

Title:

ExxonMobil's Approach to In Situ Co-Development of Oil Shale and Nahcolite

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Nahcolite, a natural form of baking soda or sodium bicarbonate, is particularly abundant in the Green River Formation in the central portion of the Piceance Basin. It occurs as nodules, beds, and finely disseminated crystals within and among some of the thickest, richest oil shale units in the world. Portions of the basin with particularly high nahcolite content have been designated as a multi-mineral area by the federal government, to ensure that production of either oil shale or the sodium minerals does not prevent future production of the other.

ExxonMobil has developed methodologies for in situ conversion of oil shale in nahcolite-rich areas that preserve the value of the sodium minerals and can significantly enhance their recovery. These methods focus on initial conversion of the oil shale followed by sodium mineral production. ExxonMobil's process converts most of the nahcolite to sodium carbonate during conversion of the oil shale. Sodium mineral value is preserved because sodium carbonate is a valuable commodity which, if required, can be readily converted to sodium bicarbonate. Oil shale conversion may significantly enhance permeability. The permeability created by pyrolysis of the oil shale should enhance leaching and removal of sodium carbonate during solution mining, thereby improving recovery efficiency. Sodium mineral recovery could also be performed during reclamation of the converted oil shale. Such synergies improve oil shale economics via the additional revenue created by sodium mineral recovery.

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