

Lesson Plan
Derricks to Desks
July 31, 1998
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Objective: Students will identify the circumstances needed to form an oil trap and identify the different type of traps that form.

Lecture Notes:

Formation of an oil field requires several circumstances to occur in the proper order.

1st There must be a source rock deposited. Most are silt and claystones with a high concentration of organic matter, usually from marine phytoplankton, such as diatoms.

2nd There must be a reservoir rock deposited. These range from sandstones to limestones and cherts that are later fractured.

3rd Burial of these sediments is necessary to change the organic matter to crude oil and gas, consolidate the reservoir into sandstone, limestone or chert.

4th Geologic forces change these units that are usually flat lying into a trap.

Trap formation may involve any of following types

1. Anticline. - the rock units are warped upward into a hump to form an anticline
2. Fault traps - reservoir rocks are displaced along a fault line and the fault seals the units, preventing further migration of the oil.
3. Stratigraphic traps - the oil migrates along a reservoir unit until it is stopped by a change in lithology (a rock type that does not have porosity/ permeability).
4. Unconformity - the reservoir rocks are eroded and then later sealed by rocks deposited on the unconformity. Oil migration is after the sealing of the unconformity.
5. Salt domes - burial pressures force the plastic deformation of salt deposits to form domes. Sediments along the sides of these domes up warp and are sealed by the salt.

Guided Practice: **Geoblox forms can be obtained from <http://www.geoblox.com/>.**

The Geoblox forms used in this lesson plan were:

Anticline

Horst & Graben Horst

Horst & Graben Graben

Angular Unconformity

Disconformity

Salt Dome Oil Trap

Using the Geoblox forms, each student will color the stratigraphic units, identify and color in the oil field and label the type of trap formed, using their notes from the lecture.

Closing: using the blocks go over the types of traps for the Kern River Field.