RE-Powering America's Land:
Siting Renewable Energy on Potentially Contaminated Land and Mine Sites

New Rifle Uranium Mill Tailings Radiation Control Act Title I Site, Colorado

Solar to Power the Rifle Regional Wastewater Reclamation Facility at Former Uranium Processing Site

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EPA is encouraging the development of renewable energy facilities on potentially contaminated land and mine sites. This series of stories highlights successful projects and the benefits of siting renewable energy facilities on potentially contaminated land and mine sites.

Site Description

The New Rifle Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I site is located approximately two miles southwest of the City of Rifle, Colorado. The Colorado River defines its southern boundary. The site is the chosen location of Rifle's proposed Energy Innovation Center—an innovative industrial cluster that will promote bio-based industry development and pioneering energy technologies and provide quality, reliable and clean power sources to the community and local industry. The first installation of clean energy technology on this site is a 12-acre, 1.7 megawatt (MW) zero-emission solar energy system to power Rifle's new $23.2 million Regional Wastewater Reclamation Facility, which is also located on the site.

Property History

The New Rifle mill, owned and operated by Union Carbide Corporation (UCC), produced uranium and vanadium concentrates, processed tailings and uranium ore and refined upgrade products from 1958 to 1970. Uranium produced during this time was sold to the Atomic Energy Commission (AEC), while all of the mill's vanadium production was delivered to the commercial market. During that period, the mill averaged 400 tons of ore per day (TPD) throughput and treated a total of 1.8 million tons of ore. At the termination of UCC's last AEC-procurement contract (December 1970), there were about 2.5 million tons of radioactive tailings impounded at the New Rifle Mill site. The mill continued to produce uranium during 1971 and 1972 for the commercial market, and part of the mill was used to produce vanadium concentrate from 1973 to 1984.

From years of milling operations, the site became contaminated with radioactive tailings, and the ground water with arsenic, molybdenum, nitrate, selenium, uranium and vanadium. In 1978, Congress passed UMTRCA that required the cleanup of 24 inactive uranium ore processing sites, including the New Rifle site by the U.S. Department of Energy (DOE). The site under UMTRCA was purchased for cleanup by the state, while DOE performed the cleanup of surface and ground water contamination at the site. Encapsulation of radioactive materials in U.S. Nuclear Regulatory Commission-approved disposal cells began in spring 1992 and was completed in October 1996. The site's ground water contamination is being treated by natural flushing in conjunction with institutional controls and monitoring. The State of Colorado transferred ownership of the site to the City of Rifle, Colorado in 2004.

QUICK FACTS:

Location:	EPA Region 8, Garfield County, CO
Property Size:	130 acres
Site Ownership:	City of Rifle, CO
Former Use:	Uranium and vanadium processing site
Contaminants:	Arsenic, molybdenum, nitrate, selenium, uranium, and vanadium
Project Type:	DOE Uranium Mine Tailings Remediation Control Act (UMTRCA)
Type of RE:	Solar PV
Key Partners:	U.S. Department of Energy Office of Legacy Management, State of Colorado Department of Public Health and Environment, Garfield County, CO, SunEdison
Current Status:	Under construction, 2009 completion (1.7 MW Solar PV system)

PROJECT HIGHLIGHTS:

- 12-acre, combined 2.3 MW solar PV systems power drinking water and wastewater treatment facilities, reducing greenhouse gas emissions by 76,000 tons each year.
- Project financed, installed and maintained by SunEdison at no cost to the City of Rifle.
- City of Rifle entered into an agreement to purchase electricity from SunEdison for the next 20 years at a fixed rate below what the city currently pays for conventionally produced electricity.
- Rifle's taxpayers saved approximately $2 million by siting the project on contaminated land already owned by the city.
- Energy Innovation Center adjacent to the site will help create green jobs for local residents, foster entrepreneurial opportunity, and guide land use decisions in the area to be sustainable, innovative, and technology-driven.

Renewable Energy Development

The City of Rifle began construction of its new wastewater reclamation facility on the UMTRCA Title I site in December 2008. SunEdison, LLC began installation of a 1.72 MW Direct Current (DC) solar photovoltaic (PV) system on 12 acres of the site in December 2008. The system will provide 60% of the daytime power needed to operate Rifle's wastewater reclamation facility. On a nearby site, SunEdison installed a 0.60 MW DC PV solar system that provides 100% of the power needed to pump drinking water for local residents from the Colorado River. During their first complete year of operation, these two systems will produce more than 4 million kilowatt hours (kWh) of clean solar energy, and more than 75 million kWh over 20 years—enough energy to power 7,039 homes for a year. Over the first 20 years of generation, the two zero-emission systems will replace the more than 76,000 tons of carbon dioxide that would have been emitted by electricity production from fossil fuels. In addition to solar energy, a geothermal system will heat and cool the wastewater facility's administration building, and premium efficiency motors will power the facility's pumping system.

SunEdison will sell power generated at the site to the City of Rifle at a reduced rate under a 20-year power purchase agreement. In return, SunEdison will retain the solar renewable energy certificates (RECs) from power generated at the site. These credits will help Colorado to meet its Renewable Portfolio Standard (RPS), which requires that 20% of all energy generated in the state come from renewable sources by 2020, including 0.4% from solar.

In addition to the PV solar project, and at the core of Rifle's Energy Innovation Center, is the development of a bio-based industry cluster—a collection of individual pads for private, bio-based companies that can utilize renewable bio-based materials such as carbohydrates to produce products and energy, helping to make Rifle a center for energy and bio-processing and production. These pads will all be connected as part of a large power grid, and will be able to either utilize or supply electricity, steam heat, cooled water or natural gas to other users on the site or onto the external power grid. The Rifle Energy Innovation Center also will include a bio-based research and visitor center, an energy feedstock storage area and gathering space for renewable energy expositions and conferences.

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