



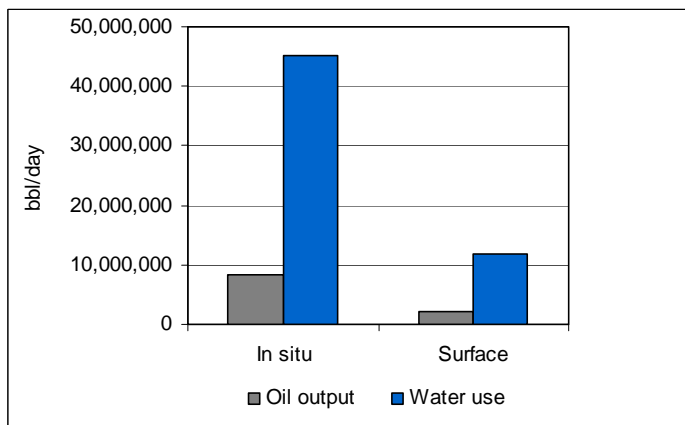
THE
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Oil Shale Fact Sheet

Water Consumption and Pollution

“Colorado is very mindful of the potential impacts of oil shale development on Colorado’s water resources...If oil shale were to consume vast quantities of water, there would be corresponding impacts to the State’s agricultural, recreational, and other energy sectors...Hence, the State is very concerned that the water implications of this industry be understood prior to decisions regarding commercialization.”—Bill Ritter, Governor of Colorado¹

- Extracting, producing, and refining oil shale requires more water than the region has available.** Tremendous amounts of water are needed for every step of oil shale production, including mining and handling, electricity generation, retorting, and refining. Water requirements for such activities vary widely according to location and technology, but as seen in the chart below, the water usage for oil shale production far outstrips the amount of oil produced during both in situ and surface oil shale development—and this does not even include the water needed to refine shale oil into useable products.



Ratio of daily oil output to water used.

(Based on assumptions and calculations for Colorado, BLM Programmatic Environmental Impact Statement, page 4-41)

- The available water for oil shale production will continue to decline, adding further pressures to an already arid and stressed region.** In the upper Colorado River basin, where most oil shale sites are found, water is a coveted resource, yet the amount available for consumptive use is projected to dwindle in the coming decades. In Utah, the remaining available Colorado River water for the state’s use could decline from 396,000 acre-feet/year in 2000 to 193,000 acre-feet/year in 2050, meaning that water requirements for an individual oil shale development project could climb from as low as the current 1.3% of available water to up to 18% in 2050.² Moreover climate change is

¹ In comments Draft Oil Shale and Tar Sands Resource Management Plan Amendments to Address Land Use Allocations in Colorado, Utah, and Wyoming and Programmatic Environmental Impact Statement.

² Final Programmatic Environmental Impact Statement page 4-46, http://ostseis.anl.gov/documents/fpeis/volumes/OSTS_FPEIS_Vol_1.pdf.

likely to reduce water resources in the Colorado River basin in the coming century.³ The additional use of large amounts of water would likely have an effect on interstate water agreements such as the Colorado River Compacts.⁴ Unfortunately, the Programmatic Environmental Impact Statement (PEIS) does not explain how new oil shale developments would address these growing water supply problems, and so conflicts with agricultural, municipal, recreational, or users may ensue.

- Surface heating of mined shale ore yields significant toxic byproducts and hazardous waste.** The primary concern for water quality in surface mining is the material remaining after the shale has been processed. This spent rock is either left on the surface or placed back into the mine. In both cases, salts and toxic materials can remain in the liquid that drains from the mine, risking contamination of surrounding surface and groundwater.⁵ Hazardous wastes are also expected from oil shale development, such as coal combustion waste, contaminated water, and sludge with heavy metals.⁶ While adverse impacts on water supplies can be minimized with proper safety measures, the PEIS notes, “[G]iven the relative newness of oil shale development technologies, identification of such waste elimination and waste recycling opportunities may not result until substantial volumes of field experiences are assembled.”⁷
- Heating oil shale in the ground threatens to contaminate groundwater supplies.** Shale extraction through in situ development risks leaching of toxic by-products such as mineral salts and trace metals into the surrounding groundwater.⁸ Extracting the shale also leaches salt into an area where salinity is already a problem. High salt concentrations in groundwater restrict water to plants, which is particularly harmful to agriculture. In the Colorado River Basin, where most oil shale development will occur, damages from salinity are already between \$500 to \$750 million per year.⁹ This price tag could grow if shale drilling is permitted with existing technology.
- Commercialization of oil shale will affect communities and species in as of yet unknown ways.** The government and companies experimenting in oil shale development have yet to quantify exactly how increased water usage would affect neighboring ecosystems and areas. According to one group, “It’s not clear that the PDEIS fully estimates water demands stemming from secondary water needs, i.e. municipal and electrical power, and more importantly, it does not consider water needs, both primary and secondary, stemming from other energy development.”¹⁰ Additionally, significantly increased water usage would affect endangered fish species, which rely on specified flow levels in order to survive. Says one researcher: “Oil shale...development, were it to occur on even a modest scale, would seriously undermine the past successes and future potential of recovery efforts. The most important basins for the native fish are the very ones on which BLM leasing alternatives have painted bulls-eyes.”¹¹

³ See McCabe and Wollock USGS report: http://water.usgs.gov/nrp/proj/bib/Publications/2007/mccabe_wollock_2007.pdf

⁴ See public comments on Draft PEIS from Colorado Governor Bill Ritter.

⁵ Argonne National Laboratory, page 15, http://www.ead.anl.gov/pub/doc/ANL-EVS-R06-9_oil_shale_report.pdf

⁶ Final Programmatic Impact Statement page 4-169.

⁷ Final Programmatic Environmental Impact Statement page 4-176.

⁸ RAND, page 20, http://www.rand.org/pubs/monographs/2005/RAND_MG414.pdf

⁹ Bureau of Reclamation, Colorado River Basin Salinity Control Program, <http://www.usbr.gov/dataweb/html/crwq.html>

¹⁰ Comments of the Colorado River Water Conservation District. Draft Oil Shale and Tar Sands Programmatic Draft Environmental Impact Statement. February 27, 2008. See <http://ostseis.anl.gov/involve/draftcomments/index.cfm>.

¹¹ See public comments of Daniel F. Luecke on draft PEIS.