



Acquisition Documentation

for

VSP Acquisition Services

in EnCana's

Weyburn Field

22 November 2002



OVERVIEW	3
ACQUISITION.....	3
RECEIVER TOOL DESCRIPTION	3
VIBRATOR DESCRIPTION.....	3
CHANNEL CONFIGURATION	4
RECORDER TIMING.....	4
DATA TAPES	4
DATA QUALITY	5
OFFSET #1	5
OFFSET #2	6
OFFSET #3	6
OFFSET #4	7
APPENDIX A – SURVEY LOGS	8



Overview

Acquisition of a zero offset and 3 offset VSP's were recorded into well 101/6-13 in the Weyburn field following the conclusion of the crosswell seismic operations. The borehole tool was the TARS (TomoSeis Analog Receiver System) hydrophone system and the source was an IO vibrator. TomoSeis responsibility in this acquisition was to assist with equipment interface, recording and on-site data QC. The exact surface locations were specified by Dale Cox and were not known exactly by the TomoSeis staff. Approximate locations of the vibe points are given for completeness.

Acquisition

Acquisition operations began at around noon November 18, 2002 and continued uninterrupted through approximately 3:00 a.m. November 19, 2002. The receiver tool was deployed in the 101/6-13 for each profile with receivers spanning from 1337 to 380 meters at a 3-meter level spacing. Depth measured relative to GL elevation

Vibrator points were selected by Dale Cox. Approximate locations of vibe points are given below when known.

Receiver tool description

The receiver tool consists of ten 16 element by 3 meter hydrophone arrays. The array centers are separated by 3 meters for an effective level spacing of 3 meters.

Vibrator description

The vibrator was an IO device capable of generating both P and S wave energy. The majority of acquisition was performed using P-wave source, however some levels were recorded using S-wave source. S-wave source shots on offset #1 were recorded with the axis of excitation off axis from the direction of the profile. This was corrected and repeated on offset #2.

The table below describes the approximate locations of the vibrator for the 4 offsets acquired.

Offset	Description	Approximate distance (m)
1	Along 111/12-13 to 101/6-13 line.	800
2	Along 101/4-13 to 101/6-13 line.	1200
3	Zero offset	On 101/6-13 pad
4	Along 101/4-13 to 101/6-13 line.	580

A similarity test was conducted prior to the start of acquisition to ensure the vibrator encoder signal and the encoder in the recording unit were producing the same sweep. These test are recorded on shot numbers 31-35. The recorder unit encoder sweep is recorded on channel #1 while the vibrator encoder sweep is recorded on channel 4. Following the similarity test the sweeps from the encoder in the receiver unit were the only ones recorded.

Channel configuration

The VSP recording was performed on an EGG Strataview recorder. This system wrote the SEG-Y data to disk and tape during acquisition. The disk files were QC'd in the field and the tape files (two copies) were archived for delivery.

The channel configuration used during acquisition is described in the table below.

Channel #	Description	Channel #	Description
1	Sweep	8	Depth=Z+9
2	Aux	9	Depth=Z+12
3	Aux	10	Depth=Z+15
4	Aux	11	Depth=Z+18
5	Top receiver (Depth=Z)	12	Depth=Z+21
6	Depth=Z+3	13	Depth=Z+24
7	Depth=Z+6	14	Depth=Z+27

Recorder Timing

The vibrator encoder box was unable to trigger the Strataview recorder as planned so an alternative triggering scheme was used. The time break signal for the vibrator was used as the recorder start trigger for all VSP data.

Data Tapes

Field data tapes (4-mm) were delivered to the TomoSeis Houston processing center at the end of the survey. The Field Observation Reports are included in Appendix A. The 4-mm tapes were transcribed to 8-mm tapes for delivery to LBL. The field tapes are SEG-Y format with trace data as 4 byte fixed point data (format code 2). The data are as recorded in the field and have not been correlated with the pilot sweep. Important trace header locations are listed below, of which the most useful are high lighted in red. The Reel Identification Header is standard SEG-Y format.

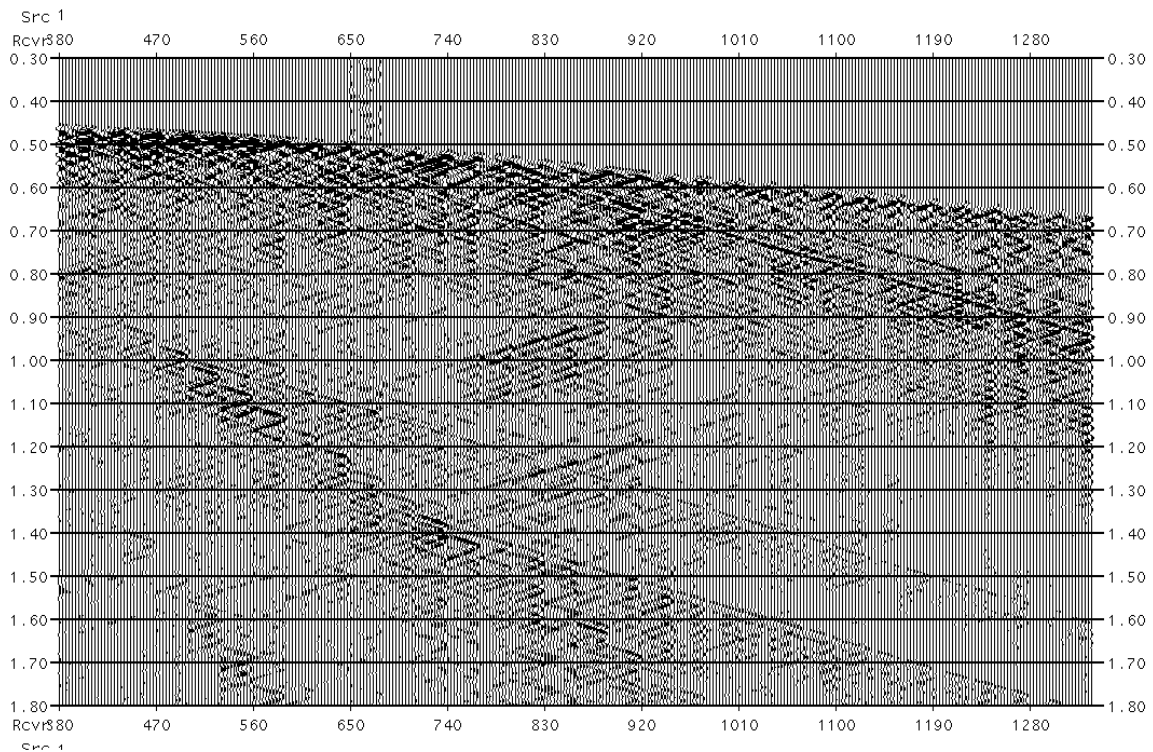
Description	Bytes	Description	Bytes
Trace sequence number	001-004	Number of samples	115-116
Field recorder channel number	005-008	Sample period (us)	117-118
Field file ID	009-012	Gain type	119-120
Sequential channel number	013-016	Instrument gain	121-122
Sequential shot number in file	017-020	Initial gain	123-124
Trace ID code	029-030	Low cut filter corner frequency	149-150
Receiver measured depth.	041-044	Anti-alias filter corner frequency	151-152
Source measured depth.	045-048	Hour of day	161-162

Source depth from encoder	049-052	Minute of hour	163-164
Acquisition delay (milliseconds)	109-110	Second of minute	165-166

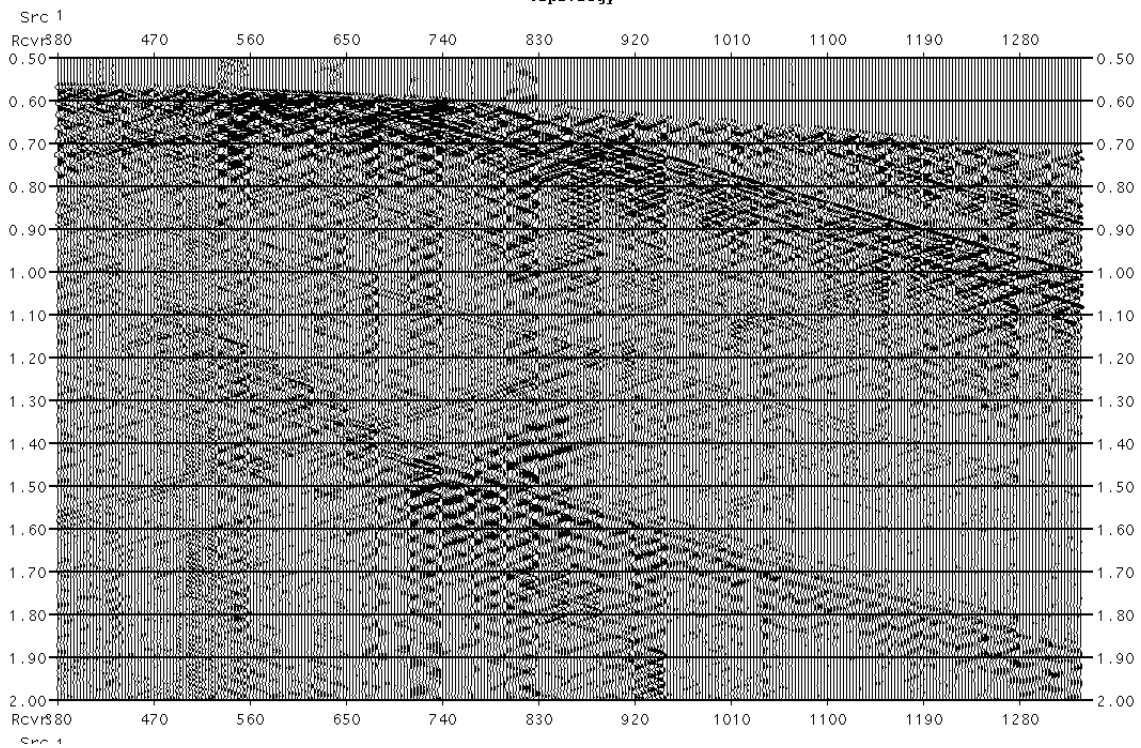
Data Quality

Examples of the data as viewed in the field for each offset. The results are scaled by the RMS level of all traces in the display (panel or section normalization) and processing is a simple mean stack followed by correlation with the recorded pilot. No trace editing prior to stack or subsequent filtering have been performed.

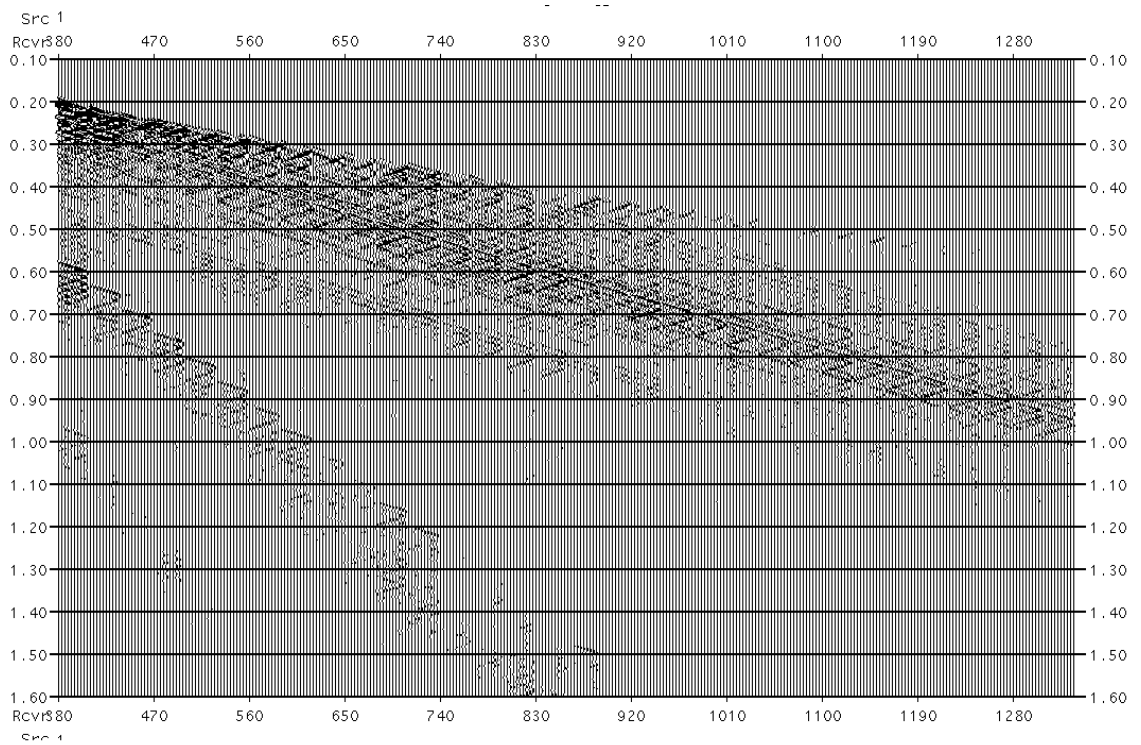
Offset #1



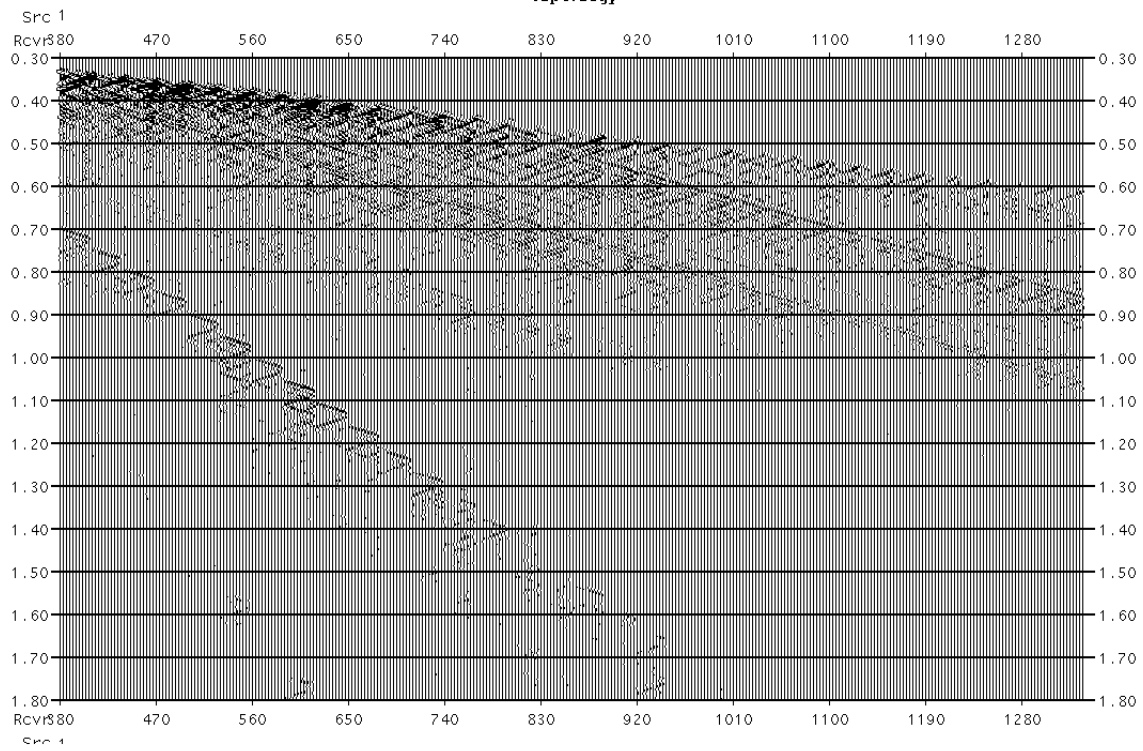
Offset #2



Offset #3



Offset #4





Appendix A – Survey Logs