

Q-Borehole Survey Report

Schlumberger

Survey type: Zero Offset VSP Survey
Company: Origin Energy Resources Ltd.
Well: Trefoil-1
Field: Trefoil
Country: Australia
Run: Suite-1, Run 2
Date: 25-Nov-2004

Recorded by: J. Robertson/C.
Bassignana/M.Webb/S.Nakanishi

Witnessed by: Dave Cohen/Mark Tindale

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Introduction

On the 25th of November 2004 a Zero Offset VSP survey using a rig source was carried out for Origin Energy Resources Ltd (Origin Energy) on the TREFOIL 1 well in the offshore T/18P Bass Basin, Tasmania.

A dual G-Gun cluster was deployed as a rig source using the Rig crane (port side), with an azimuth of 8 degrees with reference to North (Rig heading was 53 degrees). The offset of guns was fixed at 55 m from well head. The guns were submerged from a buoy to 4.3 meters below water surface. 2 hydrophones were deployed 6.5 meters below the center of the gun cluster.

Survey Results

Total acquisition time for the survey was recorded as 10 hrs 50 mins from rig up to full rig down. Tool was held up at 3419 mMD due to hole condition.

Data quality generally for the Zero Offset VSP considered to be good throughout the survey; data was recorded from 3409 m to 239m MD with 20 meters interval.. At least 5 good repeatable shots were recorded at each VSP level (3279 m to 519 m).

Casing arrivals were evident above on levels above 499 m on Z component signal. Transit-Time information is obtained through horizontal component signal (X or Y), from 479 to 319.1 m.

Macha TGS-8 Gun controller was used for the auto-tuning of cluster gun. Depth and Pressure of Cluster gun were monitored and recorded by TGS-8 at each shot for source QC purpose. This report includes Macha Gun delay statistic as well as the record of gun pressure and depth.

Depth correlation shows 2 meters shallower than reference log. Time-Depth listing in this report is not corrected by 2 meter offset.

Conclusions and Recommendations

Good quality VSP data was acquired providing accurate Time-Depth information and corridor Stack.

This VSP dataset can also be used as input for advance VSP Processing products. Recommended further processing options:

- Sonic Calibration and Synthetic Seismogram generation
- Surface seismic Composite Displays
- Phase Matching
- Q-Analysis

Well Information

Company	Origin Energy Resources Ltd.
Well	Trefoil-1
Field	Trefoil
Country	Australia
State	Tasmania
Logging Date	25-Nov-2004
Run Number	Suite-1, Run 2
Service Order	
Well Head (Latitude)	39 51' 41.58"S
Well Head (Longitude)	145 22' 30.87"E
Well Head (X Coordinate)	391028.0 UTM
Well Head (Y Coordinate)	5586346.0 UTM
Total Depth - Driller	3545.1 m
Total Depth - Logger	3419.0 m
Maximum Hole Deviation	0.7 deg
Azimuth of Maximum Deviation	
Program Version	12C0-301
Bit Size	8.500 in
Recorded by	J. Robertson/C. Bassignana/M. Webb/S. Naka
Witnessed by	Dave Cohen/Mark Tindale

Elevation Information

Permanent Datum	Mean Sea Level
Elevation Permanent Datum	0.0 m
Above Permanent Datum	39.9 m
Drilling Measured From	Drill Floor (RT)
Derrick Floor	39.9 m
Ground Level	-68.9 m
Kelly Bush	39.9 m
Log Measured From	Drill Floor (RT)
Elevation Log Zero	39.9 m

Depth Corrected Information

Water Velocity	1524.0 m/s
Seismic Reference Datum	0.0 m

Remarks

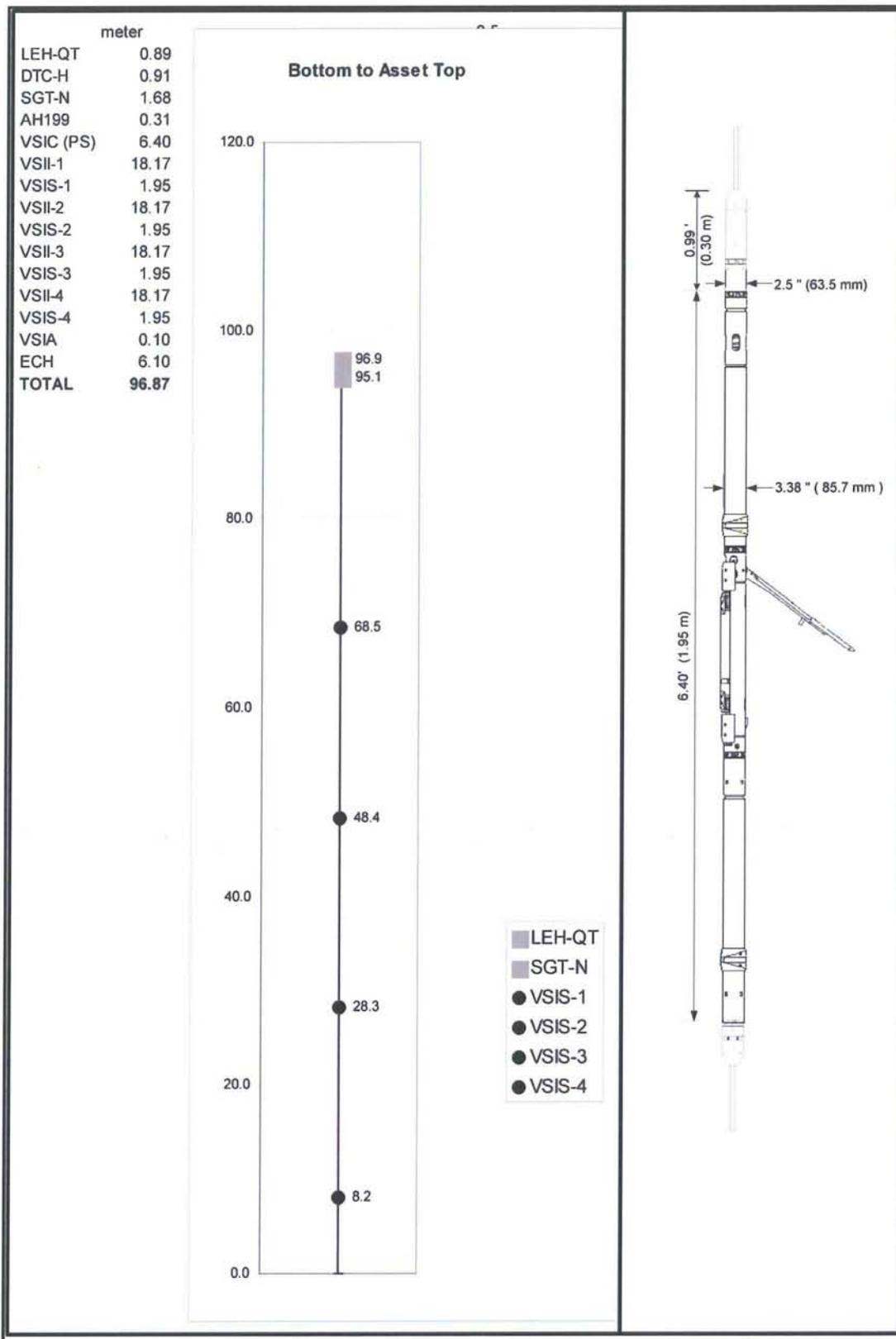
Correlated to gamma ray from logging run#1 SP-HRLA-CMR-GR date 24 Nov 2004
Correlation log shows 2 meters shallow in VSP survey.
Time-Depth listing does not take account of 2 meter off depth.

Three thermometers run in logging head. Max recorded temperature was 246degF, 246 degF and 247 degF @ 05:45 25 Nov 2004 at 3419 m.
Circulation Stopped 0:45 24 Nov 2004.

Well Sketch

Production String		Well Schematic		Casing String		
OD	ID	MD	MD	OD	ID	
Derrick Floor Elevation Mean Sea Level		39.9 0		Drillers Depth Used		
				142.6	26	Casing String
				214.6	16	Casing Shoe
				659.6	13.375	Casing Shoe
				2460.6	9.625	Casing Shoe
				2460.6	8.500	Borehole Segment
			3545.13	8.500	Borehole Segment Bottom	

Tool Sketch



Operating Time Summary

DATE	Time Start	Time Taken Hr : min	OPERATION	
25-Nov-04	2:00	0:50	Rig Up VSI	
	2:50	0:10	Surface Check VSI	
	3:00	0:15	RIH in hole	
	3:15	0:15	VSI at 100m, perform system check	
	3:30	0:50	RIN to 1729 m	
	4:20	0:30	at 1729 m QCshot	
	4:50	0:55	at 2331 m QCKshot	
	5:45	0:45	VSI held up at 3419m (bottom depth)	
	6:30	4:50	Start main survey from 3409 m	
	11:20	0:30	End main survey at 319.1 m	
	11:50	1:00	VSI at surface, commence rig down of VSI	
	12:50		Rig down completed well released	
			10:50	HRS -TOTAL OPERATING TIME

Well Information

Well Type	Vertical Exploration Well
Rig / Platform Type	ENSCO 102
Well Reference Azimuth (Magnetic, True, or Grid North)	Grid North

Elevation Information

Water Depth	68.9 meters
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Sea Condition

Sea Condition	Clam
Wave Height	Less than 0.5 m
Tide Level	Low Tide -0.8 m @ 05:25 25Nov04 High Tide 1.1 m @ 09:59 25Nov04,

Velocity Information

Water Velocity	1524 m/sec used for static correction
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Remarks:

- The tide level used "zero" for the static correction.
- Static correction of transit time does not use tide correction in this report.
- Tide Level obtains from King Island

Downhole Equipment Information

Tool Type	VSIT
Surface Equipment	WASM-AB sn838, TGS-8 sn118741
Combined Tool	DTC-H 9166, SGT-N 9901
Number of Shuttles	4
Nominal Receiver Spacing	20.0 m
Gimbaled (Y/N)	No
Downhole Geophone Type	GAC-D 3-axis orthogonal
Sensitivity	0.5 V/G 3%
Natural Frequency	20 Hz
Damping Factor	N/A
DC Resistance	1500 Ohms 3% @25 degC
Measurement Specification	
Dynamic range	> 105 dB at 36 dB
Distortion	< -90 dB
Analog Low-Cut filter	0.3 Hz, -6 dB/Oct
Digital Low-Cut filter	None
DC Offset removal	Averaging by surface software
Digital High-Cut filter	Linear phase at down hole
Pass band ripple	+ - 0.01 dB
Stop band attenuation	< -130 dB
Bandwidth	80% of Nyquist frequency
Test Signal harmonic distortion	< -110 dB
Tool SN	
VSPC-AA	8074
VSCC-AA	8074
VSII-AB (18.17 m)	8235
Receiver #1 (VSIS-CA)	8315
VSII-AB (18.17 m)	8234
Receiver #2 (VSIS-CA)	8314
VSII-AB (18.17 m)	8233
Receiver #3 (VSIS-CA)	8312
VSII-AB (18.17 m)	8223
Receiver #4 (VSIS-CA)	8313
VSIA	8086

Note:

Extra weight is added at bottom of VSIA using Shooting Bridle (1-42, 1.2m) / PEKB / AH-66 / ECH (3.2m) / Bottom Nose (hole-finder), in order to aid descending.

General Information

Survey Type	Zero Offset VSP
Surface Recording Length	1000.0 ms
Surface Sampling Rate	1.0 ms
Downhole Recording Length	5000.0 ms
Downhole Sampling Rate	1.0 ms
Top of Survey	239.0 m
Bottom of Survey	3484.0 m
Number of Shots	220
Number of Downhole Traces	880
Number of Downhole Traces used for Processing	805

Source Configuration (Air Gun)

Source Location (Rig, Boat, Pit, Borehole)	Rig
Source Group ID (A, B, C, ...)	ENSCO 102
Source Offset (for fixed offset)	55 m
Source Azimuth (for fixed offset)	8 deg
Source Depth from Surface	4.3 m
Source Depth from Logging Zero	44.2 m

Gun Controller Type	Macha TGS-8
Gun Controller Model Name	TGS-8
Gun Controller Serial Number	MWA 118741
Gun Type	G-Gun
Gun Serial Number(s)	37189, 371674
Gun Configuration (3 Gun Cluster, Gun Array, etc.)	2 Gun Parallel Cluster 90 cm spacing
Gun Chamber Volumes	2 x 150 cubic Inch
Gun Pit/Borehole Information	N/A
Compressor Type	Type30 H10T2 28 SCFM @280Bar
Compressor Flow Rate	28 SCFM
Air Regulator Pressure	1800 psi

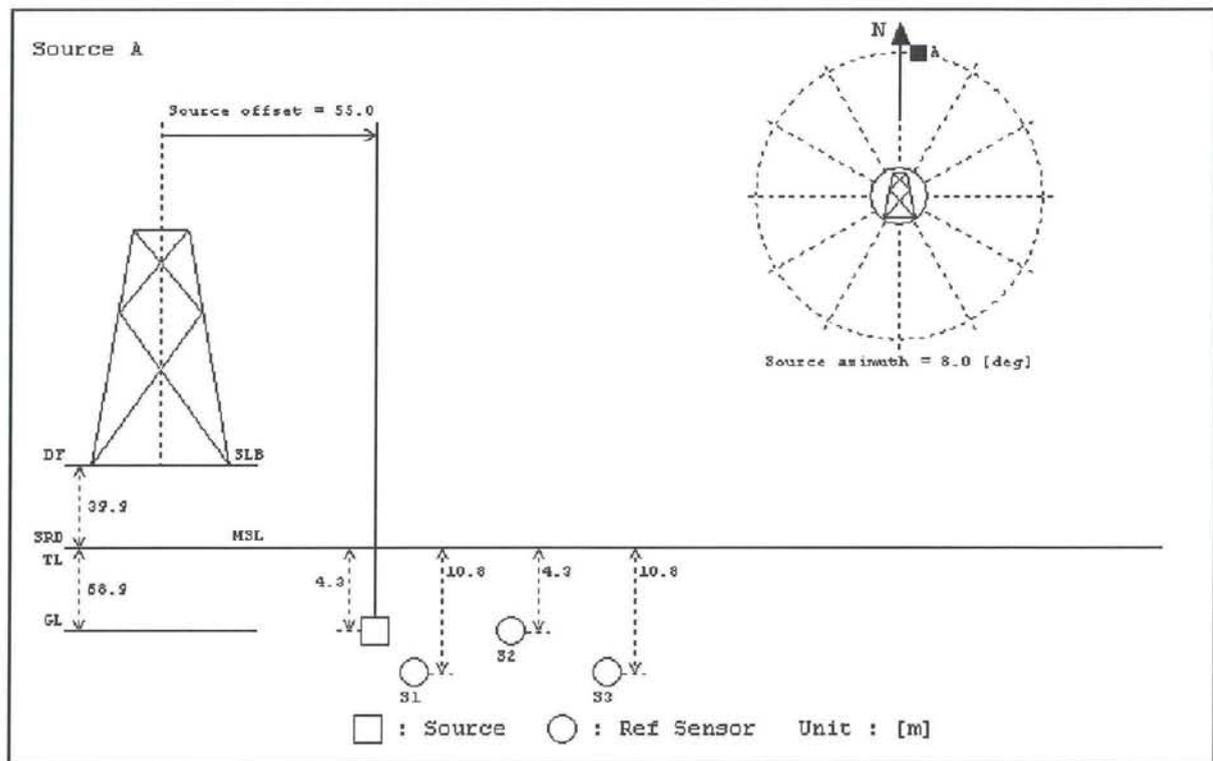
Surface Sensor Configuration

Number of Surface Reference Sensors	3
Surface Recording Length	1000 msec
Surface Sampling Rate	1 msec
Sensor Type (S1)	MP24-L3 (UH signal through TGS-8)
Sensor Type (S2)	PF signal provided by TGS-8
Sensor Type (S3)	MP24-L3
Sensor Depth from Surface (S1)	10.8m
Sensor Depth from Surface (S2)	4.3 m
Sensor Depth from Surface (S3)	10.8m
Sensor Depth from Logging Zero (S1)	50.7 m
Sensor Depth from Logging Zero (S2)	44.2 m
Sensor Depth from Logging Zero (S2)	50.7 m
Sensor Offset from Source (S1)	55 m
Sensor Offset from Source (S2)	55 m
Sensor Offset from Source (S3)	55 m

Remarks

- The Parallel Cluster Gun was suspended by floatation Buoys.
- Auto-tuning function by Gun Controller TGS-8 was utilized for two-gun cluster using M/P Time-Break sensor of each gun.
- Gun Pressure and Depth were recorded by TGS-8 system.

Source Geometry Sketch



Shot Summary Listing (1/6)

Measured Depth [m]	Tool Number	Stack Number	Relative Bearing [deg]	Caliper [in]	Anchoring force [kg]	Shot number
319.1	1	47	-10.9	9.7	908.4	232
339.1	2	47	0.8	9.6	796.1	231, 232, 233
359.1	3	47	6.1	9.6	740.0	231, 232, 233
379.1	4	47	6.2	9.6	753.8	231, 232, 233
399.0	1	46	-11.0	9.6	917.8	228, 229, 230
419.0	2	46	1.3	9.6	791.1	228, 229, 230
439.0	3	46	5.9	9.6	732.8	228, 229, 230
459.0	4	46	5.9	9.6	745.2	228, 229, 230
479.0	1	45	-11.5	9.6	905.2	223, 224, 225, 226, 227
499.0	2	45	4.2	9.6	794.6	223, 224, 225, 226, 227
519.0	3	45	6.8	9.6	736.0	223, 224, 225, 226, 227
539.0	4	45	8.7	9.6	742.4	223, 224, 225, 226, 227
559.0	1	44	-11.6	9.6	901.9	217, 218, 219, 220, 221
579.0	2	44	-3.9	9.6	781.8	217, 218, 219, 220, 221
599.0	3	44	8.1	9.6	731.0	217, 218, 219, 220, 221
619.0	4	44	8.9	9.6	719.1	217, 218, 219, 220, 221
639.0	1	43	-9.1	9.6	889.0	212, 213, 214, 215, 216
659.0	2	43	3.8	9.6	779.4	212, 213, 214, 215, 216
679.0	3	43	6.6	9.6	714.7	212, 213, 214, 215, 216
699.0	4	43	8.6	9.5	720.4	212, 213, 214, 215, 216
719.0	1	42	-6.9	9.5	887.9	207, 208, 209, 210, 211
739.0	2	42	0.3	9.6	753.7	207, 208, 209, 210, 211
759.0	3	42	6.2	9.6	703.5	207, 208, 209, 210, 211
779.0	4	42	5.7	9.5	706.5	207, 208, 209, 210, 211
798.9	1	41	-6.8	9.6	887.2	202, 203, 204, 205, 206
818.9	2	41	-2.8	9.5	753.4	202, 203, 204, 205, 206
838.9	3	41	3.7	9.6	712.1	202, 203, 204, 205, 206
858.9	4	41	10.7	9.6	685.8	202, 203, 204, 205, 206

Shot Summary Listing (2/6)

Measured Depth [m]	Tool Number	Stack Number	Relative Bearing [deg]	Caliper [in]	Anchoring force [kg]	Shot number
879.0	1	40	-12.5	9.6	876.9	197, 198, 199, 200, 201
899.0	2	40	-1.9	9.6	753.9	197, 198, 199, 200, 201
919.0	3	40	3.7	9.6	704.4	197, 198, 199, 200, 201
939.0	4	40	7.9	9.6	709.6	197, 198, 199, 200, 201
959.0	1	39	-7.7	9.6	866.4	192, 193, 194, 195, 196
979.0	2	39	3.1	9.6	752.4	192, 193, 194, 195, 196
999.0	3	39	3.3	9.6	689.6	192, 193, 194, 195, 196
1019.0	4	39	5.3	9.6	691.4	192, 193, 194, 195, 196
1039.0	1	38	-7.5	9.6	870.9	187, 188, 189, 190, 191
1059.0	2	38	-4.6	9.5	751.9	187, 188, 189, 190, 191
1079.0	3	38	3.1	9.6	688.2	187, 188, 189, 190, 191
1099.0	4	38	8.0	9.5	666.2	187, 188, 189, 190, 191
1119.0	1	37	-17.3	9.6	855.2	182, 183, 184, 185, 186
1139.0	2	37	1.0	9.6	744.2	182, 183, 184, 185, 186
1159.0	3	37	3.0	9.6	682.0	182, 183, 184, 185, 186
1179.0	4	37	8.1	9.5	674.4	182, 183, 184, 185, 186
1198.9	1	36	-7.6	9.6	851.7	177, 178, 179, 180, 181
1218.9	2	36	-0.0	9.5	740.9	177, 178, 179, 180, 181
1238.9	3	36	3.0	9.6	677.7	177, 178, 179, 180, 181
1258.9	4	36	5.6	9.5	675.7	177, 178, 179, 180, 181
1279.0	1	35	-7.6	9.6	855.7	172, 173, 174, 175, 176
1299.0	2	35	-1.2	9.5	724.1	172, 173, 174, 175, 176
1319.0	3	35	5.4	9.5	650.3	172, 173, 174, 175, 176
1339.0	4	35	7.7	9.5	641.8	172, 173, 174, 175, 176
1359.0	1	34	-20.9	9.6	838.6	167, 168, 169, 170, 171
1379.0	2	34	-1.9	9.5	725.6	167, 168, 169, 170, 171
1399.0	3	34	5.6	9.5	655.9	167, 168, 169, 170, 171
1419.0	4	34	4.5	9.5	662.7	167, 168, 169, 170, 171

Shot Summary Listing (3/6)

Measured Depth [m]	Tool Number	Stack Number	Relative Bearing [deg]	Caliper [in]	Anchoring force [kg]	Shot number
1439.0	1	33	-19.2	9.6	844.7	162, 163, 164, 165, 166
1459.0	2	33	-2.7	9.5	718.4	162, 163, 164, 165, 166
1479.0	3	33	5.7	9.6	645.8	162, 163, 164, 165, 166
1499.0	4	33	0.2	9.5	658.5	162, 163, 164, 165, 166
1519.0	1	32	-19.1	9.6	838.2	157, 158, 159, 160, 161
1539.0	2	32	-1.3	9.5	721.7	157, 158, 159, 160, 161
1559.0	3	32	9.8	9.6	632.2	157, 158, 159, 160, 161
1579.0	4	32	12.3	9.5	636.0	157, 158, 159, 160, 161
1599.1	1	31	-8.4	9.6	822.2	152, 153, 154, 155, 156
1619.1	2	31	-2.6	9.5	691.7	152, 153, 154, 155, 156
1639.1	3	31	9.6	9.5	622.5	152, 153, 154, 155, 156
1659.1	4	31	11.7	9.5	632.3	152, 153, 154, 155, 156
1679.0	1	30	-6.9	9.6	811.9	147, 148, 149, 150, 151
1699.0	2	30	-9.2	9.5	685.9	147, 148, 149, 150, 151
1719.0	3	30	3.4	9.6	615.4	147, 148, 149, 150, 151
1739.0	4	30	7.8	9.5	611.1	147, 148, 149, 150, 151
1759.0	1	29	-19.6	9.5	820.0	142, 143, 144, 145, 146
1779.0	2	29	-3.3	9.5	687.7	142, 143, 144, 145, 146
1799.0	3	29	5.6	9.6	620.1	142, 143, 144, 145, 146
1819.0	4	29	5.2	9.5	599.4	142, 143, 144, 145, 146
1839.0	1	28	-19.8	9.5	791.3	137, 138, 139, 140, 141
1859.0	2	28	-8.0	9.5	656.8	137, 138, 139, 140, 141
1879.0	3	28	9.6	9.5	612.1	137, 138, 139, 140, 141
1899.0	4	28	4.4	9.5	586.7	137, 138, 139, 140, 141
1919.0	1	27	-14.3	9.5	781.0	132, 133, 134, 135, 136
1939.0	2	27	-2.3	9.5	645.5	132, 133, 134, 135, 136
1959.0	3	27	9.4	9.5	599.5	132, 133, 134, 135, 136
1979.0	4	27	2.7	9.5	565.5	132, 133, 134, 135, 136

Shot Summary Listing (4/6)

Measured Depth [m]	Tool Number	Stack Number	Relative Bearing [deg]	Caliper [in]	Anchoring force [kg]	Shot number
1998.8	1	26	-5.3	9.5	763.0	127, 128, 129, 130, 131
2018.8	2	26	-10.0	9.5	637.8	127, 128, 129, 130, 131
2038.8	3	26	9.9	9.5	584.3	127, 128, 129, 130, 131
2058.8	4	26	-0.6	9.5	566.6	127, 128, 129, 130, 131
2079.0	1	25	-9.1	9.5	778.8	122, 123, 124, 125, 126
2099.0	2	25	-8.3	9.5	630.8	122, 123, 124, 125, 126
2119.0	3	25	6.8	9.6	589.7	122, 123, 124, 125, 126
2139.0	4	25	-5.8	9.5	584.6	122, 123, 124, 125, 126
2158.9	1	24	-8.3	9.5	763.7	117, 118, 119, 120, 121
2178.9	2	24	29.0	9.5	640.3	117, 118, 119, 120, 121
2198.9	3	24	6.8	9.5	571.1	117, 118, 119, 120, 121
2218.9	4	24	-12.1	9.4	564.4	117, 118, 119, 120, 121
2239.0	1	23	8.4	9.5	734.3	112, 113, 114, 115, 116
2259.0	2	23	118.8	9.5	627.2	112, 113, 114, 115, 116
2279.0	3	23	16.0	9.5	581.8	112, 113, 114, 115, 116
2299.0	4	23	-28.1	9.4	546.4	112, 113, 114, 115, 116
2319.0	1	22	13.7	9.6	764.6	107, 108, 109, 110, 111
2339.0	2	22	143.1	9.5	627.2	107, 108, 109, 110, 111
2359.0	3	22	18.1	9.5	584.3	107, 108, 109, 110, 111
2379.0	4	22	-44.1	9.5	539.9	107, 108, 109, 110, 111
2399.0	1	21	-2.1	9.5	749.6	102, 103, 104, 105, 106
2419.0	2	21	-1.0	13.4	623.8	102, 103, 104, 105, 106
2439.0	3	21	0.6	9.1	573.6	102, 103, 104, 105, 106
2459.0	4	21	11.5	9.1	552.6	102, 103, 104, 105, 106
2479.0	1	20	-14.8	9.2	729.8	96, 97, 98, 99, 100, 101
2499.0	2	20	-11.4	9.1	606.8	96, 97, 98, 99, 100, 101
2519.0	3	20	14.1	9.2	566.7	96, 97, 98, 99, 100, 101
2539.0	4	20	5.2	9.2	553.5	96, 97, 98, 99, 100, 101

Shot Summary Listing (5/6)

Measured Depth [m]	Tool Number	Stack Number	Relative Bearing [deg]	Caliper [in]	Anchoring force [kg]	Shot number
2558.9	1	19	-7.0	9.1	698.2	90, 91, 92, 93, 94, 95
2578.9	2	19	-6.3	9.2	614.0	90, 91, 92, 93, 94, 95
2598.9	3	19	0.9	9.2	533.8	90, 91, 92, 93, 94, 95
2618.9	4	19	-5.6	9.1	529.5	90, 91, 92, 93, 94, 95
2638.9	1	18	147.5	9.1	698.6	83, 84, 85, 86, 87, 88, 89
2658.9	2	18	-118.3	9.1	588.5	83, 84, 85, 86, 87, 88, 89
2678.9	3	18	22.1	9.1	525.7	83, 84, 85, 86, 87, 88, 89
2698.9	4	18	21.7	9.2	535.6	83, 84, 85, 86, 87, 88, 89
2718.9	1	17	-9.5	9.3	731.3	77, 78, 79, 80, 81, 82
2738.9	2	17	-3.5	9.2	581.3	77, 78, 79, 80, 81, 82
2758.9	3	17	7.9	9.4	566.7	77, 78, 79, 80, 81, 82
2778.9	4	17	-3.2	9.2	535.9	77, 78, 79, 80, 81, 82
2799.2	1	16	-11.7	9.5	714.3	70, 71, 72, 73, 74, 75, 76
2819.2	2	16	4.5	9.5	590.0	70, 71, 72, 73, 74, 75, 76
2839.2	3	16	-0.3	9.4	538.4	70, 71, 72, 73, 74, 75, 76
2859.2	4	16	-2.9	9.1	479.6	70, 71, 72, 73, 74, 75, 76
2879.2	1	14	-2.9	9.3	683.2	63, 64, 65, 66, 67, 68
2899.2	2	14	3.7	9.1	584.5	63, 64, 65, 66, 67, 68
2919.2	3	14	-1.1	9.1	537.8	63, 64, 65, 66, 67, 68
2939.2	4	14	-12.8	9.2	529.9	63, 64, 65, 66, 67, 68
2958.8	1	13	-28.8	9.2	701.3	58, 59, 60, 61, 62
2978.8	2	13	0.8	9.0	558.4	58, 59, 60, 61, 62
2998.8	3	13	-1.9	9.1	539.7	58, 59, 60, 61, 62
3018.8	4	13	10.7	9.0	497.0	58, 59, 60, 61, 62
3039.0	1	12	-1.2	9.0	635.4	51, 52, 53, 54, 55, 56, 57
3059.0	2	12	8.0	9.2	563.2	51, 52, 53, 54, 55, 56, 57
3079.0	3	12	0.4	9.2	534.5	51, 52, 53, 54, 55, 56, 57
3099.0	4	12	9.7	9.0	480.8	52, 53, 54, 55, 56, 57

Shot Summary Listing (6/6)

Measured Depth [m]	Tool Number	Stack Number	Relative Bearing [deg]	Caliper [in]	Anchoring force [kg]	Shot number
3119.0	1	11	0.8	9.2	682.5	45, 46, 47, 48, 49, 50
3139.0	2	11	13.1	9.0	557.8	45, 46, 47, 48, 49, 50
3159.0	3	11	-3.9	9.2	525.2	45, 46, 47, 48, 49, 50
3179.0	4	11	18.0	9.2	511.3	45, 46, 47, 48, 49, 50
3199.0	1	10	-9.3	9.1	683.2	40, 41, 42, 43, 44
3219.0	2	10	-39.4	9.1	553.9	40, 41, 42, 43, 44
3239.0	3	10	-0.2	9.2	528.4	40, 41, 42, 43, 44
3259.0	4	10	6.9	9.2	524.0	40, 41, 42, 43, 44
3279.0	1	9	-9.6	9.1	658.6	35, 36, 37, 38, 39
3299.0	2	9	-13.1	9.1	545.9	35, 36, 37, 38, 39
3319.0	3	9	12.8	9.1	503.3	35, 36, 37, 38, 39
3339.0	4	9	3.3	9.2	498.3	35, 36, 37, 38, 39
3349.1	1	8	-12.1	9.0	638.9	30, 31, 32, 33, 34
3369.1	2	8	-3.0	9.1	552.1	30, 31, 32, 33, 34
3389.1	3	8	-5.3	9.1	502.6	30, 31, 32, 33, 34
3409.1	4	8	-49.8	9.2	499.2	30, 31, 32, 33, 34

Stack Summary Listing (1/6) from VSI_001_A_geo_wavfield_z.ldb

Stack Number ACQUISITION SHOT_ NUMBER	Measured Depth [m] CABLE_ LENGTH	True Vertical Depth [m] RECEIVER_ CORRECTION_ Z	Measured Time [s] TRANSIT_ TIME	One-way Vertical Time [s] TRANSIT_ TIME_SRD	Two-way Vertical Time [s] TRANSIT_ TIME_ INITIAL	Interval Velocity [m/s] VELOCITY_ 1	Average Velocity [m/s] VELOCITY_ 2	RMS Velocity [m/s] VELOCITY_ 3
	0	0	0	0	0			
						1722.5		
47	319.1	279.2	0.1625	0.1621	0.3241		1722.5	1722.5
						2152.0		
47	339.1	299.2	0.1715	0.1714	0.3427		1745.8	1748.5
						2179.4		
47	359.1	319.2	0.1805	0.1805	0.3611		1767.8	1772.9
						2526.0		
47	379.1	339.2	0.1882	0.1885	0.3769		1799.7	1810.9
						3221.4		
46	399.0	359.1	0.1941	0.1946	0.3893		1844.8	1872.1
						2391.9		
46	419.0	379.1	0.2024	0.2030	0.4060		1867.4	1896.3
						1911.0		
46	439.0	399.1	0.2127	0.2135	0.4269		1869.5	1897.0
						2319.2		
46	459.0	419.1	0.2212	0.2221	0.4442		1887.0	1915.1
						2435.8		
45	479.0	439.1	0.2293	0.2303	0.4606		1906.6	1936.2
						3558.5		
45	499.0	459.1	0.2348	0.2359	0.4719		1945.9	1990.2
						2362.6		
45	519.0	479.1	0.2432	0.2444	0.4888		1960.4	2004.3
						2826.4		
45	539.0	499.1	0.2502	0.2515	0.5029		1984.7	2032.0
						2298.3		
44	559.0	519.1	0.2589	0.2602	0.5204		1995.2	2041.5
						2697.1		
44	579.0	539.1	0.2662	0.2676	0.5352		2014.7	2062.5
						2761.7		
44	599.0	559.1	0.2734	0.2748	0.5497		2034.4	2083.9
						2778.9		
44	619.0	579.1	0.2805	0.2820	0.5641		2053.4	2104.5
						2636.7		
43	639.0	599.1	0.2881	0.2896	0.5793		2068.6	2120.1
						2761.8		
43	659.0	619.1	0.2952	0.2969	0.5937		2085.6	2138.1
						2778.8		
43	679.0	639.1	0.3024	0.3041	0.6081		2102.0	2155.4
						2666.1		
43	699.0	659.1	0.3099	0.3116	0.6231		2115.5	2169.1
						2446.6		
42	719.0	679.1	0.3180	0.3197	0.6395		2124.0	2176.7
						2896.1		
42	739.0	699.1	0.3249	0.3266	0.6533		2140.3	2194.3
						3058.2		
42	759.0	719.1	0.3314	0.3332	0.6664		2158.3	2214.5
						3015.2		
42	779.0	739.1	0.3380	0.3398	0.6796		2175.1	2232.9
						2752.4		
41	798.9	759.0	0.3452	0.3470	0.6941		2187.1	2244.9
						2699.5		
41	818.9	779.0	0.3525	0.3545	0.7089		2197.8	2255.4
						2601.7		
41	838.9	799.0	0.3602	0.3621	0.7243		2206.4	2263.3
						2534.7		
41	858.9	819.0	0.3681	0.3700	0.7401		2213.4	2269.4
						2841.7		

Stack Summary Listing (2/6) from VSI_001_A_geo_wavfield_z.ldf

Stack Number ACQUISITION SHOT_ NUMBER	Measured Depth [m] CABLE_ LENGTH	True Vertical Depth [m] RECEIVER_ CORRECTION Z	Measured Time [s] TRANSIT_ TIME	One-way Vertical Time [s] TRANSIT_ TIME_SRD	Two-way Vertical Time [s] TRANSIT_ TIME_ INITIAL	Interval Velocity [m/s] VELOCITY_ 1	Average Velocity [m/s] VELOCITY_ 2	RMS Velocity [m/s] VELOCITY_ 3
40	879.0	839.1	0.3751	0.3771	0.7542	2451.5	2225.2	2281.5
40	899.0	859.1	0.3832	0.3853	0.7705	2491.8	2229.9	2285.2
40	919.0	879.1	0.3912	0.3933	0.7866	2257.2	2235.3	2289.6
40	939.0	899.1	0.4001	0.4021	0.8043	2145.6	2235.8	2288.9
39	959.0	919.1	0.4094	0.4115	0.8229	2109.3	2233.7	2285.7
39	979.0	939.1	0.4189	0.4209	0.8419	2192.9	2230.9	2281.9
39	999.0	959.1	0.4280	0.4301	0.8601	2172.9	2230.1	2280.1
39	1019.0	979.1	0.4372	0.4393	0.8785	2276.1	2228.9	2277.9
38	1039.0	999.1	0.4459	0.4481	0.8961	2167.6	2229.8	2277.8
38	1059.0	1019.1	0.4552	0.4573	0.9146	2124.9	2228.6	2275.7
38	1079.0	1039.1	0.4646	0.4667	0.9334	2165.0	2226.5	2272.7
38	1099.0	1059.1	0.4738	0.4759	0.9519	2263.9	2225.3	2270.7
37	1119.0	1079.1	0.4826	0.4848	0.9696	2300.3	2226.0	2270.6
37	1139.0	1099.1	0.4913	0.4935	0.9869	2288.7	2227.3	2271.1
37	1159.0	1119.1	0.5000	0.5022	1.0044	2329.6	2228.4	2271.4
37	1179.0	1139.1	0.5086	0.5108	1.0216	2333.2	2230.1	2272.4
36	1198.9	1159.0	0.5171	0.5193	1.0387	2312.2	2231.8	2273.4
36	1218.9	1179.0	0.5258	0.5280	1.0560	2353.6	2233.1	2274.0
36	1238.9	1199.0	0.5342	0.5365	1.0730	2336.5	2235.0	2275.3
36	1258.9	1219.0	0.5428	0.5450	1.0901	2424.7	2236.6	2276.3
35	1279.0	1239.1	0.5510	0.5533	1.1066	2361.2	2239.4	2278.6
35	1299.0	1259.1	0.5595	0.5618	1.1236	2360.0	2241.2	2279.8
35	1319.0	1279.1	0.5680	0.5703	1.1405	2256.6	2243.0	2281.1
35	1339.0	1299.1	0.5768	0.5791	1.1582	2372.9	2243.2	2280.7
34	1359.0	1319.1	0.5852	0.5875	1.1751	2347.1	2245.1	2282.0
34	1379.0	1339.1	0.5938	0.5961	1.1921	2434.2	2246.5	2283.0
34	1399.0	1359.1	0.6020	0.6043	1.2086	2453.6	2249.1	2285.1
34	1419.0	1379.1	0.6101	0.6124	1.2249	2451.1	2251.8	2287.4
33	1439.0	1399.1	0.6182	0.6206	1.2412	2392.3	2254.4	2289.7

Stack Summary Listing (3/6) from VSI_001_A_geo_wavfield_z.ldr

Stack Number ACQUISITION SHOT_ NUMBER	Measured Depth [m] CABLE_ LENGTH	True Vertical Depth [m] RECEIVER_ CORRECTION_ Z	Measured Time [s] TRANSIT_ TIME	One-way Vertical Time [s] TRANSIT_ TIME_SRD	Two-way Vertical Time [s] TRANSIT_ TIME_ INITIAL	Interval Velocity [m/s] VELOCITY_ 1	Average Velocity [m/s] VELOCITY_ 2	RMS Velocity [m/s] VELOCITY_ 3
33	1459.0	1419.1	0.6266	0.6289	1.2579	2503.0	2256.3	2291.0
33	1479.0	1439.1	0.6346	0.6369	1.2739	2575.7	2259.4	2293.8
33	1499.0	1459.1	0.6423	0.6447	1.2894	2732.1	2263.2	2297.4
32	1519.0	1479.1	0.6497	0.6520	1.3041	2608.6	2268.4	2302.8
32	1539.0	1499.1	0.6573	0.6597	1.3194	2715.2	2272.4	2306.6
32	1559.0	1519.1	0.6647	0.6671	1.3341	2560.0	2277.3	2311.5
32	1579.0	1539.1	0.6725	0.6749	1.3498	2653.5	2280.6	2314.5
31	1599.1	1559.2	0.6801	0.6824	1.3649	2638.4	2284.7	2318.5
31	1619.1	1579.2	0.6876	0.6900	1.3800	2574.0	2288.6	2322.3
31	1639.1	1599.2	0.6954	0.6978	1.3956	2674.1	2291.8	2325.2
31	1659.1	1619.2	0.7029	0.7053	1.4105	2691.7	2295.8	2329.2
30	1679.0	1639.1	0.7103	0.7127	1.4254	2568.7	2299.9	2333.3
30	1699.0	1659.1	0.7180	0.7205	1.4409	2570.0	2302.8	2335.9
30	1719.0	1679.1	0.7258	0.7282	1.4565	2641.6	2305.7	2338.6
30	1739.0	1699.1	0.7334	0.7358	1.4716	2467.6	2309.1	2341.9
29	1759.0	1719.1	0.7415	0.7439	1.4878	2635.8	2310.9	2343.3
29	1779.0	1739.1	0.7491	0.7515	1.5030	2652.3	2314.1	2346.4
29	1799.0	1759.1	0.7566	0.7591	1.5181	2588.1	2317.5	2349.7
29	1819.0	1779.1	0.7643	0.7668	1.5336	2678.4	2320.2	2352.2
28	1839.0	1799.1	0.7718	0.7743	1.5485	2661.2	2323.7	2355.5
28	1859.0	1819.1	0.7793	0.7818	1.5636	2906.2	2326.9	2358.7
28	1879.0	1839.1	0.7862	0.7887	1.5773	2851.7	2332.0	2364.0
28	1899.0	1859.1	0.7932	0.7957	1.5913	2844.8	2336.6	2368.7
27	1919.0	1879.1	0.8002	0.8027	1.6054	2958.0	2341.0	2373.3
27	1939.0	1899.1	0.8070	0.8095	1.6189	3023.4	2346.2	2378.8
27	1959.0	1919.1	0.8136	0.8161	1.6321	2969.7	2351.7	2384.7
27	1979.0	1939.1	0.8203	0.8228	1.6456	3107.0	2356.7	2390.1
26	1998.8	1958.9	0.8267	0.8292	1.6583	3042.9	2362.5	2396.4
26	2018.8	1978.9	0.8332	0.8357	1.6715	3141.6	2367.8	2402.2

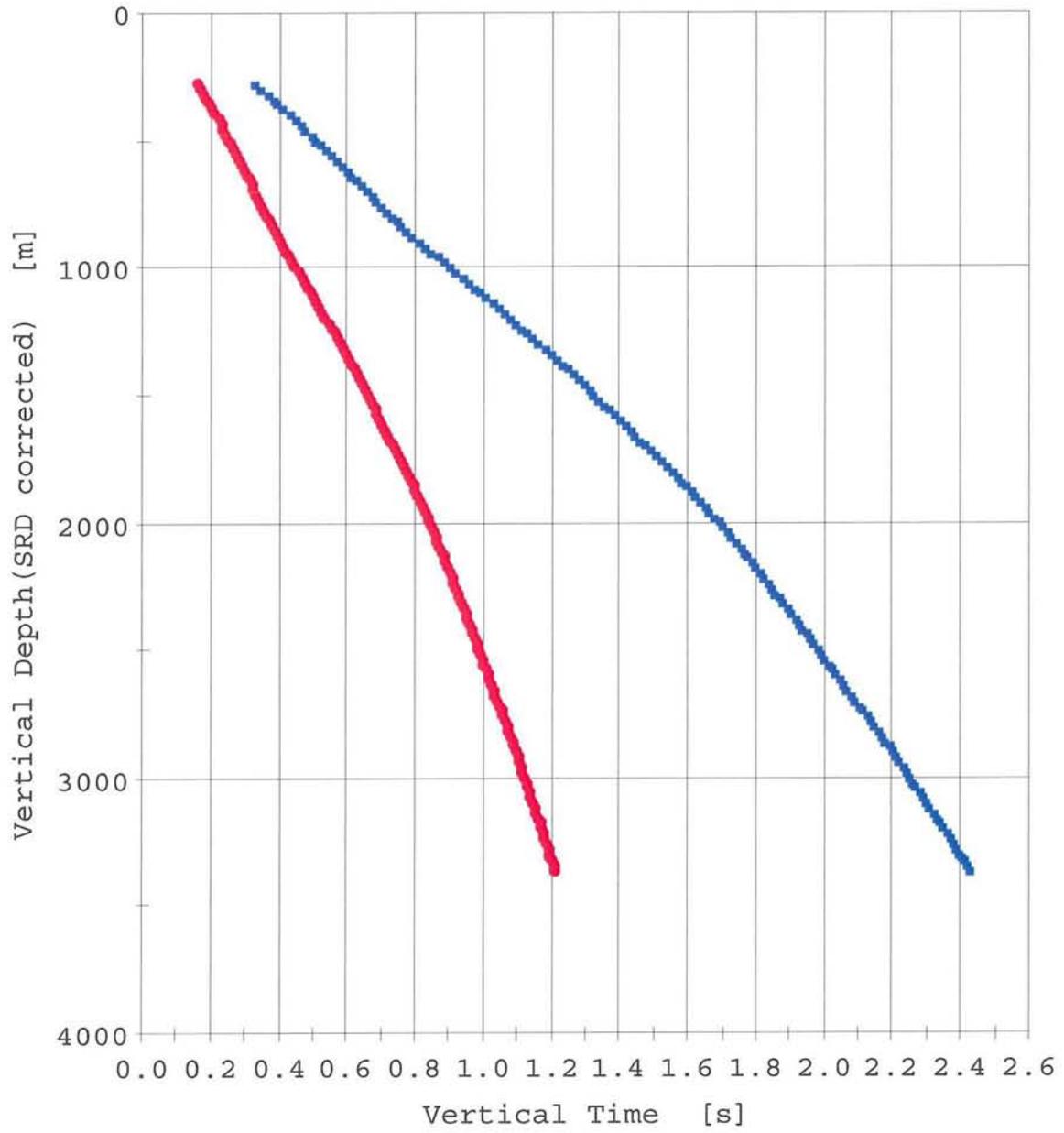
Stack Summary Listing (4/6) from VSI_001_A_geo_wavfield_z.ldr

Stack Number ACQUISITION SHOT_ NUMBER	Measured Depth [m] CABLE_ LENGTH	True Vertical Depth [m] RECEIVER_ CORRECTION_ Z	Measured Time [s] TRANSIT_ TIME	One-way Vertical Time [s] TRANSIT_ TIME_SRD	Two-way Vertical Time [s] TRANSIT_ TIME_ INITIAL	Interval Velocity [m/s] VELOCITY_ 1	Average Velocity [m/s] VELOCITY_ 2	RMS Velocity [m/s] VELOCITY_ 3
26	2038.8	1998.9	0.8396	0.8421	1.6842		2373.7	2408.6
						3122.9		
26	2058.8	2018.9	0.8460	0.8485	1.6970		2379.3	2414.8
						3146.2		
25	2079.0	2039.1	0.8524	0.8549	1.7099		2385.1	2421.1
						3123.4		
25	2099.0	2059.1	0.8588	0.8613	1.7227		2390.6	2427.1
						3098.1		
25	2119.0	2079.1	0.8653	0.8678	1.7356		2395.8	2432.8
						3131.9		
25	2139.0	2099.1	0.8717	0.8742	1.7483		2401.2	2438.6
						3411.9		
24	2158.9	2119.0	0.8775	0.8800	1.7600		2407.9	2446.3
						3464.5		
24	2178.9	2139.0	0.8833	0.8858	1.7716		2414.8	2454.3
						3444.1		
24	2198.9	2159.0	0.8891	0.8916	1.7832		2421.5	2462.1
						3410.1		
24	2218.9	2179.0	0.8949	0.8975	1.7949		2428.0	2469.4
						3574.4		
23	2239.0	2199.1	0.9005	0.9031	1.8062		2435.1	2477.8
						3461.6		
23	2259.0	2219.1	0.9063	0.9089	1.8177		2441.6	2485.3
						3412.7		
23	2279.0	2239.1	0.9122	0.9147	1.8294		2447.9	2492.4
						3548.0		
23	2299.0	2259.1	0.9178	0.9204	1.8407		2454.6	2500.2
						3335.7		
22	2319.0	2279.1	0.9238	0.9264	1.8527		2460.3	2506.5
						3463.6		
22	2339.0	2299.1	0.9296	0.9321	1.8643		2466.5	2513.5
						3346.2		
22	2359.0	2319.1	0.9355	0.9381	1.8762		2472.1	2519.7
						3754.2		
22	2379.0	2339.1	0.9409	0.9434	1.8869		2479.4	2528.4
						3309.5		
21	2399.0	2359.1	0.9469	0.9495	1.8990		2484.6	2534.1
						3376.6		
21	2419.0	2379.1	0.9528	0.9554	1.9108		2490.2	2540.2
						3429.9		
21	2439.0	2399.1	0.9587	0.9612	1.9225		2495.9	2546.5
						3611.8		
21	2459.0	2419.1	0.9642	0.9668	1.9335		2502.3	2553.9
						4416.3		
20	2479.0	2439.1	0.9687	0.9713	1.9426		2511.2	2565.7
						3417.7		
20	2499.0	2459.1	0.9746	0.9771	1.9543		2516.6	2571.7
						3792.5		
20	2519.0	2479.1	0.9798	0.9824	1.9648		2523.5	2579.8
						3685.0		
20	2539.0	2499.1	0.9853	0.9878	1.9757		2529.8	2587.1
						3507.0		
19	2558.9	2519.0	0.9909	0.9935	1.9871		2535.4	2593.3
						4234.2		
19	2578.9	2539.0	0.9957	0.9983	1.9965		2543.5	2603.5
						3595.4		
19	2598.9	2559.0	1.0012	1.0038	2.0076		2549.3	2610.0
						3532.5		

Stack Summary Listing (5/6) from VSI_001_A_geo_wavfield_z.ldr

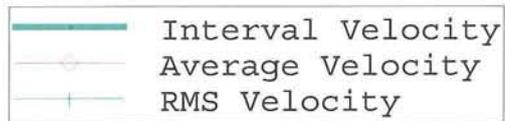
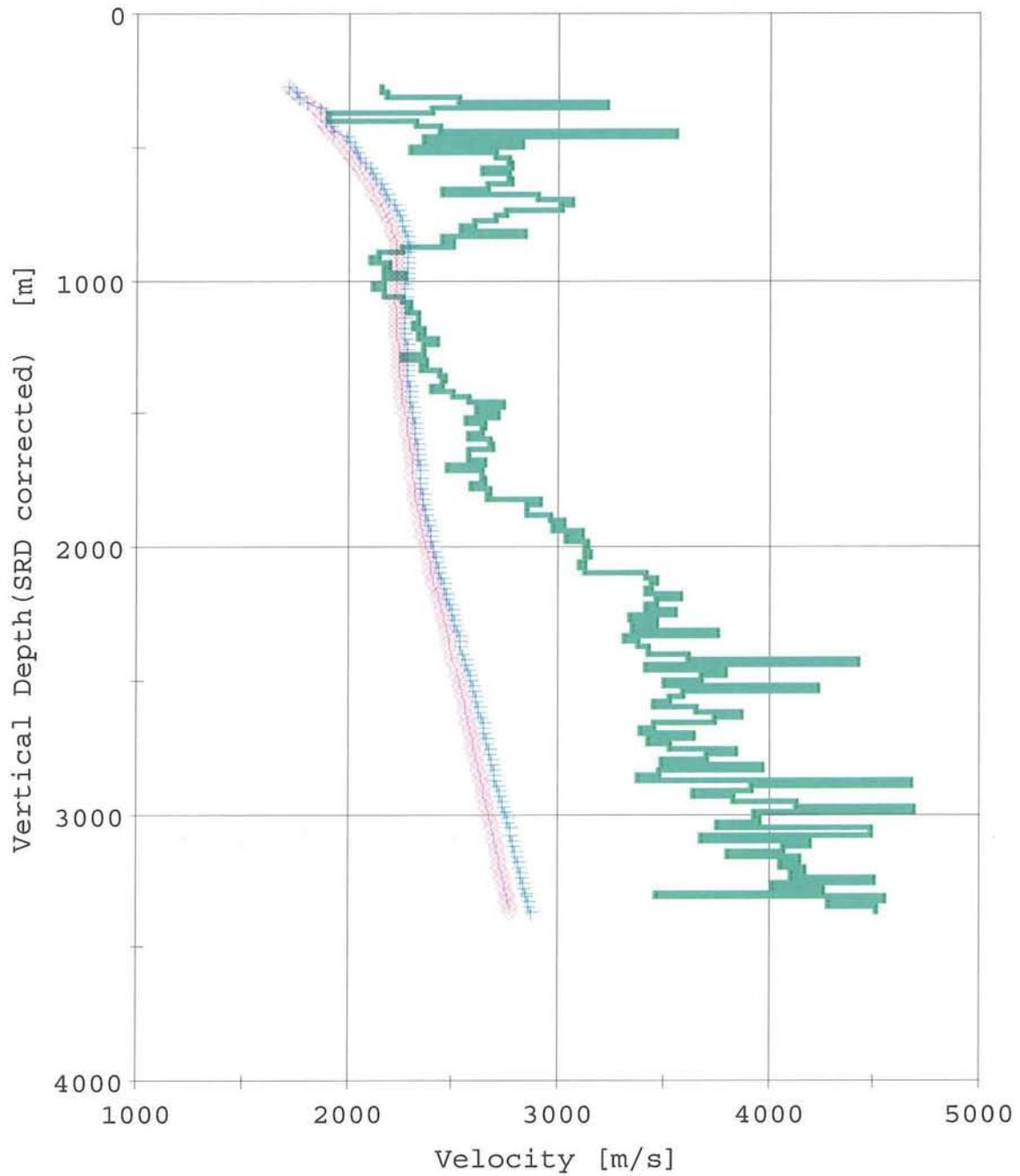
Stack Number ACQUISITION SHOT_ NUMBER	Measured Depth [m] CABLE_ LENGTH	True Vertical Depth [m] RECEIVER_ CORRECTION Z	Measured Time [s] TRANSIT_ TIME	One-way Vertical Time [s] TRANSIT_ TIME_SRD	Two-way Vertical Time [s] TRANSIT_ TIME_ INITIAL	Interval Velocity [m/s] VELOCITY_ 1	Average Velocity [m/s] VELOCITY_ 2	RMS Velocity [m/s] VELOCITY_ 3
19	2618.9	2579.0	1.0069	1.0095	2.0190		2554.8	2616.1
						3457.3		
18	2638.9	2599.0	1.0127	1.0153	2.0305		2560.0	2621.7
						3654.7		
18	2658.9	2619.0	1.0181	1.0207	2.0415		2565.8	2628.3
						3864.1		
18	2678.9	2639.0	1.0233	1.0259	2.0518		2572.4	2636.0
						3743.9		
18	2698.9	2659.0	1.0287	1.0312	2.0625		2578.4	2642.9
						3458.1		
17	2718.9	2679.0	1.0344	1.0370	2.0740		2583.3	2648.2
						3392.3		
17	2738.9	2699.0	1.0403	1.0429	2.0858		2587.9	2652.9
						3647.7		
17	2758.9	2719.0	1.0458	1.0484	2.0968		2593.5	2659.1
						3432.1		
17	2778.9	2739.0	1.0516	1.0542	2.1084		2598.1	2664.0
						3529.2		
16	2799.2	2759.3	1.0574	1.0600	2.1200		2603.2	2669.5
						3838.0		
16	2819.2	2779.3	1.0626	1.0652	2.1304		2609.2	2676.4
						3703.8		
16	2839.2	2799.3	1.0680	1.0706	2.1412		2614.7	2682.6
						3495.3		
16	2859.2	2819.3	1.0737	1.0763	2.1527		2619.4	2687.6
						3968.6		
14	2879.2	2839.3	1.0787	1.0814	2.1627		2625.7	2694.9
						3476.2		
14	2899.2	2859.3	1.0845	1.0871	2.1742		2630.2	2699.7
						3380.4		
14	2919.2	2879.3	1.0904	1.0930	2.1861		2634.2	2703.8
						4669.0		
14	2939.2	2899.3	1.0947	1.0973	2.1946		2642.2	2714.3
						3923.1		
13	2958.8	2918.9	1.0997	1.1023	2.2046		2648.0	2721.0
						3645.7		
13	2978.8	2938.9	1.1052	1.1078	2.2156		2652.9	2726.3
						3824.7		
13	2998.8	2958.9	1.1104	1.1130	2.2261		2658.4	2732.5
						4130.2		
13	3018.8	2978.9	1.1153	1.1179	2.2358		2664.8	2740.1
						4680.3		
12	3039.0	2999.1	1.1196	1.1222	2.2444		2672.6	2750.2
						3936.6		
12	3059.0	3019.1	1.1246	1.1273	2.2545		2678.2	2756.7
						3952.0		
12	3079.0	3039.1	1.1297	1.1323	2.2646		2683.9	2763.1
						3751.1		
12	3099.0	3059.1	1.1350	1.1377	2.2753		2688.9	2768.6
						4490.5		
11	3119.0	3079.1	1.1395	1.1421	2.2842		2696.0	2777.4
						3679.5		
11	3139.0	3099.1	1.1449	1.1475	2.2951		2700.6	2782.3
						4193.7		
11	3159.0	3119.1	1.1497	1.1523	2.3046		2706.8	2789.7
						4074.9		
11	3179.0	3139.1	1.1546	1.1572	2.3144		2712.6	2796.4
						3800.1		

Time Depth Plot Page



- One-way Vertical Time
- Two-way Vertical Time

Velocity Plot Page



Process Flow	Parameter
<pre> graph TD LoadLdf --> Output_1_1[Output_1] Output_1_1 --> TraceRange TraceRange --> Output_1_2[Output_1] TraceRange --> Shift Output_1_2 --> BPFfilter BPFfilter --> Output_1_3[Output_1] BPFfilter --> Frequency Output_1_3 --> GenVelfil GenVelfil --> Residual_1[Residual] Residual_1 --> Frequency2 Residual_1 --> WaveDecon WaveDecon --> Up_Output_1[Up_Output] Up_Output_1 --> Frequency1 Up_Output_1 --> Up_Output_2[Up_Output] Up_Output_2 --> BPFfilter1 BPFfilter1 --> Output_1_4[Output_1] Output_1_4 --> TVG_TAR[TVG(TAR)] TVG_TAR --> Output_1_5[Output_1] Output_1_5 --> GenVelfil1 GenVelfil1 --> Enhanced Enhanced --> Corridor </pre>	<p>[LoadLdf] Input 1: VSI_001_A_geo_wavefield_z.1df</p> <p>[BPFfilter] Phase: Zero Band Width: 3.0 - 200.0Hz</p> <p>[GenVelfil] Apply internal Normalization/Denormalization 7 Traces</p> <p>[Frequency3] Process all samples Apply FK</p> <p>[WaveDecon] Waveshape Deconvolution Design Filter trace Input start at TRANSIT_TIME wavelet: 8.0 - 60.0 Hz zero-phase Polarity: Positive</p> <p>[BPFfilter1] Phase: Zero Band Width: 3.0 - 65.0Hz</p> <p>[TVG(TAR)] Travel time exponent = 1.30</p> <p>[GenVelfil1] 5 Traces</p> <p>[Corridor] Window Start: TRANSIT_TIME - 0.000 (s) Window End: TRANSIT_TIME - -0.100 (s) (Deepest 10 traces remain) Mean Stack BPF 5.0 - 100.0Hz</p> <p>[Frequency2] Process all samples Apply FZ</p> <p>[Frequency1] Process all samples Apply FK</p> <p>[Frequency] Process all samples Apply FK</p>

[LoadLdf]

FileLoadLdf Parameters

Input 1: VSI_001_A_geo_wavefield_z.ldf

[TraceRange]

Trace Range Set Manual Parameters

Trace Range Set Parameters

Remove Bad Trace

[Shft]

Shift Parameters

Shift: + TRANSIT_TIME_ACCURACY - 0 s

Update selected headers

[BPFilter]

BPF Parameters

Butterworth Filter, Zero Phase

Characteristic: 3.000 Hz to 200.000 Hz Order 3

[GenVelFil]

Mean/Median Generalized Velocity Filter Parameters

Align events using times of TRANSIT_TIME x 1.000

Compute both enhanced and residual output

Apply internal Normalization/Denormalization based on RMS of time window

From TRANSIT_TIME - 0.020 s

Window length = 0.200 s

Tuckey's trimean Stacking

Stacking window (traces): 7

Stacking window (samples): 1

Source and receiver coordinates Parameters

Source Offset: SOURCE_LINE_POSITION_RHO

Source Depth: SOURCE_LINE_POSITION_Z

Receiver Offset: RECEIVER_LINE_POSITION_RHO

Receiver Depth: RECEIVER_LINE_POSITION_Z

[Frequency3]

Spectral Analyser Parameters

Process all samples

Depth/Offset header = CABLE_LENGTH

Output is FK Domain

Compute Amplitude spectrum in dB

[WaveDecon]

Waveshaping deconvolution Parameters

Design Filter trace by trace

Filter input start at TRANSIT_TIME - 0.080 s

Filter input window: 1.000 s

Filter Length is filter input window

Desired wavelet created by filtered unit impulse from 8.000 Hz to 60.000 Hz

Positive wavelet polarity

Wavelet delay time = Filter Length / 2

White noise (%): 5.000

Waveshaping optimization Parameters

[BPFilter1]

BPF Parameters

Butterworth Filter, Zero Phase
Characteristic: 3.000 Hz to 65.000 Hz Order 3

[TVG(TAR)]

Time-Varying Gain Parameters

Window start at TRANSIT_TIME - 0.000000
Window length = 2.999000
Travel time exponent = 1.300000
Exponential Weighting = 0.000000

[GenVelfill]

Mean/Median Generalized Velocity Filter Parameters

Align events using times of TRANSIT_TIME x -1.000
Compute both enhanced and residual output
Tuckey's trimean Stacking
Stacking window (traces): 5
Stacking window (samples): 1
Source and receiver coordinates Parameters
Source Offset: SOURCE_LINE_POSITION_RHO
Source Depth: SOURCE_LINE_POSITION_Z
Receiver Offset: RECEIVER_LINE_POSITION_RHO
Receiver Depth: RECEIVER_LINE_POSITION_Z

[Corridor]

Corridor stack Parameters

Mute before TRANSIT_TIME - 0 s
Mute after TRANSIT_TIME - -0.100 s
All traces except the deepest (traces): 10
Depth header: RECEIVER_POSITION_Z
Mean stack
Apply +TT with TRANSIT_TIME
Replicate corridor stack x 10
BPF Parameters
Butterworth Filter, Zero Phase
Characteristic: 5.000 Hz to 100.000 Hz Order 3

[Frequency2]

Spectral Analyser Parameters

Process all samples
Depth/Offset header = RECEIVER_POSITION_Z
Output is Frequency Domain
Compute Amplitude spectrum in dB

[Frequency1]

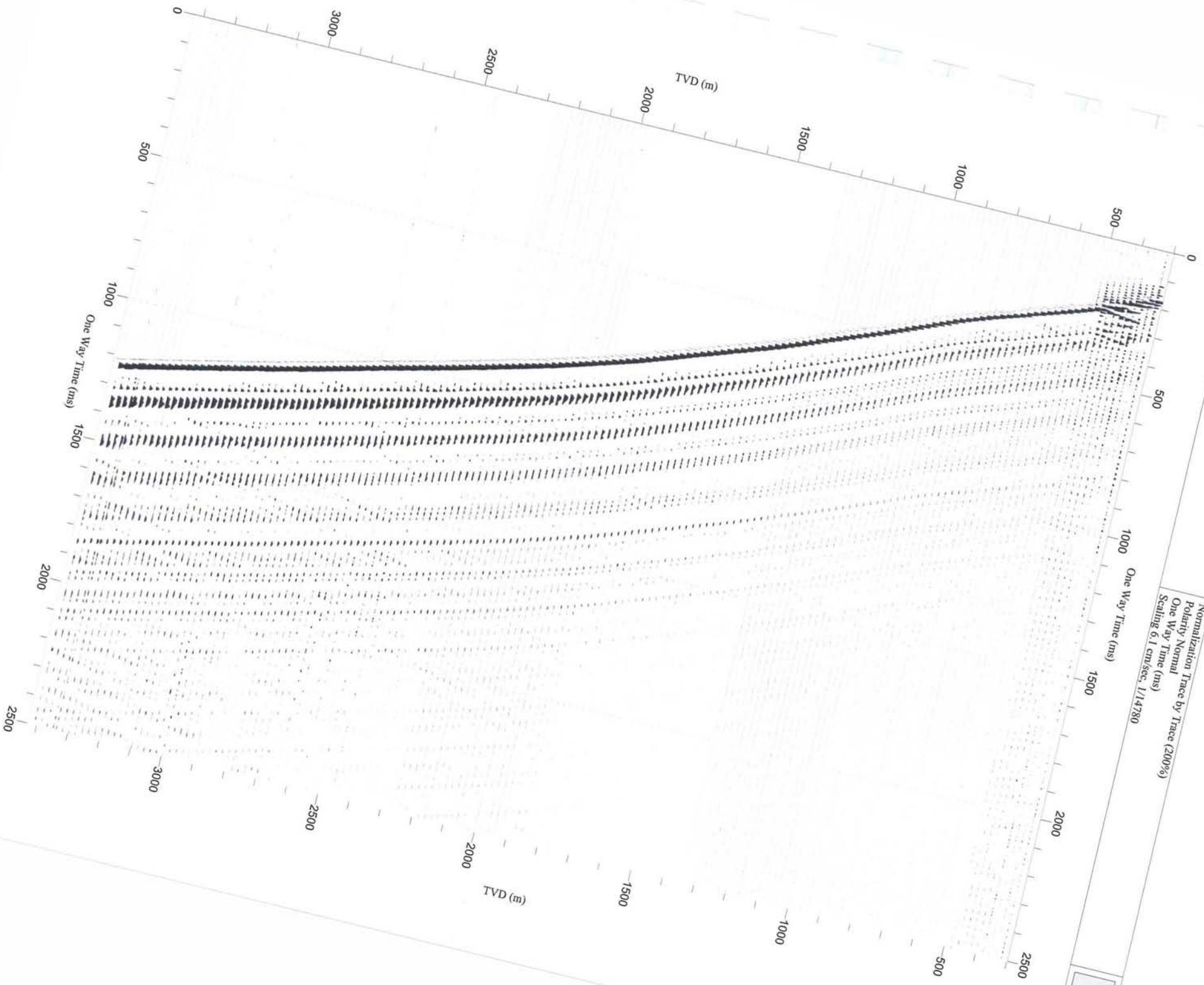
Spectral Analyser Parameters

Process all samples
Depth/Offset header = RECEIVER_POSITION_Z
Output is FK Domain
Compute Amplitude spectrum in dB

[Frequency]

Spectral Analyser Parameters

Process all samples
Depth/Offset header = RECEIVER_POSITION_Z
Output is FK Domain
Compute Amplitude spectrum in dB



Raw Stack (Z)

Normalization Trace by Trace (200%)
Polarity Normal
One Way Time (ms)
Scaling 6.1 cm/sec. 1/14780



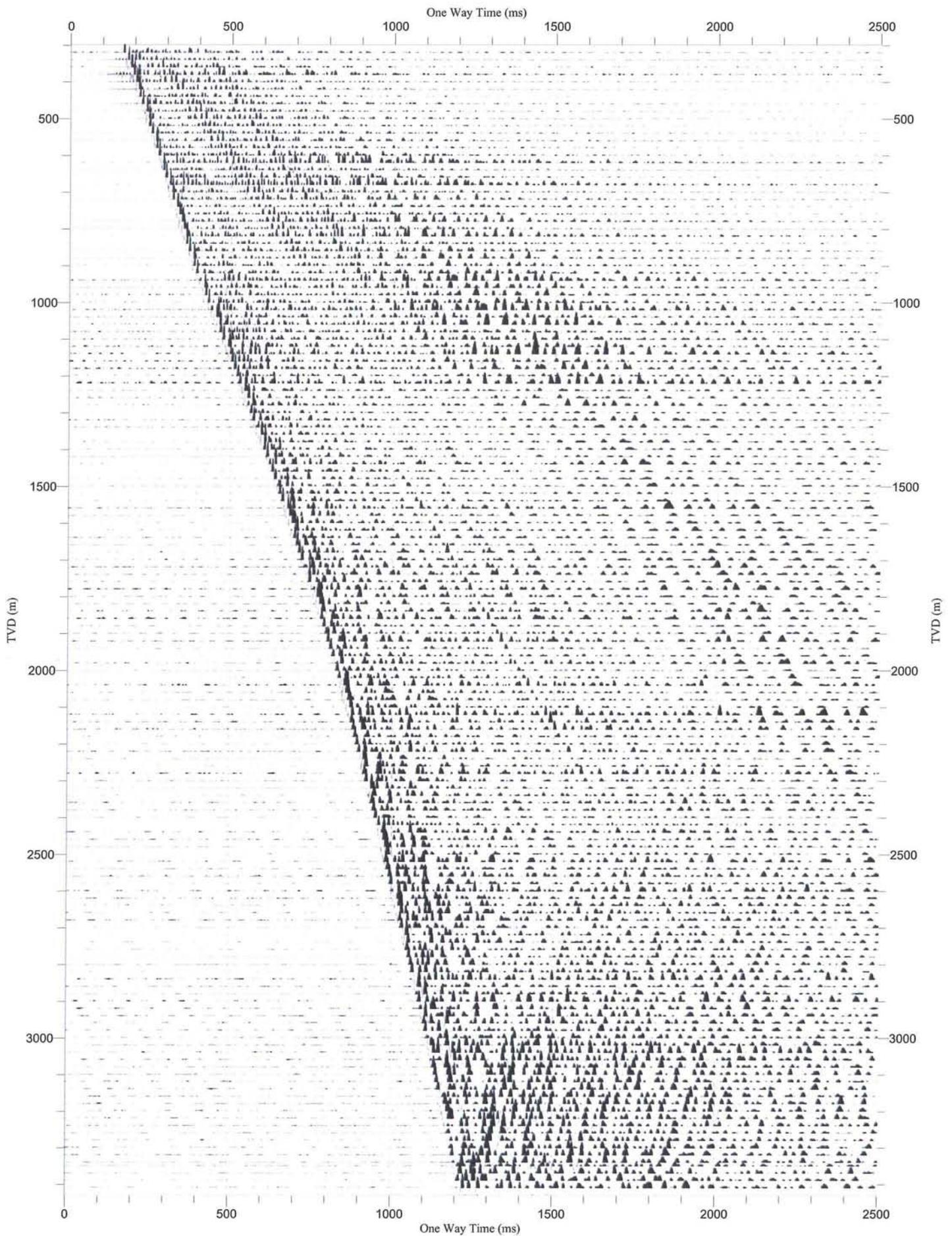
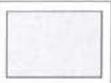
Raw Stack (X)

Normalization Trace by Trace (200%)

Polarity Normal

One Way Time (ms)

Scaling 6.5 cm/sec, 1/13510



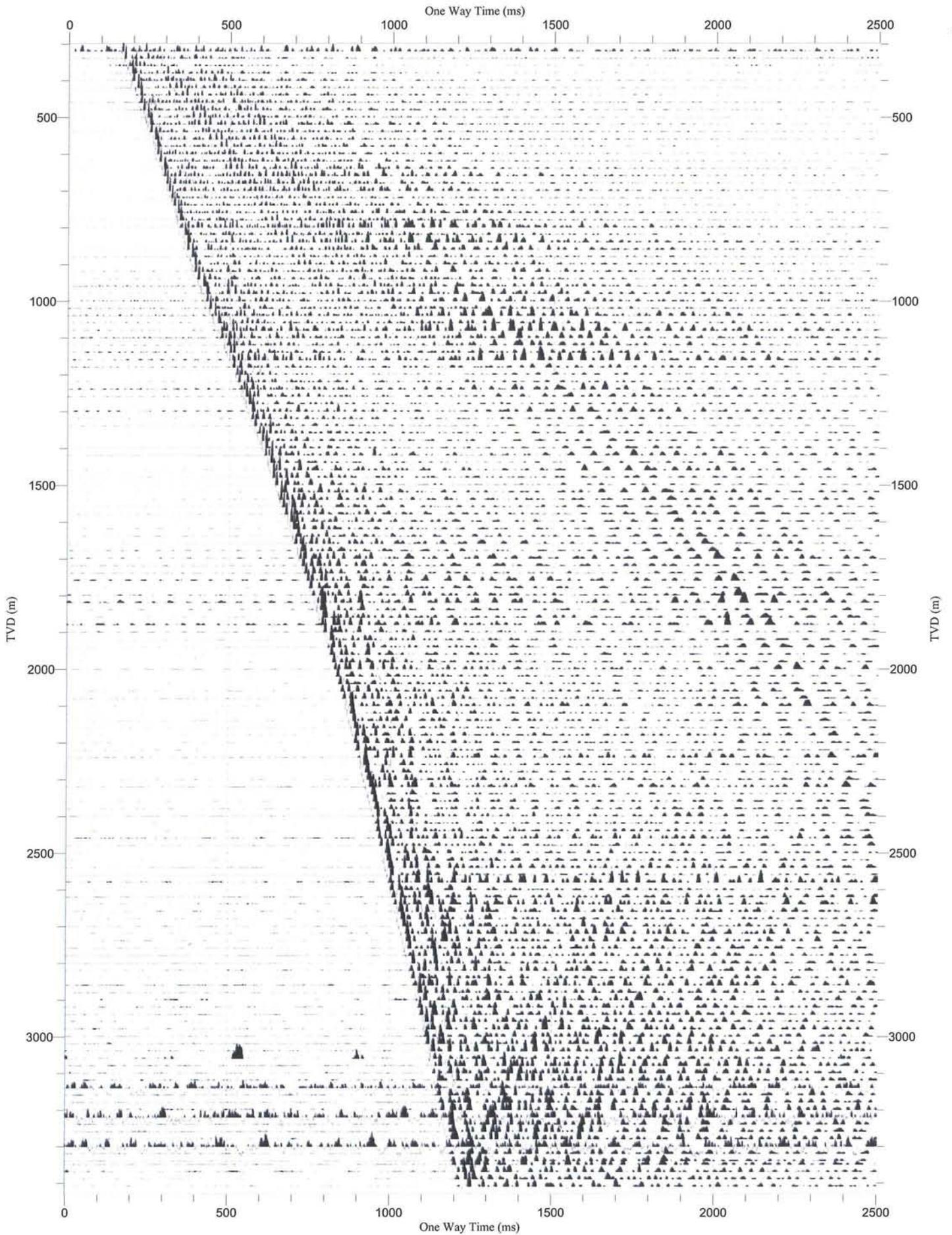
Raw Stack (Y)

Normalization Trace by Trace (200%)

Polarity Normal

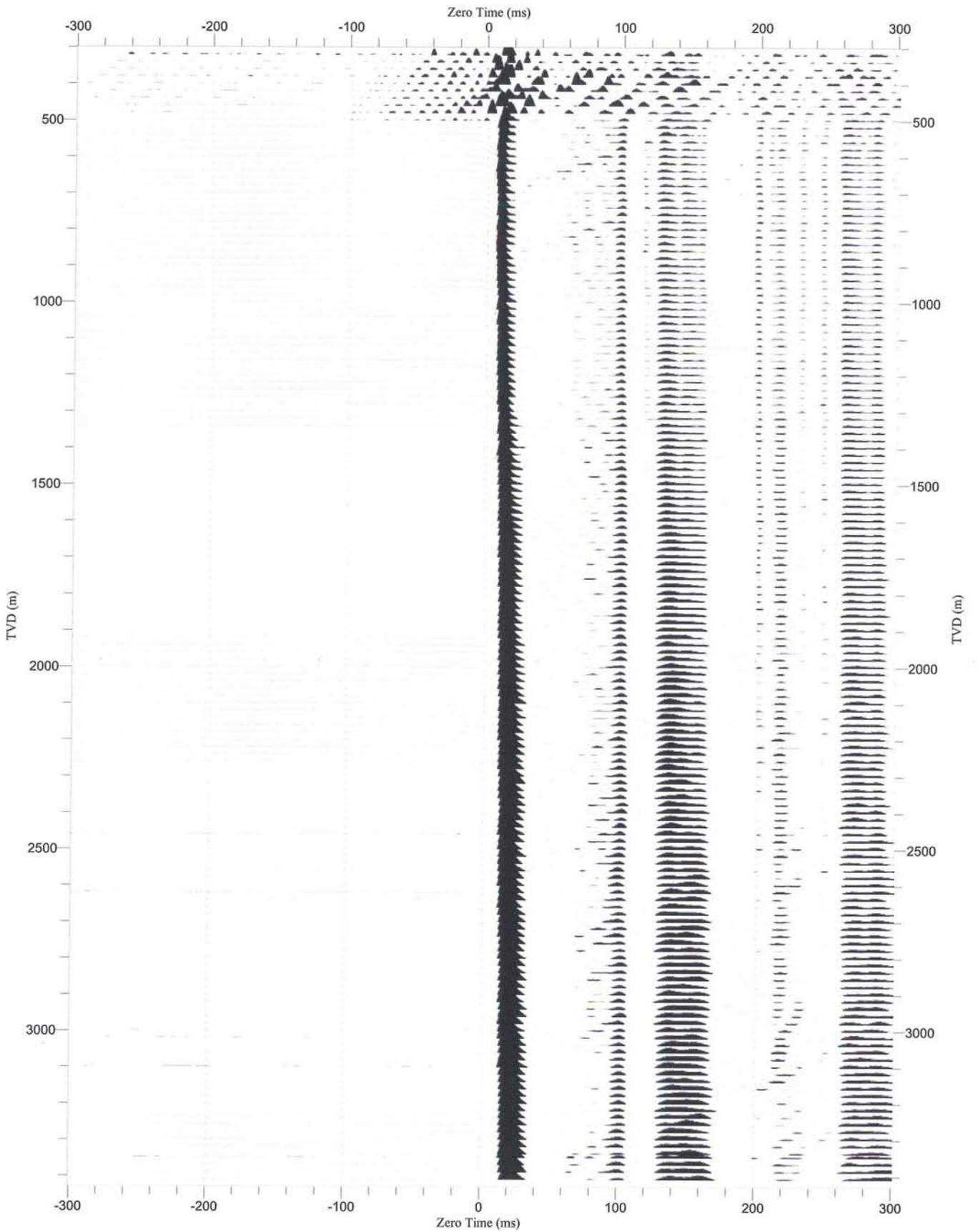
One Way Time (ms)

Scaling 6.5 cm/sec, 1/13510



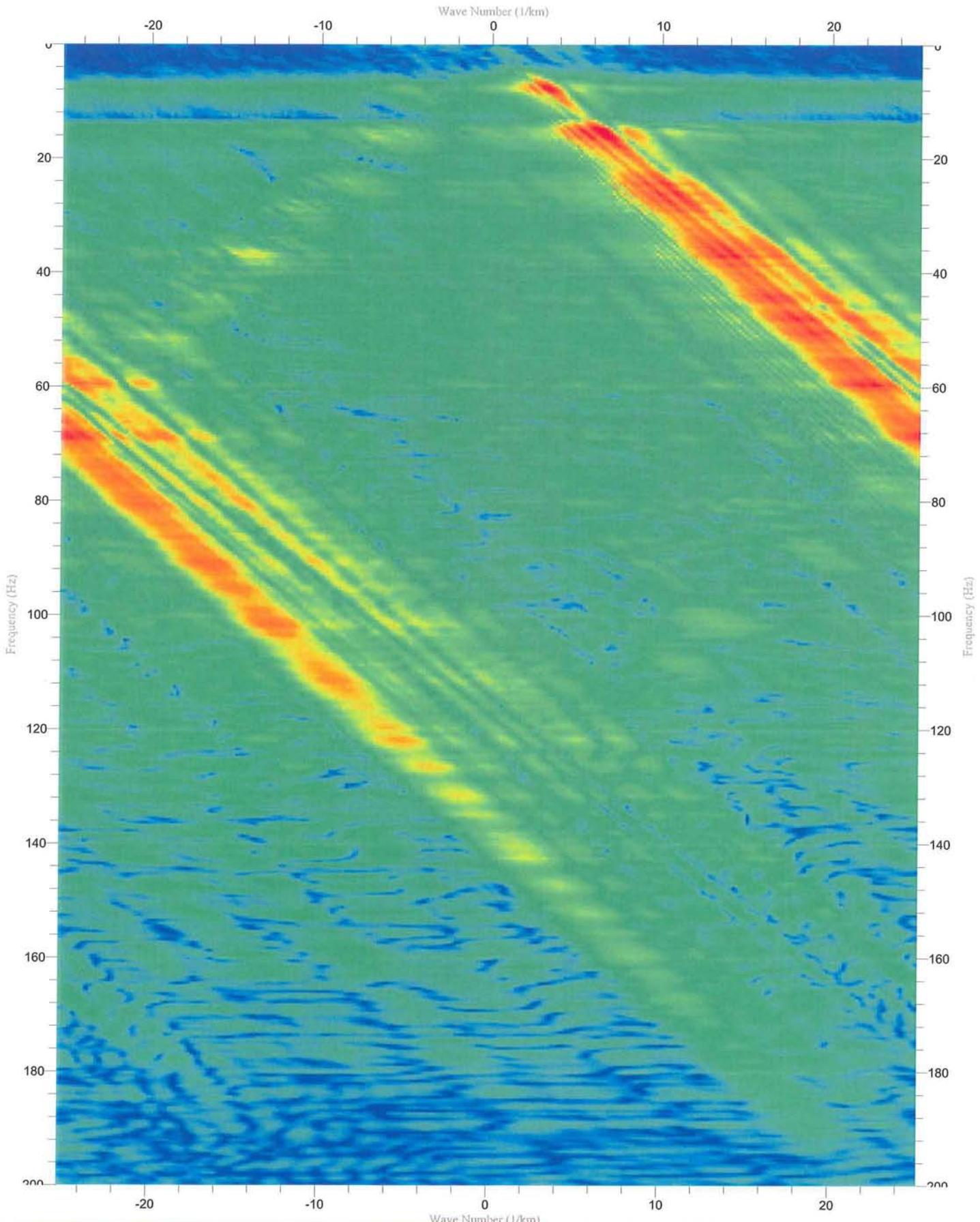
Raw Stack (Z) (Magnified)

Normalization Trace by Trace (200%)
Polarity Normal
Zero Time (ms)
Scaling 25.3 cm/sec, 1/14780



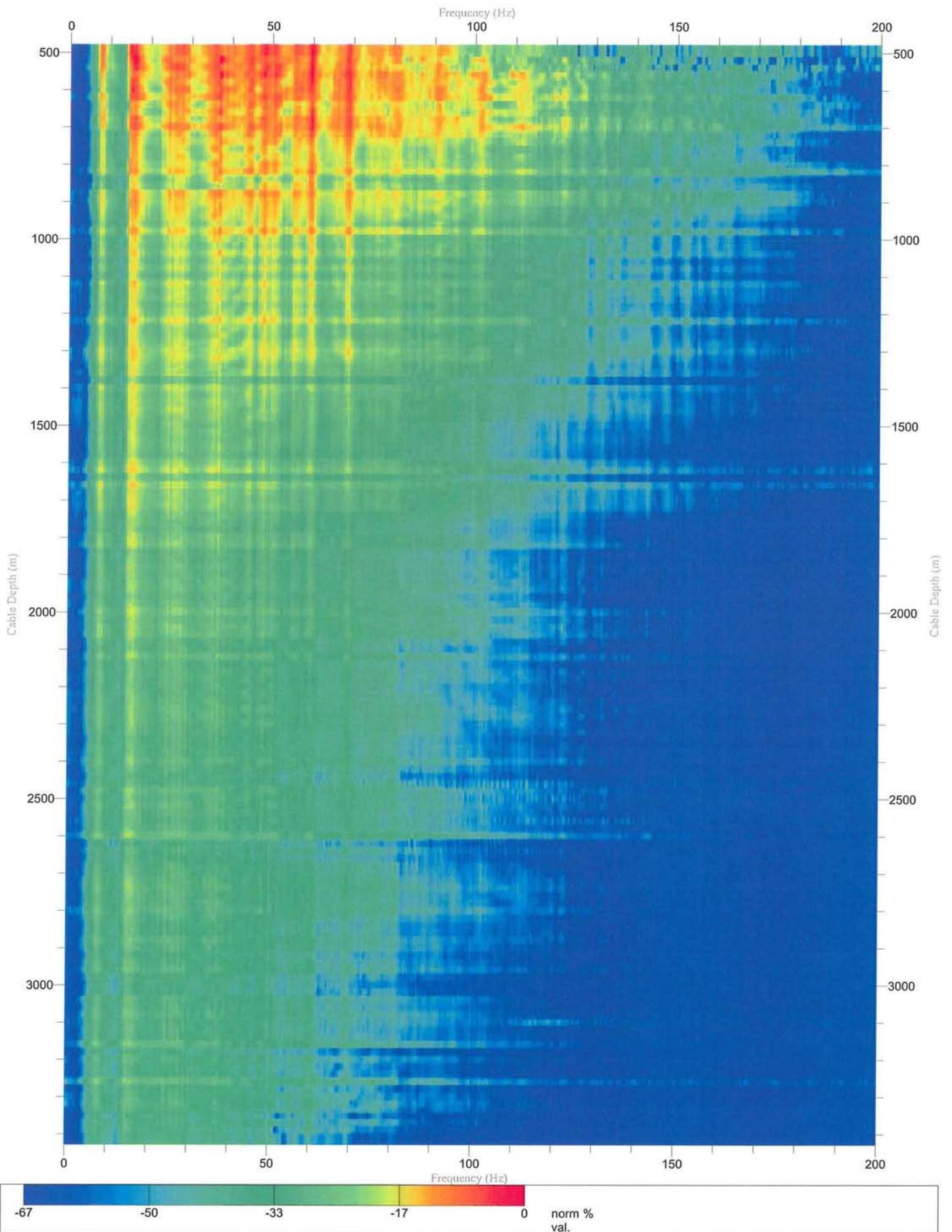
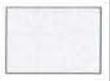
VSP Raw Stack (Z) FK
Apply FK

Normalization First Trace in Gather (100%)
Polarity Normal
Frequency (Hz)
Scaling 0.12 cm/Hz, 0.33(1/km)/cm



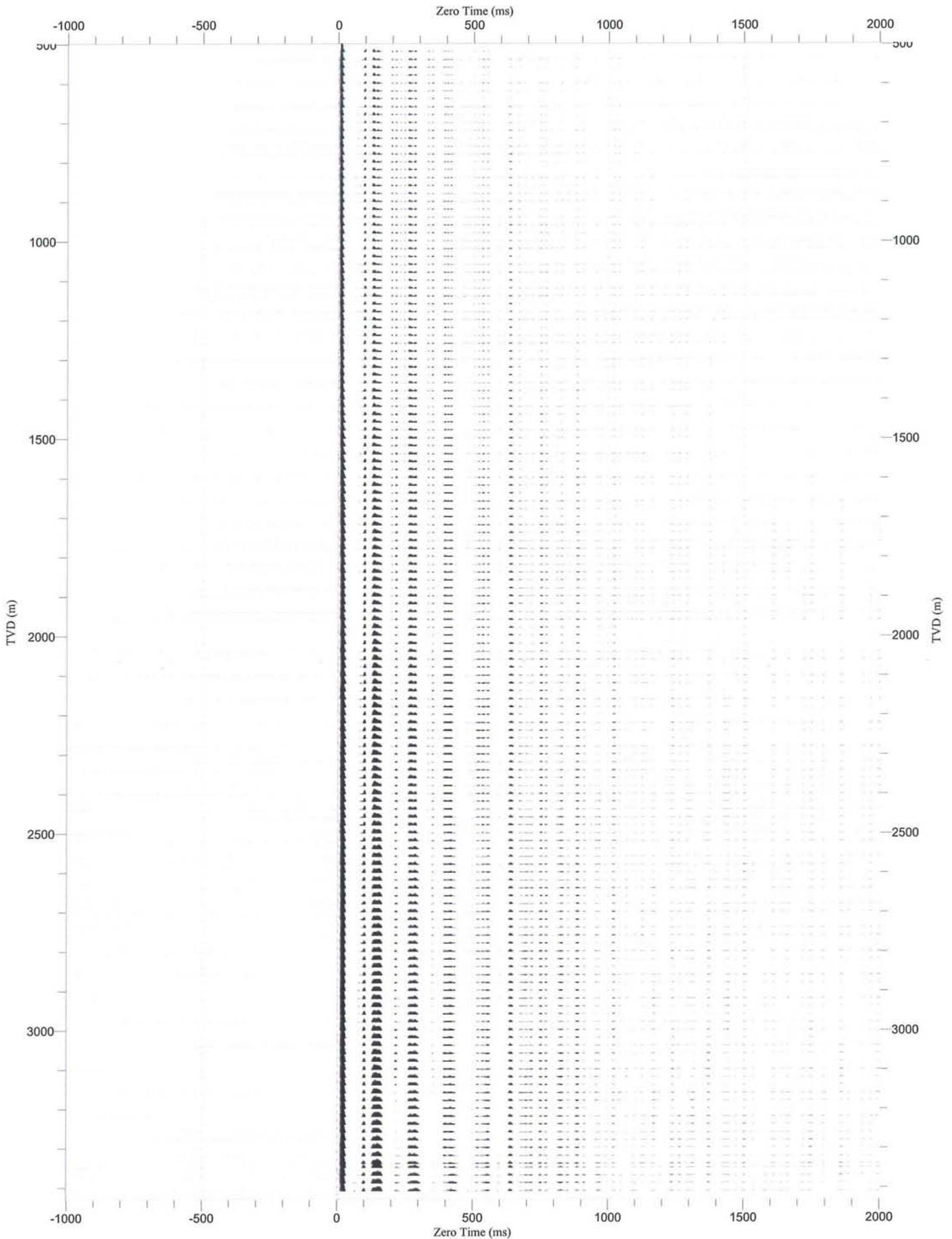
VSP Raw Stack (Z) FZ
Apply FZ

Normalization Trace by Trace (100%)
Polarity Normal
Frequency (Hz)
Scaling 0.1 cm/Hz, 1/12770



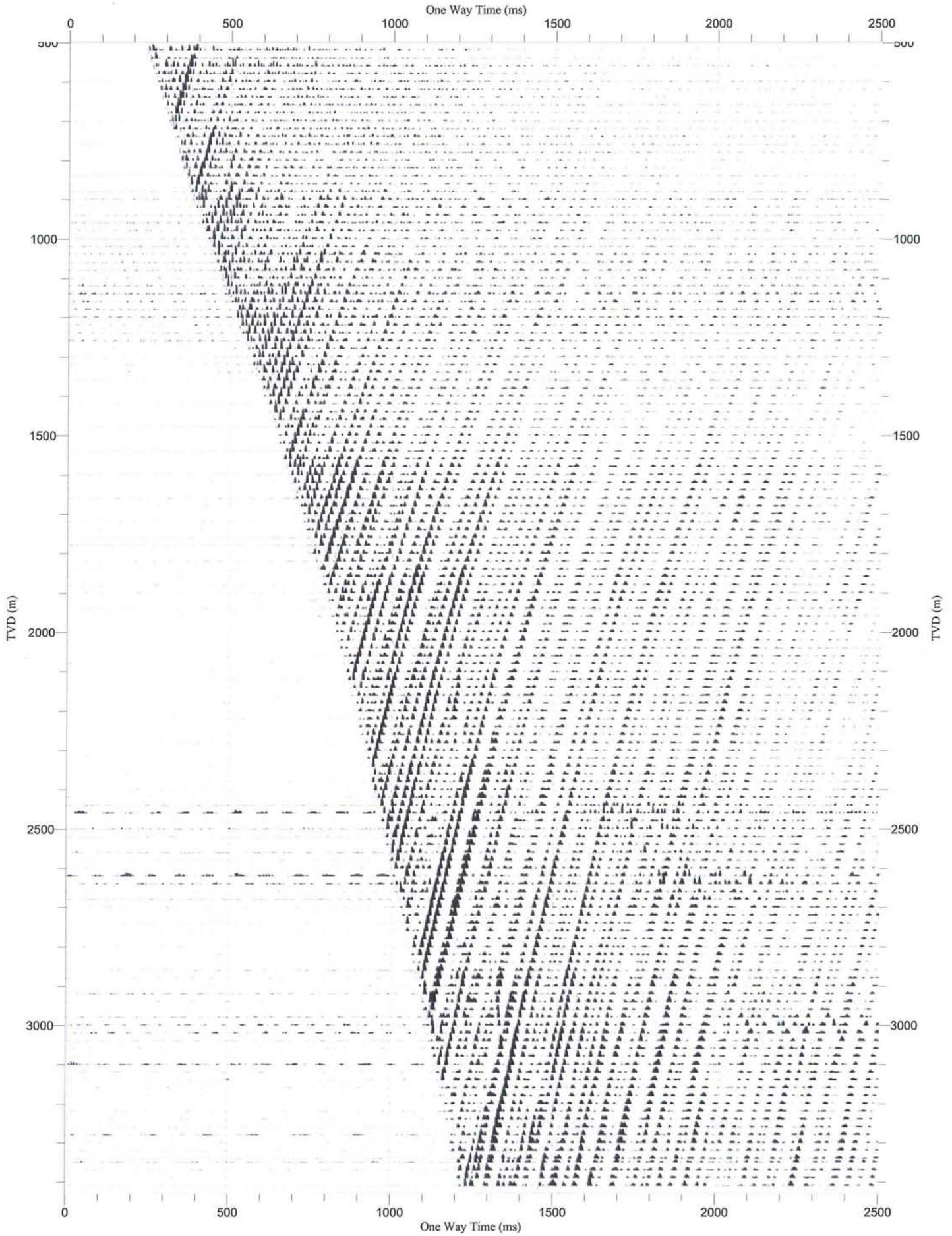
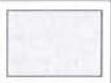
VSP Downgoing
BPF 3.0 - 200.0Hz
7 Traces

Normalization Trace by Trace (200%)
Polarity Normal
Zero Time (ms)
Scaling 5.4 cm/sec, 1/12650



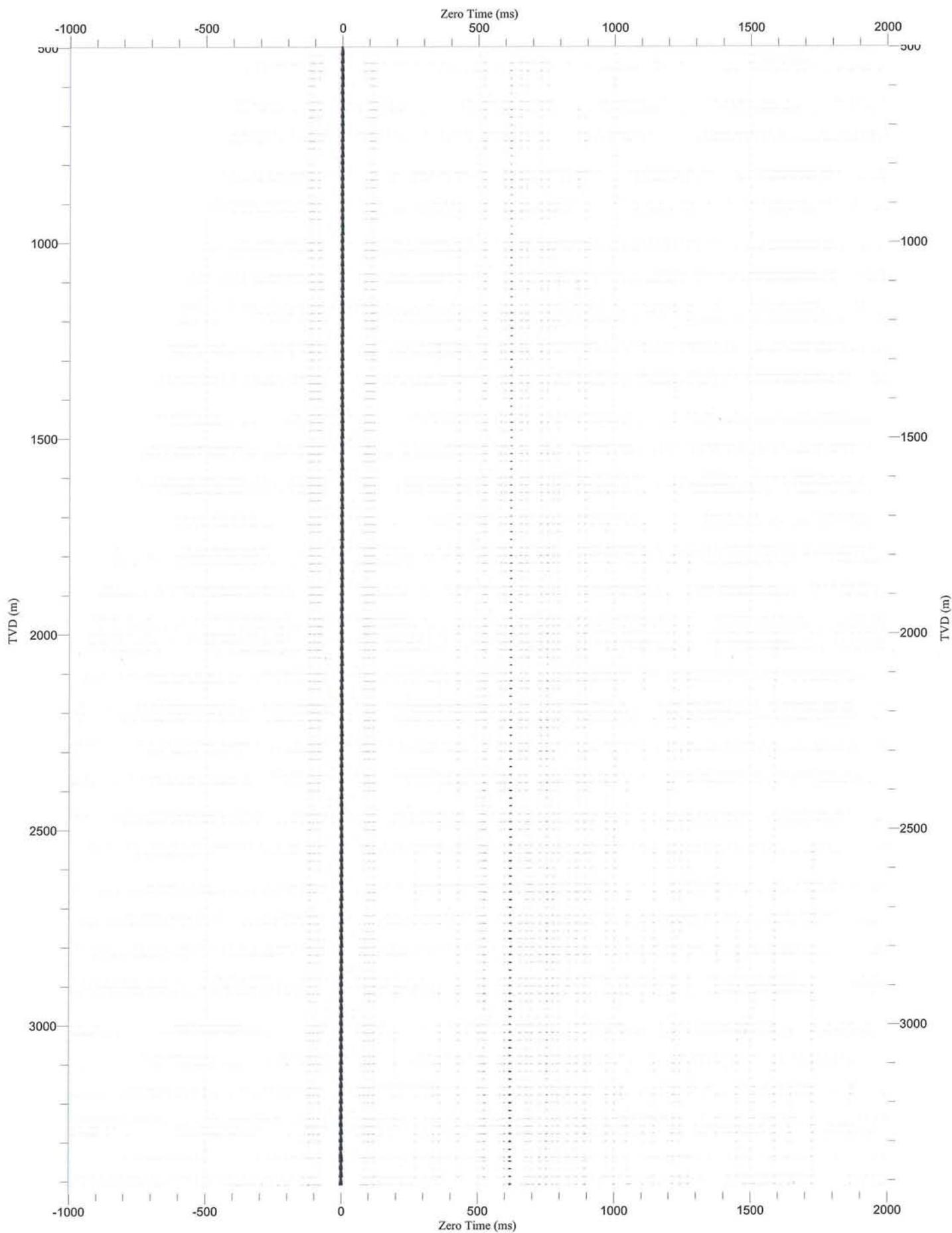
VSP Upgoing
BPF 3.0 - 200.0Hz
7 Traces

Normalization Trace by Trace (150%)
Polarity Normal
One Way Time (ms)
Scaling 6.5 cm/sec, 1/12650



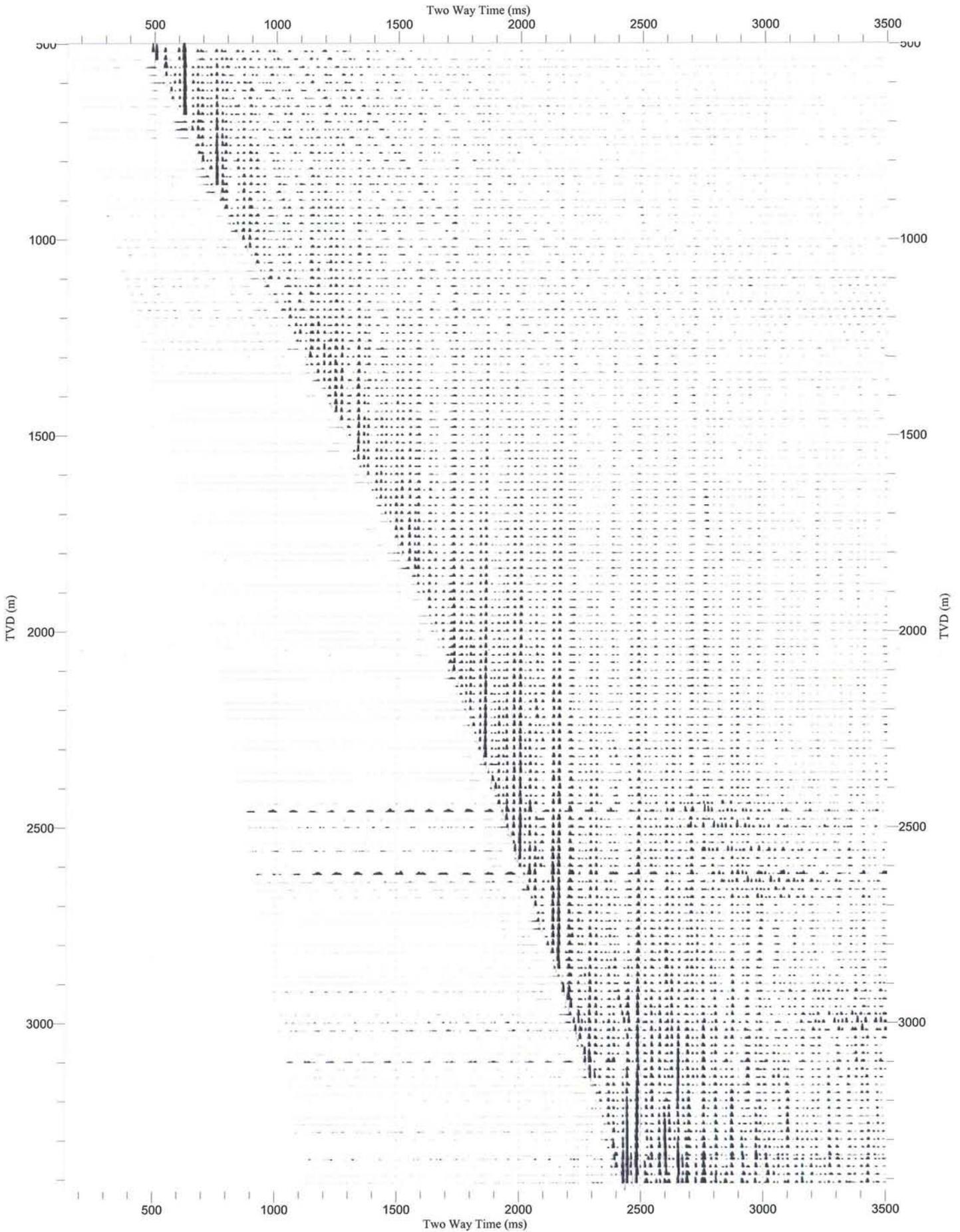
VSP Waveshape decon downgoing
BPF 3.0 - 200.0Hz
7 Traces
Waveshape Decon.(wavelet: 8.0 - 60.0 Hz zero-phase)

Normalization Largest Trace in Gather (150%)
Polarity Normal
Zero Time (ms)
Scaling 5.4 cm/sec, 1/12800



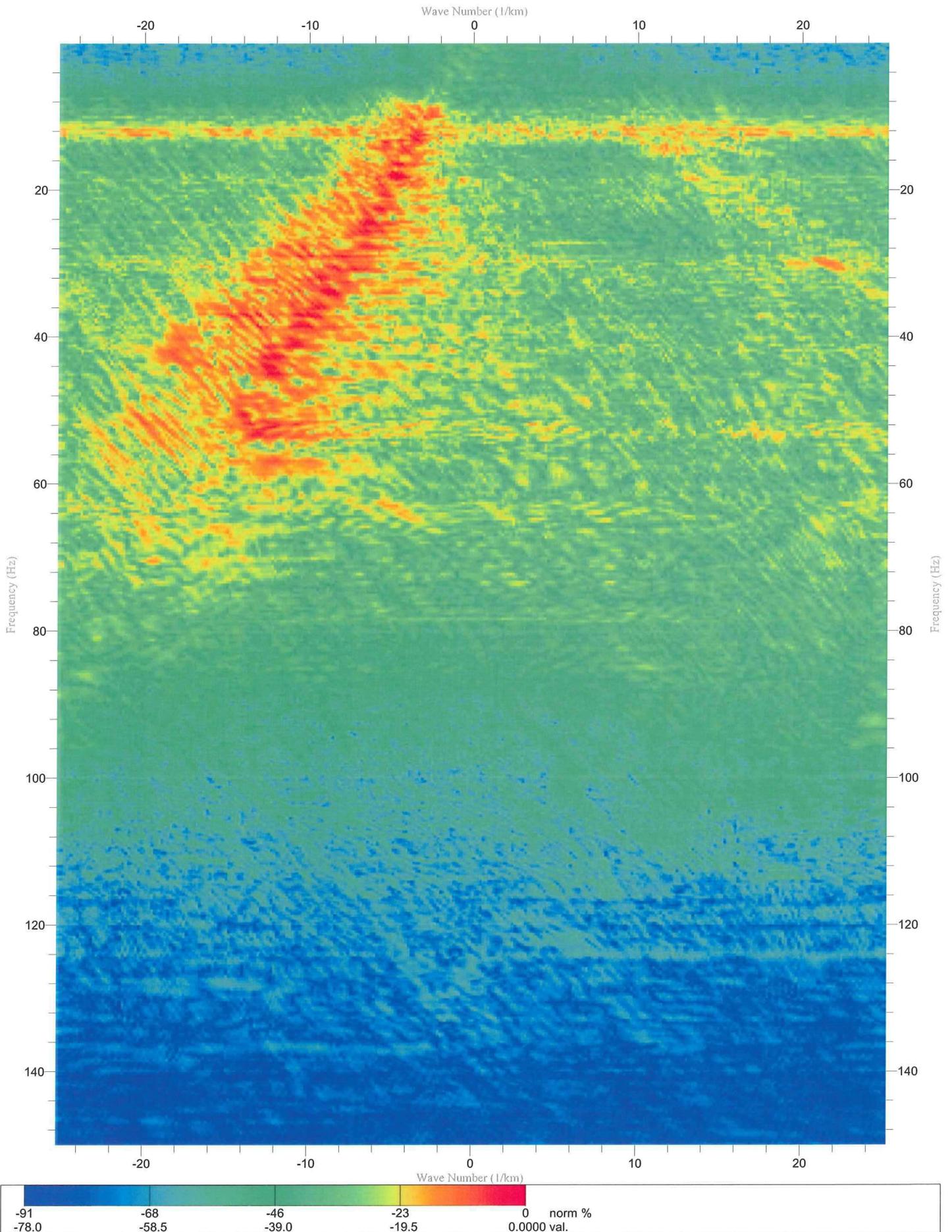
VSP Waveshape deconv upgoing
BPF 3.0 - 200.0Hz
7 Traces
Waveshape Deconv.(wavelet: 8.0 - 60.0 Hz zero-phase)

Normalization Largest Trace in Gather (300%)
Polarity Normal
Two Way Time (ms)
Scaling 4.8 cm/sec, 1/12800



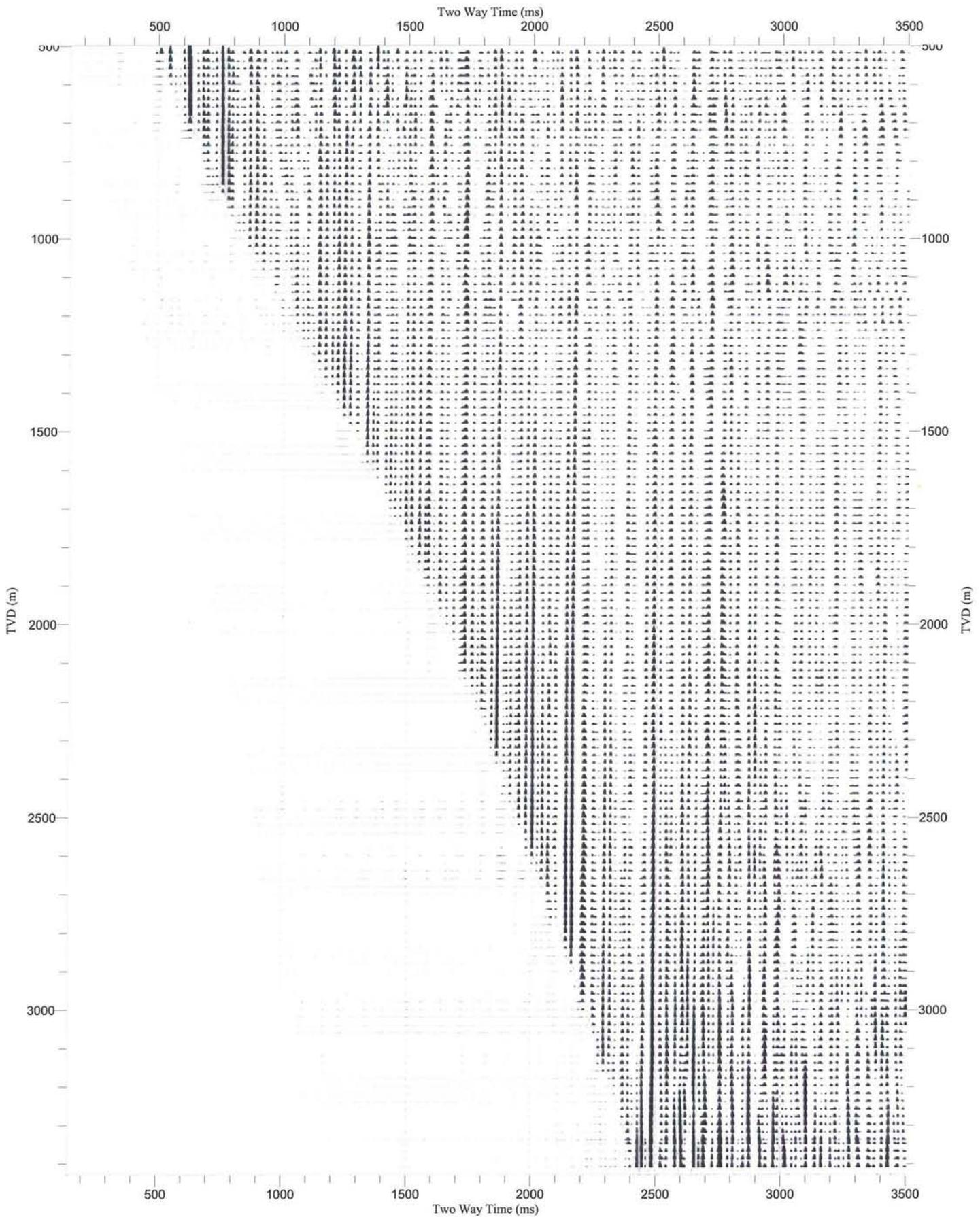
VSP Waveshape deconvolving FK
Apply FK

Normalization First Trace in Gather (100%)
Polarity Normal
Frequency (Hz)
Scaling 0.15 cm/Hz, 0.33(1/km)/cm

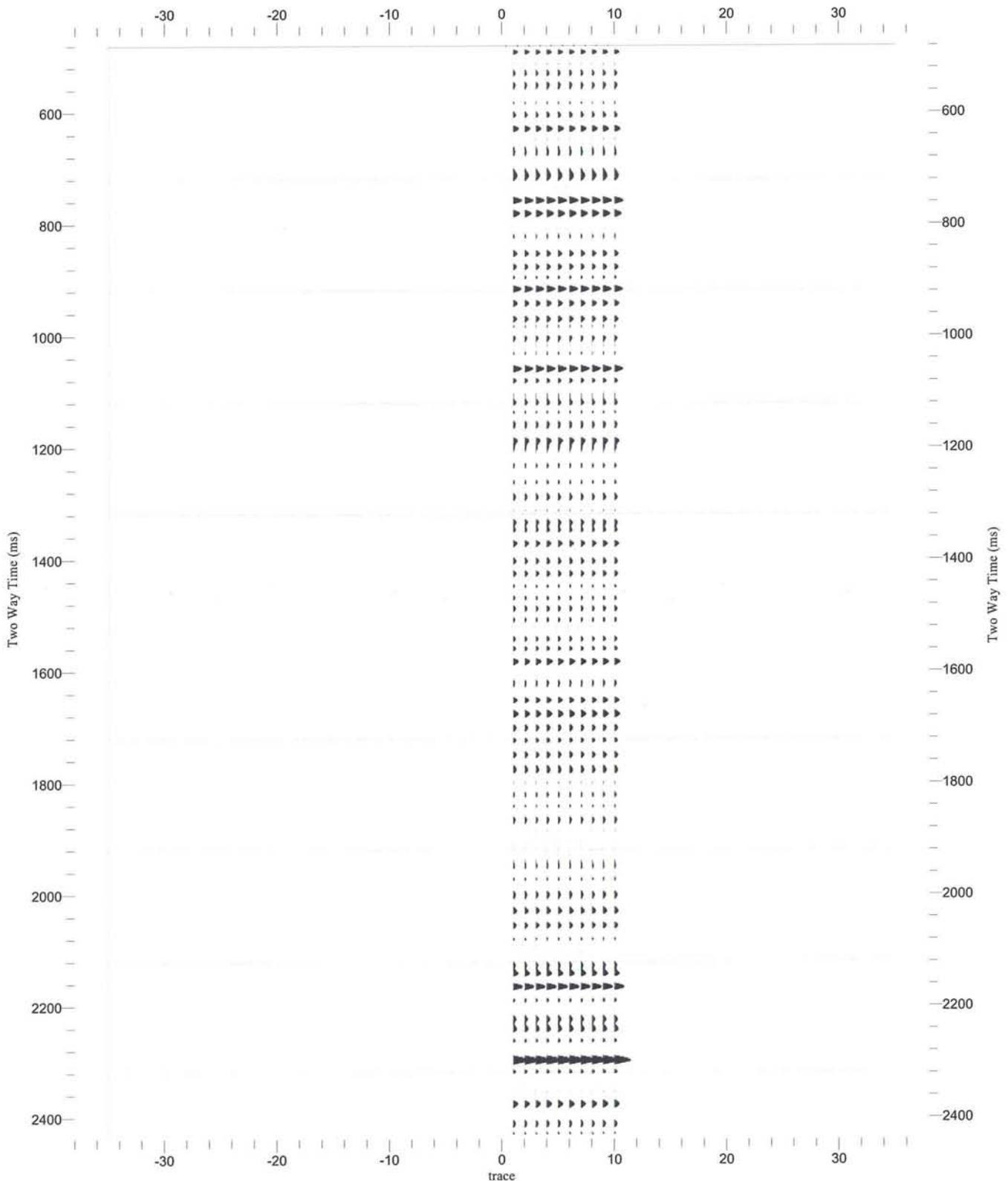


VSP Corridor Stack (Input)
BPF 3.0 - 200.0Hz
7 Traces
Waveshape Decon.(wavelet: 8.0 - 60.0 Hz zero-phase)
BPF 3.0 - 65.0Hz
Travel time exponent = 1.30
5 Traces

Normalization Largest Trace in Gather (320%)
Polarity Normal
Two Way Time (ms)
Scaling 4.8 cm/sec, 1/13300

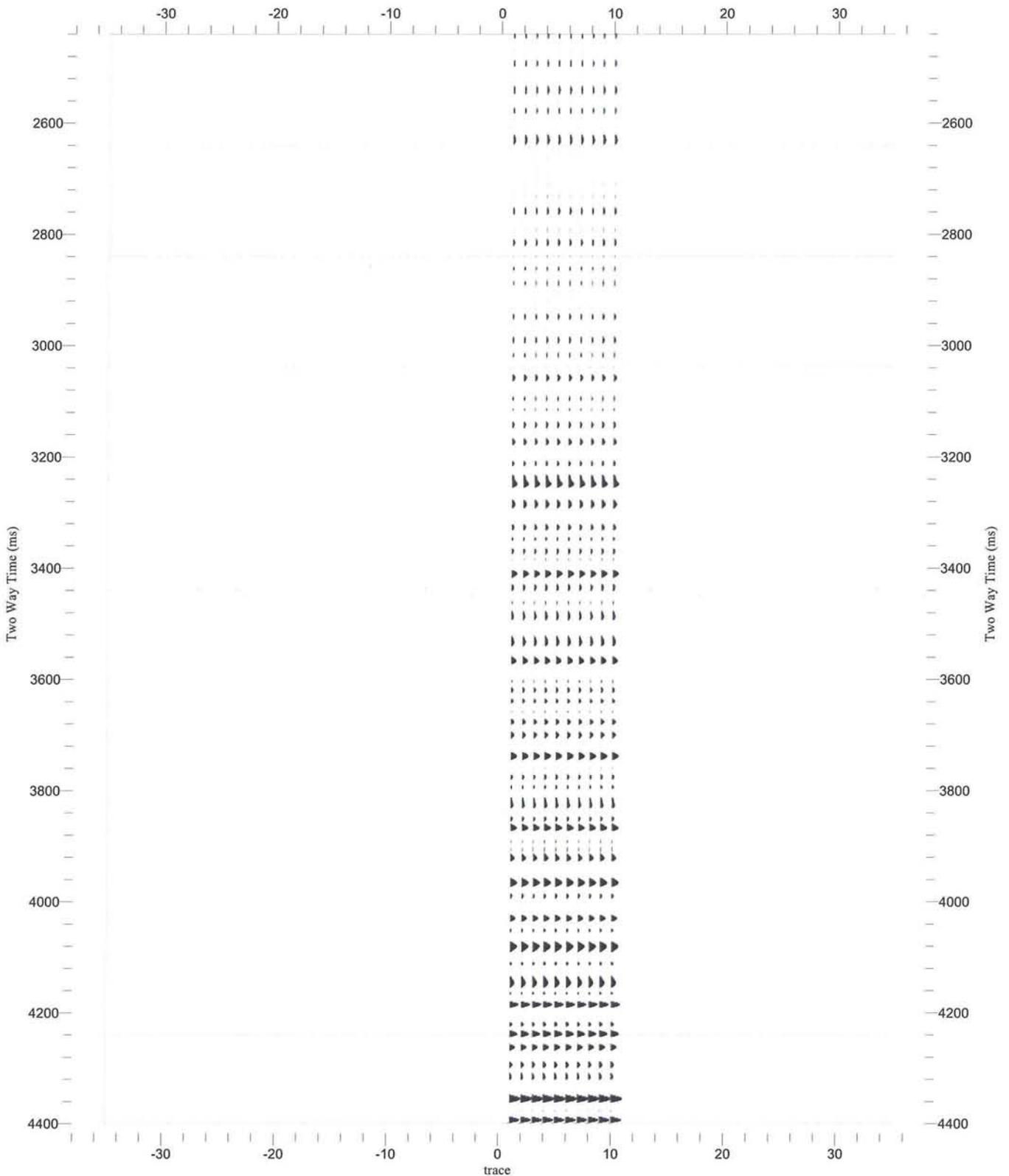


<p>VSP Corridor Stack (output) BPF 3.0 - 200.0Hz 7 Traces Waveshape Decon.(wavelet: 8.0 - 60.0 Hz zero-phase) BPF 3.0 - 65.0Hz Travel time exponent = 1.30 5 Traces Corridor Stack (Mean): BPF 5.0 - 100.0Hz</p>	<p>Normalization Trace by Trace (150%) Polarity Normal Two Way Time (ms) Scaling 10.0 cm/sec, 5.0 traces/cm</p>	
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VSP Corridor Stack (output)
BPF 3.0 - 200.0Hz
7 Traces
Waveshape Decon.(wavelet: 8.0 - 60.0 Hz zero-phase)
BPF 3.0 - 65.0Hz
Travel time exponent = 1.30
5 Traces
Corridor Stack (Mean): BPF 5.0 - 100.0Hz

Normalization Trace by Trace (150%)
Polarity Normal
Two Way Time (ms)
Scaling 10.0 cm/sec, 5.0 traces/cm



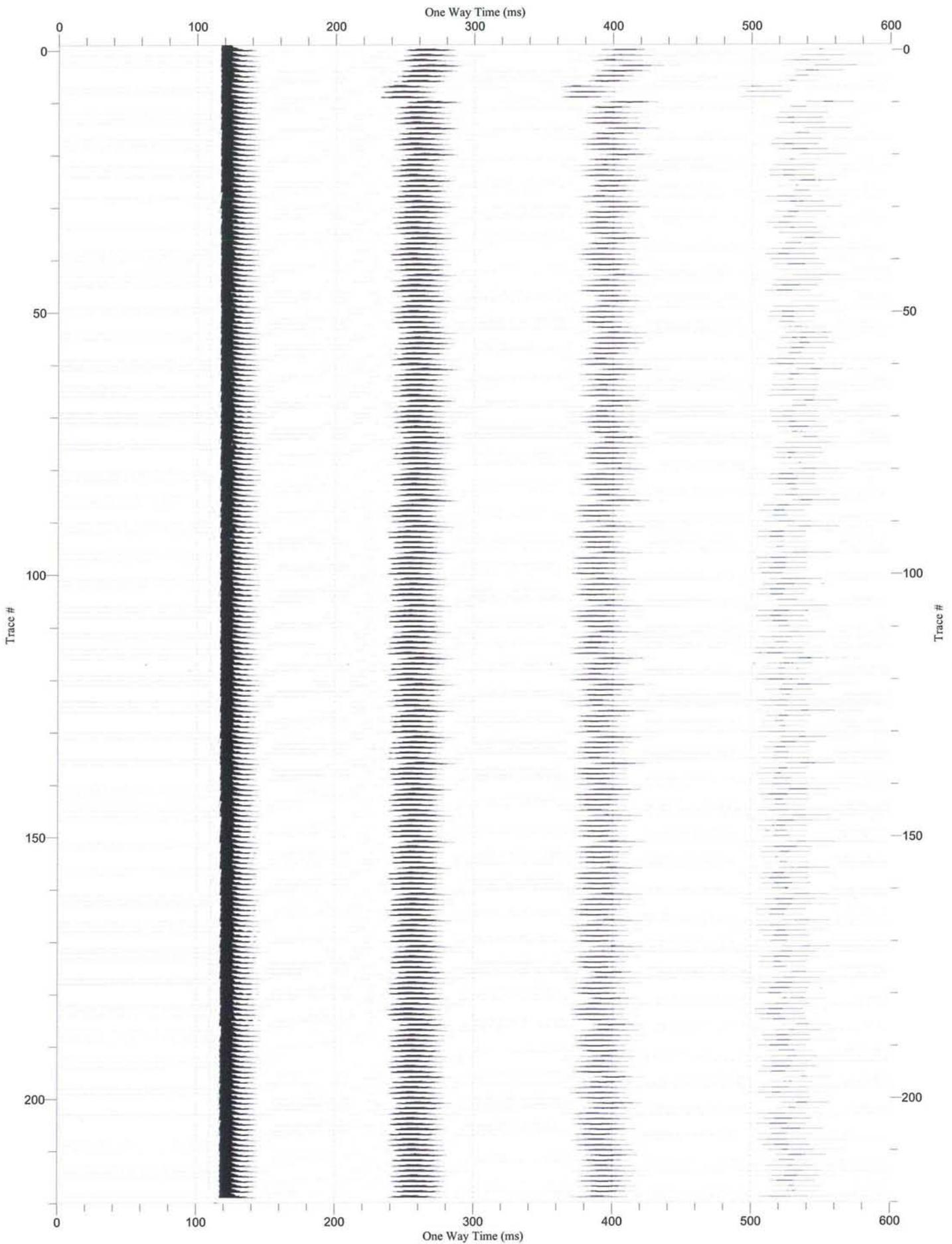
Source Sensor Signature

Normalization Largest Trace in Gather (275%)

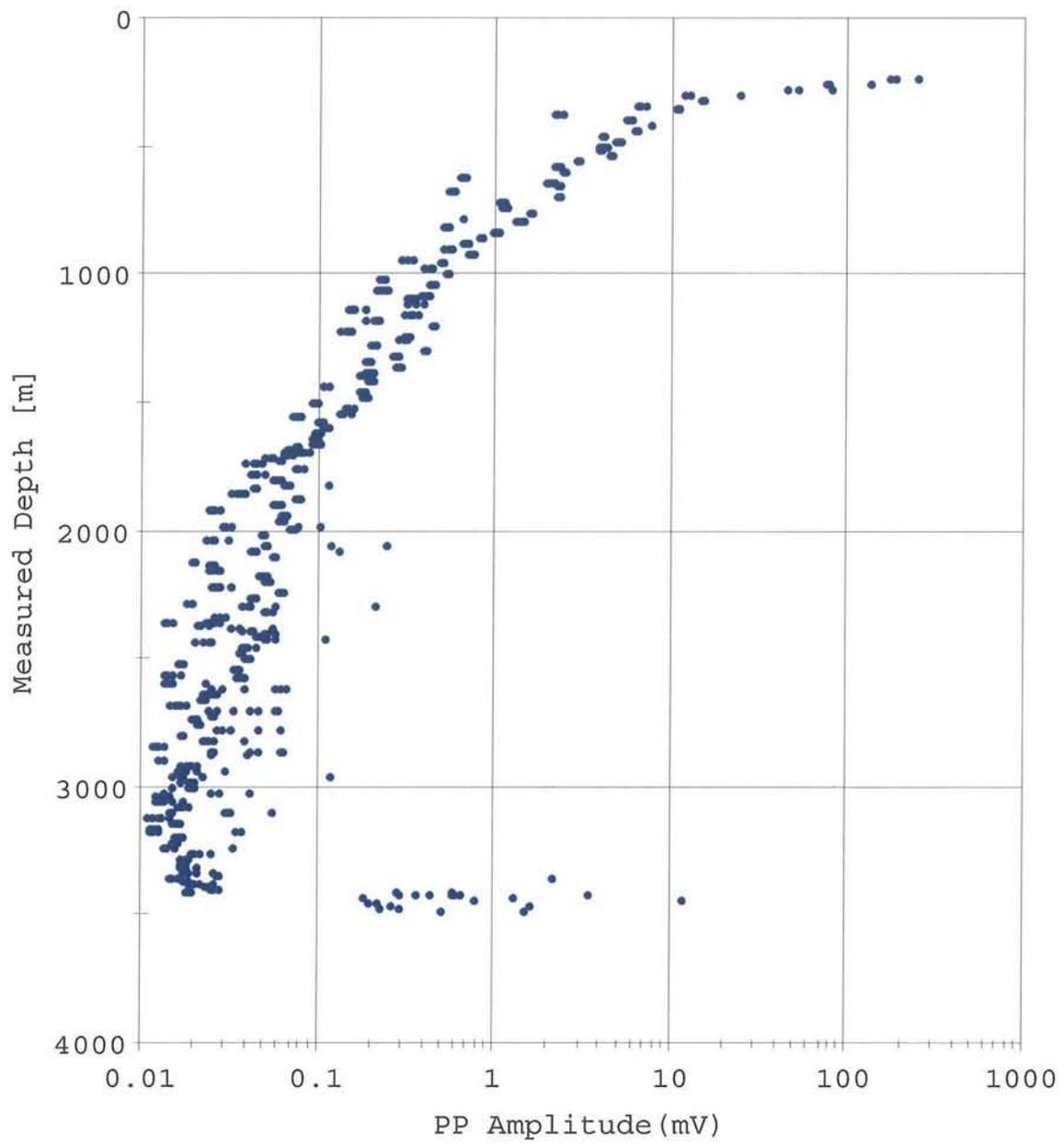
Polarity Normal

One Way Time (ms)

Scaling 27.54 cm/sec, 0.10/cm

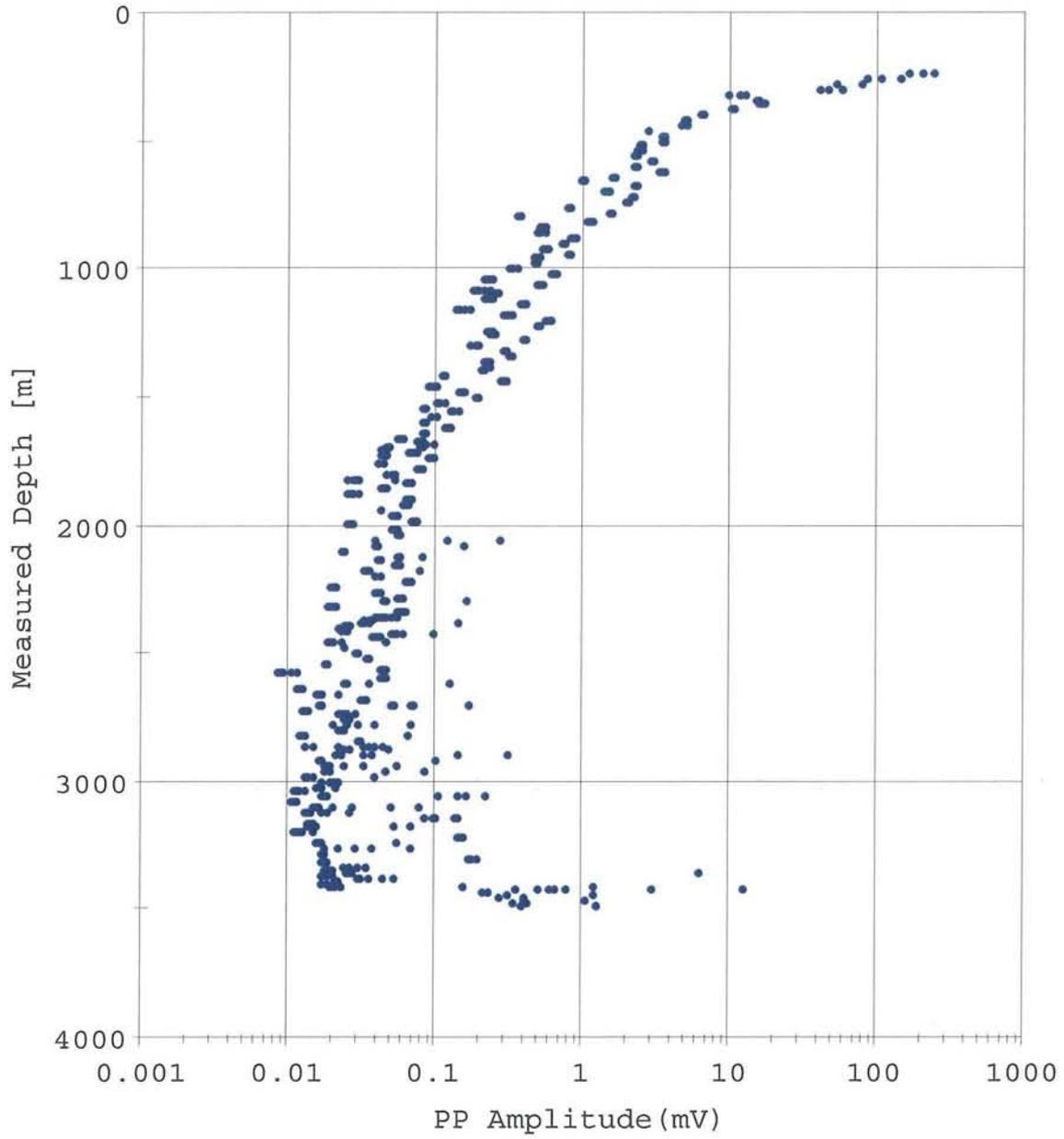


Peak To Peak Plot (X)



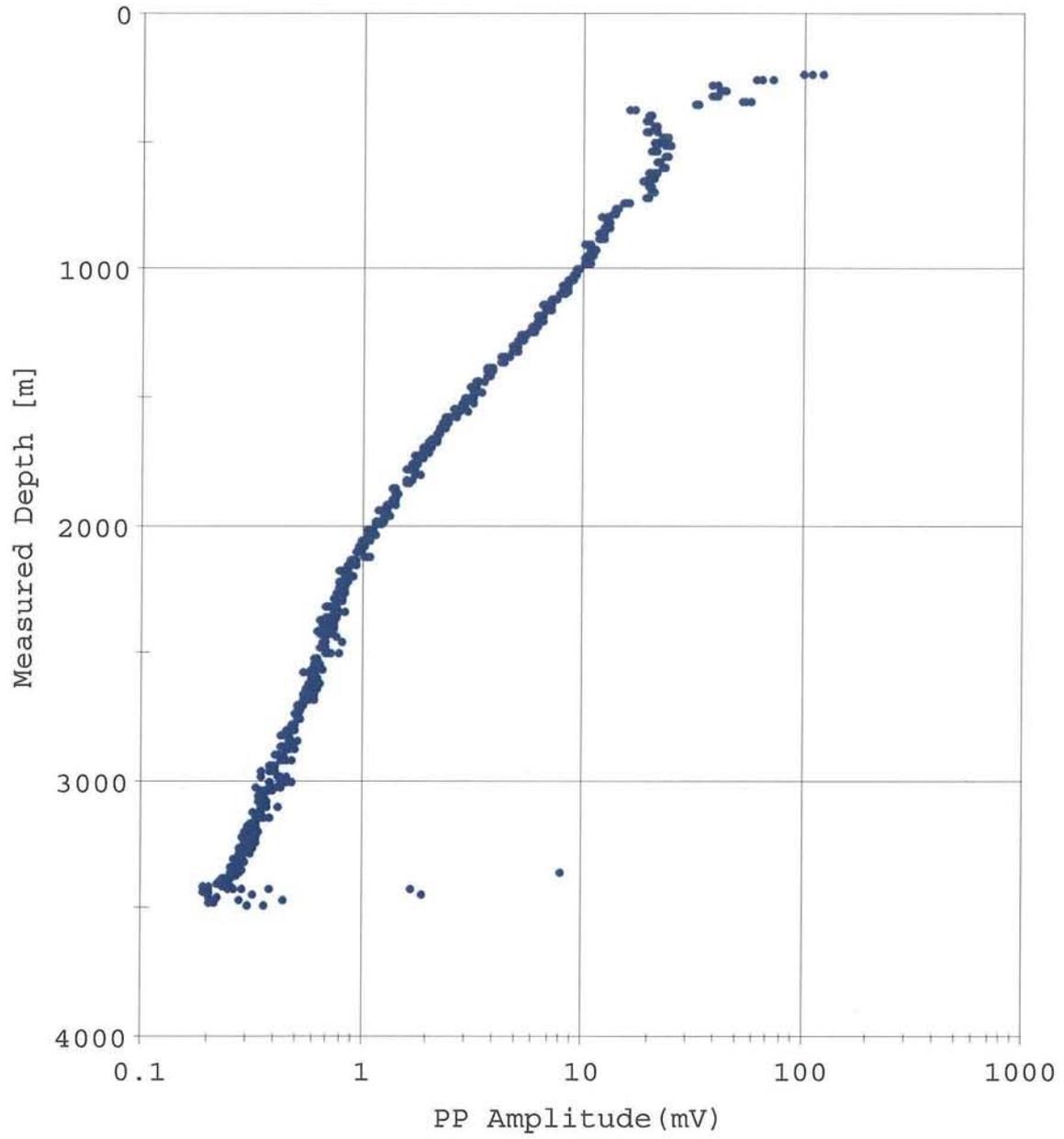
• PP Amplitude (mV)

Peak To Peak Plot (Y)



• PP Amplitude (mV)

Peak To Peak Plot (Z)

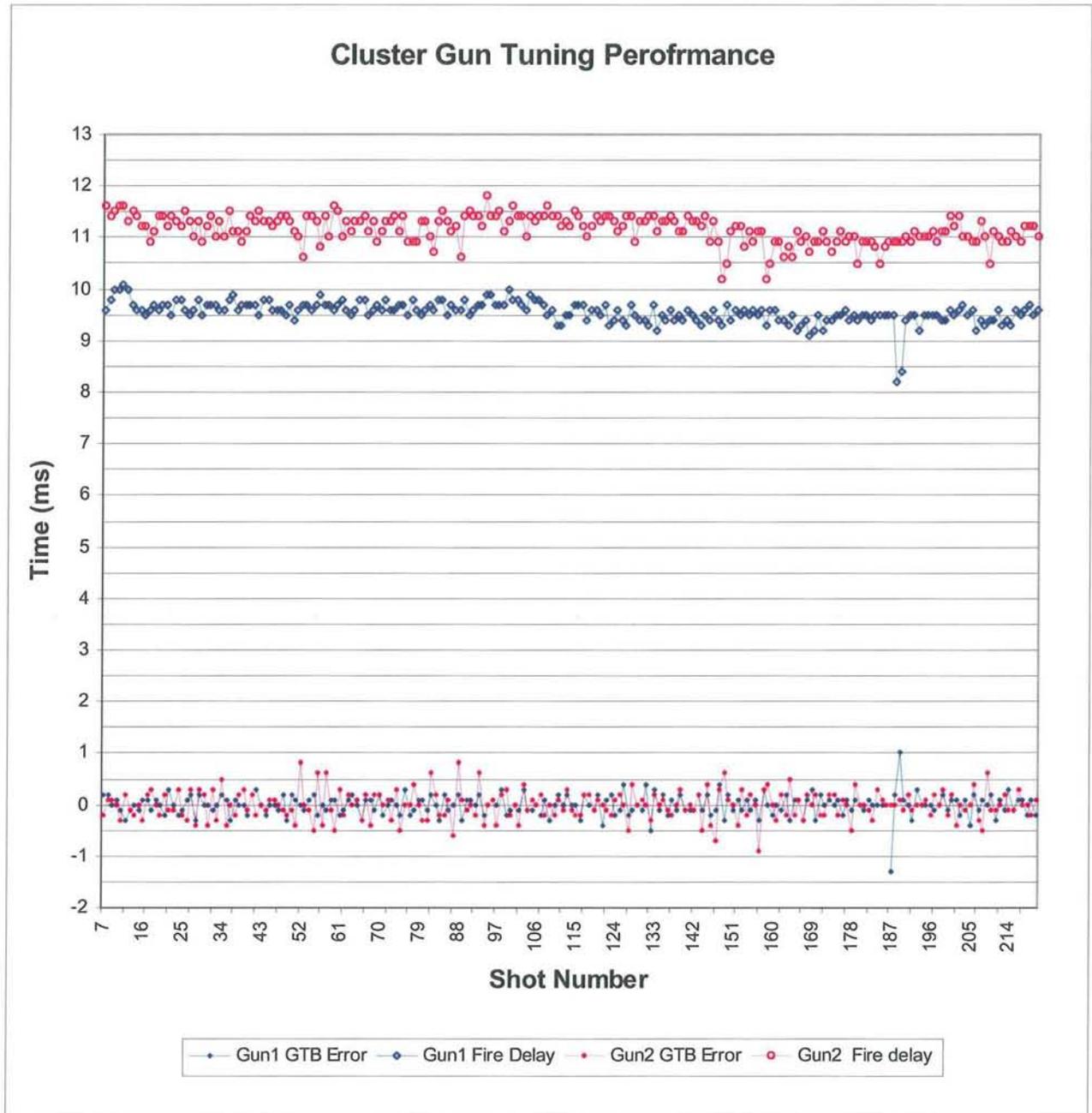


• PP Amplitude (mV)

THE GUN SYSTEM - 8
macha international, inc.

Gun Controller Report

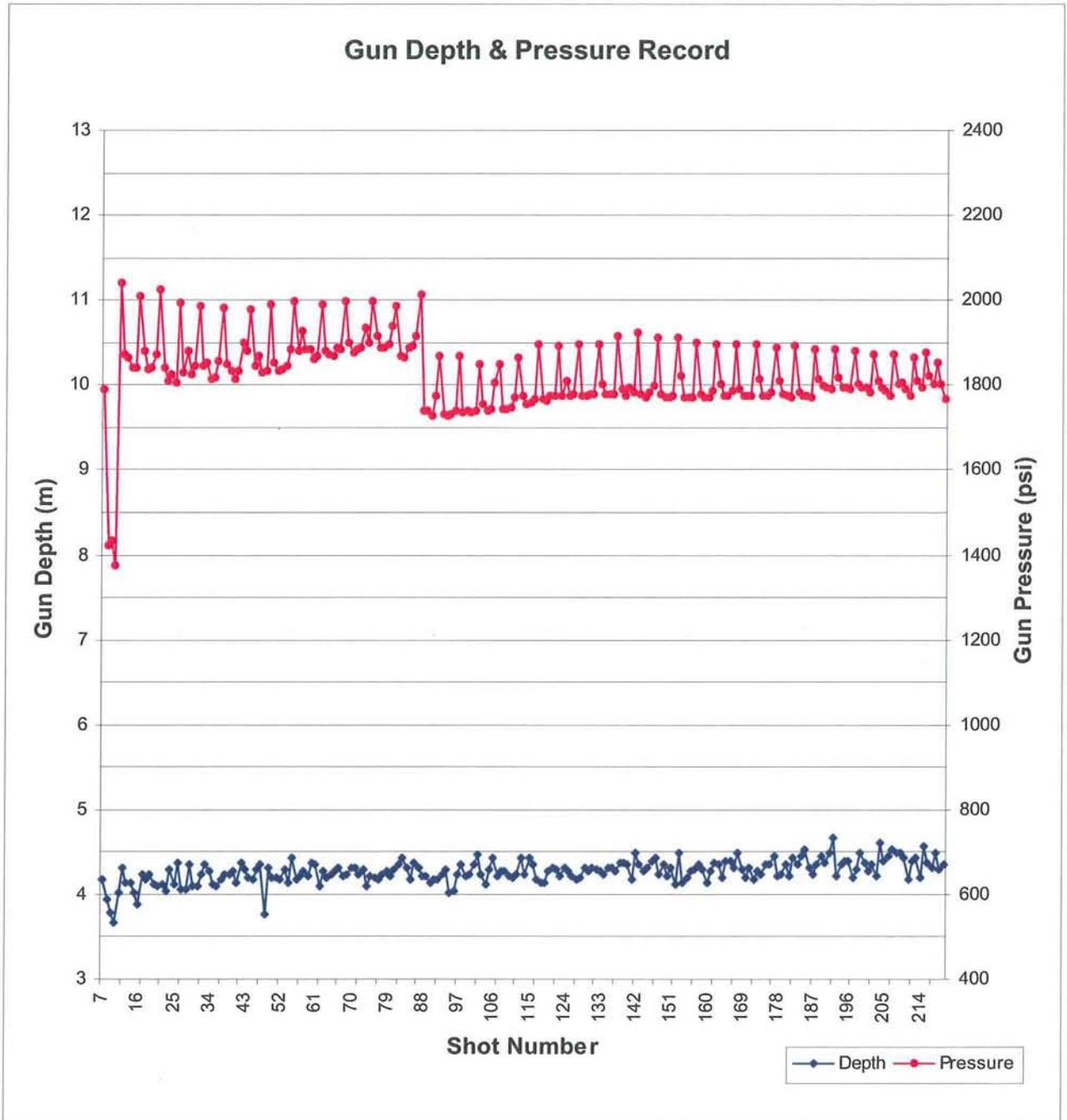
Gun Statistics Report



THE GUN SYSTEM - 8
macha international, inc.

Gun Controller Report

Depth/Pressure Statistics Report



Observer's Note (1/4)

Well depth [m]	Time	Shot Type	Shot#	Stack#	Source	Remarks
188.5	00:10:01	ENLO	1			
188.5	00:10:25	ENHI	2			
188.5	00:10:34	ETHD	3			
188.5	00:10:49	DRNG	4			
188.5	00:11:03	GA02	5			
188.5	00:11:13	GA04	6			
188.5	00:11:23	GA08	7			
188.5	00:11:33	GA16	8			
188.5	00:11:43	GA32	9			
188.5	00:11:58	XTLK	10			
188.5	00:12:17	XTLK	11			
188.5	00:12:36	XTLK	12			
188.5	00:12:54	EIMP	13			
1729.0	01:23:44	SHAK	14			
1729.0	01:24:07	SHOT	15	2	A	
1729.0	01:26:25	SHOT	16	2	A	
1729.0	01:26:42	SHOT	17	2	A	
2415.2	01:50:27	SHOT	18	3	A	
2415.2	01:52:23	SHOT	19	3	A	
2415.2	01:52:41	SHOT	20	3	A	
3484.0	02:54:10	SHOT	21	4	A	
3484.0	02:54:36	SHOT	22	4	A	
3474.7	03:05:17	SHOT	23	5	A	
3474.7	03:06:14	SHOT	24	5	A	
3419.0	03:34:25	SHOT	25	7	A	
3419.0	03:35:14	SHOT	26	7	A	
3419.0	03:35:54	SHOT	27	7	A	
3419.0	03:36:19	SHOT	28	7	A	
3419.0	03:36:44	SHOT	29	7	A	Bottom shuttle probably still tangled
3409.1	03:43:03	SHOT	30	8	A	
3409.1	03:43:58	SHOT	31	8	A	
3409.1	03:44:24	SHOT	32	8	A	
3409.1	03:44:52	SHOT	33	8	A	
3409.1	03:45:31	SHOT	34	8	A	Test in between shots to verify that all shuttles are free.
3339.0	03:53:34	SHOT	35	9	A	
3339.0	03:54:03	SHOT	36	9	A	
3339.0	03:54:21	SHOT	37	9	A	
3339.0	03:54:43	SHOT	38	9	A	
3339.0	03:54:58	SHOT	39	9	A	
3259.0	03:59:53	SHOT	40	10	A	
3259.0	04:00:13	SHOT	41	10	A	
3259.0	04:01:00	SHOT	42	10	A	
3259.0	04:01:19	SHOT	43	10	A	
3259.0	04:01:41	SHOT	44	10	A	Second shuttle in Y is very noisy
3179.0	04:06:00	SHOT	45	11	A	
3179.0	04:06:29	SHOT	46	11	A	
3179.0	04:07:04	SHOT	47	11	A	
3179.0	04:07:22	SHOT	48	11	A	
3179.0	04:07:39	SHOT	49	11	A	
3179.0	04:08:08	SHOT	50	11	A	One of the shots is very noisy, hence 6 shots were performed
3099.0	04:12:14	SHOT	51	12	A	
3099.0	04:12:40	SHOT	52	12	A	
3099.0	04:13:01	SHOT	53	12	A	
3099.0	04:13:16	SHOT	54	12	A	
3099.0	04:13:35	SHOT	55	12	A	
3099.0	04:14:25	SHOT	56	12	A	
3099.0	04:14:59	SHOT	57	12	A	Shuttle 4 didn't stack all shots. Extra ones were done
3018.8	04:18:49	SHOT	58	13	A	
3018.8	04:19:09	SHOT	59	13	A	

Observer's Note (2/4)

Well depth [m]	Time	Shot Type	Shot#	Stack#	Source	Remarks
3018.8	04:19:37	SHOT	60	13	A	
3018.8	04:19:52	SHOT	61	13	A	
3018.8	04:20:07	SHOT	62	13	A	Y axis is not noisy anymore.
2939.2	04:24:39	SHOT	63	14	A	
2939.2	04:24:57	SHOT	64	14	A	
2939.2	04:25:12	SHOT	65	14	A	
2939.2	04:25:28	SHOT	66	14	A	
2939.2	04:25:43	SHOT	67	14	A	
2939.2	04:26:07	SHOT	68	14	A	
2859.2	04:30:41	SHAK	69			
2859.2	04:31:04	SHOT	70	15	A	
2859.2	04:31:31	SHOT	71	15	A	
2859.2	04:32:52	SHOT	72	16	A	Same depth as stack 15
2859.2	04:33:18	SHOT	73	16	A	
2859.2	04:33:42	SHOT	74	16	A	
2859.2	04:33:57	SHOT	75	16	A	
2859.2	04:34:13	SHOT	76	16	A	
2778.9	04:38:18	SHOT	77	17	A	
2778.9	04:38:38	SHOT	78	17	A	
2778.9	04:38:54	SHOT	79	17	A	
2778.9	04:39:09	SHOT	80	17	A	
2778.9	04:39:27	SHOT	81	17	A	
2778.9	04:39:42	SHOT	82	17	A	
2698.9	04:43:37	SHOT	83	18	A	
2698.9	04:44:00	SHOT	84	18	A	
2698.9	04:44:15	SHOT	85	18	A	
2698.9	04:44:30	SHOT	86	18	A	
2698.9	04:44:45	SHOT	87	18	A	
2698.9	04:45:16	SHOT	88	18	A	
2698.9	04:45:31	SHOT	89	18	A	
2618.9	04:49:07	SHOT	90	19	A	
2618.9	04:49:34	SHOT	91	19	A	
2618.9	04:49:49	SHOT	92	19	A	
2618.9	04:50:04	SHOT	93	19	A	
2618.9	04:50:19	SHOT	94	19	A	
2618.9	04:50:50	SHOT	95	19	A	first signal in shuttle 1 and 4 are noisy
2539.0	04:55:09	SHOT	96	20	A	
2539.0	04:55:24	SHOT	97	20	A	
2539.0	04:55:39	SHOT	98	20	A	
2539.0	04:55:58	SHOT	99	20	A	
2539.0	04:56:16	SHOT	100	20	A	
2539.0	04:56:42	SHOT	101	20	A	One of the signals on shuttle 2 is noisy
2459.0	05:06:45	SHOT	102	21	A	
2459.0	05:07:01	SHOT	103	21	A	
2459.0	05:07:20	SHOT	104	21	A	
2459.0	05:07:35	SHOT	105	21	A	
2459.0	05:08:01	SHOT	106	21	A	
2379.0	05:16:52	SHOT	107	22	A	
2379.0	05:17:08	SHOT	108	22	A	
2379.0	05:17:23	SHOT	109	22	A	
2379.0	05:17:38	SHOT	110	22	A	
2379.0	05:17:53	SHOT	111	22	A	
2299.0	05:27:02	SHOT	112	23	A	
2299.0	05:27:17	SHOT	113	23	A	
2299.0	05:27:35	SHOT	114	23	A	
2299.0	05:27:50	SHOT	115	23	A	
2299.0	05:28:05	SHOT	116	23	A	
2218.9	05:33:07	SHOT	117	24	A	
2218.9	05:33:27	SHOT	118	24	A	

Observer's Note (3/4)

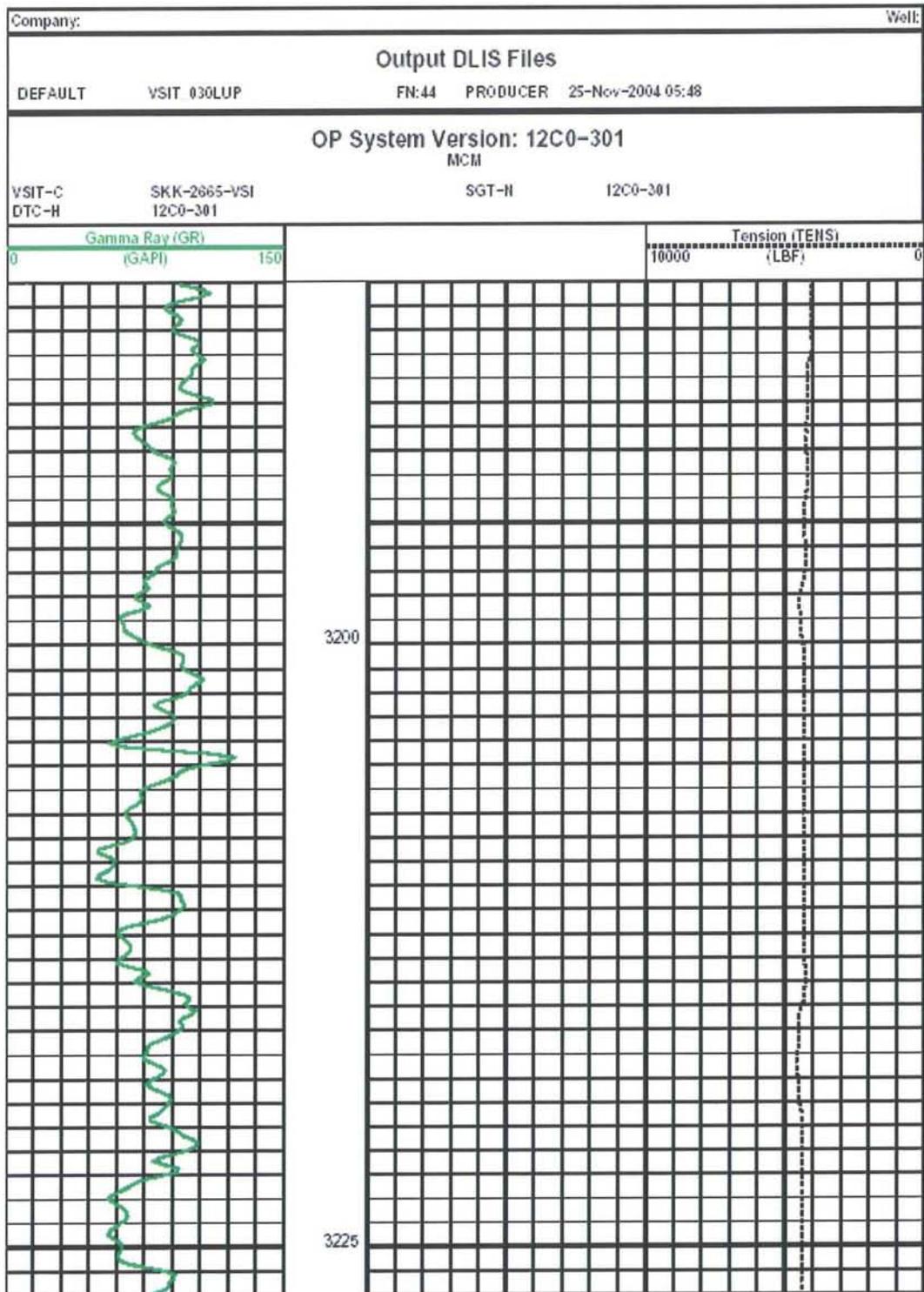
Well depth [m]	Time	Shot Type	Shot#	Stack#	Source	Remarks
2218.9	05:33:42	SHOT	119	24	A	
2218.9	05:33:57	SHOT	120	24	A	
2218.9	05:35:16	SHOT	121	24	A	
2139.0	05:40:00	SHOT	122	25	A	
2139.0	05:40:15	SHOT	123	25	A	
2139.0	05:40:30	SHOT	124	25	A	
2139.0	05:40:45	SHOT	125	25	A	
2139.0	05:41:04	SHOT	126	25	A	
2058.8	05:44:35	SHOT	127	26	A	
2058.8	05:44:57	SHOT	128	26	A	
2058.8	05:45:12	SHOT	129	26	A	
2058.8	05:45:27	SHOT	130	26	A	
2058.8	05:45:42	SHOT	131	26	A	
1979.0	05:51:09	SHOT	132	27	A	
1979.0	05:51:24	SHOT	133	27	A	
1979.0	05:51:39	SHOT	134	27	A	
1979.0	05:51:56	SHOT	135	27	A	
1979.0	05:52:11	SHOT	136	27	A	
1899.0	05:57:02	SHOT	137	28	A	
1899.0	05:57:17	SHOT	138	28	A	
1899.0	05:57:50	SHOT	139	28	A	
1899.0	05:58:05	SHOT	140	28	A	
1899.0	05:58:20	SHOT	141	28	A	
1819.0	06:03:27	SHOT	142	29	A	
1819.0	06:03:42	SHOT	143	29	A	
1819.0	06:03:57	SHOT	144	29	A	
1819.0	06:04:12	SHOT	145	29	A	
1819.0	06:04:28	SHOT	146	29	A	
1739.0	06:09:13	SHOT	147	30	A	
1739.0	06:09:37	SHOT	148	30	A	
1739.0	06:09:52	SHOT	149	30	A	
1739.0	06:10:07	SHOT	150	30	A	
1739.0	06:10:22	SHOT	151	30	A	
1659.1	06:18:36	SHOT	152	31	A	
1659.1	06:18:54	SHOT	153	31	A	
1659.1	06:19:09	SHOT	154	31	A	
1659.1	06:19:28	SHOT	155	31	A	
1659.1	06:19:43	SHOT	156	31	A	
1579.0	06:29:23	SHOT	157	32	A	
1579.0	06:29:39	SHOT	158	32	A	
1579.0	06:29:54	SHOT	159	32	A	
1579.0	06:30:10	SHOT	160	32	A	
1579.0	06:30:31	SHOT	161	32	A	
1499.0	06:38:01	SHOT	162	33	A	
1499.0	06:38:18	SHOT	163	33	A	
1499.0	06:38:33	SHOT	164	33	A	
1499.0	06:38:48	SHOT	165	33	A	
1499.0	06:39:03	SHOT	166	33	A	
1419.0	06:46:34	SHOT	167	34	A	
1419.0	06:47:23	SHOT	168	34	A	
1419.0	06:47:38	SHOT	169	34	A	
1419.0	06:47:53	SHOT	170	34	A	
1419.0	06:48:08	SHOT	171	34	A	
1339.0	06:53:58	SHOT	172	35	A	
1339.0	06:54:14	SHOT	173	35	A	
1339.0	06:54:29	SHOT	174	35	A	
1339.0	06:54:44	SHOT	175	35	A	
1339.0	06:55:01	SHOT	176	35	A	
1258.9	07:00:08	SHOT	177	36	A	

Observer's Note (4/4)

Well depth [m]	Time	Shot Type	Shot#	Stack#	Source	Remarks
1258.9	07:00:34	SHOT	178	36	A	
1258.9	07:00:49	SHOT	179	36	A	
1258.9	07:01:04	SHOT	180	36	A	
1258.9	07:01:22	SHOT	181	36	A	gain changed on Z after first shot
1179.0	07:07:21	SHOT	182	37	A	
1179.0	07:07:39	SHOT	183	37	A	
1179.0	07:07:54	SHOT	184	37	A	
1179.0	07:08:09	SHOT	185	37	A	
1179.0	07:08:24	SHOT	186	37	A	
1099.0	07:13:59	SHOT	187	38	A	
1099.0	07:14:33	SHOT	188	38	A	
1099.0	07:14:48	SHOT	189	38	A	
1099.0	07:15:03	SHOT	190	38	A	
1099.0	07:15:19	SHOT	191	38	A	
1019.0	07:20:33	SHOT	192	39	A	
1019.0	07:21:00	SHOT	193	39	A	
1019.0	07:21:15	SHOT	194	39	A	
1019.0	07:21:30	SHOT	195	39	A	
1019.0	07:21:45	SHOT	196	39	A	
939.0	07:27:19	SHOT	197	40	A	
939.0	07:27:35	SHOT	198	40	A	
939.0	07:27:50	SHOT	199	40	A	
939.0	07:28:05	SHOT	200	40	A	
939.0	07:28:20	SHOT	201	40	A	
858.9	07:33:35	SHOT	202	41	A	
858.9	07:34:03	SHOT	203	41	A	
858.9	07:34:23	SHOT	204	41	A	
858.9	07:34:43	SHOT	205	41	A	
858.9	07:35:03	SHOT	206	41	A	
779.0	07:40:34	SHOT	207	42	A	
779.0	07:41:06	SHOT	208	42	A	
779.0	07:41:26	SHOT	209	42	A	
779.0	07:41:46	SHOT	210	42	A	
779.0	07:42:06	SHOT	211	42	A	
699.0	07:47:14	SHOT	212	43	A	
699.0	07:47:34	SHOT	213	43	A	
699.0	07:47:54	SHOT	214	43	A	
699.0	07:48:14	SHOT	215	43	A	
699.0	07:48:34	SHOT	216	43	A	
619.0	07:53:28	SHOT	217	44	A	
619.0	07:53:55	SHOT	218	44	A	
619.0	07:54:15	SHOT	219	44	A	
619.0	07:54:35	SHOT	220	44	A	
619.0	07:54:55	SHOT	221	44	A	
539.0	08:00:20	SHAK	222			
539.0	08:00:41	SHOT	223	45	A	
539.0	08:01:01	SHOT	224	45	A	
539.0	08:01:27	SHOT	225	45	A	
539.0	08:01:47	SHOT	226	45	A	
539.0	08:02:07	SHOT	227	45	A	
459.0	08:07:18	SHOT	228	46	A	
459.0	08:07:44	SHOT	229	46	A	
459.0	08:08:04	SHOT	230	46	A	
379.1	08:13:01	SHOT	231	47	A	
379.1	08:13:40	SHOT	232	47	A	
379.1	08:14:02	SHOT	233	47	A	
299.0	08:19:33	SHOT	234	48	A	
299.0	08:20:03	SHOT	235	48	A	
299.0	08:20:23	SHOT	236	48	A	

GR Correlation

Main run



VSI Seismic Evaluation Report

ELECTRICAL NOISE LOW TEST

2004/11/25 03:10:01

Shot No: 1

Station Depth: 188.45 m

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
DC Offset	1	X	-25.3137	milli V	-100.0000	100.0000	PASS
RMS Noise Level	1	X	0.1209	micro V	-	0.5000	PASS
Noise Peak	1	X	0.4374	micro V	-	2.0000	PASS
DC Offset	1	Y	-25.3572	milli V	-100.0000	100.0000	PASS
RMS Noise Level	1	Y	0.1210	micro V	-	0.5000	PASS
Noise Peak	1	Y	0.4441	micro V	-	2.0000	PASS
DC Offset	1	Z	-25.3825	milli V	-100.0000	100.0000	PASS
RMS Noise Level	1	Z	0.1179	micro V	-	0.5000	PASS
Noise Peak	1	Z	0.4056	micro V	-	2.0000	PASS
DC Offset	2	X	-25.3389	milli V	-100.0000	100.0000	PASS
RMS Noise Level	2	X	0.1189	micro V	-	0.5000	PASS
Noise Peak	2	X	0.4515	micro V	-	2.0000	PASS
DC Offset	2	Y	-25.4848	milli V	-100.0000	100.0000	PASS
RMS Noise Level	2	Y	0.1237	micro V	-	0.5000	PASS
Noise Peak	2	Y	0.4155	micro V	-	2.0000	PASS
DC Offset	2	Z	-25.3639	milli V	-100.0000	100.0000	PASS
RMS Noise Level	2	Z	0.1236	micro V	-	0.5000	PASS
Noise Peak	2	Z	0.4534	micro V	-	2.0000	PASS
DC Offset	3	X	-25.3050	milli V	-100.0000	100.0000	PASS
RMS Noise Level	3	X	0.1243	micro V	-	0.5000	PASS
Noise Peak	3	X	0.4617	micro V	-	2.0000	PASS
DC Offset	3	Y	-25.4421	milli V	-100.0000	100.0000	PASS
RMS Noise Level	3	Y	0.1210	micro V	-	0.5000	PASS
Noise Peak	3	Y	0.4368	micro V	-	2.0000	PASS
DC Offset	3	Z	-25.3404	milli V	-100.0000	100.0000	PASS
RMS Noise Level	3	Z	0.1462	micro V	-	0.5000	PASS
Noise Peak	3	Z	0.5205	micro V	-	2.0000	PASS
DC Offset	4	X	-25.4022	milli V	-100.0000	100.0000	PASS
RMS Noise Level	4	X	0.1169	micro V	-	0.5000	PASS
Noise Peak	4	X	0.3993	micro V	-	2.0000	PASS
DC Offset	4	Y	-25.4528	milli V	-100.0000	100.0000	PASS
RMS Noise Level	4	Y	0.1198	micro V	-	0.5000	PASS
Noise Peak	4	Y	0.4491	micro V	-	2.0000	PASS
DC Offset	4	Z	-25.4517	milli V	-100.0000	100.0000	PASS
RMS Noise Level	4	Z	0.1210	micro V	-	0.5000	PASS
Noise Peak	4	Z	0.4433	micro V	-	2.0000	PASS

ELECTRICAL NOISE HIGH TEST

2004/11/25 03:10:25

Shot No: 2

Station Depth: 188.45 m

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
DC Offset	1	X	-25.1535	milli V	-100.0000	100.0000	PASS
RMS Noise Level	1	X	0.1203	micro V	-	0.5000	PASS
Noise Peak	1	X	0.4192	micro V	-	2.0000	PASS
DC Offset	1	Y	-25.2744	milli V	-100.0000	100.0000	PASS
RMS Noise Level	1	Y	0.1163	micro V	-	0.5000	PASS
Noise Peak	1	Y	0.3971	micro V	-	2.0000	PASS
DC Offset	1	Z	-25.4119	milli V	-100.0000	100.0000	PASS
RMS Noise Level	1	Z	0.1194	micro V	-	0.5000	PASS
Noise Peak	1	Z	0.4306	micro V	-	2.0000	PASS
DC Offset	2	X	-25.2369	milli V	-100.0000	100.0000	PASS
RMS Noise Level	2	X	0.1216	micro V	-	0.5000	PASS
Noise Peak	2	X	0.4538	micro V	-	2.0000	PASS
DC Offset	2	Y	-25.7129	milli V	-100.0000	100.0000	PASS
RMS Noise Level	2	Y	0.1249	micro V	-	0.5000	PASS
Noise Peak	2	Y	0.4421	micro V	-	2.0000	PASS
DC Offset	2	Z	-25.0696	milli V	-100.0000	100.0000	PASS
RMS Noise Level	2	Z	0.1215	micro V	-	0.5000	PASS
Noise Peak	2	Z	0.4513	micro V	-	2.0000	PASS
DC Offset	3	X	-24.9273	milli V	-100.0000	100.0000	PASS
RMS Noise Level	3	X	0.1227	micro V	-	0.5000	PASS
Noise Peak	3	X	0.4484	micro V	-	2.0000	PASS

DC Offset	3	Y	-25.5796	milli V	-100.0000	100.0000	PASS
RMS Noise Level	3	Y	0.1200	micro V	-	0.5000	PASS
Noise Peak	3	Y	0.4954	micro V	-	2.0000	PASS
DC Offset	3	Z	-24.9645	milli V	-100.0000	100.0000	PASS
RMS Noise Level	3	Z	0.1487	micro V	-	0.5000	PASS
Noise Peak	3	Z	0.5488	micro V	-	2.0000	PASS
DC Offset	4	X	-25.1432	milli V	-100.0000	100.0000	PASS
RMS Noise Level	4	X	0.1149	micro V	-	0.5000	PASS
Noise Peak	4	X	0.3777	micro V	-	2.0000	PASS
DC Offset	4	Y	-25.3403	milli V	-100.0000	100.0000	PASS
RMS Noise Level	4	Y	0.1196	micro V	-	0.5000	PASS
Noise Peak	4	Y	0.4246	micro V	-	2.0000	PASS
DC Offset	4	Z	-25.2033	milli V	-100.0000	100.0000	PASS
RMS Noise Level	4	Z	0.1186	micro V	-	0.5000	PASS
Noise Peak	4	Z	0.4323	micro V	-	2.0000	PASS

ELECTRICAL DISTORTION TEST

2004/11/25 03:10:34

Station Depth: 188.45 m

Shot No: 3

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
Total Harmonic Distortion	1	X	-98.7002	dB	-	-90.0000	PASS
Total Harmonic Distortion	1	Y	-97.3298	dB	-	-90.0000	PASS
Total Harmonic Distortion	1	Z	-100.2432	dB	-	-90.0000	PASS
Total Harmonic Distortion	2	X	-97.7461	dB	-	-90.0000	PASS
Total Harmonic Distortion	2	Y	-100.5202	dB	-	-90.0000	PASS
Total Harmonic Distortion	2	Z	-99.2124	dB	-	-90.0000	PASS
Total Harmonic Distortion	3	X	-102.5577	dB	-	-90.0000	PASS
Total Harmonic Distortion	3	Y	-99.2911	dB	-	-90.0000	PASS
Total Harmonic Distortion	3	Z	-103.9072	dB	-	-90.0000	PASS
Total Harmonic Distortion	4	X	-105.6281	dB	-	-90.0000	PASS
Total Harmonic Distortion	4	Y	-103.8192	dB	-	-90.0000	PASS
Total Harmonic Distortion	4	Z	-104.1229	dB	-	-90.0000	PASS

SYSTEM DYNAMIC RANGE TEST

2004/11/25 03:10:49

Station Depth: 188.45 m

Shot No: 4

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
System Dynamic Range	1	X	107.1750	dB	103.0000	-	PASS
System Dynamic Range	1	Y	107.2515	dB	103.0000	-	PASS
System Dynamic Range	1	Z	106.8619	dB	103.0000	-	PASS
System Dynamic Range	2	X	107.5648	dB	103.0000	-	PASS
System Dynamic Range	2	Y	108.7312	dB	103.0000	-	PASS
System Dynamic Range	2	Z	108.1113	dB	103.0000	-	PASS
System Dynamic Range	3	X	107.1655	dB	103.0000	-	PASS
System Dynamic Range	3	Y	107.3766	dB	103.0000	-	PASS
System Dynamic Range	3	Z	106.6274	dB	103.0000	-	PASS
System Dynamic Range	4	X	107.6822	dB	103.0000	-	PASS
System Dynamic Range	4	Y	107.9996	dB	103.0000	-	PASS
System Dynamic Range	4	Z	107.7193	dB	103.0000	-	PASS

AMPLIFIER GAIN 2 TEST

2004/11/25 03:11:03

Station Depth: 188.45 m

Shot No: 5

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
Gain Accuracy	1	X	0.1277	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	X	0.0000	dB	-0.5000	0.5000	PASS
Gain Accuracy	1	Y	0.1391	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	Y	0.0000	dB	-0.5000	0.5000	PASS
Gain Accuracy	1	Z	0.1458	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	Z	0.0000	dB	-0.5000	0.5000	PASS
Gain Accuracy	2	X	0.1502	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	2	X	0.0000	dB	-0.5000	0.5000	PASS
Gain Accuracy	2	Y	0.1582	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	2	Y	0.0000	dB	-0.5000	0.5000	PASS
Gain Accuracy	2	Z	0.1466	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	2	Z	0.0000	dB	-0.5000	0.5000	PASS
Gain Accuracy	3	X	0.1633	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	3	X	0.0000	dB	-0.5000	0.5000	PASS

Gain Accuracy	3	Y	0.1535	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	3	Y	0.0000	dB	-0.5000	0.5000	PASS
Gain Accuracy	3	Z	0.1611	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	3	Z	0.0000	dB	-0.5000	0.5000	PASS
Gain Accuracy	4	X	0.1333	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	4	X	0.0000	dB	-0.5000	0.5000	PASS
Gain Accuracy	4	Y	0.1306	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	4	Y	0.0000	dB	-0.5000	0.5000	PASS
Gain Accuracy	4	Z	0.1350	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	4	Z	0.0000	dB	-0.5000	0.5000	PASS

AMPLIFIER GAIN 4 TEST

2004/11/25 03:11:13

Shot No: 6

Station Depth: 188.45 m

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
Gain Accuracy	1	X	0.1229	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	X	0.0048	dB	-0.5000	0.5000	PASS
Gain Accuracy	1	Y	0.1373	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	Y	0.0018	dB	-0.5000	0.5000	PASS
Gain Accuracy	1	Z	0.1513	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	Z	-0.0055	dB	-0.5000	0.5000	PASS
Gain Accuracy	2	X	0.1474	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	2	X	0.0027	dB	-0.5000	0.5000	PASS
Gain Accuracy	2	Y	0.1555	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	2	Y	0.0027	dB	-0.5000	0.5000	PASS
Gain Accuracy	2	Z	0.1448	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	2	Z	0.0018	dB	-0.5000	0.5000	PASS
Gain Accuracy	3	X	0.1604	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	3	X	0.0029	dB	-0.5000	0.5000	PASS
Gain Accuracy	3	Y	0.1508	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	3	Y	0.0027	dB	-0.5000	0.5000	PASS
Gain Accuracy	3	Z	0.1604	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	3	Z	0.0007	dB	-0.5000	0.5000	PASS
Gain Accuracy	4	X	0.1316	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	4	X	0.0018	dB	-0.5000	0.5000	PASS
Gain Accuracy	4	Y	0.1291	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	4	Y	0.0015	dB	-0.5000	0.5000	PASS
Gain Accuracy	4	Z	0.1340	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	4	Z	0.0010	dB	-0.5000	0.5000	PASS

AMPLIFIER GAIN 8 TEST

2004/11/25 03:11:23

Shot No: 7

Station Depth: 188.45 m

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
Gain Accuracy	1	X	0.1216	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	X	0.0061	dB	-0.5000	0.5000	PASS
Gain Accuracy	1	Y	0.1391	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	Y	0.0000	dB	-0.5000	0.5000	PASS
Gain Accuracy	1	Z	0.1544	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	Z	-0.0086	dB	-0.5000	0.5000	PASS
Gain Accuracy	2	X	0.1483	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	2	X	0.0018	dB	-0.5000	0.5000	PASS
Gain Accuracy	2	Y	0.1541	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	2	Y	0.0041	dB	-0.5000	0.5000	PASS
Gain Accuracy	2	Z	0.1459	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	2	Z	0.0006	dB	-0.5000	0.5000	PASS
Gain Accuracy	3	X	0.1598	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	3	X	0.0035	dB	-0.5000	0.5000	PASS
Gain Accuracy	3	Y	0.1504	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	3	Y	0.0031	dB	-0.5000	0.5000	PASS
Gain Accuracy	3	Z	0.1596	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	3	Z	0.0015	dB	-0.5000	0.5000	PASS
Gain Accuracy	4	X	0.1312	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	4	X	0.0022	dB	-0.5000	0.5000	PASS
Gain Accuracy	4	Y	0.1295	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	4	Y	0.0011	dB	-0.5000	0.5000	PASS
Gain Accuracy	4	Z	0.1345	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	4	Z	0.0005	dB	-0.5000	0.5000	PASS

AMPLIFIER GAIN 16 TEST

2004/11/25 03:11:33

Shot No: 8

Station Depth: 188.45 m

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
Gain Accuracy	1	X	0.1171	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	X	0.0106	dB	-0.5000	0.5000	PASS
Gain Accuracy	1	Y	0.1334	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	Y	0.0058	dB	-0.5000	0.5000	PASS
Gain Accuracy	1	Z	0.1481	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	Z	-0.0023	dB	-0.5000	0.5000	PASS
Gain Accuracy	2	X	0.1454	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	2	X	0.0048	dB	-0.5000	0.5000	PASS
Gain Accuracy	2	Y	0.1507	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	2	Y	0.0075	dB	-0.5000	0.5000	PASS
Gain Accuracy	2	Z	0.1443	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	2	Z	0.0023	dB	-0.5000	0.5000	PASS
Gain Accuracy	3	X	0.1560	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	3	X	0.0073	dB	-0.5000	0.5000	PASS
Gain Accuracy	3	Y	0.1456	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	3	Y	0.0079	dB	-0.5000	0.5000	PASS
Gain Accuracy	3	Z	0.1571	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	3	Z	0.0040	dB	-0.5000	0.5000	PASS
Gain Accuracy	4	X	0.1297	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	4	X	0.0036	dB	-0.5000	0.5000	PASS
Gain Accuracy	4	Y	0.1254	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	4	Y	0.0052	dB	-0.5000	0.5000	PASS
Gain Accuracy	4	Z	0.1322	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	4	Z	0.0029	dB	-0.5000	0.5000	PASS

AMPLIFIER GAIN 32 TEST

2004/11/25 03:11:43

Shot No: 9

Station Depth: 188.45 m

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
Gain Accuracy	1	X	0.1205	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	X	0.0072	dB	-0.5000	0.5000	PASS
Gain Accuracy	1	Y	0.1401	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	Y	-0.0010	dB	-0.5000	0.5000	PASS
Gain Accuracy	1	Z	0.1526	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	Z	-0.0068	dB	-0.5000	0.5000	PASS
Gain Accuracy	2	X	0.1463	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	2	X	0.0039	dB	-0.5000	0.5000	PASS
Gain Accuracy	2	Y	0.1531	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	2	Y	0.0051	dB	-0.5000	0.5000	PASS
Gain Accuracy	2	Z	0.1453	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	2	Z	0.0013	dB	-0.5000	0.5000	PASS
Gain Accuracy	3	X	0.1592	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	3	X	0.0041	dB	-0.5000	0.5000	PASS
Gain Accuracy	3	Y	0.1480	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	3	Y	0.0055	dB	-0.5000	0.5000	PASS
Gain Accuracy	3	Z	0.1587	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	3	Z	0.0024	dB	-0.5000	0.5000	PASS
Gain Accuracy	4	X	0.1306	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	4	X	0.0027	dB	-0.5000	0.5000	PASS
Gain Accuracy	4	Y	0.1280	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	4	Y	0.0025	dB	-0.5000	0.5000	PASS
Gain Accuracy	4	Z	0.1377	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	4	Z	-0.0026	dB	-0.5000	0.5000	PASS

CROSS TALK X TEST

2004/11/25 03:11:58

Shot No: 10

Station Depth: 188.45 m

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
Cross Talk X-Y	1	-	-100.4145	dB	-	-90.0000	PASS
Cross Talk X-Z	1	-	-98.7120	dB	-	-90.0000	PASS
Cross Talk X-Y	2	-	-100.1607	dB	-	-90.0000	PASS
Cross Talk X-Z	2	-	-98.9901	dB	-	-90.0000	PASS
Cross Talk X-Y	3	-	-100.6233	dB	-	-90.0000	PASS

Cross Talk X-Z	3	-	-97.4021	dB	-	-90.0000	PASS
Cross Talk X-Y	4	-	-100.5341	dB	-	-90.0000	PASS
Cross Talk X-Z	4	-	-98.9673	dB	-	-90.0000	PASS

CROSS TALK Y TEST

2004/11/25 03:12:17

Shot No: 11

Station Depth: 188.45 m

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
Cross Talk Y-Z	1	-	-98.0216	dB	-	-90.0000	PASS
Cross Talk Y-X	1	-	-99.7328	dB	-	-90.0000	PASS
Cross Talk Y-Z	2	-	-98.5068	dB	-	-90.0000	PASS
Cross Talk Y-X	2	-	-99.9230	dB	-	-90.0000	PASS
Cross Talk Y-Z	3	-	-97.1246	dB	-	-90.0000	PASS
Cross Talk Y-X	3	-	-99.8828	dB	-	-90.0000	PASS
Cross Talk Y-Z	4	-	-98.5060	dB	-	-90.0000	PASS
Cross Talk Y-X	4	-	-99.9278	dB	-	-90.0000	PASS

CROSS TALK Z TEST

2004/11/25 03:12:36

Shot No: 12

Station Depth: 188.45 m

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
Cross Talk Z-X	1	-	-97.3385	dB	-	-90.0000	PASS
Cross Talk Z-Y	1	-	-96.8722	dB	-	-90.0000	PASS
Cross Talk Z-X	2	-	-97.7581	dB	-	-90.0000	PASS
Cross Talk Z-Y	2	-	-96.9094	dB	-	-90.0000	PASS
Cross Talk Z-X	3	-	-97.0600	dB	-	-90.0000	PASS
Cross Talk Z-Y	3	-	-96.5209	dB	-	-90.0000	PASS
Cross Talk Z-X	4	-	-97.7691	dB	-	-90.0000	PASS
Cross Talk Z-Y	4	-	-97.3542	dB	-	-90.0000	PASS

IMPULSE RESPONSE TEST

2004/11/25 03:12:54

Shot No: 13

Station Depth: 188.45 m

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
Amplitude (0.3Hz)	1	X	-1.5978	dB	-5.0000	-	PASS
Amplitude (400Hz)	1	X	-3.5707	dB	-5.0000	-	PASS
Impulse Amplitude	1	X	573.1796	milli V	-	-	-
Phase Diff. at 0.3Hz from X1	1	X	0.0000	degree	-	-	-
Amplitude (0.3Hz)	1	Y	-1.6343	dB	-5.0000	-	PASS
Amplitude (400Hz)	1	Y	-3.5732	dB	-5.0000	-	PASS
Impulse Amplitude	1	Y	573.7990	milli V	-	-	-
Phase Diff. at 0.3Hz from X1	1	Y	-2.3311	degree	-	-	-
Amplitude (0.3Hz)	1	Z	-1.6269	dB	-5.0000	-	PASS
Amplitude (400Hz)	1	Z	-3.5708	dB	-5.0000	-	PASS
Impulse Amplitude	1	Z	574.2680	milli V	-	-	-
Phase Diff. at 0.3Hz from X1	1	Z	-0.7545	degree	-	-	-
Amplitude (0.3Hz)	2	X	-1.5560	dB	-5.0000	-	PASS
Amplitude (400Hz)	2	X	-3.5720	dB	-5.0000	-	PASS
Impulse Amplitude	2	X	574.3579	milli V	-	-	-
Phase Diff. at 0.3Hz from X1	2	X	-1.6623	degree	-	-	-
Amplitude (0.3Hz)	2	Y	-1.4848	dB	-5.0000	-	PASS
Amplitude (400Hz)	2	Y	-3.5686	dB	-5.0000	-	PASS
Impulse Amplitude	2	Y	574.7844	milli V	-	-	-
Phase Diff. at 0.3Hz from X1	2	Y	-3.6344	degree	-	-	-
Amplitude (0.3Hz)	2	Z	-1.7001	dB	-5.0000	-	PASS
Amplitude (400Hz)	2	Z	-3.5767	dB	-5.0000	-	PASS
Impulse Amplitude	2	Z	573.9604	milli V	-	-	-
Phase Diff. at 0.3Hz from X1	2	Z	0.0133	degree	-	-	-
Amplitude (0.3Hz)	3	X	-1.6746	dB	-5.0000	-	PASS
Amplitude (400Hz)	3	X	-3.5727	dB	-5.0000	-	PASS
Impulse Amplitude	3	X	574.8829	milli V	-	-	-
Phase Diff. at 0.3Hz from X1	3	X	-0.1661	degree	-	-	-
Amplitude (0.3Hz)	3	Y	-1.6555	dB	-5.0000	-	PASS
Amplitude (400Hz)	3	Y	-3.5745	dB	-5.0000	-	PASS
Impulse Amplitude	3	Y	574.2968	milli V	-	-	-
Phase Diff. at 0.3Hz from X1	3	Y	2.8160	degree	-	-	-
Amplitude (0.3Hz)	3	Z	-1.5938	dB	-5.0000	-	PASS
Amplitude (400Hz)	3	Z	-3.5744	dB	-5.0000	-	PASS

Impulse Amplitude	3	Z	574.5537	milli V	-	-	-
Phase Diff. at 0.3Hz from X1	3	Z	-1.0443	degree	-	-	-
Amplitude (0.3Hz)	4	X	-1.6425	dB	-5.0000	-	PASS
Amplitude (400Hz)	4	X	-3.5751	dB	-5.0000	-	PASS
Impulse Amplitude	4	X	573.2418	milli V	-	-	-
Phase Diff. at 0.3Hz from X1	4	X	-0.7210	degree	-	-	-
Amplitude (0.3Hz)	4	Y	-1.4450	dB	-5.0000	-	PASS
Amplitude (400Hz)	4	Y	-3.5770	dB	-5.0000	-	PASS
Impulse Amplitude	4	Y	572.9935	milli V	-	-	-
Phase Diff. at 0.3Hz from X1	4	Y	-2.7018	degree	-	-	-
Amplitude (0.3Hz)	4	Z	-1.6393	dB	-5.0000	-	PASS
Amplitude (400Hz)	4	Z	-3.5774	dB	-5.0000	-	PASS
Impulse Amplitude	4	Z	573.4516	milli V	-	-	-
Phase Diff. at 0.3Hz from X1	4	Z	-0.8350	degree	-	-	-