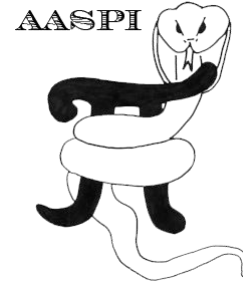# Well Log Utilities: Program LAS file importer

## Overview

The well log modules in AASPI allow you to:

➢ import LAS format *.las files and convert them to *.H AASPI format,
➢ display the curves, and
➢ export AASPI-format *.H files as LAS-format *.las files.

## AASPI Implementation

To run and visualize well log curves use the step by step process summarized below.

### Step 1: Accessing the Well Log Utilities

Well log utilities are located on the second row of tabs under the **aaspi_util** GUI:
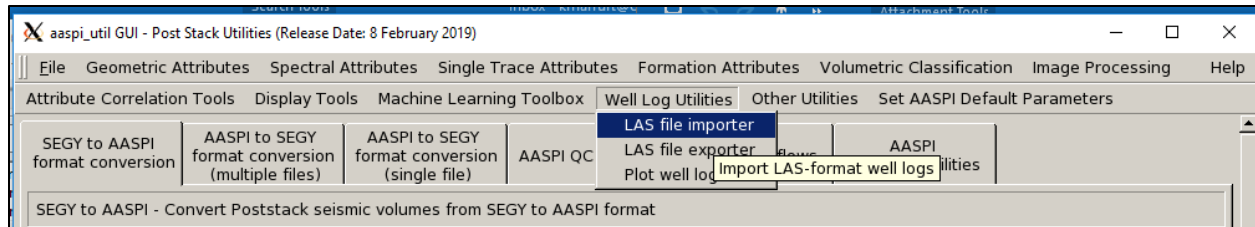


*Figure 1. Accessing the well log utilities in AASPI.*

### Step 2: Importing the LAS file

AASPI currently only imports the LAS 2.0 format. To import a LAS file:

1. Click on browse and import and add to current list (**Figure 2**)
2. Input the well head location coordinates (**X** and **Y**)
3. For a directional well, a well trajectory file can also be imported. In this example we will load a vertical well with hypothetical coordinates. In case, **X** and **Y** coordinates are available we will input the **X** and **Y** coordinates
4. A unique project name and suffix are required. In this case, we will define the project name to be *test* and suffix as zero.

5. Click *Execute las_file_import*. On successful completion of program, a new window will pop up with normal completion message.
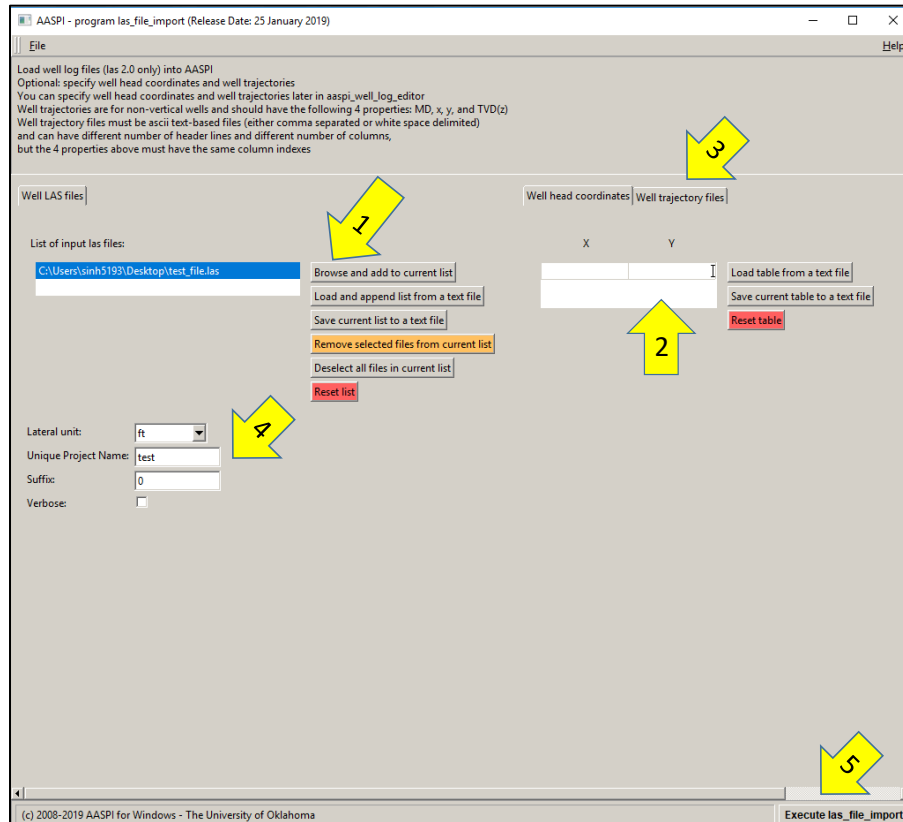6. Click exit



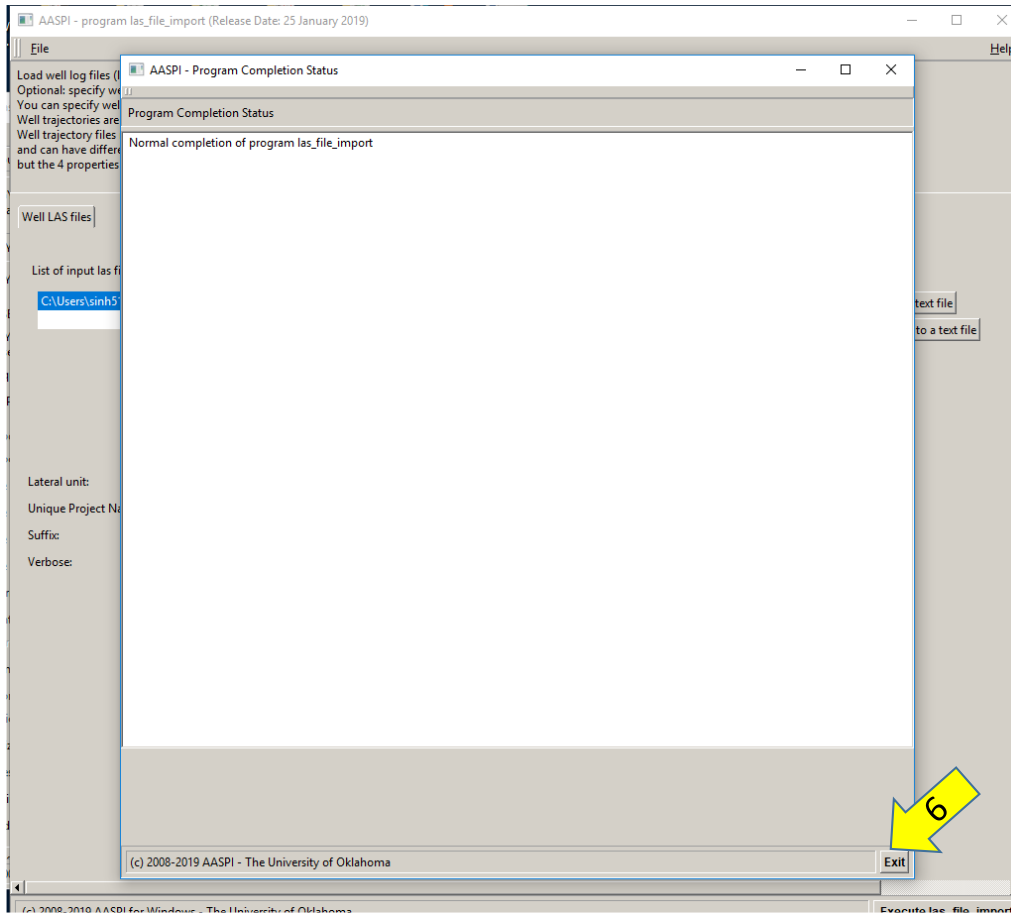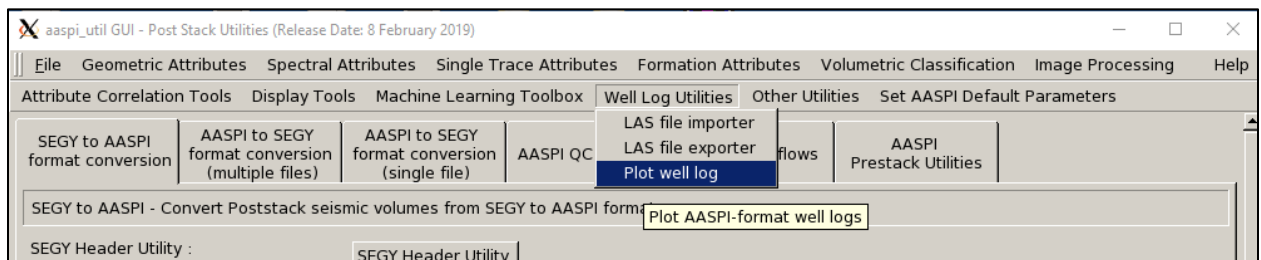***Figure 2.  Importing an LAS-format file in AASPI***

*Figure 3. The normal completion pop-up window resulting from LAS file import*

### Step 3: Plotting and displaying an LAS-format file

The steps for displaying a well log curve are summarized below.

1. Go to well log utilities, plot well logs.



A new window will open like one shown in Figure 4.

2. Click on input *AASPI well log fil*e, browse and select the file in *.H format.
3. Select the curves you want to remove from the list and keep the ones to be plotted.
4. Select the appropriate depth curve (MD or TVD). In the example below, it's called *depth*.
5. Select the depth range of the logs to be displayed.
6. Click *Execute*. A new window will pop up displaying the well log curves. The controls on the bottom left allows the user to pan over and zoom in on the curves.
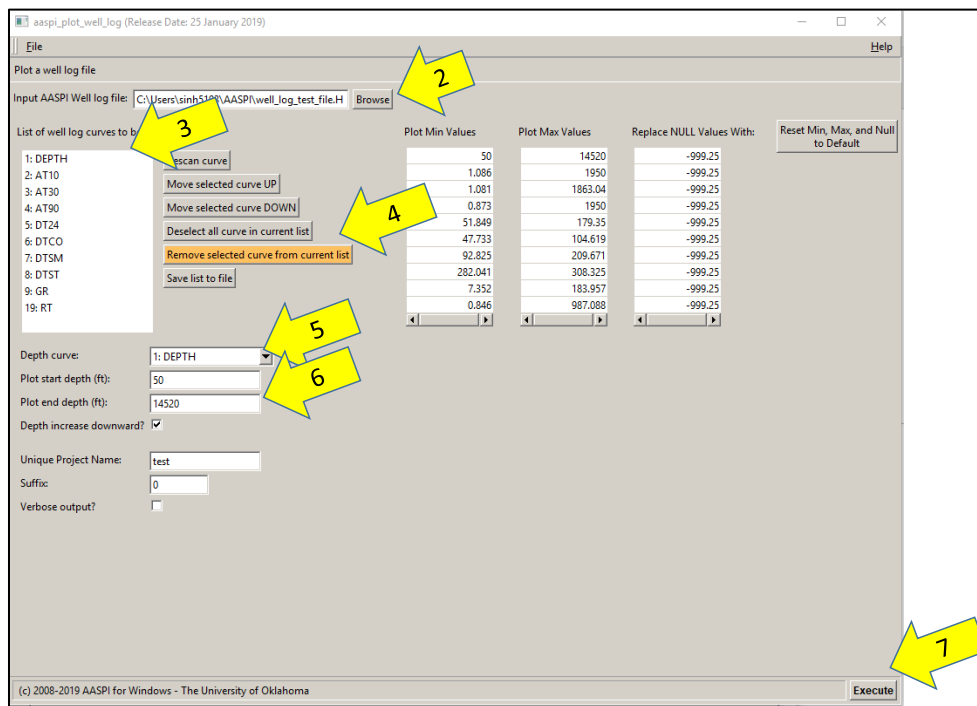


*Figure 4.  Parameters setup in AASPI to display a well log*
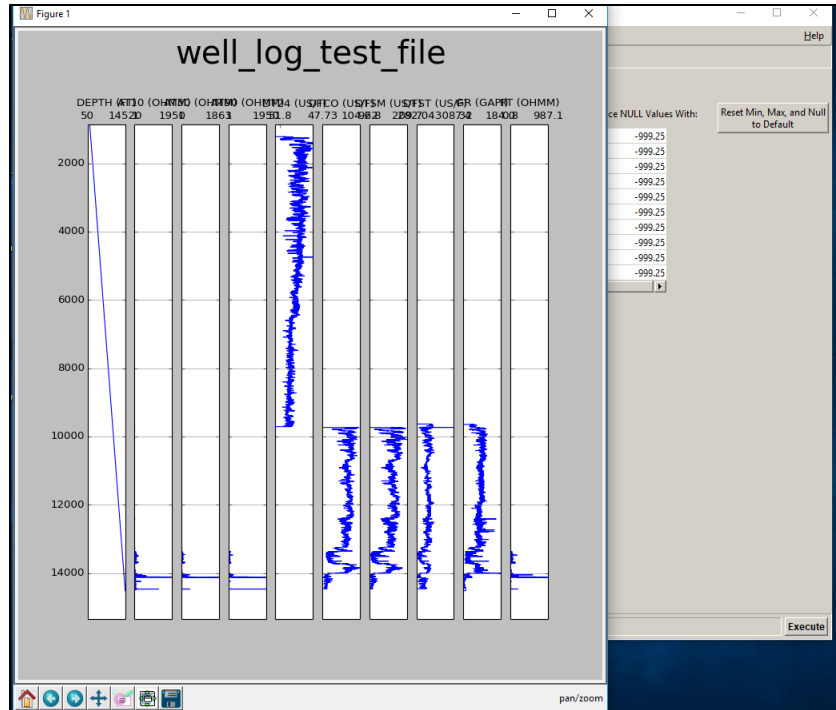
*Figure 5. AASPI well log display. The controls on the bottom left provide basic tools to zoom and pan the curves.*

### LAS and AASPI Format

While LAS is the standard format for reading the well log data throughout the industry AASPI utilizes binary .H format to run any operations on well logs. A comparison of these two file formats headers is shown in **Figure 4**.

### a) AASPI .H Format
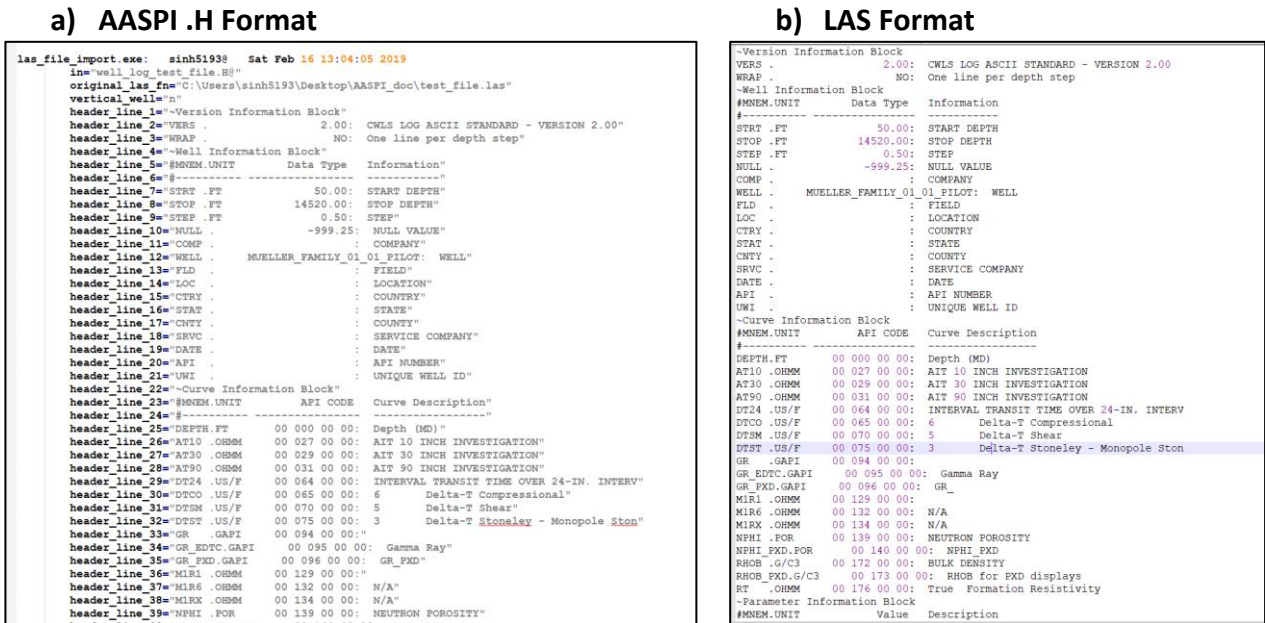


### b) LAS Format



*Figure 4 a) AASPI binary format b) LAS format*

### LAS export from AASPI

The AASPI Export LAS file GUI is found in the same area as the Import GUI:
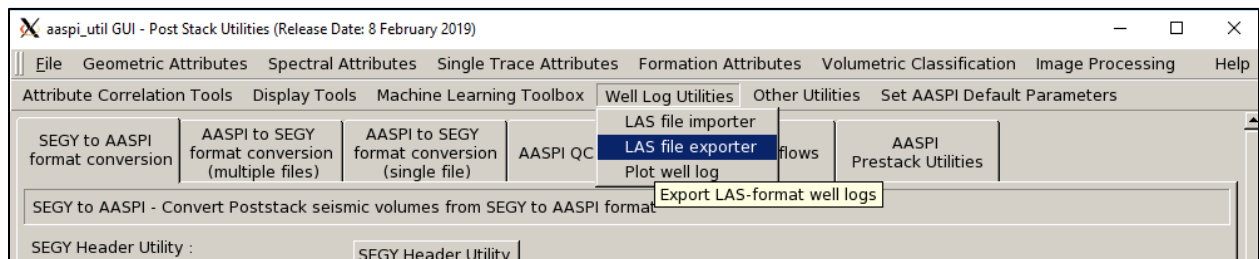


While all operations in AASPI on well logs are performed on the .H format, the wells can also be exported back into LAS format for use in commercial software.

AASPI provides the text wrapping option to export the well logs. A comparison with and without text wrapping is shown in **Figure 6** and **Figure 7**.

To export the well logs from AASPI format to LAS format:

1. Click LAS file exporter from the well log utilities. The GUI in Figure 6 appears.
2. Click browse and add to the current list
3. From the text wrapping dropdown menu select YES ( **Figure 5**)
4. Provide a unique project name
5. Click *Execute las_file_import*
6. Repeat the same process with the text wrapping option "NO"
7. **Figure 6** shows the LAS file with text wrapping option "YES" and **Figure 7** with option "NO". Notice the difference between the two formats.
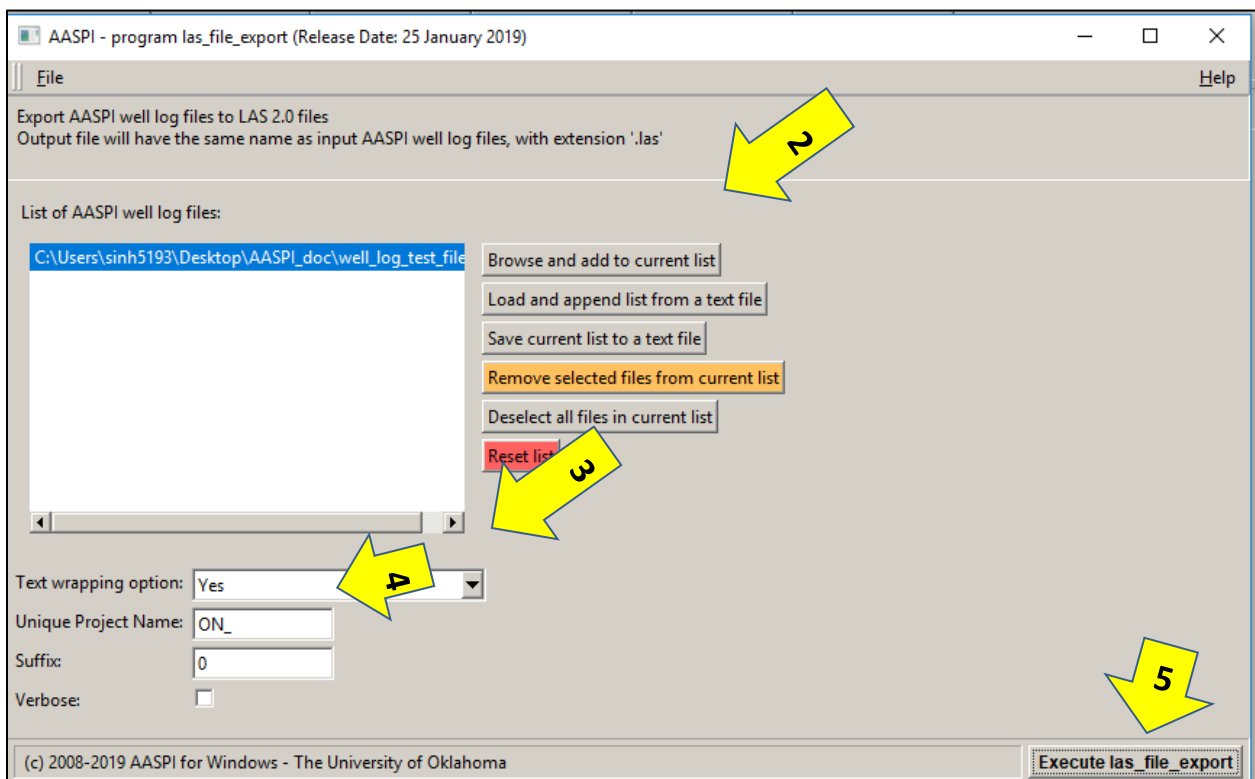


***Figure 5. Exporting LAS file with "text wrapping ON"***

```
#MNEM.UNIT        API CODE   Curve Description
#---------- ---------------  ------------------
DEPTH      . FT                  :   1 Depth (MD)
AT10       . OHMM                :   2 AIT 10 INCH INVESTIGATION
AT30       . OHMM                :   3 AIT 30 INCH INVESTIGATION
AT90       . OHMM                :   4 AIT 90 INCH INVESTIGATION
DT24       . US/F                :   5 INTERVAL TRANSIT TIME OVER 24-IN. INTERV
DTCO       . US/F                :   6 Delta-T Compressional
DTSM       . US/F                :   7 Delta-T Shear
DTST       . US/F                :   8 Delta-T Stoneley - Monopole Ston
GR         . GAPI                :   9
GR_EDTC    . GAPI                :  10 Gamma Ray
GR_PXD     . GAPI                :  11 GR_PXD
M1R1       . OHMM                :  12
M1R6       . OHMM                :  13 N/A
M1RX       . OHMM                :  14 N/A
NPHI       . POR                 :  15 NEUTRON POROSITY
NPHI_. POR                       :  16 NPHI_PXD
RHOB       . G/C3                :  17 BULK DENSITY
RHOB_PXD . G/C3                  :  18 RHOB for PXD displays
RT         . OHMM                :  19 True  Formation Resistivity
~Parameter Information Block
#MNEM.UNIT           Value   Description
#---------- ---------------  -----------
PROJECT.      :
SET  .              WIRE1:
~Other Information Block
#
################################################################################
# DEPTH
#          AT10        AT30        AT90        DT24        DTCO
#          DTSM        DTST          GR      GR_EDTC      GR_PXD
#          M1R1        M1R6        M1RX        NPHI      NPHI_PXD
#          RHOB      RHOB_PXD         RT
################################################################################
~A
50.0000
          -999.2500   -999.2500   -999.2500   -999.2500   -999.2500
          -999.2500   -999.2500   -999.2500   -999.2500     30.0670
          -999.2500   -999.2500   -999.2500   -999.2500   -999.2500
          -999.2500   -999.2500   -999.2500
50.5000
          -999.2500   -999.2500   -999.2500   -999.2500   -999.2500
          -999.2500   -999.2500   -999.2500   -999.2500     30.6760
```

*Figure 6 . LAS export with text wrapping ON*

```
M1R6    . OHMM          :  13 N/A
M1RX    . OHMM          :  14 N/A
NPHI    . POR           :  15 NEUTRON POROSITY
NPHI_ . POR             :  16 NPHI_
RHOB    . G/C3          :  17 BULK DENSITY
RHOB_ . G/C3            :  18 RHOB for  displays
RT      . OHMM          :  19 True  Formation Resistivity
~Parameter Information Block
#MNEM.UNIT       Value  Description
#--------- --------------- -----------
PROJECT.
SET  .          WIRE1:
~Other Information Block
#
~A     DEPTH       AT10        AT30        AT90        DT24        DTCO        DTSM        DTST          GR      GR_EDTC      GR_PXD
      50.0000   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500     30.0670
      50.5000   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500     30.6760
      51.0000   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500     30.7620
      51.5000   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500     30.2350
      52.0000   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500     30.1500
      52.5000   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500     29.9240
      53.0000   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500     29.3740
      53.5000   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500     29.5770
      54.0000   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500     29.8980
      54.5000   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500     28.3740
      55.0000   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500     26.2310
      55.5000   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500     25.9650
      56.0000   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500     26.9680
      56.5000   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500     27.1880
      57.0000   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500     26.6940
      57.5000   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500     27.4030
      58.0000   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500   -999.2500     28.1190
```

*Figure 7. LAS export with text wrapping OFF*