

ORIGINAL

BSU Borehole Engineering Seismology Preliminary Observations

Date: 4 JUNE 96

Type of Phones Geostuff / 070

1. Name of well MWCP18A

2. Location of well
X= 9897.046

Y= 10067.8

Z= 820.7338 m (0 msl) (Casing Elevation, CE.)

H₂O

4.43m

+1.12m

VD

20.375m

+1.12m

3. Depth to top of water table (measured from CE) 17.74ft

4. Height above ground level to CE 0.67m

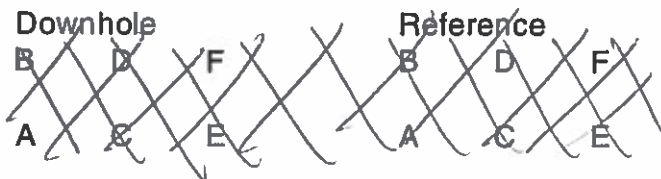
5. Reference Phone offset from borehole 3.10m

6. Reference Phone depth below ground level 0.10m

7. Source Offset from borehole 1.40m

8. Sketch of setup

9. Break out box wiring



10. Blue box channel settings

Channel	Component
<u>1</u>	Vertical
<u>2</u>	Longitudinal (radial)
<u>3</u>	Transverse

Rec

1-164 = 5H

165-246 = P

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 167 m Above G
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset 3.10m
 Azimuth 180°
 Elev. 0.10 m below G
 X = 0
 Y = 3.10

Channel Configuration:
 Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization:
 V 0
 R 0
 T 270

Vert. (deg.)
0
90
90

Date: 4 June 96 Location: MWCP18A CAPSTN
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
[X = 9897.046, Y = 10067.8, Z = 820.7338 m below]

Shot		Borehole Geophone			Source			Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Vertical
01	CPMWB001	21.0		1.50m	180°		0	-1.50m	90
02		21.60							90
03		20.75							90
04		20.75							90
05		20.50							90
06		20.50							90
07		20.25							90
08		20.25							90
09		20.00							90
10		20.00							90

10.56

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 67 m Above G
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: _____ Offset: _____
 Azimuth _____
 Elev. 10 m below G
 X= 0
 Y= -3.10

Channel Configuration: Borehole Phone Reference Phone
 V=Channel 1 V=Channel 4
 R=Channel 2 R=Channel 5
 T=Channel 3 T=Channel 6

Reference Polarization: Azi.(deg.) Vert.(deg.)
 V 0 0
 R 0 90
 T 270 90

Date: 4 June 96 Location: MWCP18A CRFSTN
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
X = 9897.046, Y = 10067.8 Z = 820.7338 m below

Shot		Borehole Geophone			Source			Source Polarization	
		Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Vertical
11		19.75		1.50	180°		0	-1.50	90
12		19.75							90
13		19.50							90
14		19.50							90
15		19.25							90
16		19.25							90
17		19.00							90
18		19.00							90
19		18.75							90
20		18.75							90

11:01

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 67 m Above G
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 410 m below G
 X= 0
 Y= -3.10

Channel Configuration:
 Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization:
 V 0
 R 0
 T 270

Vert. (deg.)
0
90
90

Date: 4 June 96 Location: MwCP18A CAPSTN

High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500

[X = 9897.046 , Y = 10067.8 Z = 820.7338 meters]

Shot		Borehole Geophone			Source			Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Vertical
21		18.50		1.50	180°		0	-1.50	270 90
22		18.50							90 90
23		18.25							270 90
24		18.25							90 90
25		18.00							270 90
26		18.00							90 90
27		17.75							270 90
28		17.75							90 90
29		17.50							270 90
30		17.50							90 90

1066w
 11:07 5816w
 ↓

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 67 m Above G
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 0.10 m below G
 X= 0
 Y= -3.10

Channel Configuration: Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Phone: Reference Polarization: Azl.(deg.) Vert.(deg.)
 V 0 0
 R 0 90
 T 270 90

Date: 4 June 96 Location: MWCP18A CAPSTN
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
X = 9897.046, Y = 10067.8 Z = 820.7338 m below

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
31		17.25		1.50	180°		0	-1.50	270	90
32		17.25							90	90
33		17.00							270	90
34		17.00							90	90
35		16.75							270	90
36		16.75							90	90
37		16.50							270	90
38		16.50							90	90
39		16.25							270	90
40		16.25							90	90

11:14

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BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 67 m Above G
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 0.10 m below G
 X= 0
 Y= -3.10

Channel Configuration: Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization: Azi.(deg.) Vert.(deg.)
 V 0 0
 R 0 90
 T 270 90

Date: 4 June 96 Location: MWCP18A CAPSTN

High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500

[X = 9897.046 , Y = 10067.8 Z = 820.7338 meters]

Shot		Borehole Geophone			Source			Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Vertical
41		16.00		1.50	180°		0	-1.50	90
42		16.00							90
43		15.75							90
44		15.75							90
45		15.50							90
46		15.50							90
47		15.25							90
48		15.25							90
49		15.00							90
50		15.00							90

11:16

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 67 m Above G
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 10 m below G
 X = 0
 Y = -3.10

Channel Configuration: Borehole Phone
 V=Channel 1 V=Channel 4
 R=Channel 2 R=Channel 5
 T=Channel 3 T=Channel 6

Reference Polarization: Azi.(deg.) Vert.(deg.)
 V 0 0
 R 0 90
 T 270 90

Date: 4 June 96 Location: MwCP15A CAPSTN
 High Cut 1000 Low Cut 4 Sample Int. 0.002 Number of Samples 2500
X = 9897.046 Y = 10067.8 Z = 820.7338 meters

Shot		Borehole Geophone			Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
51		14.75		1.50	180°		0	-1.5	270	90
52		14.75							90	90
53		14.50							270	90
54		14.50							90	90
55		14.25							270	90
56		14.25							90	90
57		14.00							270	90
58		14.00							90	90
59		13.75							270	90
60		13.75							90	90

11:21

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 67 m Above
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 0.10 m below
 X= 0
 Y= -3.10

Channel Configuration: Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization: Azi.(deg.) Vert.(deg.)
 V 0 0
 R 0 90
 T 270 90

Date: 4 June 96 Location: MWCP18A CAPSTN

High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500

[X = 9897.046 , Y = 10067.8 Z = 820.7338 m below]

Shot			Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical	
61		13.50		1.50	180°		0	-1.50	270	90	
62		13.50							90	90	
63		13.25							270	90	
64		13.25							90	90	
65		13.00							270	90	
66		13.00							90	90	
67		12.75							270	90	
68		12.75							90	90	
69		12.50							270	90	
70		12.50							90	90	

11:28

11:30

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BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 67 m Above G
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 0.10 m below G
 X= 0
 Y= -3.10

Channel Configuration: Borehole Phone Reference Phone
 V=Channel 1 V=Channel 4
 R=Channel 2 R=Channel 5
 T=Channel 3 T=Channel 6

Reference Polarization: Azi.(deg.) Vert.(deg.)
 V 0 0
 R 0 90
 T 270 90

Date: 4 June 96 Location: MwCP18A CAPSTN

High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500

[X = 9897.046 , Y = 10067.8 Z = 820.7338 m below]

Shot		Borehole Geophone			Source					Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical	
71		12.25		1.50	180°		0	-1.50	270	90	
72		12.25							90	90	
73		12.00							270	90	
74		12.00							90	90	
75		11.75							270	90	
76		11.75							90	90	
77		11.50							270	90	
78		11.50							90	90	
79		11.25							270	90	
80		11.25							90	90	

11:31

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BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: -67 m Above G
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 0.10 m below G
 X= 0
 Y= -3.16

Channel Configuration:
 Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization:
 V=Channel 4
 R=Channel 5
 T=Channel 6

Azi.(deg.)
 V 0
 R 0
 T 270

Vert.(deg.)
 V 0
 R 90
 T 90

Date: 4 June 96 Location: MWCP18A CAPSTN

High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500

[X = 9897.046 , Y = 10067.8 Z = 820.7338 m below]

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
81		11.00		1.50	180°		0	-1.50	270	96
82		11.00							90	90
83		10.75							270	90
84		10.75							90	90
85		10.50							270	90
86		10.50							90	90
87		10.25							270	90
88		10.25							90	90
89		10.00							270	90
90		10.00							90	90

11:34

11:40

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BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 67 m Above
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 0.10 m below
 X= 0
 Y= -3.10

Channel Configuration: Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization: Azi.(deg.) Vert.(deg.)
 V 0 0
 R 0 90
 T 270 90

Date: 4 June 96 Location: MwCPI 8 A CAPSTN
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
X = 9897.046 Y = 10067.8 Z = 820.7338 m below

Shot		Borehole Geophone			Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
91		9.75		1.50	180°		0	-1.50	270	90
92		9.75							90	90
93		9.50							270	90
94		9.50							90	90
95		9.25							270	90
96		9.25							90	90
97		9.00							270	90
98		9.00							90	90
99		8.75							270	90
100		8.75							90	90

(10)

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 67 m Above G
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 0.10 m below G
 X= 0
 Y= -3.10

Channel Configuration: Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization: Azi.(deg.) Vert.(deg.)
 V 0 0
 R 0 90
 T 270 90

Date: 4 June 96 Location: MWCP18A CAPSTN
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
X = 9897.046 Y = 10067.8 Z = 820.7338 m below

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
101		8.50		1.50 m	180°		0	-1.50	270	90
102		8.50							90	90
103		8.25							270	90
104		8.25							90	90
105		8.00							270	90
106		8.00							90	90
107		7.75							270	90
108		7.75							90	90
109		7.50							270	90
110		7.50							90	90

11:45

11:49

(11)

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 67 m Above G
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset

Azimuth
 Elev. 0.10 m below G
 X= 0
 Y= -3.10 m

Channel Configuration:
 Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization:
 Azi.(deg.)
 V 0
 R 0
 T 270

Date: 4 June 96 Location: MWCP18A CASTN
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
X = 9897.046 Y = 10067.8 Z = 820.7338 meters

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
111		7.25		1.50 m	180°		0	-1.50	270	90
112		7.25							90	90
113		7.00							270	90
114		7.00							90	90
115		6.75							270	90
116		6.75							90	90
117		6.50							270	90
118		6.50							90	90
119		6.25							270	90
120		6.25							90	90

(12)

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 67 m Above G
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 10 m below G
 X = 0
 Y = -3.10

Channel Configuration:
 Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization:
 V 0
 R 0
 T 270

Vert. (deg.)
0
90
90

Date: 4 June 96 Location: MwCPI 8 A CAPSTN
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
X = 9897.046, Y = 10067.8 Z = 820.7338 m below

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
121		6.00		1.50	180°		0	-1.50	270	90
122		6.02		1	1				90	90
123		5.75		1	1				270	90
124		5.75		1	1				90	90
125		5.50		1	1				270	90
126		5.50		1	1				90	90
127		5.25		1	1				270	90
128		5.25		1	1				90	90
129		5.00		1	1				270	90
130		5.00		1	1				90	90

11:55

11:59

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BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 67 m Above G
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 0.10 m below G
 X= 0
 Y= -3.10

Channel Configuration: Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization: Azi.(deg.) Vert.(deg.)
 V 0 0
 R 0 90
 T 270 90

Date: 4 June 96 Location: MwCPI8A CAPSTN

High Cut 1000 Low Cut 4 Sample Int. 0.002 Number of Samples 2500
X = 9897.046 Y = 10067.8 Z = 820.7338 meters

Shot		Borehole Geophone			Source			Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Vertical
131		4.75		1.50	180°		0	-1.50	90
132		4.75							90
133		4.50							90
134		4.50							90
135		4.25							90
136		4.25							90
137		4.00							90
138		4.00							90
139		3.75							90
140		3.75							90

12:00

12:03

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.67m Above G
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 0.10 m below G
 X= 0
 Y= -3.10

Channel Configuration:
 Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization:
 Azi.(deg.)
 V 0
 R 0
 T 270
 Vert.(deg.)
0
90
90

Date: 4 June 96 Location: MWCP18A CAPSTN

High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500

[X = 9897.046 , Y = 10067.8 Z = 820.7338 meters]

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
141		3.50		1.50m	180°		0	-1.50	270°	90
142		3.50							90	90
143		3.25							270	90
144		3.25							90	90
145		3.00							270	90
146		3.00							90	90
147		2.75							270	90
148		2.75							90	90
149		2.50							270	90
150		2.50							90	90

12:04

(15)

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 0.67 m Above G
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 0.10 m below G
 X= 0
 Y= -3.10m

Channel Borehole Phone Reference Phone
 Configuration: V=Channel 1 V=Channel 4
 R=Channel 2 R=Channel 5
 T=Channel 3 T=Channel 6

Reference Polarization: Azi.(deg.) Vert.(deg.)
 V 0 0
 R 0 90
 T 270 90

Date: 4 June 96 Location: MwCPI8A CAPSTN

High Cut 1000 Low Cut 4 Sample Int. 1000 Number of Samples 2500
X = 9897.046 Y = 10067.8 Z = 820.7338 m below

Shot		Borehole Geophone			Source					Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical	
151		2.25		1.50m	180°		0	-1.50	270	90	
152		2.25							90	90	
153		2.00							270	90	
154		2.00							90	90	
155		1.75							270	90	
156		1.75							90	90	
157		1.50							270	90	
158		1.50							90	90	
159		1.25							270	90	
160		1.25							90	90	

12:09

6m L

(16)

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 64 m Above
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 10 m below
 X= 0
 Y= -3.10

Channel Configuration: Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization: Azi.(deg.) Vert.(deg.)
 V 0 0
 R 0 90
 T 270 90

Date: 4 June 96 Location: MWCP18A CRPSTN
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
X = 9897.046 Y = 10067.8 Z = 820.7338 m below

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
161		1.00m		1.50m	180°		0	-1.50	270	90
162		1.00m							90	90
163		0.75							270	90
164		0.75							90	90
165	1/1/1	21.00				end SH	0	-1.50	180°	180°
166		20.75							0	180°
167		20.50							0	180°
168		20.25							0	180°
169		20.00							0	180°

12:16

12:17

28°
 12:40
 P wave

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BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 67 m Above G
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 0.10 m below G
 X= 0
 Y= -3.10

Channel Configuration: Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization: Azi.(deg.) Vert.(deg.)
 V 0 0
 R 0 90
 T 270 90

Date: 4 June 96 Location: MWCP18A CAPSTN

High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500

[X = 9897.046 , Y = 10067.8 Z = 820.7338 m below]

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
170		19.75		1.50	180		0	-1.50	0	180
171		19.50							0	180
172		19.25							0	180
173		19.00							0	180
174		18.75							0	180
175		18.50							0	180
176		18.25							0	180
177		18.00							0	180
178		17.75							0	180
179		17.50							0	180

12:44

(18)

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: .67 m Above G
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. .10 m below G
 X= 0
 Y= -3.10

Channel Configuration:
 Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization:
 V=Channel 4
 R=Channel 5
 T=Channel 6

Azi.(deg.)
 V 0
 R 90
 T 90

Vert.(deg.)
 V 0
 R 90
 T 90

Date: 4 June 96 Location: MWCP18A CAPSTN

High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500

[X = 9897.046 , Y = 10067.8 Z = 820.7338 m below]

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
180		17.25		1.50	180		0	-1.50	0	180
181		17.00							0	180
182		16.75							0	180
183		16.50							0	180
184		16.25							0	180
185		16.00							0	180
186		15.75							0	180
187		15.50							0	180
188		15.25							0	180
189		15.00							0	180

12:55

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: .67 m Above G
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 0.10 m below G
 X= 0
 Y= -3.10

Channel Configuration: Borehole Phone Reference Phone
 V=Channel 1 V=Channel 4
 R=Channel 2 R=Channel 5
 T=Channel 3 T=Channel 6

Reference Polarization: Azi.(deg.) Vert.(deg.)
 V 0 0
 R 0 90
 T 270 90

Date: 4 June 96 Location: MwCP18A CAPSTN
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
[X = 9897.046 , Y = 10067.8 Z = 820.7338 meters]

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
190		14.75		1.50	180°		0	-1.50	0	180
191		14.50							0	180
192		14.25							0	180
193		14.00							0	180
194		13.75							0	180
195		13.50							0	180
196		13.25							0	180
197		13.00							0	180
198		12.75							0	180
199		12.50							0	180

13:01

13:06

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 67 m Above G
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 10 m below G
 X = 0
 Y = -3.16

Channel Configuration:
 Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization:
 V 0
 R 0
 T 270

Azi.(deg.) Vert.(deg.)

Date: 4 June 96 Location: MWCP18A CRPSTN

High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500

[X = 9897.046 , Y = 10067.8 Z = 820.7338 m below]

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
200		12.25		1.50	180°		0	-1.50	0	180°
201		12.00							0	180°
202		11.75							0	180°
203		11.50							0	180°
204		11.25							0	180°
205		11.00							0	180°
206		10.75							0	180°
207		10.50							0	180°
208		10.25							0	180°
209		10.00							0	180°

13:07

13:11
13:14

(21)

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 67 m Above G
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 0.10 m below G
 X= 0
 Y= -3.10

Channel Configuration: Borehole Phone
 V=Channel 1 V=Channel 4
 R=Channel 2 R=Channel 5
 T=Channel 3 T=Channel 6

Reference Polarization: Azi.(deg.) Vert.(deg.)
 V 0 0
 R 0 90
 T 270 90

Date: 4 June 96 Location: MwCP18A CAPSTN

High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500

[X = 9897.046 , Y = 10067.8 Z = 820.7338 m below]

Shot		Borehole Geophone			Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
210		9.75		1.50	180		0	-1.50	0	180
211		9.50							0	180
212		9.25							0	180
213		9.00							0	180
214		8.75							0	180
215		8.50							0	180
216		8.25							0	180
217		8.00							0	180
218		7.75							0	180
219		7.50							0	180

13:15

13:20

(22)

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: .67 m Above G
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 0.10 m below G
 X= 0
 Y= -3.16

Channel Configuration: Borehole Phone Reference Phone
 V=Channel 1 V=Channel 4
 R=Channel 2 R=Channel 5
 T=Channel 3 T=Channel 6

Reference Polarization: Azi.(deg.) Vert.(deg.)
 V 0 0
 R 0 90
 T 270 90

Date: 4 June 96 Location: MWCP18A CAPSTN

High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
X = 9897.046 Y = 10067.8 Z = 820.7338 m below

Shot		Borehole Geophone			Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
220		7.25		1.50	180		0	-1.50	0	180
221		7.00							0	180
222		6.75							0	180
223		6.50							0	180
224		6.25							0	180
225		6.00							0	180
226		5.75							0	180
227		5.50							0	180
228		5.25							0	180
229		5.00							0	180

13:21

13:25

(23)

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: .67 m Above G
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. .10 m below G
 X= 0
 Y= -3.10

Channel Configuration: Borehole Phone
 V=Channel 1 V=Channel 4
 R=Channel 2 R=Channel 5
 T=Channel 3 T=Channel 6

Reference Polarization: Azi.(deg.) Vert.(deg.)
 V 0 0
 R 0 90
 T 270 90

Date: 4 June 96 Location: MwCP18A CAPSTN
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500
[X = 9897.046 , Y = 10067.8 Z = 820.7338 meters]

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
230		4.75		1.50 m	180°		0	-1.50	0	180
231		4.50							0	180
232		4.25							0	180
233		4.00							0	180
234		3.75							0	180
235		3.50							0	180
236		3.25							0	180
237		3.00							0	180
238		2.75							0	180
239		2.50							0	180

15:30

(24)

BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole
 Casing Elevation: 67 m Above G
 Azimuth of X-Axis 90°
 Azimuth of Y-Axis 0°

Reference Phone: Offset _____
 Azimuth _____
 Elev. 0.10 m below G
 X= 0
 Y= -3.10

Channel Configuration:
 Borehole Phone
 V=Channel 1
 R=Channel 2
 T=Channel 3

Reference Polarization:
 V 0
 R 0
 T 270

Vert.(deg.)
0
90
90

Date: 4 June 96 Location: MWCP18A CAPSTN

High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500

[X = 9897.046 , Y = 10067.8 Z = 820.7338 meters]

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
240		2.25		1.50m	180°		0	-1.50m	0	180
241		2.00							0	180
242		1.75							0	180
243		1.50							0	180
244		1.25							0	180
245		1.00							0	180
246		0.75							0	180
////		////			end R wave			////		

12:34

120°


Down Hole Geophone Field Check List

Project: CAPSTN

Date: 4 JUNE 96

Odometer Start: 4832

Finish: 4838 Blue Van

OFFICE

Item	Out	In	Comment
BHG-2 Borehole Geophone	✓	✓	
BHGC-1 Geophone Controller (Blue)	✓	✓	
Cable: Spool to BHGC-1	✓	✓	
Cable: BHGC-1 to Bison	✓	✓	
Ban./Alligator Power Cables BHGC-1	✓	✓	
Break out Box			Leave behind
Oyo 3-C Reference Phone (Blue)	✓	✓	
Dummy tool	✓	✓	
Pulley/Winch Assem.	✓	✓	
Bison Seismograph	✓	✓	
Vertical Hammer Source	✓	✓	
Black Tape	✓	✓	
WD-40	✓	✓	
Observer's Sheets/Note Book	✓	✓	
Rope	✓	✓	
Rock Hammer	✓	✓	
Tape measure (50 m)	✓	✓	
Gloves			
Compass and Maps	✓	✓	
Trigger Switch Toggle Box			leave behind
Gas Card & Keys	✓	✓	
Water Table Logging Probe	✓	✓	

Lincoln Street and Garage

Item	Out	In	Comment
Bison Cable Box (yellow) ✓ Power Cable ✓ Trigger Cables ✓ Black Tape <i>NO</i>	✓	✓	<i>order more Tape</i>
Bison Tool Box (grey) Paper for bison Miscl. Electronics/Safety	✓	✓	<i>ORDER more Bison paper</i>
Tool Box			
Trigger Extension Cord	<i>✓</i>	<i>✓</i>	
Tripod Head	✓	✓	
Tripod Legs (3)	<i>✓</i>	<i>✓</i>	
Batteries (12V car) Need 2	<i>✓</i>	<i>✓</i>	
Jumper Cable for 24V operation	✓	✓	
Railroad Tie Horizontal Hammers	✓	✓	
Sand Bags (2)	✓	✓	
Shovel	✓	✓	
Pick	✓	✓	
Nails to hold off hammer heads	✓	✓	
<i>Voltmeter</i>	✓	✓	
<i>Steel Wool</i>	✓	✓	