



# Availability of Tar Sands on Public Lands: An Overview

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September 21, 2006

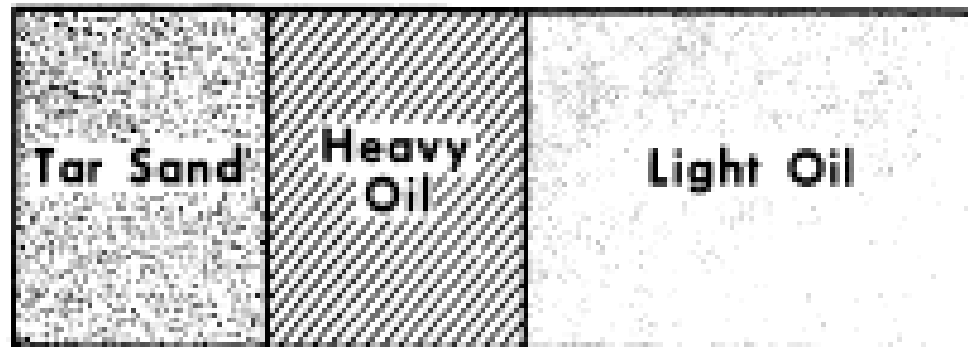
# Presentation Summary

- Provide an overview of Utah Tar Sand Resources
- Provide historical summary Tar Sand Leasing on Federal Lands
  - Early leasing efforts - 1960
  - Combined Hydrocarbon Leasing – 1981
  - Energy Policy Act of 2005
- Outline current leasing process

# What are Tar Sands?

- Fossil oil reservoirs where the lighter, more volatile fractions have been removed due to exposure
- "Tar sands" means any consolidated or unconsolidated rock (other than coal, oil shale, or gilsonite) that
  - contains a hydrocarbonaceous material with a gas-free viscosity, at original reservoir temperature, greater than 10,000 centipoise; or
  - contains a hydrocarbonaceous material and is produced by mining or quarrying.
- For federal leasing purposes – restricted to designated tar sand areas in Utah

Viscosity (cP)	$>10^6$	10,000	100	1-
°API	0°	10°	20°	45°



Original Resource In Place (Billion bbl )	~60	~100	~400
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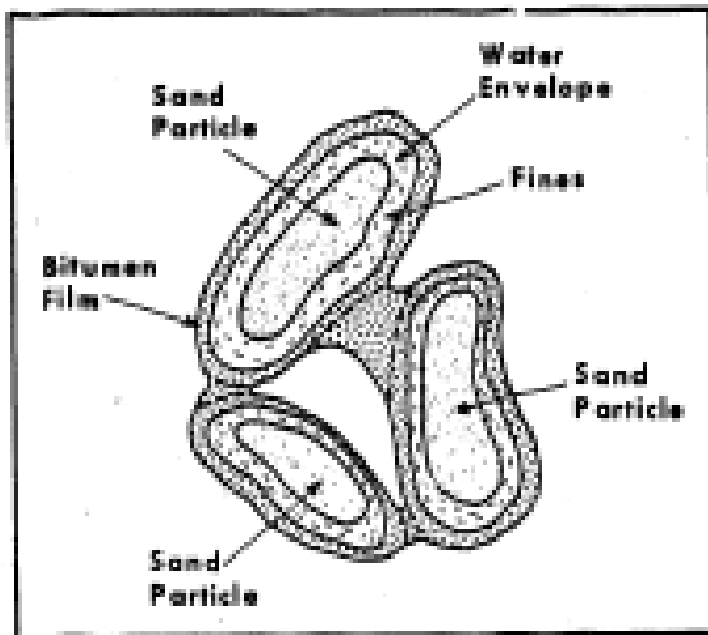
**Figure 1. Definition of Tar Sand Compared to Heavy and Light Oils**

Source: DOE, 1990

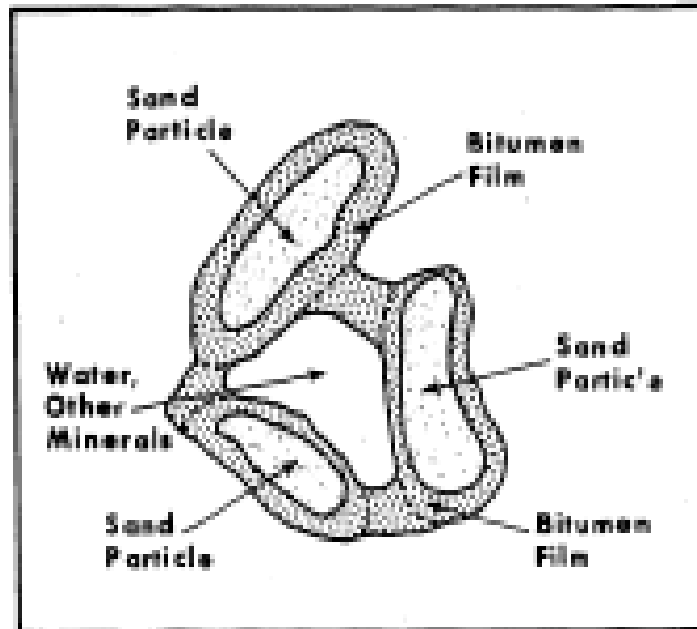


# Utah Tar Sands vs. Canadian Tar Sands

- Utah tar sands generally in consolidated rocks
- Utah tar sands considered to be hydrocarbon wetted vs. water wetted in Canada



CANADIAN

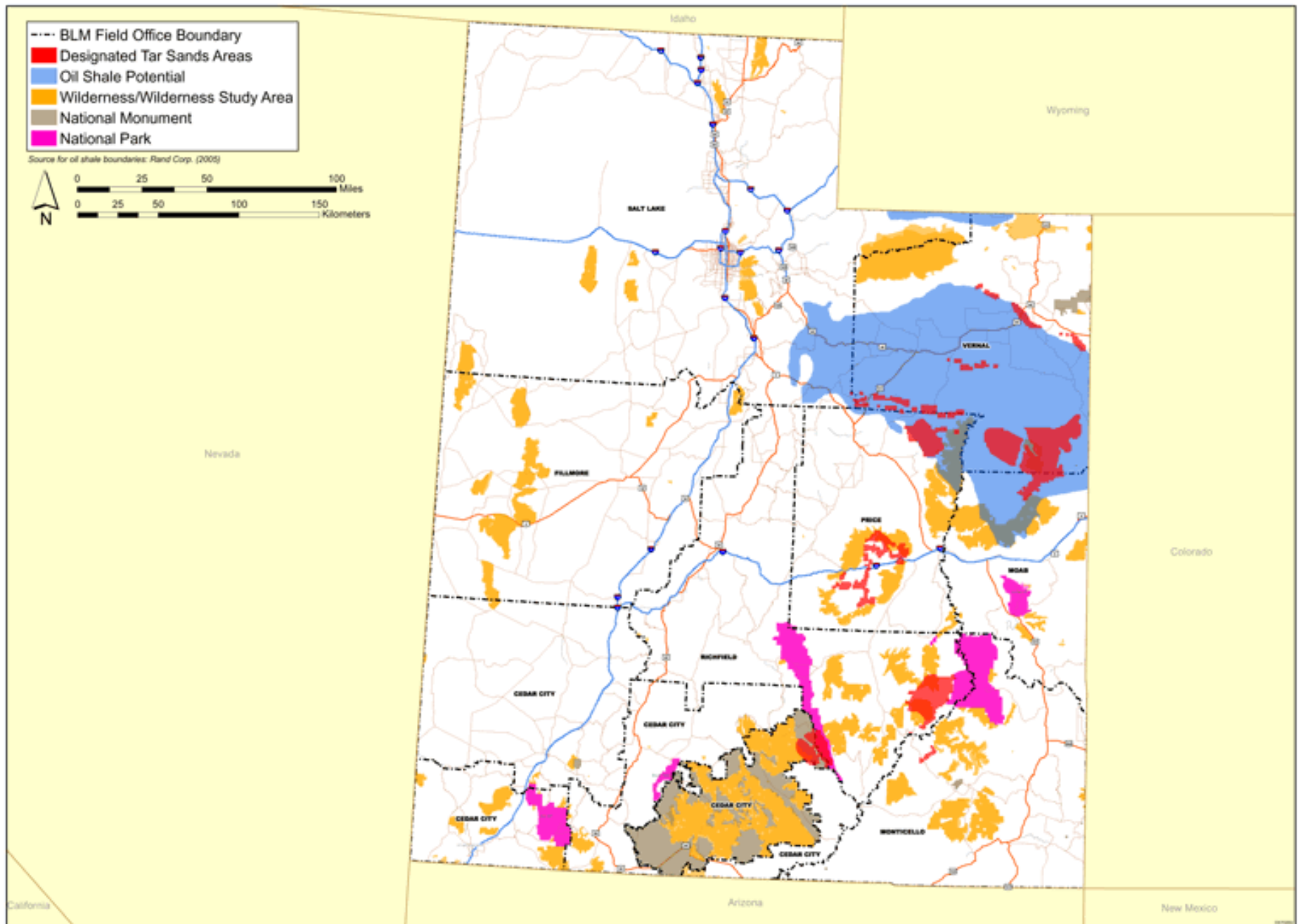


U.S. DOMESTIC

Figure 5. Comparison of U.S. to Canadian Tar Sand

Source: DOE, 1990

# Oil Shale & Tar Sand Deposits in Utah



# In-Place Resources Major Tar Sand Areas

(Million Barrels) (Source: IOCC, 1984)

Tar Sand Area	Measured	Speculative
PR Spring	2,140	2,230
Hill Creek	320	560
Sunnyside	4,400	1,700
Whiterocks	60	60
Asphalt Ridge	830	310
Tar Sand Triangle	2,500	420
Circle Cliffs	590	1,140
San Rafael Swell	300	250
Total	11,140	6,670

# Land Ownership in Major Tar Sand Areas

Tar Sand Area	Total Acres	Federal Acres	% Federal
PR Spring	274,560	196,480	71.6%
Hill Creek	106,640	32,256	30.2%
Sunnyside	107,856	83,872	77.8%
Asphalt Ridge/ Whiterocks	36,536	7,040	19.3%
Tar Sand Triangle	160,280	143,000	89.2%
Circle Cliffs	94,320	94,320	100%
San Rafael Swell	130,536	114,536	87.7%
Total	910,728	671,504	73.7%

# History of Tar Sand Leasing on Federal Lands

- Pre-1960
  - No special provisions for tar sands
- Public Law 86-705 (1960)
  - Amended section 21 of MLA to authorize leases for tar sands
  - Created conflicts with conventional oil resulting in a leasing moratorium in 1965
- Combined Hydrocarbons Act (1981)
- Energy Policy Act (2005)

# Combined Hydrocarbon Act of 1981

- Removed reference to tar sand in MLA section 21
- Defined oil as including all non-gaseous hydrocarbons except coal, oil shale, and gilsonite
- Required combined hydrocarbon leases (CHL) in designated special tar sand areas in Utah with special considerations for tar sand
- Allowed existing oil and gas leases in tar sand areas to be converted to CHL

# Combined Hydrocarbon Act Implementation

- Regulations promulgated at 43 CFR 3140
- Completed programmatic EIS on combined hydrocarbon leasing
- Started processing CHL conversion applications
  - Completed EIS on Sunnyside and PR Springs
  - Conversion leases still outstanding for about 130,000 acres
- Held CHL sale in 1995

# Energy Policy Act of 2005

- Section 350
  - Provided for separate leases for tar sands and conventional oil and gas
- Section 369
  - Declared tar sands to be a strategically important resource
  - Tar sand development should be environmentally sound manner to minimize impacts
  - Development should occur with emphasis on sustainability
  - Directed Interior to prepare a programmatic EIS for leasing within 18 months

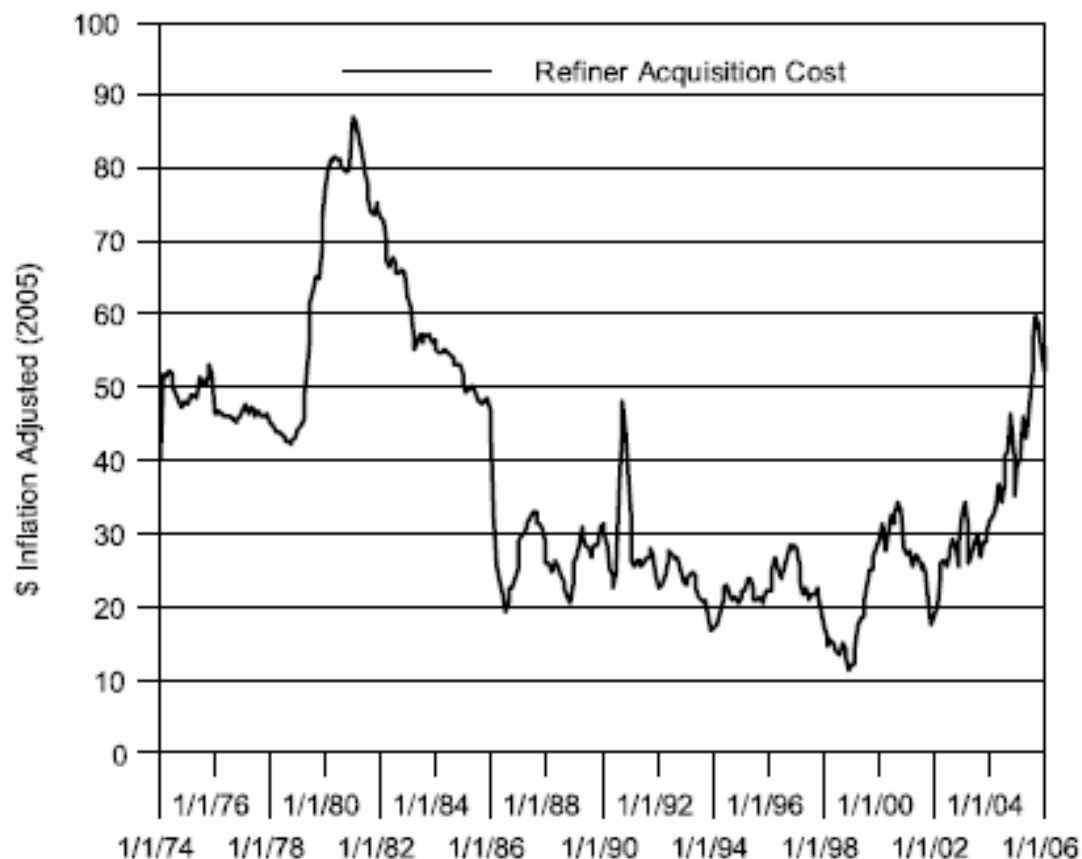
# Process for Federal Tar Sand Leases

- CHL's can be initiated by BLM or in response to expressions of interest or nominations
  - Leasing will require conformance with land use plan and compliance with NEPA
  - Leasing is competitive with sealed bid
  - Lands can be explored before leasing with and exploration license
- Separate tar sand leases not available until after PEIS is completed

# Challenges for Tar Sand Development

- Mining and Surface Processing
  - Material handling
  - Waste disposal
    - Sand
    - Chemicals or solvents used in the process
  - Water availability
- In situ
  - Potential groundwater contamination
  - Maximizing resource recovery
- Common to all
  - Water and air quality
  - Socioeconomic impacts
  - Some STSA's in environmentally sensitive areas

**Figure 2. Refiner Acquisition Cost of Imported Crude Oil**



**Source:** U.S. DOE EIA, *World Oil Market and Oil Price Chronologies 1970-2004*, Mar. 2005, at [<http://www.eia.doe.gov/cabs/chron.html>]; EIA Refiner Acquisition Cost of Crude Oil (for July 2005 to Jan. 2006), at [[http://tonto.eia.doe.gov/dnav/pet/pet\\_pri\\_rac2\\_dcu\\_nus\\_m.htm](http://tonto.eia.doe.gov/dnav/pet/pet_pri_rac2_dcu_nus_m.htm)].