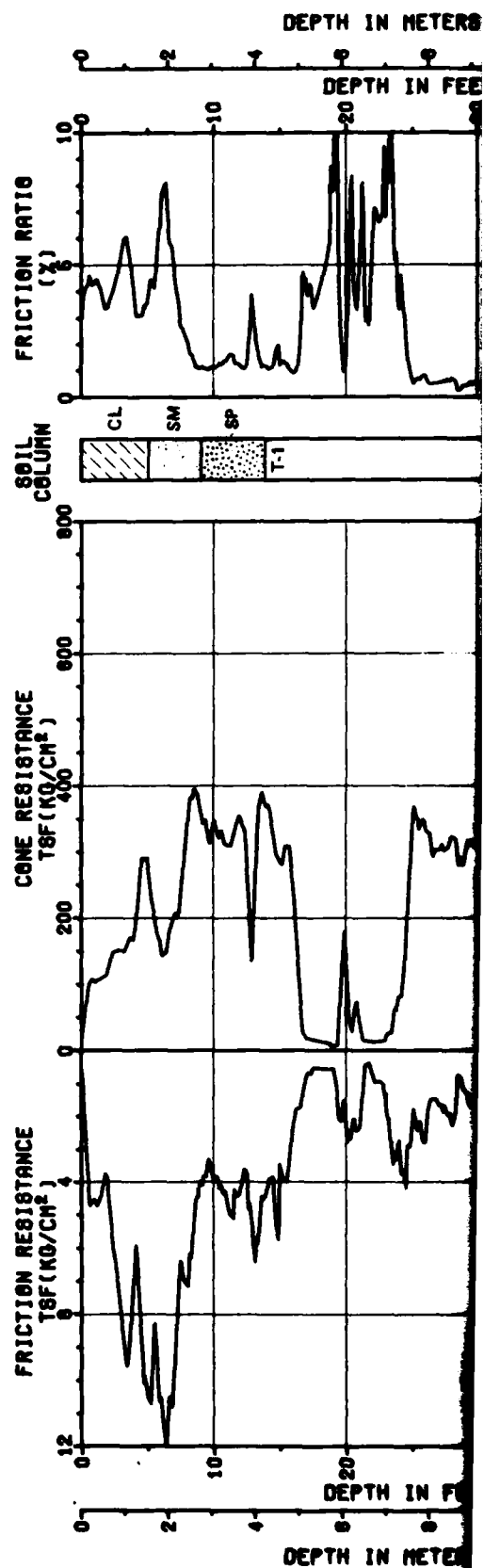
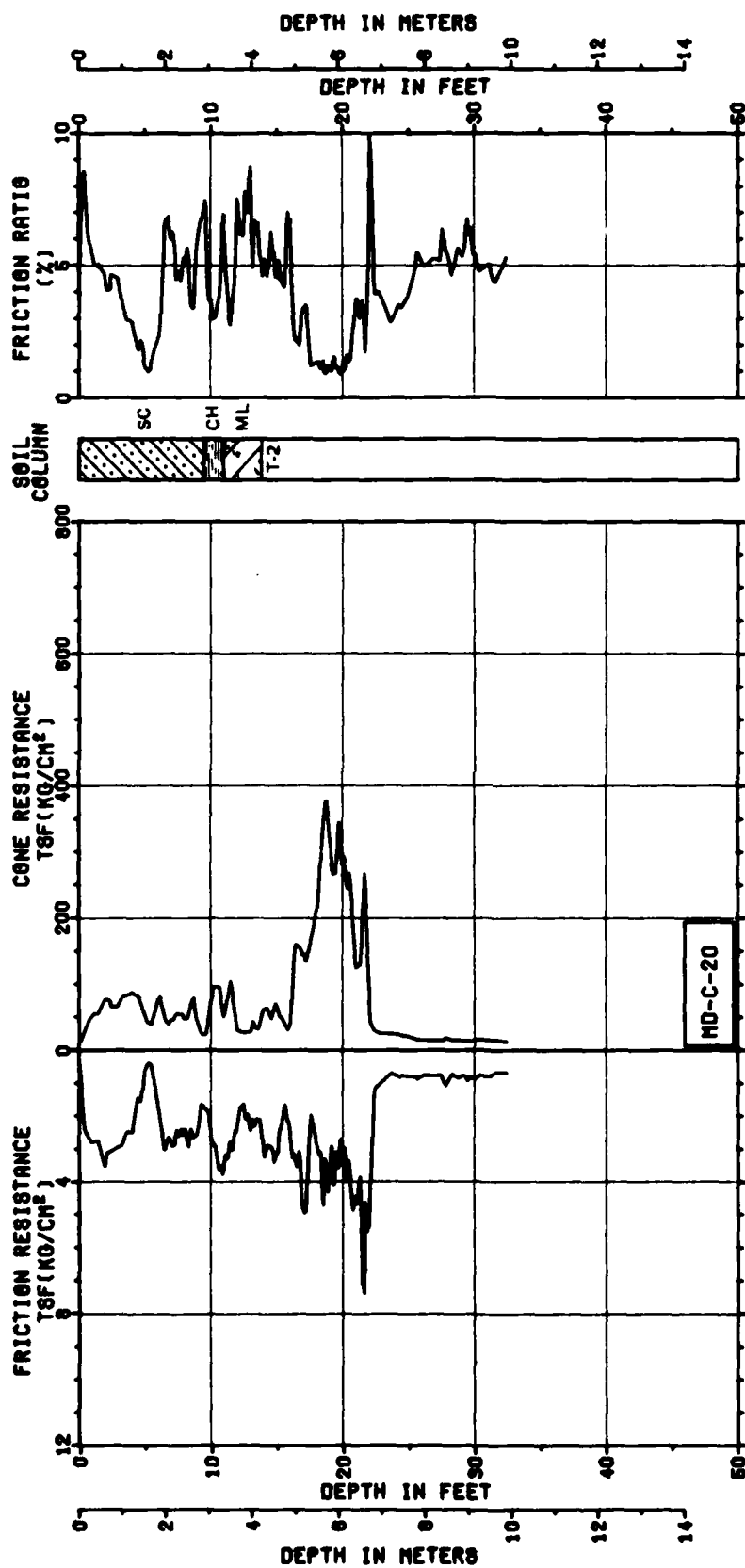


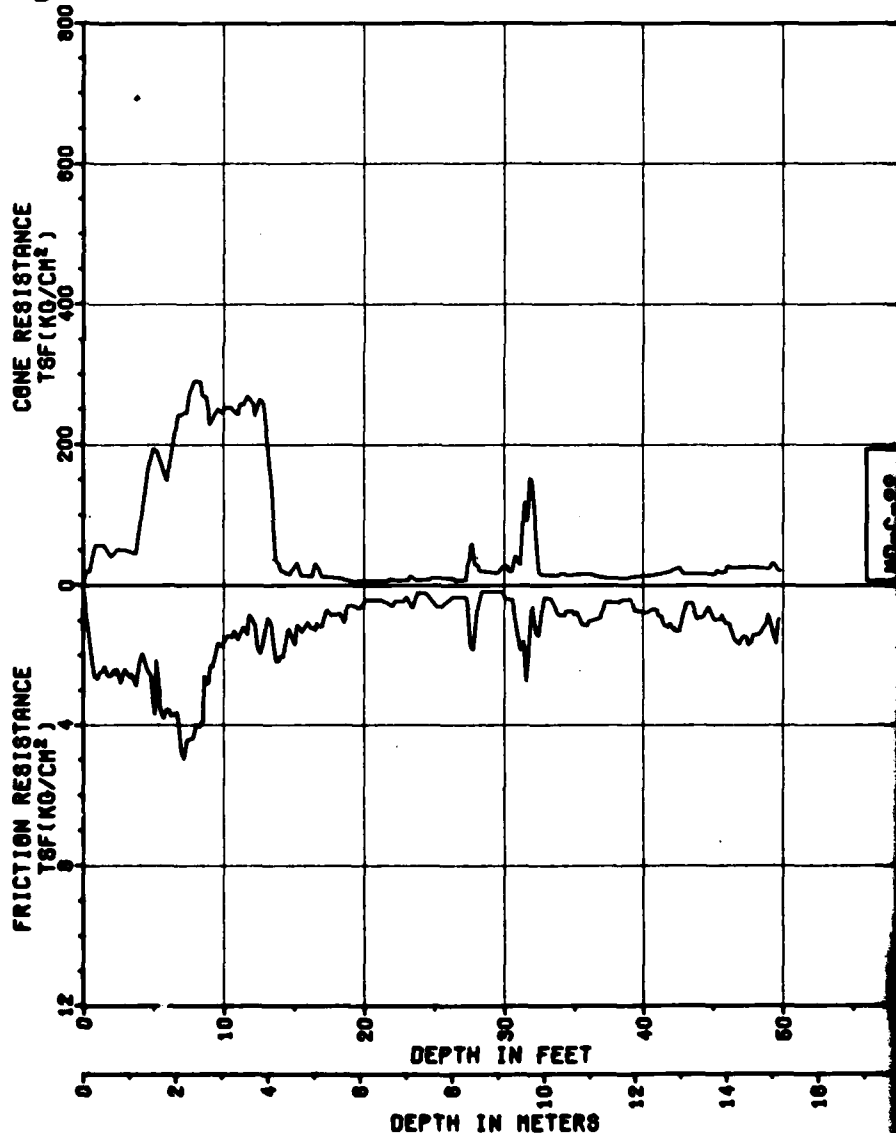
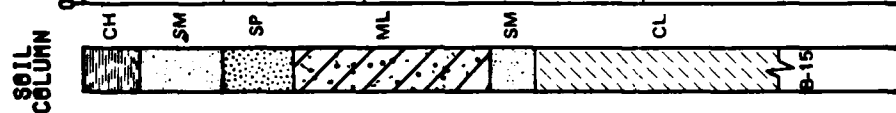
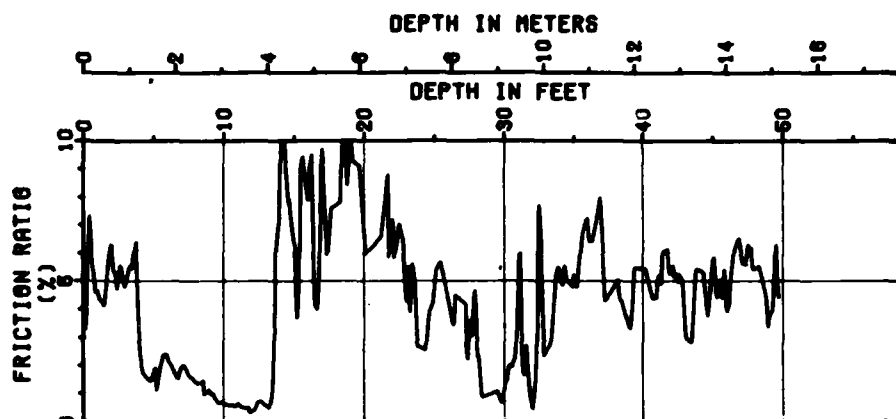
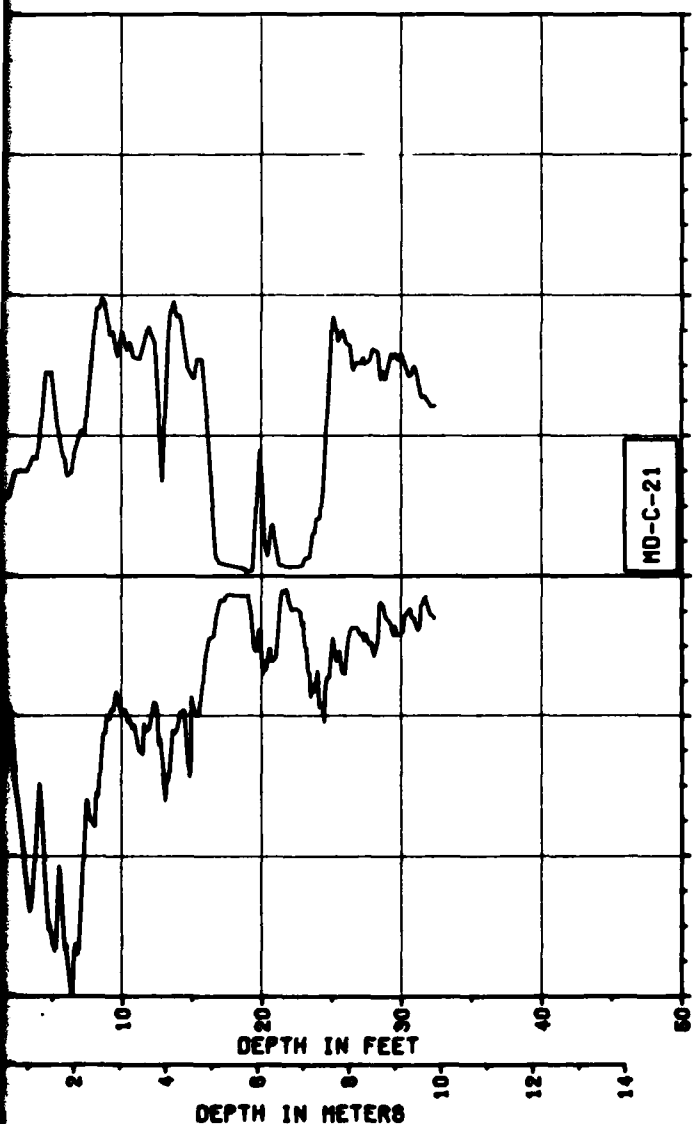
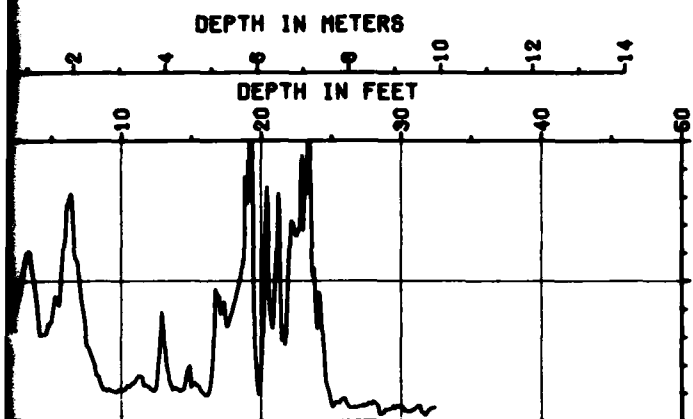
CONE PENETROMETER TEST MD-C-16, 17, 18 & 19
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
II-6-1
6 OF 25

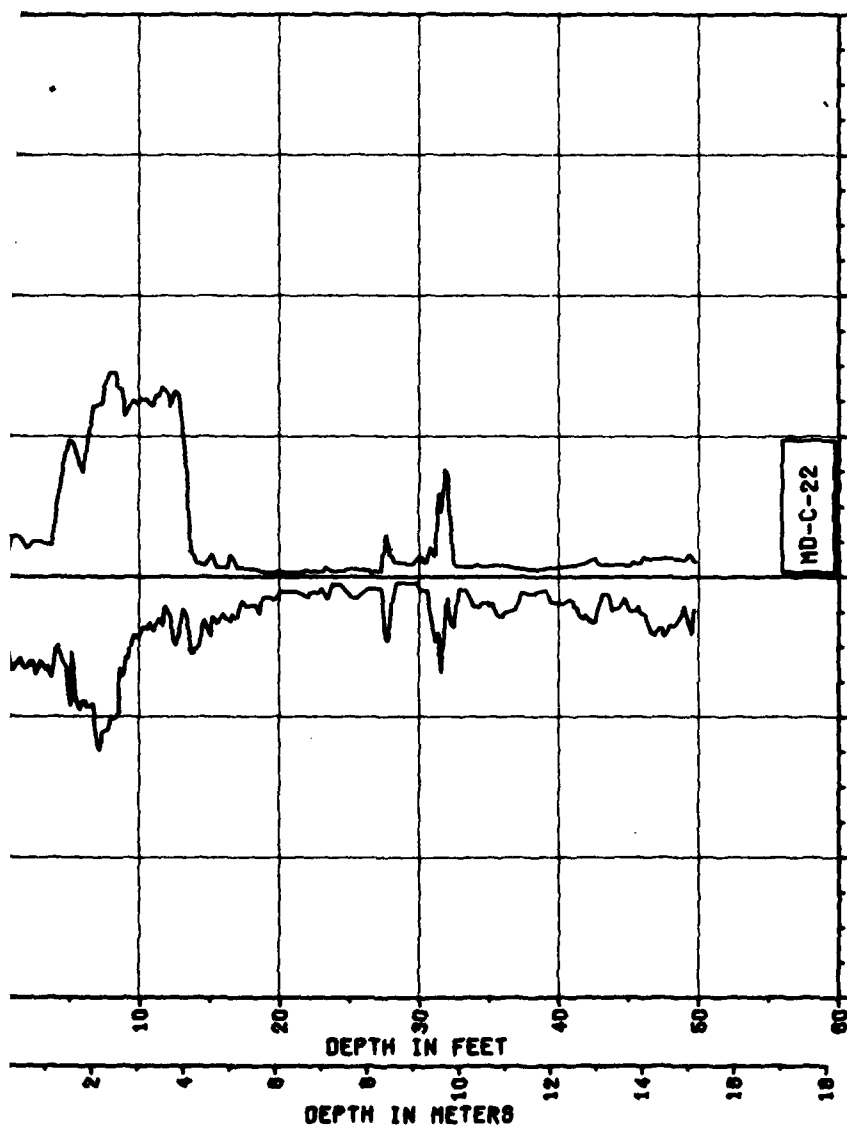
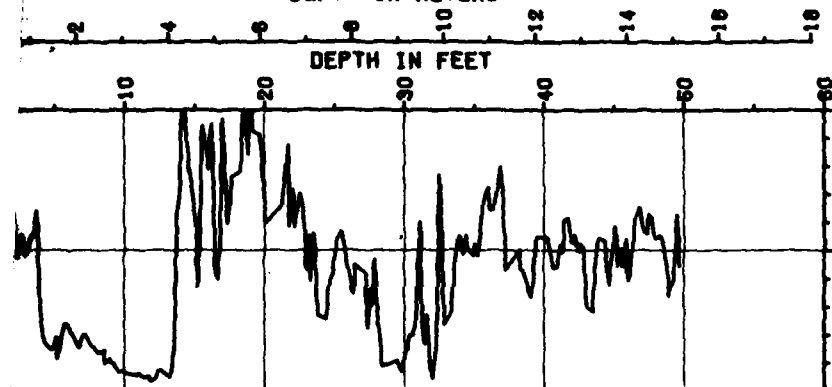
FUGRO NATIONAL, INC.





DEPTH IN METERS

DEPTH IN FEET

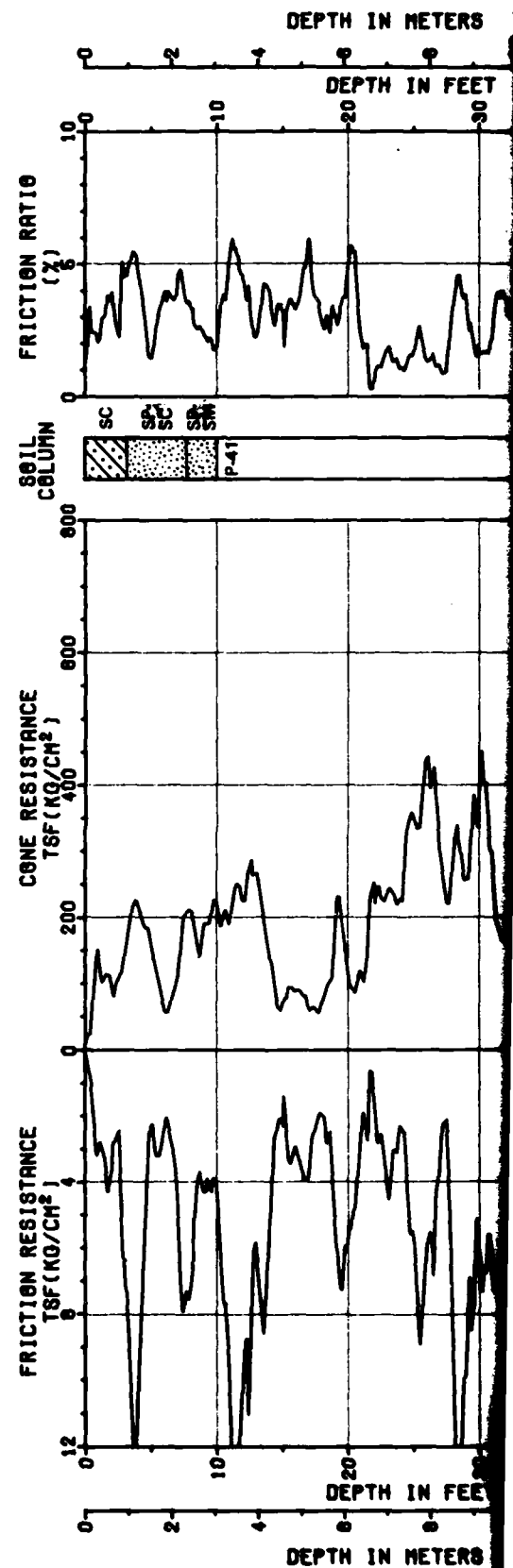
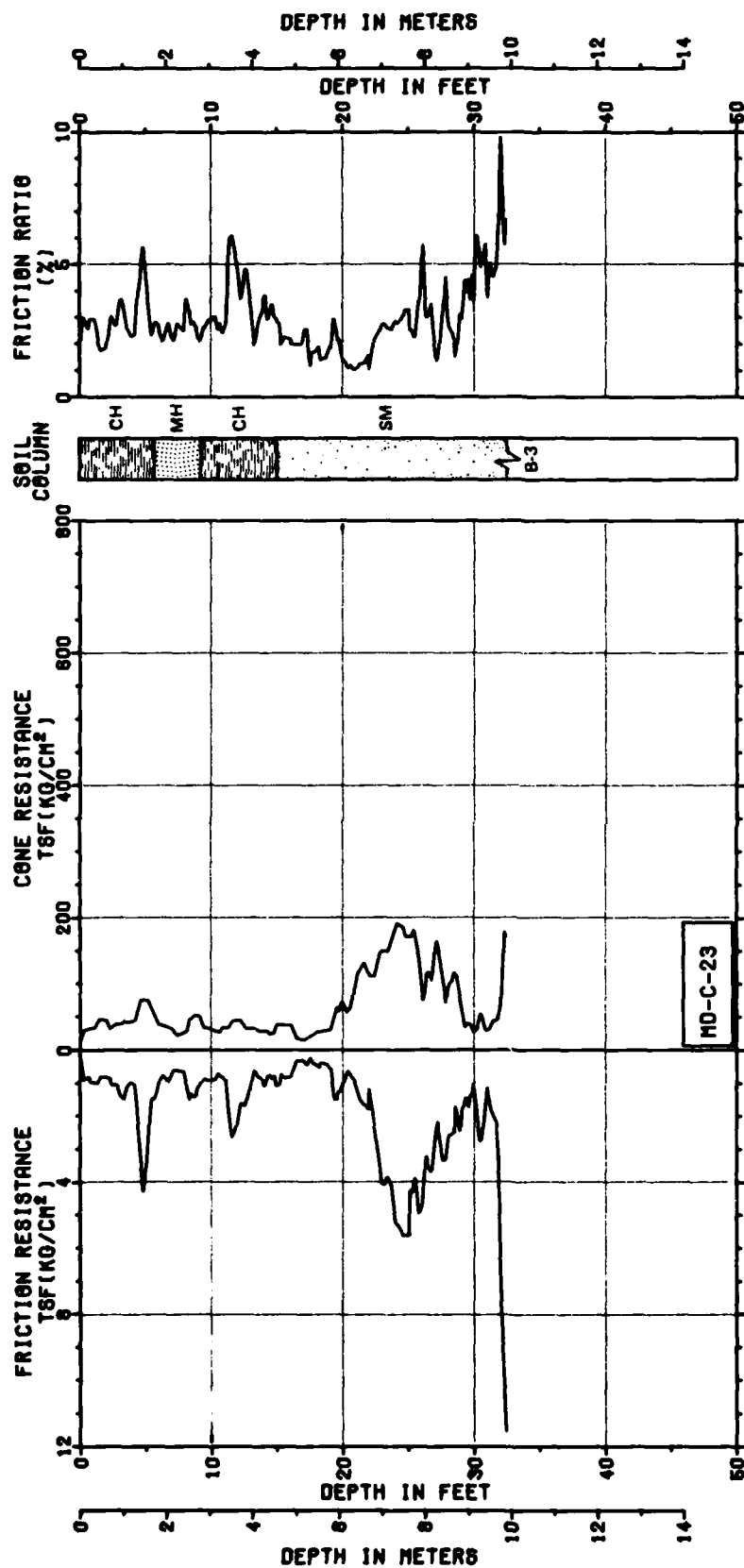


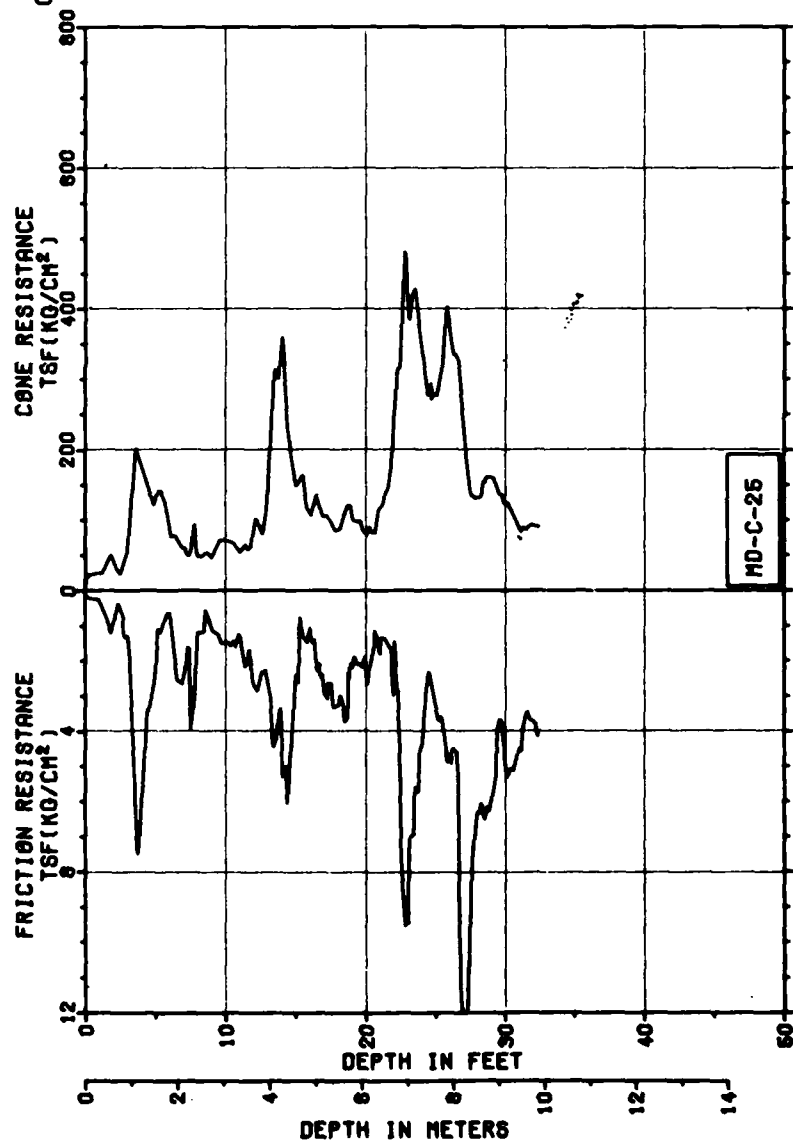
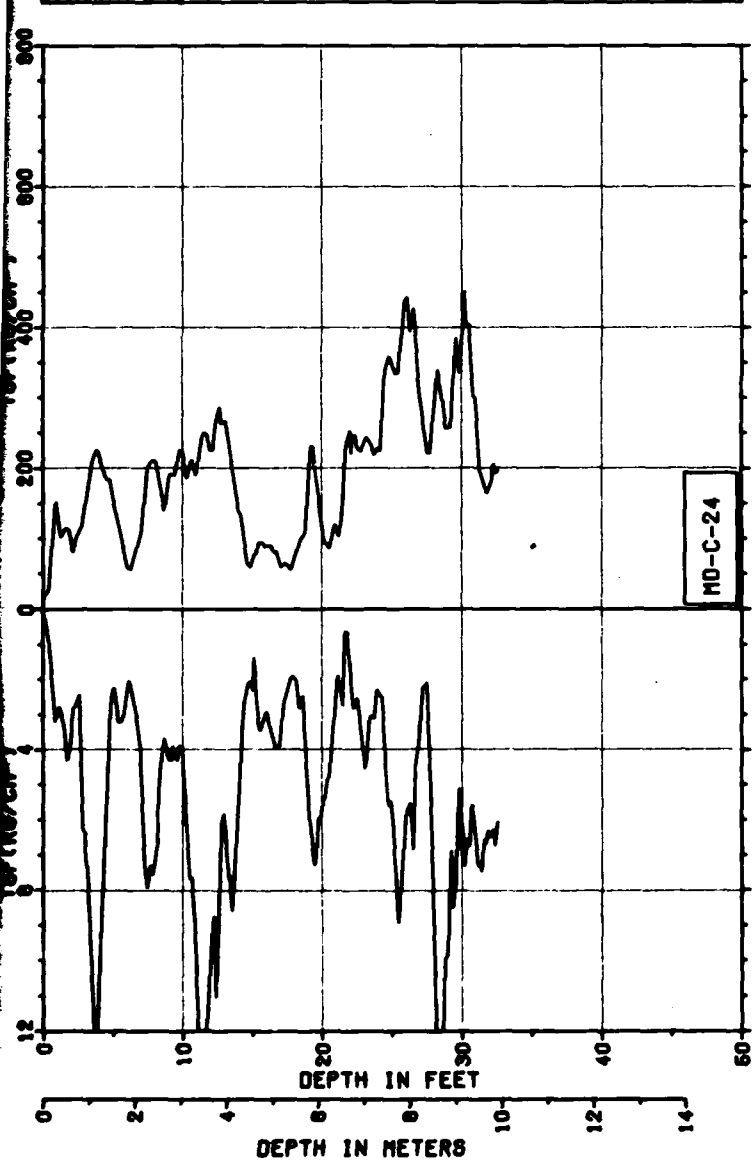
CONE PENETROMETER TEST, MD-C-20, 21 & 22
OPERATIONAL BASE SITES
MILFORD, UTAH

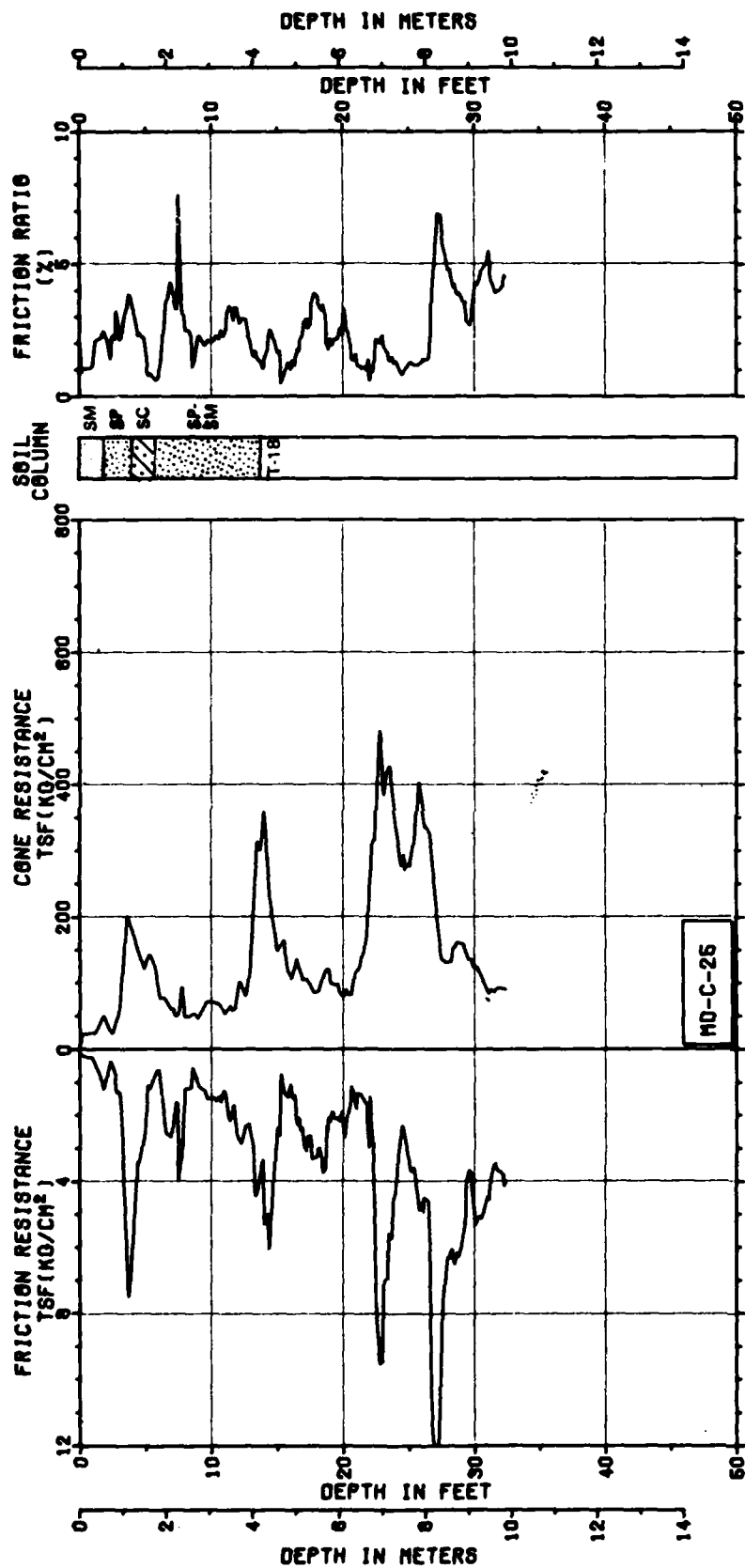
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SMO

FIGURE
II-6-1
7 OF 25

FUGRO NATIONAL, INC.





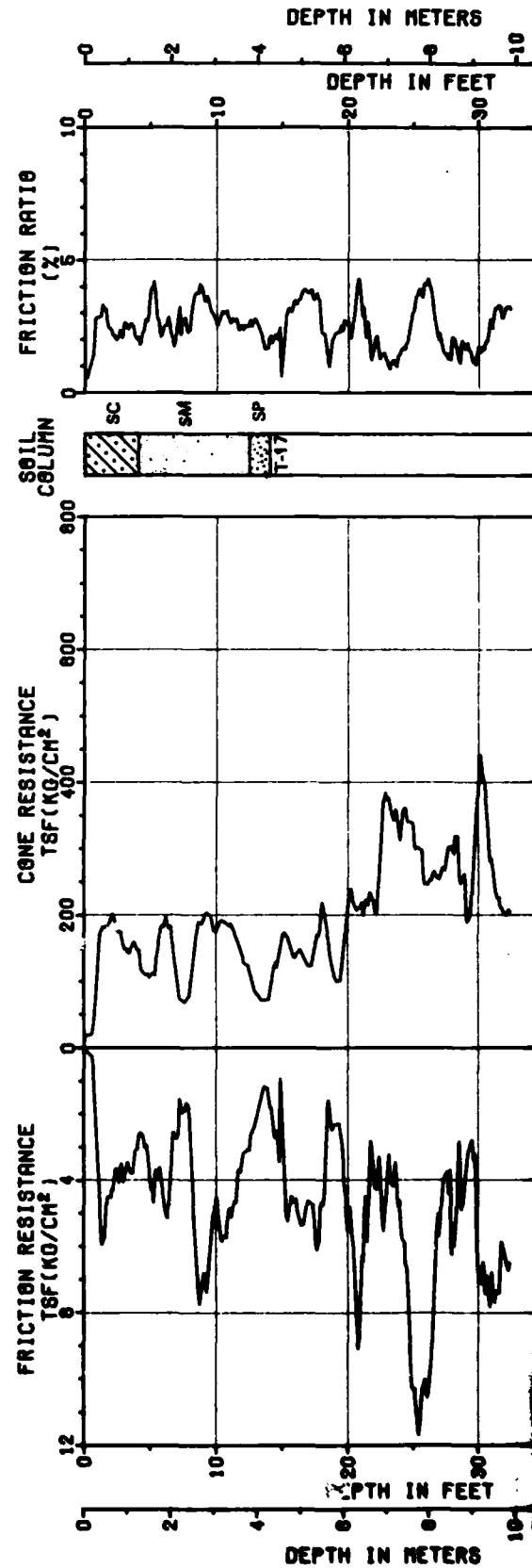
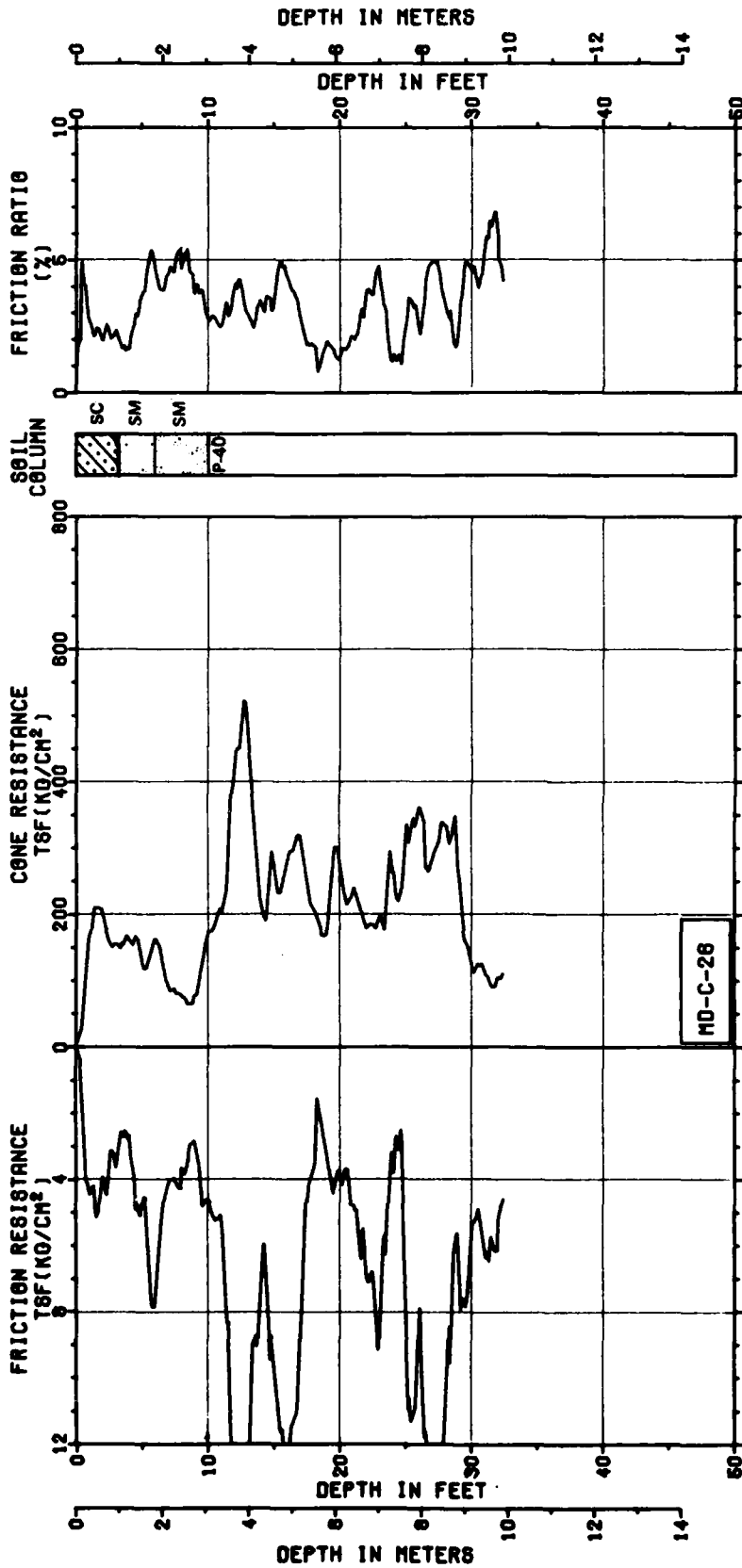


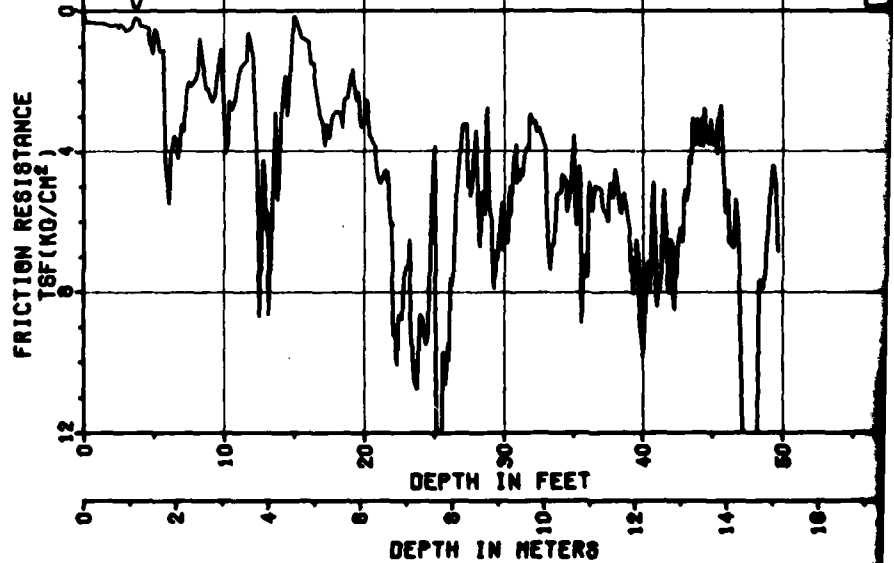
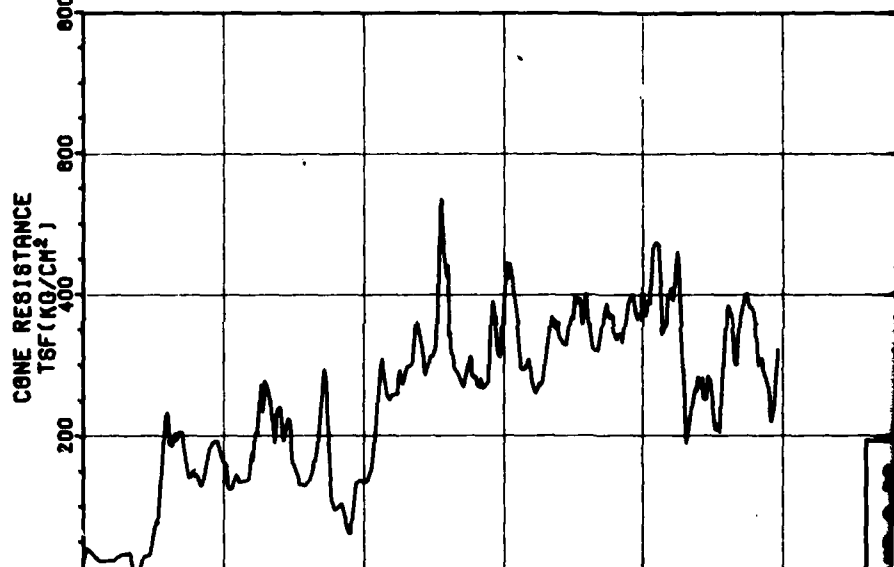
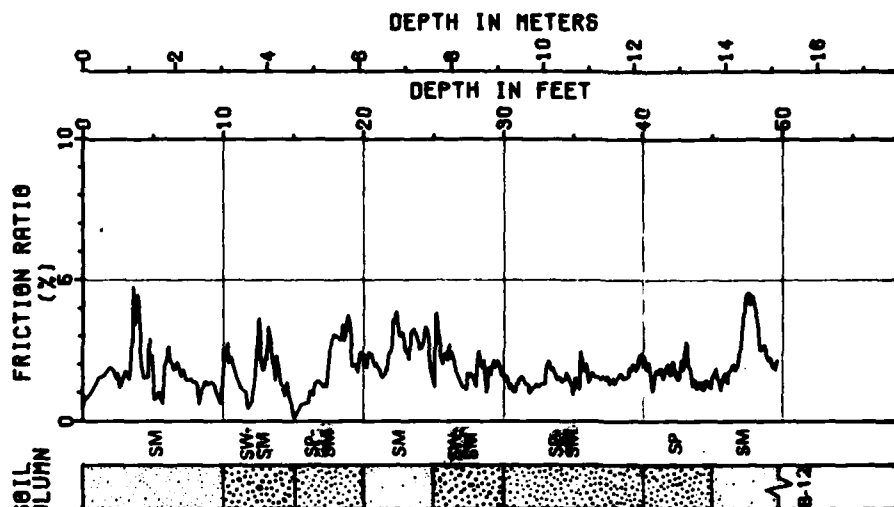
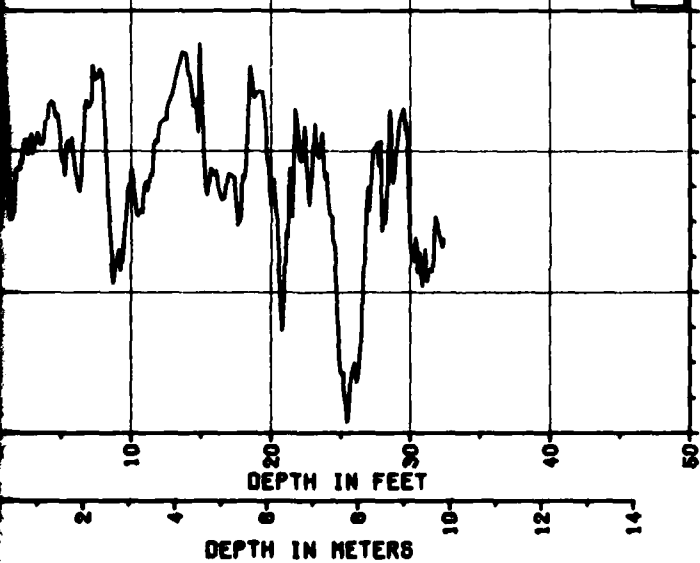
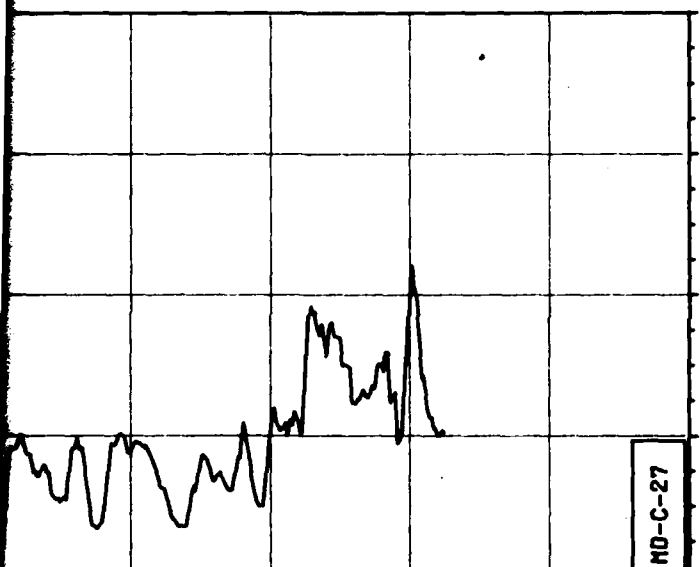
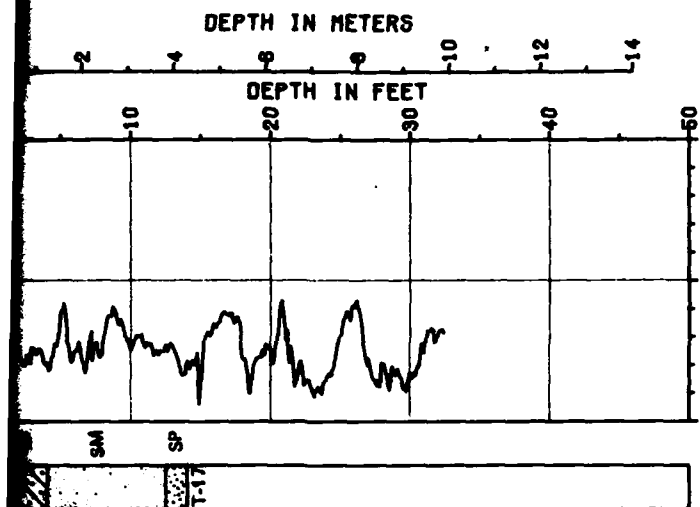
CONE PENETROMETER TEST MD-C-25, 26 & 28
OPERATIONS, SAGE
MELBORNE, VIRM

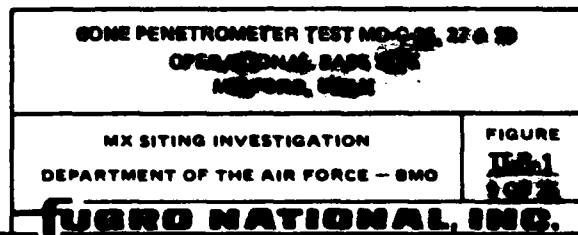
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SMO

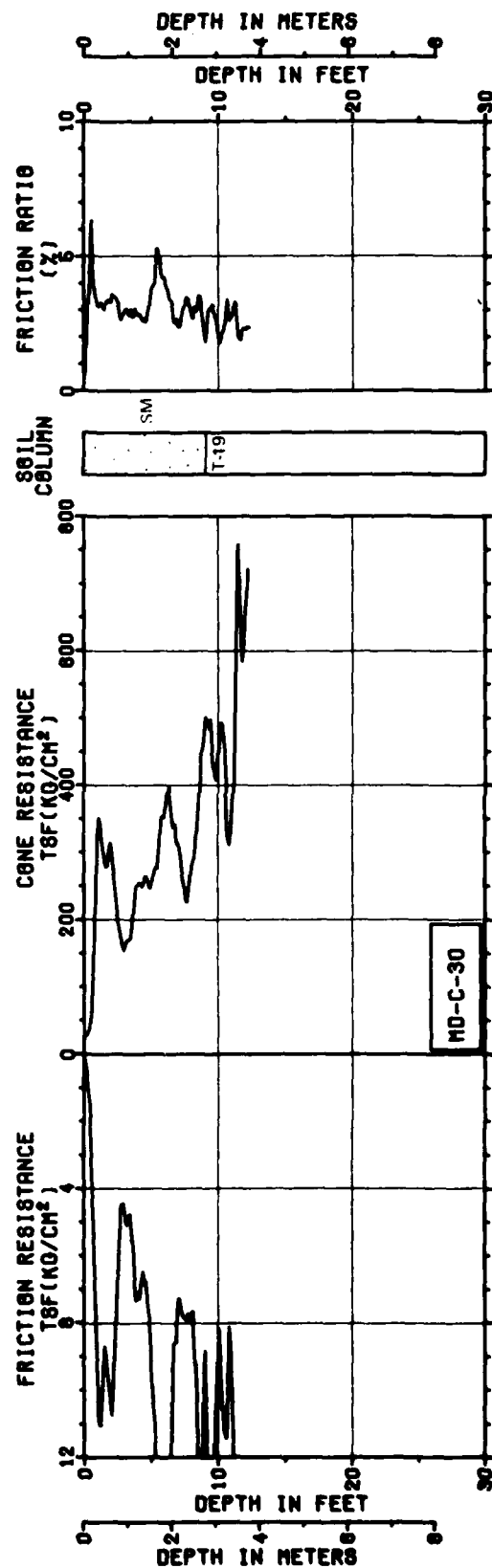
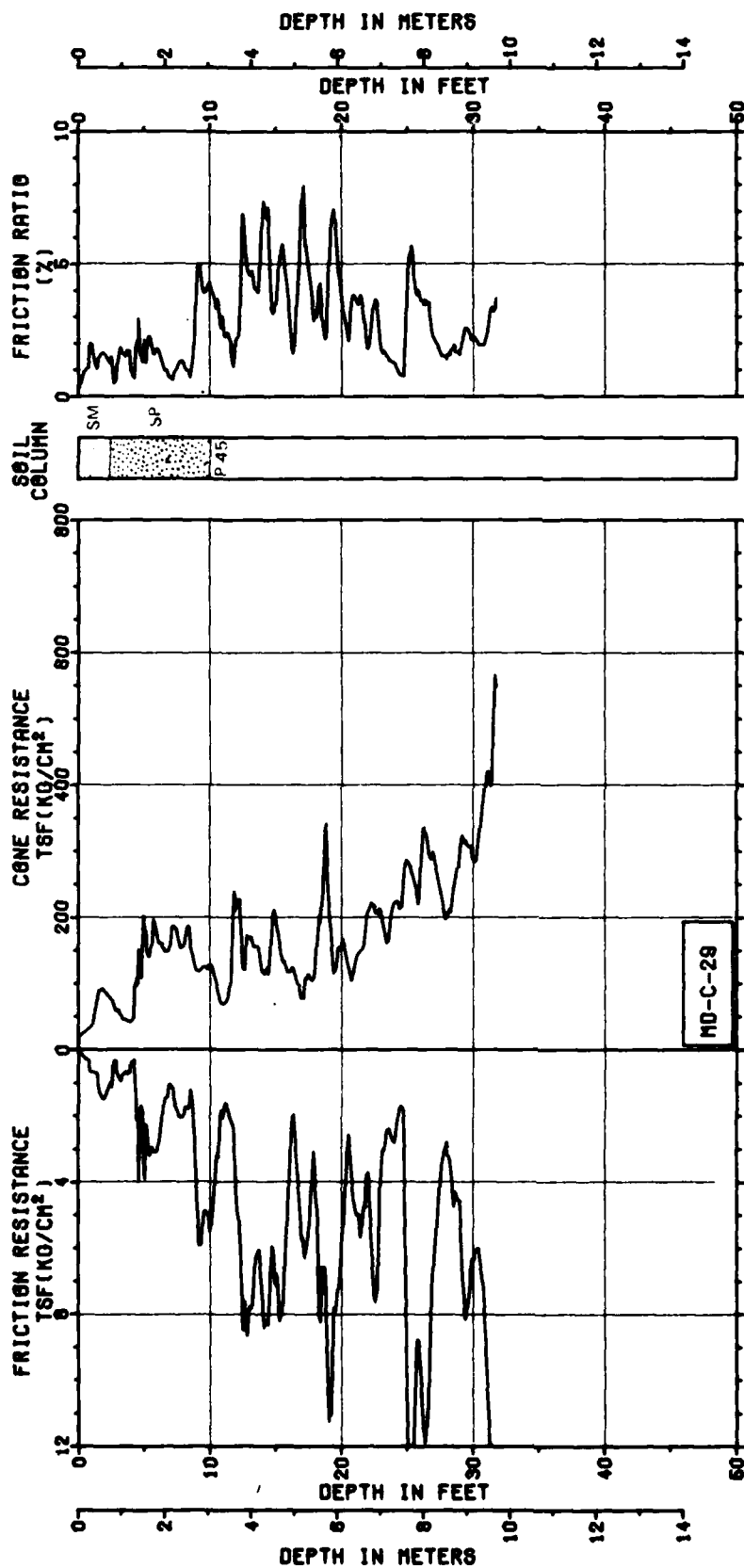
FIGURE
II-1
8 OF 25

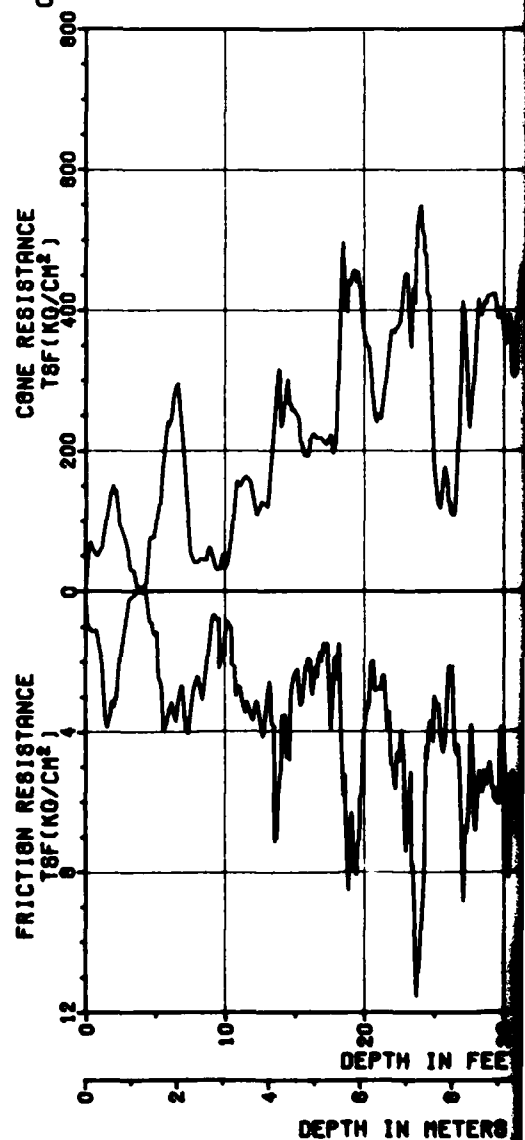
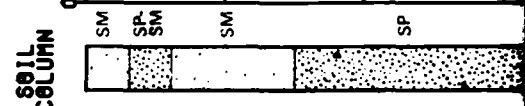
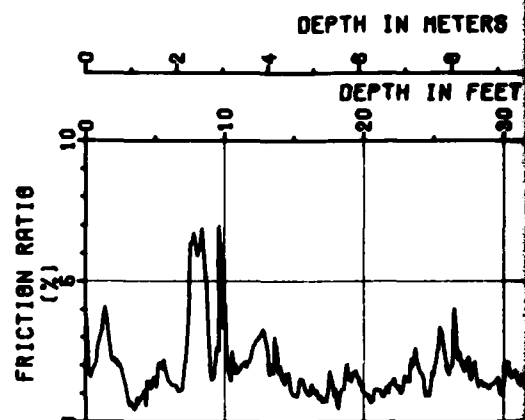
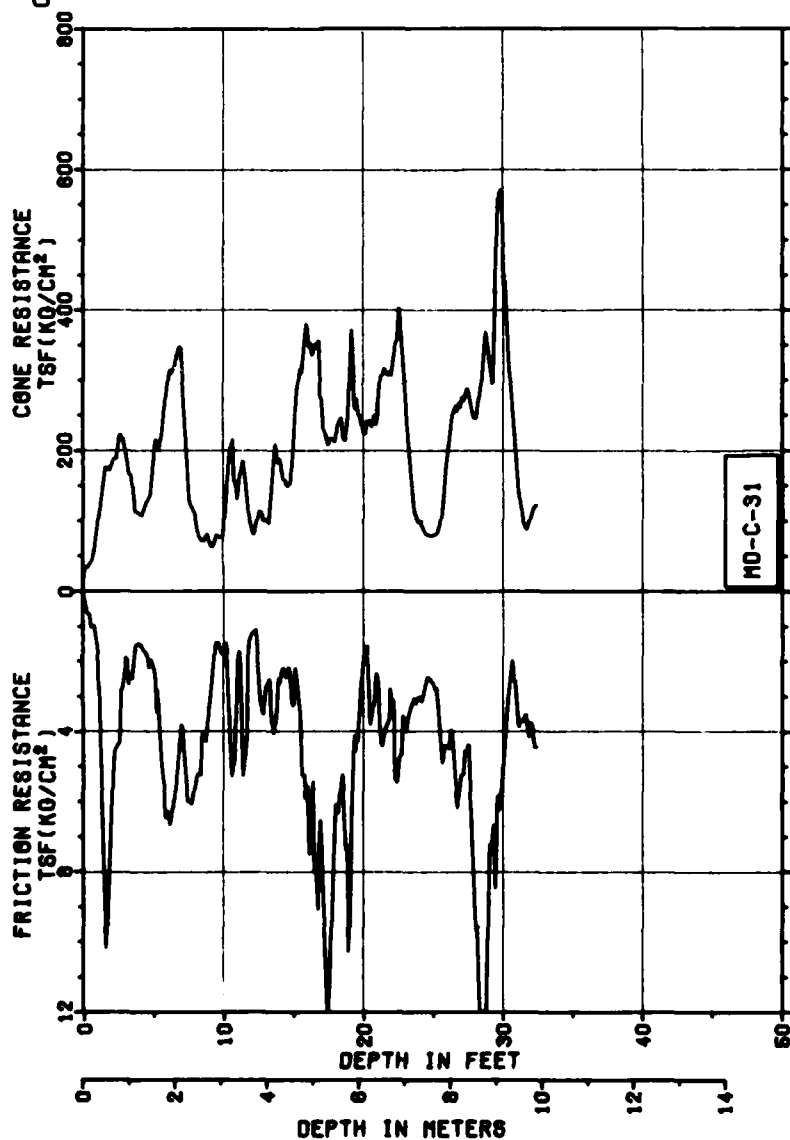
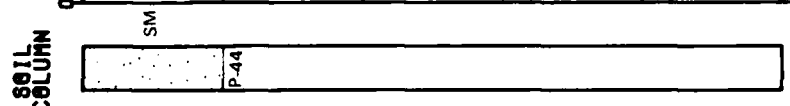
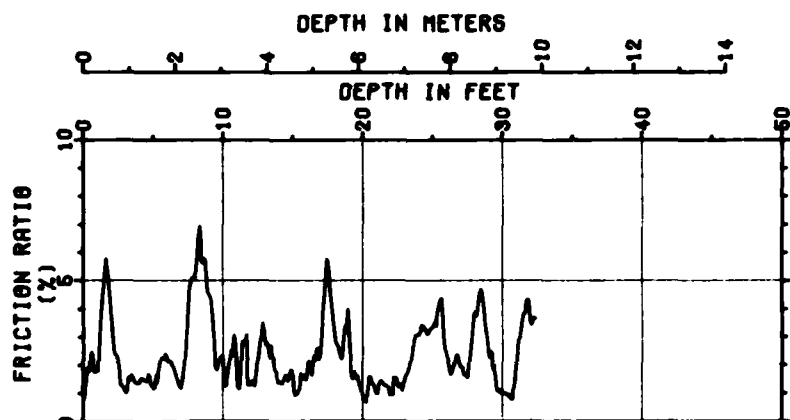
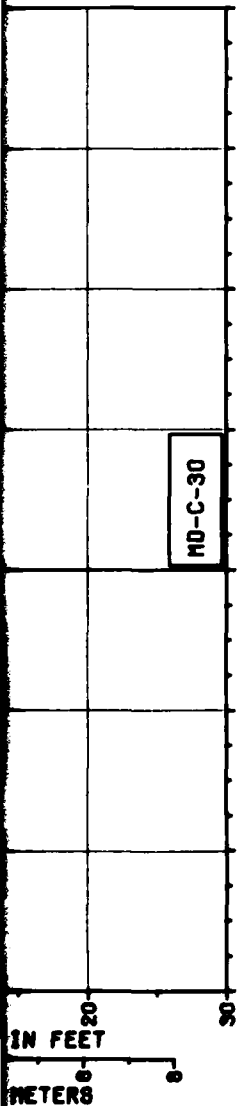
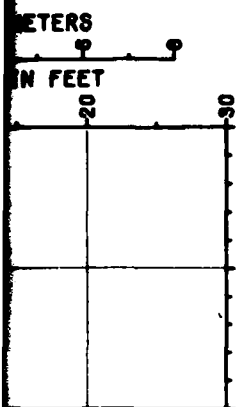
FUGRO NATIONAL, INC.

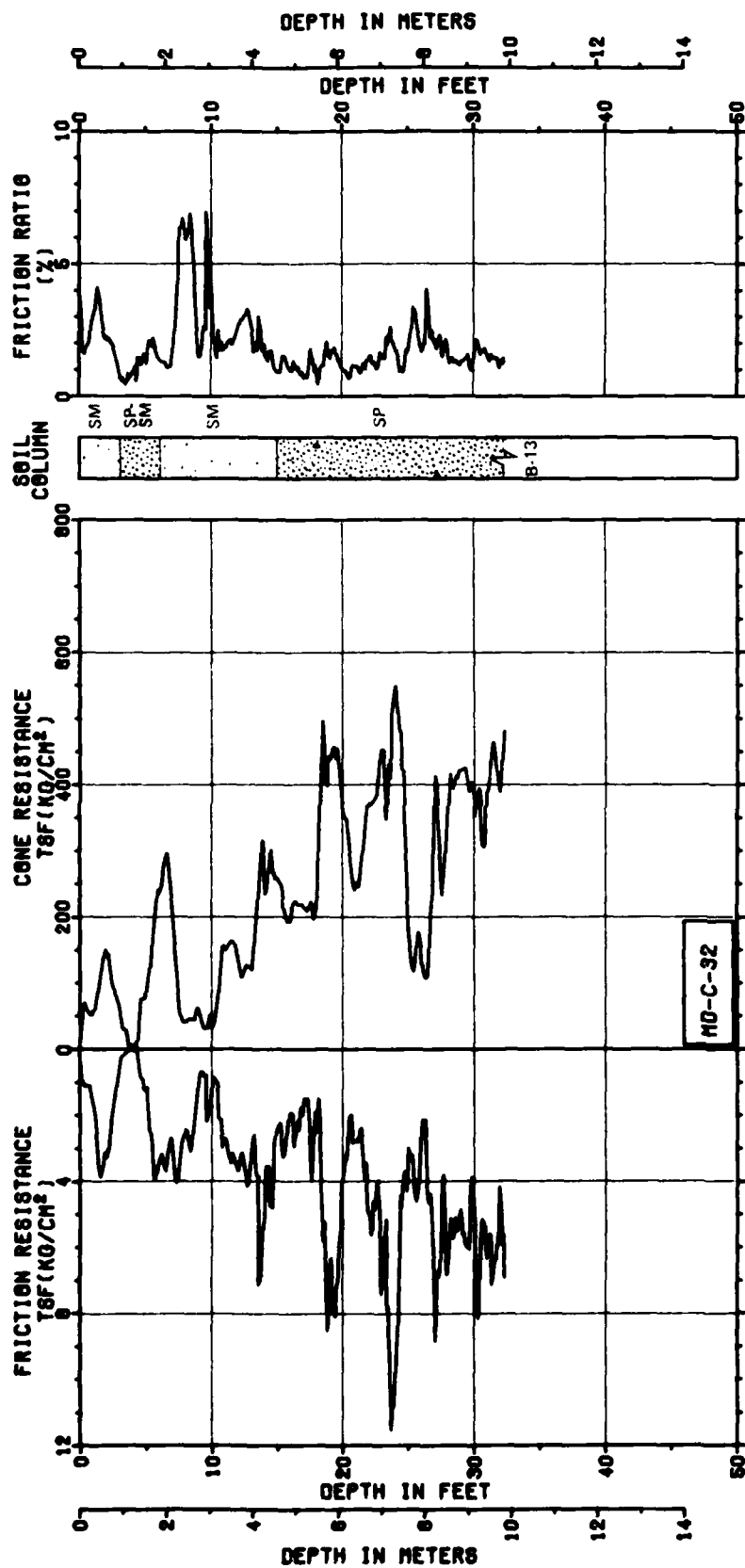










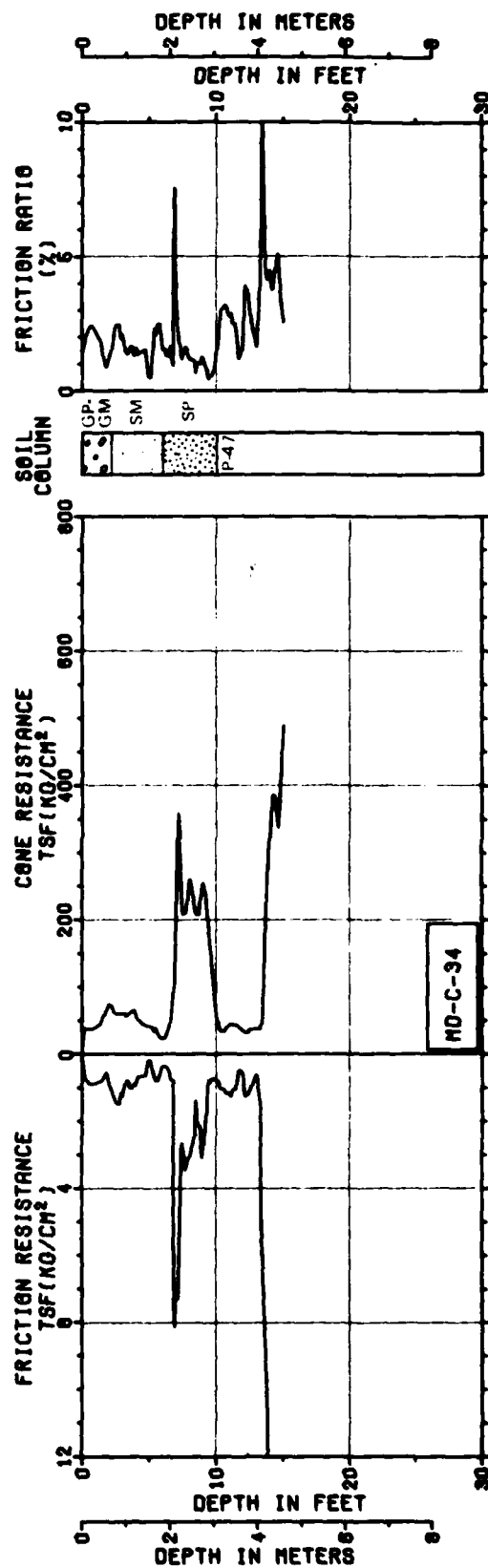
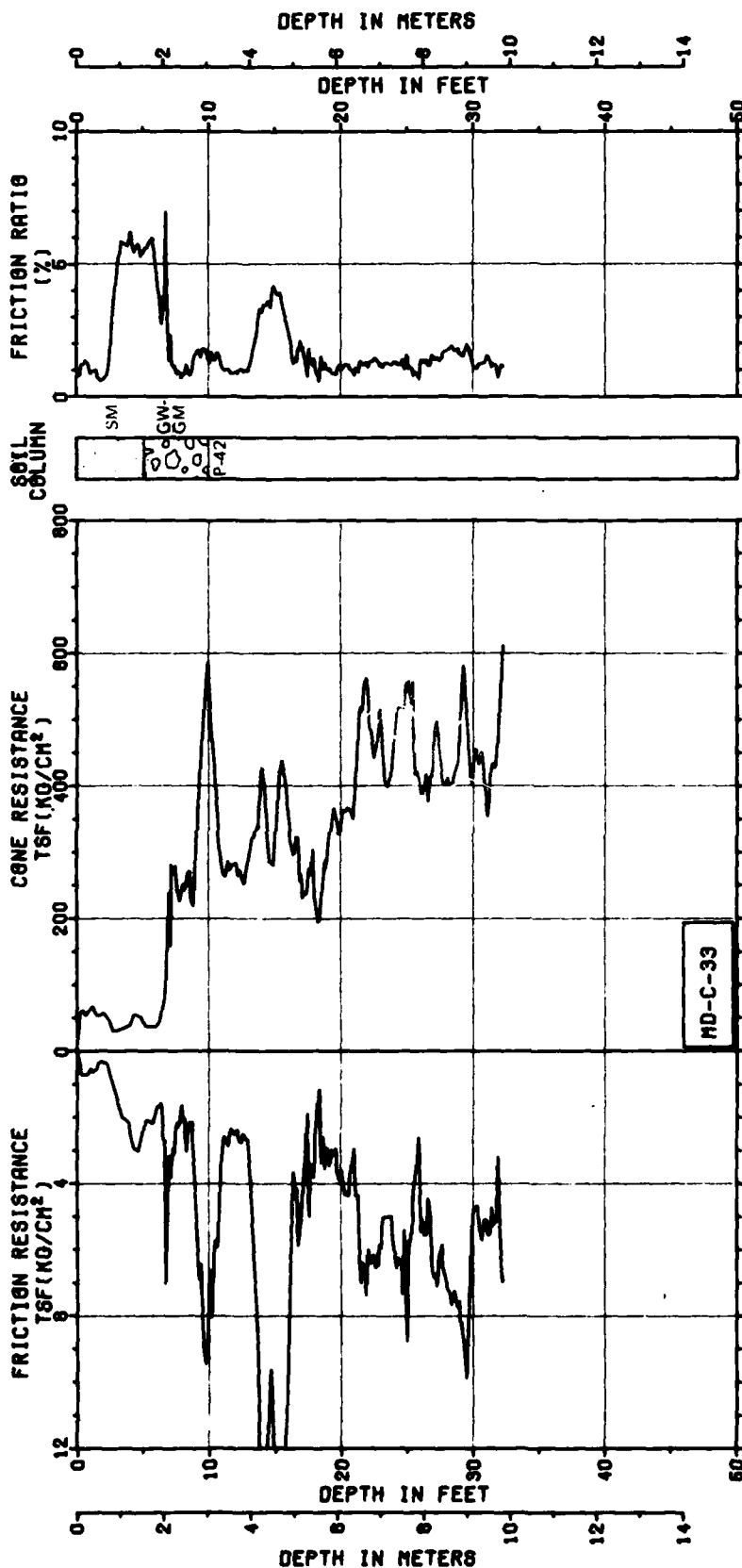


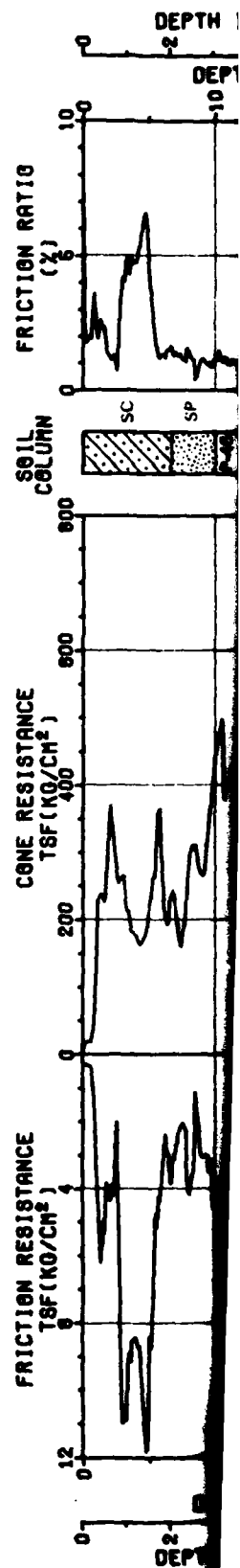
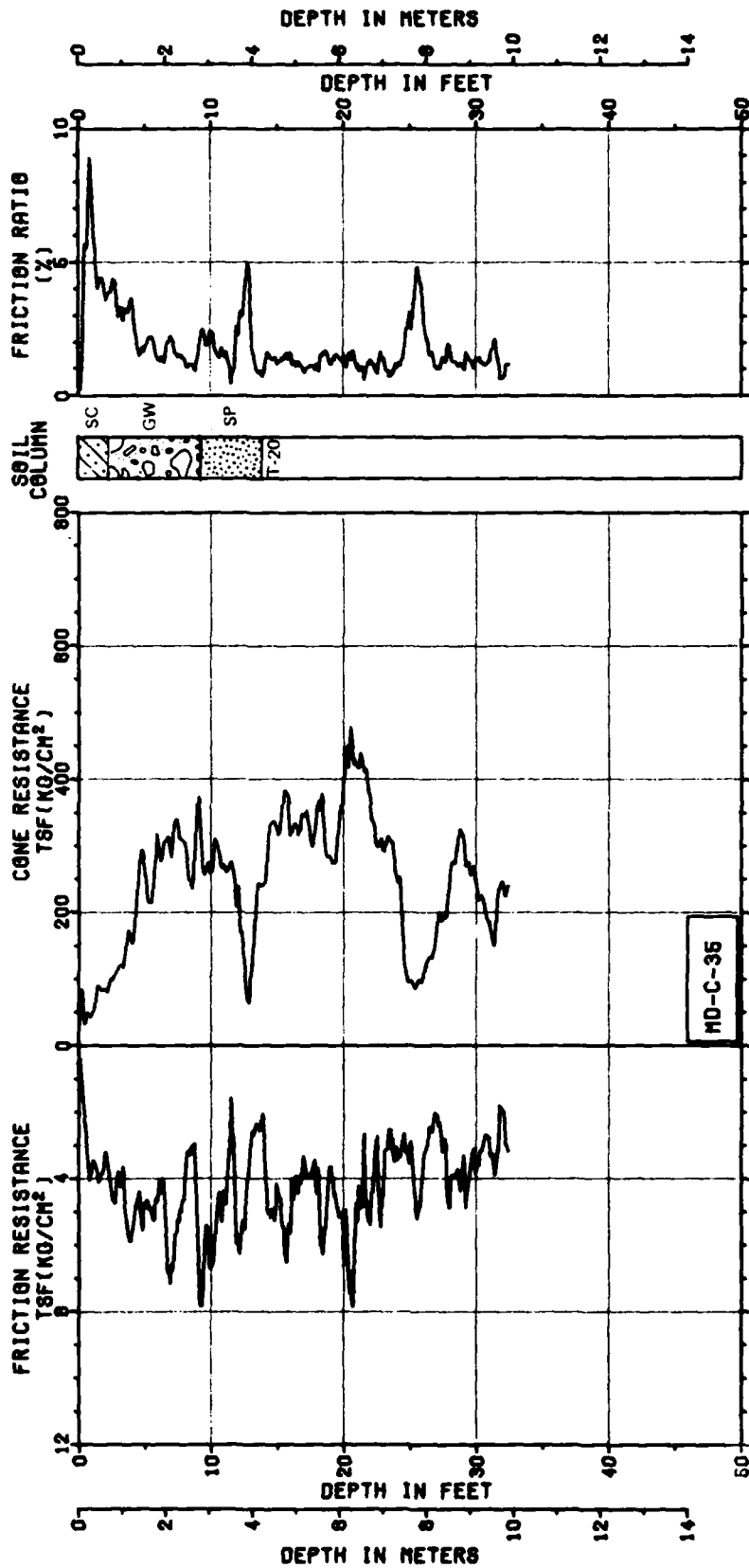
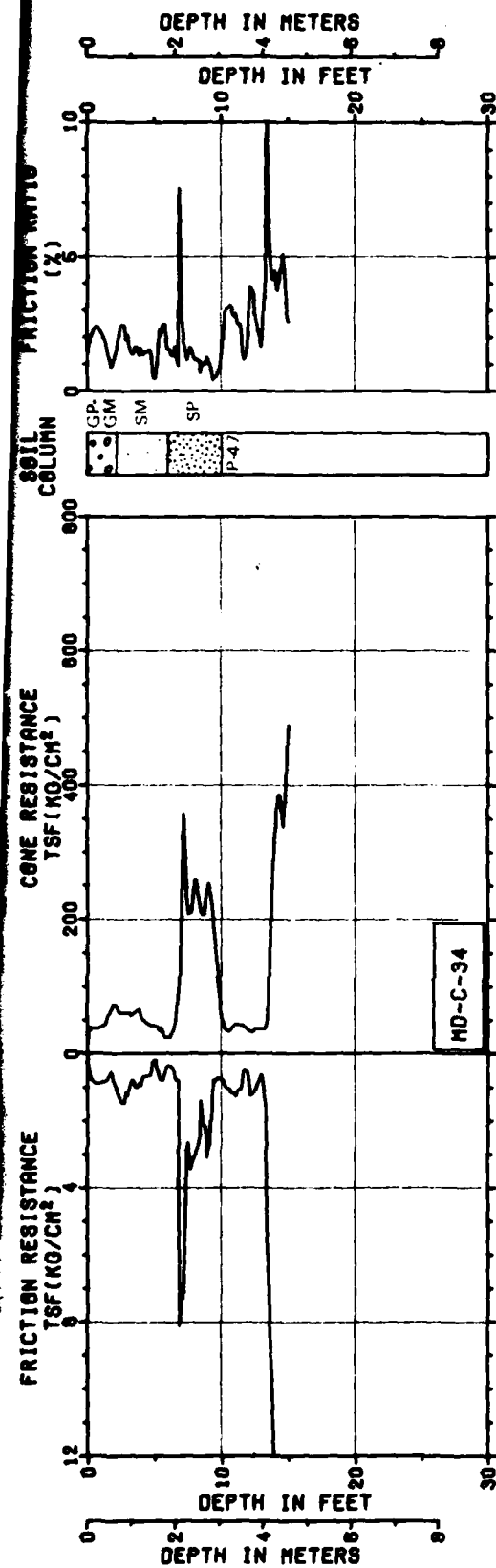
CONE PENETROMETER TEST MD-C-29, 30, 31 & 32
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

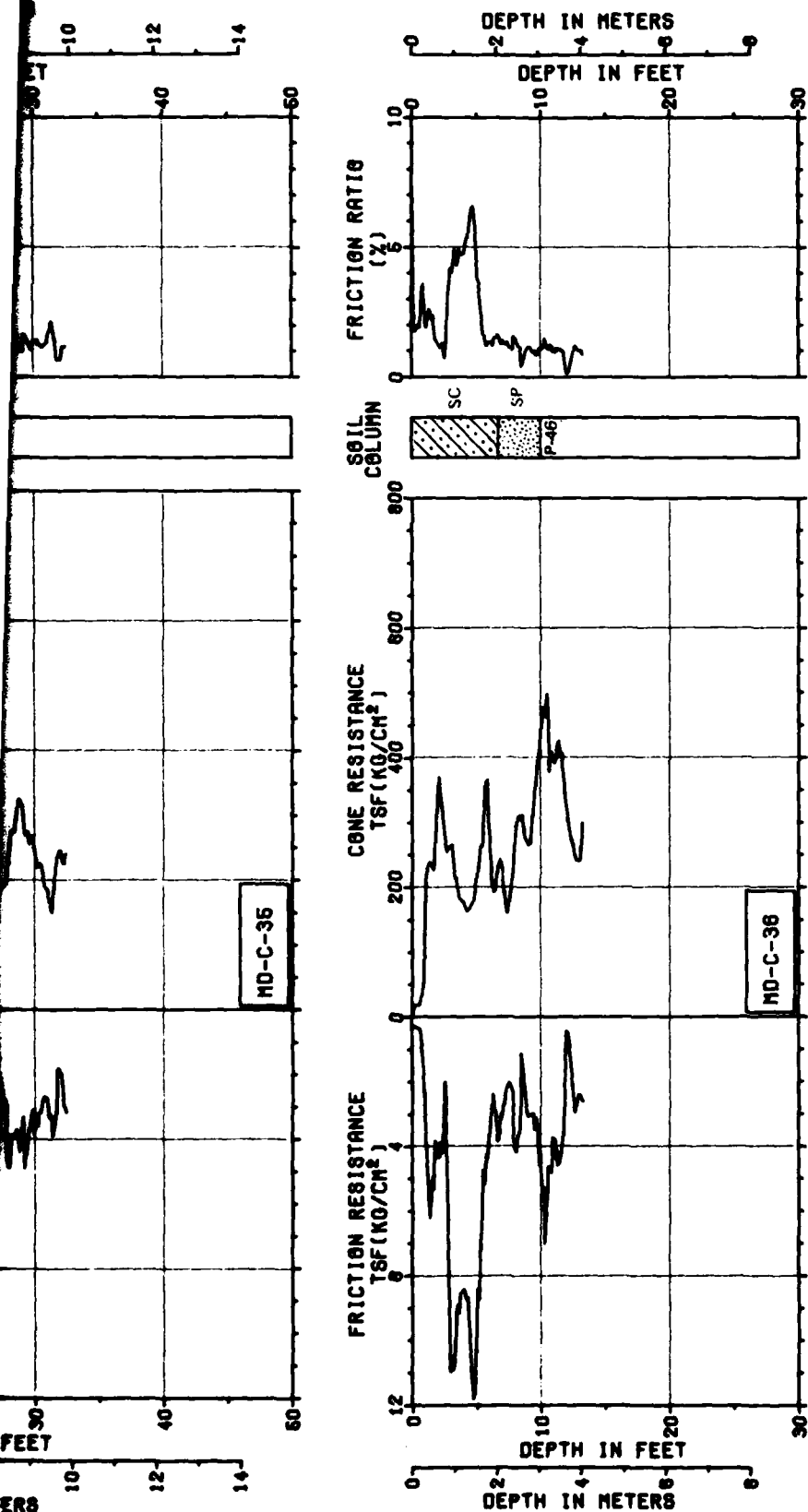
FIGURE
II-6-1
10 OF 25

FUGRO NATIONAL, INC.





2



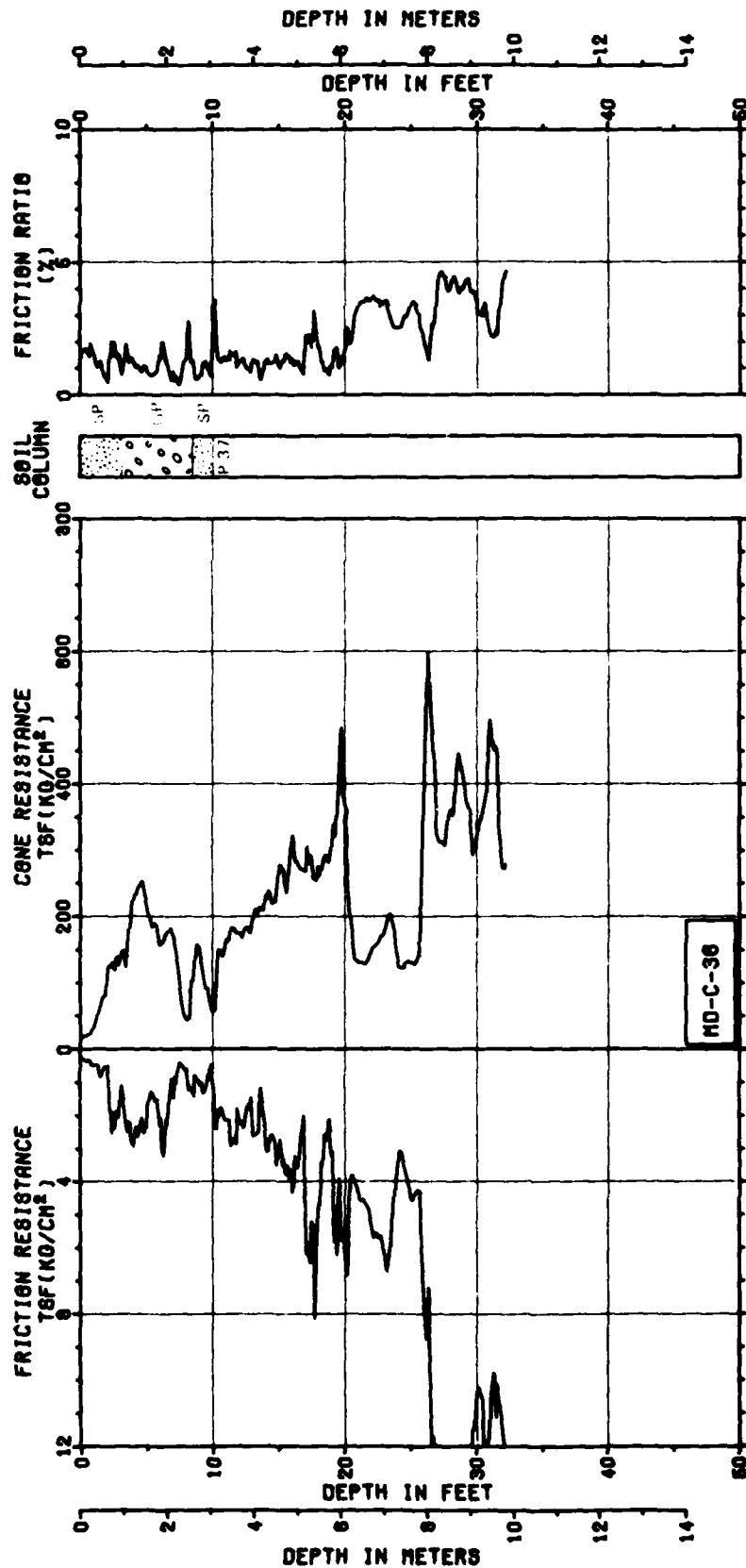
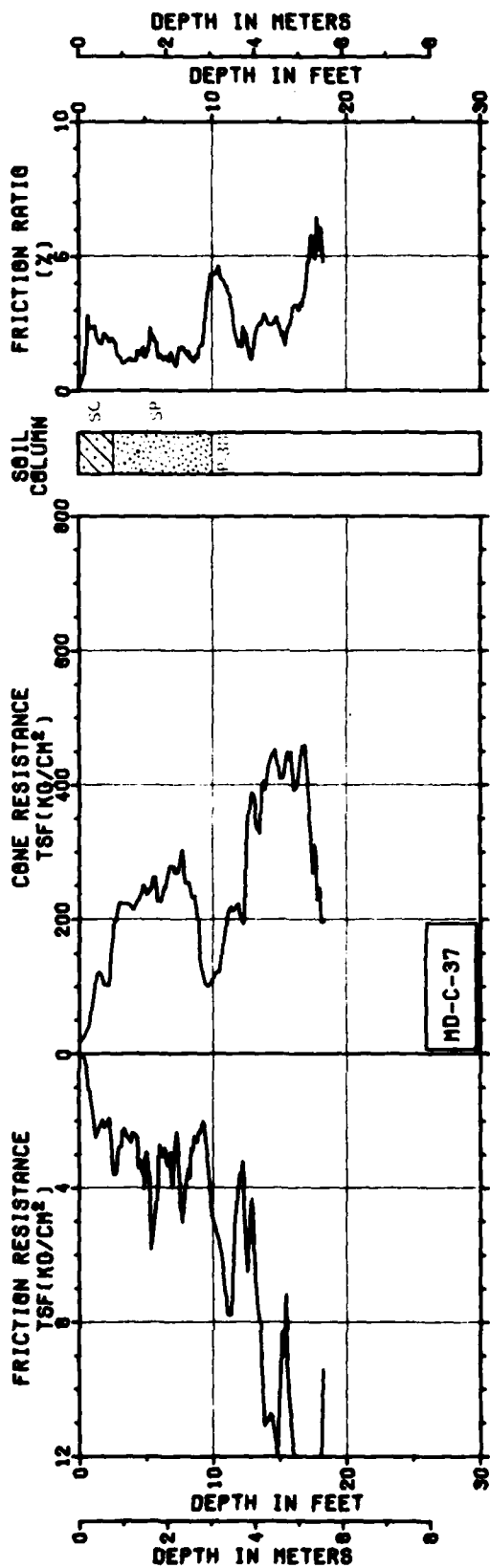
CONE PENETROMETER TEST MD-C-33, 34, 35 & 36
OPERATIONAL BASE SITE
MILFORD, UTAH

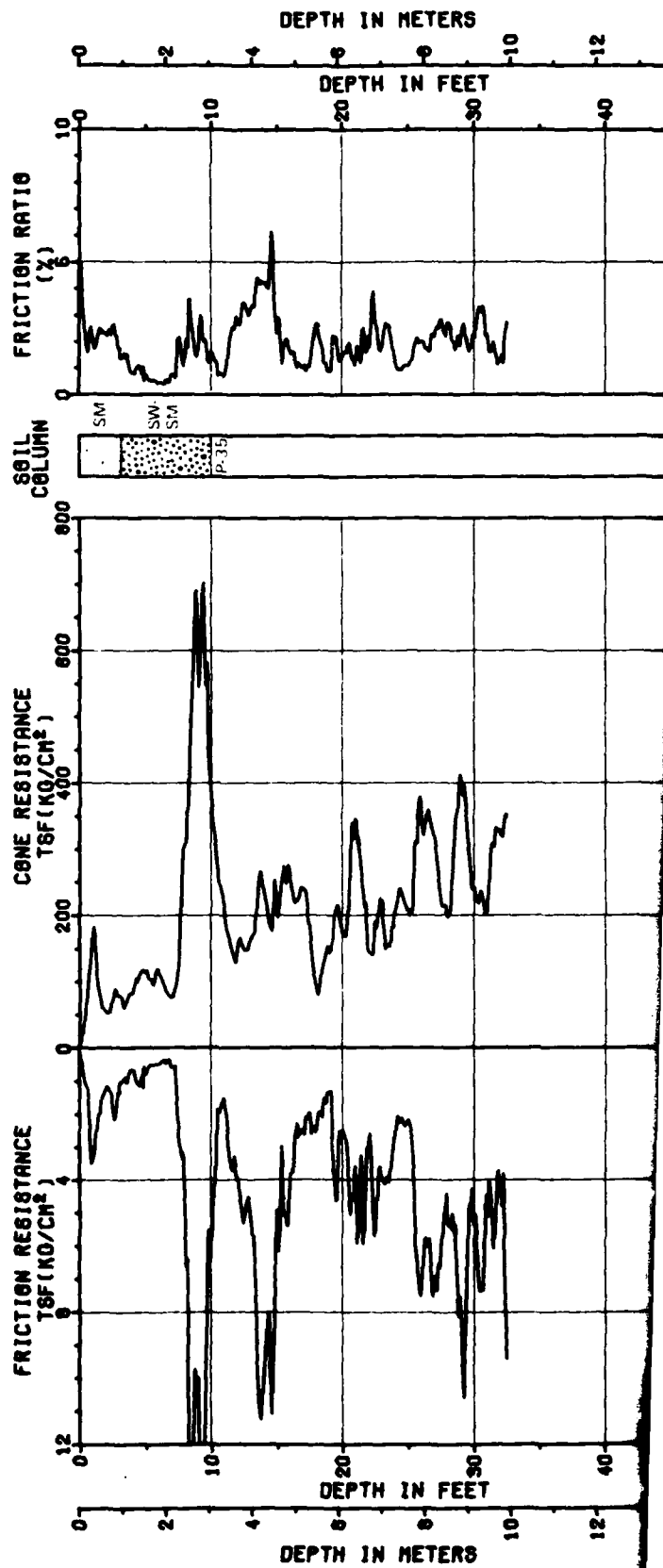
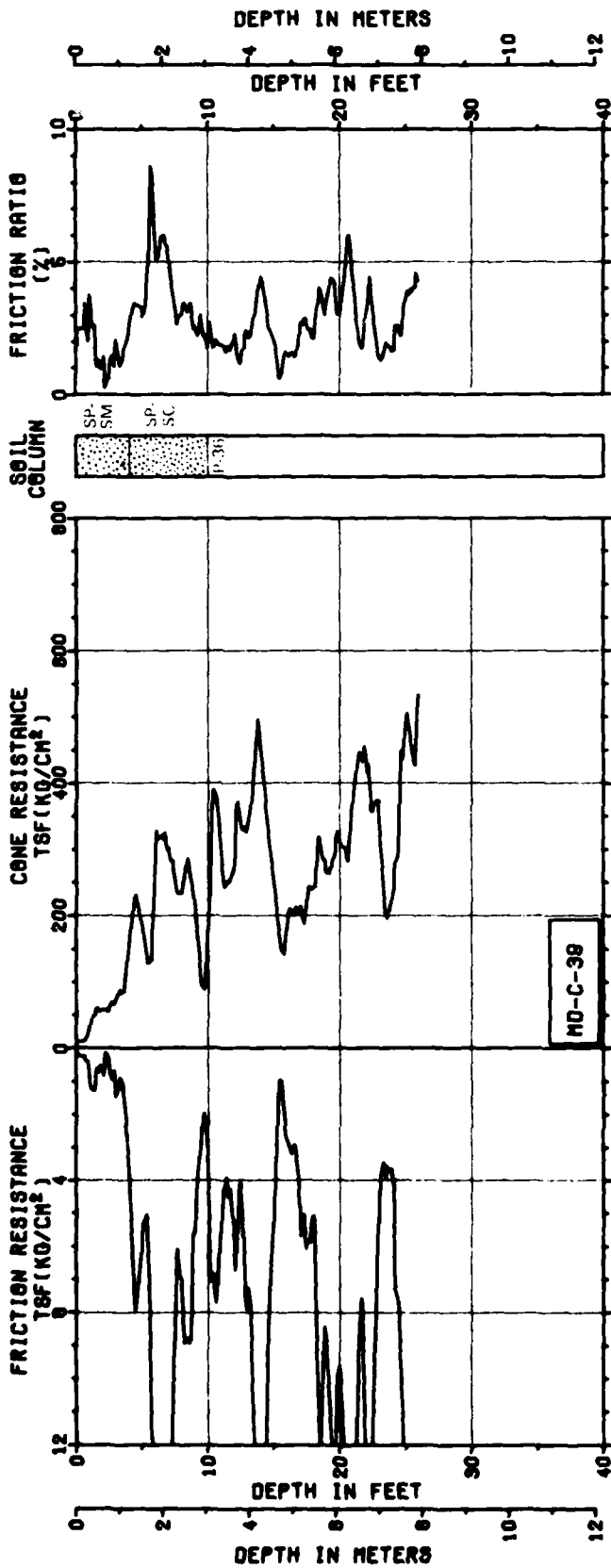
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

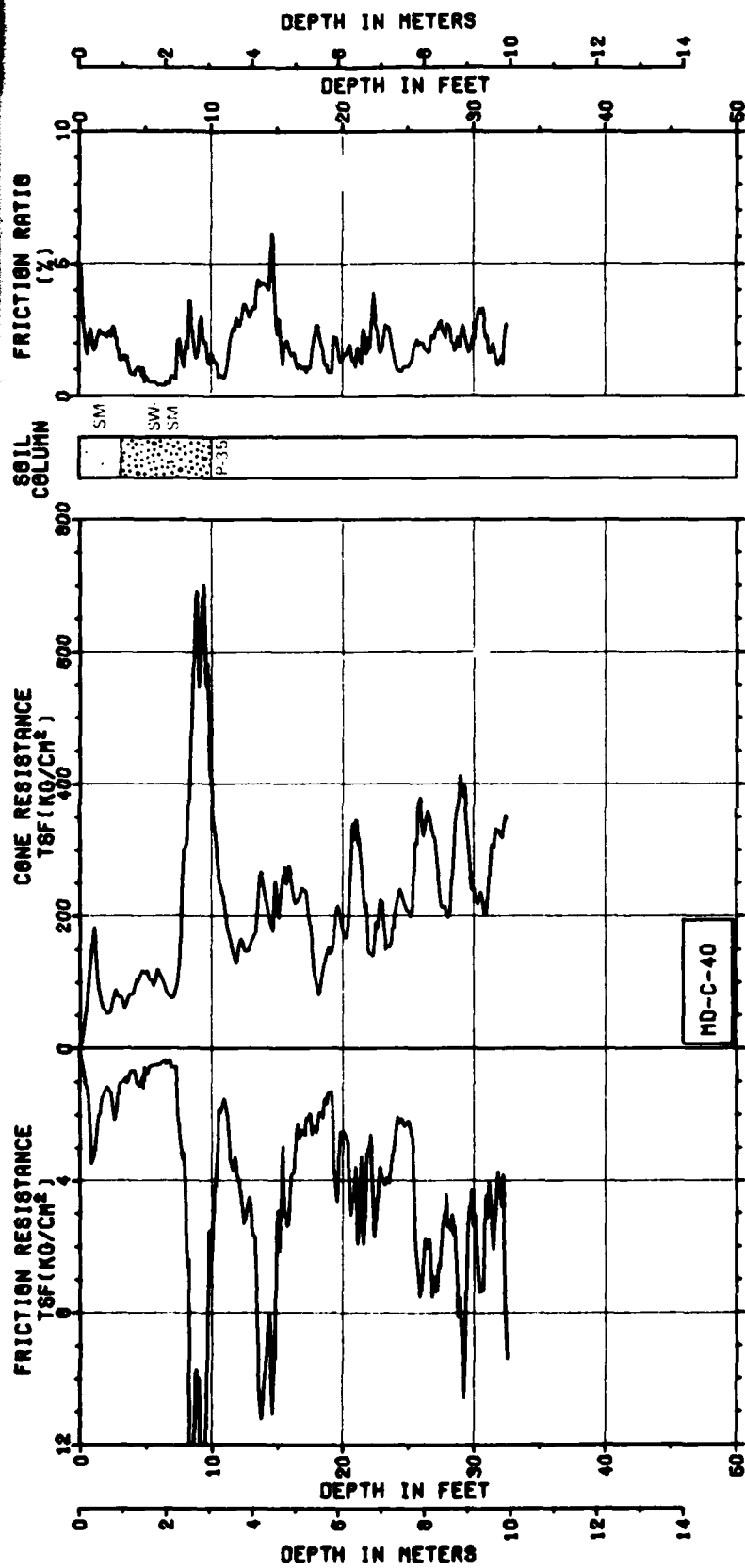
FIGURE
II-6-1
11 OF 25

FUGRO NATIONAL, INC.

3





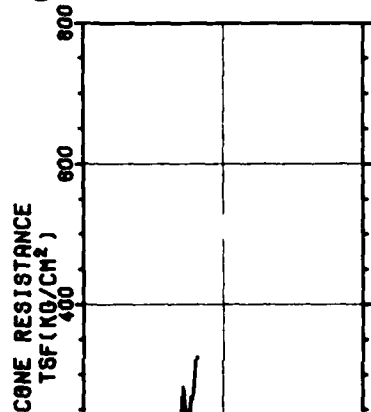
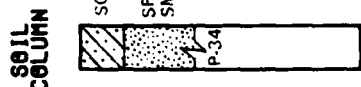
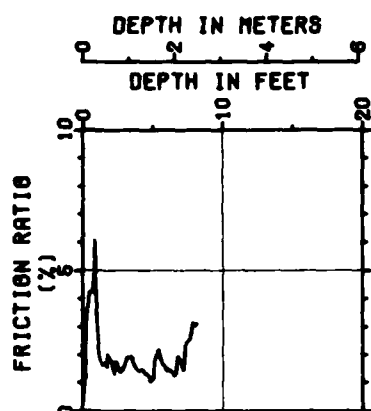


CONE PENETROMETER TEST MD-C-37, 38, 39 & 40
OPERATIONAL BASE SITE
MILFORD, UTAH

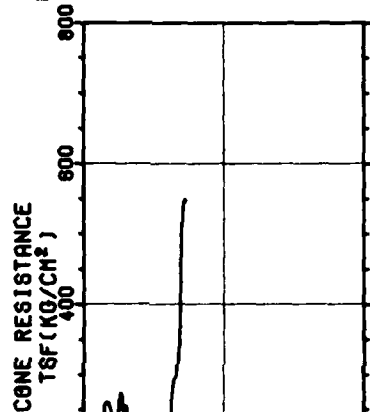
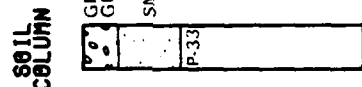
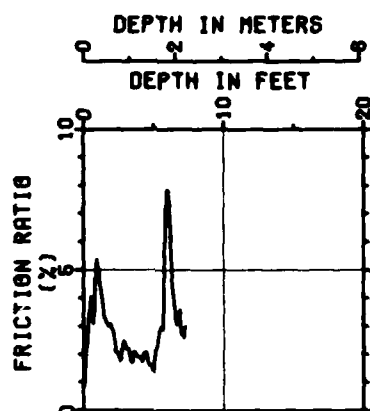
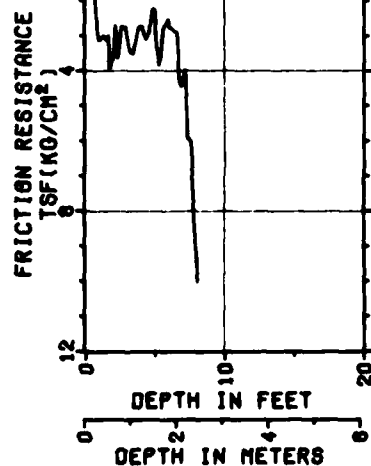
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE SMO

FIGURE
II-6-1
12 OF 25

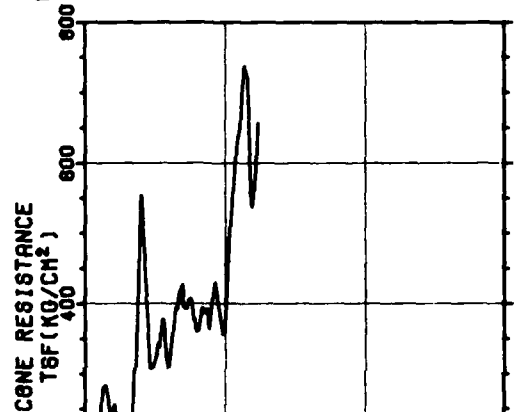
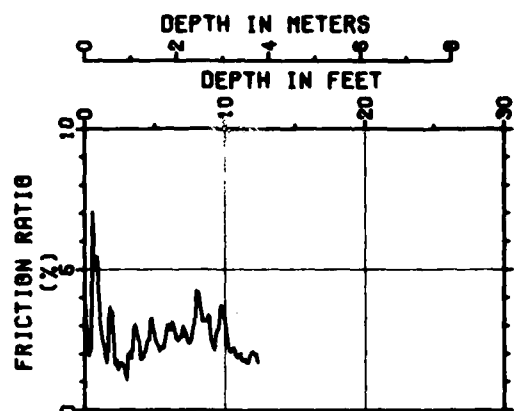
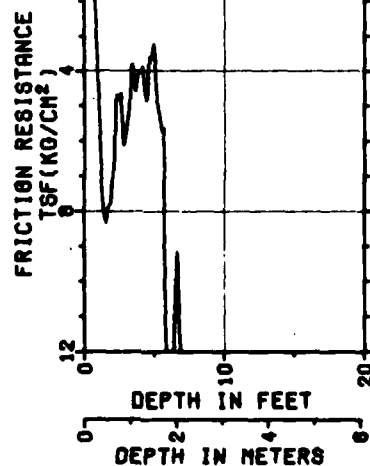
FUGRO NATIONAL, INC.



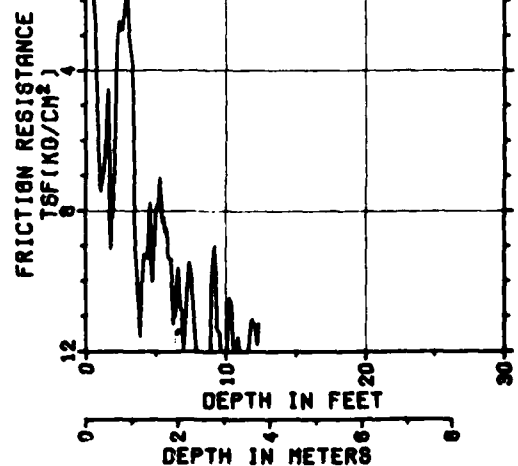
MD-C-41

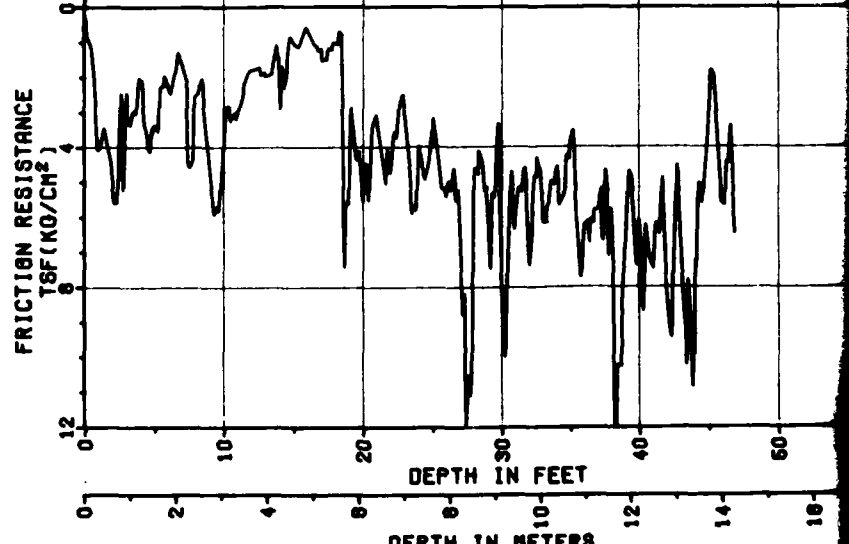
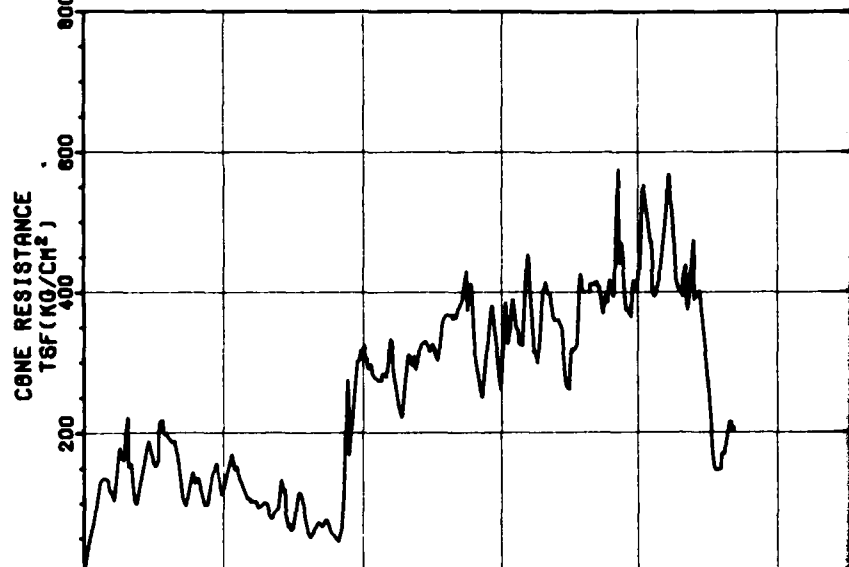
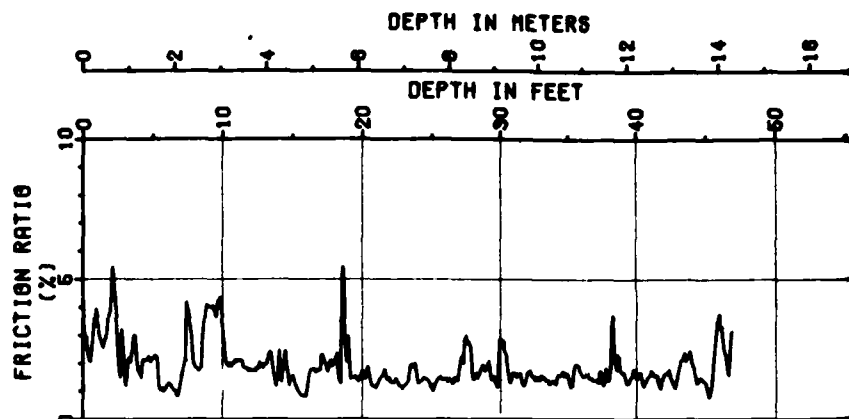
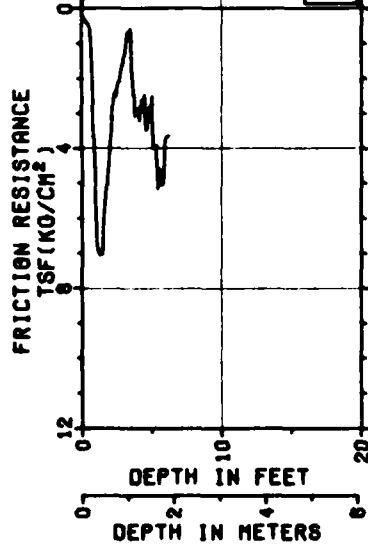
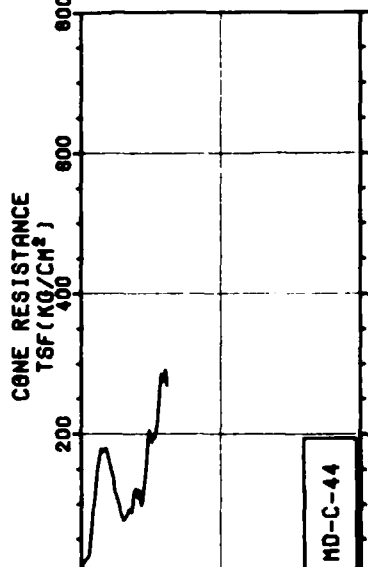
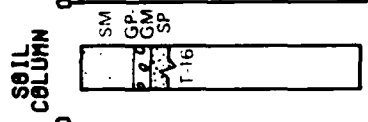
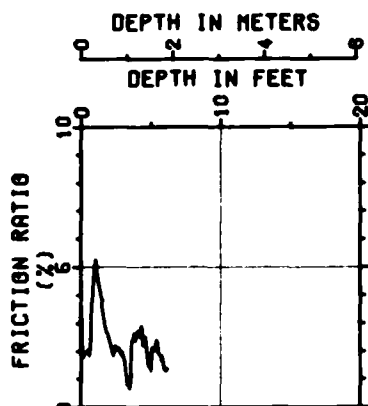
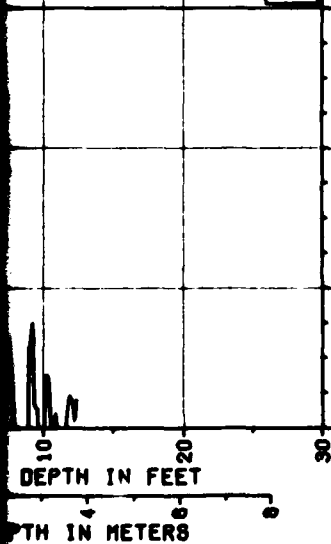
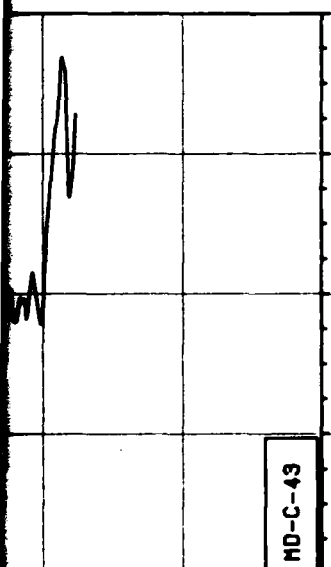
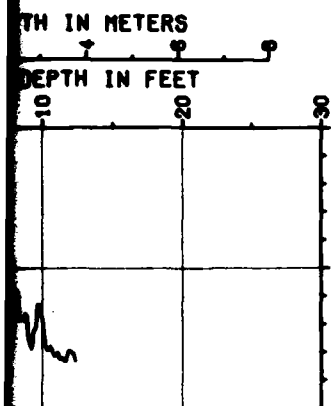


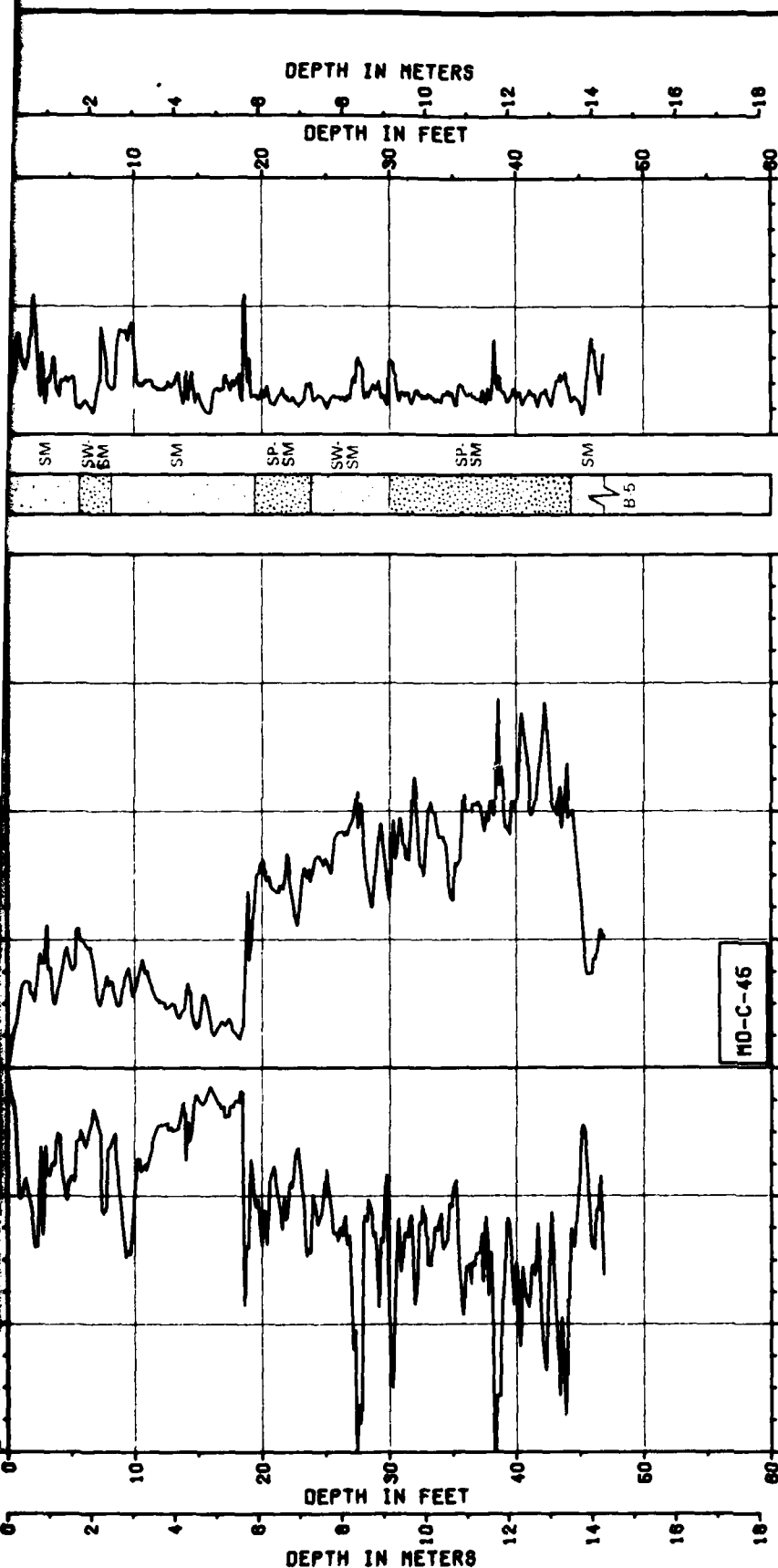
MD-C-42



MD-C-43





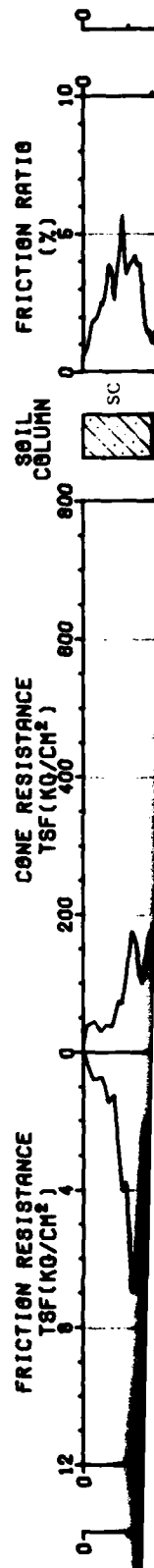
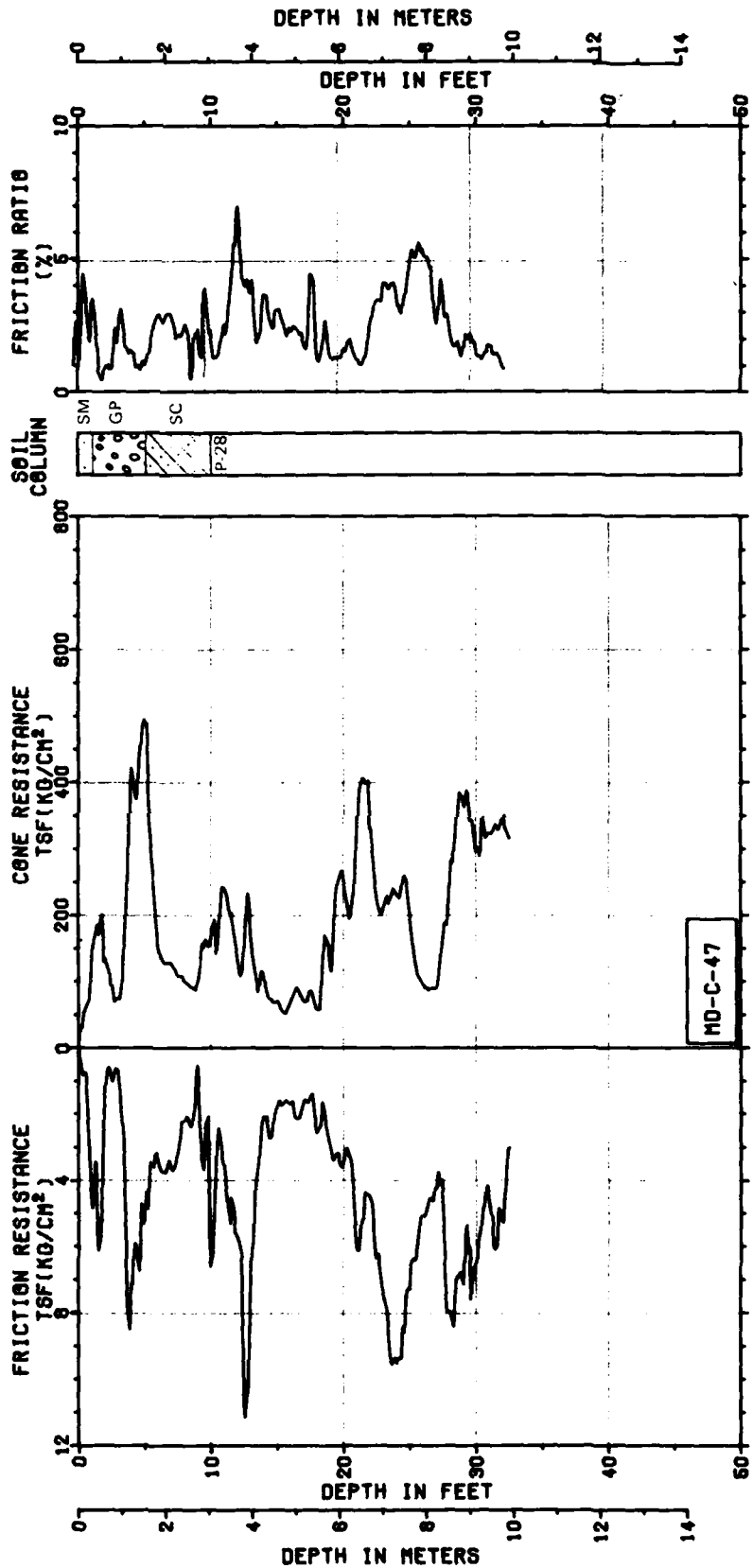
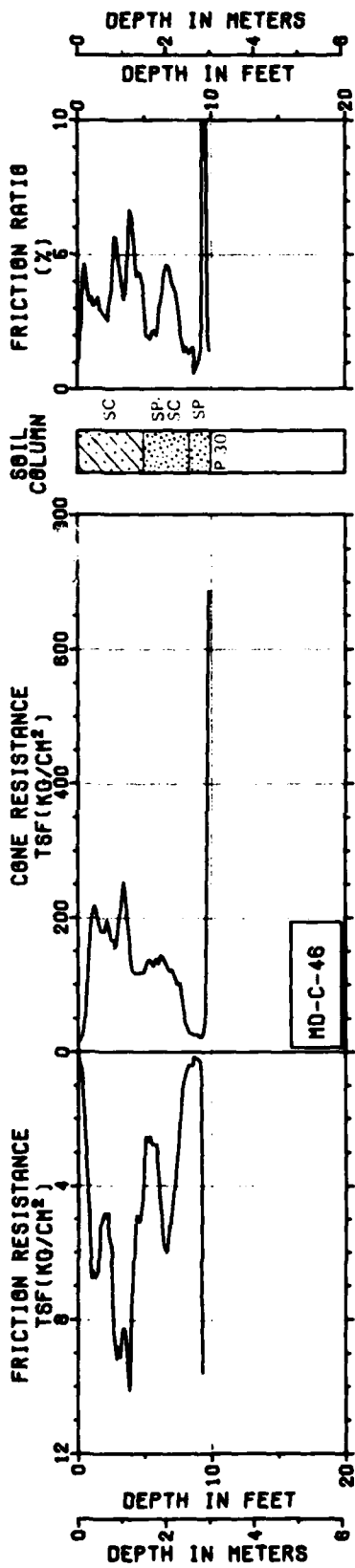


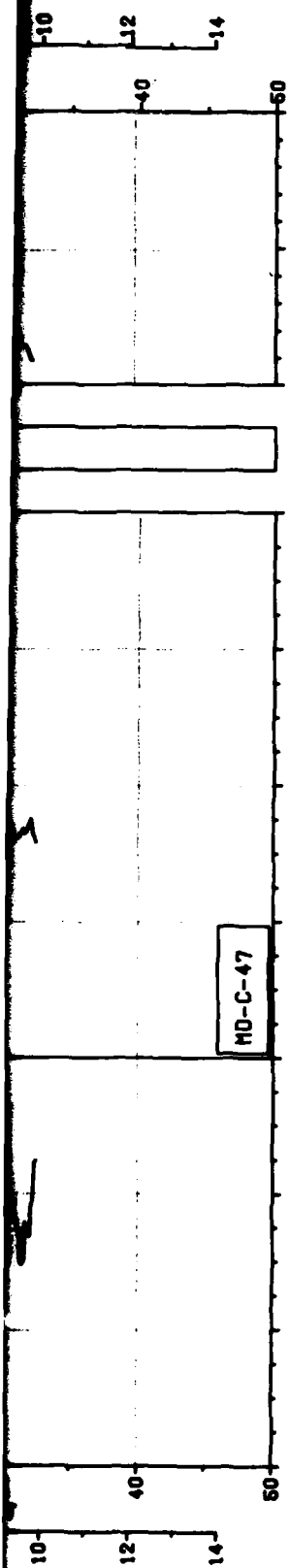
CONE PENETROMETER TEST MD-C-41, 42, 43, 44 & 45
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

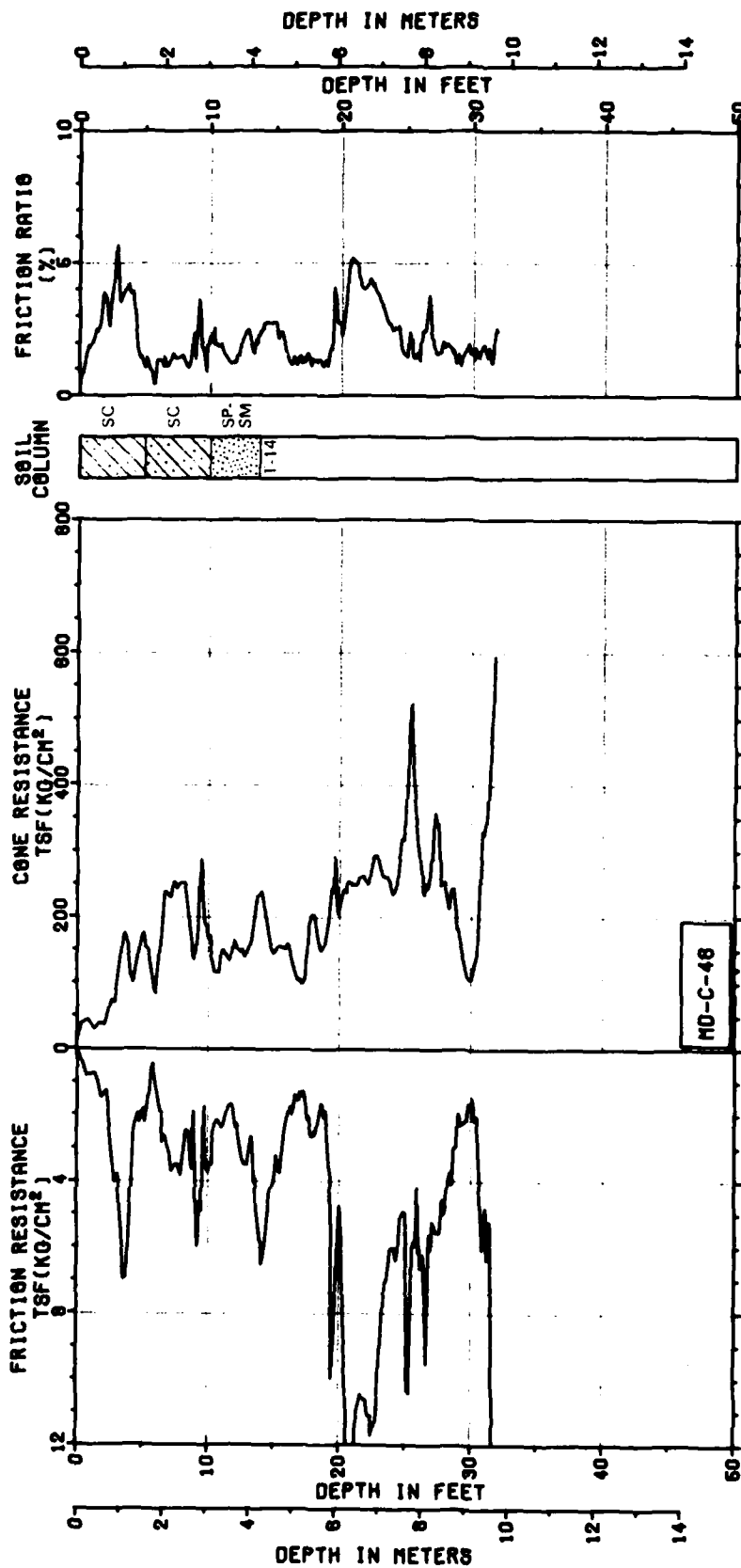
FIGURE
 II-6-1
 13 OF 26

FUGRO NATIONAL, INC.

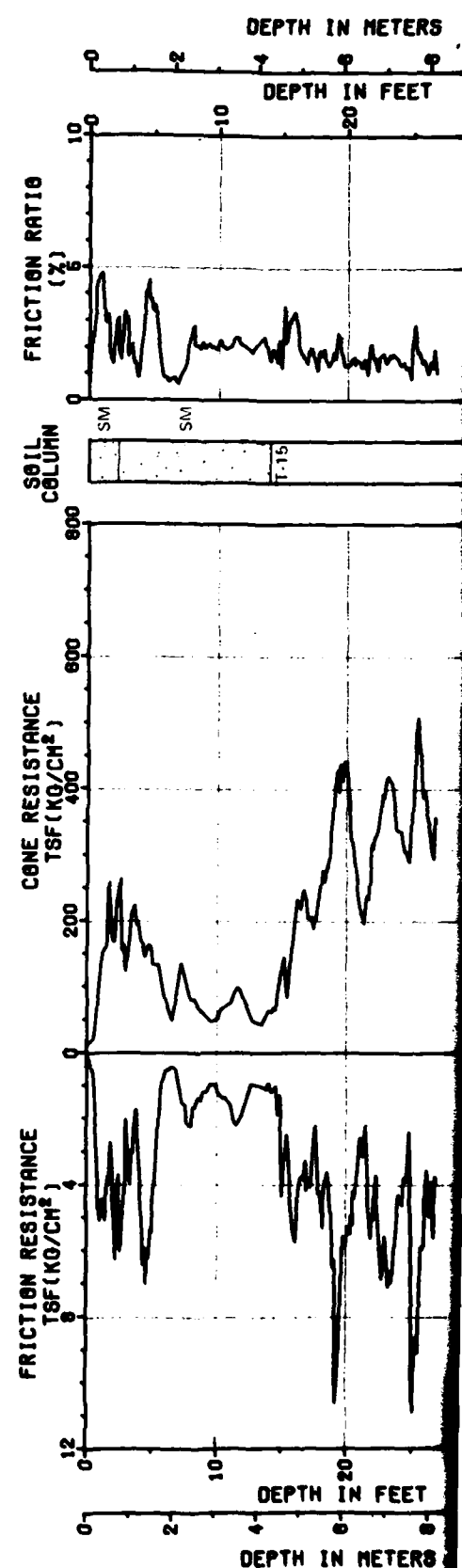


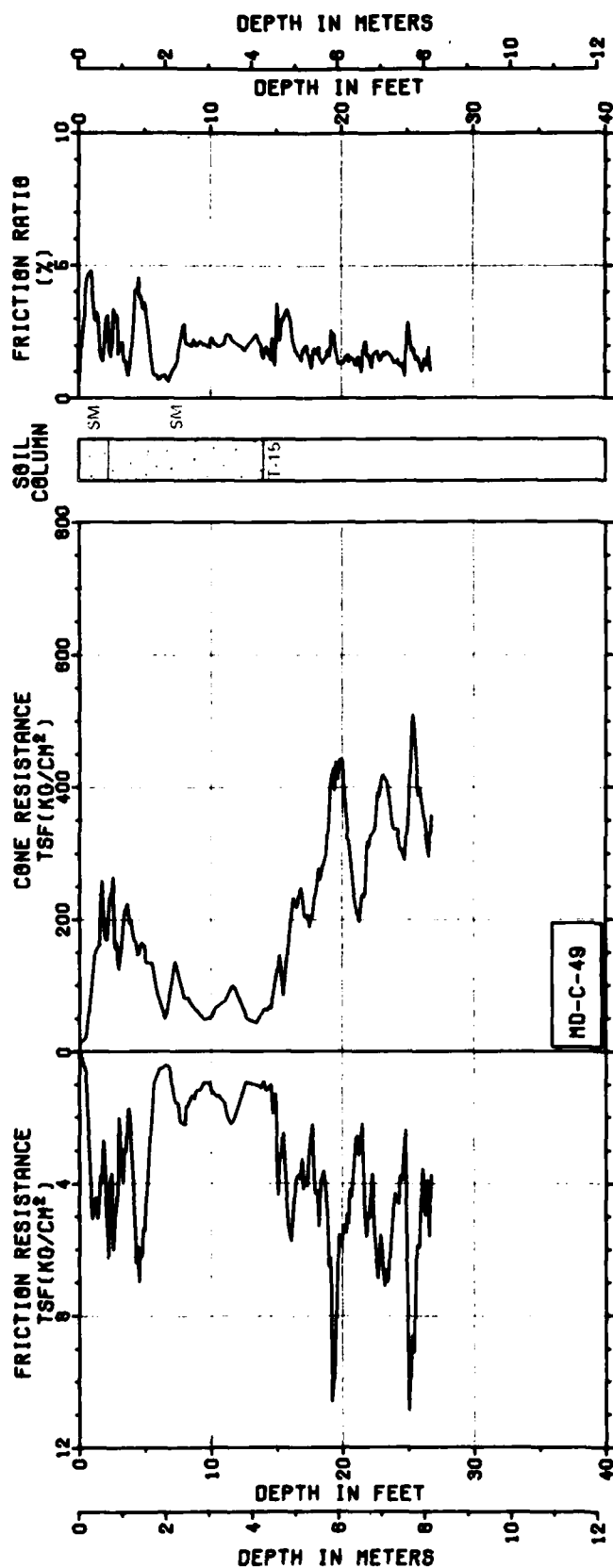


MD-C-47



MD-C-48



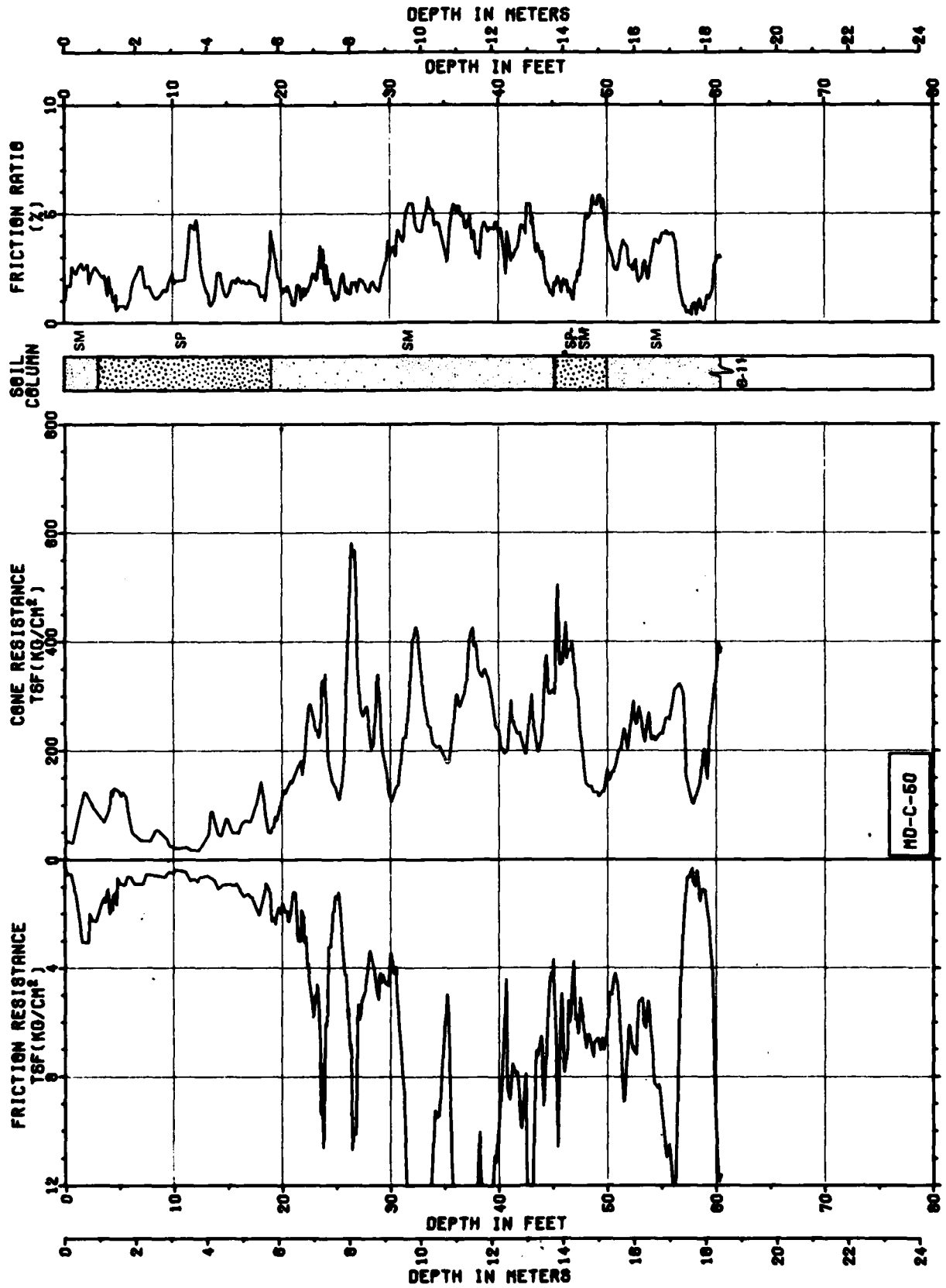


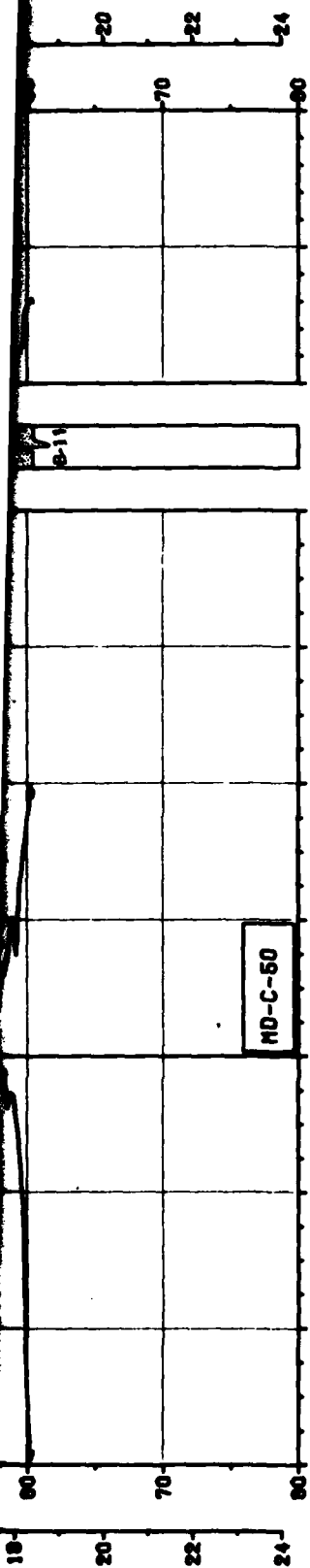
CONE PENETROMETER TEST MD-C-46, 47, 48 & 49
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE BMO

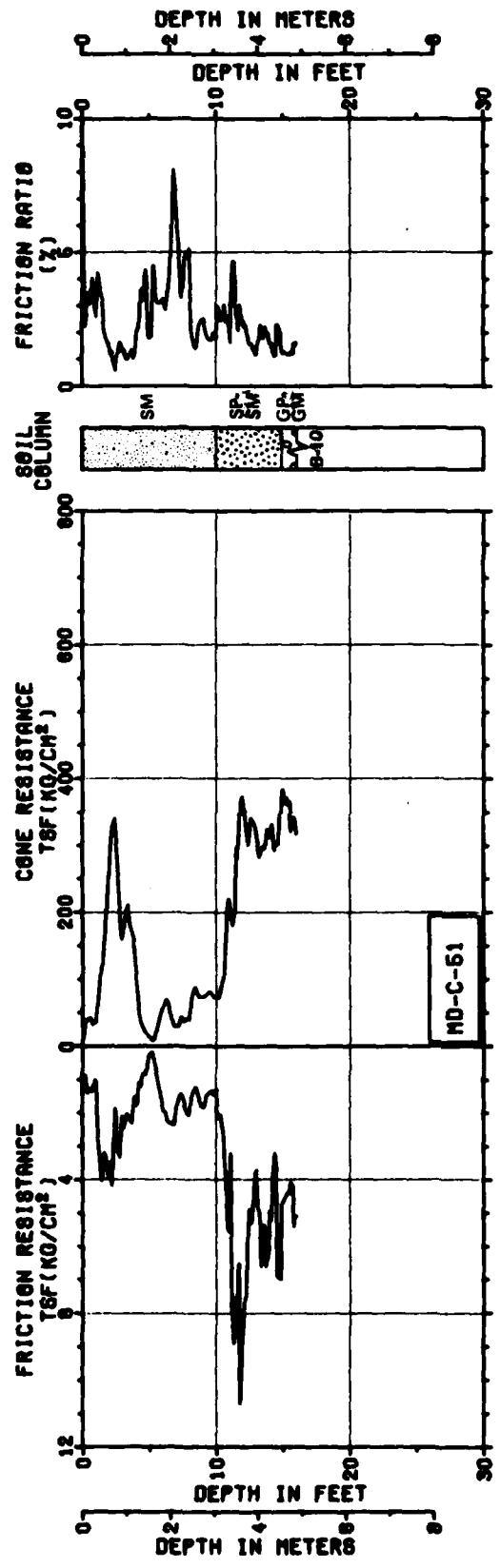
FIGURE
 II-6-1
 14 OF 25

FUGRO NATIONAL, INC.

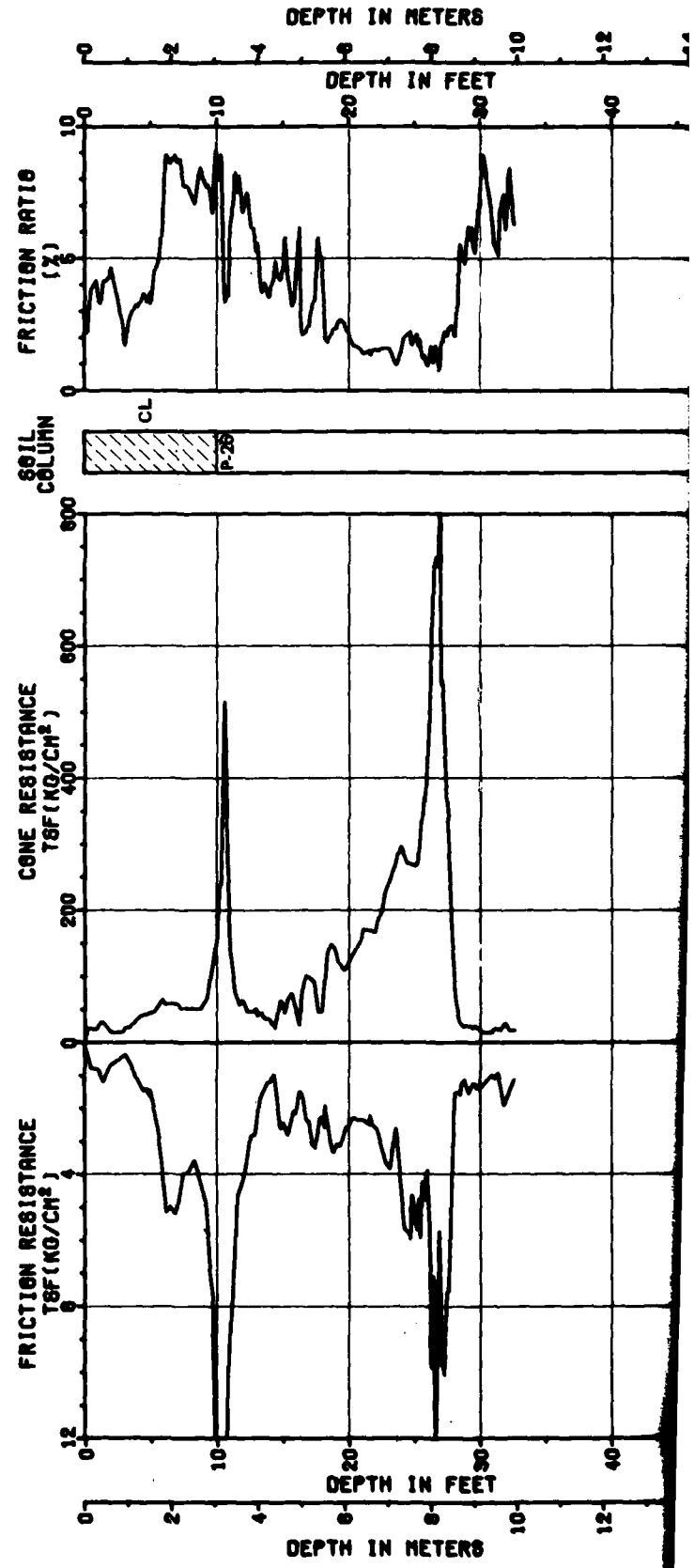


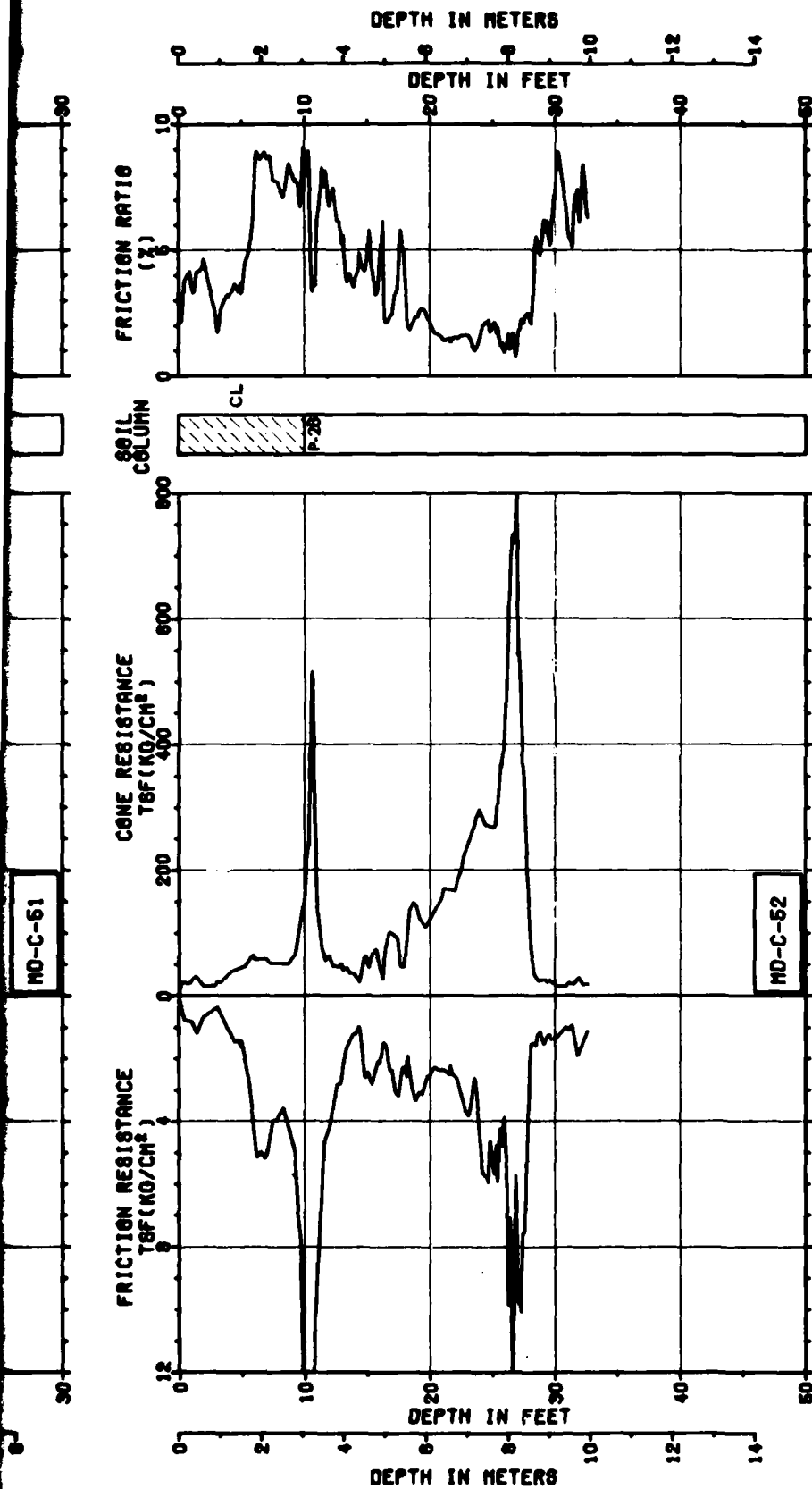


MD-C-50



MD-C-51



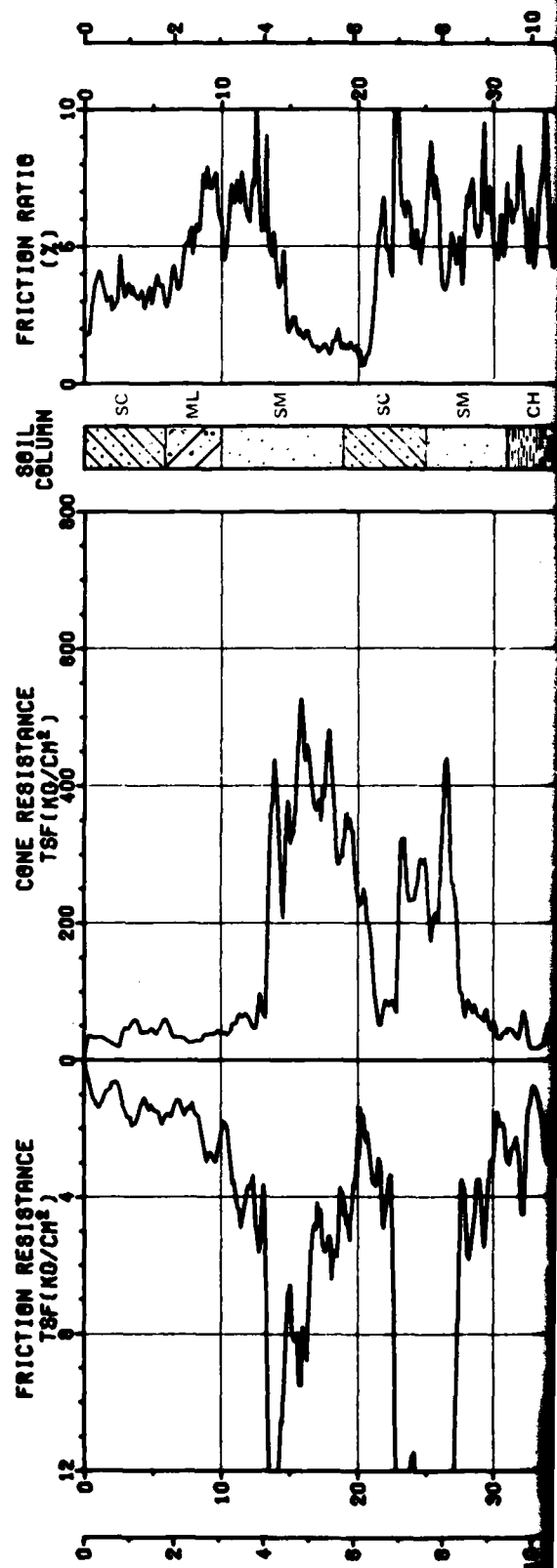
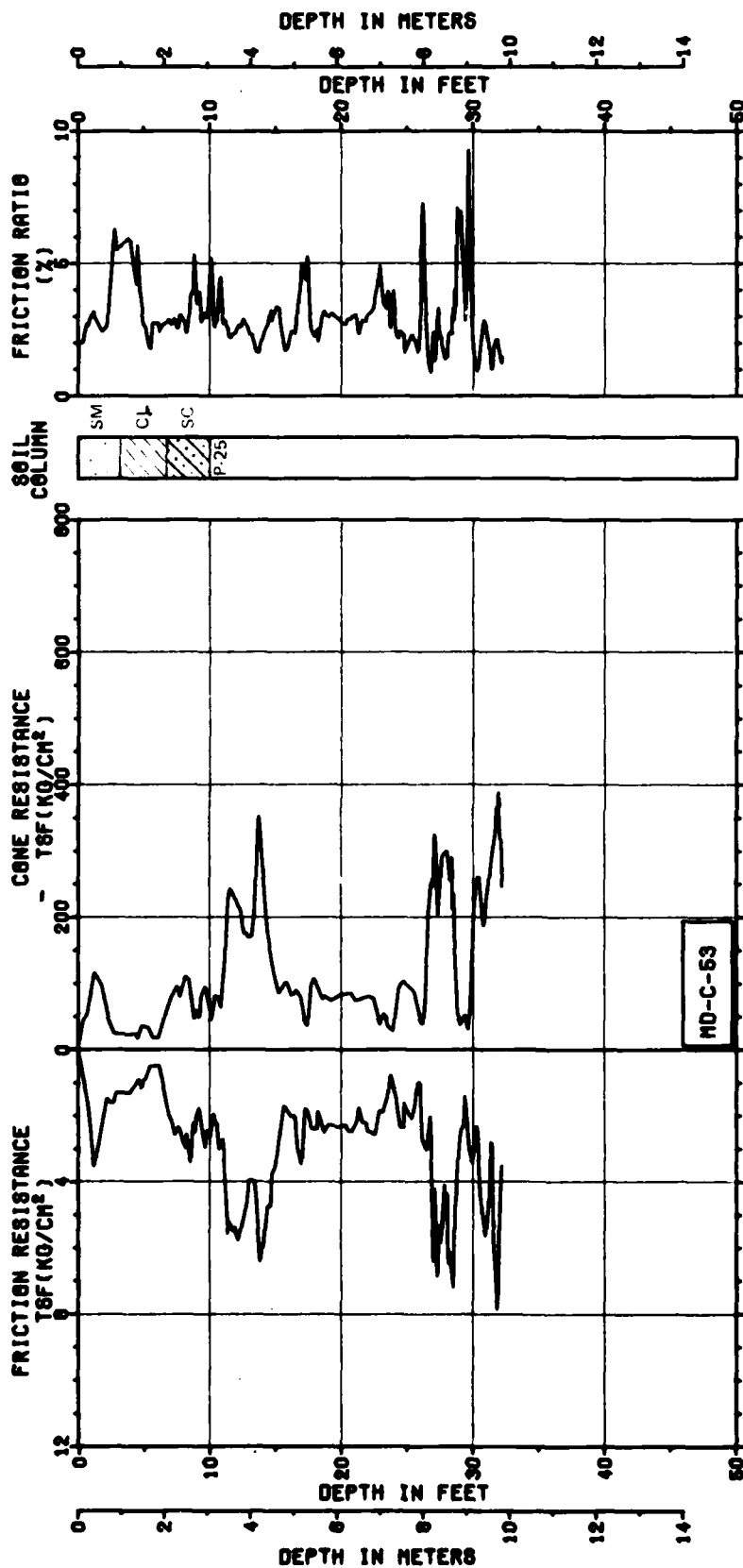


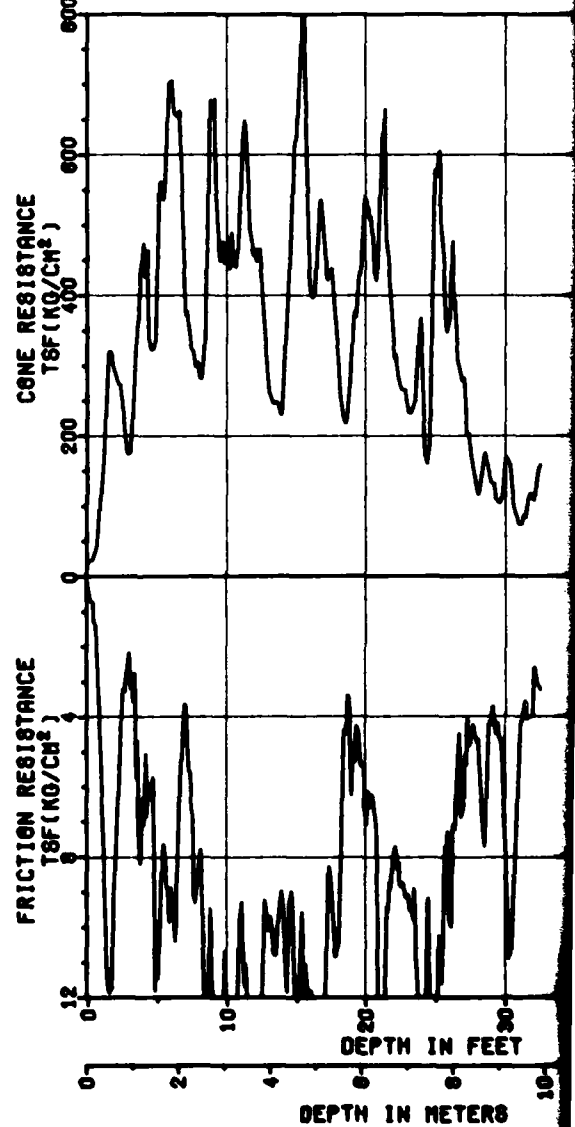
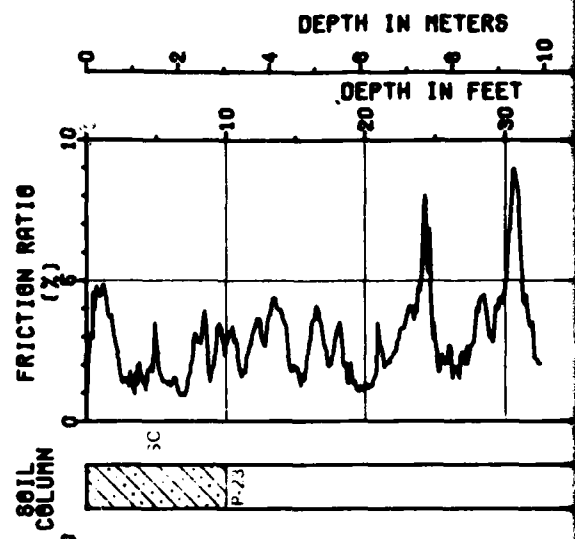
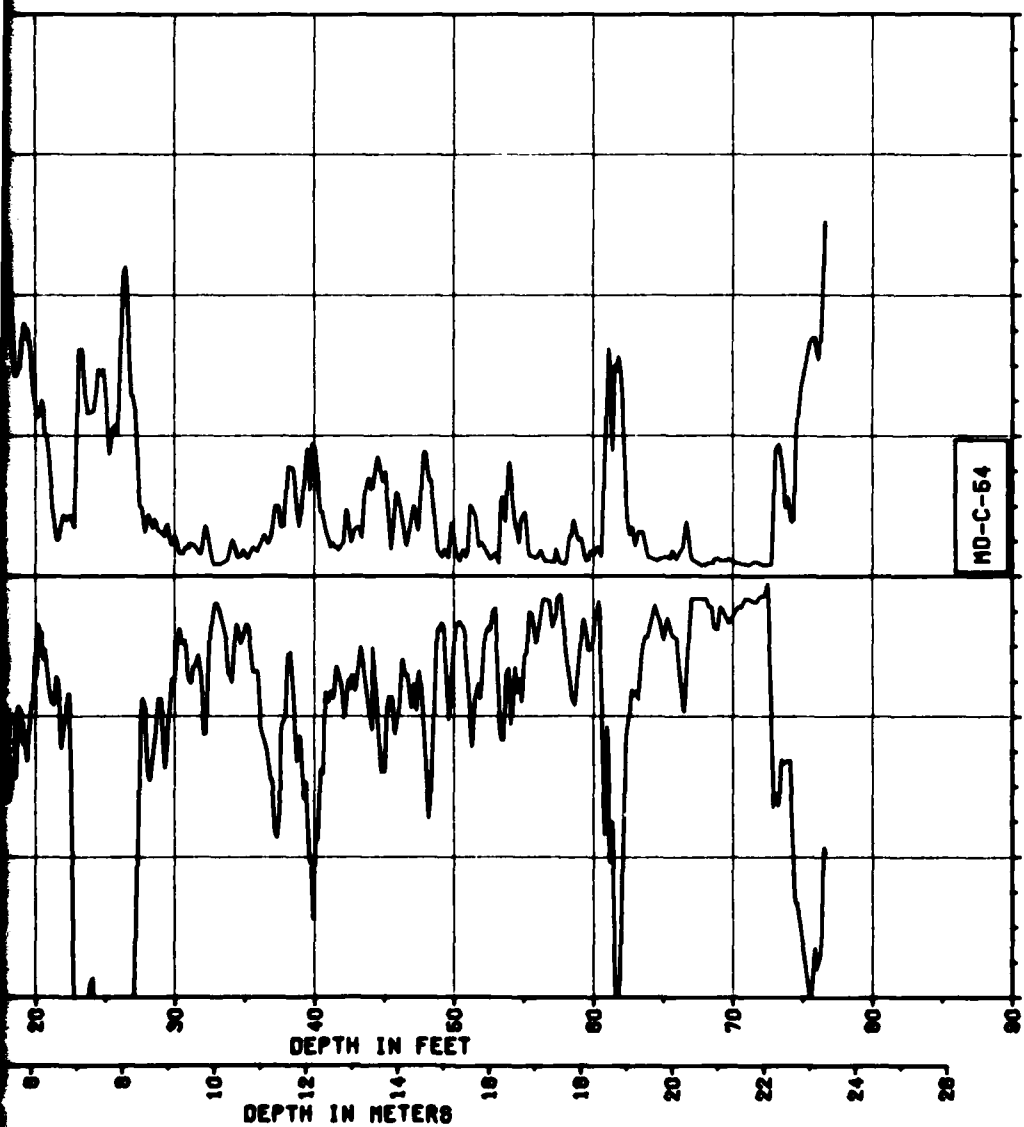
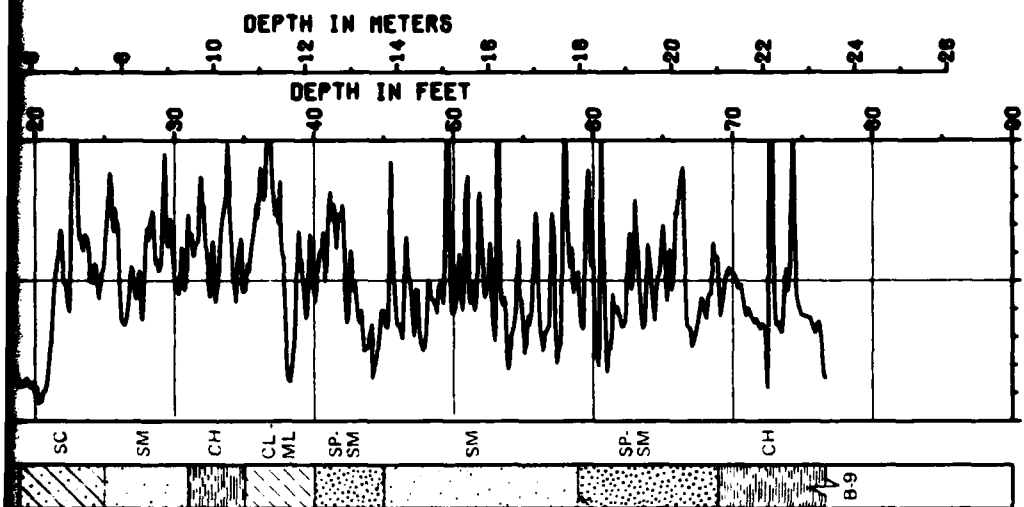
CONE PENETROMETER TEST MD-C-61, 51 & 52
OPERATIONAL BASE SITE
MILFORD, UTAH

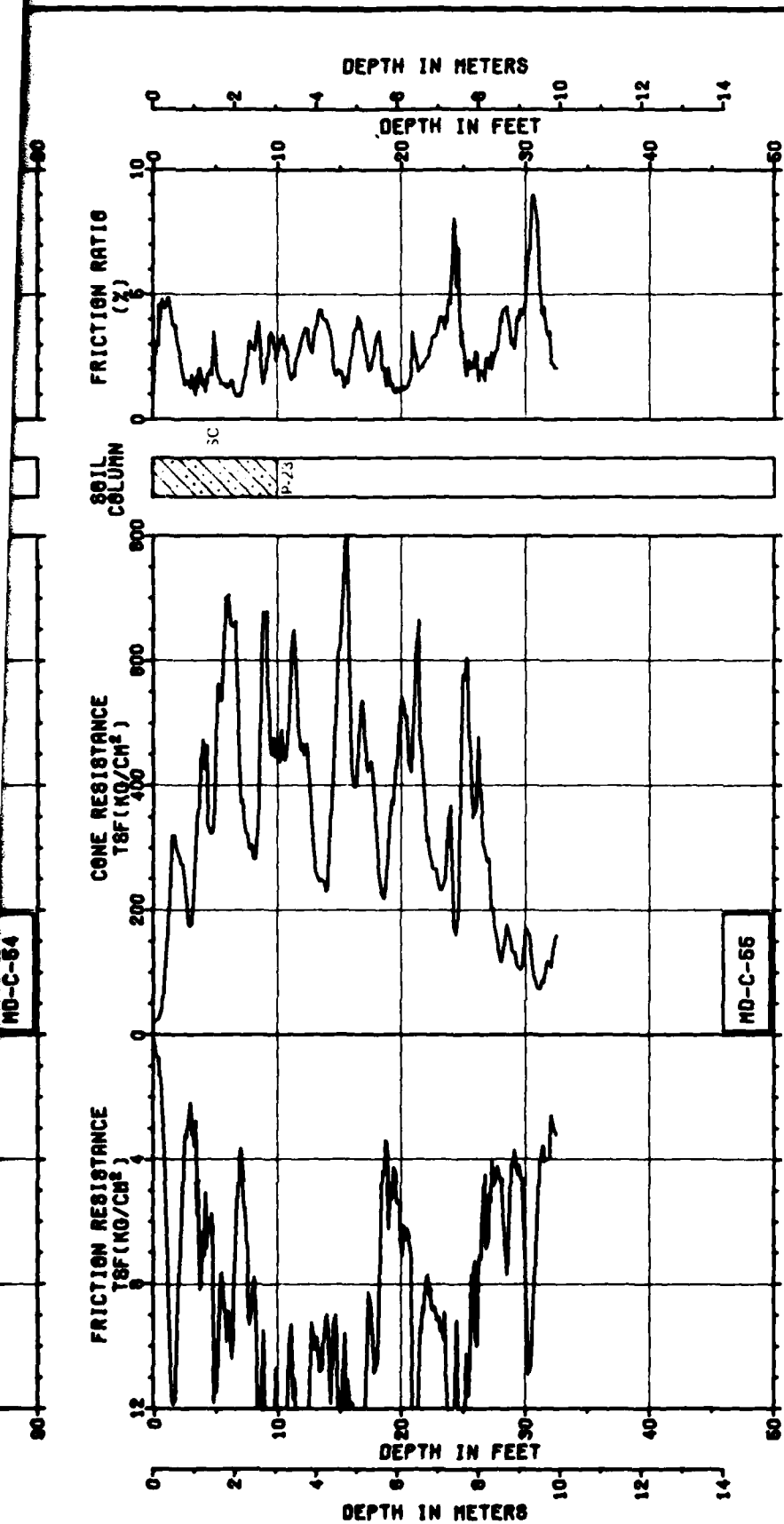
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
10-1
15 OCT 73

FUGRO NATIONAL, INC.





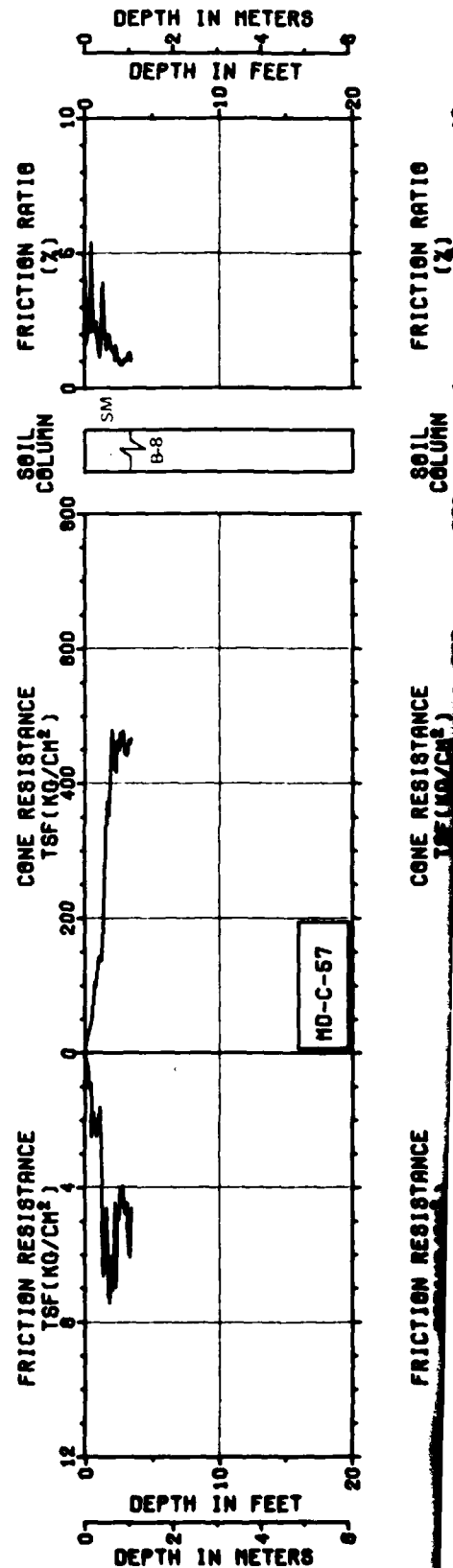
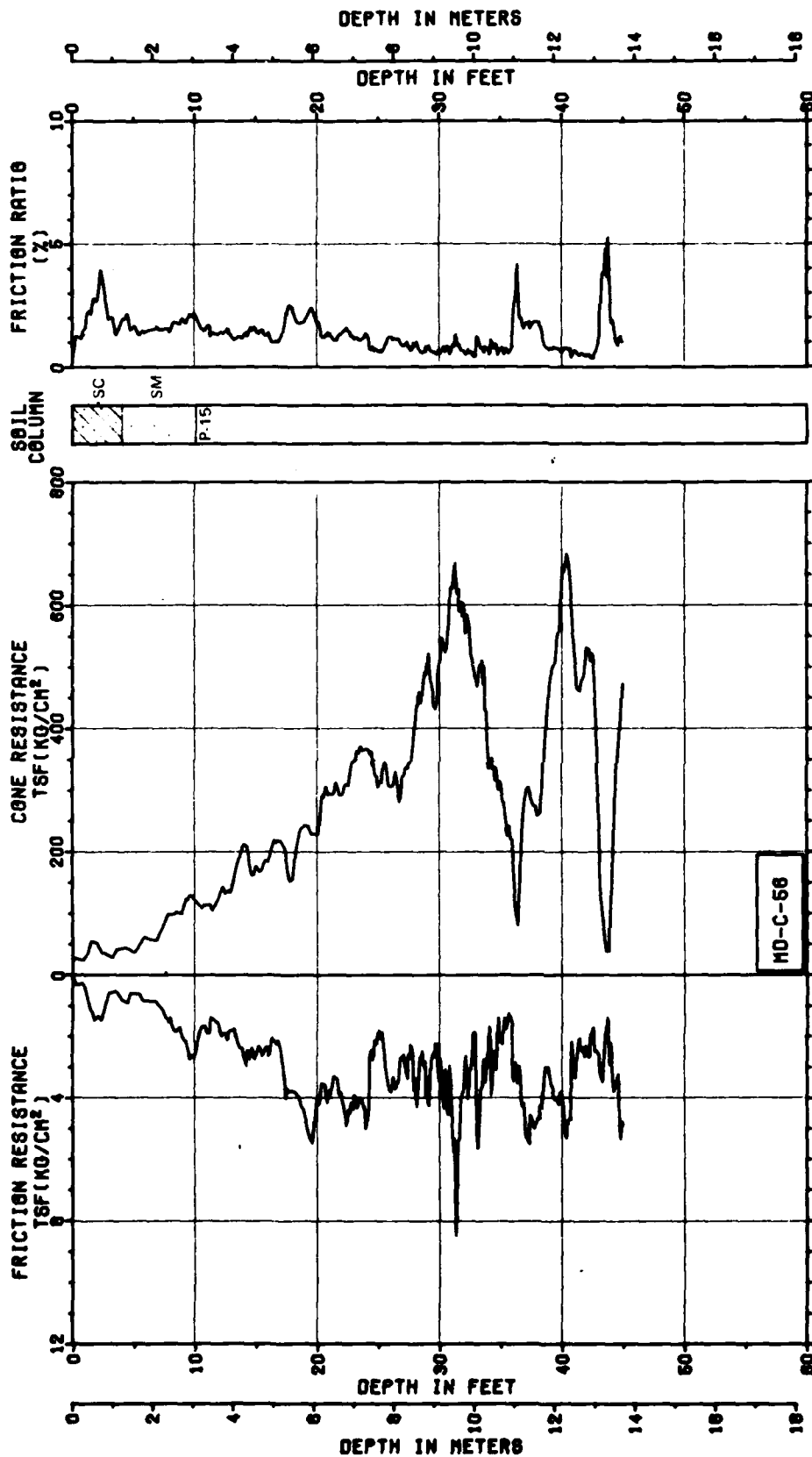


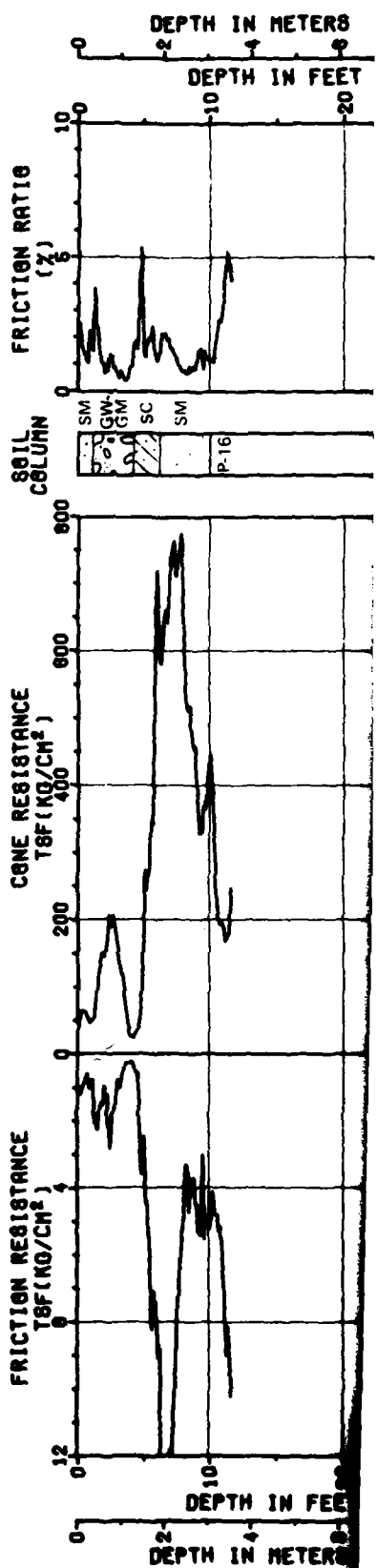
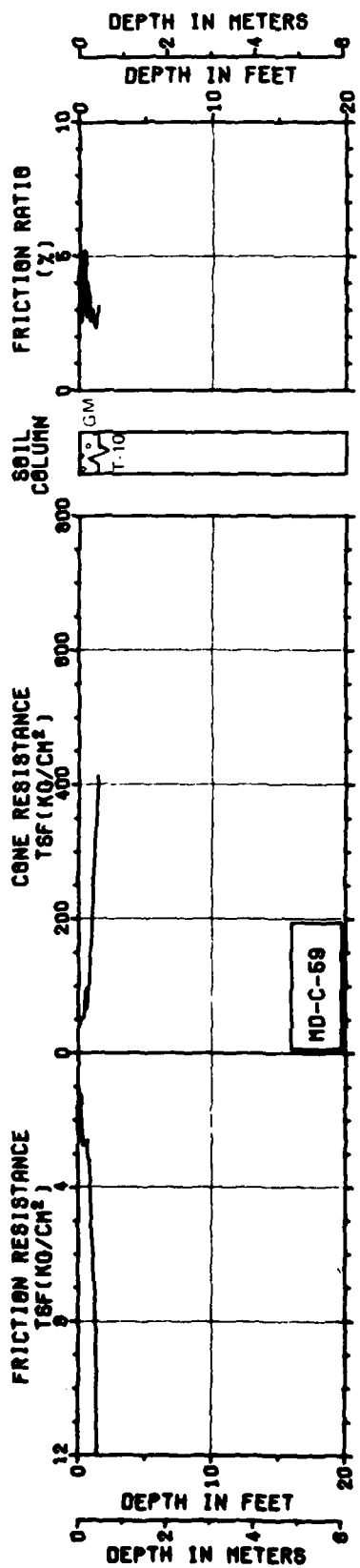
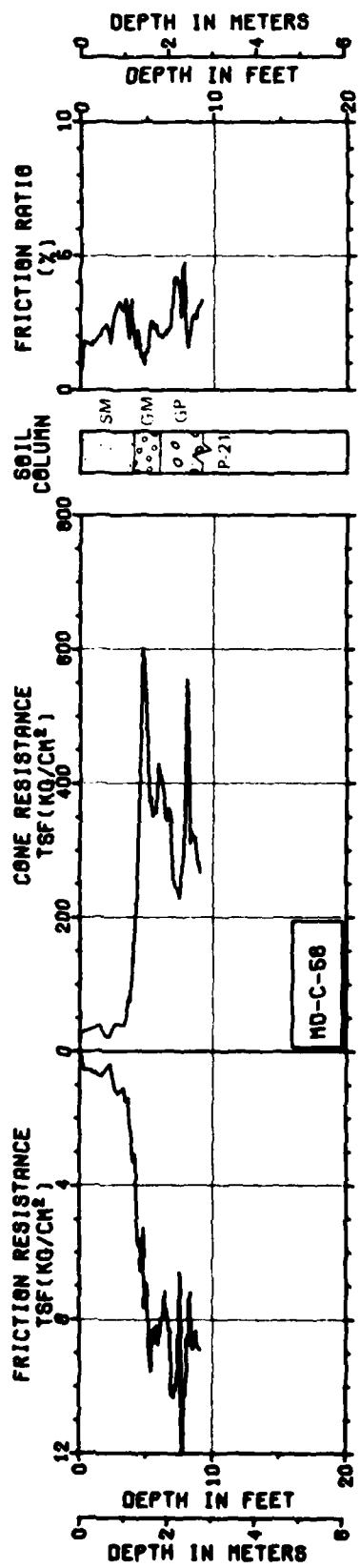
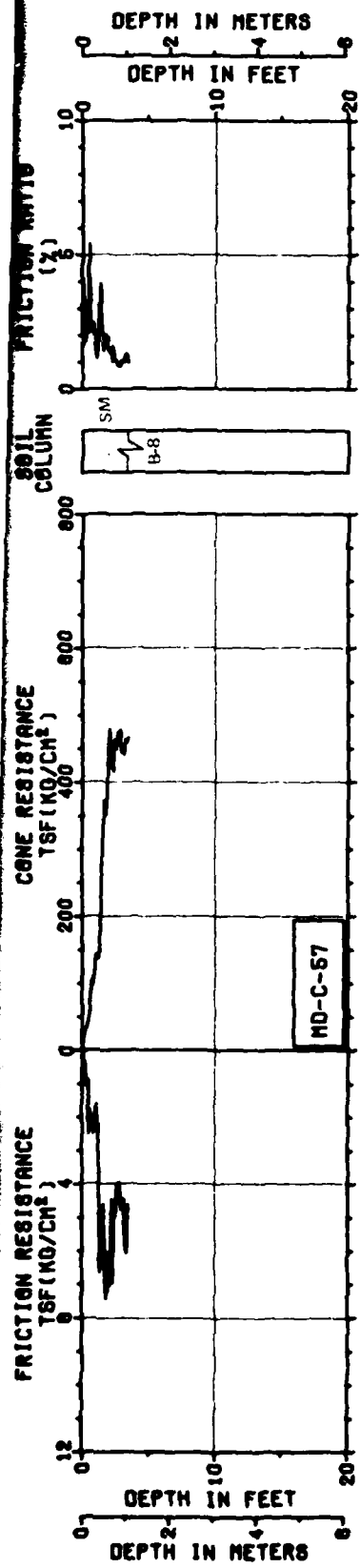
CONE PENETROMETER TEST MD-C-53, 54 & 55
 OPERATIONAL BASE SITE
 MILFORD, UTAH

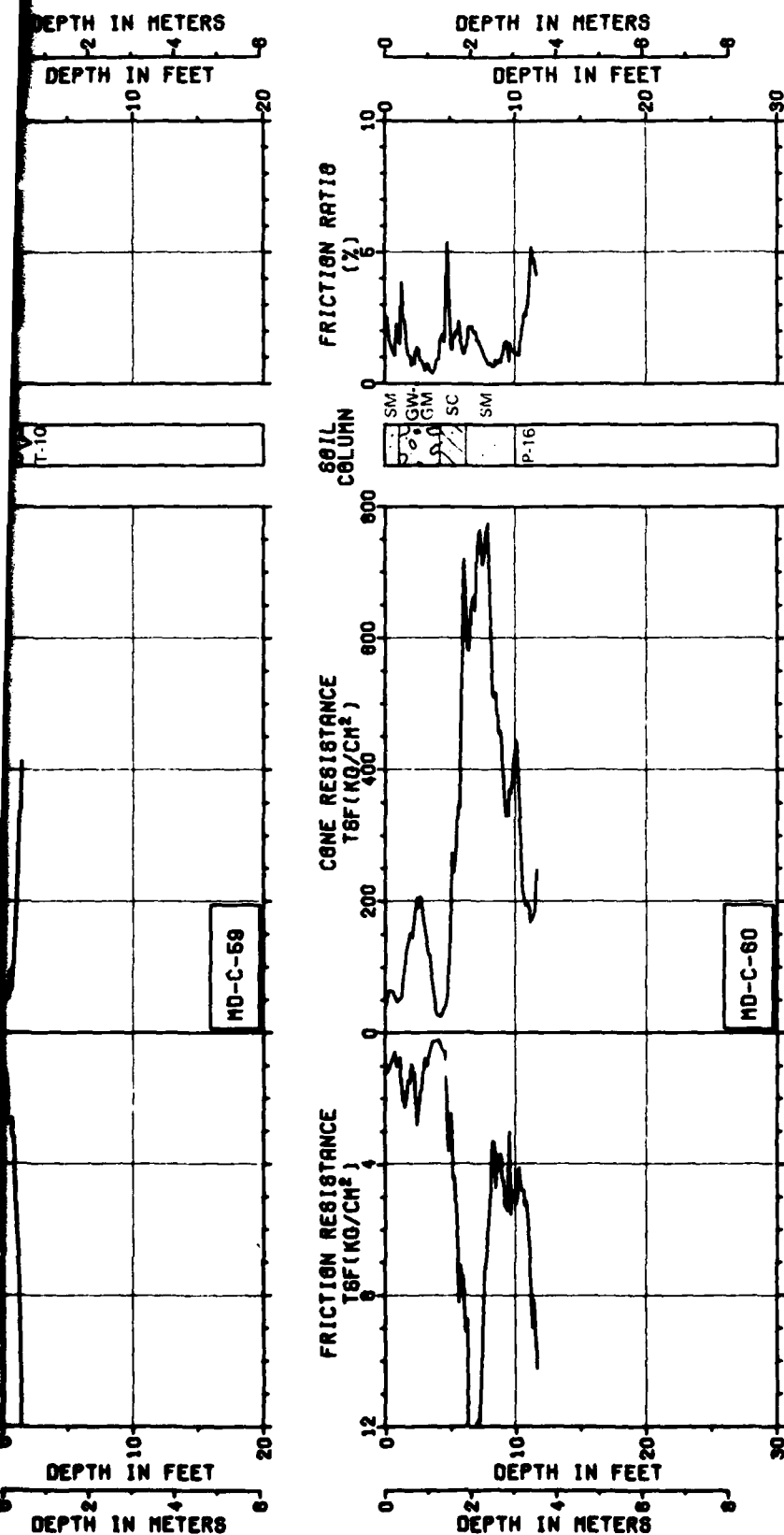
MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
 II-6-1
 16 OF 25

FUGRO NATIONAL, INC.





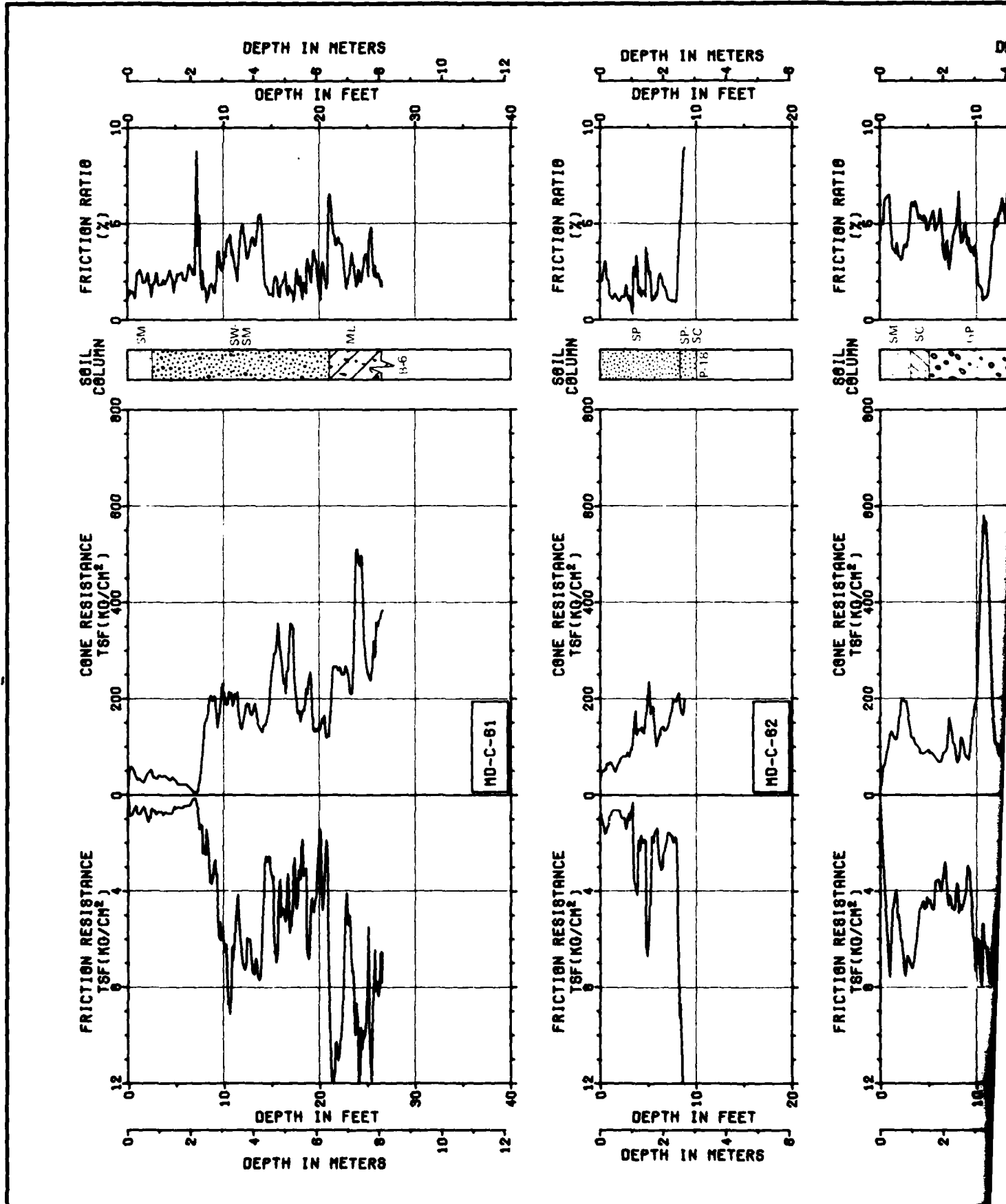


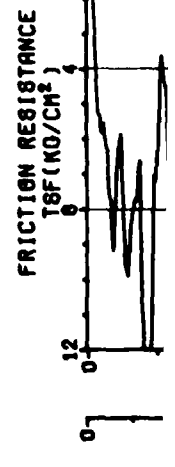
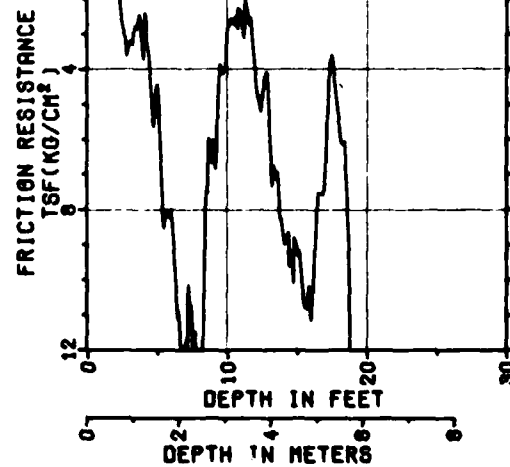
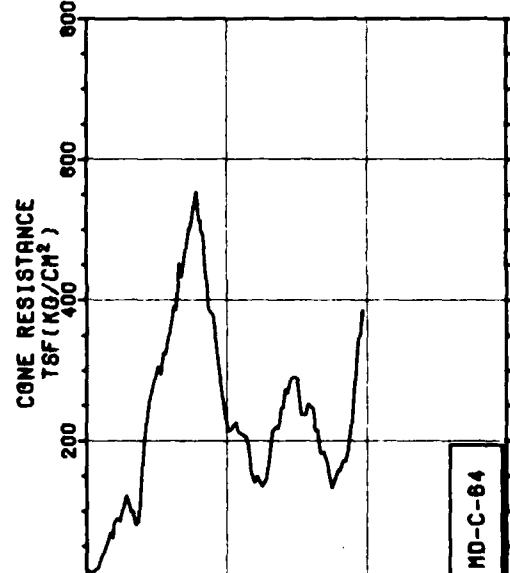
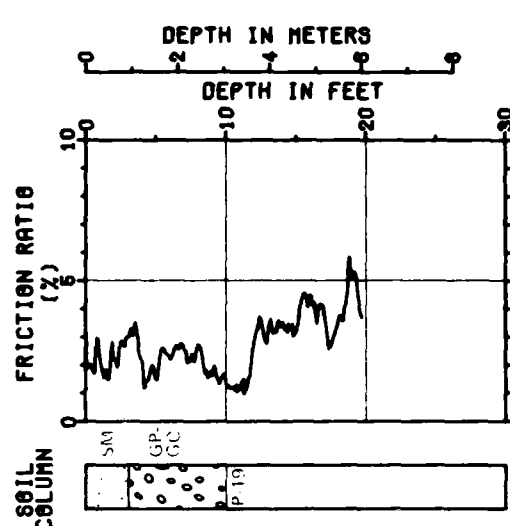
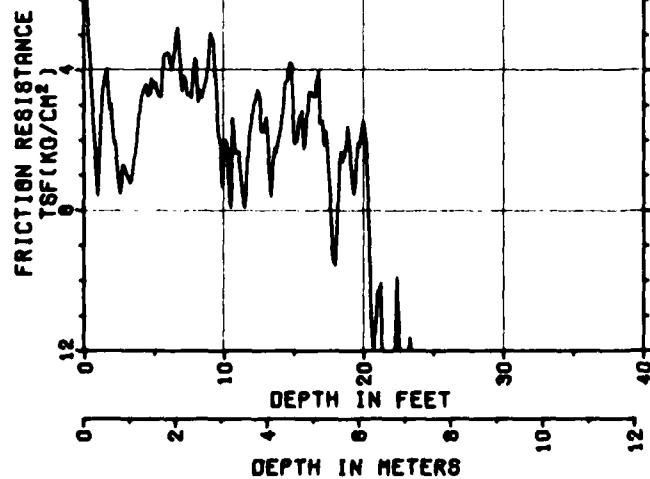
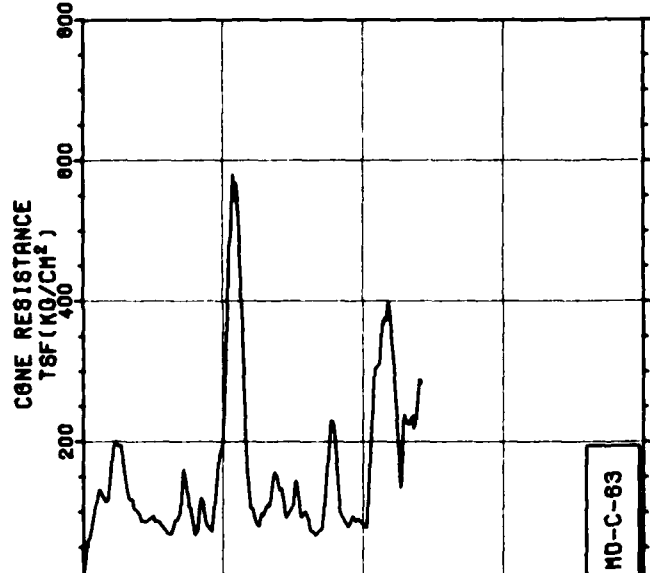
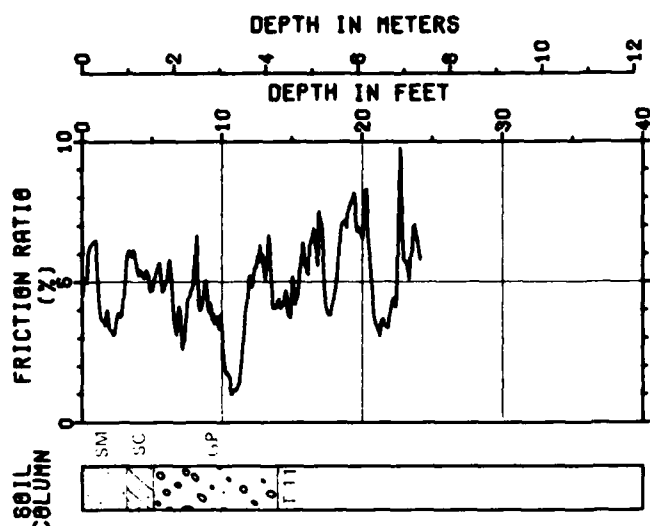
CONE PENETROMETER TEST MD-C-56, 57, 58, 59 & 60
OPERATIONAL BASE SITE
MILFORD, UTAH

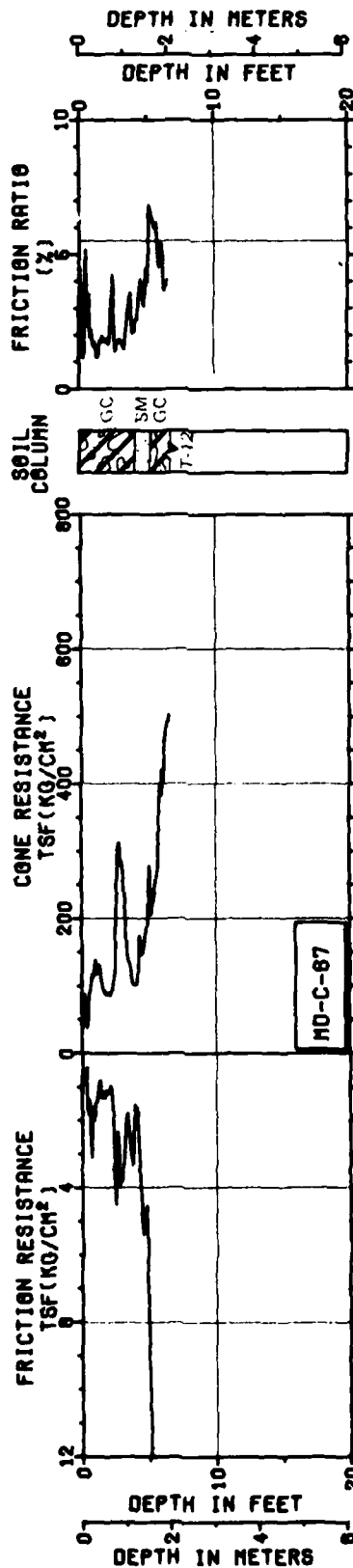
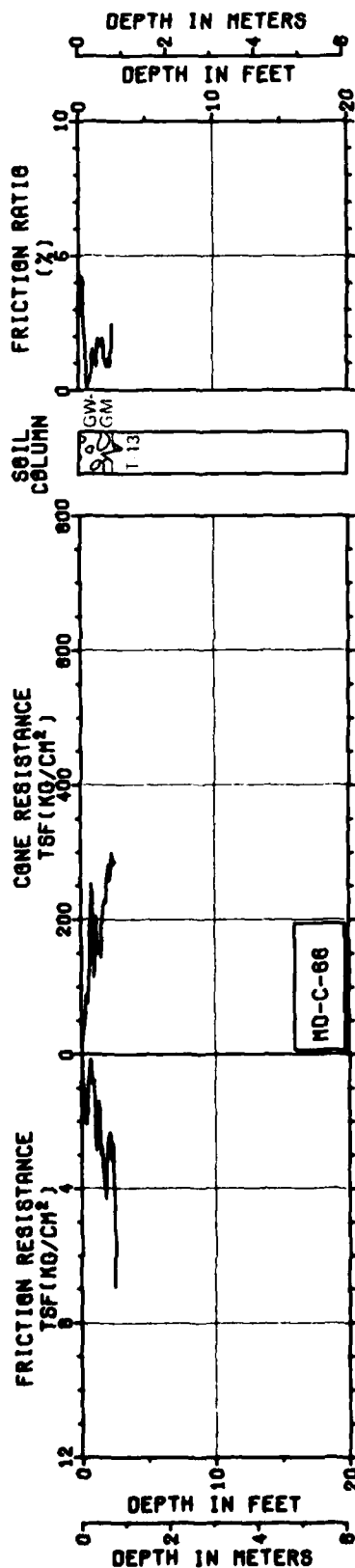
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE BMO

FIGURE
II-6-1
17 OF 25

FUGRO NATIONAL, INC.



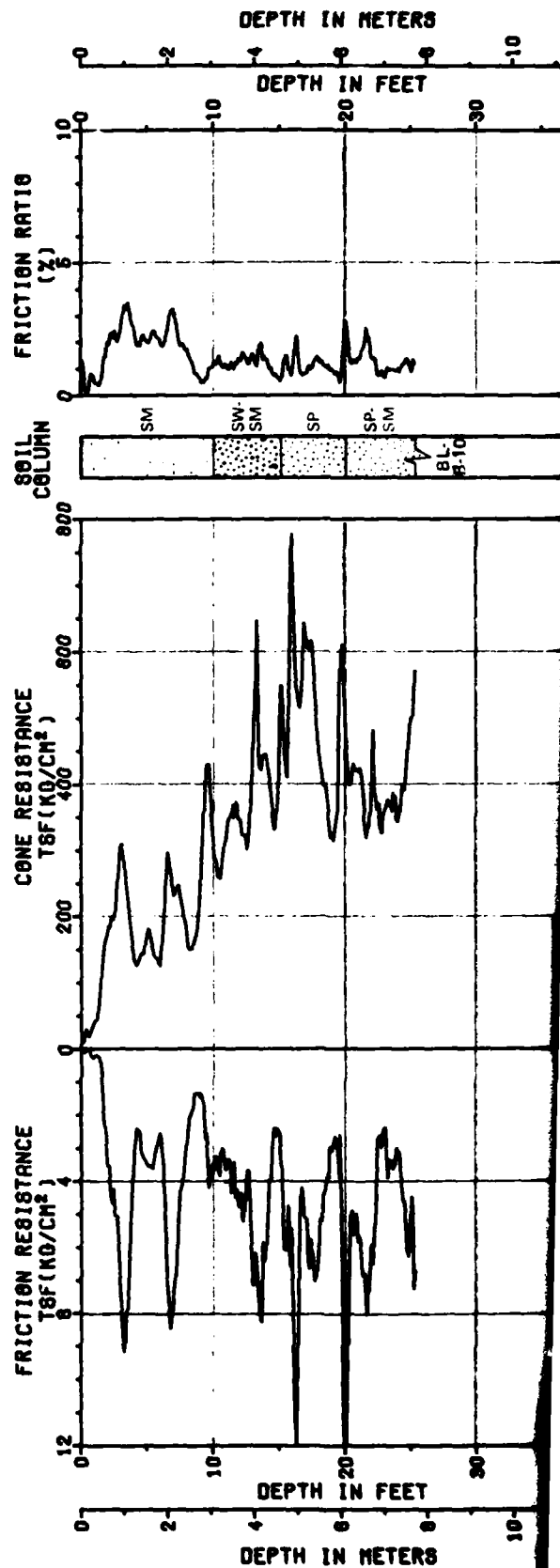
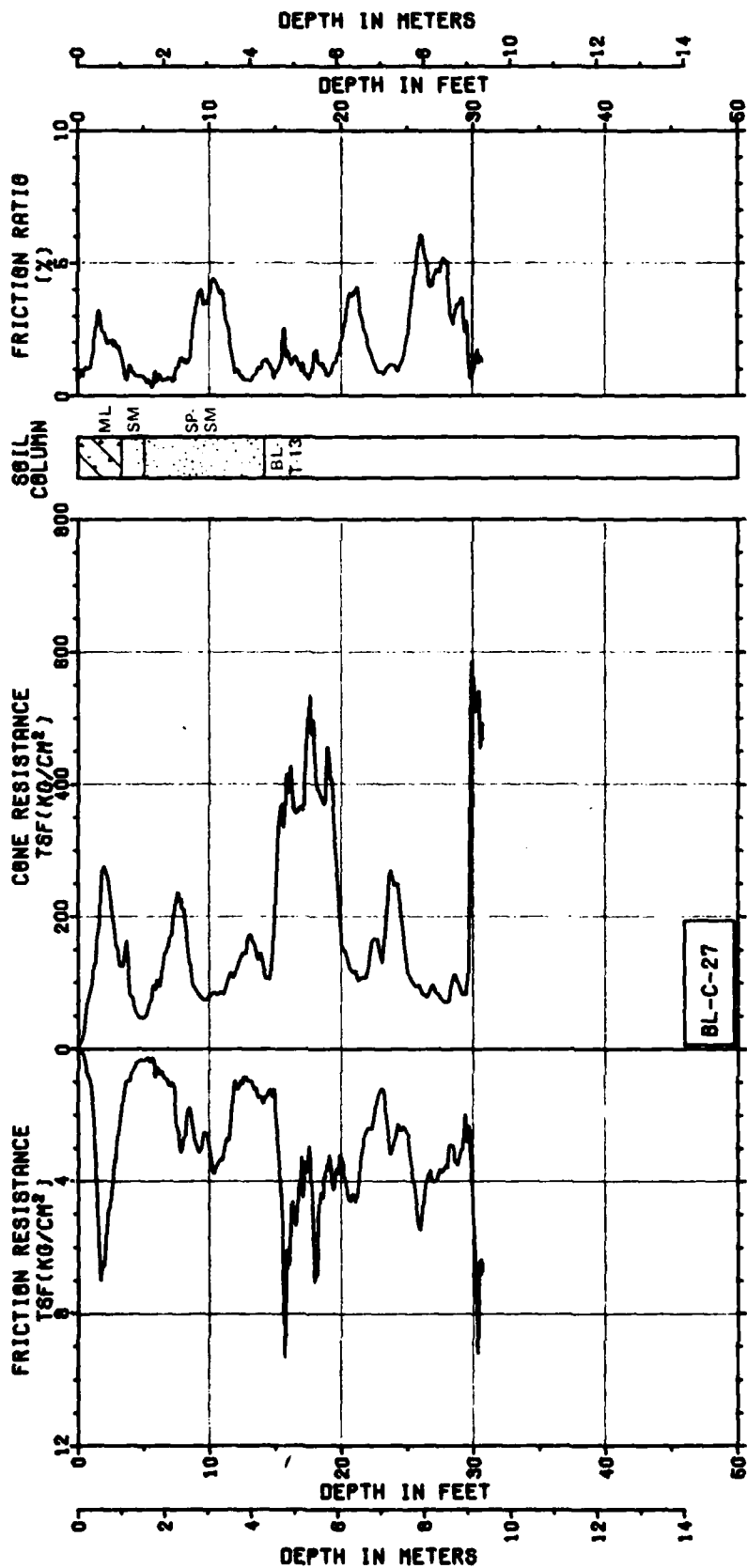


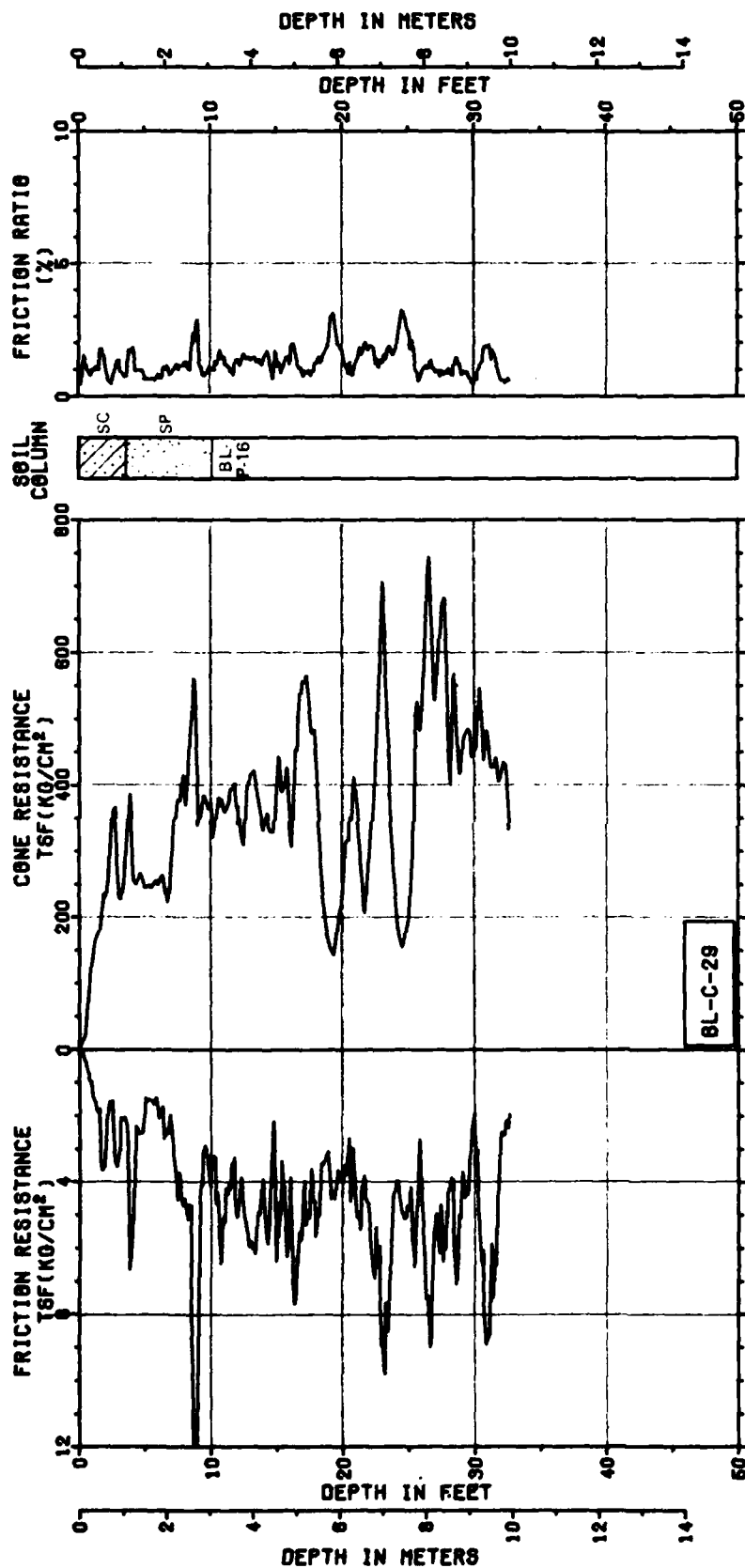


CONE PENETROMETER TEST MD-C-66 & 67
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

UGRO NATIONAL, INC.



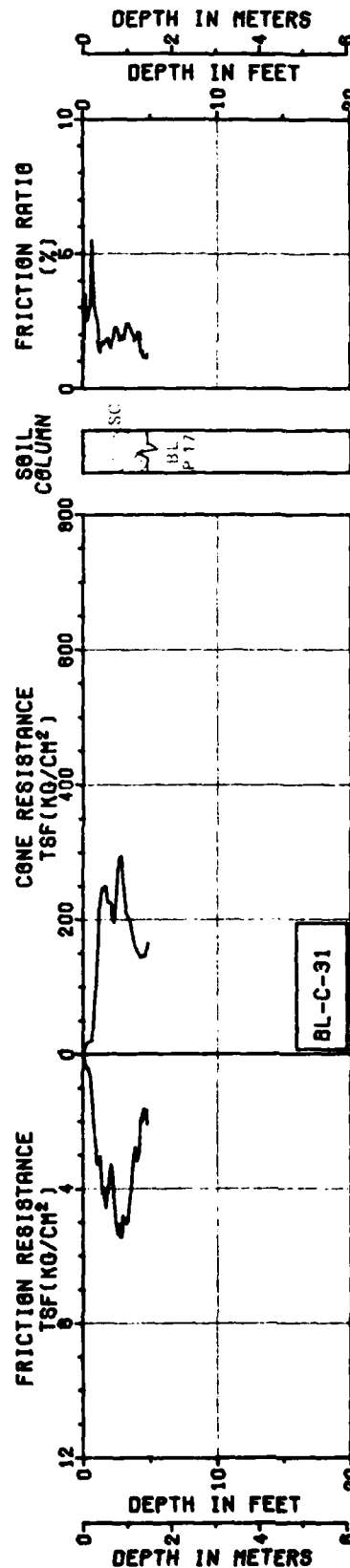
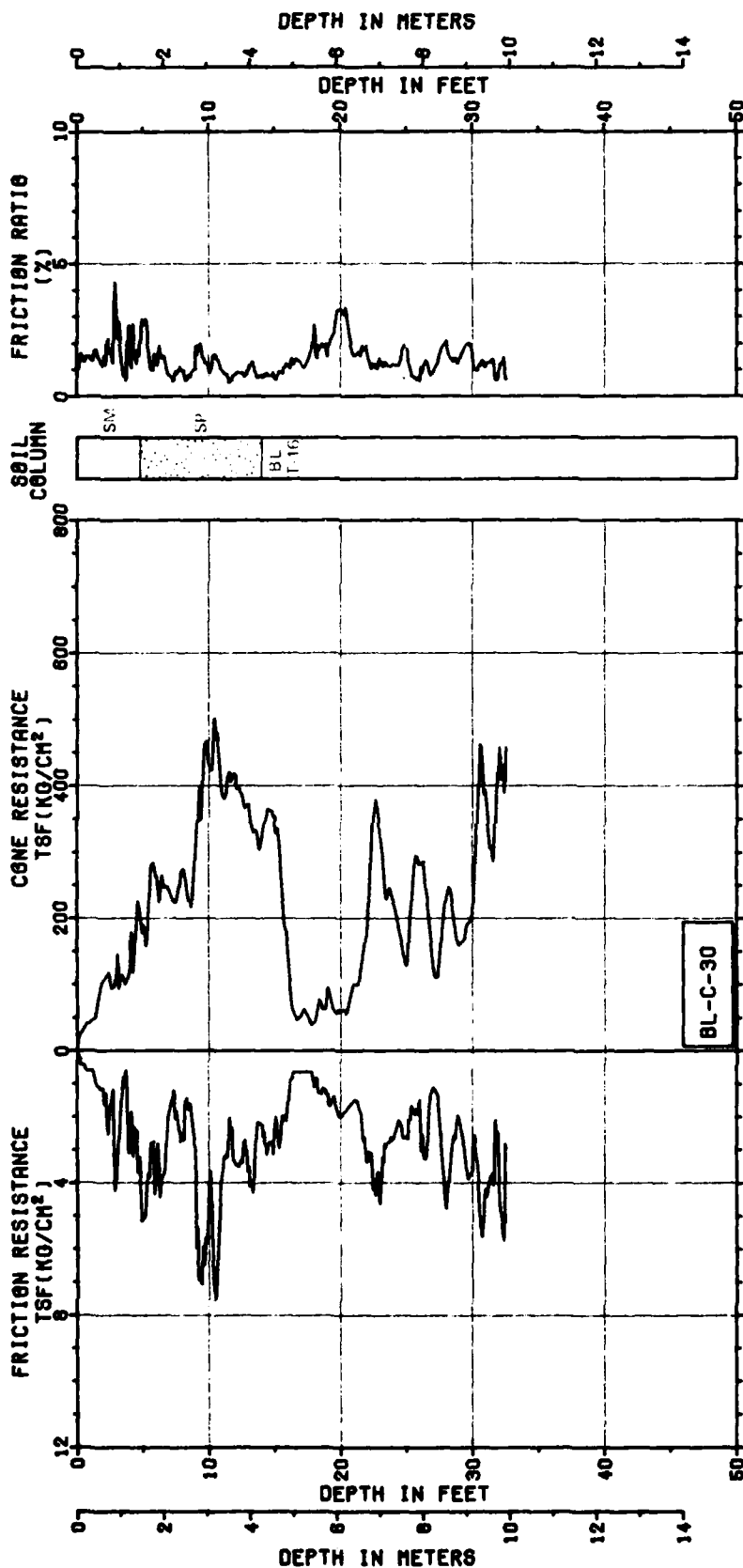


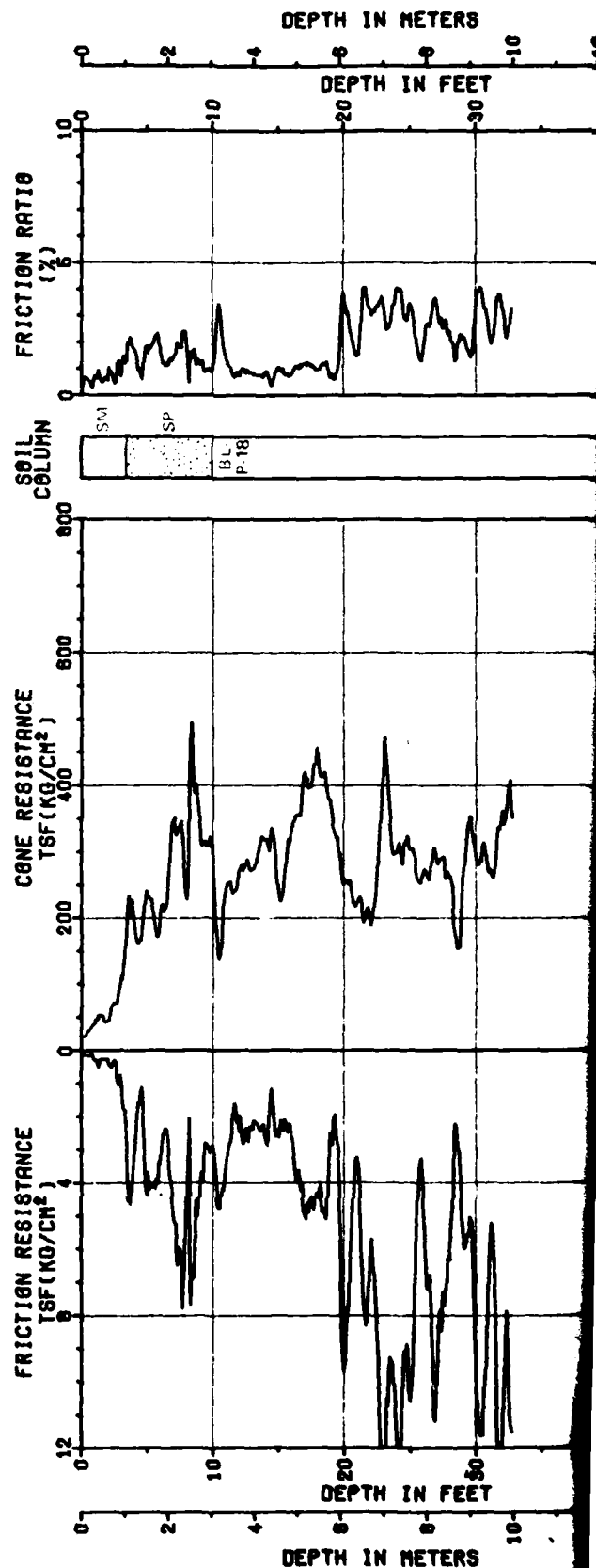
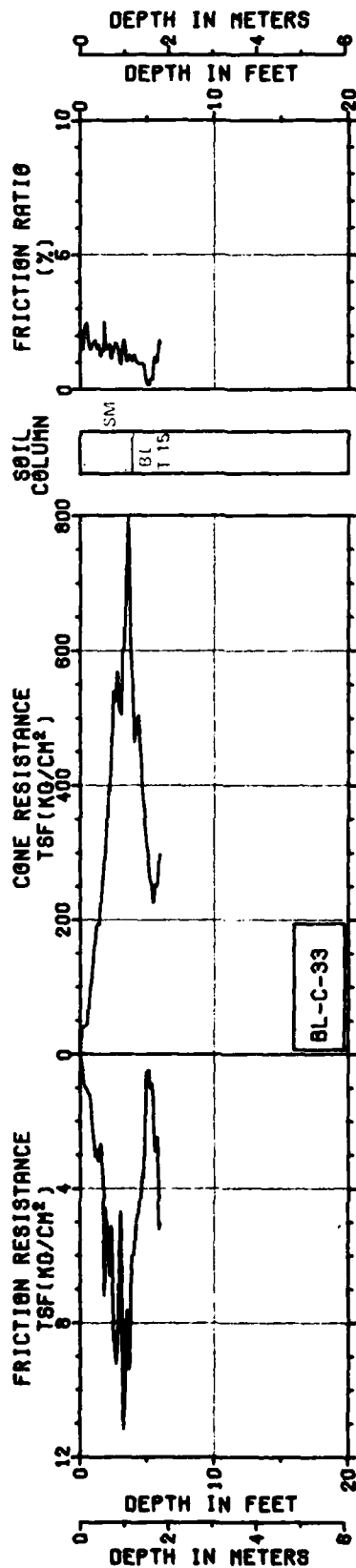
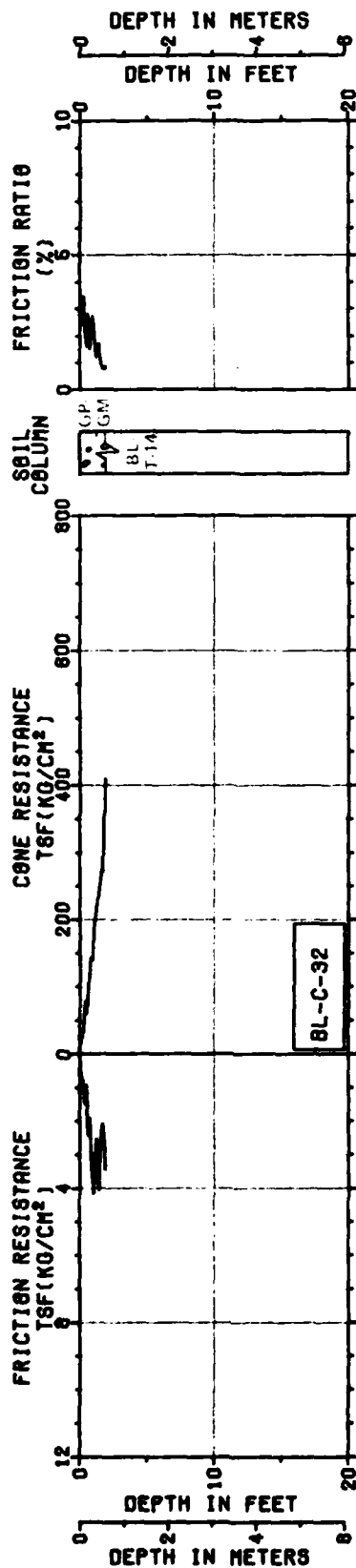
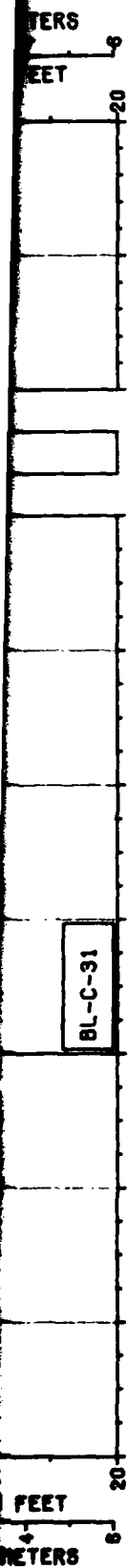
CONE PENETROMETER TEST BL-C-27, 28 & 29
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
II-8-1
2002

FUGRO NATIONAL, INC.

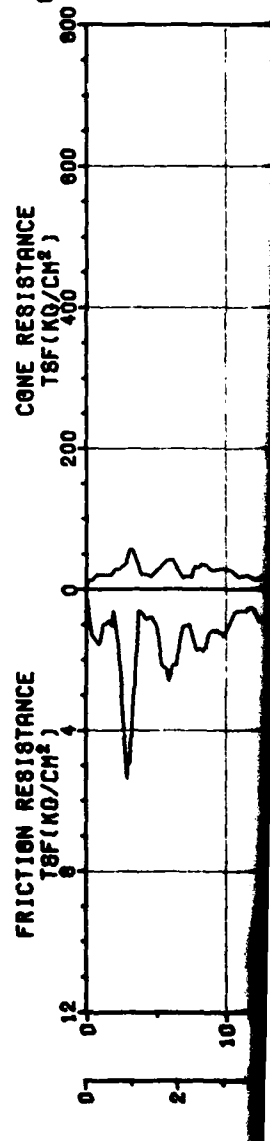
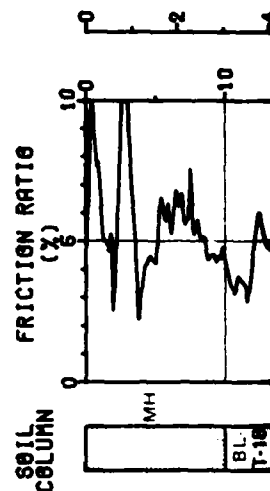
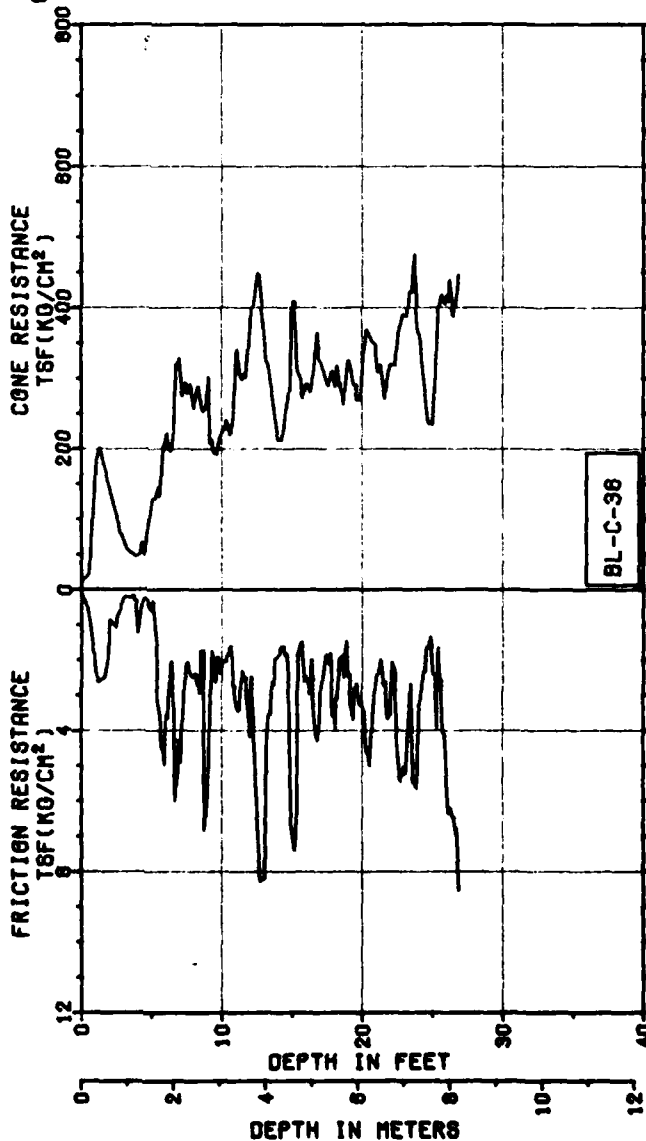
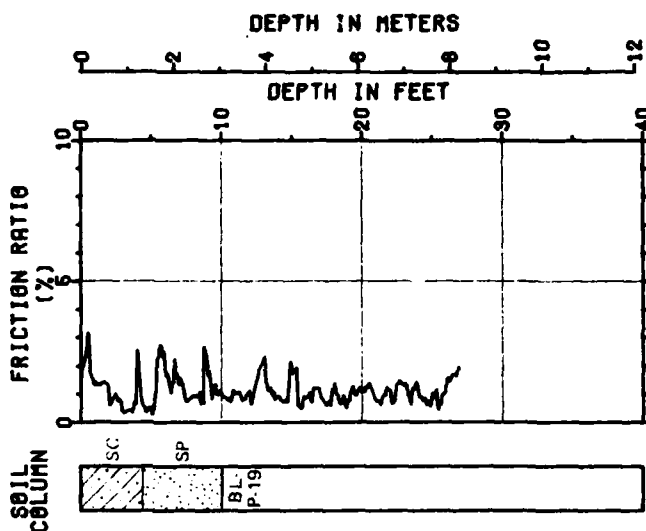
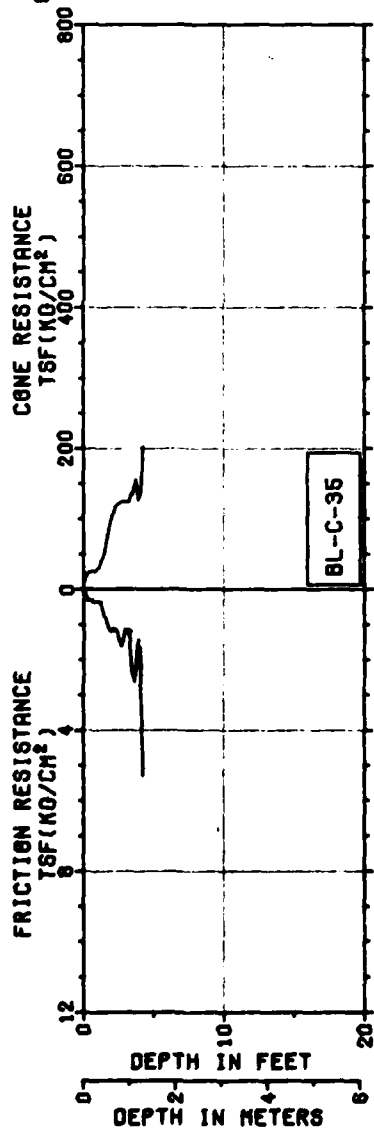
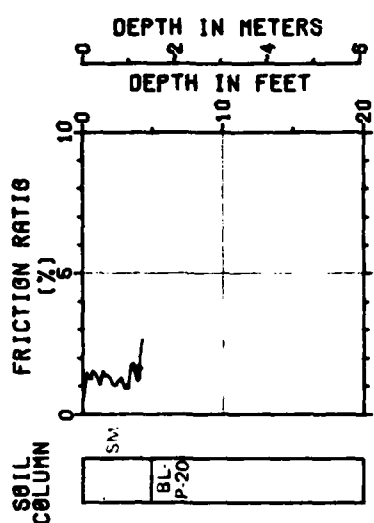


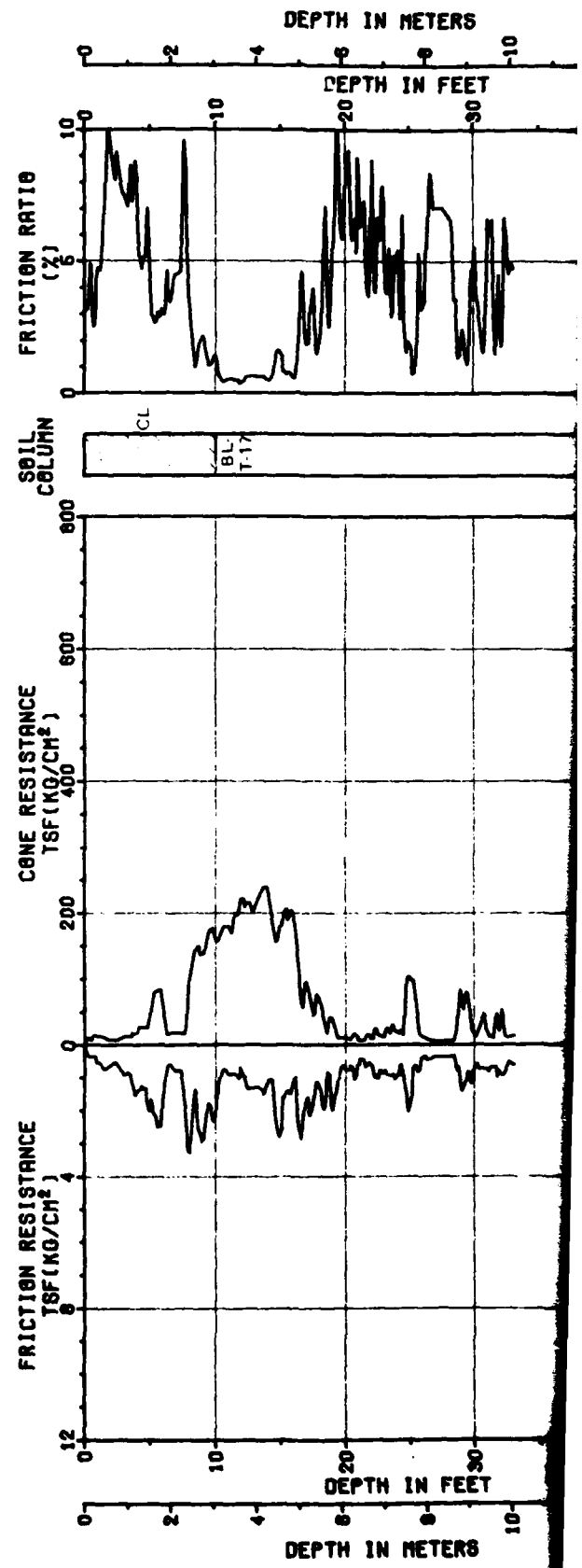
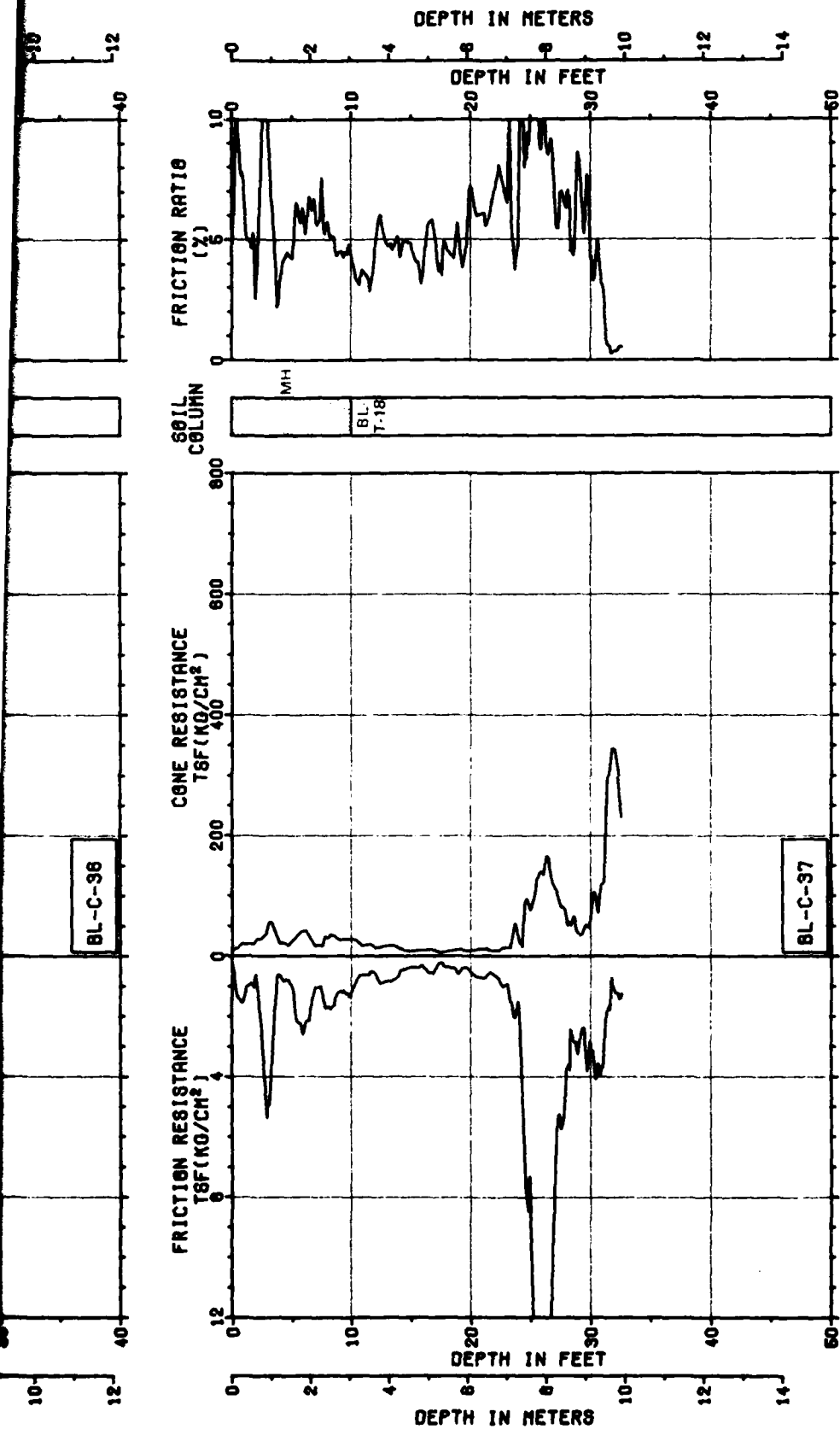


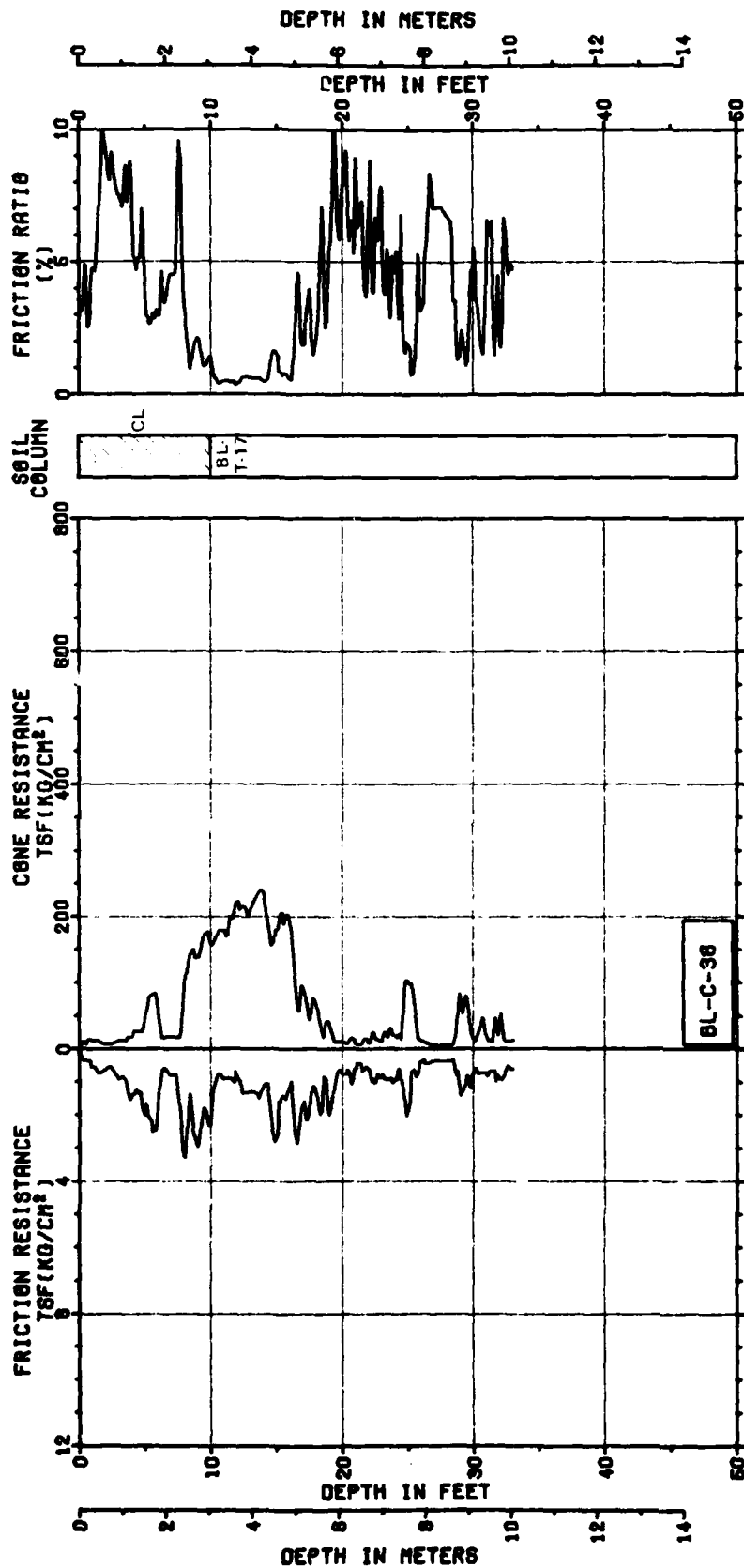


MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SMO

FUGRO NATIONAL, INC.





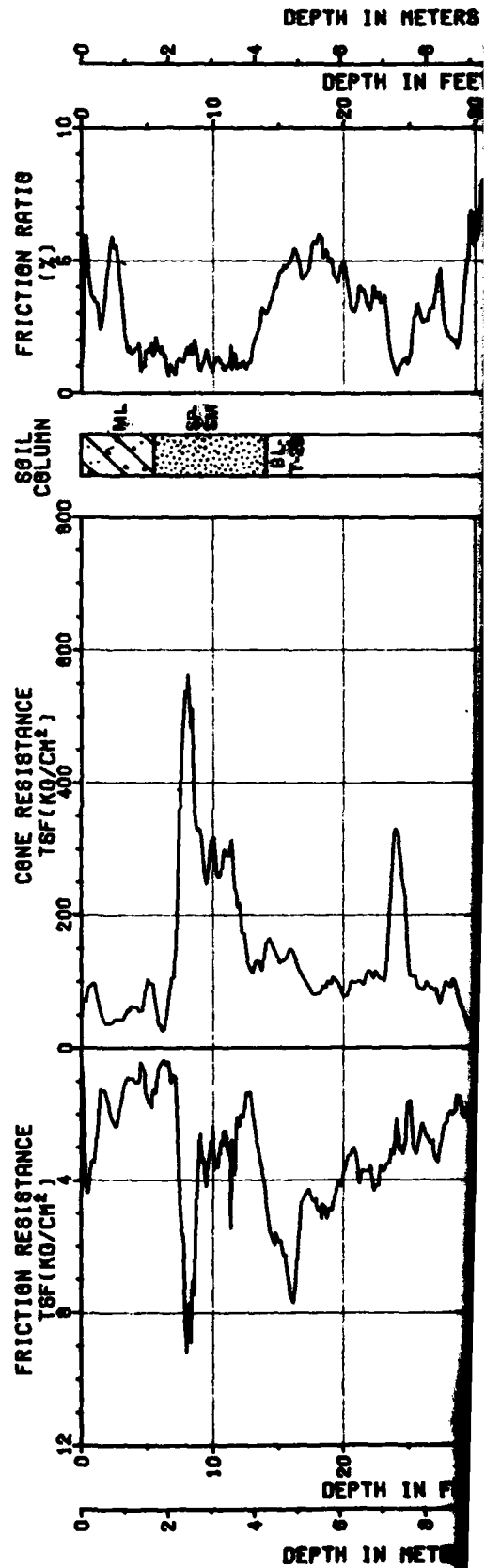
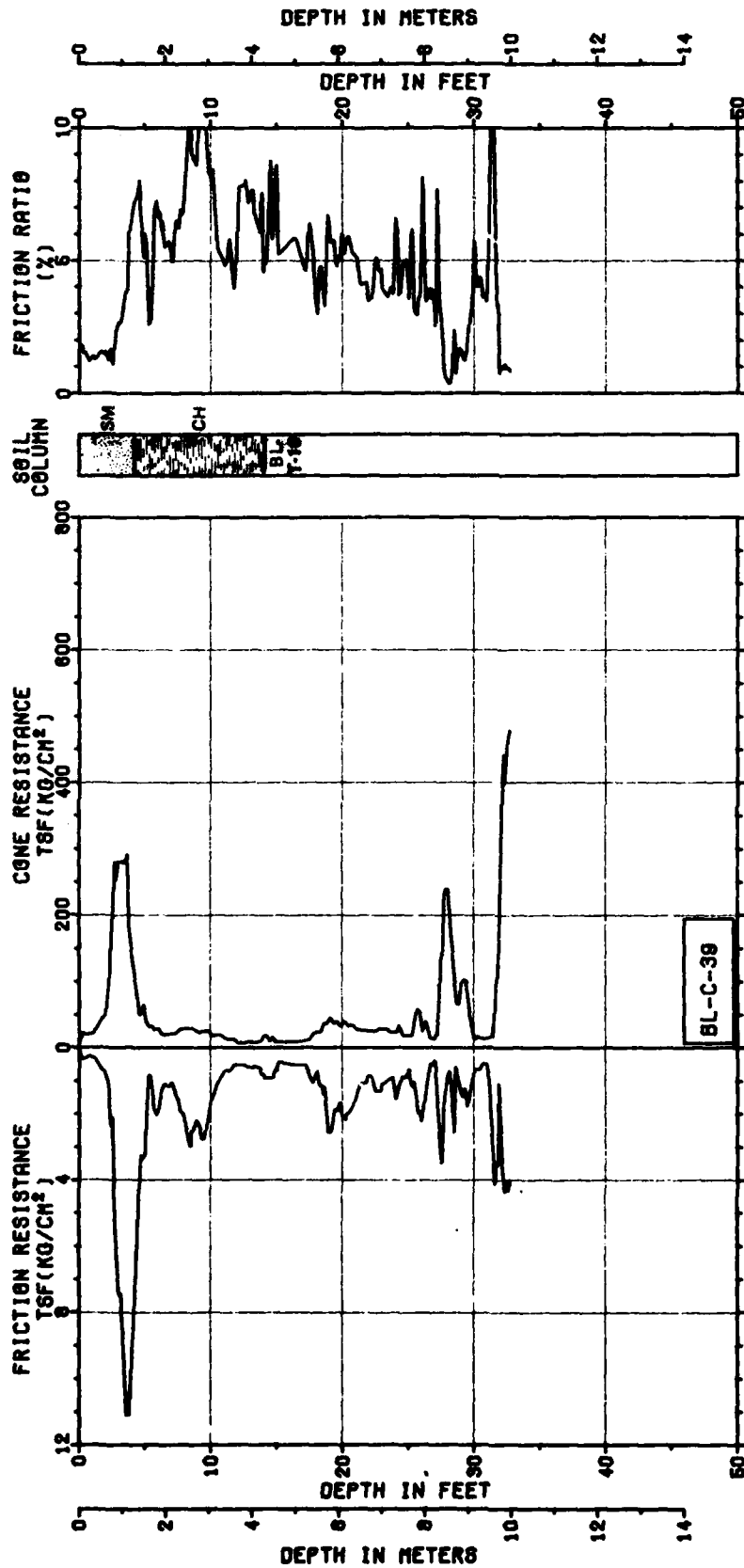


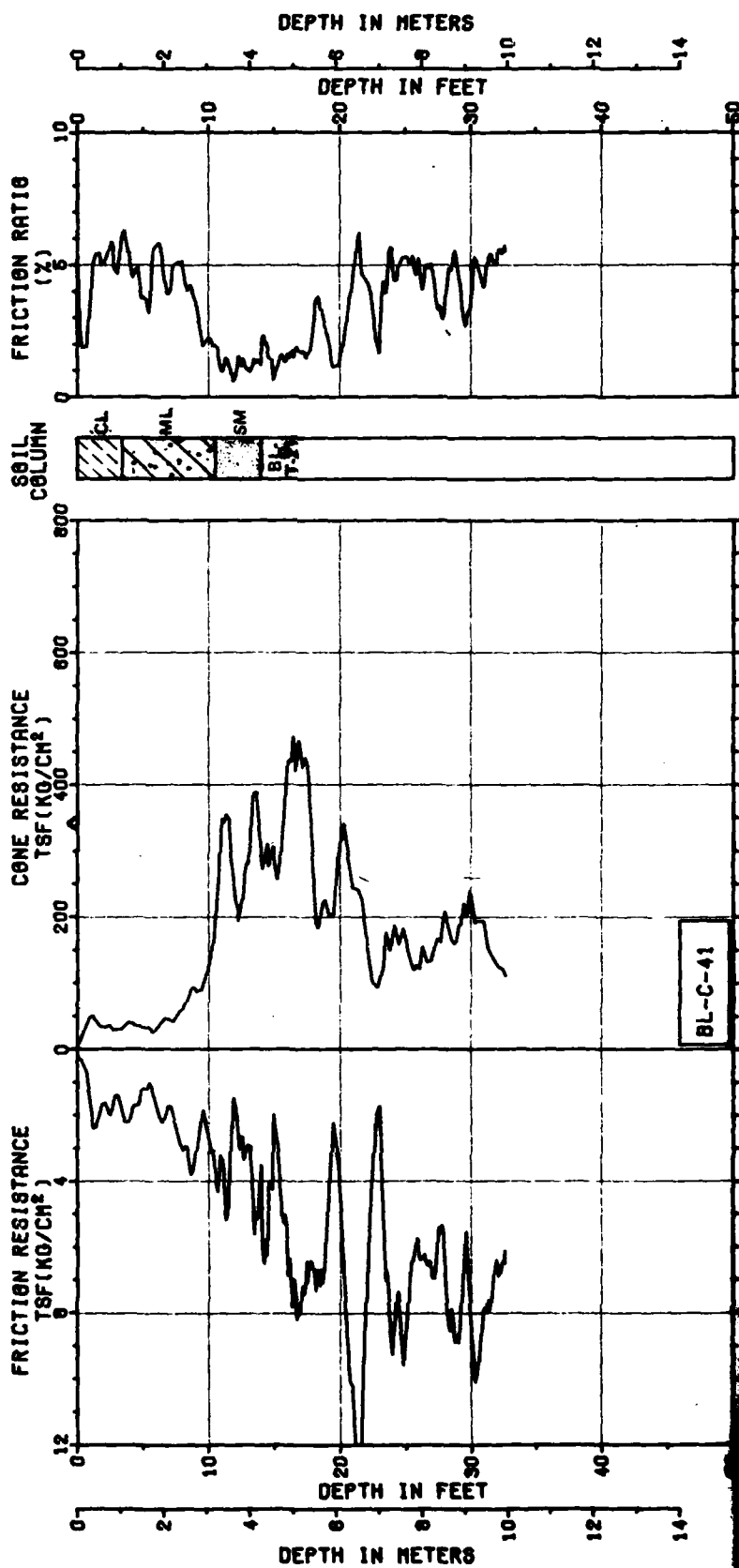
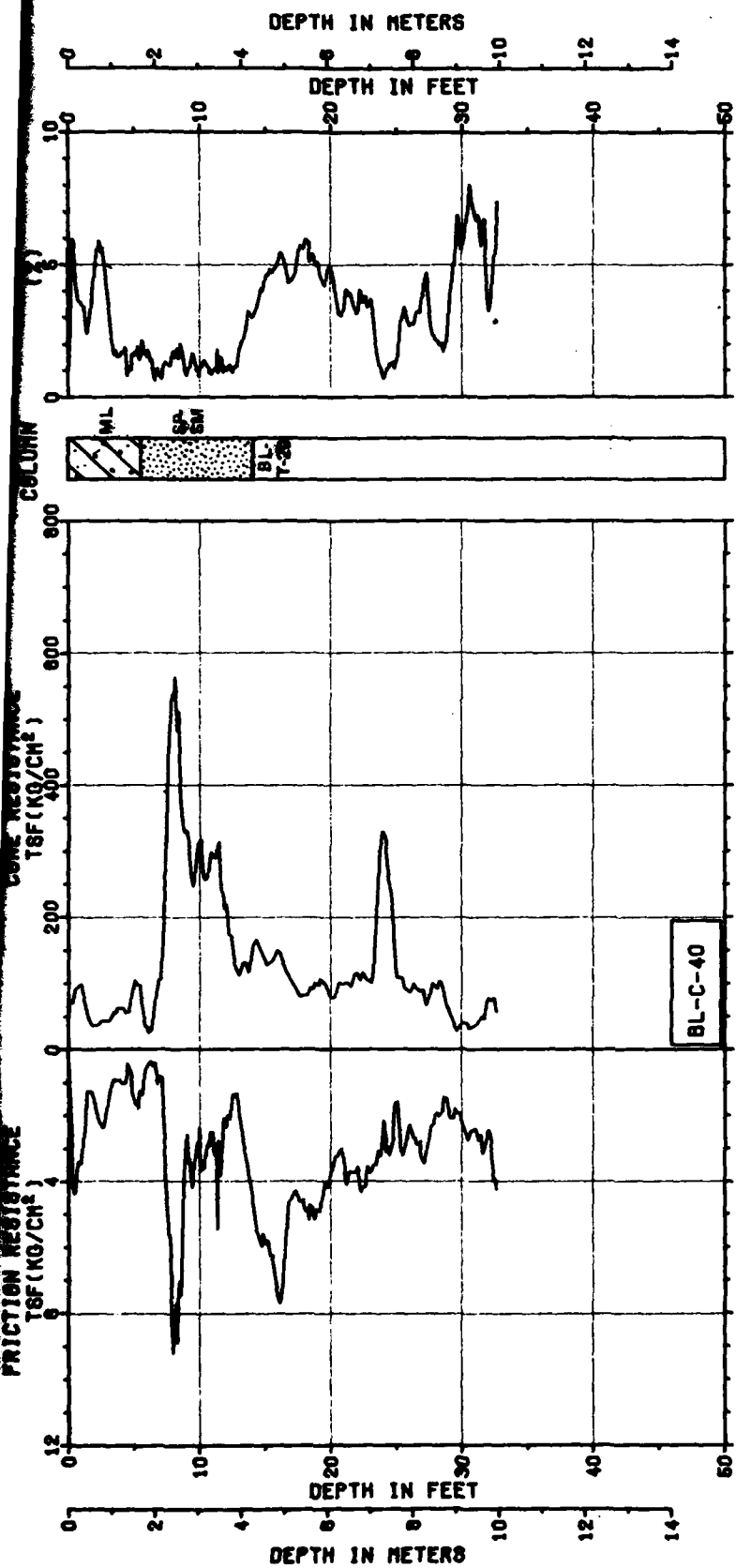
CONE PENETROMETER TEST BL-C-35, 36, 37 & 38
 OPERATIONAL BASE SITE
 MILFORD, UTAH

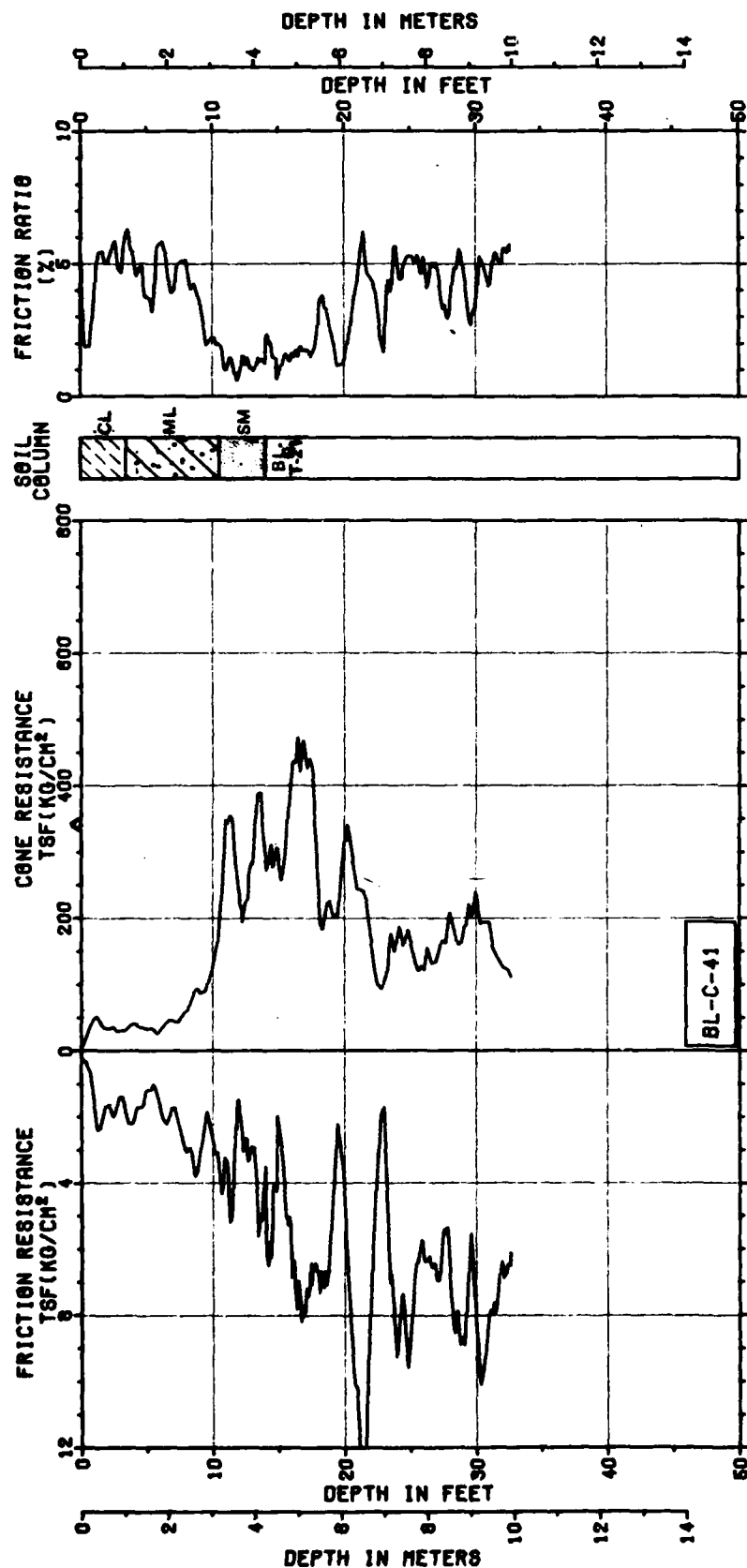
MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - SMO

FIGURE
 II-6-1
 22 OF 26

FUGRO NATIONAL, INC.





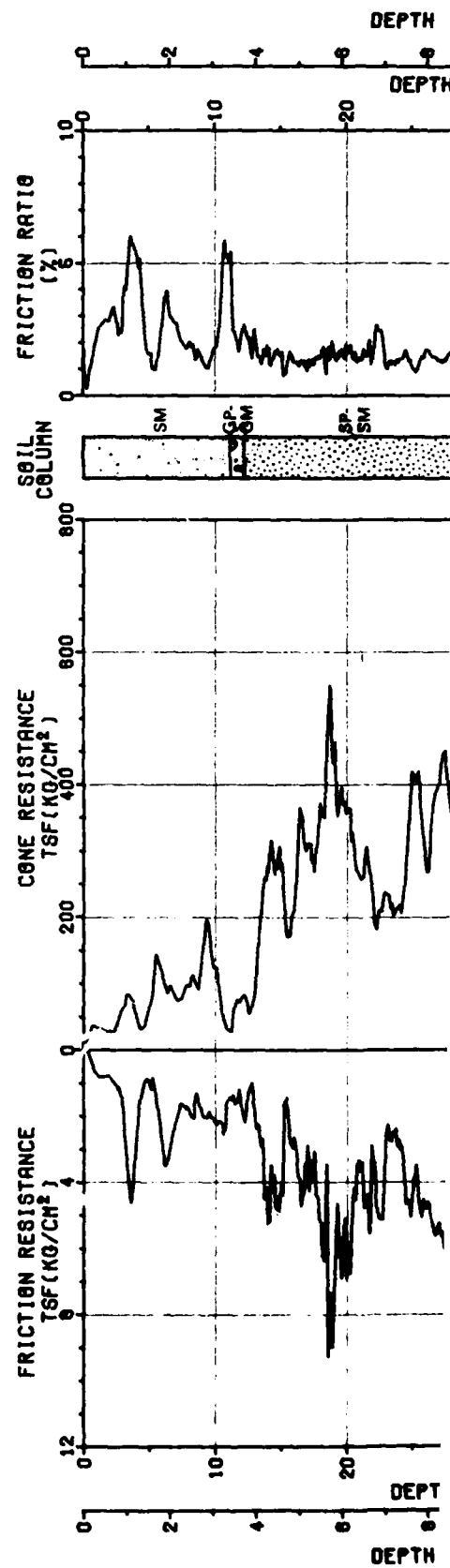
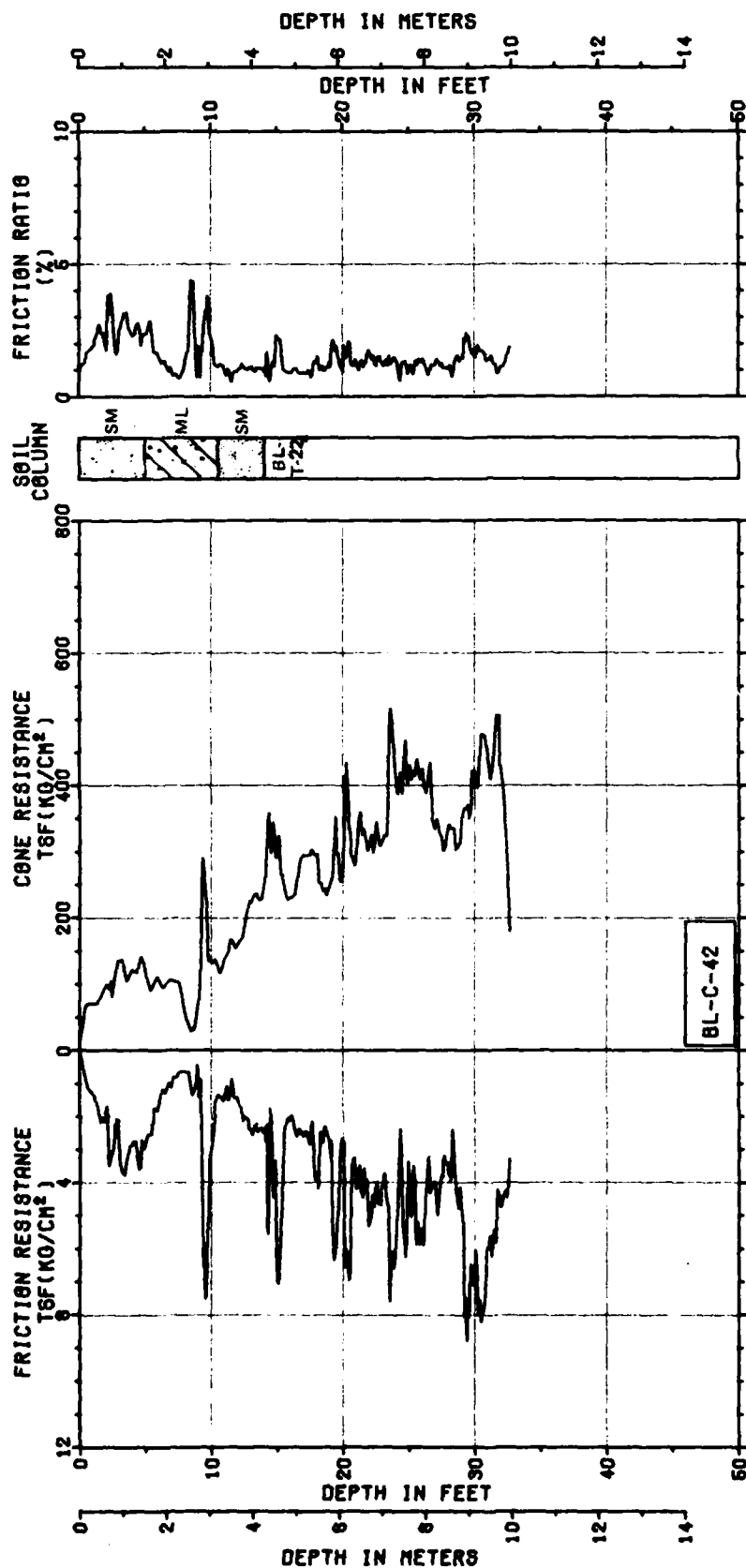


CONE PENETROMETER TEST BL-C-39, 40 & 41
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
10-1
ECS

TUGRO NATIONAL, INC.



FUGRO NATIONAL INC LONG BEACH CA

F/6 B/13

FEB 81

OPERATIONAL BASIS-
E04704-80-C-0006

FN-TR-44-VOL-2

NI

4.4

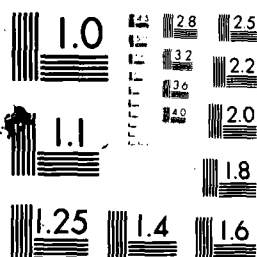
3. *Journal of the American Medical Association*, 1997; 277: 1001-1005.

END
DATE
FILMED
4 82
DTIC

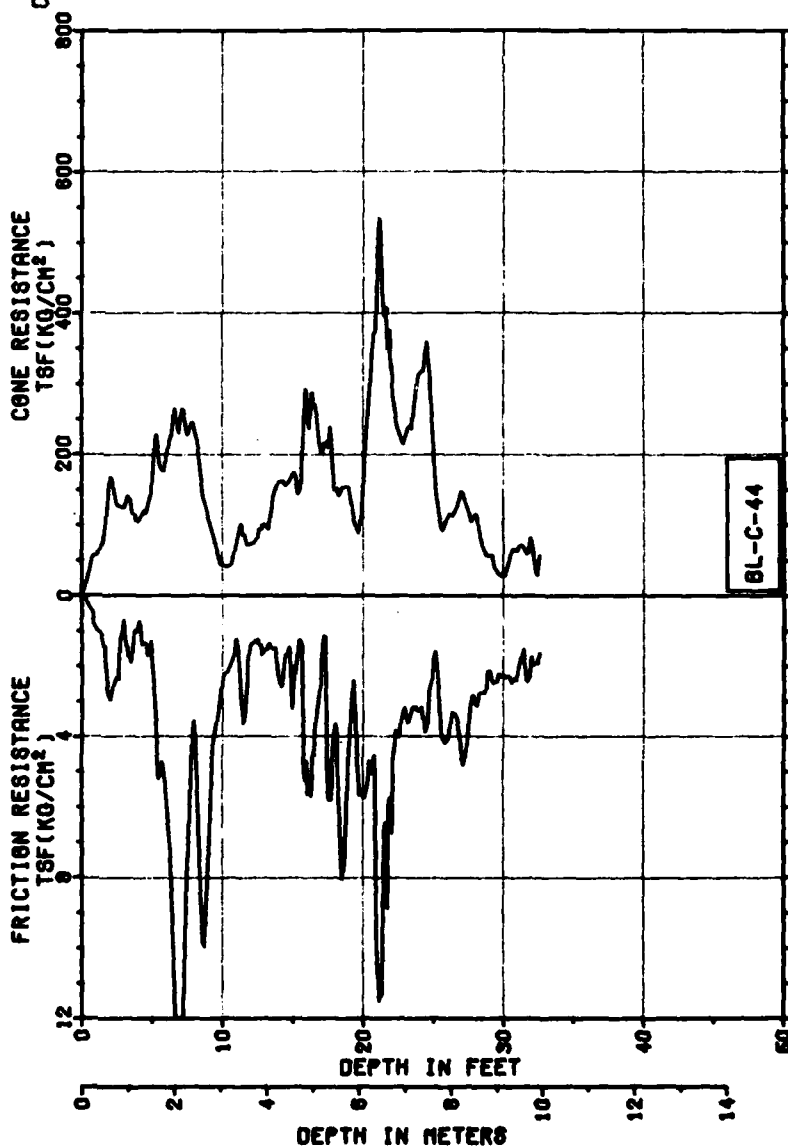
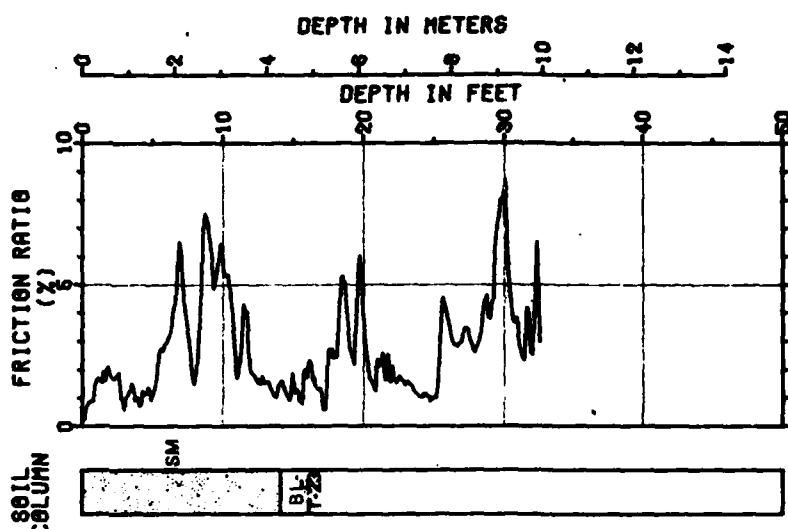
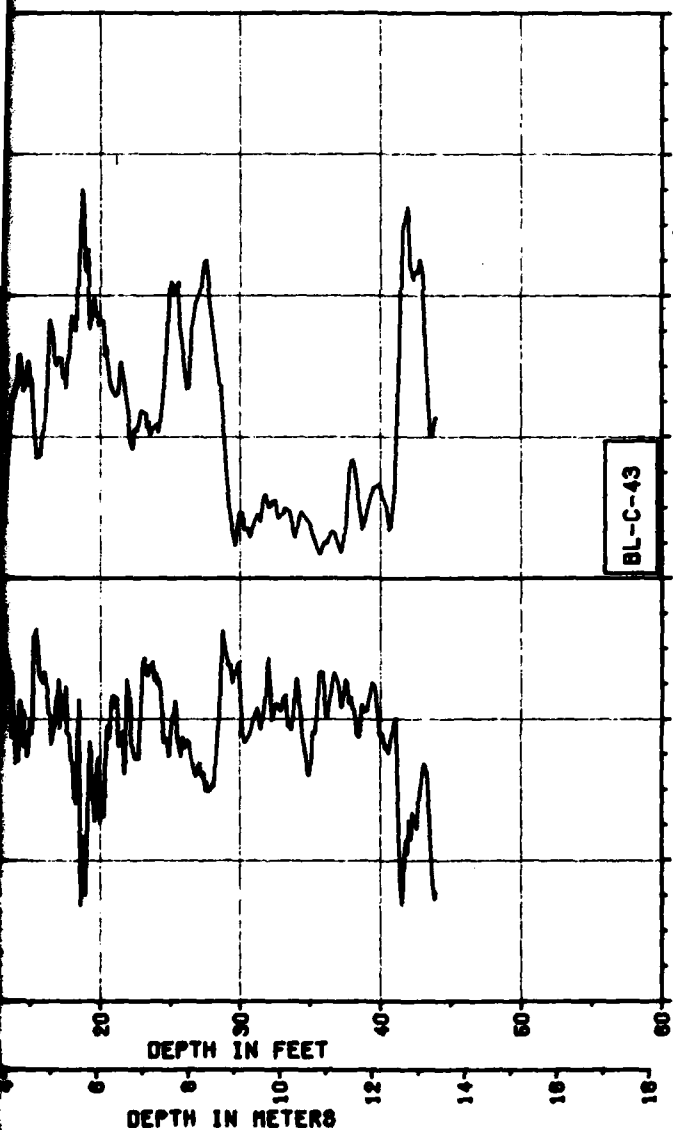
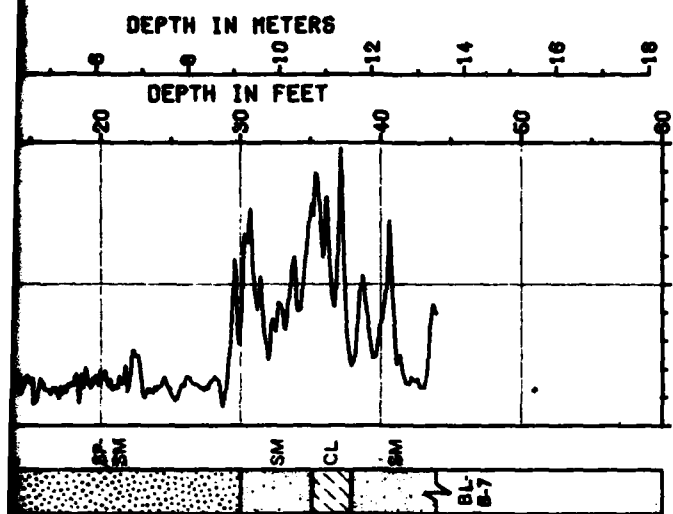
4 OF 4

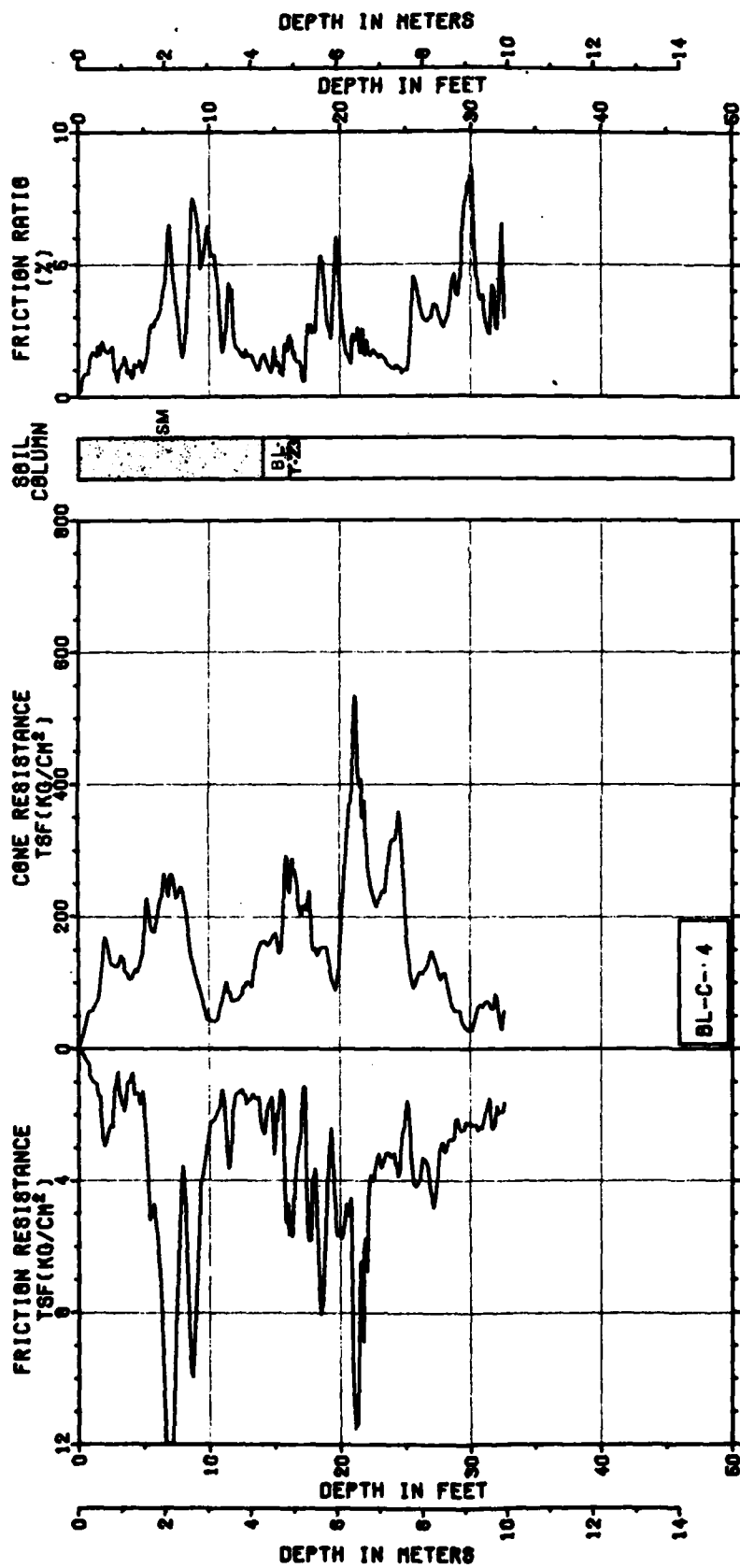
AD-

A112987



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A





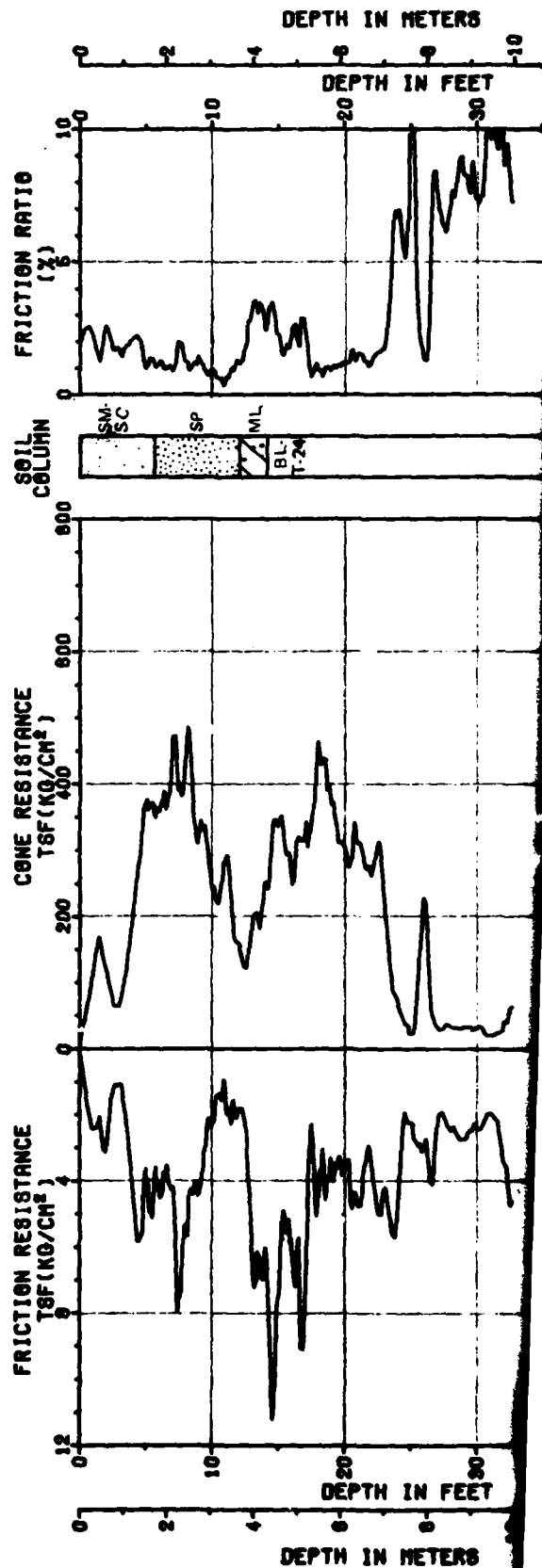
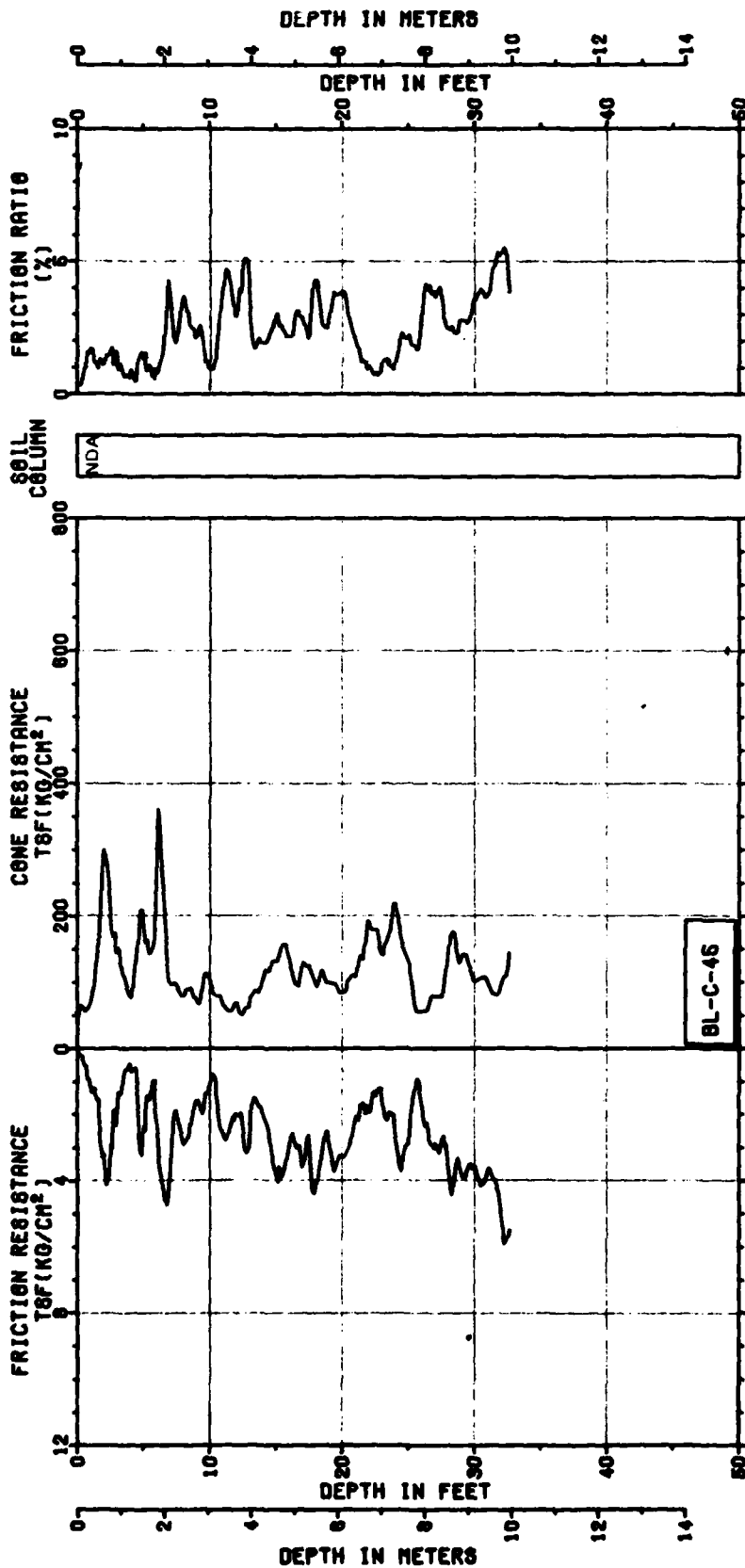
CONE PENETROMETER TEST BL-C-4, 43-8-66
 OPERATIONAL BASE SITE
 MORGAN, UTAH

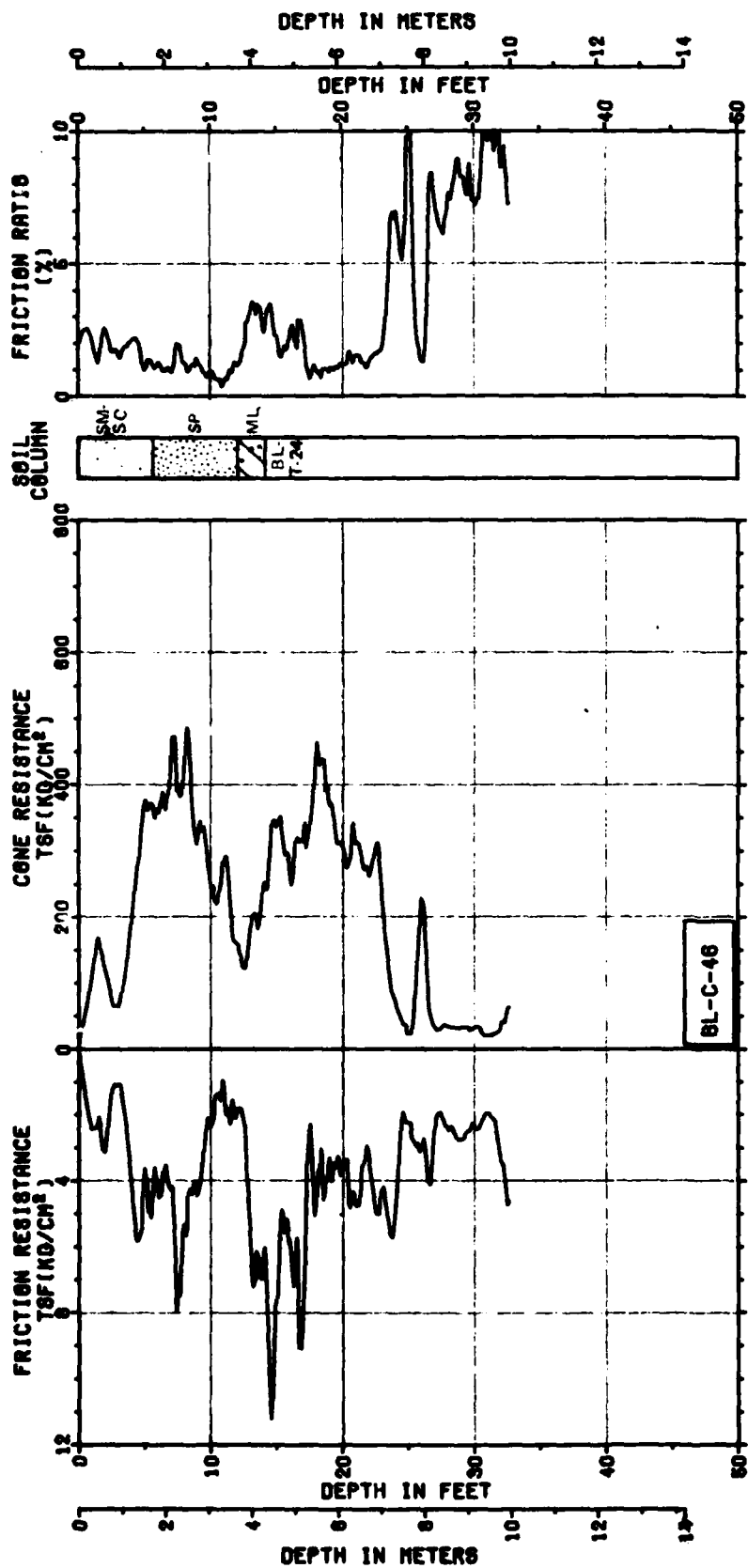
MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - SMO

FIGURE
 1-1
 M.O.B.

FUGRO NATIONAL, INC.

3





CONE PENETROMETER TEST BL-C-45 & 46
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE - BMO

FIGURE
 II-6-1
 25 OF 25

FUGRO NATIONAL, INC.

SECTION 7.0
EXPLANATION OF
SEISMIC REFRACTION DATA

7.0 EXPLANATION OF SEISMIC-REFRACTION DATA

Each figure shows seismic wave travel times plotted versus surface distance between the energy source (shot) and the detector (geophone) for a single seismic line. Distances are measured along the line from geophone number 1 which is designated as zero distance. Distances to the right (on the paper) of geophone 1 are positive. The direction arrow gives the approximate direction along the geophone array from geophone 1 to geophone 24.

Travel Time Versus Distance Graph (Upper Half of Figure)

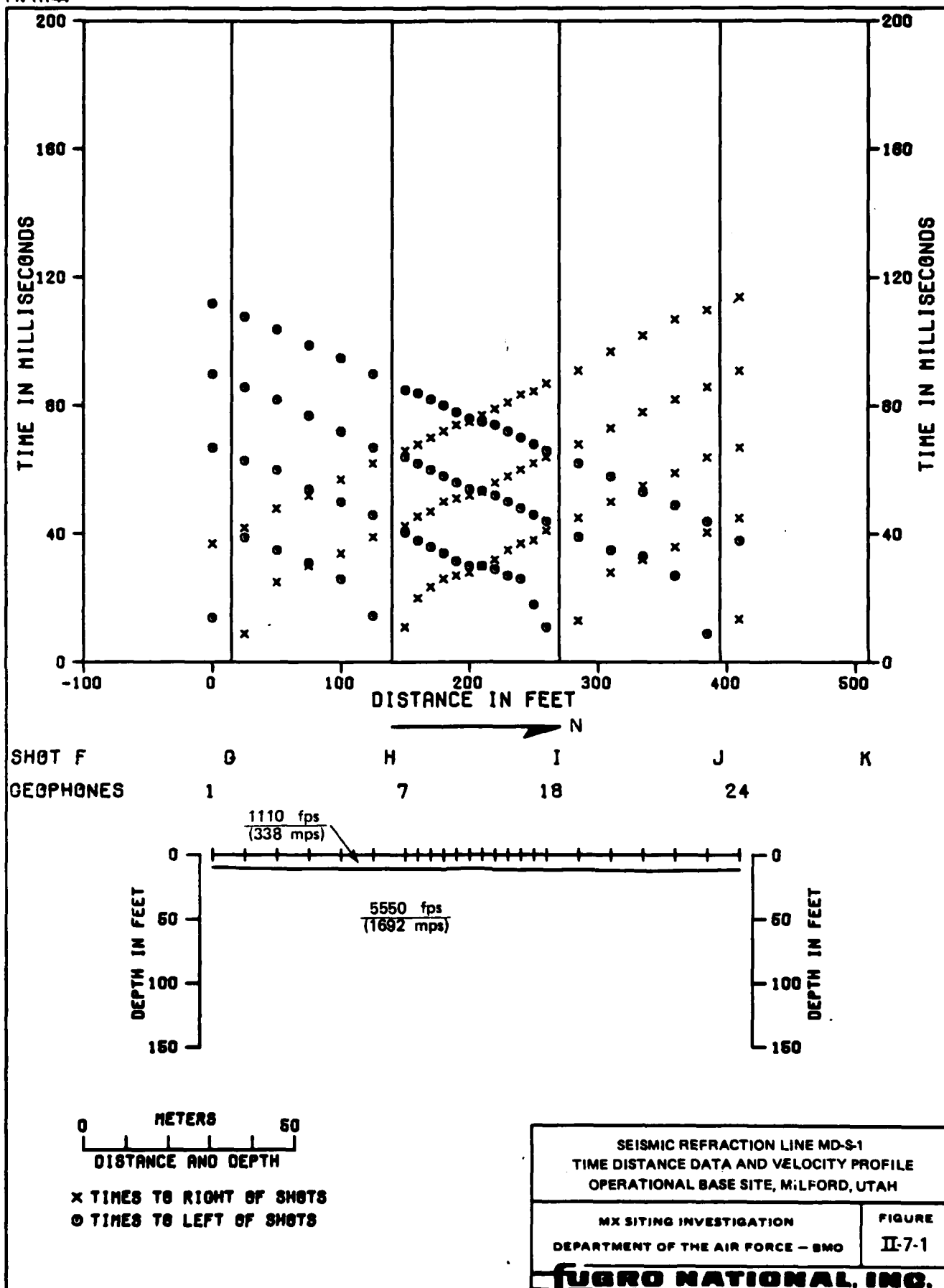
This is a travel time versus distance graph. The abscissa represents distance; the ordinate, time. The six vertical lines represent the locations of shots (designated as F, G, H, I, J, and K). The symbol, X, denotes travel times at geophones that were located to the right of a shot. The symbol, O, denotes travel times that were located to the left of shots.

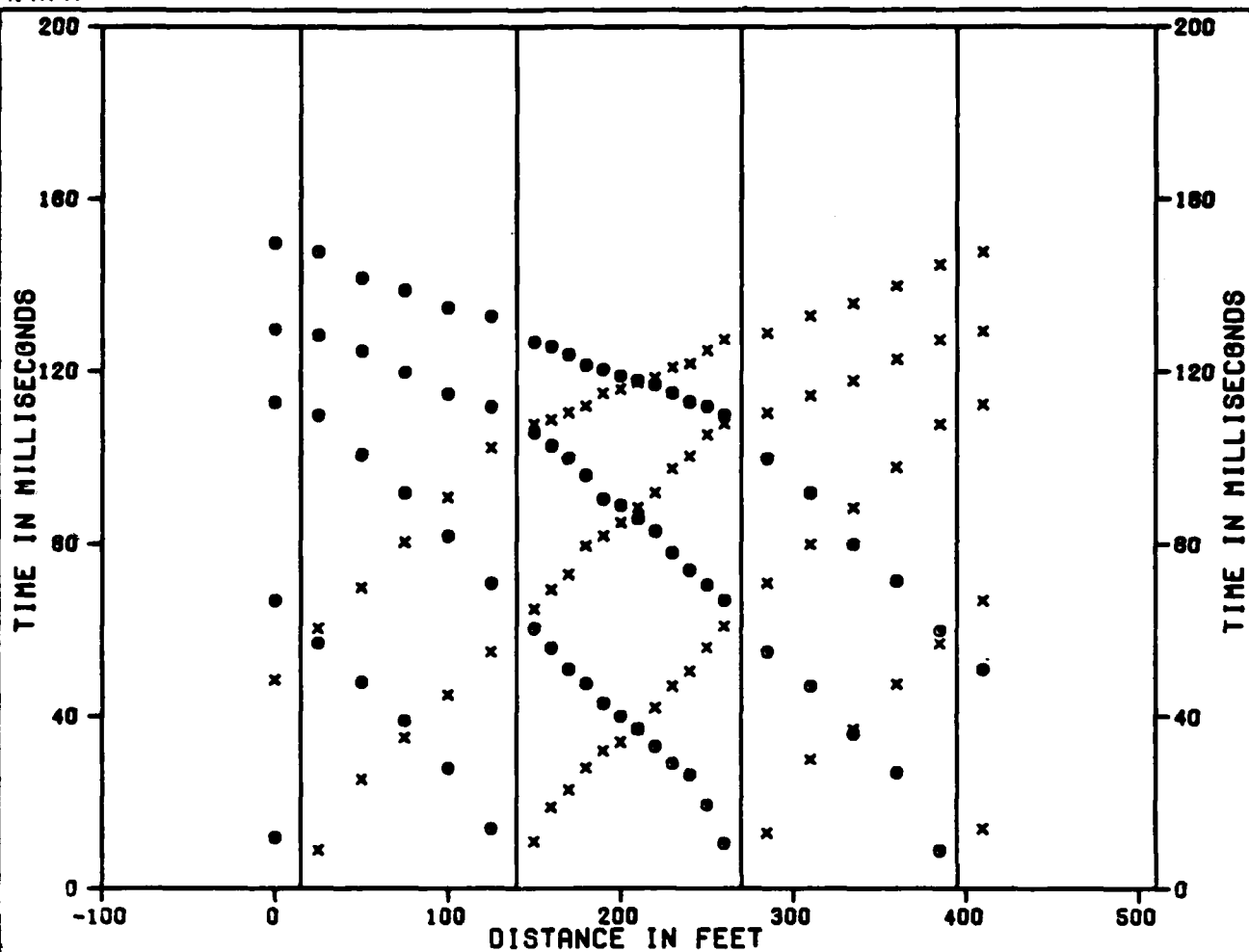
Velocity Cross Section (Lower Half of Figure)

This is an interpreted velocity cross section beneath the seismic line. The top line represents the ground-surface profile. The short vertical lines crossing the top line mark the geophone positions. The depth scale is plotted relative to a point on the line which was arbitrarily chosen as "zero elevation" at the time the line was surveyed. The additional lines across the cross section represent the interpreted boundaries between layers of material with different compressional wave

velocities. These boundaries are commonly called "refractors." The velocity interpreted to be representative of each layer is shown.

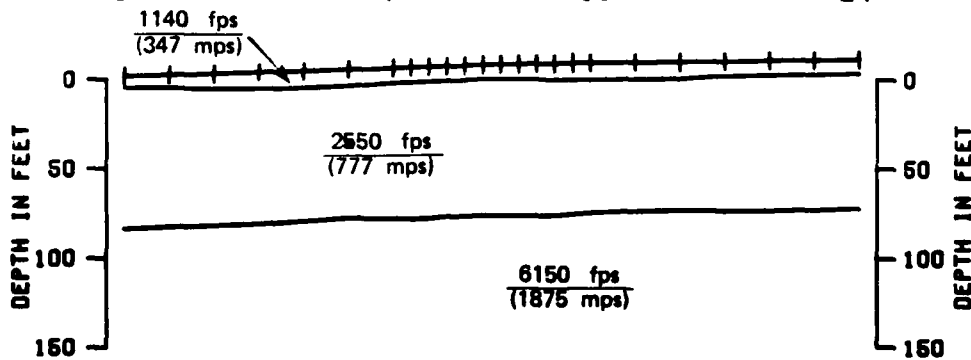
NOTE: There were no seismic refraction lines at locations MD-SR-10 or MD-SR-11.





SHOT F
GEOPHONES

SHOT	F	G	H	I	J	K
GEOPHONES	1		7	18	24	



0 50 100 150
METERS
DISTANCE AND DEPTH

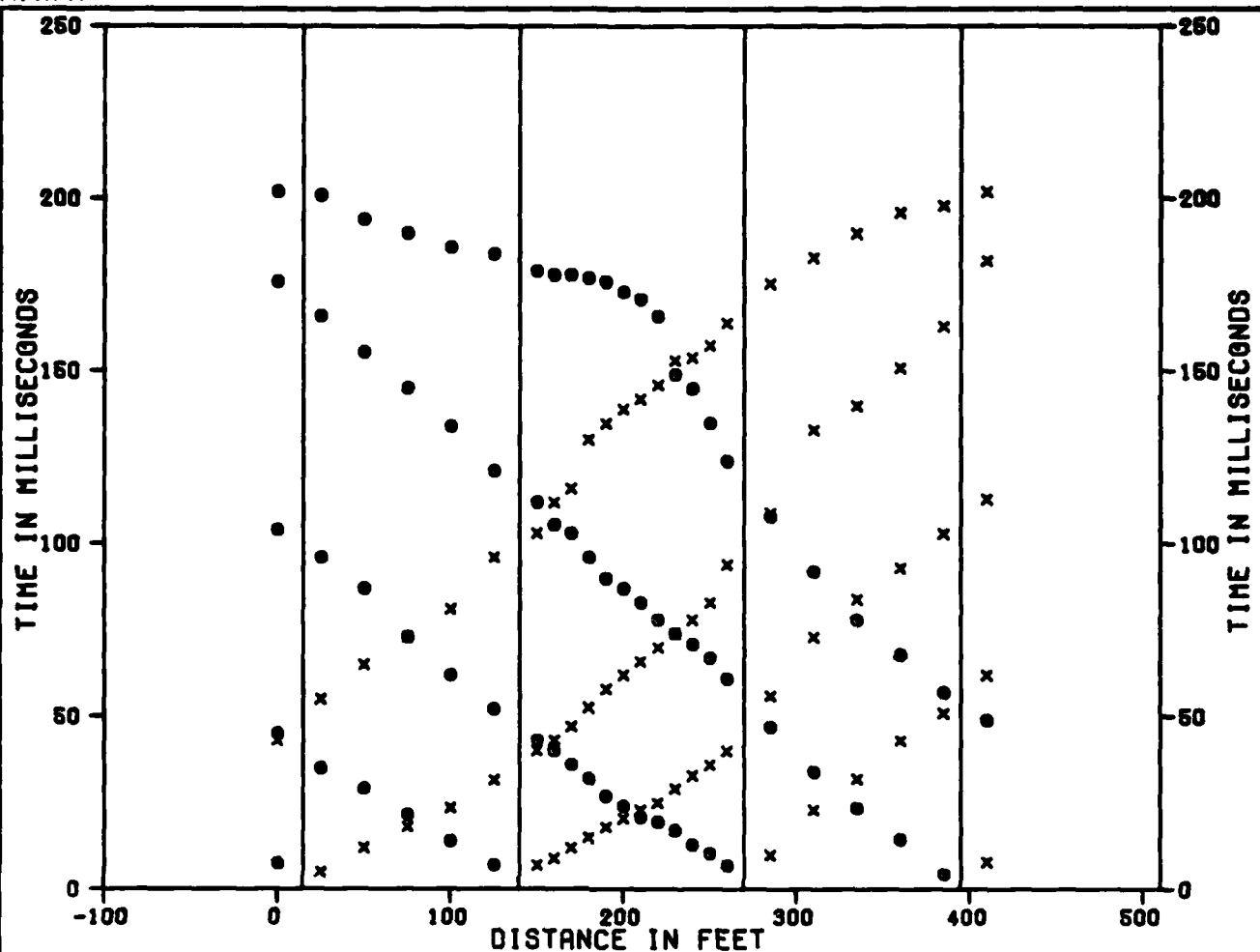
x TIMES TO RIGHT OF SHOTS
o TIMES TO LEFT OF SHOTS

SEISMIC REFRACTION LINE MD-S-2
TIME DISTANCE DATA AND VELOCITY PROFILE
OPERATIONAL BASE SITE, MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SMO

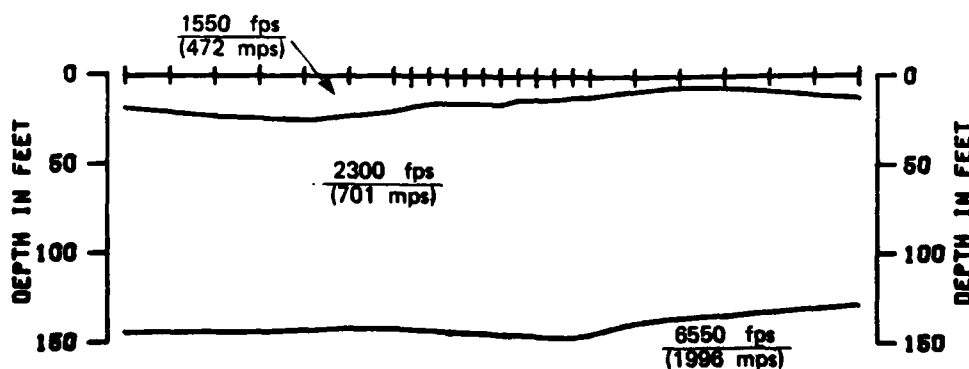
FIGURE
II-7-2

FUGRO NATIONAL, INC.



SHOT F
GEOPHONES

G H I J K
1 7 18 24



0 METERS 50
DISTANCE AND DEPTH

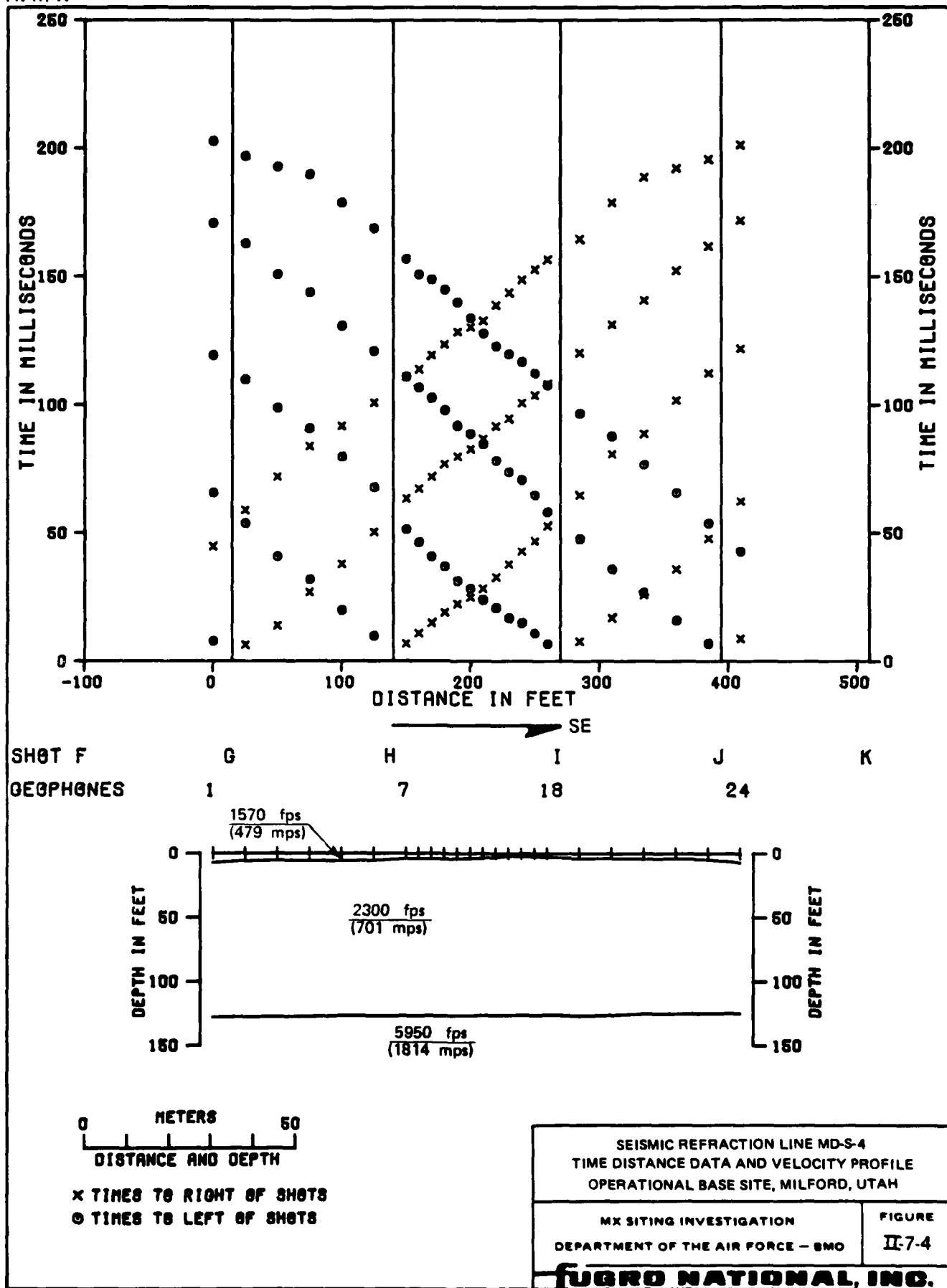
x TIMES TO RIGHT OF SHOTS
o TIMES TO LEFT OF SHOTS

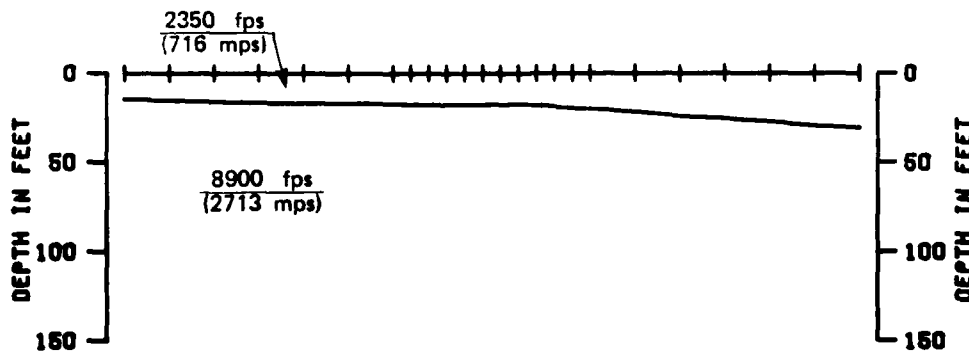
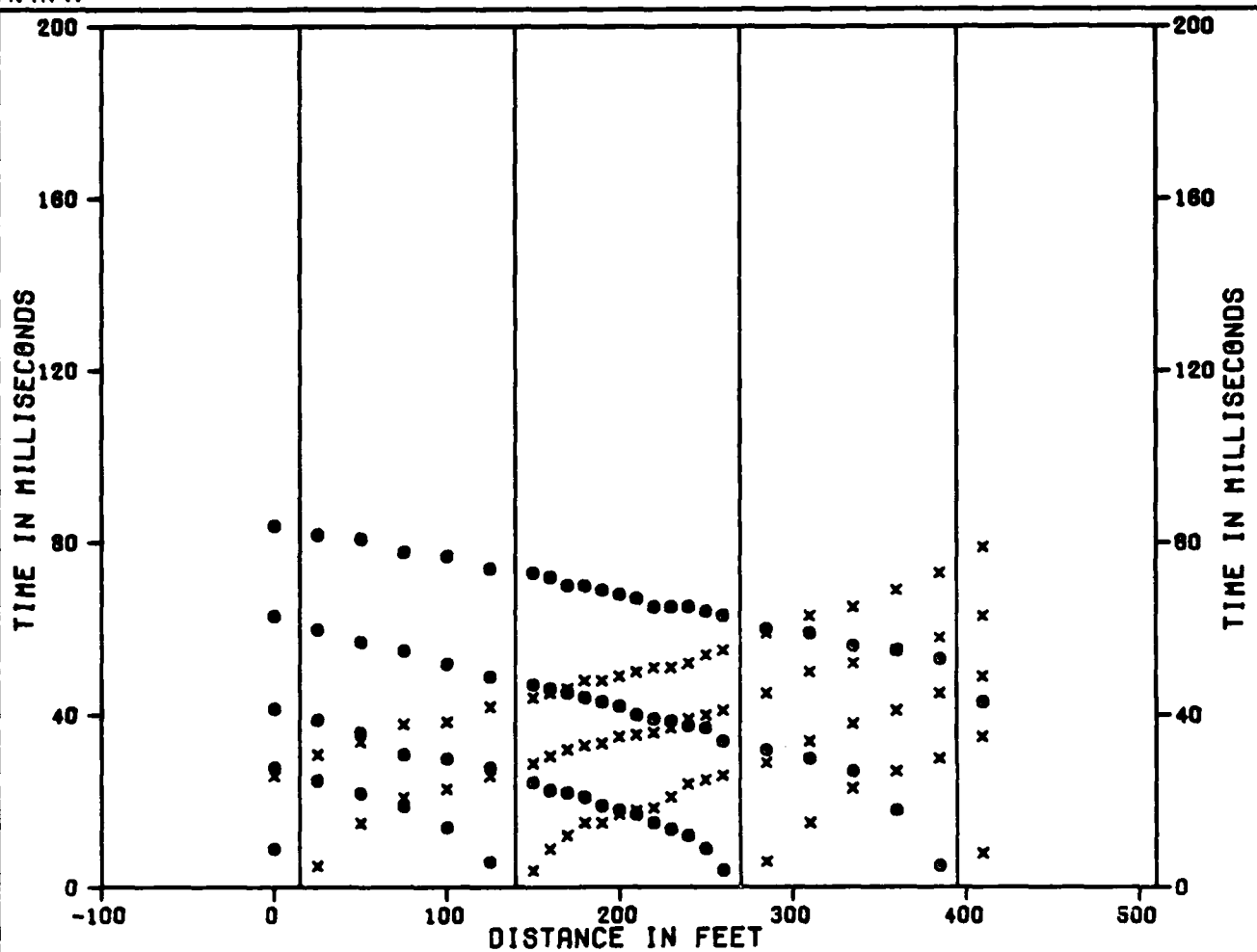
SEISMIC REFRACTION LINE MD-S-3
TIME DISTANCE DATA AND VELOCITY PROFILE
OPERATIONAL BASE SITE, MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SMO

FIGURE
II-7-3

FUGRO NATIONAL, INC.





0 METERS 50
DISTANCE AND DEPTH

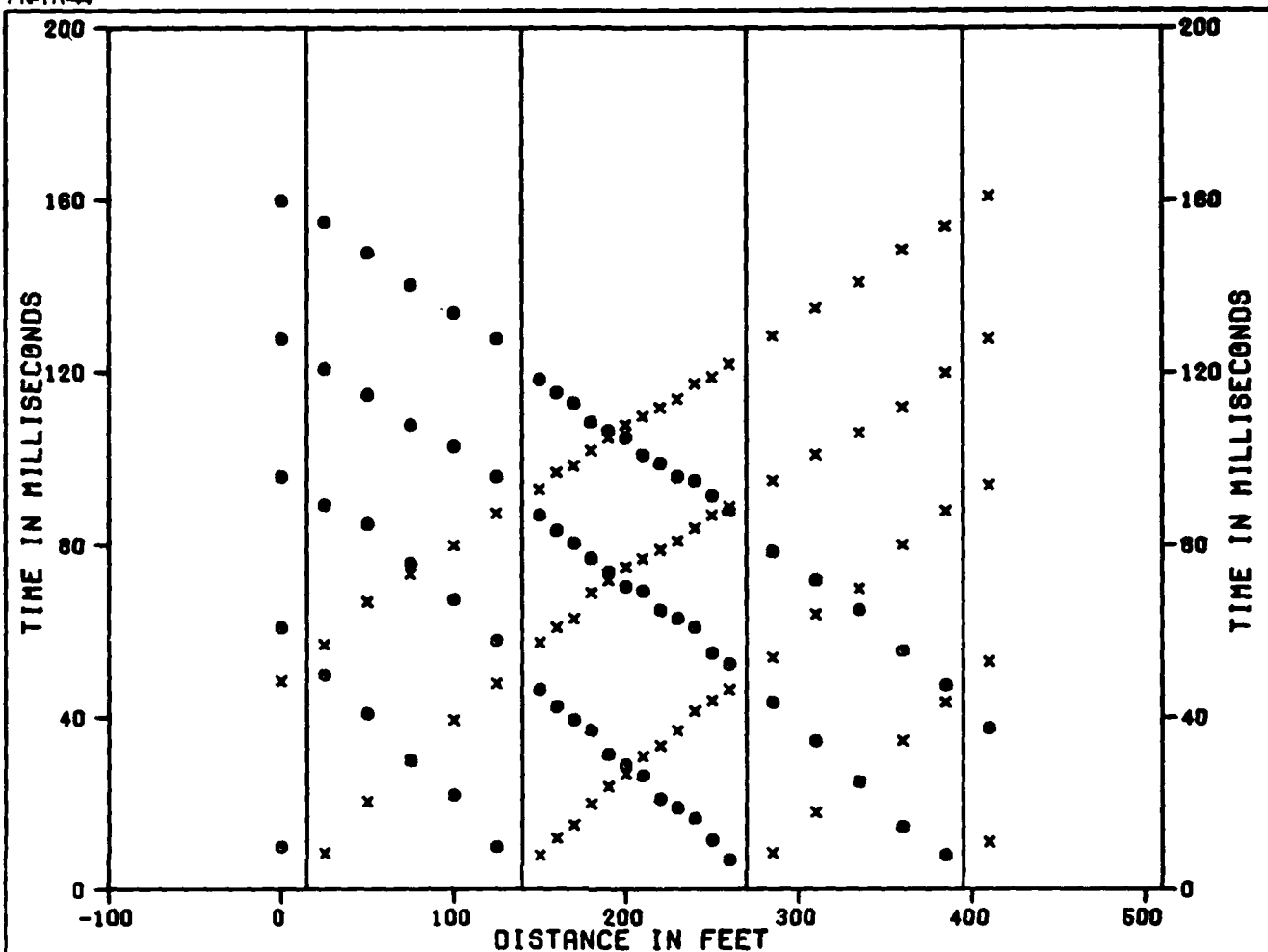
x TIMES TO RIGHT OF SHOTS
o TIMES TO LEFT OF SHOTS

SEISMIC REFRACTION LINE MD-S-5
TIME DISTANCE DATA AND VELOCITY PROFILE
OPERATIONAL BASE SITE, MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SMO

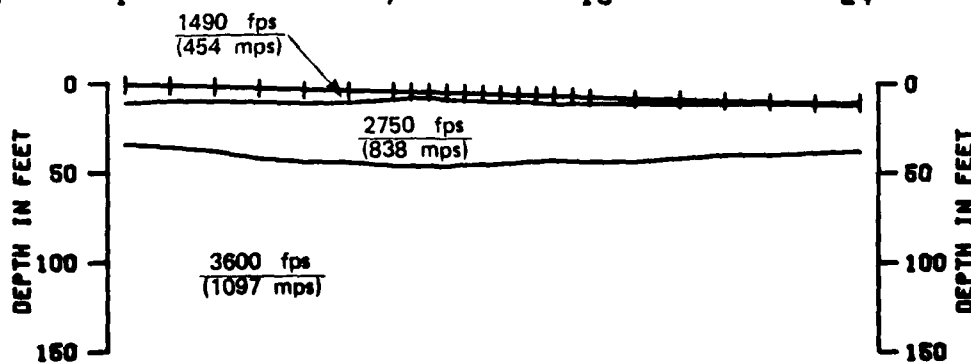
FIGURE
II-7-5

FUGRO NATIONAL, INC.



SHOT F
G EPHONES

0 1 7 18 24



0 METERS 50
DISTANCE AND DEPTH

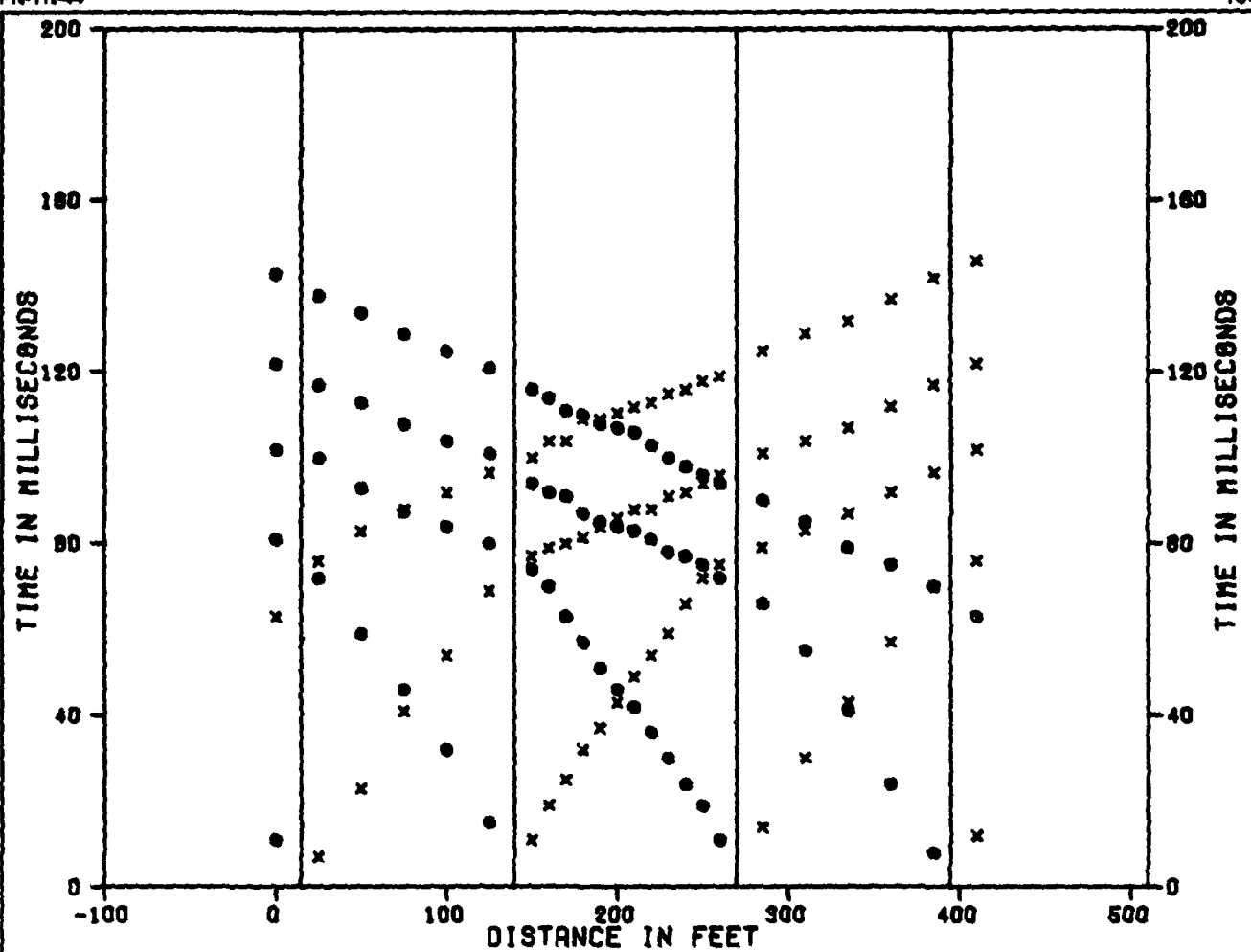
x TIMES TO RIGHT OF SHOTS
o TIMES TO LEFT OF SHOTS

SEISMIC REFRACTION LINE MD-S-6
TIME DISTANCE DATA AND VELOCITY PROFILE
OPERATIONAL BASE SITE, MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

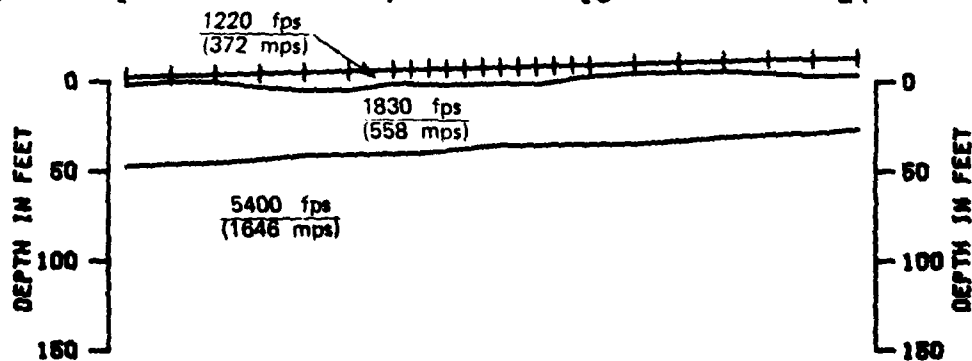
FIGURE
II-7-6

FUGRO NATIONAL, INC.



SHOT F
GEOPHONES

0 H I J K
1 7 18 24



0 METERS 50
DISTANCE AND DEPTH

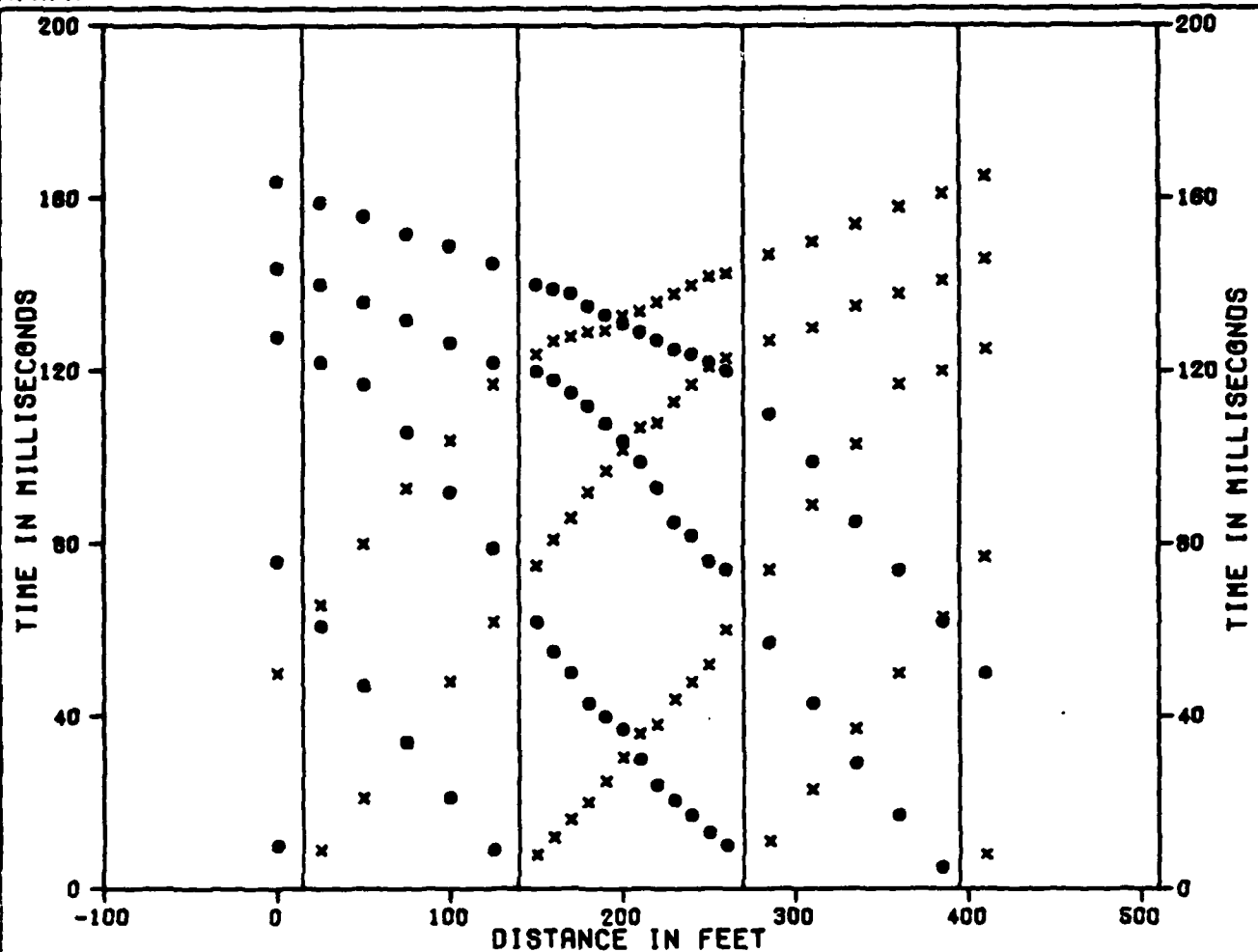
x TIMES TO RIGHT OF SHOTS
o TIMES TO LEFT OF SHOTS

SEISMIC REFRACTION LINE MD-S-7
TIME DISTANCE DATA AND VELOCITY PROFILE
OPERATIONAL BASE SITE, MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - BMO

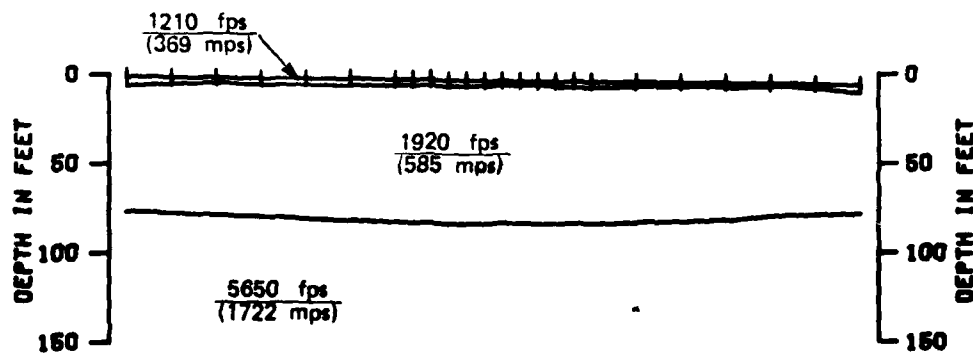
FIGURE
II-7-7

FUGRO NATIONAL, INC.



SHOT F
GEOPHONES

G H I J K
1 7 18 24



0 METERS 60
DISTANCE AND DEPTH

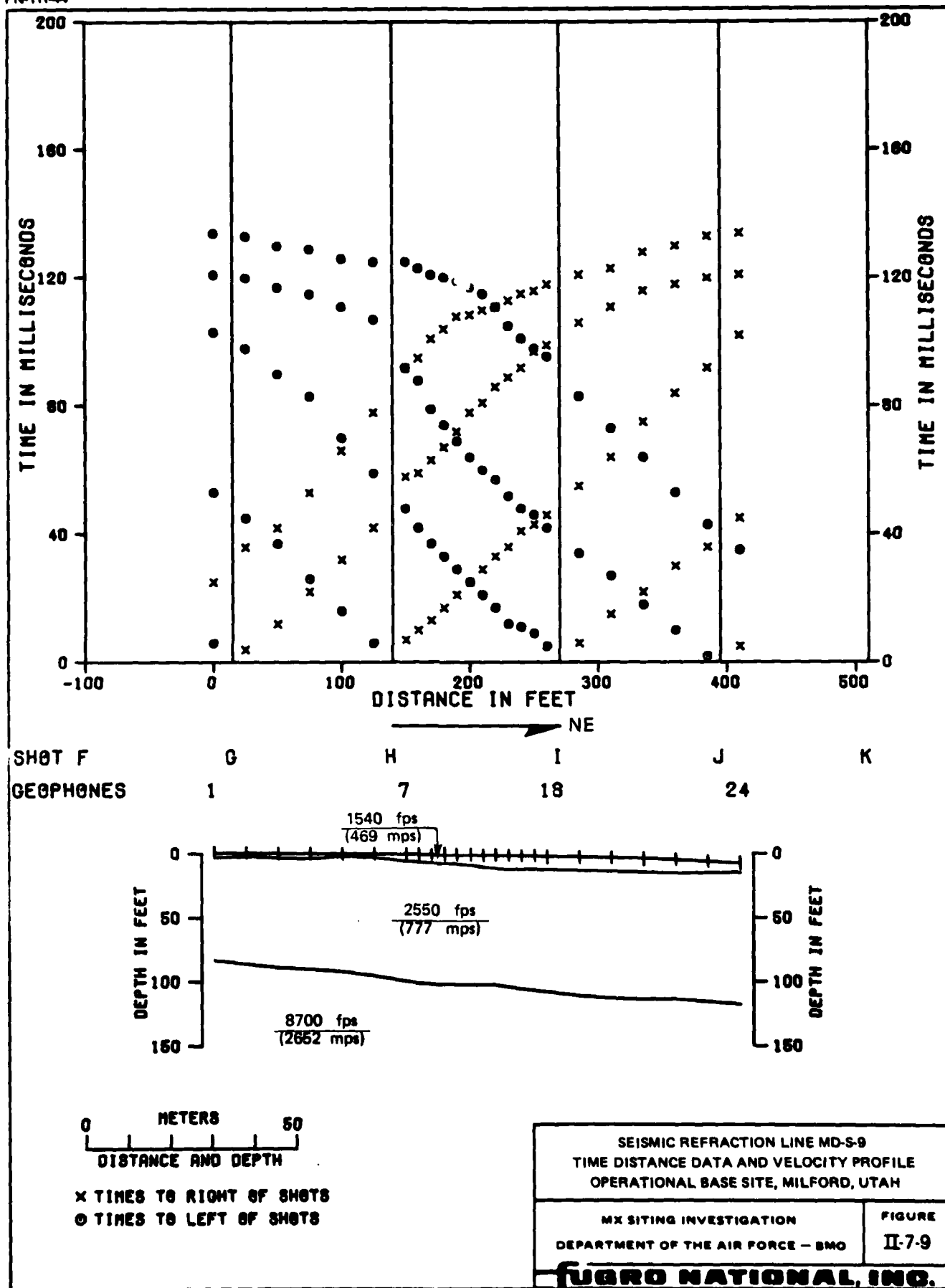
x TIMES TO RIGHT OF SHOTS
o TIMES TO LEFT OF SHOTS

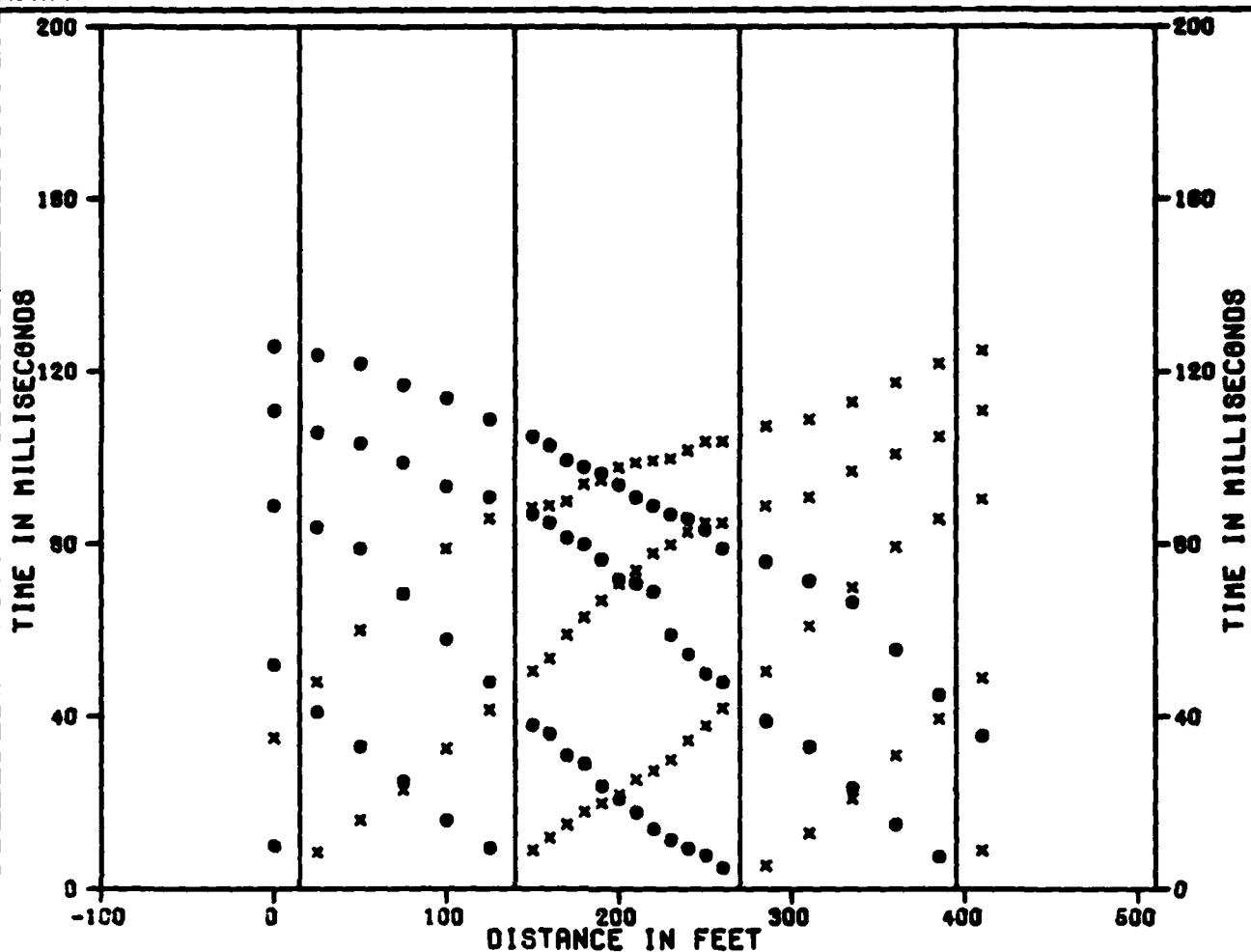
SEISMIC REFRACTION LINE MD-S-8
TIME DISTANCE DATA AND VELOCITY PROFILE
OPERATIONAL BASE SITE, MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SMO

FIGURE
II-7-8

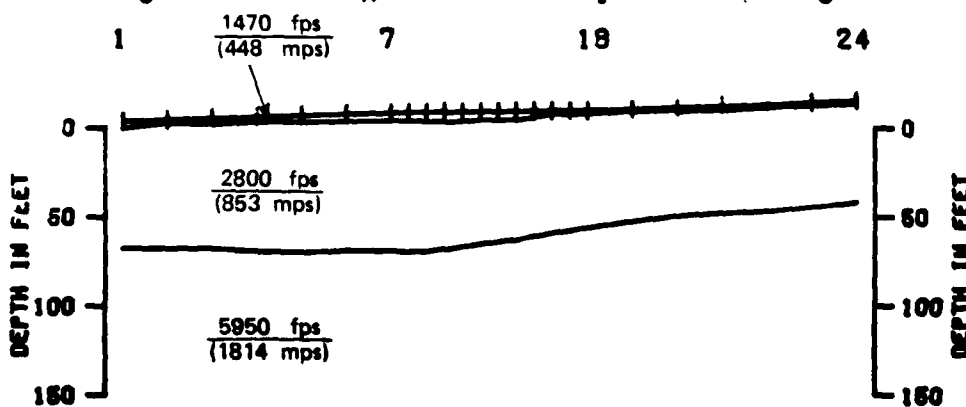
FUGRO NATIONAL, INC.





SHOT F
GEOPHONES

0 H I J K
1 7 18 24



0 METERS 50
DISTANCE AND DEPTH

11500 fps
(3508 mps)

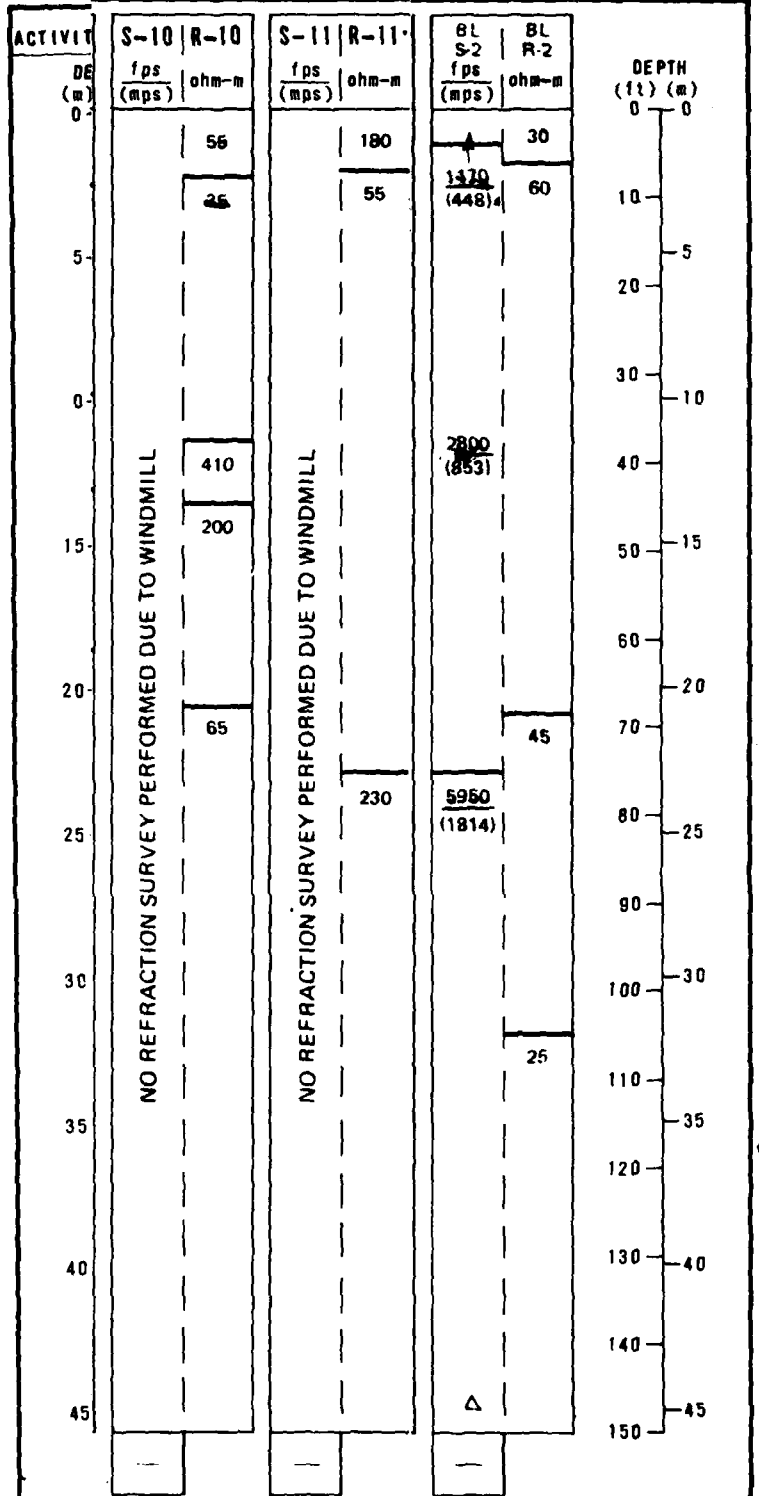
x TIMES TO RIGHT OF SHOTS
o TIMES TO LEFT OF SHOTS

SEISMIC REFRACTION LINE BL-S-2
TIME DISTANCE DATA AND VELOCITY PROFILE
OPERATIONAL BASE SITE, MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - SMO

FIGURE
II-7-10

FUGRO NATIONAL, INC.



SHALLOW SEISMIC REFRACTION
VELOCITY PROFILE
OPERATIONAL BASE SITE
MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE DMO

TABLE
II-7-1

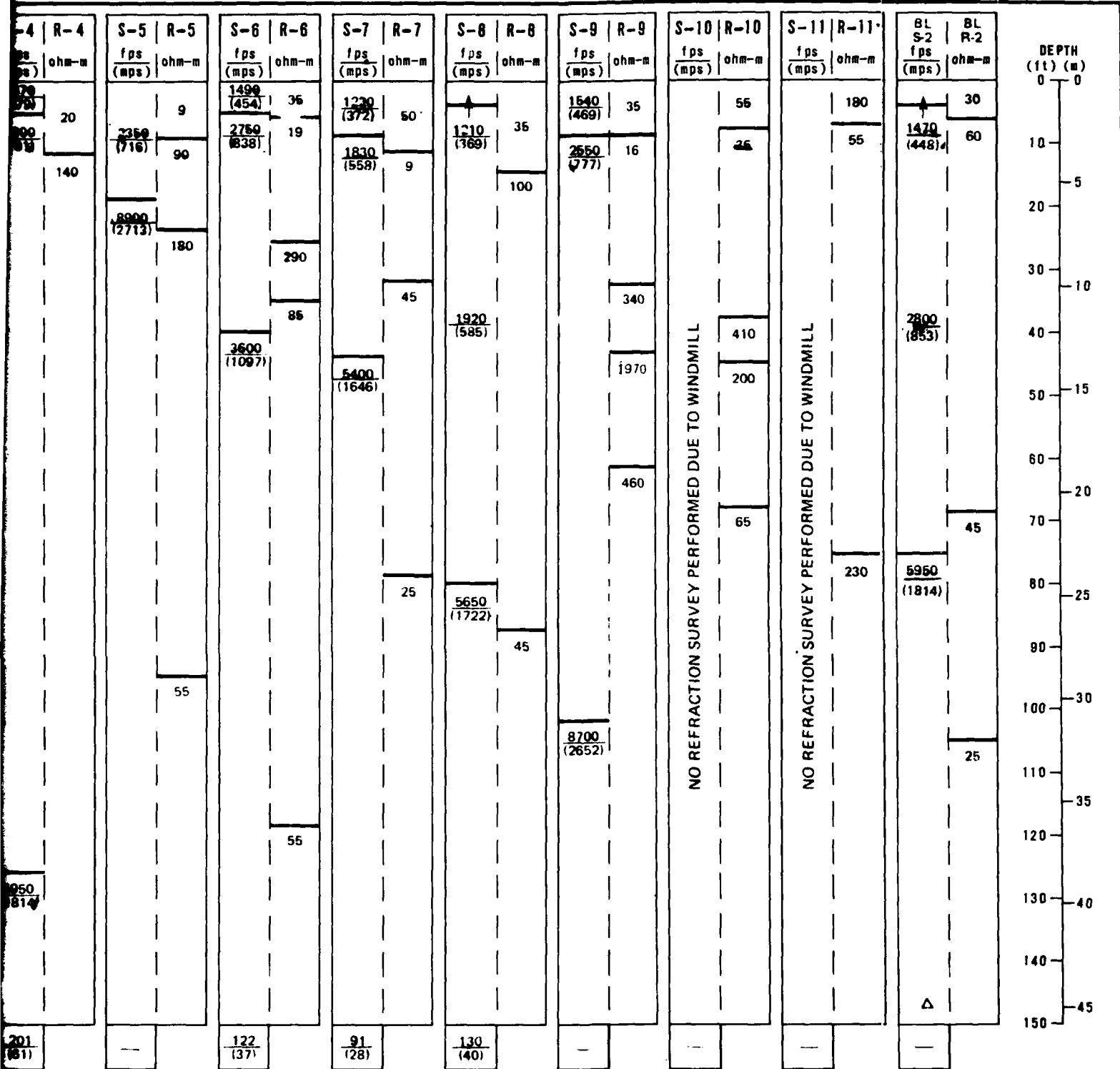
FUGRO NATIONAL, INC.

ACTIVITY NO.	S-1	R-1	S-2	R-2	S-3	R-3	S-4	R-4	S-5	R-5	S-6	R-6	S-7	R-7	S-8	R-8
DEPTH (m) (ft)	fps (mps)	ohm-m	fps (mps)	ohm-m	fps (mps)	ohm-m	fps (mps)	ohm-m	fps (mps)	ohm-m	fps (mps)	ohm-m	fps (mps)	ohm-m	fps (mps)	ohm-m
0																
10	1110 (338)	2	1140 (347)	110	1550 (472)	90	1670 (479)	20	2350 (716)	9	1490 (454)	36	1230 (372)	50	1210 (369)	35
5	5550 (1692)	4	2550 (777)	14	2300 (701)	45	2200 (701)	140		90	2750 (838)	19	1830 (558)	9		100
20									8000 (2713)	180		290				
30												85		45		
40				90							2600 (1097)				1920 (585)	
15													5400 (1646)			
60						240										
20																
70																
25														25	5650 (1722)	45
80																
90			6150 (1875)													
30				35						55						
110																
35																
120												55				
40							5950 (1814)									
140																
45					6550 (1996)	140										
150																
* ft (m)	100 (30)		120 (37)		215 (66)		201 (61)		—		122 (37)		91 (28)		130 (40)	

* Approximate depth above which there is no indication of material with a velocity as great as 7000 fps (2134 mps). See Appendix A for an explanation of how this exclusion depth is calculated when the observed velocities are all less than 7000 fps (2134 mps).

▲ 11450
(3490) @ 177 ft
(54 m)

△ 11500
(3505) @ 177 ft
(54 m)



SHALLOW SEISMIC REFRACTION
 VELOCITY PROFILE
 OPERATIONAL BASE SITE
 MILFORD, UTAH

MX SITING INVESTIGATION
 DEPARTMENT OF THE AIR FORCE DMO

TABLE
 II-7-1

FUGRO NATIONAL INC.

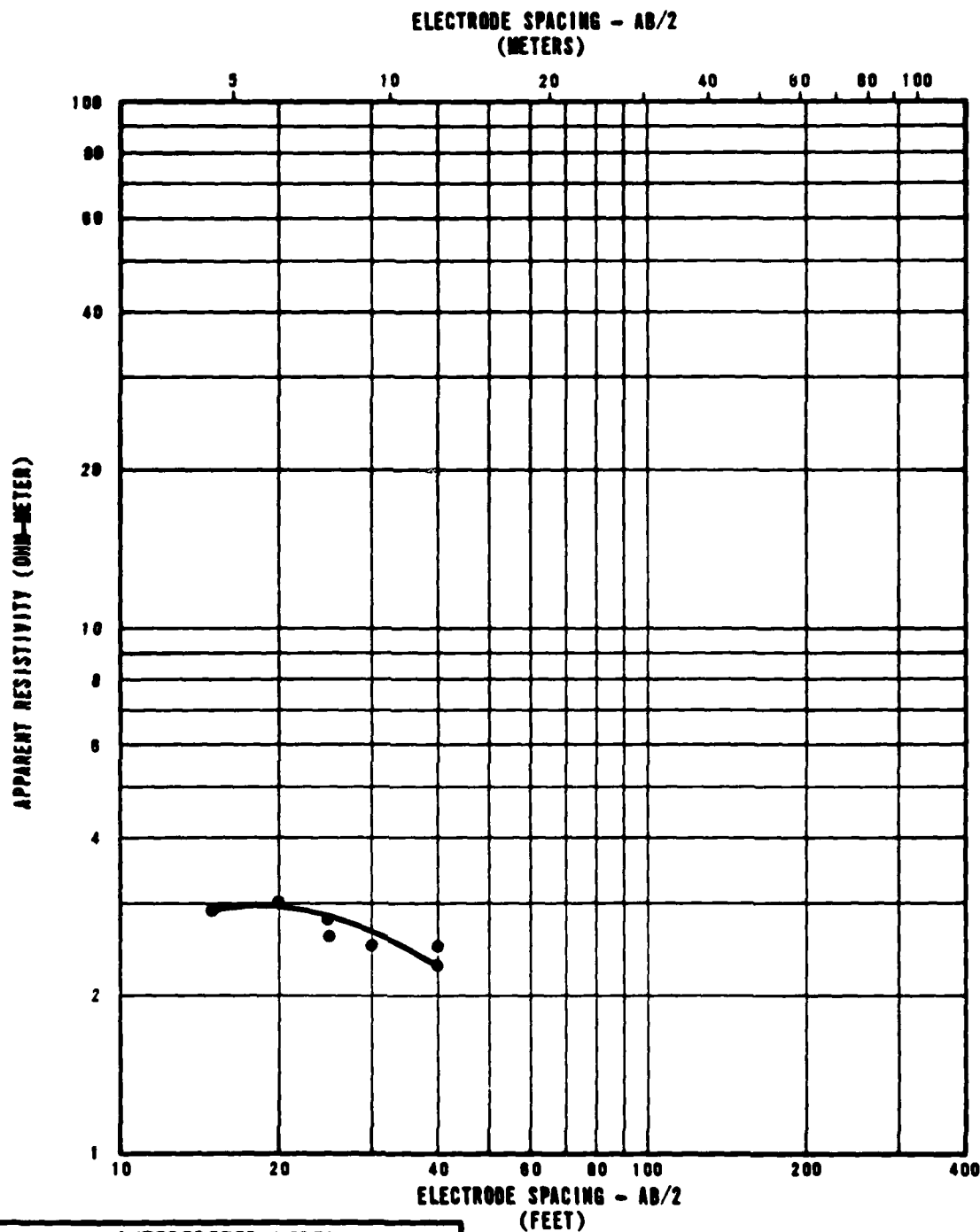
AFV-18

SECTION 8.0
EXPLANATION OF
ELECTRICAL RESISTIVITY DATA

8.0 EXPLANATION OF ELECTRICAL RESISTIVITY DATA

Each figure in this section presents the data obtained from a resistivity sounding and a tabulated model of resistivity layers that would produce a curve similar to the observed curve. The upper portion of the figures is a graph in which measured apparent resistivity values in ohm-meters are plotted versus one-half the distance between the current electrodes.

The interpreted model tabulated at the bottom of the figures shows a combination of true resistivity layers and thicknesses obtained by matching theoretical curves to the field curve.



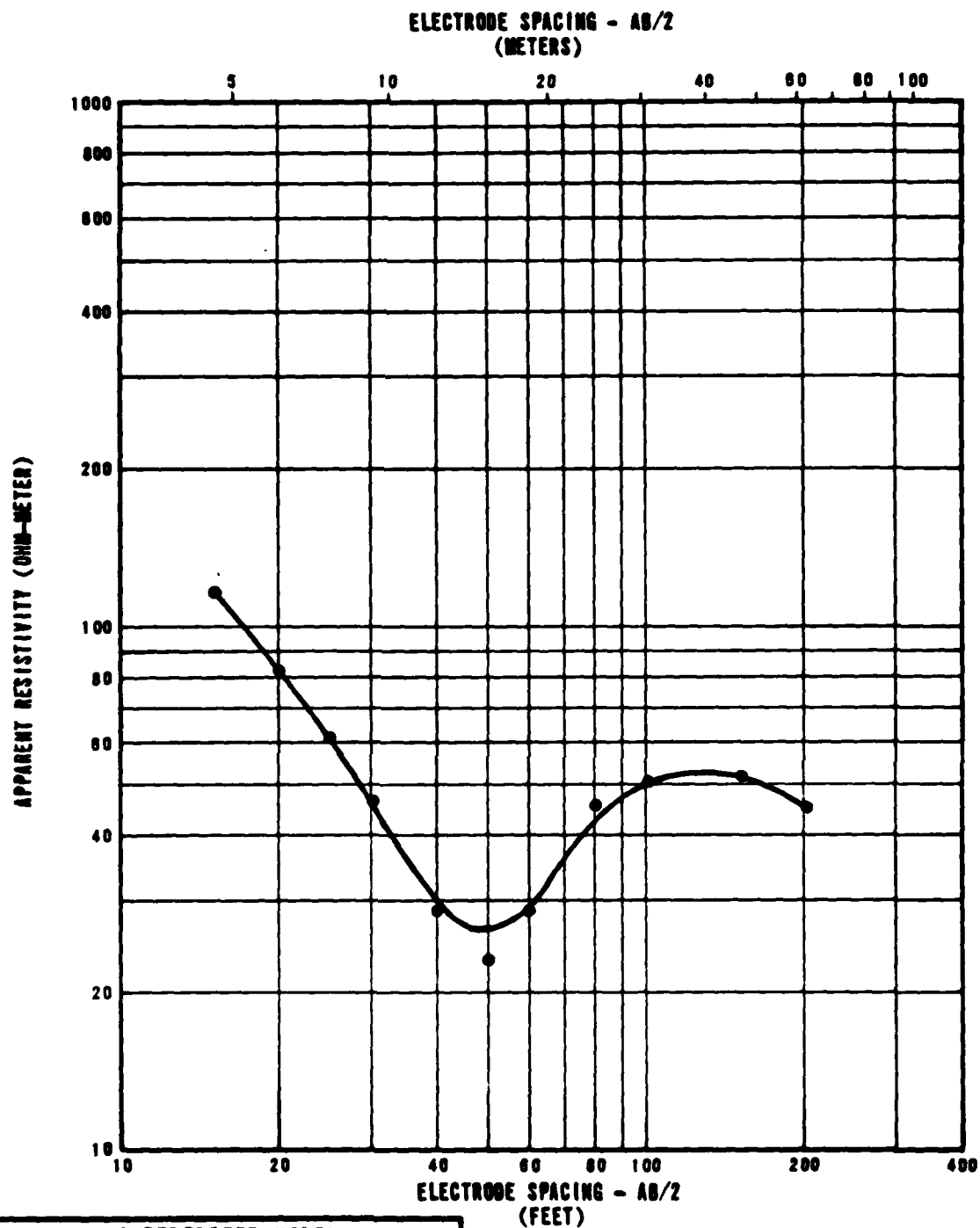
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	2
8	2	4

RESISTIVITY SOUNDING MD-R-1
SOUNDING CURVE AND INTERPRETATION
OPERATIONAL BASE SITE, MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DND

FIGURE
II-8-1

FUGRO NATIONAL INC.



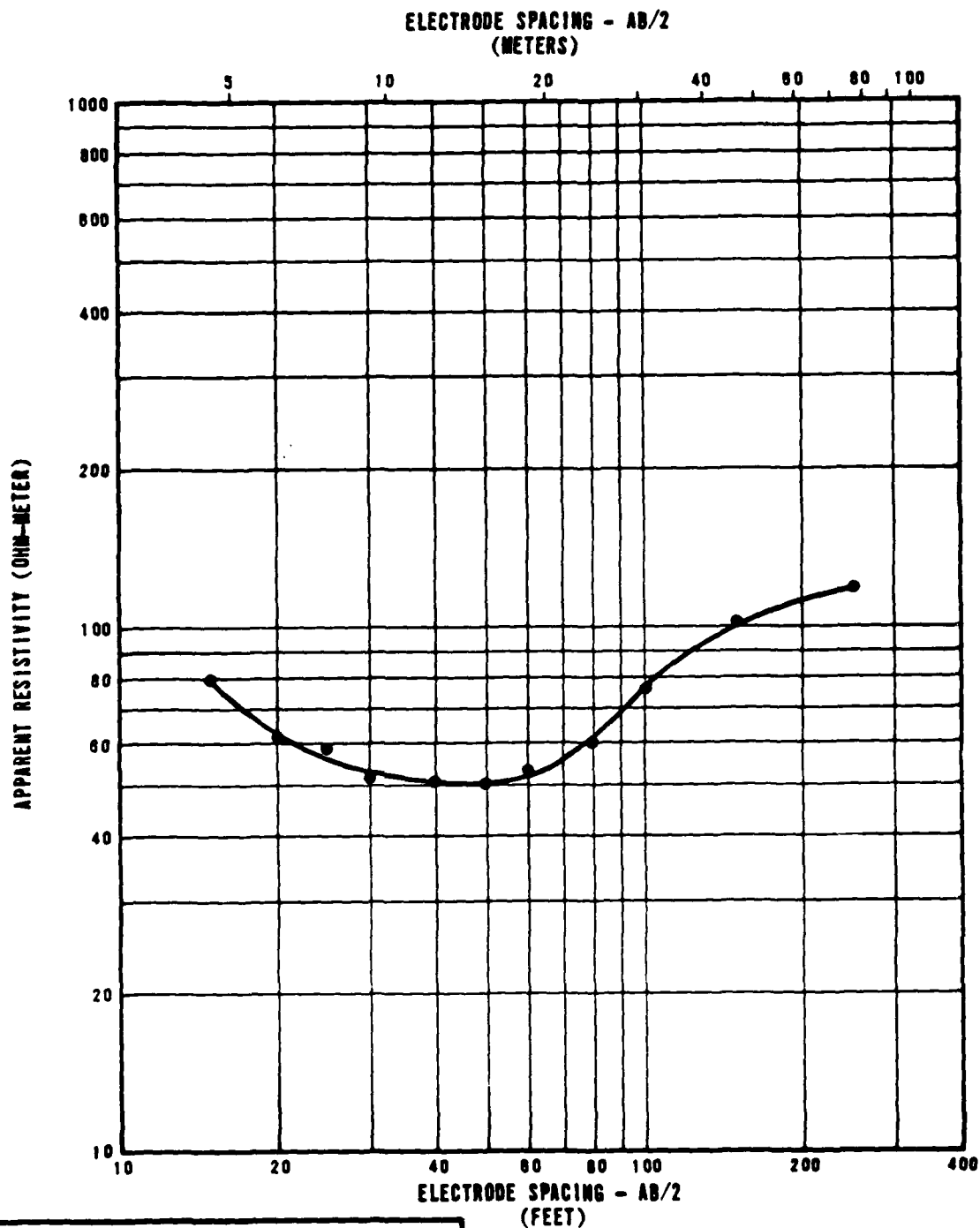
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	110
15	5	14
37	11	90
103	31	35

RESISTIVITY SOUNDING MD-R-2
SOUNDING CURVE AND INTERPRETATION
OPERATIONAL BASE SITE, MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - 800

FIGURE
II-8-2

URS NATIONAL INC.



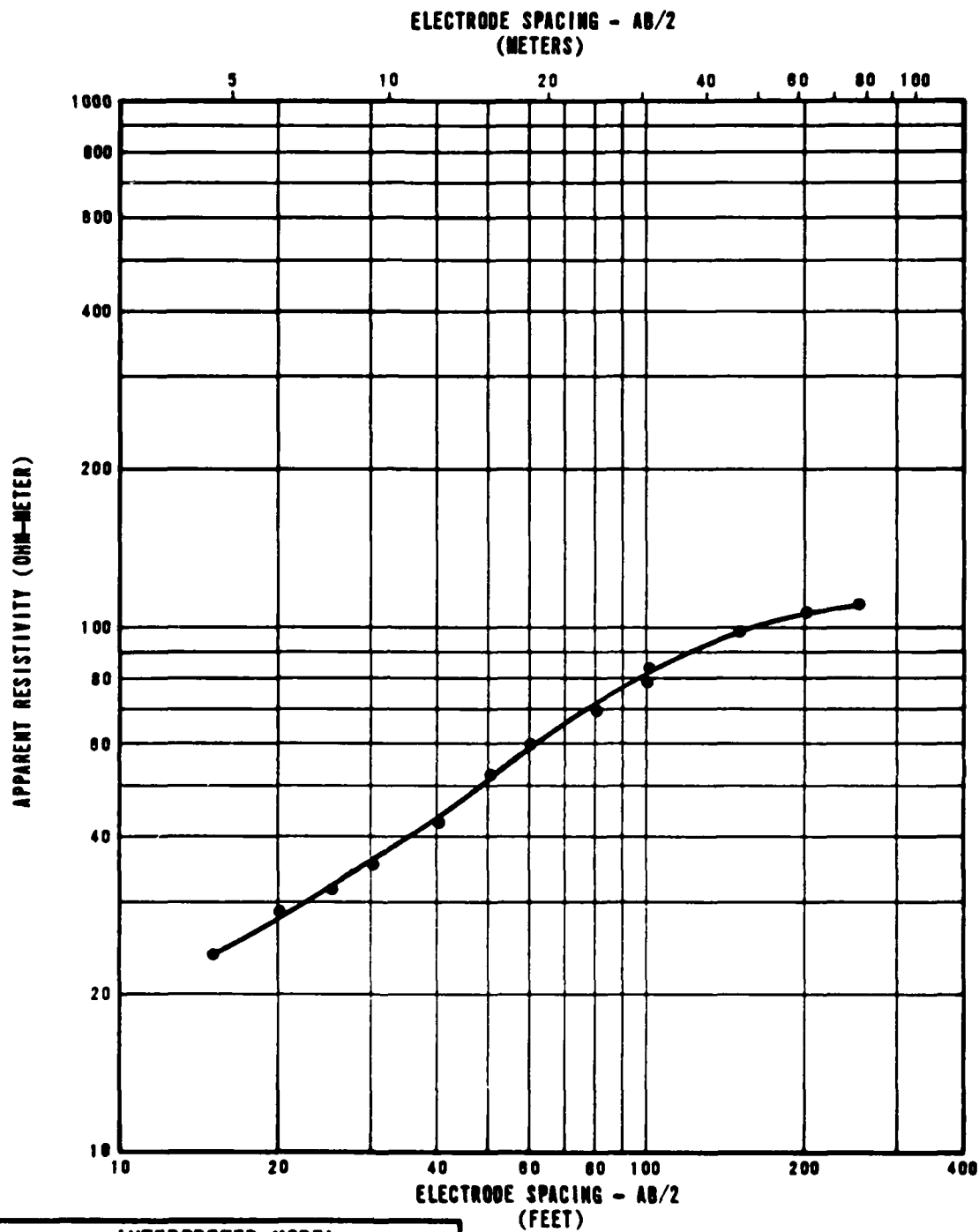
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	90
8	2	45
54	16	240
149	45	140

RESISTIVITY SOUNDING MD-R-3
SOUNDING CURVE AND INTERPRETATION
OPERATIONAL BASE SITE, MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DND

FIGURE
II-8-3

FUGRO NATIONAL INC.



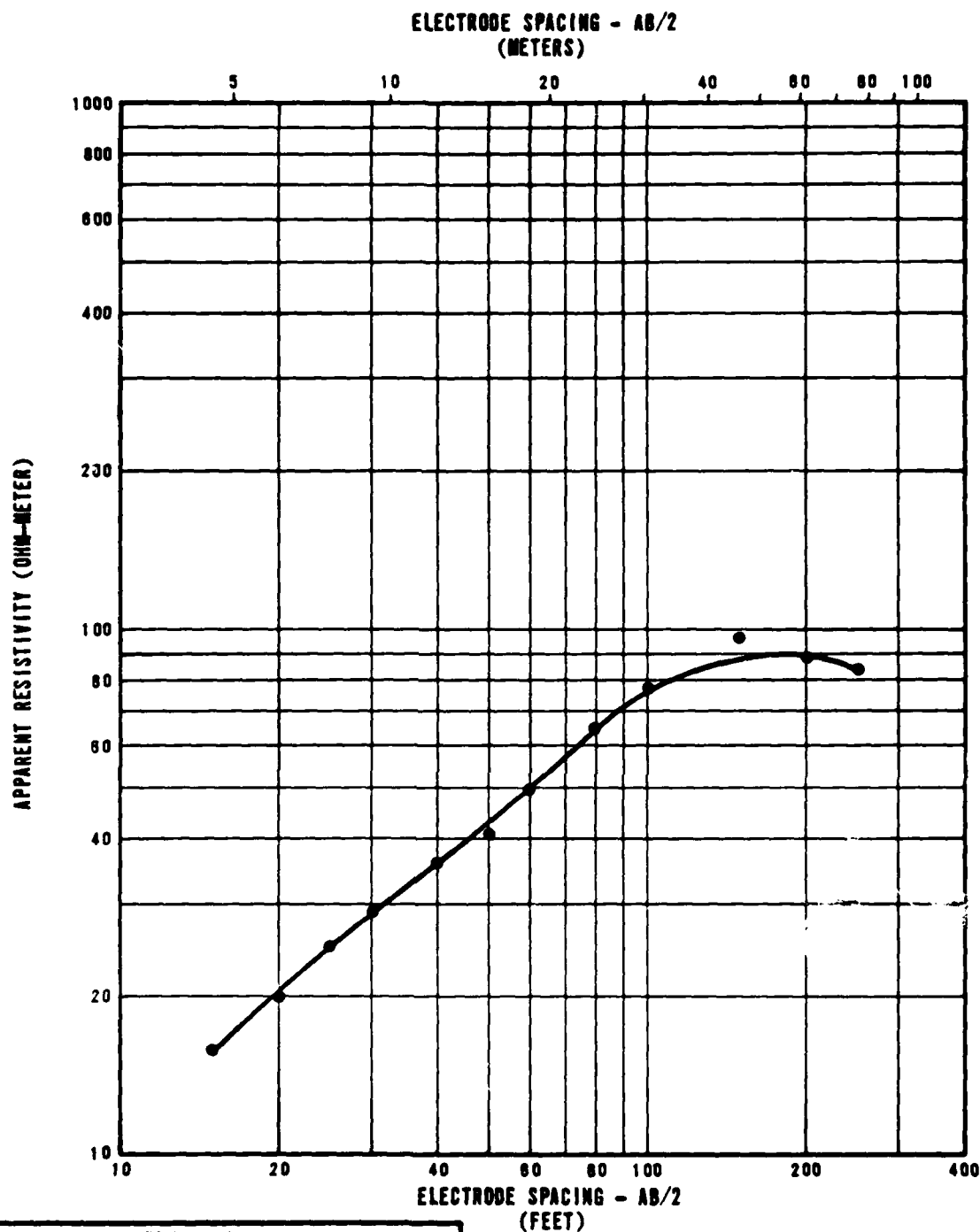
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	20
12	4	140

RESISTIVITY SOUNDING MD-R-4
SOUNDING CURVE AND INTERPRETATION
OPERATIONAL BASE SITE, MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - 0000

FIGURE
II-8-4

FUGRO NATIONAL, INC.



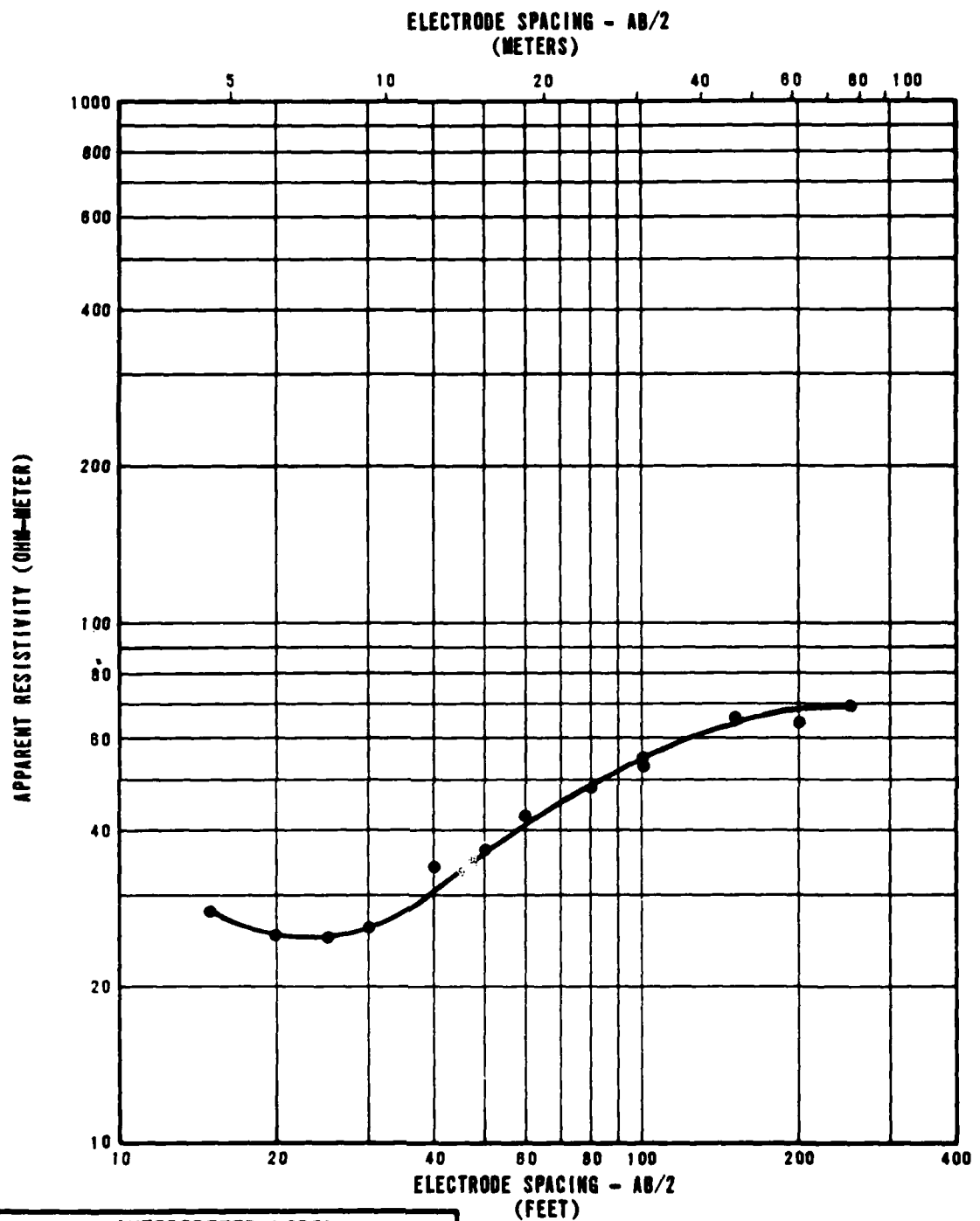
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	9
8	2	90
24	7	180
98	29	55

RESISTIVITY SOUNDING MD-R-5
SOUNDING CURVE AND INTERPRETATION
OPERATIONAL BASE SITE, MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-8-5

FUGRO NATIONAL INC.



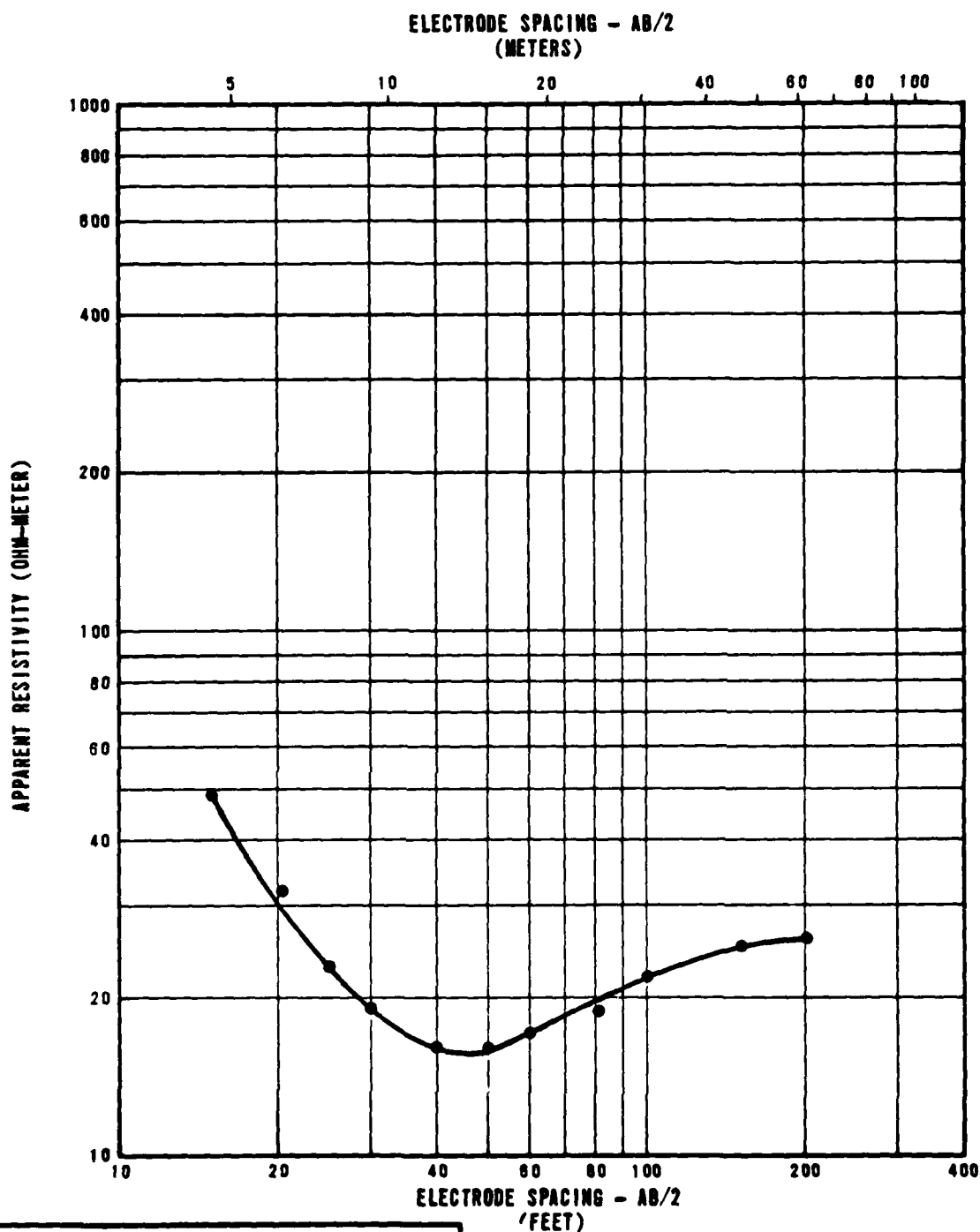
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	35
5	2	19
25	8	290
35	11	85
119	36	55

RESISTIVITY SOUNDING MD-R-6
SOUNDING CURVE AND INTERPRETATION
OPERATIONAL BASE SITE, MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-8-6

FUGRO NATIONAL INC.



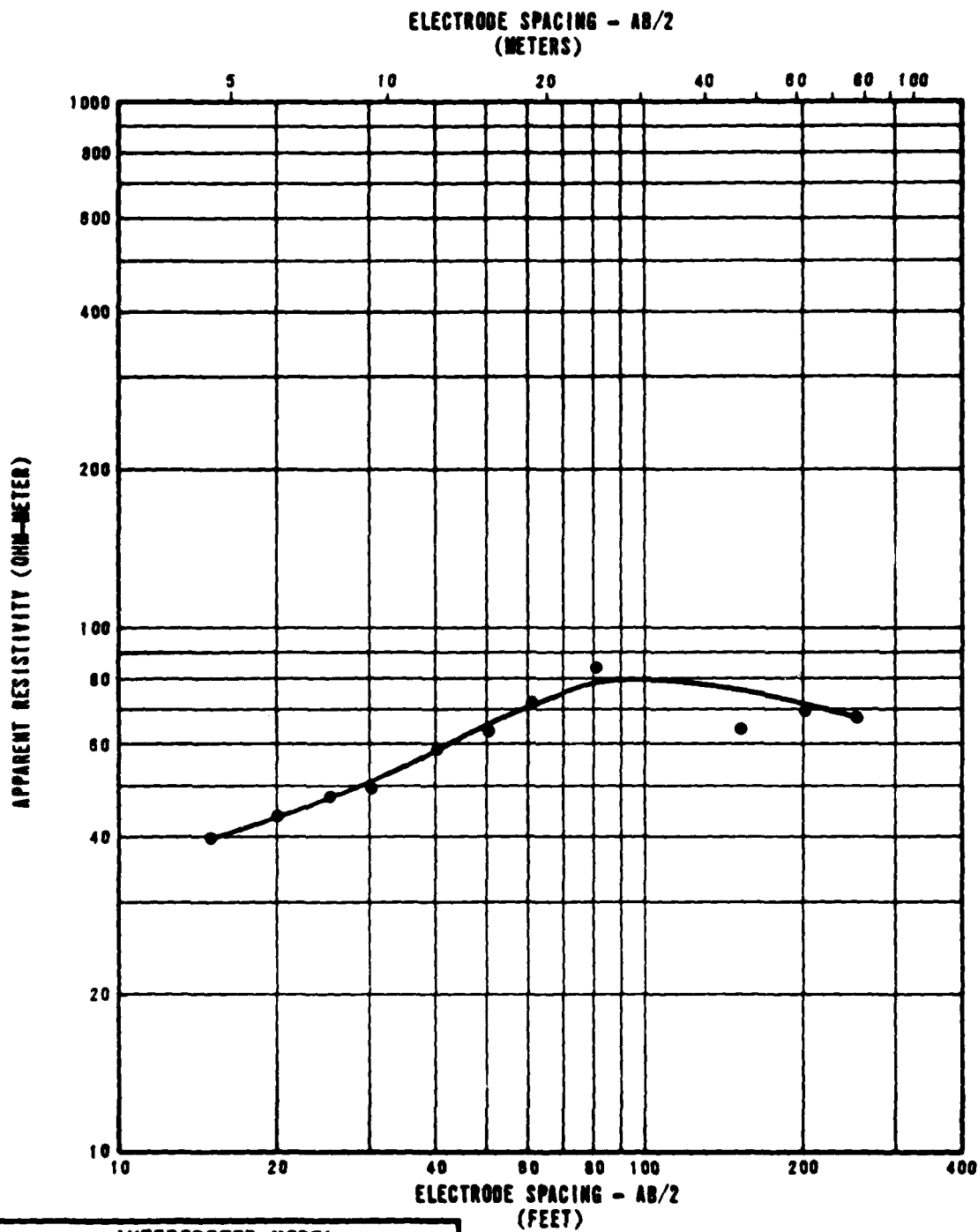
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	50
11	3	.9
32	10	45
79	24	25

RESISTIVITY SOUNDING MD-R-7
SOUNDING CURVE AND INTERPRETATION
OPERATIONAL BASE SITE, MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-8-7

FUGRO NATIONAL INC.



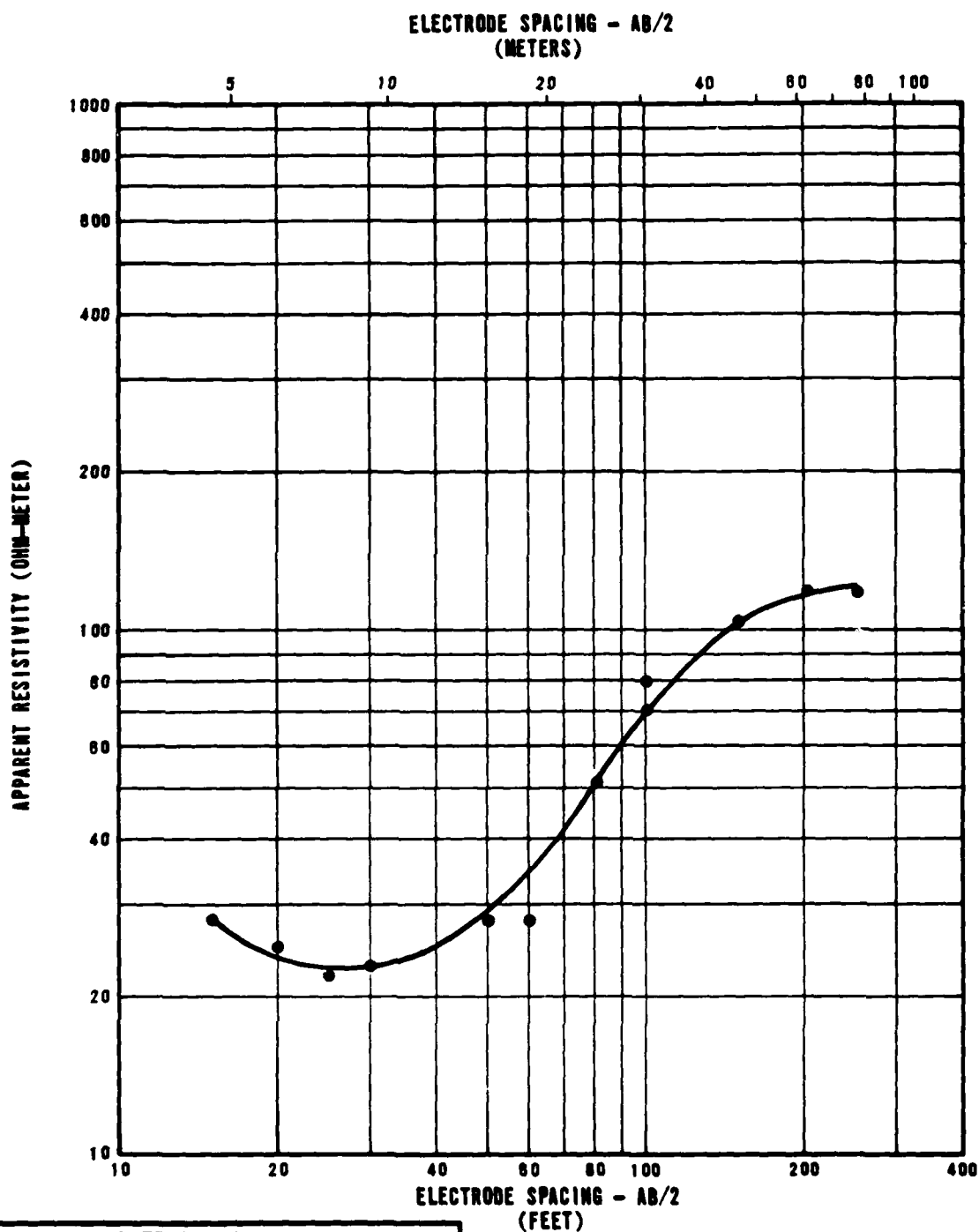
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	35
13	4	100.
88	27	45

RESISTIVITY SOUNDING MD -R- 8
SOUNDING CURVE AND INTERPRETATION
OPERATIONAL BASE SITE, MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - ONO

FIGURE
II-8-8

FUGRO NATIONAL INC.



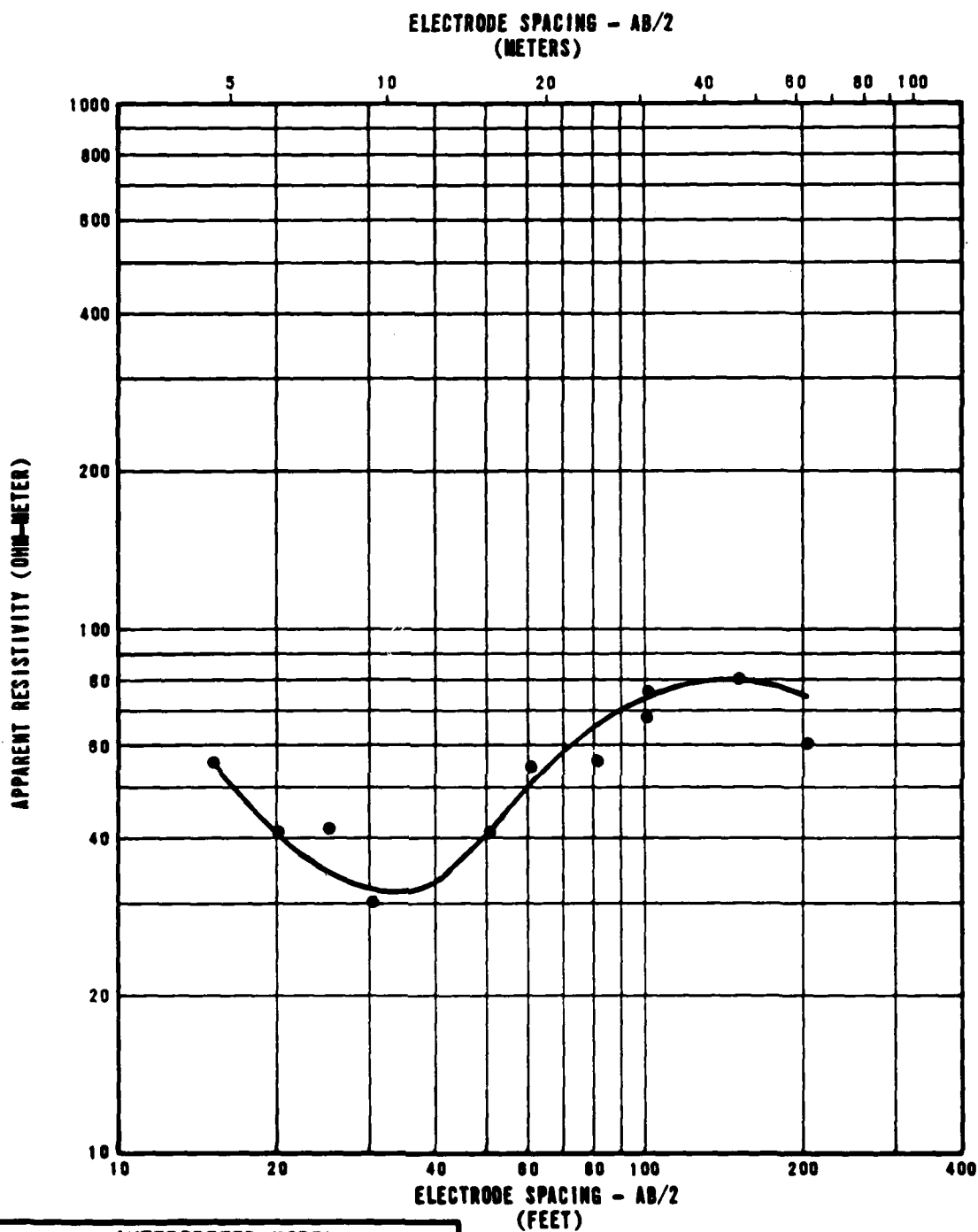
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	35
9	3	18
32	10	340
43	13	1970
61	19	480

RESISTIVITY SOUNDING MD-R-9
SOUNDING CURVE AND INTERPRETATION
OPERATIONAL BASE SITE, MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-8-9

FUGRO NATIONAL INC.



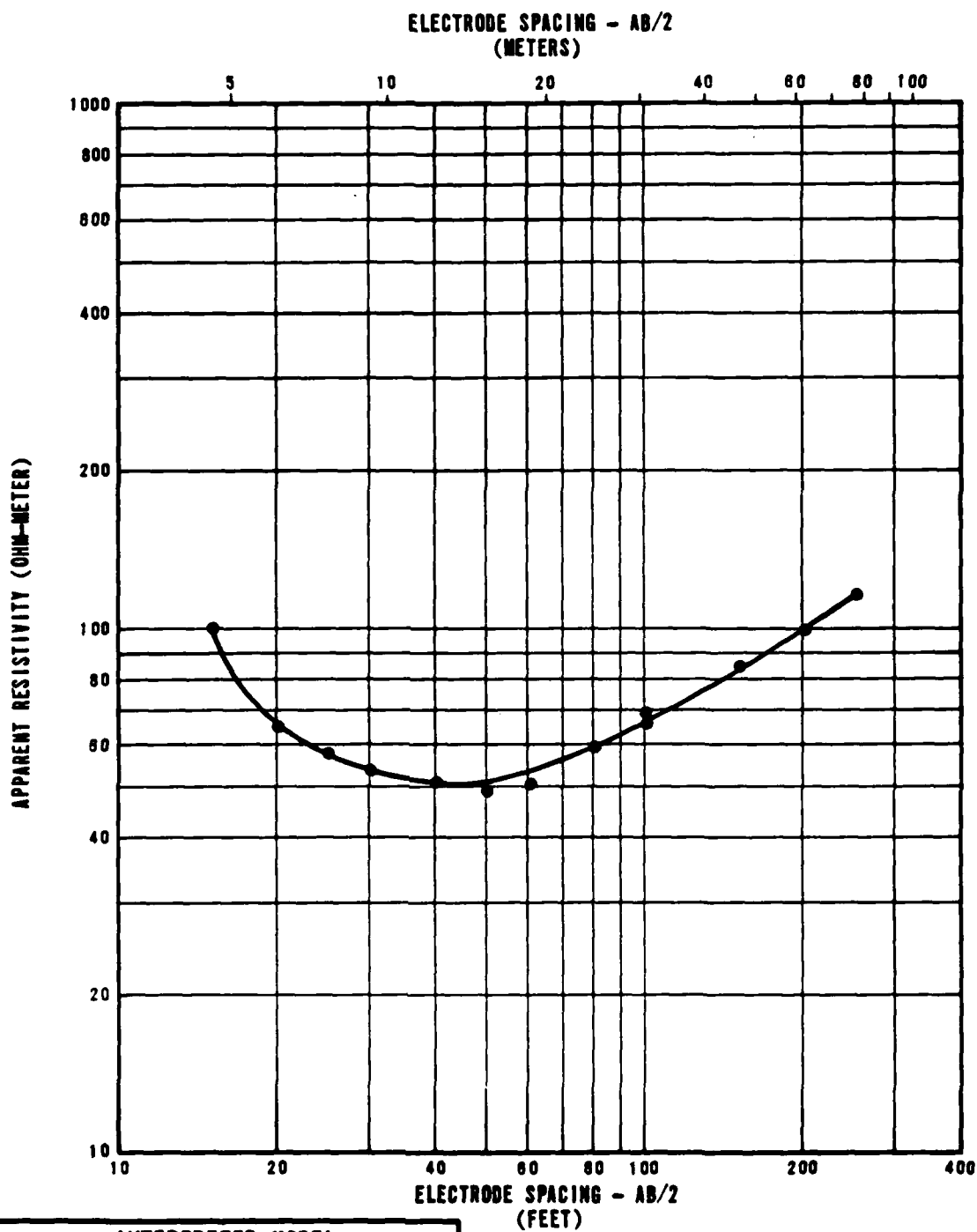
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	55
8	2	35
38	12	410
44	13	200
68	21	65

RESISTIVITY SOUNDING MD -R-10
SOUNDING CURVE AND INTERPRETATION
OPERATIONAL BASE SITE, MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - DMO

FIGURE
II-8-10

FURRO NATIONAL, INC.



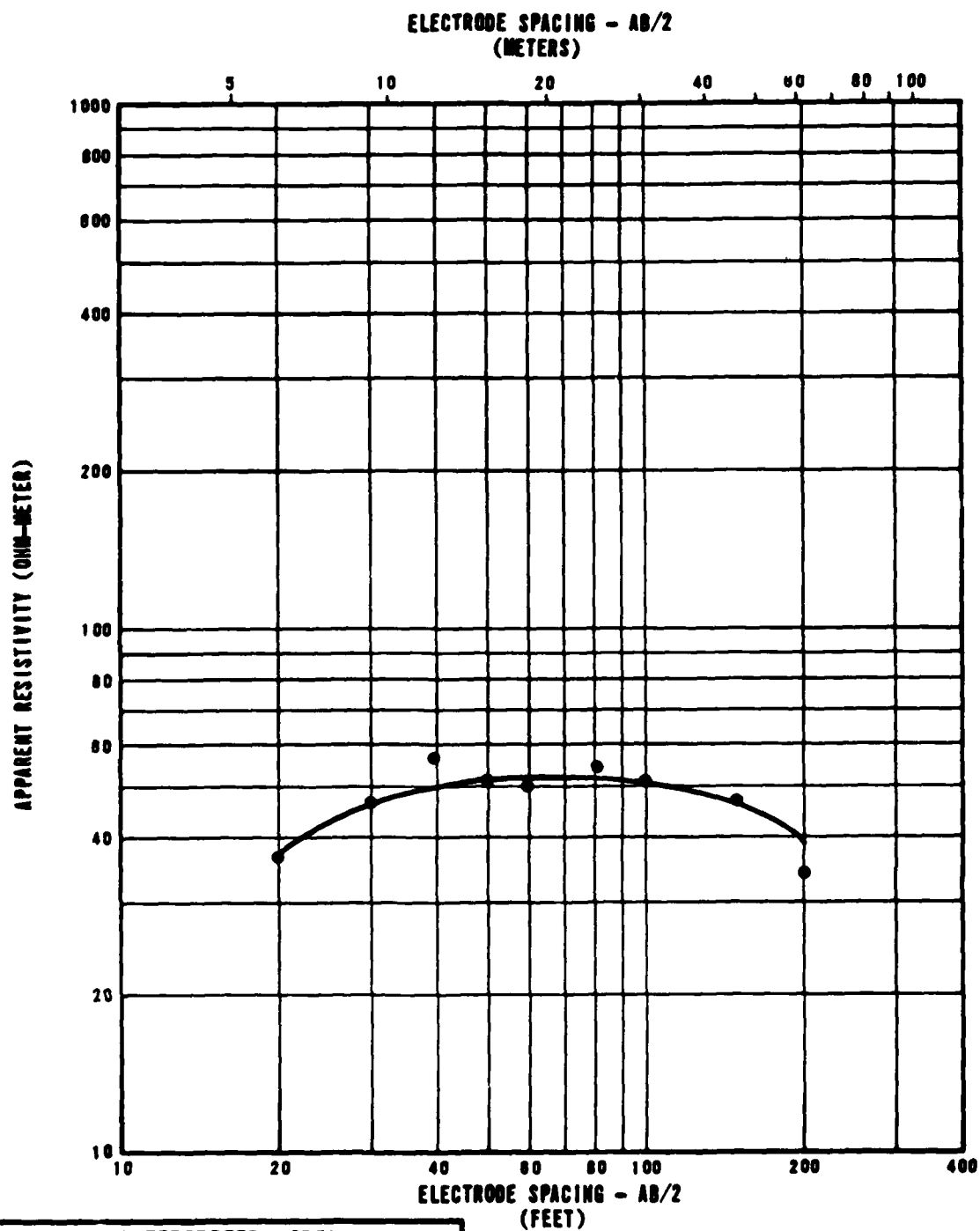
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	180
7	2	55
77	23	230

RESISTIVITY SOUNDING MD-R-11
SOUNDING CURVE AND INTERPRETATION
OPERATIONAL BASE SITE, MILFORD, UTAH

MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - ONO

FIGURE
II-8-11

FUGRO NATIONAL INC.



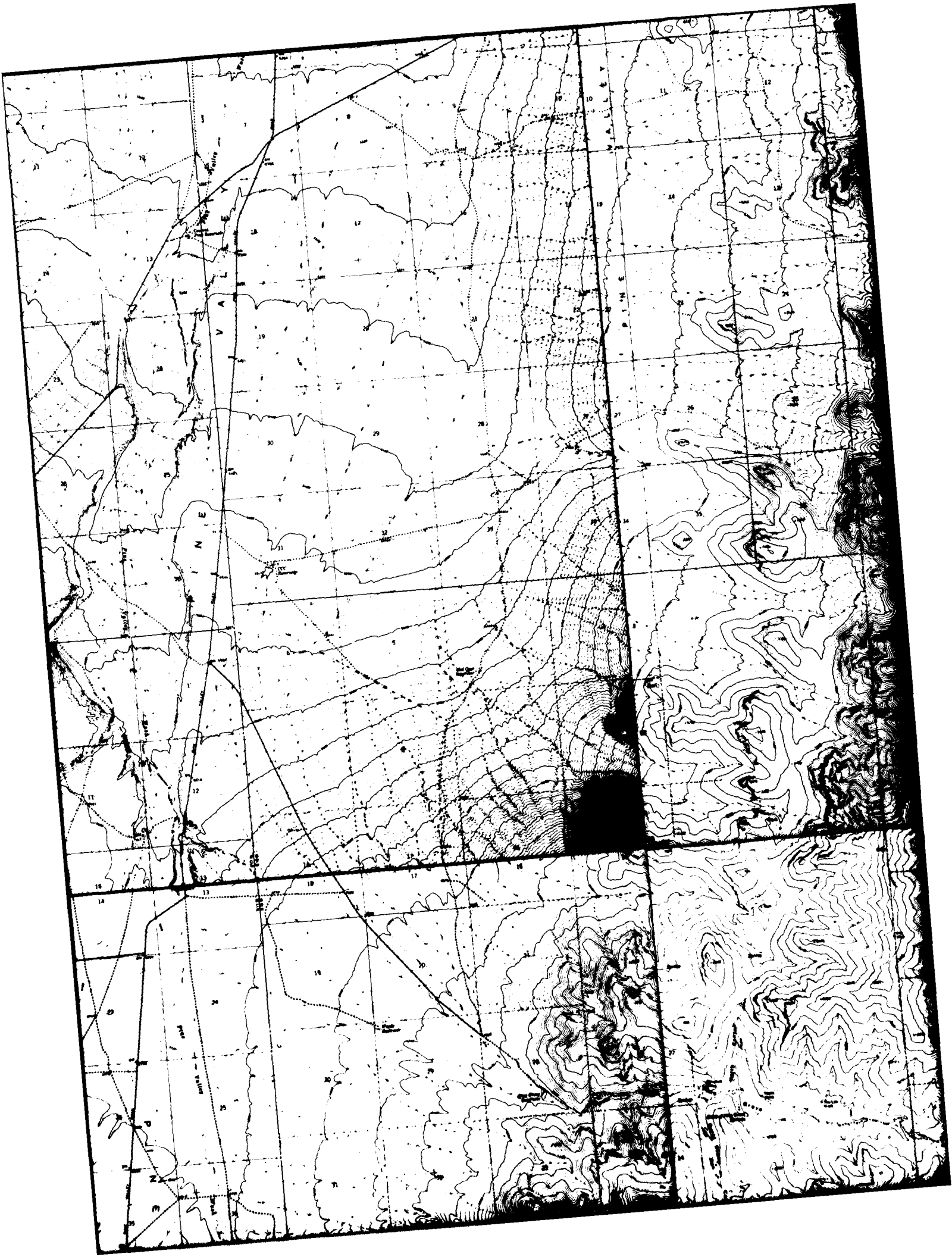
INTERPRETED MODEL		
LAYER DEPTH		RESISTIVITY VALUES
FEET	METERS	OHM-METER
0	0	30
6	2	60
68	21	45
104	32	25

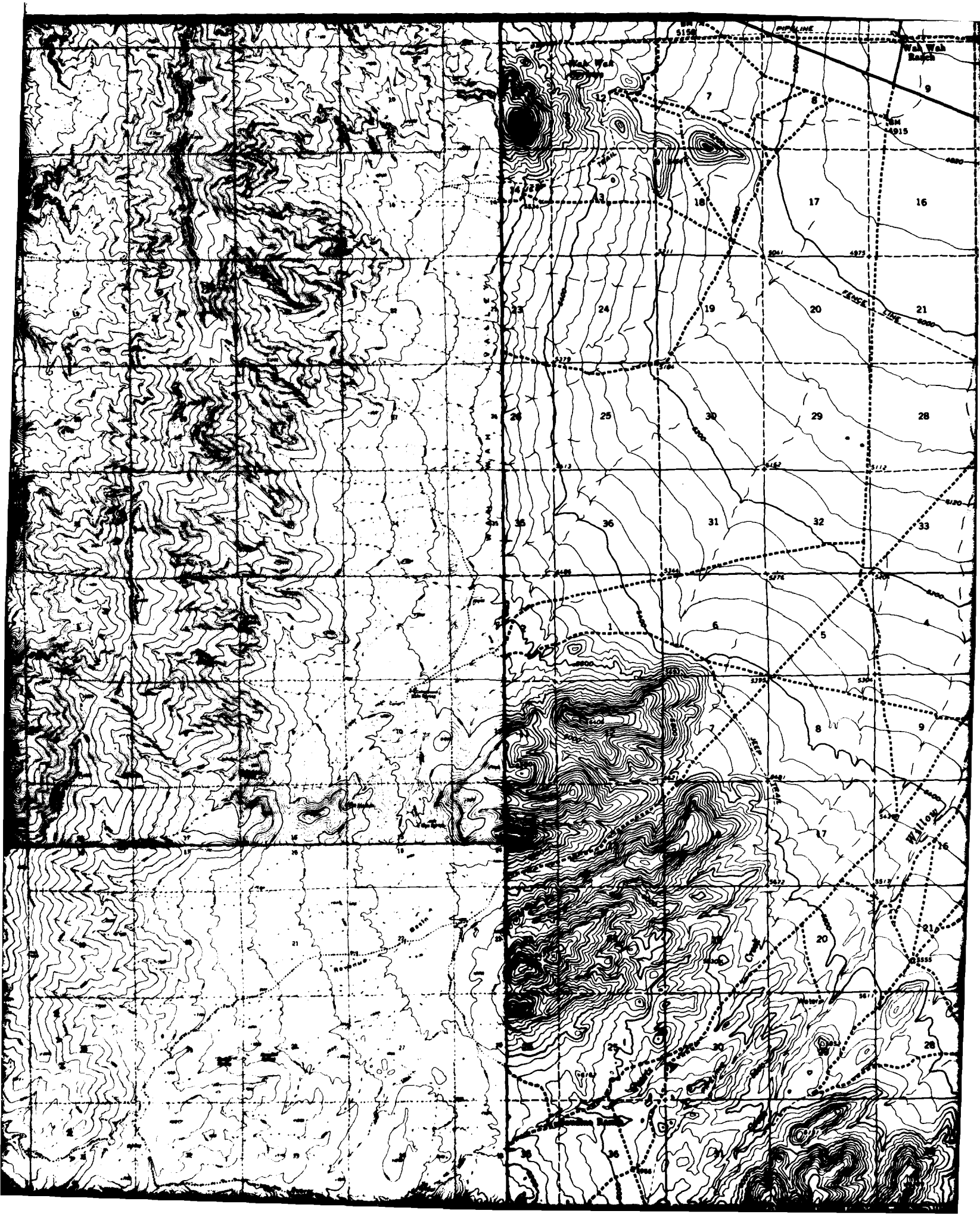
RESISTIVITY SOUNDING BL-R-2
SOUNDING CURVE AND INTERPRETATION
OPERATIONAL BASE SITE, MILFORD, UTAH

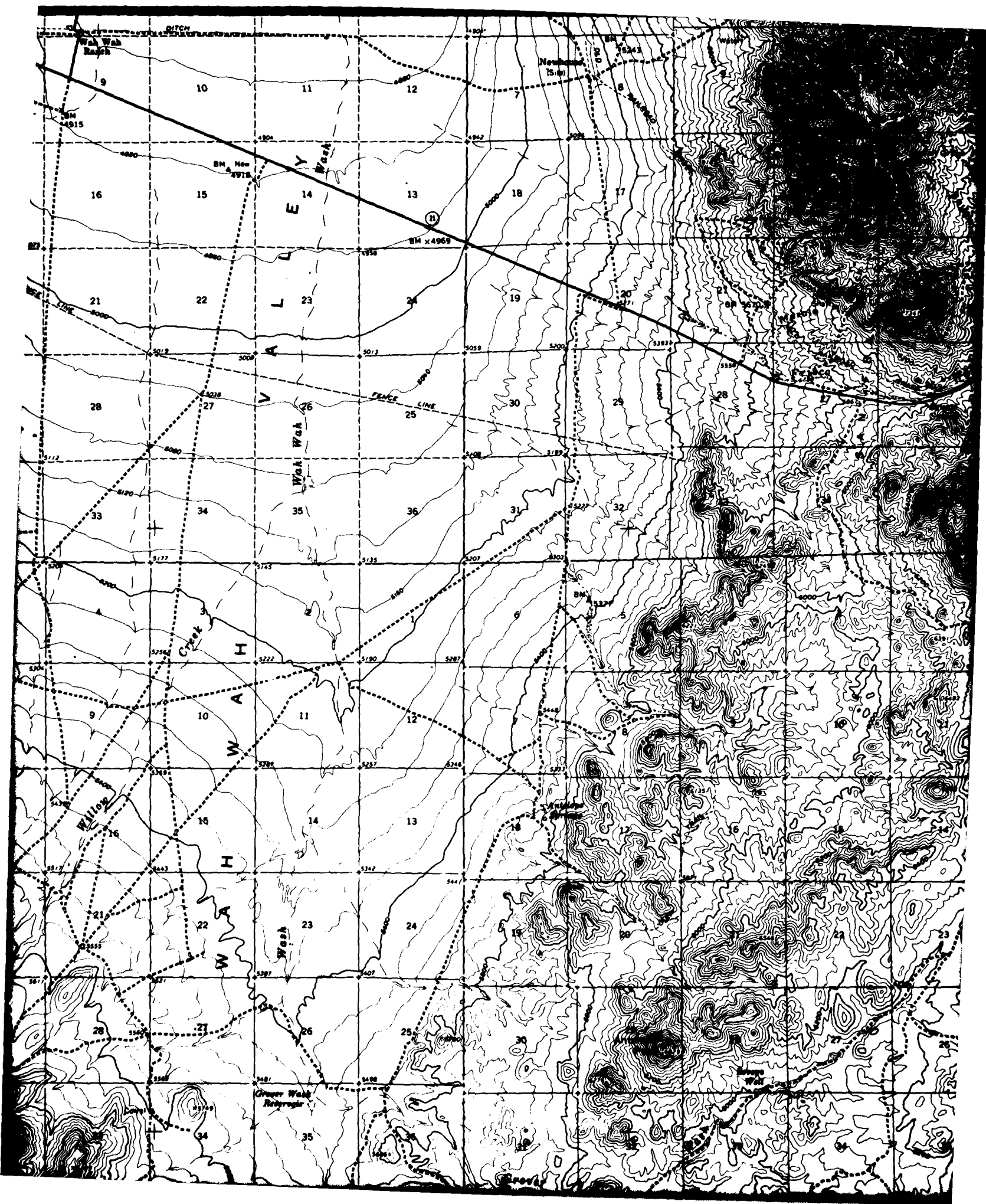
MX SITING INVESTIGATION
DEPARTMENT OF THE AIR FORCE - 000

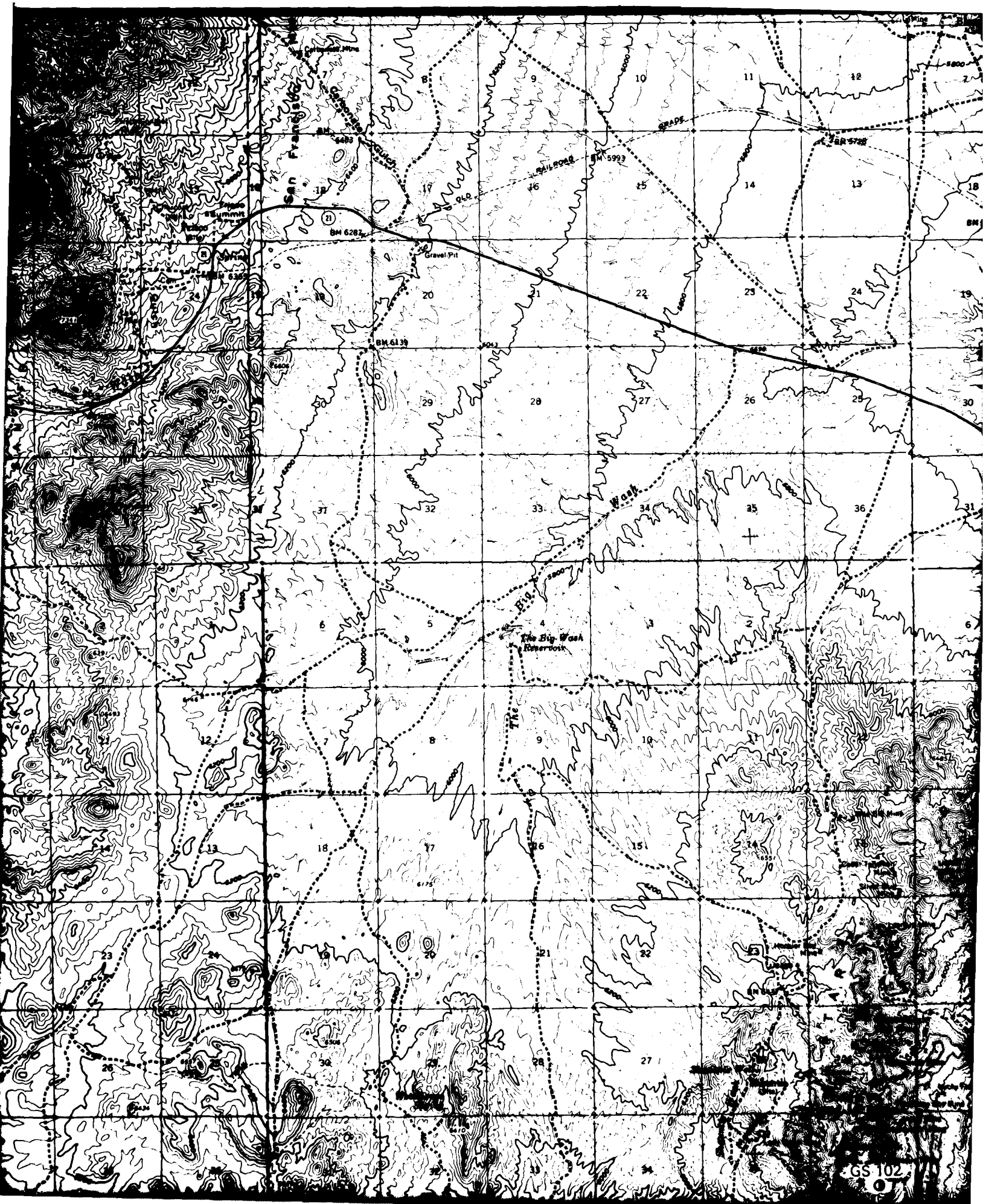
FIGURE
II-8-12

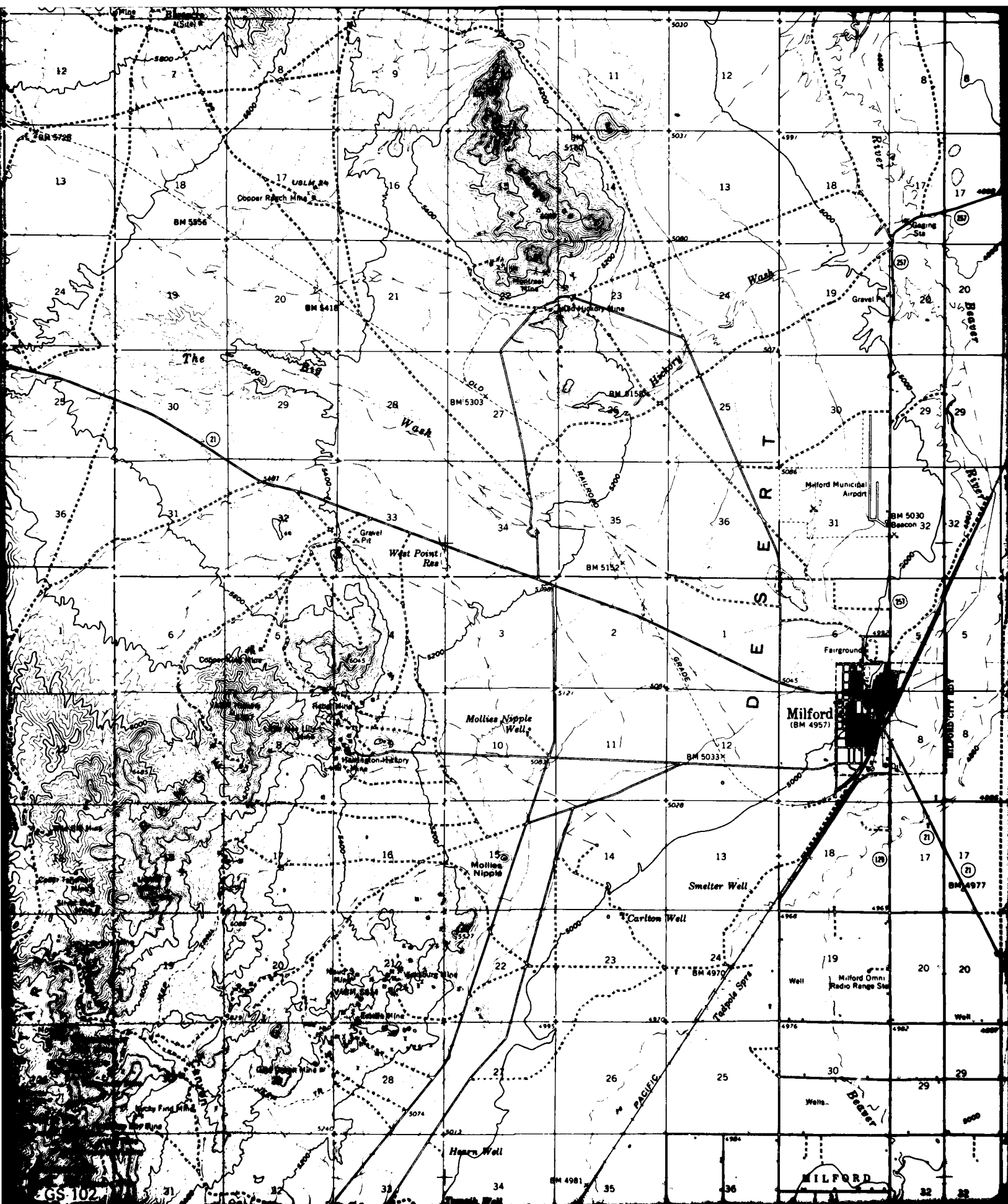
FUSRO NATIONAL, INC.

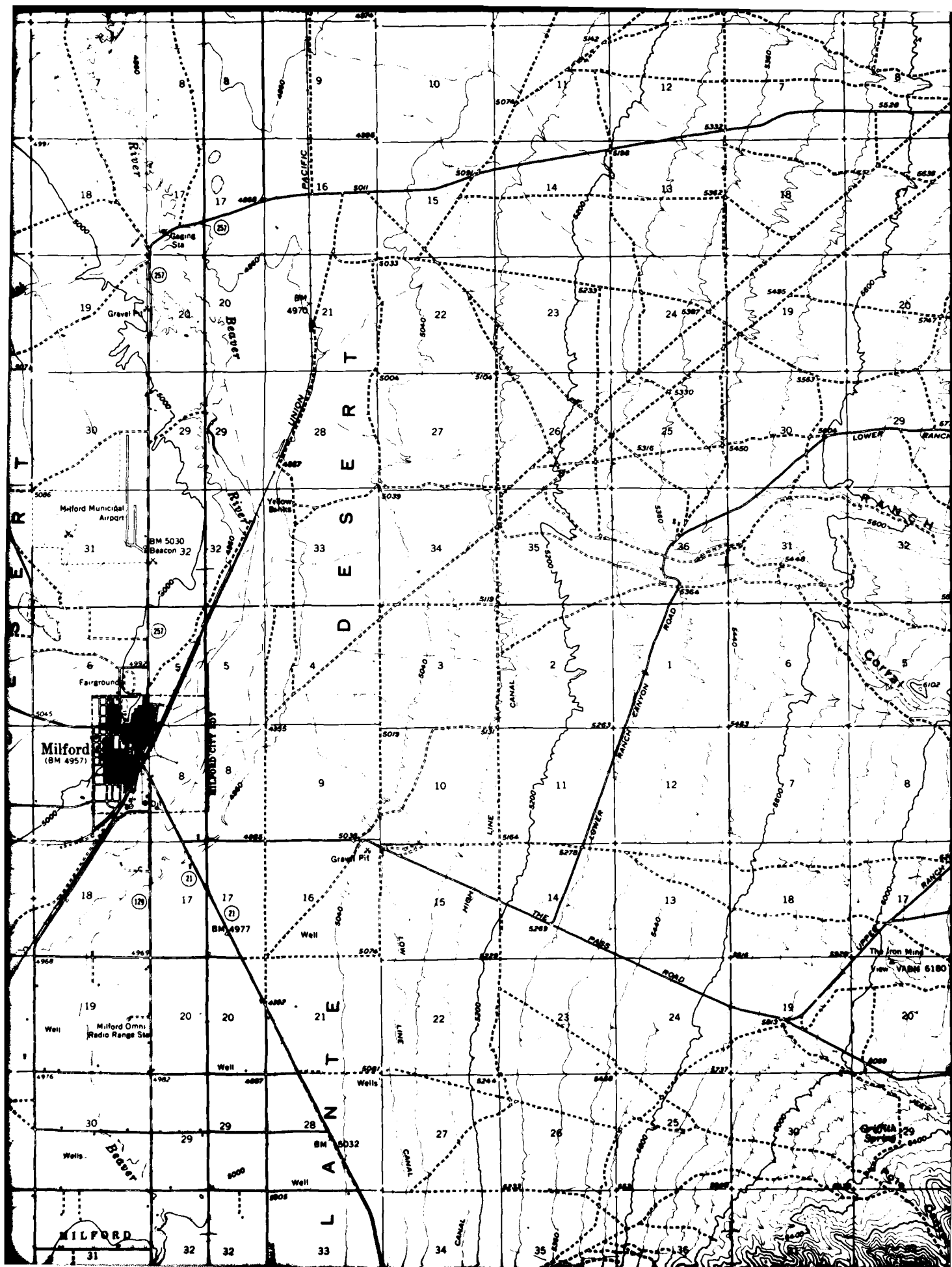


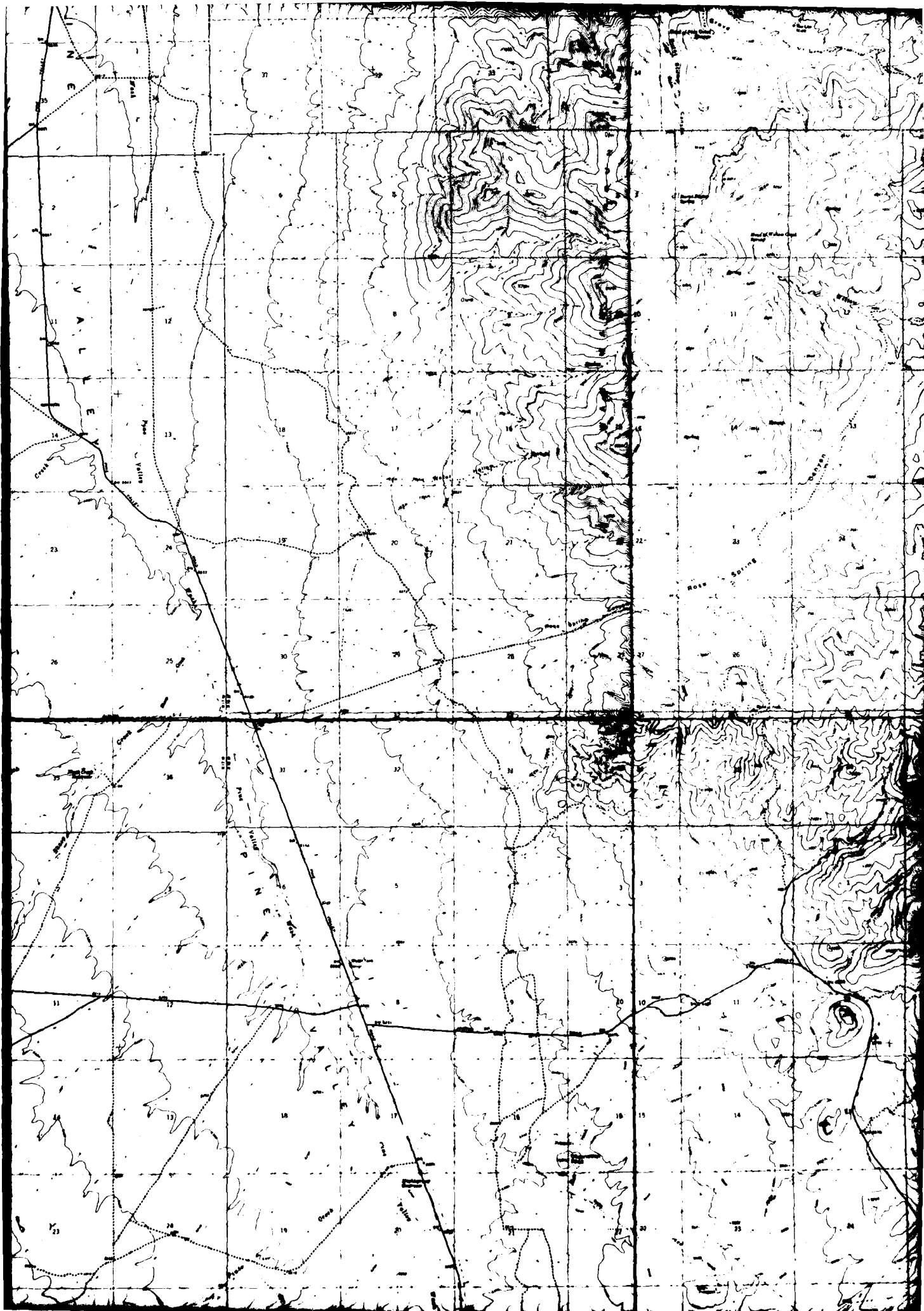


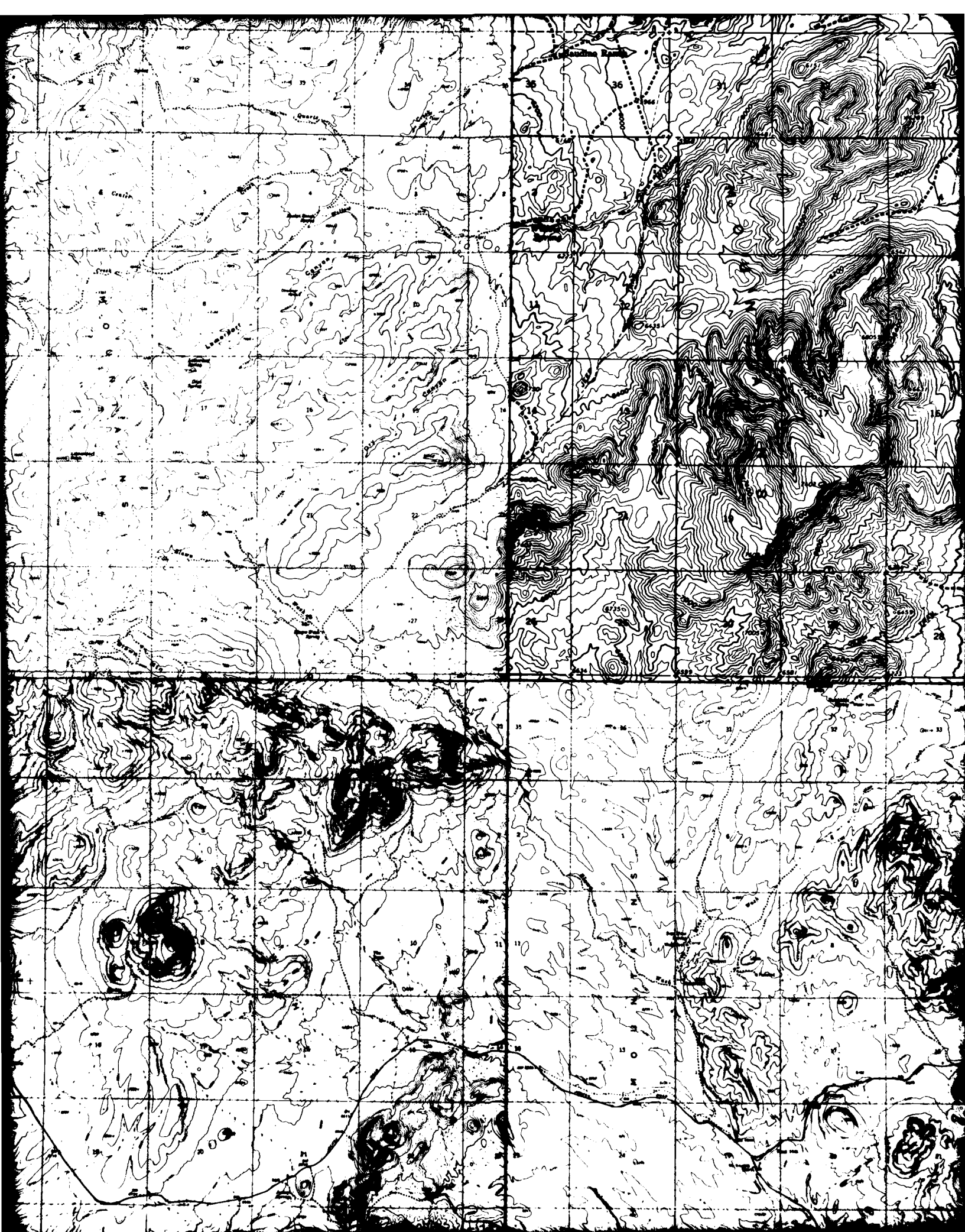


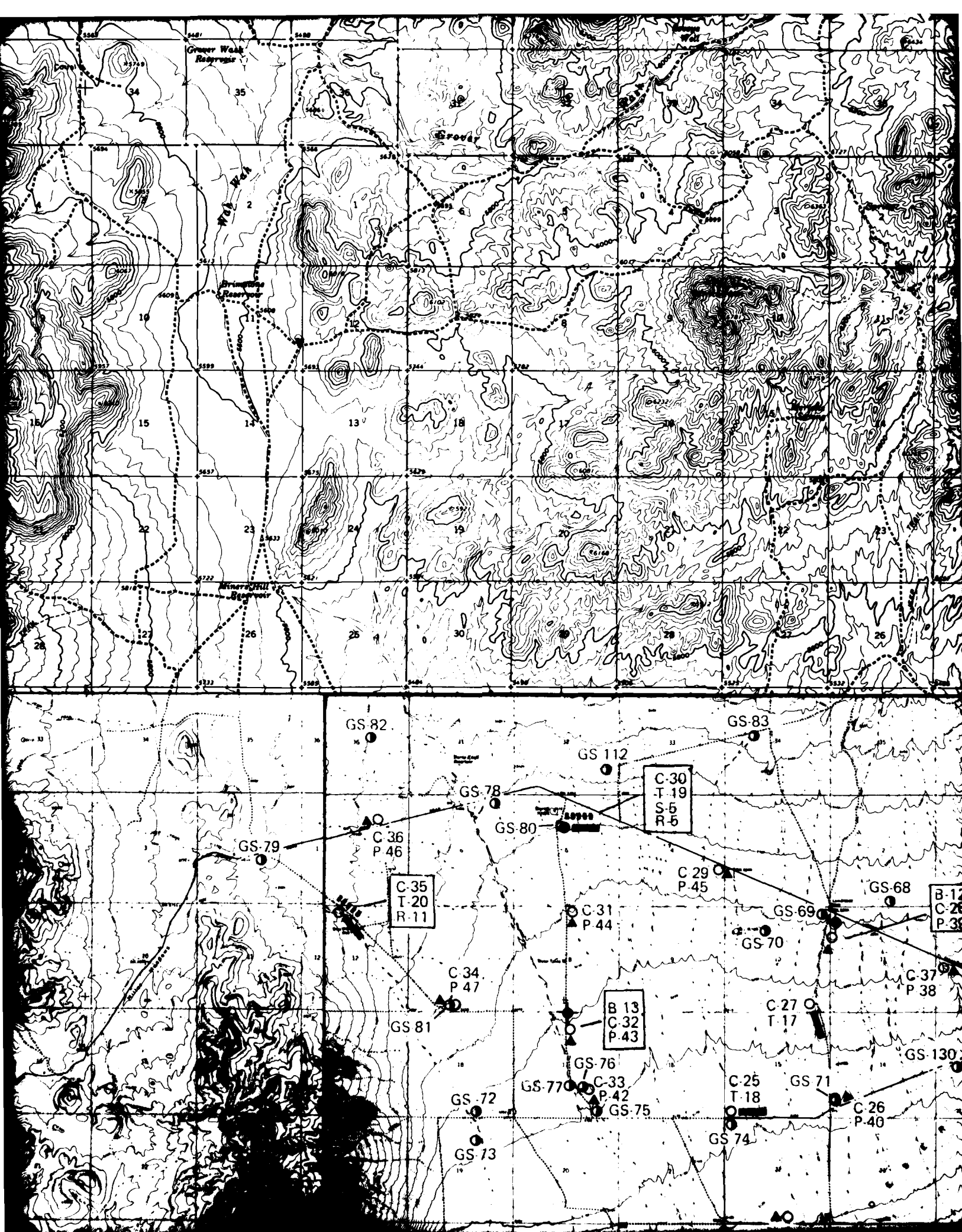


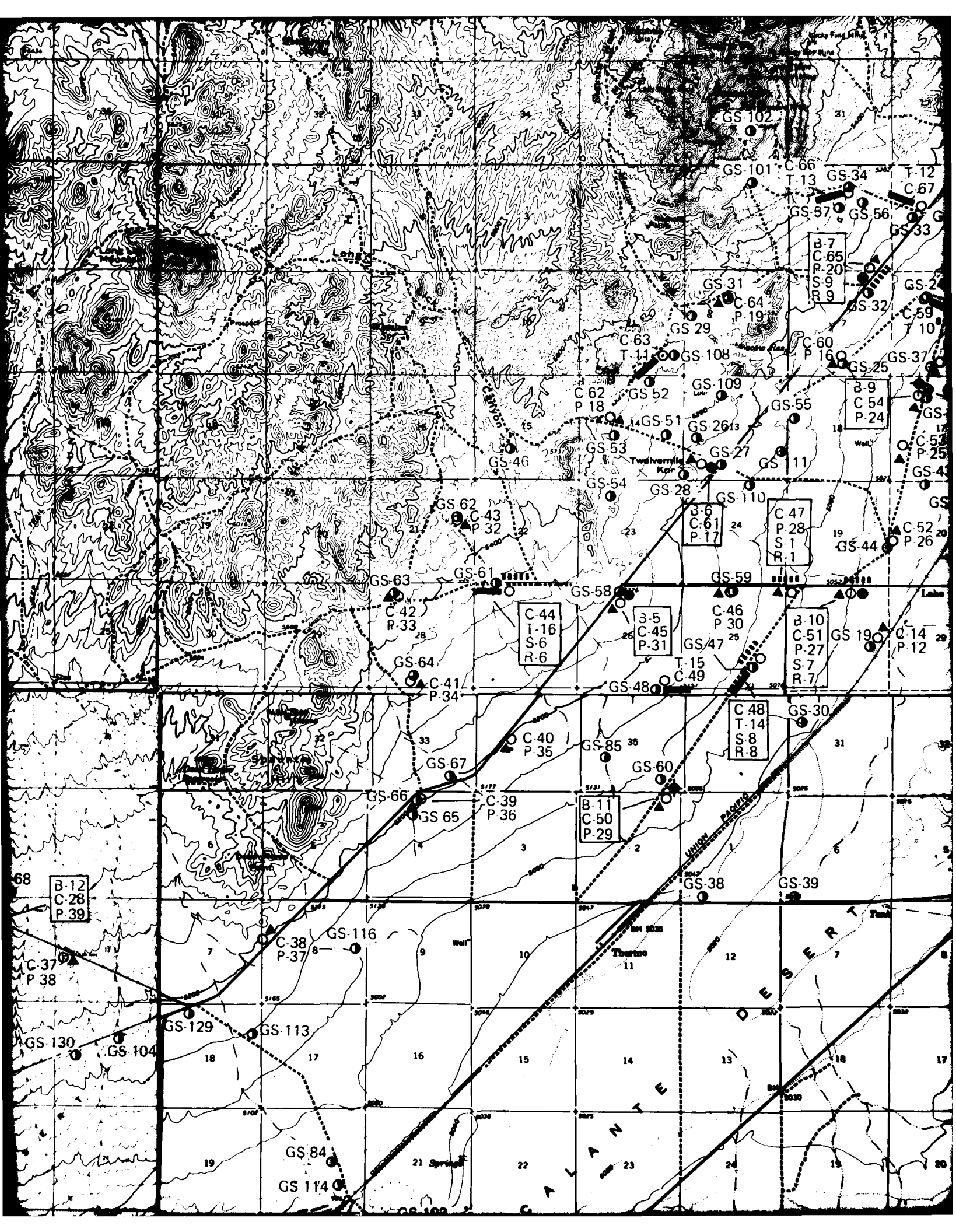


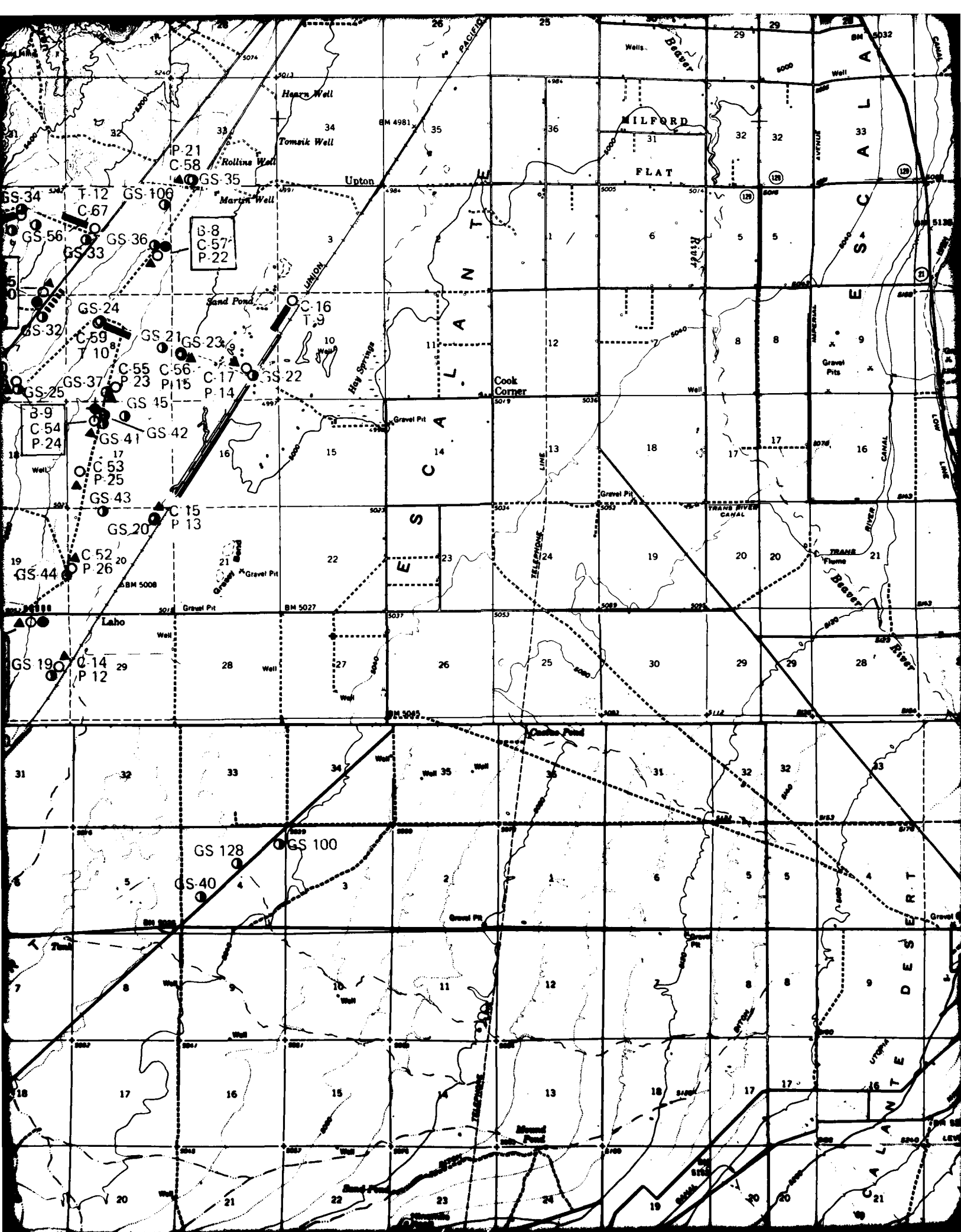


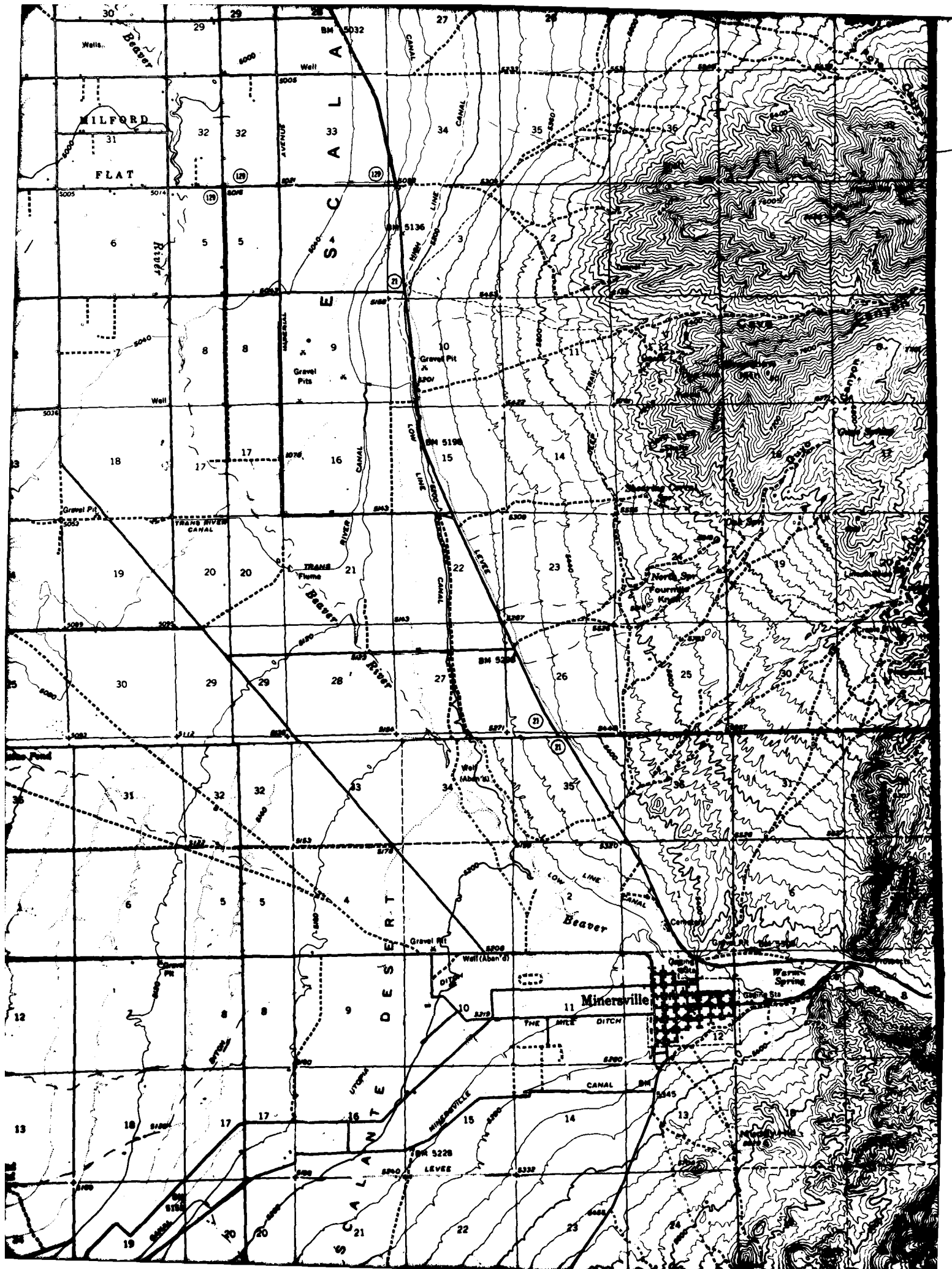


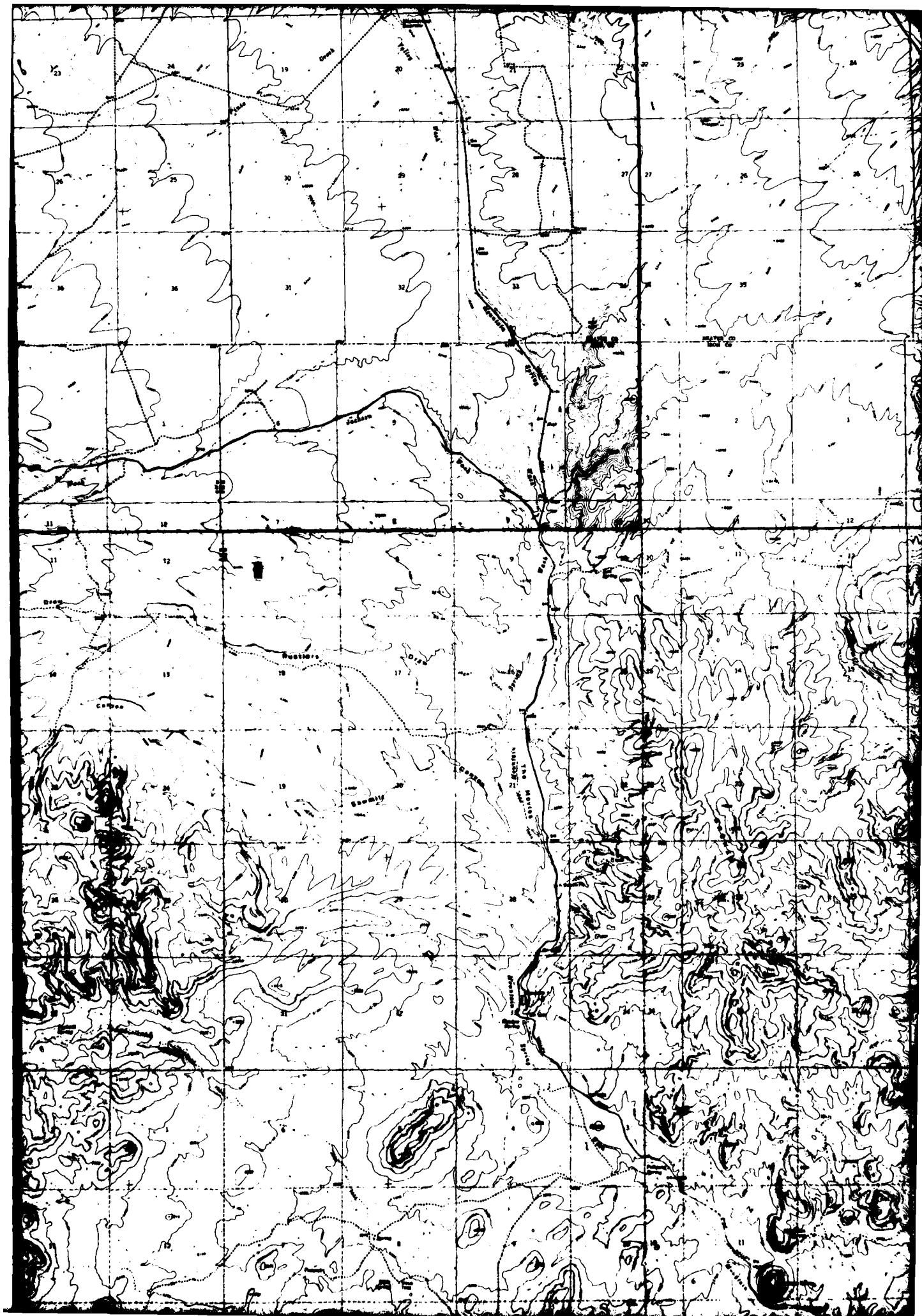


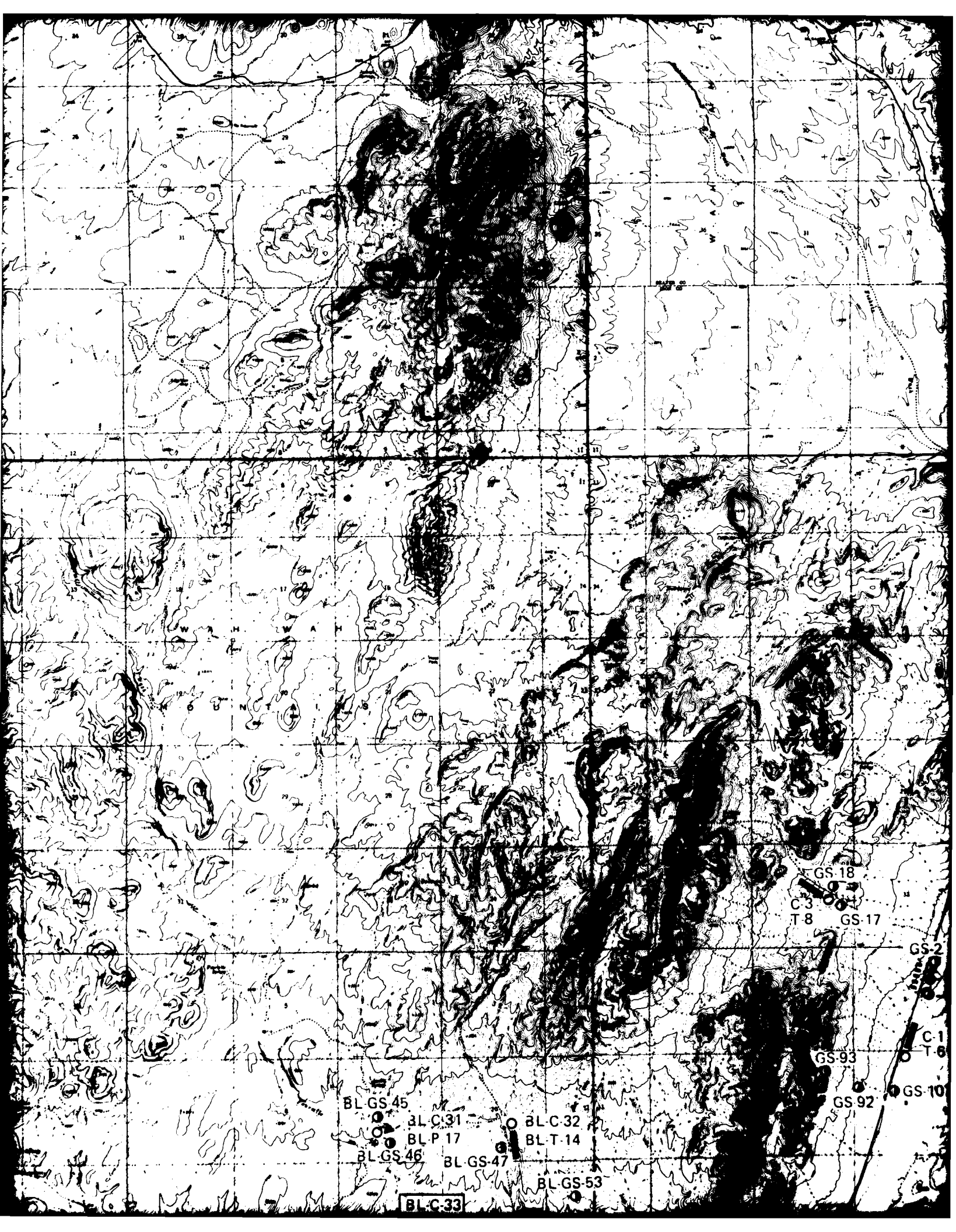


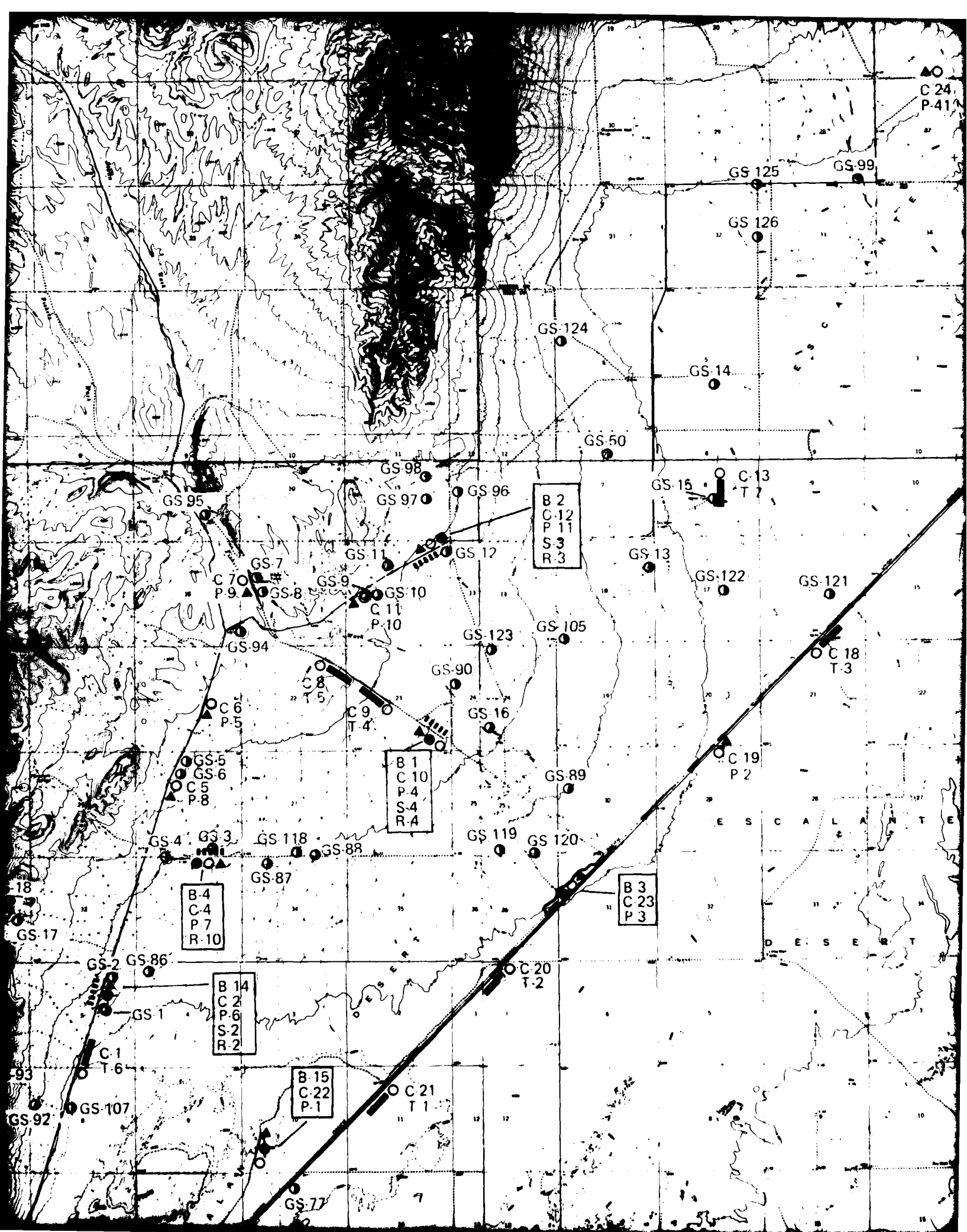


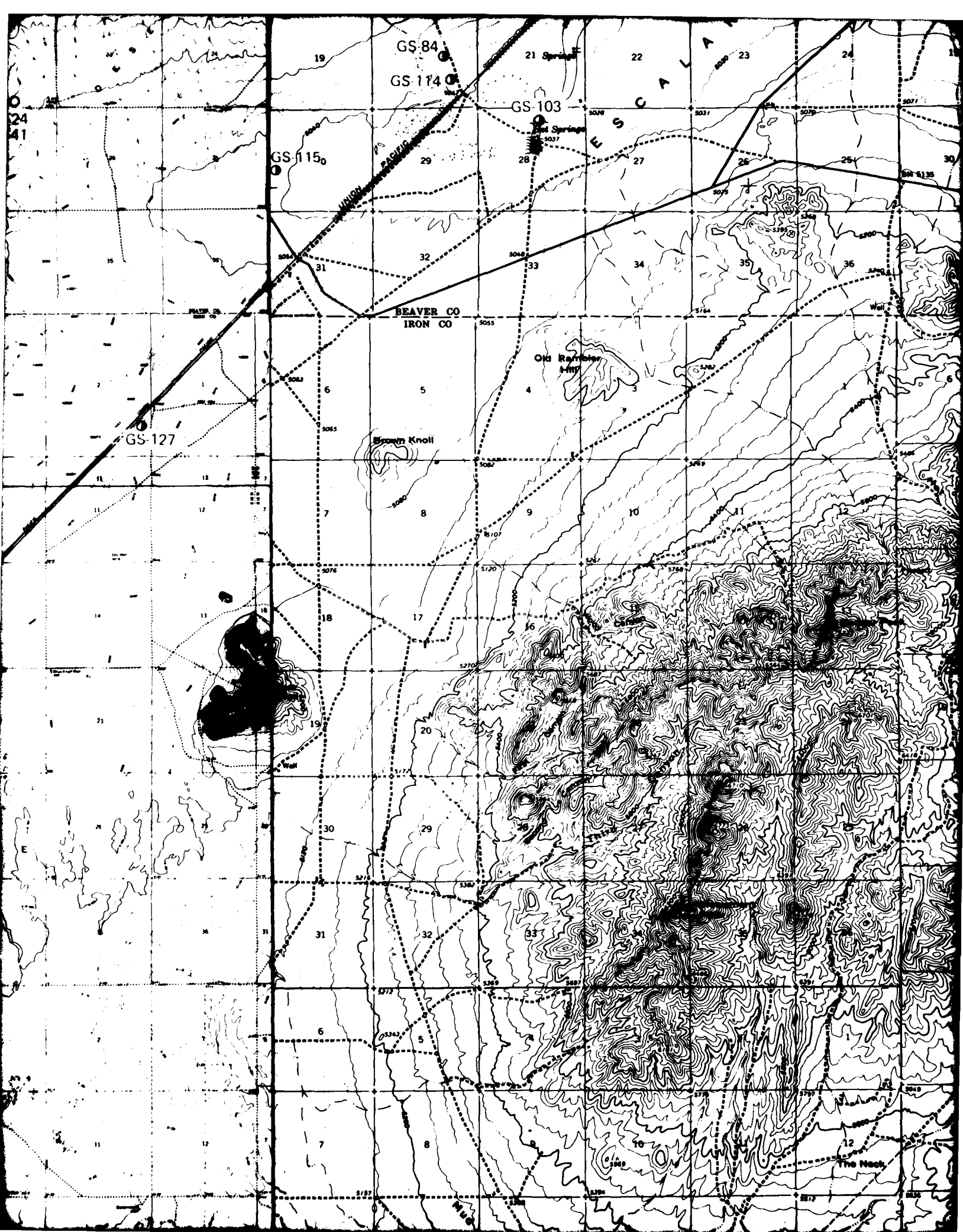


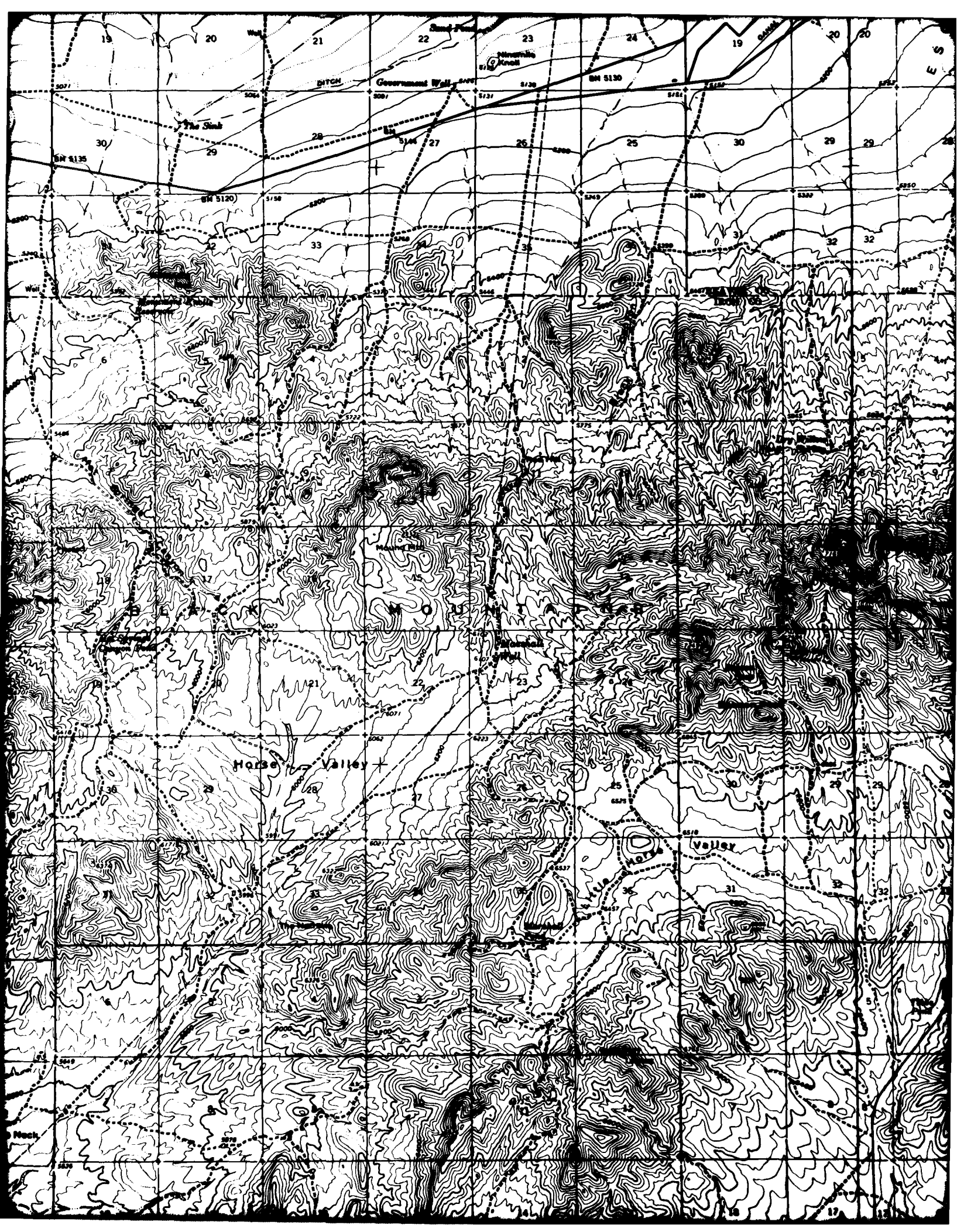


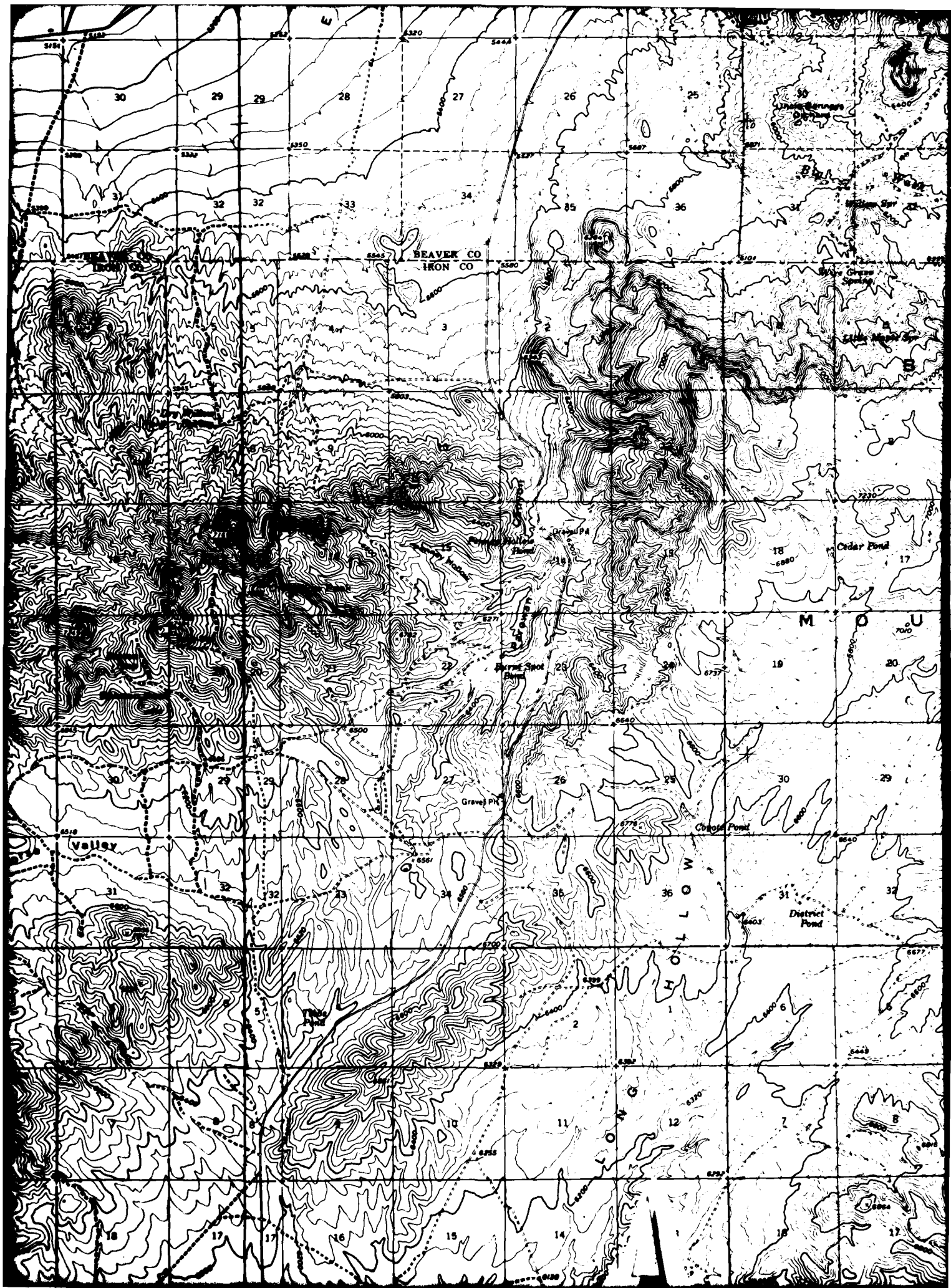


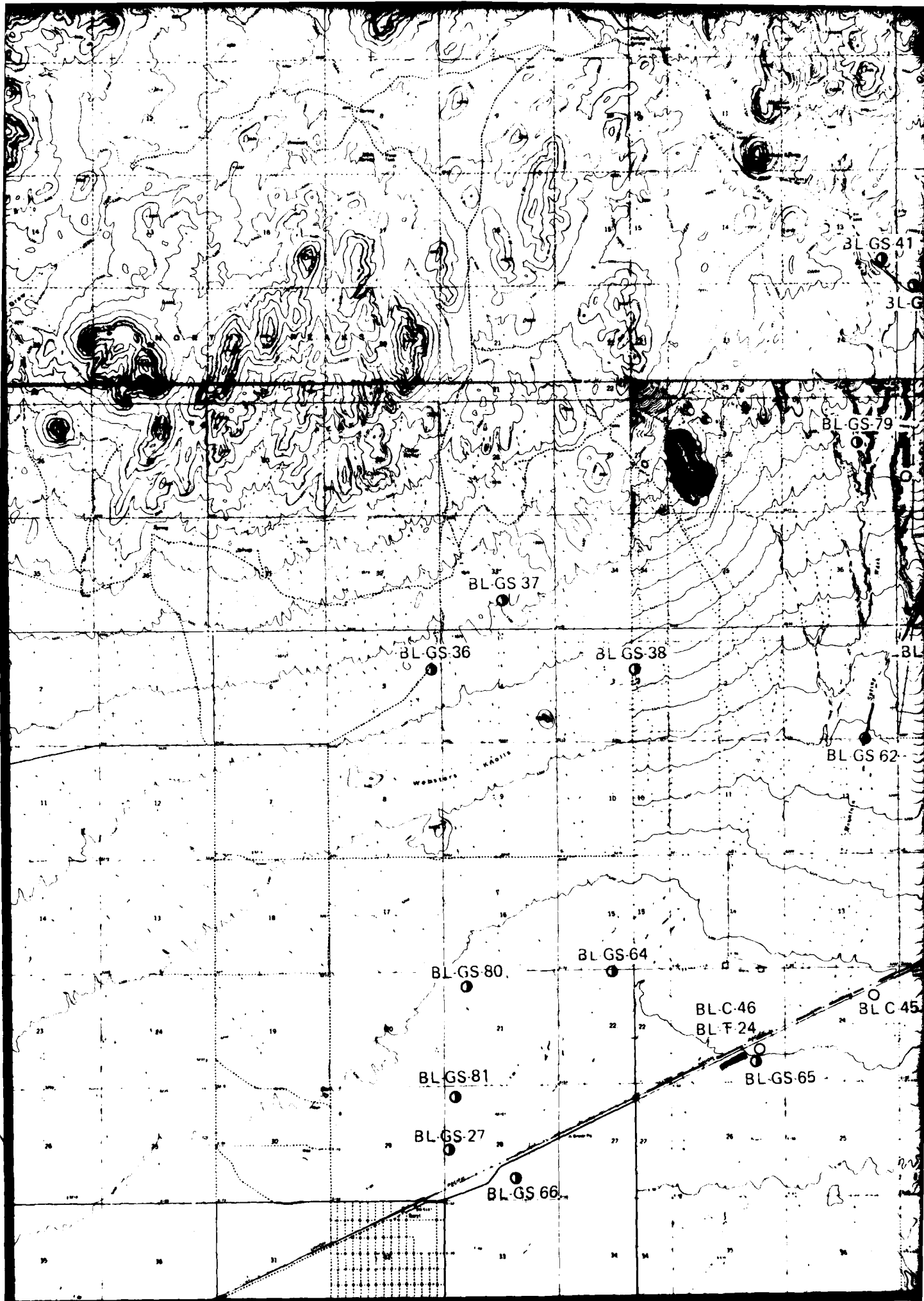


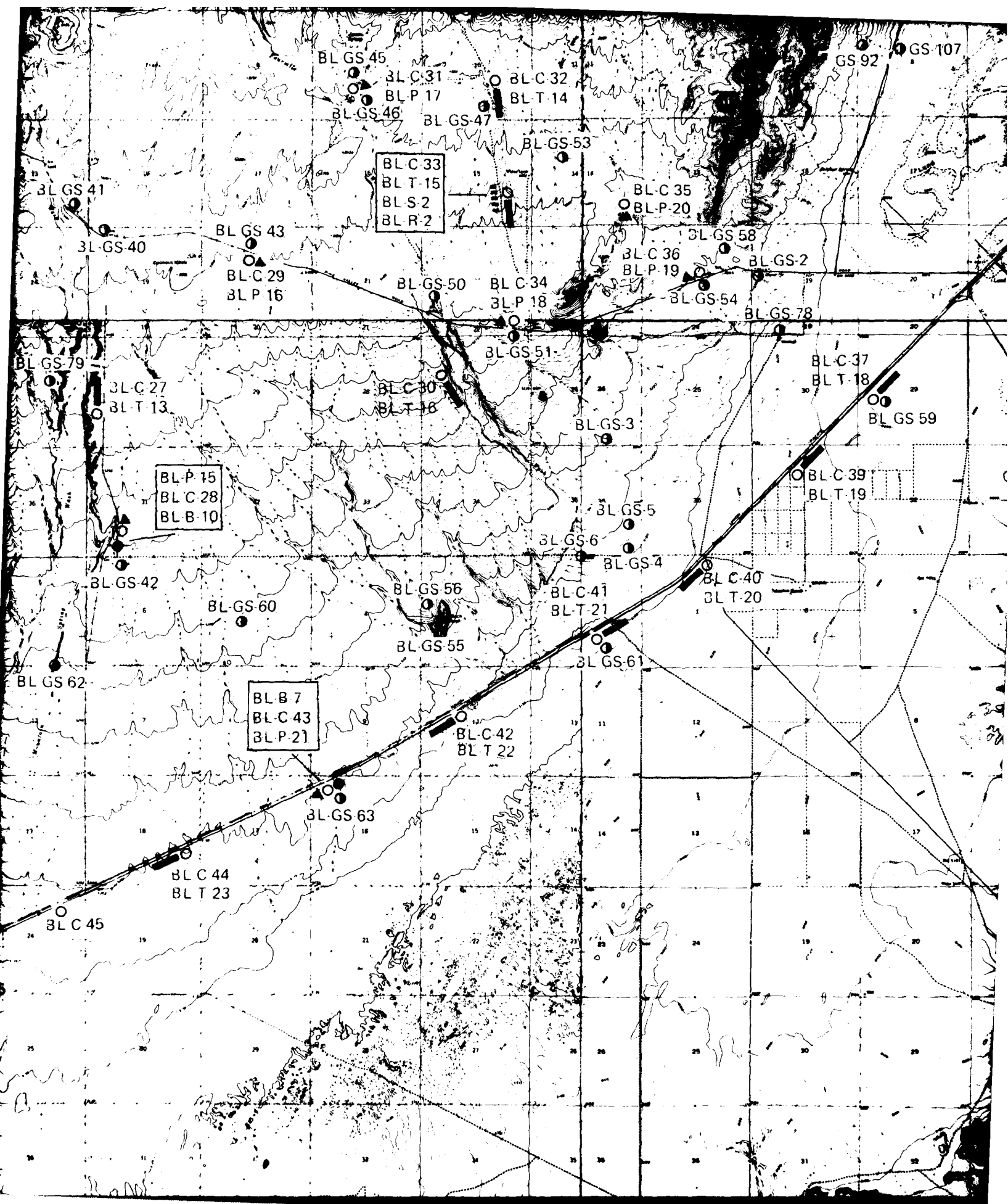


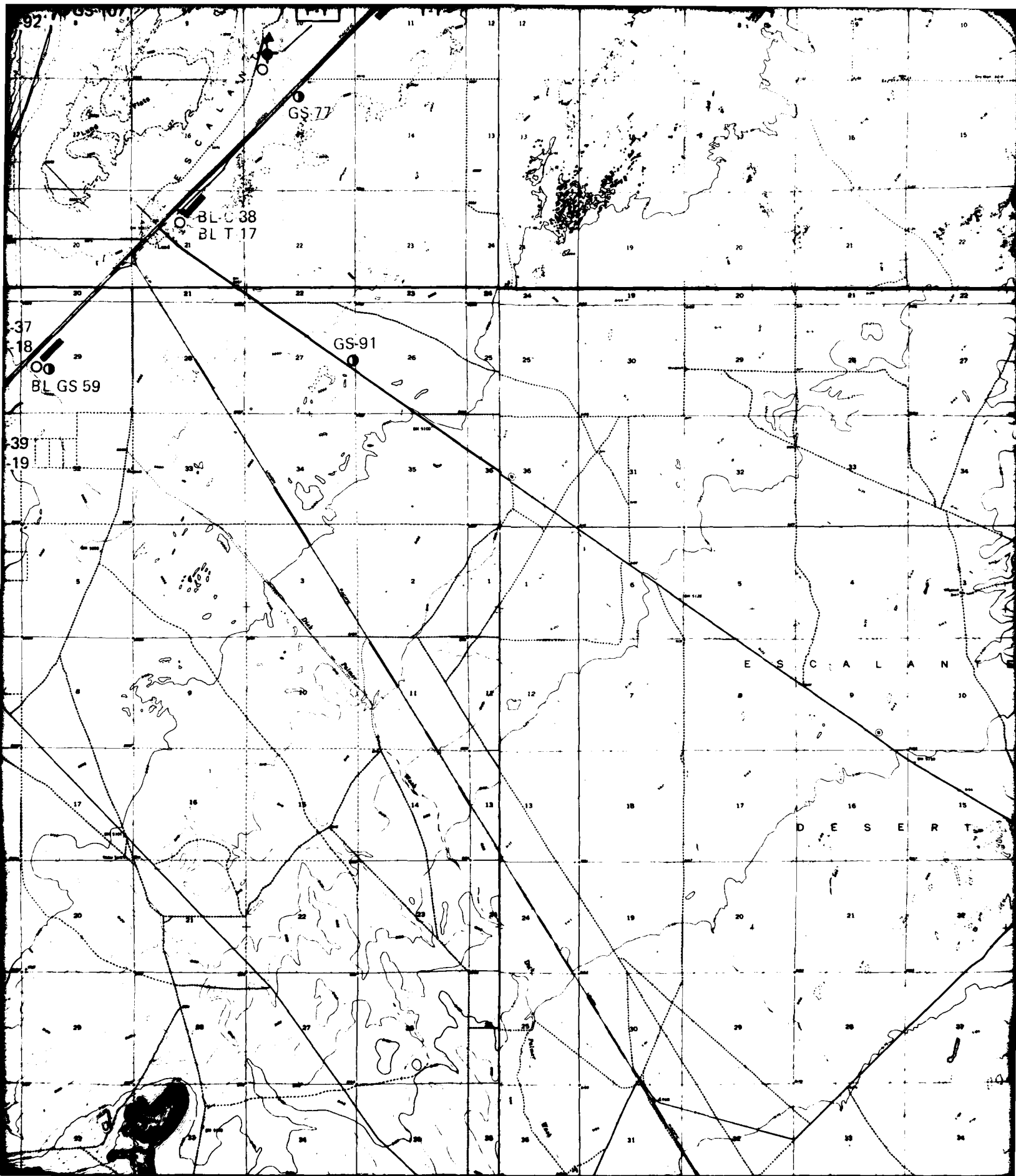


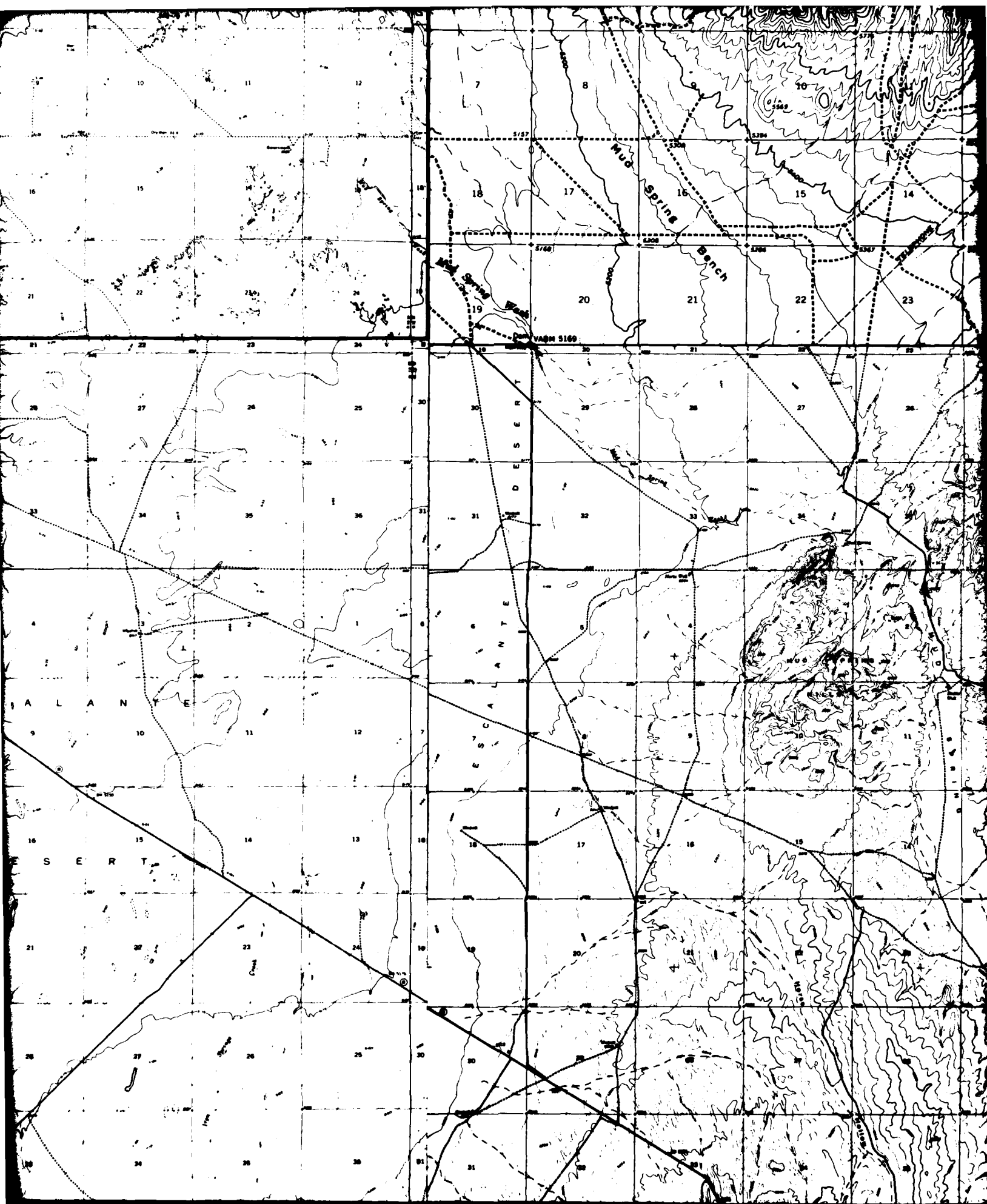


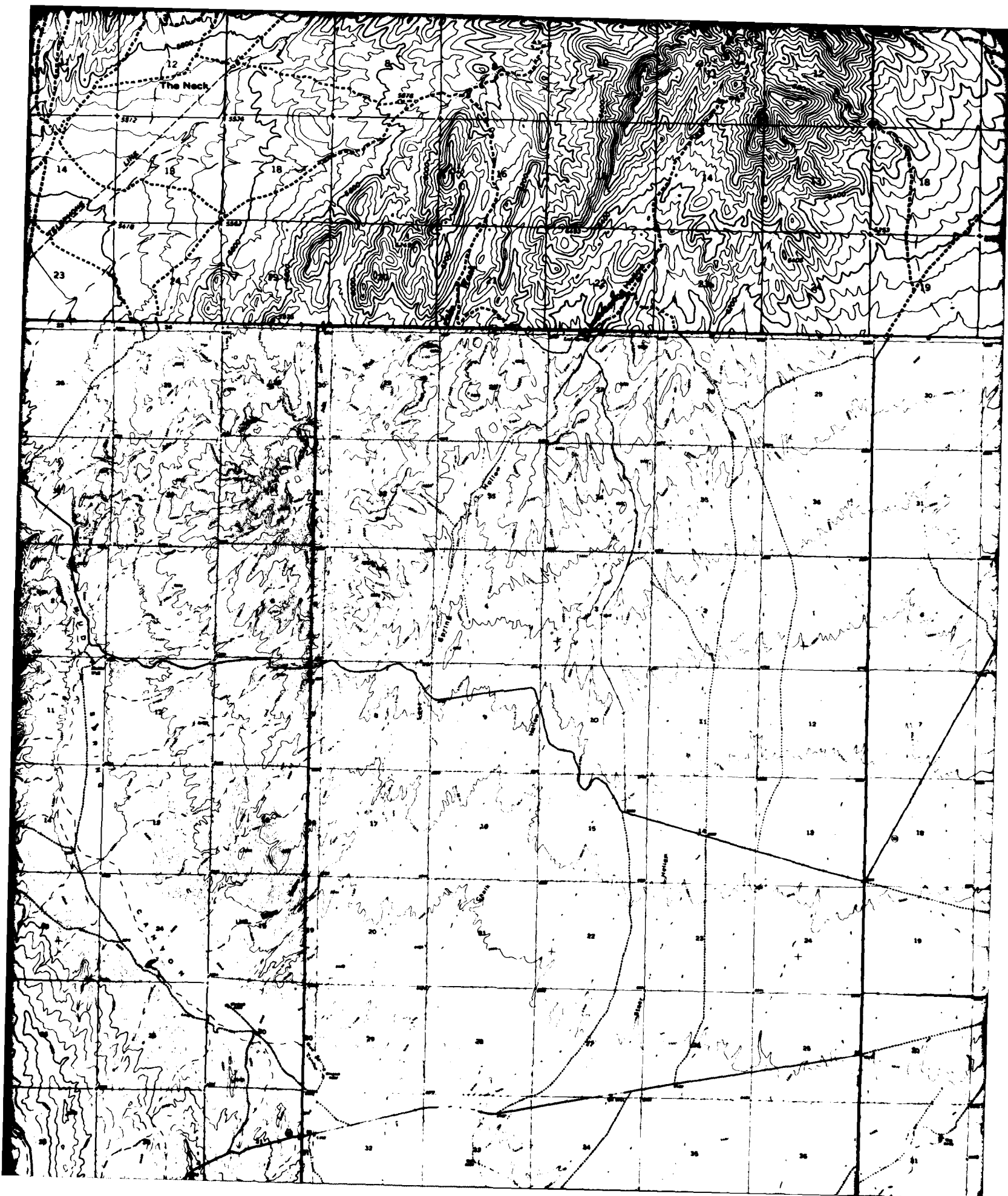


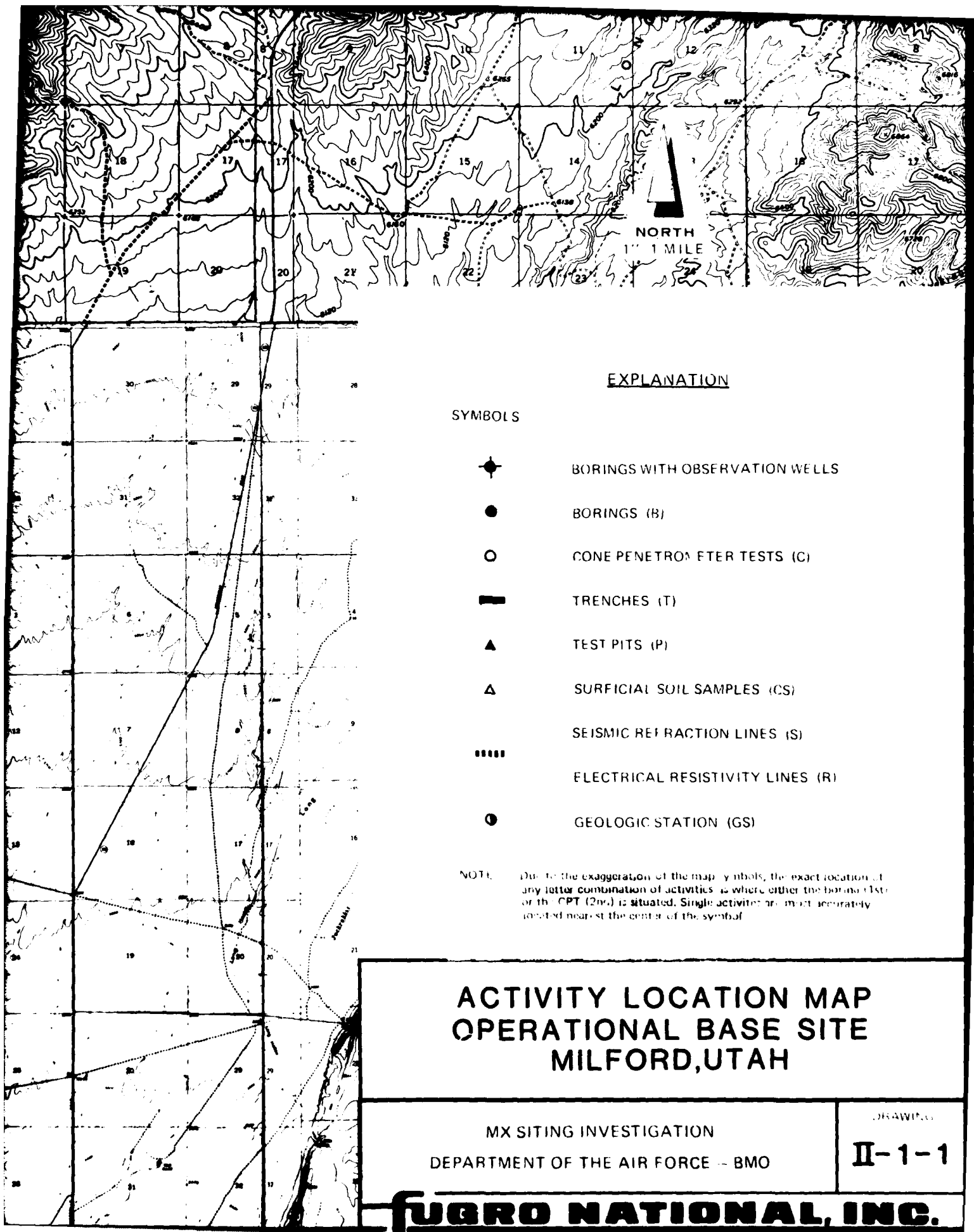












DA
FIL

4-