

# Colorado Geological Survey

## -Uranium in Colorado and the World

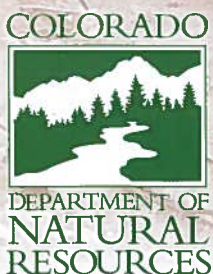
After years of absence from the news, uranium is again a topic of conversation among prospectors, miners, policy-makers, and power companies. As companies and policy-makers look around for reliable sources of baseload power that will generate when the sun isn't shining and the wind isn't blowing but will do so without releasing carbon dioxide, they are increasingly turning to nuclear power and its fuel – uranium. While oil gets the attention, the consumption of oil in this country has increased only 15% since the oil embargo of 1973. During the same period, electricity use is up 115% and electricity derived from nuclear power has increased 900%. The U.S. is the largest producer of nuclear power in the world. Twenty percent of our power comes from nuclear plants. We consume more than 50 tons of uranium annually for power generation but must import 90 % of that.

Around the world, demand for electric power is soaring in developing economies. Nuclear power now provides 15 percent of the world's electricity. According to the World Nuclear Association, 439 nuclear reactors are currently operating around the world; 36 are under construction; 93 are planned; and 218 more are proposed. That means that the worldwide demand for uranium will nearly double. After years of low uranium prices, the recognition of the world's growing demand for power caused the price of the metal to spike at \$135 per pound after years below \$10 per pound. That once again raises the potential that uranium can be profitably mined.

Colorado is where uranium was first discovered in the U.S. This heaviest of all elements was produced from mines in southwest Colorado since the 1880s. The state experienced several "rushes" for uranium and the metal that typically accompanies it – vanadium. In the early 1900s, uranium demand was driven by demand for radium, an extremely rare element accompanying uranium. In the period around the First World War, the principal demand was for vanadium, used for hardening steel. A third wave of uranium production was brought about by the nuclear era, lasting until nuclear power fell out of favor in this country in the mid-1980s. Now we have entered another phase.

Colorado is estimated to contain the third largest uranium reserves in the U.S., behind Wyoming and New Mexico. Most of the deposits are located in the Uravan District (for URanium + VANadium) in portions of Mesa, Montrose, and San Miguel Counties, but the state overall is rich in uranium. Properties are currently being investigated in a dozen or more counties. More than 20,000 claims have been filed on federal land since 2005, most of them for uranium.

If a company wants to begin mining, they must obtain permits from the Colorado Department of Public Health and Environment (CDPHE) and the Colorado Division of Reclamation, Mining and Safety (DRMS). Before those permits can be finalized, a list of other permit items must be satisfied, including county special use permits, a federal plan of operation and an environmental assessment (EA), Department of Transportation permit, air quality permit, storm water control permit, water discharge permit if applicable, a permit from the federal Mine Safety and Health Administration (MSHA), an explosives permit, and a spill prevention control and countermeasures plan (SPCC plan) as per 40 CFR part 112. Water rights and sewage disposal regulations must also be satisfied.

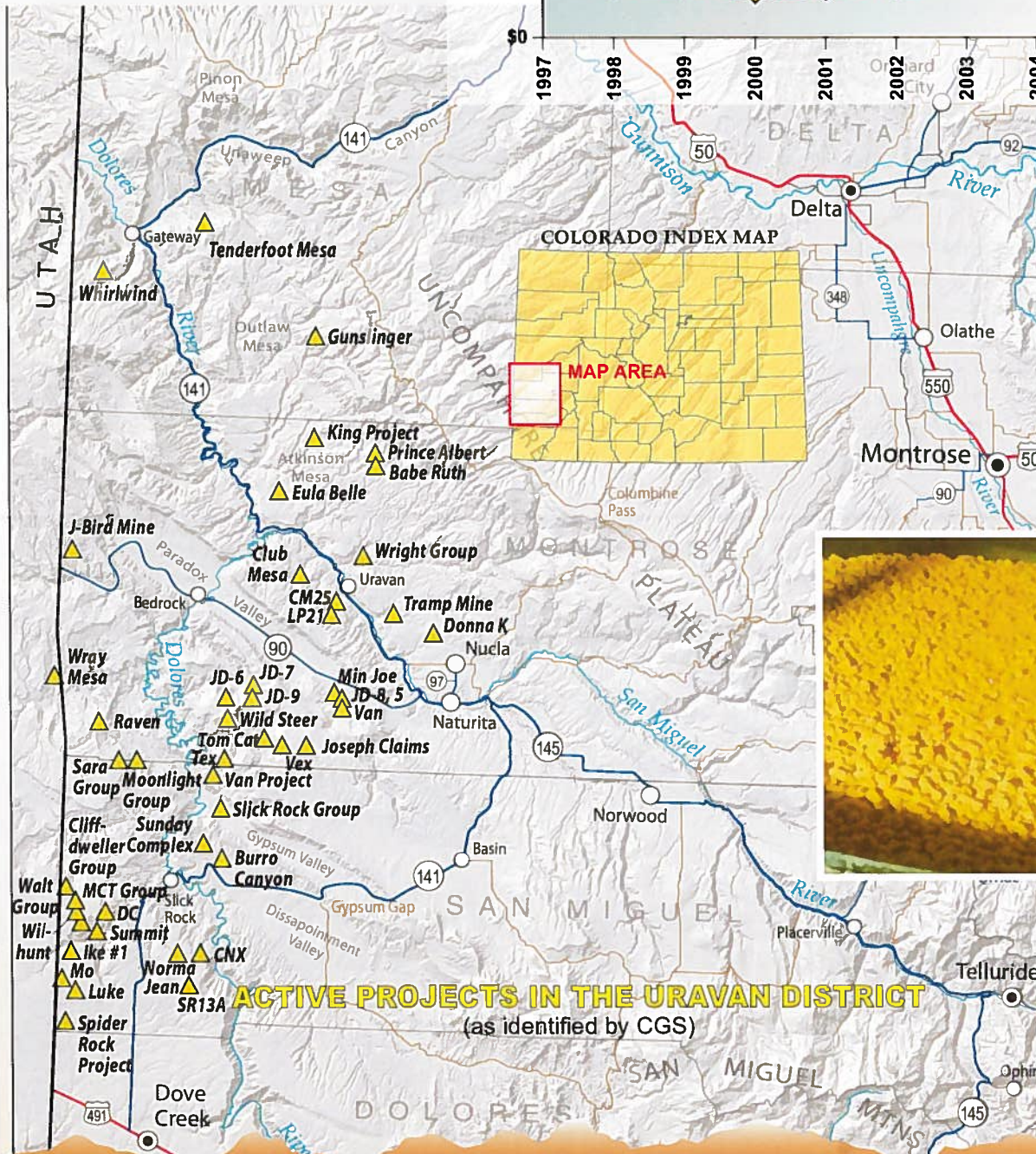
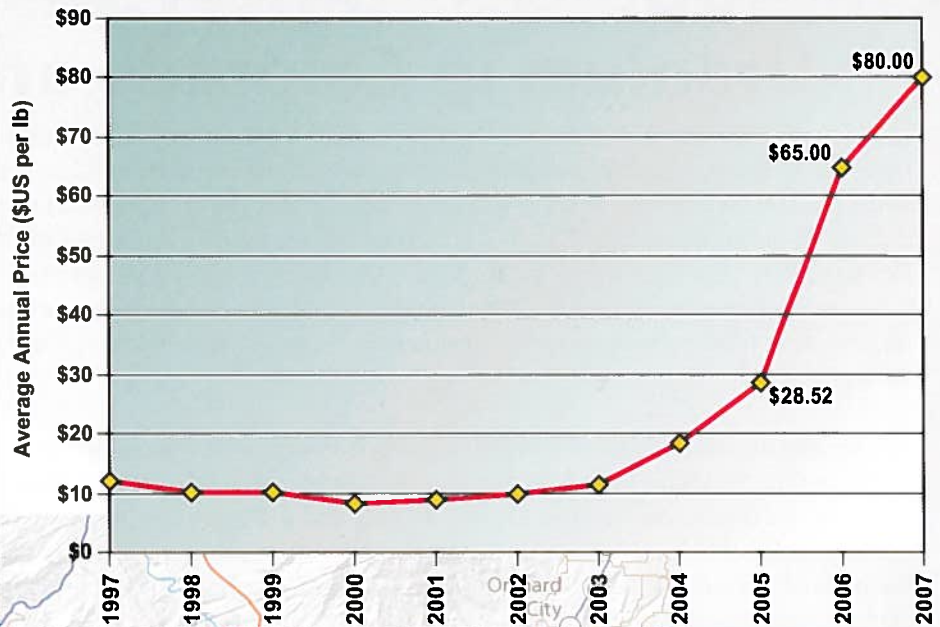


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# Uranium in Colorado

The price of uranium was revived in 2004 by the anticipation of a growing demand because of plans by nations around the world to build new nuclear power generating capacity, the loss of the single largest mine in the world for an indefinite period of time, and the pending end of the treaty by which Russian nuclear warheads are dismantled with their uranium content being converted to nuclear fuel rods. The price actually hit a peak of \$135 per pound in the spring of 2006, but has since settled into a range between \$75 and \$85 per pound.

## Uranium Price from 1997-2007



Uranium ore arrives at the mill containing less than 1 percent uranium. Through the milling process, yellowcake is produced – a powder consisting of approximately 90%  $U_3O_8$  with about 0.3% of the fissionable isotope U-235.



The yellowcake is then shipped to a plant where the concentration of U-235 is raised to about 4% for use in fuel rods for nuclear power plants.

