Dataset Description:

We are providing you with a dataset from the **North Viking Graben in the North Sea**, which includes a set of three well logs and a seismic data cube. The wells are situated within the contour of the seismic data (Fig. 1).

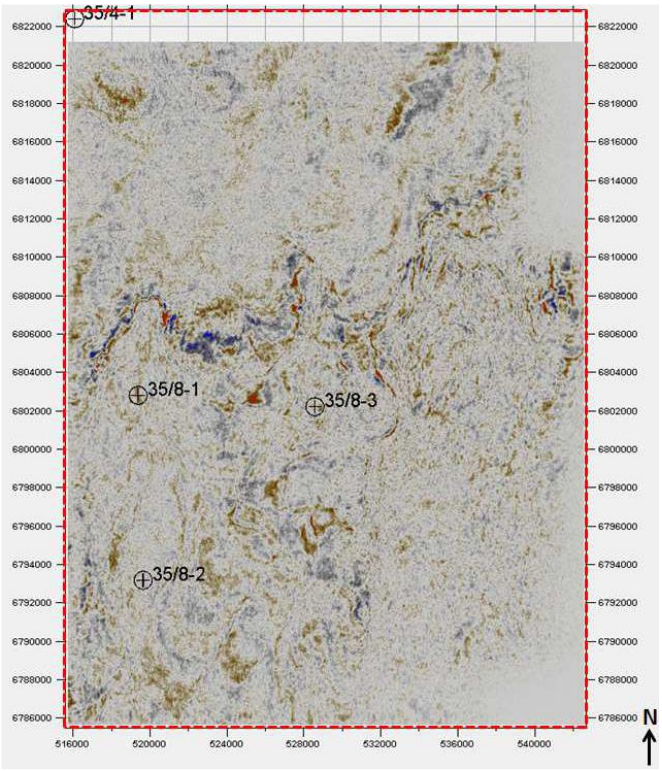

Fig. 1. Plan view of a slice from the seismic cube showing the location of the wells.

Well Data: For the wells 35-8-1, 35-8-2, and 35-8-3, the dataset includes various types of logs:

- **Caliper Log (CAL)**: Measures the borehole's size and shape.
- **Acoustic Log (DT)**: Measures the time taken for a seismic wave to travel a certain distance through the formation.
- **Density Log (RHOB)**: Provides continuous measurement of formation density.
- **Neutron Log (NPHI)**: Measures the hydrogen index of the formation which is closely related to porosity.
- **Gamma Log (GR)**: Measures the natural radioactivity in formations.
- **Time-Depth Relationship**: Helps to relate the depth domain (used in well logging) with the time domain (used in seismic).
- **Mud Weight Log**: Reflects the density of the drilling fluid that has been applied during the drilling process to prevent blowouts due to reservoir pressure (Fig. 2).

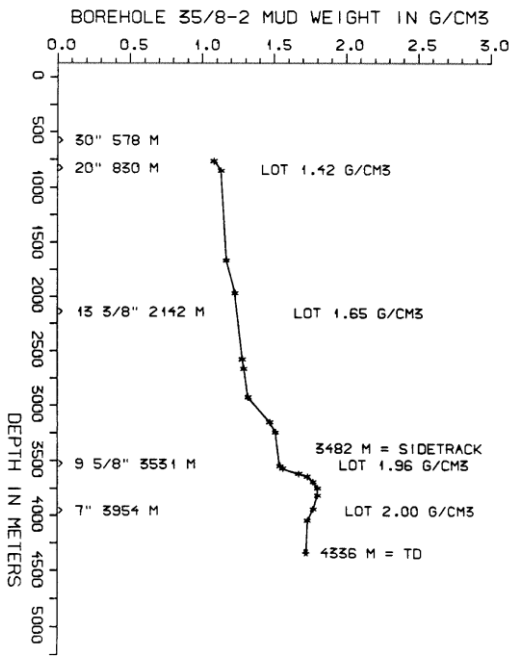

Fig. 2 Drilling fluid density profile of well 35_8_2. (Full description is available in well report named 35-8-2_General_Information).

In addition to the above, there is a file named **"North Viking Graben Tops"** that contains information on well tops, marking different geological formations or significant intervals in the well.

Some of the wells come with additional reports and summaries (Table 1).

Table 1. Description of the well's dataset

Information	35/8-1	35/8-2 35	35/8-3
Gamma ray	X	X	X
Density	X	X	X
Sonic	X	X	X
Neutron	X	X	X
Caliper	X	X	
Completion Report		X	
Completion Log		X	
Composite Log		X	
General Information		X	
Time-Depth data	X	X	X
Tops	X	X	X
Mud Weight Log		X	

Note: While the task outlined might not explicitly require all the provided data, you are encouraged to utilize any part of the dataset if you believe it will enhance the quality or precision of your solution.

Task:

1) Reconstruct* a mud weight profile for wells 35/8-1 and 35/8-3 using seismic data.

2) Compute* a pore pressure profile for wells 35/8-1, 35/8-2, 35/8-3 based on the analysis of seismic data and well logging.

3) Calculate* a volume of the recommended drilling mud weight and pore pressure prediction fields within the 3D seismic counter.

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*You can use both, data driven and physical based approaches.

Outcomes:

1) Oral presentation with slides on 10 Nov with your results with a primary focus on methods and metrics for results accessing.
2) Jupiter Notebook with the solution.