

ORIGINAL

# BSU Borehole Engineering Seismology Preliminary Observations

Date: 19 JUNE 98

Type of Phones Geostuff / Oyo

1. Name of well SPT-3

2. Location of well  
X = 9913.27551 m

Y = 10051.03441 m

Z = 820.84567 m (Casing Elevation, CE.)

3. Depth to top of water table (measured from CE) 18.56 ft <sup>Below</sup> ~~CE~~

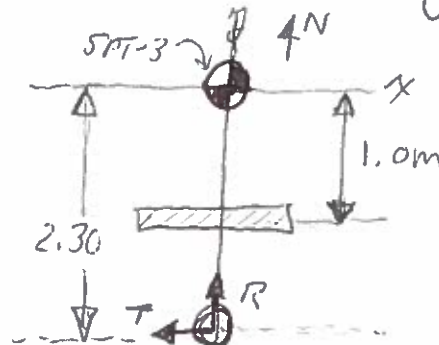
4. Height above ground level to CE 0.70 m

5. Reference Phone offset from borehole -2.30 m = y  $x=0$

6. Reference Phone depth below ground level

7. Source Offset from borehole -1.0 m = y  $x=0$

8. Sketch of setup



9. Break out box wiring

Downhole

B D F  
A C E

Reference

B D F  
A C E

10. Blue box channel settings

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

4.65m  
+ 1.12m  
5.77m  
HCC

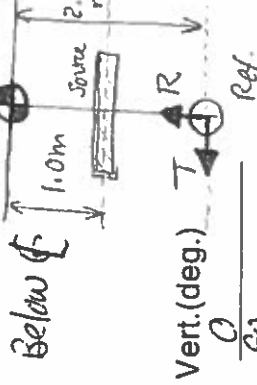
19.31m  
+ 1.22m  
20.53m  
T/D

# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole  
 Casing Elevation: 170 m above 0  
 Azimuth of X-Axis: 90°  
 Azimuth of Y-Axis: 0°

Reference Phone: Offset \_\_\_\_\_  
 Azimuth \_\_\_\_\_  
 Elev. 0.1 m  
 X = 0  
 Y = -2.30m

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



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

Date: 19 JUNE 96 Location: SPT-3 CAPSTN  
 High Cut 1000 Low Cut 4 Sample Int. 0.0002 Number of Samples 2500  
X = 9913.27551, Y = 10051.03441, Z = 820.84567 m

Shot		Borehole Geophone			Source					Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical	
1	50700001	19.75		1.0m	180°				270°	90	
2		19.75							90°	90	
3		19.50							270	90	
4		19.50							90	90	
5		19.25							270	90	
6		19.25							90	90	
7		19.00							270	90	
8		19.00							90	90	
9		18.75							270	90	
10		18.75							90	90	

①

# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole  
 Casing Elevation: 70 m Above  
 Azimuth of X-Axis: 90°  
 Azimuth of Y-Axis: 0°

Reference Phone: Offset \_\_\_\_\_  
 Azimuth \_\_\_\_\_  
 Elev. 10 m Below  
 X= 0  
 Y= -2.30 m

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: 19 JUNE 96 Location: SPT-3 CORSTN

High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500  
X = 9913.27551 Y = 10051.03441 Z = 820.84567 m

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
11		18.50		1.00	180°				270	90
12		18.50							90	90
13		18.25							270	90
14		18.25							90	90
15		18.00							270	90
16		18.00							90	90
17		17.75							270	90
18		17.75							90	90
19		17.50							270	90
20		17.50							90	90

10:20

Stick  
Reference

(2)

# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole  
 Casing Elevation: 70 m Above  
 Azimuth of X-Axis: 90°  
 Azimuth of Y-Axis: 0°

Reference Phone: Offset \_\_\_\_\_  
 Azimuth \_\_\_\_\_  
 Elev. 0.1 m Below  
 X= 0  
 Y= -2.30m

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

Reference Polarization:  
 V 0  
 R 0  
 T 270

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

Date: 19 JUNE 96 Location: SPT-3 CARSTN

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

X = 9913.27551 Y = 10051.03441 Z = 820.84567 m

Shot		Borehole Geophone			Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
21		17.25		1.0 m	180°				270°	90°
22		17.25							90	90
23		17.00							270	90
24		17.00							90	90
25		16.75							270	90
26		16.75							90	90
27		16.50							270	90
28		16.50							90	90
29		16.25							270	90
30		16.25							90	90

10126

3

# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole  
 Casing Elevation: 0.70 m Above  
 Azimuth of X-Axis: 90°  
 Azimuth of Y-Axis: 0°

Reference Phone: Offset \_\_\_\_\_  
 Azimuth \_\_\_\_\_  
 Elev. 0.10 m Below  
 X= 0  
 Y= -2.30 m

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: 19 JUNE 96 Location: SPT-3 CAPSTN

High Cut 1000 Low Cut 4 Sample Int. 0.0002 Number of Samples 2500  
X = 9913.27551, Y = 10051.03441 Z = 820.84567 m

Shot		Borehole Geophone			Source			Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Vertical
31		16.00		1.0 m	180				90
32		16.00							90
33		15.75							90
34		15.75							90
35		15.50							90
36		15.50							90
37		15.25							90
38		15.25							90
39		15.00							90
40		15.00							90

10:50

4

# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole  
 Casing Elevation: 0.70 m Above  
 Azimuth of X-Axis: 90°  
 Azimuth of Y-Axis: 0°

Reference Phone: Offset \_\_\_\_\_  
 Azimuth \_\_\_\_\_  
 Elev. 10 m Below  
 X= 0  
 Y= -2.30 m

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

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

Date: 19 JUNE 96 Location: SPT-3 CORSTN

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

X = 9913.27551, Y = 10051.03441 Z = 820.84567 m

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
41		14.75		1.0m	180°				270	90
42		14.75							90	90
43		14.50							270	90
44		14.50							90	90
45		14.25							270	90
46		14.25							90	90
47		14.00							270	90
48		14.00							90	90
49		13.75							270	90
50		13.75							90	90

10:35

5

# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole  
 Casing Elevation: 0.70 m Above 0  
 Azimuth of X-Axis: 90°  
 Azimuth of Y-Axis: 0°

Reference Phone: Offset \_\_\_\_\_  
 Azimuth \_\_\_\_\_  
 Elev. 0.10 m Below 0  
 X= 0  
 Y= -2.30m

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

Reference Polarization:  
 V 0  
 R 0  
 T 270

Azi.(deg.)  
0  
90  
90

Date: 19 JUNE 96 Location: SPT-3 CORSTN

High Cut 1000 Low Cut 4 Sample Int. 0.0002 Number of Samples 2500

X = 9913.27551 Y = 10051.03441 Z = 820.84567 m

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
51		13.50		1.0m	180°				270	90
52		13.56							90	90
53		13.25							270	90
54		13.25							90	90
55		13.00							270	90
56		13.00							90	90
57		12.75							270	90
58		12.75							90	90
59		12.50							270	90
60		12.50							90	90

10:39

6

# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole  
 Casing Elevation: 0.70 m Above  
 Azimuth of X-Axis: 90°  
 Azimuth of Y-Axis: 0°

Reference Phone: Offset \_\_\_\_\_  
 Azimuth \_\_\_\_\_  
 Elev. 0.10 m Below  
 X= 0  
 Y= -2.30 m

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: 19 JUNE 96 Location: SPT-3 CORSTN

High Cut 1000 Low Cut 4 Sample Int. 0.0002 Number of Samples 2500  
X = 9913.27551, Y = 10051.03441 Z = 820.84367 m

Shot		Borehole Geophone			Source			Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Vertical
61		12.25		1.0m	180°				90
62		12.25							90
63		12.00							90
64		12.00							90
65		11.75							90
66		11.75							90
67		11.50							90
68		11.50							90
69		11.25							90
70		11.25							90

10:43

7



# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole  
 Casing Elevation: 0.70 m Above 0  
 Azimuth of X-Axis: 90°  
 Azimuth of Y-Axis: 0°

Reference Phone: \_\_\_\_\_  
 Offset: \_\_\_\_\_  
 Azimuth: \_\_\_\_\_  
 Elev.: 0.10 m Below 0  
 X = 0  
 Y = -2.30 m

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

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

Date: 19 JUNE 96 Location: SPT-3 CAPSTN

High Cut 1000 Low Cut 4 Sample Int. 0.0002 Number of Samples 2500  
X = 9913.27551 Y = 10051.03441 Z = 820.84567 m

Shot		Borehole Geophone			Source				Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical	
71		11.00		1.0 m	180				270	90	10:47
72		11.00							90	90	
73		10.75							270	90	
74		10.75							90	90	
75		10.50							270	90	
76		10.50							90	90	
77		10.25							270	90	
78		10.25							90	90	
79		10.00							270	90	
80		10.00							90	90	

8

# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole  
 Casing Elevation: 0.70 m Above 0  
 Azimuth of X-Axis: 90°  
 Azimuth of Y-Axis: 0°

Reference Phone: Offset \_\_\_\_\_  
 Azimuth \_\_\_\_\_  
 Elev. 0.10 m Below 0  
 X= 0  
 Y= -2.30m

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

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

Date: 19 JUNE 96 Location: SPT-3 CRFSTN

High Cut 1000 Low Cut 4 Sample Int. 0.0002 Number of Samples 2500  
X = 9913.27551 Y = 10051.03441 Z = 820.84567 m

Shot		Borehole Geophone			Source					Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical	
81		9.75		1.00	180°				270	90	
82		9.75							90	90	
83		9.50							270	90	
84		9.50							90	90	
85		9.25							270	90	
86		9.25							90	90	
87		9.00							270	90	
88		9.00							90	90	
89		8.75							270	90	
90		8.75							90	90	

10:52

9

# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole  
 Casing Elevation: 0.70 m above  
 Azimuth of X-Axis: 90°  
 Azimuth of Y-Axis: 0°

Reference Phone: Offset \_\_\_\_\_  
 Azimuth \_\_\_\_\_  
 Elev. 0.10 m Below  
 X= 0  
 Y= -2.30 m

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: 19 JUNE 96 Location: SPT-3 CAPSTN  
 High Cut 1000 Low Cut 4 Sample Int. 0.0002 Number of Samples 2500  
X = 9913.27551, Y = 10051.03441 Z = 820.84567 m

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
91		8.50		1.0 m	180°				270	90
92		8.50							90	90
93		8.25							270	90
94		8.25							90	90
95		8.00							270	90
96		8.00							90	90
97		7.75							270	90
98		7.75							90	90
99		7.50							270	90
100		7.50							90	90

10:56

10

# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole  
 Casing Elevation: 70 m Above  
 Azimuth of X-Axis: 90°  
 Azimuth of Y-Axis: 0°

Reference Phone: Offset \_\_\_\_\_  
 Azimuth \_\_\_\_\_  
 Elev. 0.10 m Below  
 X= 0  
 Y= -2.30

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: 19 JUNE 96 Location: SPT-3 CORSTN

High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500  
X = 9913.27551 Y = 10051.03441 Z = 820.84567 m

Shot		Borehole Geophone			Source			Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Vertical
101		7.25		1.0 m	180°				270 90
102		7.25							90 90
103		7.00							270 90
104		7.00							90 90
105		6.75							270 90
106		6.75							90 90
107		6.50							270 90
108		6.50							90 90
109		6.25							270 90
110		6.25							90 90

11.0)

11

# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole  
 Casing Elevation: 0.70 m Above  
 Azimuth of X-Axis: 90°  
 Azimuth of Y-Axis: 0°

Reference Phone: Offset \_\_\_\_\_  
 Azimuth \_\_\_\_\_  
 Elev.: 0.10 m Below  
 X= 0  
 Y= -2.30m

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: 19 JUNE 96 Location: SPT-3 CORSTN

High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500  
X = 9913.27551, Y = 10051.03441 Z = 820.84567 m

Shot		Borehole Geophone			Source					Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical	
111		6.00		1.0 m	180°				270	90	
112		6.00							90	90	
113		5.75							270	90	
114		5.75							90	90	
115		5.50							270	90	
116		5.50							90	90	
117		5.25							270	90	
118		5.25							90	90	
119		5.00							270	90	
120		5.00							90	90	

11:07

12

# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole  
 Casing Elevation: 0.70 m Above  
 Azimuth of X-Axis: 90°  
 Azimuth of Y-Axis: 0°

Reference Phone: \_\_\_\_\_ Offset: \_\_\_\_\_  
 Azimuth: \_\_\_\_\_  
 Elev.: 0.10 m Below  
 X= 0  
 Y= -2.30 m

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: 19 JUNE 96 Location: SPT-3 CRFSTN

High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500  
X = 9913.27551, Y = 10051.03441 Z = 820.84567 m

Shot		Borehole Geophone			Source			Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Vertical
121		4.75		1.00m	180°				90
122		4.75							90
123		4.50							90
124		4.50							90
125		4.25							90
126		4.25							90
127		4.00							90
128		4.00							90
129		3.75							90
130		3.75							90

11/11

Stack  
 Release

13

# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole  
 Casing Elevation: 0.70 m Above  
 Azimuth of X-Axis: 90°  
 Azimuth of Y-Axis: 0°

Reference Phone: \_\_\_\_\_ Offset: \_\_\_\_\_  
 Azimuth: \_\_\_\_\_  
 Elev.: 0.10 m Below  
 X= 0  
 Y= -2.30

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: 19 JUNE 96 Location: SPT-3 CARSTN  
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500  
X = 9913.27551, Y = 10051.03441, Z = 820.84567 m

Shot		Borehole Geophone			Source					Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical	
131		3.50		1.0 m	180°				270	90°	
132		3.50							90	90	
133		3.25							270	90	
134		3.25							90	90	
135		3.00							270	90	
136		3.00							90	90	
137		2.75							270	90	
138		2.75							90	90	
139		2.50							270	90	
140		2.50							90	90	

11:17

14

# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole  
 Casing Elevation: 0.70 m Above  
 Azimuth of X-Axis: 90°  
 Azimuth of Y-Axis: 0°

Reference Phone: Offset \_\_\_\_\_  
 Azimuth \_\_\_\_\_  
 Elev. 0.10 m Below  
 X = 0  
 Y = -2.30

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: 19 JUNE 96 Location: SPT-3 CORSTN

High Cut 1000 Low Cut 4 Sample Int. 0.0002 Number of Samples 2500  
X = 9913.27551, Y = 10051.03441 Z = 820.84567 m

Shot		Borehole Geophone			Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
141		2.25		1.0m	180°				270	90
142		2.25							90	90
143		2.00							270	90
144		2.00							90	90
145		1.75							270	90
146		1.75							90	90
147		1.50							270	90
148		1.50							90	90
149		1.25							270	90
150		1.25							90	90

11:22

15



# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole  
 Casing Elevation: 0.70 m Above  
 Azimuth of X-Axis: 90°  
 Azimuth of Y-Axis: 0°

Reference Phone: Offset \_\_\_\_\_  
 Azimuth \_\_\_\_\_  
 Elev. 0.10 m Below  
 X= 0  
 Y= -2.30

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

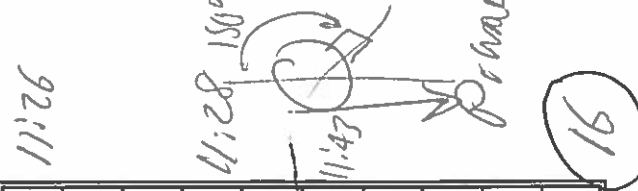
Reference Polarization:  
 V 0  
 R 0  
 T 270

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

Date: 19 JUNE 96 Location: SPT-3 CORSTN

High Cut 1000 Low Cut 4 Sample Int. 0.0002 Number of Samples 2500  
X = 9913.27551 Y = 10051.03441 Z = 820.84567 m

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
151		1.00		1.0	180°				270	90
152		1.00							90	90
153		.75							270	90
154		.75							90	90
155		19.75							0	180
156		19.50							0	180
157		19.25							0	180
158		19.00							0	180
159		18.75							0	180



# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole  
 Casing Elevation: 0.70 m Above  
 Azimuth of X-Axis: 90°  
 Azimuth of Y-Axis: 0°

Reference Phone: Offset \_\_\_\_\_  
 Azimuth \_\_\_\_\_  
 Elev. 0.10 m Below  
 X= 0  
 Y= -2.30 m

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: 19 JUNE 96 Location: SPT-3 CAPSTN

High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500  
X = 9913.27551, Y = 10051.03441 Z = 820.84567 m

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
160		18.50		1.0 m	180°				0	180°
161		18.25							0	180°
162		18.00							0	180°
163		17.75							0	180°
164		17.50							0	180°
165		17.25							0	180°
166		17.00							0	180°
167		16.75							0	180°
168		16.50							0	180°
169		16.25							0	180°

11:46

17

# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole  
 Casing Elevation: 0.70 m Above  
 Azimuth of X-Axis: 90°  
 Azimuth of Y-Axis: 0°

Reference Phone: Offset \_\_\_\_\_  
 Azimuth \_\_\_\_\_  
 Elev. 0.10 m Below  
 X = 0  
 Y = -2.30 m

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

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

Date: 19 JUNE 96 Location: SPT-3 CAPSTN

High Cut 1000 Low Cut 4 Sample Int. 0.002 Number of Samples 2500  
X = 9913.27551, Y = 10051.03441 Z = 820.84567 m

Shot		Borehole Geophone			Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
170		16.00		1.0	180°				0	180
171		15.75							0	180
172		15.50							0	180
173		15.25							0	180
174		15.00							0	180
175		14.75							0	180
176		14.50							0	180
177		14.25							0	180
178		14.00							0	180
179		13.75							0	180

11:51

18

# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole  
 Casing Elevation: 0.70 m Above 0  
 Azimuth of X-Axis: 90°  
 Azimuth of Y-Axis: 0°

Reference Phone: Offset \_\_\_\_\_  
 Azimuth \_\_\_\_\_  
 Elev. 0.10 m Below 0  
 X= 0  
 Y= -2.30 m

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

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

Date: 19 JUNE 96 Location: SPT-3 CORSTN

High Cut 1000 Low Cut 4 Sample Int. 0.0002 Number of Samples 2500  
X = 9913.27551 Y = 10051.03441 Z = 820.84587 m

Shot		Borehole Geophone			Source					Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical	
180		13.50		1.0m	180°				0	180	
181		13.25							0	180	
182		13.00							0	180	
183		12.75							0	180	
184		12.50							0	180	
185		12.25							0	180	
186		12.00							0	180	
187		11.75							0	180	
188		11.50							0	180	
189		11.25							0	180	

11:55

19

# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole  
 Casing Elevation: 70 m Above 0  
 Azimuth of X-Axis: 90°  
 Azimuth of Y-Axis: 0°

Reference Phone: Offset \_\_\_\_\_  
 Azimuth \_\_\_\_\_  
 Elev. 0.10 m Below 0  
 X= 0  
 Y= -2.30m

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

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

Date: 19 JUNE 96 Location: SPT-3 CAPSTN

High Cut 1000 Low Cut 4 Sample Int. 0.0002 Number of Samples 2500  
X = 9913.27551 Y = 10051.03441 Z = 820.84567 m

Shot		Borehole Geophone			Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
190		11.00		1.0m	180°				0	180
191		10.75							0	180
192		10.50							0	180
193		10.25							0	180
194		10.00							0	180
195		9.75							0	180
196		9.50							0	180
197		9.25							0	180
198		9.00							0	180
199		8.75							0	180

12:03

20

# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole  
 Casing Elevation: 0.70 m Above 0  
 Azimuth of X-Axis: 90°  
 Azimuth of Y-Axis: 0°

Reference Phone: Offset \_\_\_\_\_  
 Azimuth \_\_\_\_\_  
 Elev. 0.10 m Below 0  
 X= \_\_\_\_\_  
 Y= -2.30 m

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

Reference Polarization:  
 V \_\_\_\_\_  
 R \_\_\_\_\_  
 T \_\_\_\_\_

Date: 19 JUNE 96 Location: SPT-3 CAPSTN

High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500  
X = 9913.27551, Y = 10051.03441 Z = 820.84567 m

Shot		Borehole Geophone			Source					Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical	
200		8.50		1.0m	180°				0	180°	
201		8.25							0	180°	
202		8.00							0	180°	
203		7.75							0	180°	
204		7.50							0	180°	
205		7.25							0	180°	
206		7.00							0	180°	
207		6.75							0	180°	
208		6.50							0	180°	
209		6.25							0	180°	

12:08

21

# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole  
 Casing Elevation: 0.70 m Above  
 Azimuth of X-Axis: 90°  
 Azimuth of Y-Axis: 0°

Reference Phone: Offset \_\_\_\_\_  
 Azimuth \_\_\_\_\_  
 Elev. 0.10 m Below  
 X= 0  
 Y= -2.30 m

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

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

Date: 19 JUNE 96 Location: SPT-3 CAPSTN

High Cut 1000 Low Cut 4 Sample Int. 0.002 Number of Samples 2500  
X = 9913.27551, Y = 10051.03441 Z = 820.84567 m

Shot		Borehole Geophone			Source			Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Vertical
210		6.00		1.0m	180°			0	180°
211		5.75						0	180°
212		5.50						0	180°
213		5.25						0	180°
214		5.00						0	180°
215		4.75						0	180°
216		4.50						0	180°
217		4.25						0	180°
218		4.00						0	180°
219		3.75						0	180°

12:14

22

# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole  
 Casing Elevation: 0.70 m Above  
 Azimuth of X-Axis: 90°  
 Azimuth of Y-Axis: 0°

Reference Phone: Offset \_\_\_\_\_  
 Azimuth \_\_\_\_\_  
 Elev. 0.10 m Below  
 X = 0  
 Y = -2.30 m

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

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

Date: 19 JUNE 96 Location: SPT-3 CAPSTN

High Cut 1000 Low Cut 4 Sample Int. 0.002 Number of Samples 2500  
X = 9913.27551, Y = 10051.03441, Z = 820.84567 m

Shot		Borehole Geophone			Source			Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Vertical
220		3.50		1.0m	180°			0	180
221		3.25						0	180
222		3.00						0	180
223		2.75						0	180
224		2.50						0	180
225		2.25						0	180
226		2.00						0	180
227		1.75						0	180
228		1.50						0	180
229		1.25						0	180

12:20

23





# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole  
 Casing Elevation: 0.70 m Above 0  
 Azimuth of X-Axis: 90°  
 Azimuth of Y-Axis: 0°

Reference Phone: AS7 T234  
910N

Offset: 0.10 m Below 0  
 Azimuth: 0  
 Elev.: 0  
 X= 0  
 Y= -2.30

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

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

Date: 19 JUNE 96 Location: SPT-3 CRSTN

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

X = 9913.27551, Y = 10051.03441 Z = 820.84567 m

Shot		Borehole Geophone			Source					Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical	
1	RecN0001	19.80		1.0m	180°				0	180	
2		19.00							0	180	
3		18.50							0	180	
4		18.00							0	180	
5		17.50							0	180	
6		17.00							0	180	
7		16.50							0	180	
8		16.00							0	180	
9		15.50							0	180	
10		15.00							0	180	

# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole  
 Casing Elevation: 0.70 m Above 0  
 Azimuth of X-Axis 90°  
 Azimuth of Y-Axis 0°

Reference Phone: Offset  
 Azimuth  
 Elev. 0.10 m Below 0  
 X= 0  
 Y= -2.30m

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: 19 JUNE 96 Location: SPT-3 CAPSTN  
 High Cut 1000 Low Cut 4 Sample Int. .0002 Number of Samples 2500  
X = 9913.27551, Y = 10051.03441 Z = 820.84567 m

Shot		Borehole Geophone			Source			Source Polarization		
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
11	RECNO011	14.50		1.0	180°				0	180
12		14.00							0	180
13		13.50							0	180
14		13.00							0	180
15		12.50							0	180
16		12.00							0	180
17		11.50							0	180
18		11.00							0	180
19		10.50							0	180
20		10.00							0	180

# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole  
 Casing Elevation: 0.70m above  
 Azimuth of X-Axis 90°  
 Azimuth of Y-Axis 0°

Reference Phone: Offset \_\_\_\_\_  
 Azimuth \_\_\_\_\_  
 Elev. 0.10 m below  
 X= 0  
 Y= -2.30m

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 90  
 R 0 90  
 T 270 90

Date: 19 June 96 Location: SPT-3 CRPSTN  
 High Cut 1000 Hz Low Cut 4 Hz Sample Int. .00025s Number of Samples 2500

Shot		Borehole Geophone		Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Vertical
21	Rc No 1	9.50		1.0m	180°				180
22		9.00							180
23		8.50							180
24		8.00							180
25		7.50							180
26		7.00							180
27		6.50							180
28		6.00							180
29		5.50							180
30		5.00							180

# BSU GEOPHYSICS VSP OBSERVER'S LOG

Coordinate System Origin at Borehole  
 Casing Elevation: 0.70 m Above  
 Azimuth of X-Axis 90°  
 Azimuth of Y-Axis 0°

Reference Phone: Offset \_\_\_\_\_  
 Azimuth \_\_\_\_\_  
 Elev. 0.10 m below  
 X= 0  
 Y= -2.30 m

Channel Borehole Phone Reference Phone  
 Configuration: 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: 19 June 96 Location: SPT-3 CAPTAN  
 High Cut 1000 Hz Low Cut 4 Hz Sample Int. 0.002 sec Number of Samples 2500

Shot		Borehole Geophone			Source				Source Polarization	
Rec	File	Depth	Elev.	Offset	Azimuth	Elev.	X	Y	Azimuth	Vertical
31	RECNO031	4.50		1.0 m	180°				0	180
32		4.00							0	180
33		3.50							0	180
34		3.00							0	180
35		2.50							0	180
36		2.00							0	180
37		1.50							0	180
38		1.00							0	180
<del>39</del>	<del>111</del>	<del>0.50</del>	<del>111</del>	<del>1.0 m</del>	<del>180°</del>	<del>END AS7910</del>			<del>P-wave</del>	<del>111</del>

## Down Hole Geophone Field Check List

Project: SPT-2 CORSEN

Date: 19 JUNE 96 Odometer Start: \_\_\_\_\_ Finish: \_\_\_\_\_

### 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
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
Gas Card & Keys	✓	✓	Picked up Van
Water Table Logging Probe	✓	✓	

## Lincoln Street and Garage

Item	Out	In	Comment
Bison Cable Box (yellow) Power Cable ✓ Trigger Cables ✓ Black Tape	✓	✓	
Bison Tool Box (grey) Paper for bison Misl. Electronics/Safety	✓	✓	
Tool Box			
Trigger Extension Cord	✓✓	✓✓	
Tripod Head	✓	✓	
Tripod Legs (3)	✓✓✓	✓✓✓	
Batteries (12V car) Need 2	✓✓✓✓	✓✓✓✓	
Jumper Cable for 24V operation	✓	✓	
Railroad Tie Horizontal Hammers	✓	✓	
Sand Bags (2)	✓	✓	
Shovel	✓	✓	
Pick	✓	✓	
Nails to hold off hammer heads	✓	✓	
well keys	✓		
Electric Drill & Bits	✓		