

Uranium Mining for Nuclear Energy



Mrs. Bentley's excellent adventure into
The Nuclear ZONE!! Wyoming, Summer
of 2011

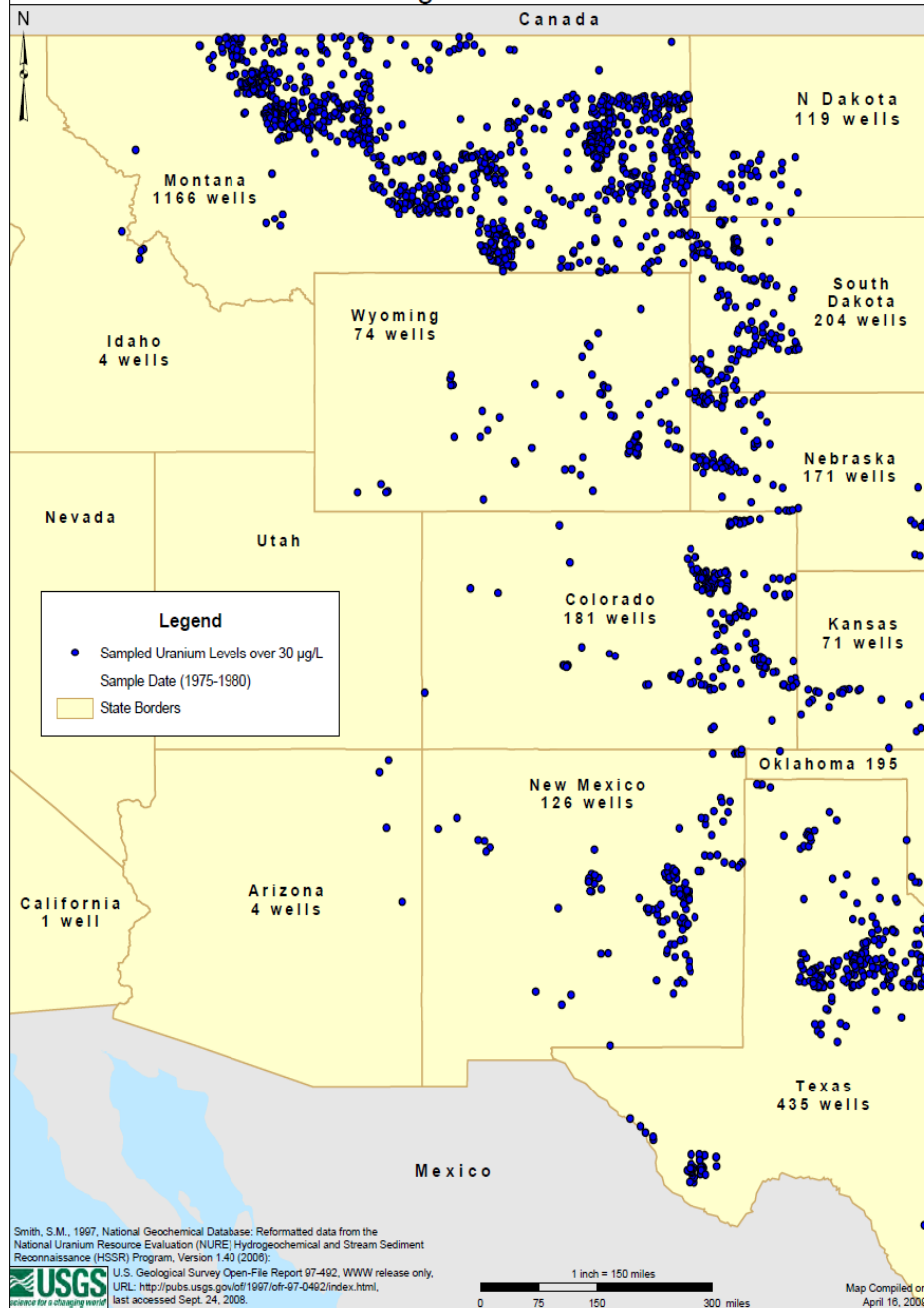
Please use this power-point to get some
basic information on the Geology, Mining
practices and uses of Uranium for
Nuclear Energy

Uranium

- 1 pellet of Uranium can provide as much energy as:
 - 149 Gallons of Oil or One TON of Coal
 - Or 17,000 Cubic Feet of Natural Gas
- 5 Uranium fuel pellets can meet a household's electricity needs for a year

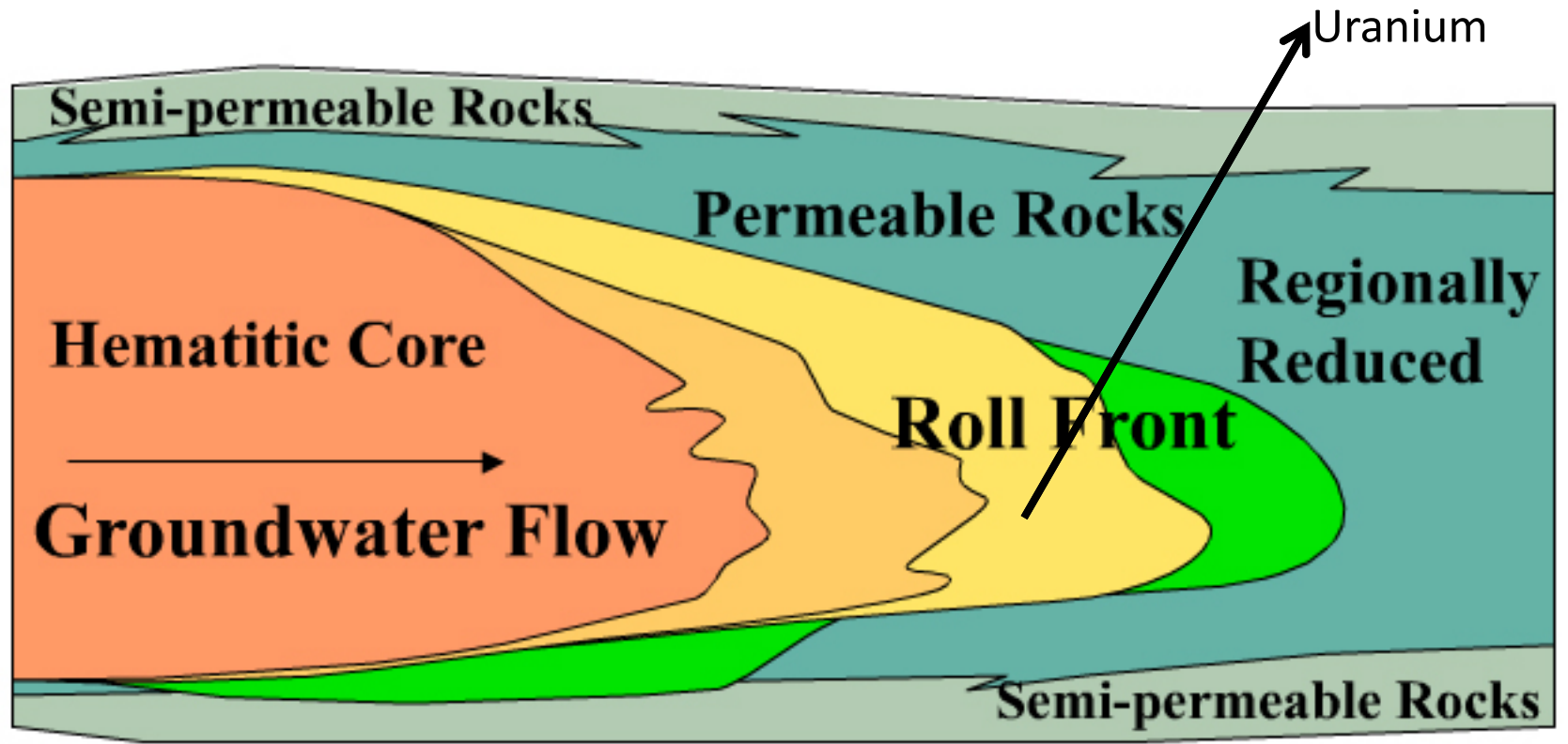


Historic Water Wells Showing Uranium Above the EPA Standard



Uranium is found in groundwater
deposits in special geologic
formations called....

“Roll Front” Formations



Hematitic Core	Alteration Envelope	Ore-Stage Uranium	Ore-Stage Pyrite	Reduced Sandstone
Hematite Magnetite	Siderite Sulfur-S ⁰ Ferroselite Goethite	Uraninite Pyrite FeS Selenium Ilsmannite	Molybdenite Pyrite Jordisite Calcite	Pyrite Jordisite Calcite

“Roll Front” Formations



One place Uranium will be mined is in the Gas Hills of Wyoming



Wind River Basin

...by Strathmore Resources: They have a permit out for an open pit mine to be opened by 2014 or 2015 in the Gas Hills



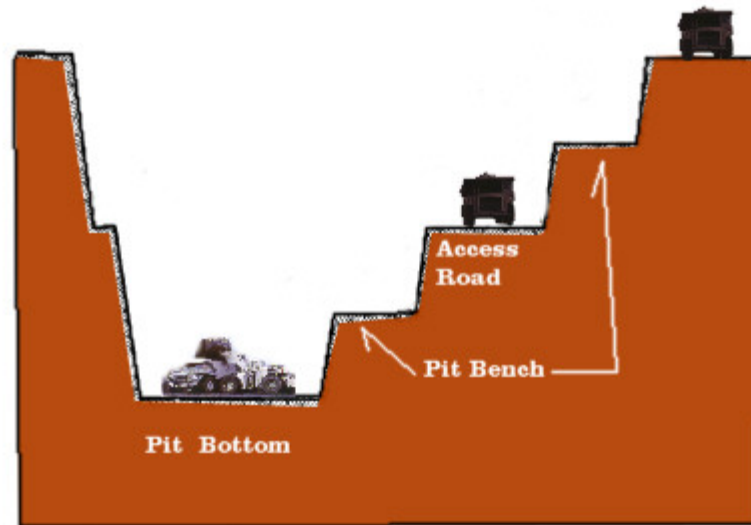
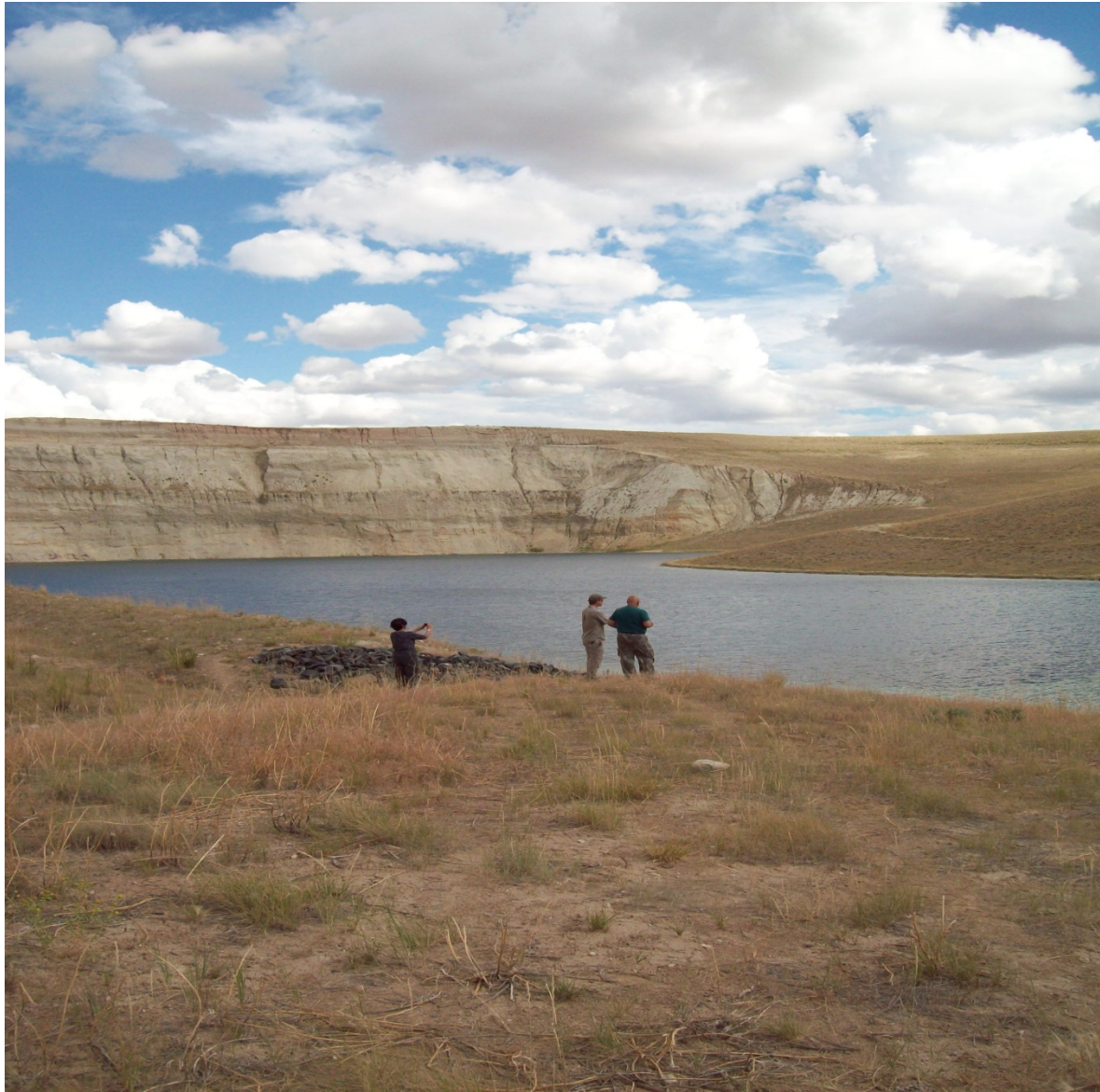


Fig. 1

An Open Pit Mine is pretty much an open pit where they have dug for the mineral(s) they are mining.



The Day Loma Open Pit Mine in the Gas Hills:

In this high wall
there are at least 3
Uranium rich
Zones.



Reclamation: Returning the land around your mine back to the way it was naturally

Natural
Landscape



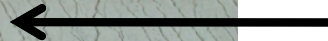
In order to reclaim the land, they use planes to map the geomorphology of the landscape. Once they determine what slope and direction to create the hills of “tailings” (Unused soil that is left over from mining) they will go in and re-plant the landscape



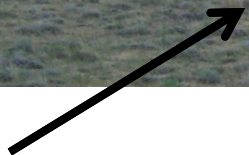
Reclaimed land



Eroding Road



Natural landscape



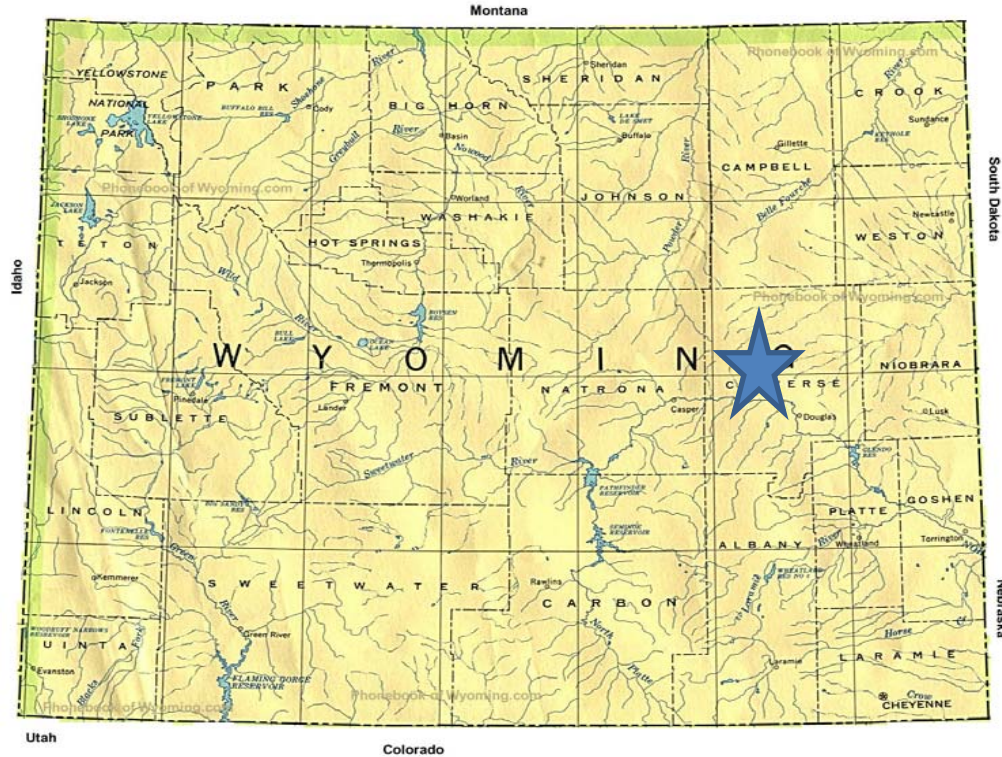
Teachers
For Scale 😊



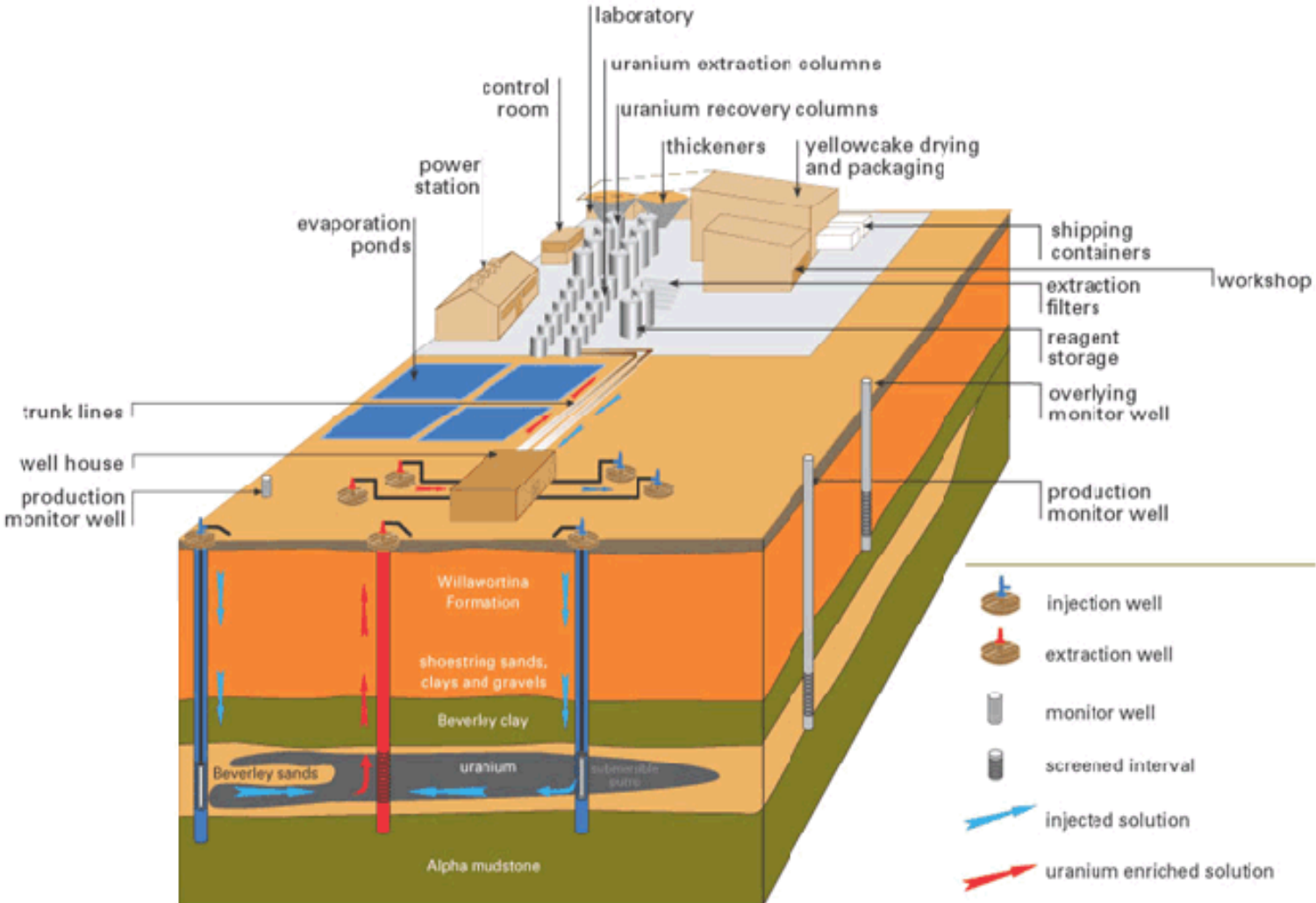
Eroding road



Another way to mine Uranium is by using In-Situ Mining Practices: A company called Cameco operates a mine called Smith Ranch-Highland (the largest uranium production facility in the United States.) Near Glenrock, Wyoming



In Situ-Mining: They pump oxygenated water into the uranium rich sands below and then they pull out the water with recovered uranium into a different well before they start the recovery process





Pipes to inject water and recover uranium rich water are placed 3.5 feet below the surface



Once the piping is put down, oxygenated water will be injected into the sand below to recover the Uranium.



This is an injection well with oxygen tank behind it.



This is a production well



The injection wells eventually get piped into these large containers where different solutions are added until the Uranium can be separated out by itself . The process basically “Washes” away the Uranium from various solutions



This miner has samples from all the different stages of production in the Uranium mine. Moves from left to right.

The dried yellowcake is the final product from this mine. It will be shipped to a refinery where they will make pellets out of it. Yellowcake sells for \$52/pound



For more information on mining techniques, and Nuclear Energy check out these Websites:

www.mine-engineer.com

www.nei.org

www.wma-life.org