



U. S. Department of the Interior
Bureau of Land Management

Oil Shale and Tar Sand Resources

Resources vs. Reserves

- Resources
 - Naturally occurring concentrations or deposits of a mineral resource in the earth's crust, in such forms and amounts that economic extraction is currently or potentially feasible
- Reserves
 - Parts of the resource base which could be economically extracted or produced at the time of determination considering environmental, legal, and technologic constraints

Oil Shale

- Definition: fine-grained sedimentary rocks containing relatively large amounts of organic matter from which significant amounts of shale oil and combustible gas can be extracted by destructive distillation.
- Generally considered to be oil and gas “source material” or an immature oil and gas deposit

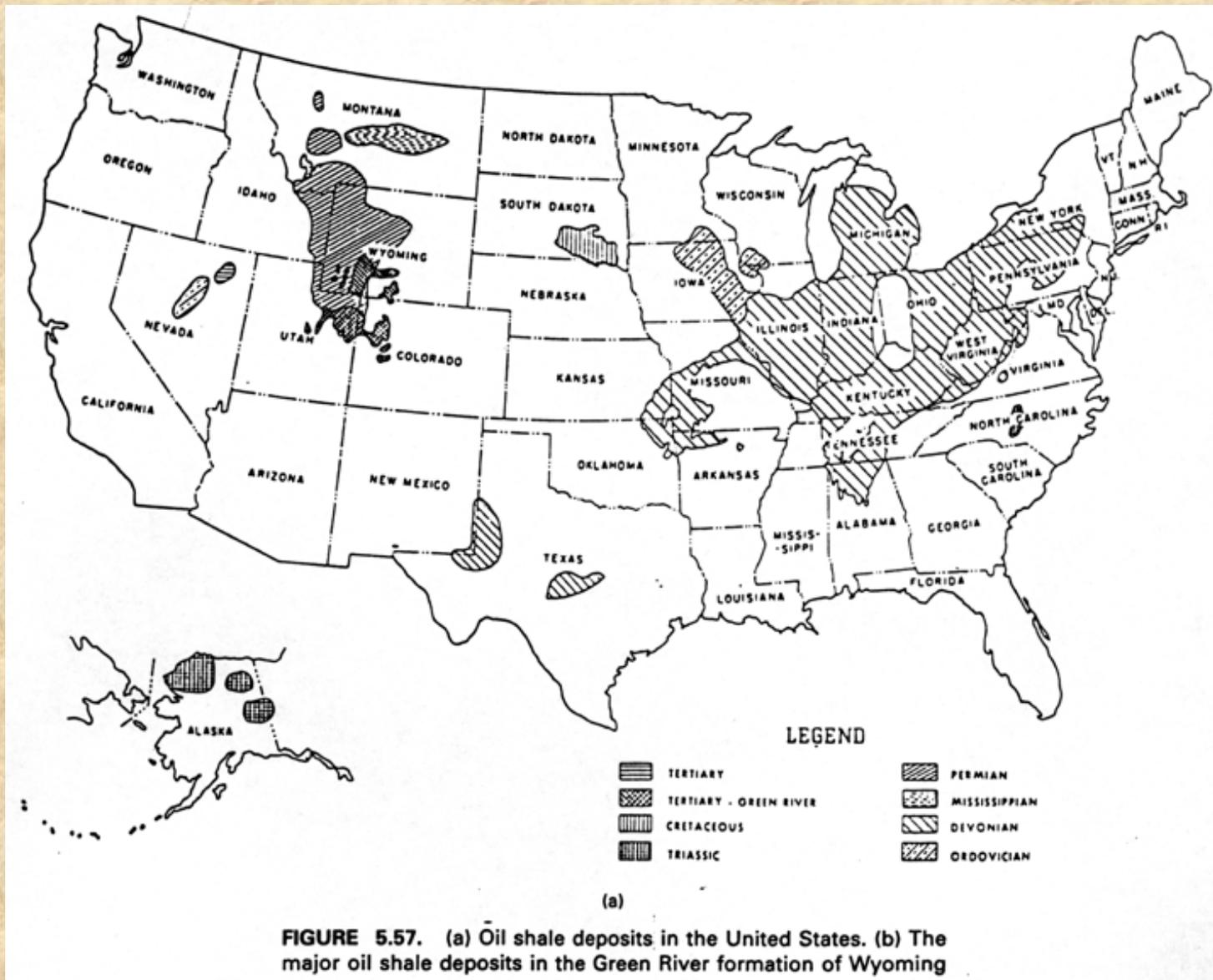
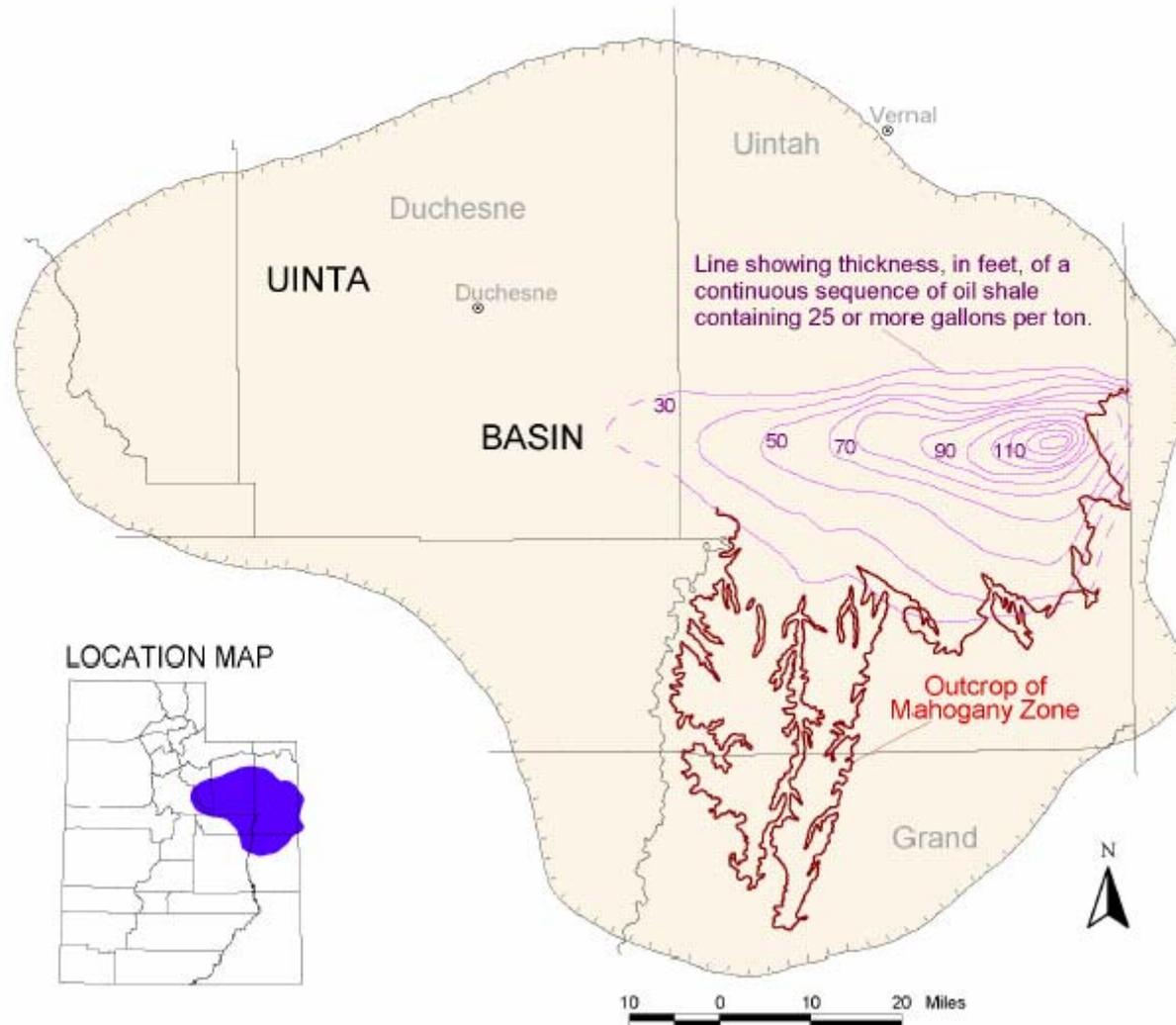


FIGURE 5.57. (a) Oil shale deposits in the United States. (b) The major oil shale deposits in the Green River formation of Wyoming

GEOLOGY OF THE MAHOGANY OIL SHALE ZONE, UINTA BASIN





Oil Shale Resources

- U.S. Primary Resources in Green River Formation in Wyoming, Utah, and Colorado
- Green River Formation estimated to contain over 2 trillion barrels of oil
- Equivalent to 1 to 2 times total world oil reserves

Impediments to Oil Shale Development

- Economic
 - Current Costs > \$60 per barrel
- Environmental
 - Global warming and greenhouse gas emissions
 - Disposal of spent shale
 - Process requires water
- Regulatory
 - U.S. presently has no regulations to lease oil shale

Tar Sands

- Definition: A type of oil sand or sandstone from which the lighter fractions of crude oil have escaped, leaving a residual asphalt to fill the interstices



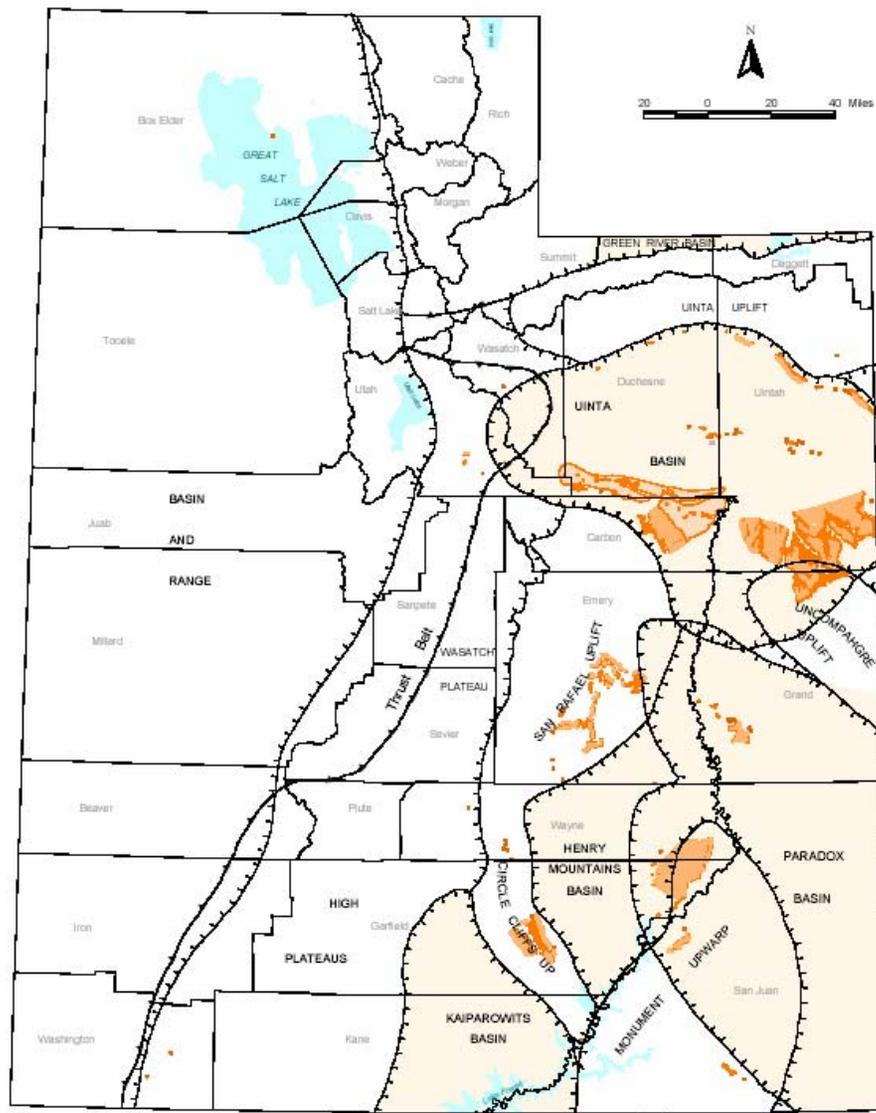
Tertiary
Duchesne River

Cretaceous
Mesa Verde

angular
unconformity

tar sand

LOCATION OF UTAH'S TAR SAND DEPOSITS



Utah Tar Sand

Estimated In-Place Resources

Deposit	Known (MMB)	Additional Projected (MMB)
Sunnyside	4,400	1,700
Tar Sand Triangle	2,500	420
PR Spring	2,140	2,230
Asphalt Ridge	820	310
Circle Cliffs	590	1,140
Other	1,410	1,530
Total:	11,860	7,330

Impediments to Tar Sand Development

- Economics – cost to mine and produce more expensive than conventional oil production
- Some of same environmental concerns as oil shale
- Federal deposits previously leased with oil and gas as Combined Hydrocarbon Leases