

COAL INFRASTRUCTURE *REUSE REPORT STUDY*

PREPARED FOR:
THE NATURE CONSERVANCY
IN WYOMING



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COAL INFRASTRUCTURE REUSE STUDY:

Pathways to Reuse for Wyoming's
Coal Industry Infrastructure

A STUDY SPONSORED BY:

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DISCLAIMER

Although the authors have made every attempt to use the best information and data available, to provide transparency in the analysis, and solicited expert opinion and review, the readers need to be reminded that the Coal Infrastructure Reuse Study is an initial compilation of public source data intended to frame a strategic discussion. Alone it is not sufficiently designed, developed, and validated to be a tactical planning and decision tool. Even though the analysis does provide site specific references of property character, these factors are intended to serve only as contextual and subjective considerations.

EXECUTIVE SUMMARY

COAL MINING & POWER GENERATION INDUSTRIES IN WY

Beginning in 1970 the Wyoming coal industry entered into a 38 year period of nearly uninterrupted growth experiencing an average annual growth rate exceeding 12% and attaining a peak production level of 466 millions tons in 2008 while supporting nearly 7,000 employees.

Development on an immense scale was required to facilitate the coal industry's initial expansion, and an impressive array of infrastructure was developed in the state. There are more than 30 major industrial sites associated with coal mining and coal-fired power generation in Wyoming (**see Figure A.1 Wyoming Statewide Coal Fired Power Plants_With Mine Permits**), each one home to \$10's to \$100's of millions in infrastructure investment, including rail, materials handling facilities, large industrial maintenance, repair and fabrication buildings, offices, high capacity power lines and substations, water infrastructure, and more.

These sites have proven the capacity to support thousands of jobs. The property, improvements and infrastructure, and the product sales they enable, are taxed generating significant revenues to the Wyoming state budget.

During 2021, 238 million tons of coal moved by unit trains (single destination trains with up to 150 cars) to energy markets in 25 states across the country. Wyoming power plants consumed another 23 million tons during the year, and 4.7 million tons went to other industrial uses.

The vast majority of all of the coal mined in Wyoming is shipped via rail to destinations outside its borders to 25 other states. The top consumers of Wyoming coal are coal-fired power plants in Texas, Missouri, and Illinois.

There are six coal fired power facilities for market generation in Wyoming, and two coal fired power facilities for dedicated industrial power generation spread across eight geographic locations in the State of Wyoming considered in the Coal Infrastructure Reuse Study

The thirty-two unique coal fired boiler-generators installed in the state fall into four general categories: 19 units generating power to the market grid, 8 generating power for direct industrial use, and 5 retired but remaining under permit.

The total acreage dedicated to coal fired power plant operations in Wyoming is over 8,800 acres. The six primary grid tied generating facilities have a generating capacity of 7,205 MW.

Revenues from the coal industry, both mining and power generation during the period of growth, came to be relied upon as the most stable of the States three primary energy commodities, often contributing up to 1/3 of State revenues while its direct and first tier support employees typically earned nearly double the average wages of other business and industry sectors in the State.

The coal mining and power plant sectors now employ just over 5,100 workers. Coal industry jobs are among the best paying in the state with Wyoming coal sector workers collecting an average annual wage of \$93,905, excluding benefits. Coal sector workers take-home pay is almost twice the statewide average wage of \$49,756 per worker.

Estimates indicate that each coal industry position supports an additional two jobs in the service and supply sectors, bringing direct and indirect employment to more than 15,000 workers.

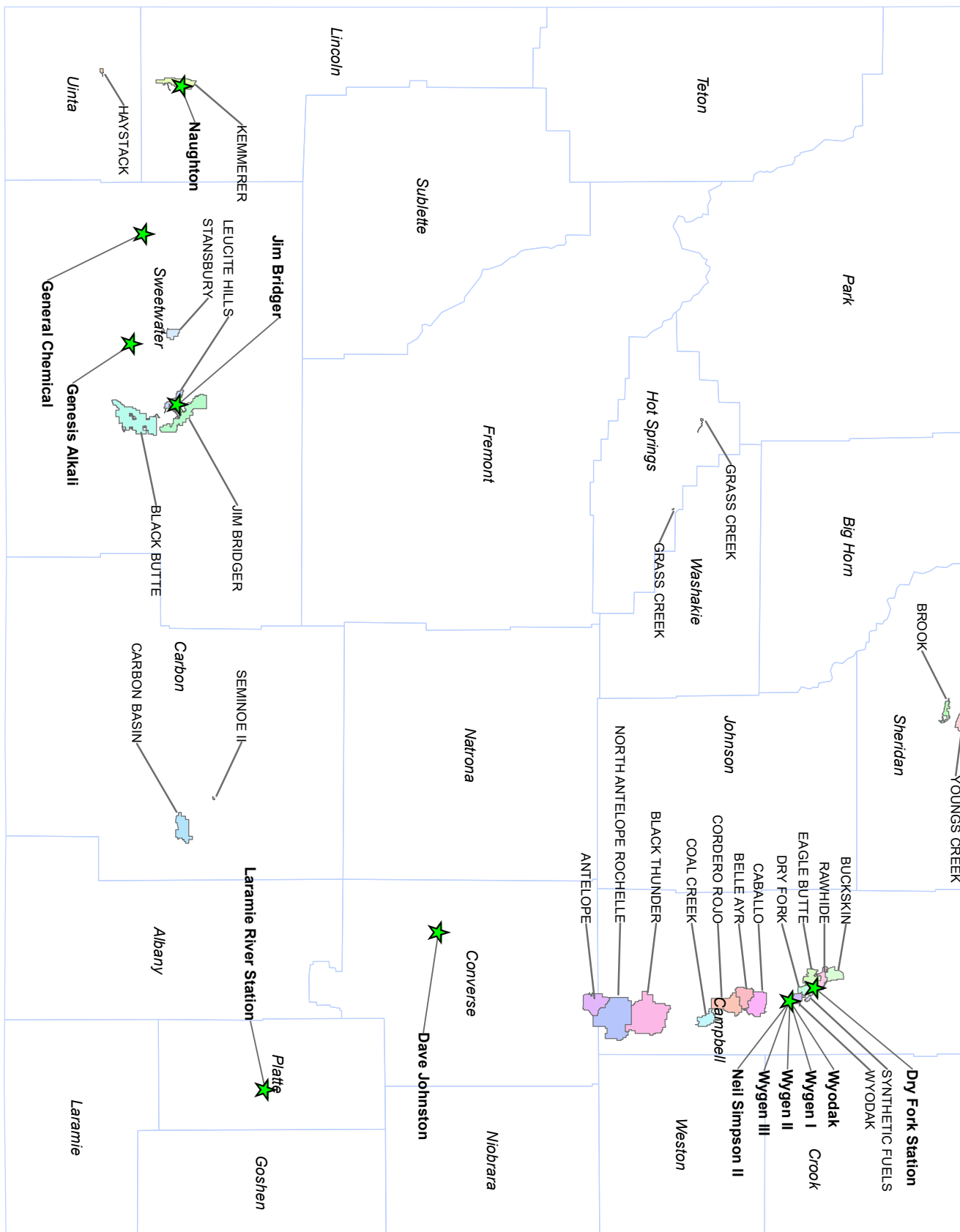


FIGURE 1.A WYOMING STATEWIDE COAL FIRED POWER PLANTS WITH MINE PERMITS

INFLUENCE & IMPACT

The drivers that primarily influence the Wyoming coal industry, both mining and power generation, originate from outside the geographic borders of Wyoming in the form of both regulation and market demands. These drivers are also outside of our ability for meaningful political or social influence.

Since 2008 coal production has been in steep decline having lost 228 million tons of production, a 49% reduction in gross quantity resulting in a loss of over 2,000 direct jobs. Similar to the drivers for the coal industry’s growth, forces causing decline are exerted from the outside, and again coming in the form of regulation and market demands.

THE COAL INFRASTRUCTURE REUSE STUDY

This study was undertaken to:

1. present an Inventory of sites that have realistic potential for reuse post mining or coal fired power generation, and offer a perspective of their Valuation
2. to identify and describe Prior Projects that have successfully employed a reuse strategy
3. to describe the Pathways that exist in the current regulatory structure to seek an exception to demolition and reclamation, and;
4. to identify Partnership and Funding Opportunities to enable a sensible and sustainable reuse strategy.

This compilation is intended to be immediately valuable to inform policy makers, regulators and industry participants facing decision points regarding retirement, decommissioning, and reclamation of valuable infrastructure associated with the coal industry.

Inventories for Mines and Power Plants are based on publicly available datasets from government, regulatory, academic and industry sources.

Obtaining relevant Valuations for Mines and Power Plants proved to be the most challenging aspect of the study. In keeping with the stated intent to identify, access and report reliable

and repeatable data sources for information presented in this report, publicly available tax assessment records were determined to be the most appropriate statements of value. (see **Table 1.B Reclamation Bond Amounts and Assessed Values for Wyoming Coal Mines**).

AT THE END OF ORIGINAL INTENDED USE

Current federal and state regulations default to demolition of all facilities and infrastructure and reclamation of the land to its prior (pre-industrial development) use and character at the closure of a mine or power plant.

If coal industry sites are fully reclaimed, they are unlikely to be targeted for renewed development. Legacy liabilities and geotechnical issues are likely obstructions. Industrial or energy projects that could have repurposed these sites would necessarily be constructed on greenfield sites elsewhere, leading to unnecessary impact to landscapes and wildlife across the state.

Implementation of reuse strategies for coal industry sites could provide displaced workers with new jobs, the state and county governments with new revenue, the state’s economy, and facilitate diversification of the state’s economy. Speed to market versus green fields would advantage reuse. Additional impacts of development on Wyoming’s landscapes and reclamation costs for coal industry companies closing their operations would be reduced or avoided.

Each of the twenty-four (24) mine sites and the twelve (12) power plant sites addressed in this report (see **Table 1.A Listing of Properties Considered in this Report**) represent an opportunity for post mining industrial reuse including low- impact development of the utility-scale renewable energy facilities.

FEDERAL AND STATE POLICY, PROJECTS AND FUNDING

Federal policy is serving to promote development of pathways, partnership and funding that supports reuse of mine lands. The Interagency Working Group on Coal and Power Plant Communities, Office of Clean Energy Demonstrations and other funding opportunities coming out of various offices of the Department of Energy and Economic Development Administration are advancing current policy.

Department of Energy and the Economic Development Administration, many other federal agencies and private markets are investing at unprecedented levels in the development of a variety of new clean energy technologies including carbon management, hydrogen, nuclear, grid scale batteries and advanced manufacturing, many of which offer opportunities for diversification of industry in Wyoming. The DOE's \$500 million funding of the Clean Energy on Mine Lands (CEML) demonstrates a signal of policy and programmatic support for the concept of mine lands re-use.

The state government including the Wyoming Energy Authority and the Office of the Governor - Energy Policy Advisory Staff, the Wyoming Business Council, its Regional Director Staff and local Economic Development Organizations and the University of Wyoming - School of Energy Resources are similarly aligning with new energy technologies to diversify and strengthen the state's economy while pledging to reduce the carbon intensity of our energy industries. Reuse of coal industry facilities represent near-ideal locations to support the development of pilot projects, demonstration sites, and commercial deployment of CO2 Storage and Hydrogen Energy Hubs.

SUCCESS STORIES:

A pathway to properly permit lands for reuse does exist in the current rules and Regulations of the WDEQ, in compliance and alignment with OSMRE requirements in:

SMRE Title 30, Subchapter B 715.13

Postmining use of land

and within Wyoming DEQ a process for a Land Use Change is in:

Land Use Change to Industrial/Commercial for Coal Mine Facilities, LQD Coal Chapter 2. Sec. 6(b)(x)(C).

Examples of navigating the existing federal and state regulatory pathways to achieve reuse do exist (*see Chapter 3. Prior Projects: Re-use Examples on Mine Lands*).

Four projects in Wyoming have sought to re-purpose mine lands with information provided in this report for:

- **Dave Johnson Mine** - Glenrock Rolling Hills Wind Energy
- **Jacobs Ranch Mine** - Rail Utilization Complex
- **Synthetic Fuels Mine** - Fort Union Industrial Park
- **Kemmerer Mine** - Terra Power Sodium Nuclear Project

The environmental impact of the new businesses that reused these lands was lessened because no new land disturbance was necessary, no additional cultural or wildlife resources were impacted.

SITES, LAND AND VALUE - QUICK FACTS

- There are **24 coal mines in the State of Wyoming considered in the Coal Infrastructure Reuse Study**
 - 24 with open permits being administered by WDEQ-LQD
 - **17 with active an on-going mining production**
 - 5 in Reclamation status
 - 1 in Temporary Cessation status
 - 1 in Non-Development status
- Lands in Wyoming associated with coal mining comprise
 - **390,000 acres** within active mine permits
 - **245,000 acres privately** owned by mining companies within and proximal to permit boundaries
 - **170,000 acres in active or reclamation status**, in current or prior disturbance disturbance or undergoing some phase of reclamation
- There are 6 **distinct coal fired power facilities for market generation**, and 2 distinct coal fired power facilities for dedicated industrial power generation **at 8 geographic locations in the State of Wyoming considered in the Coal Infrastructure Reuse Study**
 - 32 boiler/generator units considered within all classes, permit and operational status
 - **19 individual boiler/generator units generating power to the market grid**
 - 8 individual boiler/generator units generating power for direct industrial use
 - 5 boiler/generator units having been retired but with remaining open permits
- Lands in Wyoming associated with coal fired power generation comprise. Approximately **9,000 acres owned by power generating companies** proximal to plant sites
- Bonding, reclamation reserve funds by class
 - **\$1.9 billion in Total mine reclamation bonds**
 - \$990 million in Area Bonds (*mostly dedicated to pit area backfill*)
 - **\$360 million in Incremental Bonds** (*includes infrastructure demolition funds*)
 - A typical mid-sized mine in the Powder River Basin will allocate \$4.5 to \$8.0 million dollars to infrastructure demolition

- Mines and Power Plants across the State commonly have facilities that include clerical offices, labs, professional engineering and management spaces, conference and training rooms, warehouses, and heavy industrial repair and fabrication shops. Even the smallest of the mine facilities are comprised of 40-50,000 square feet of total facilities with the largest being in excess of 200,000 square feet of total buildings of all classes.
- Assessed Values for Select Asset Categories and Types
 - **Public tax records indicate replacement costs in excess of \$980 million for Buildings, Site Improvements and Plant Machinery and Equipment**
 - **A differential cost approaching \$1.35 billion is indicated between demolition and reclamation of Buildings, Site Improvements and Plant Machinery and Equipment and the replacement of the same on a build ready greenfields site.**

TAKE AWAYS:

Efforts to develop a strategic framework that pursues policy, statute and regulation that result in reuse as a preferential pathway are encouraged to avoid unnecessary and regressive destruction of assets and infrastructure that would return lands to a lesser productive condition and value.

Presently coal mine and coal power plant owners must view disturbed lands, transportation infrastructure, permanent improvements and utilities as liabilities. A properly formed reuse strategy would allow the owners, communities and future industries to realize these as assets.

Wyoming's workers, businesses, environment and financial bottom line would benefit from the reuse of coal mine and coal power plant lands, assets and infrastructure.

**EXECUTIVE SUMMARY TABLE 1.A
LISTING OF PROPERTIES CONSIDERED IN THE REPORT**

COAL MINES

MINE NAME	COMPANY	COUNTY
Antelope	Navajo Transitional Energy Company, LLC	Converse
Belle Ayr	Eagle Speciality Materials, LLC	Campbell
Black Butte	Black Butte Coal Company	Sweetwater
Black Thunder	Thunder Basin Coal Company, LLC	Campbell
Brook	Brook Mining Company, LLC	Sheridan
Buckskin	Buckskin Mining Company	Campbell
Caballo	Peabody Caballo Mining, LLC	Campbell
Carbon Basin	Arch of WY LLC	Carbon
Coal Creek Mine	Thunder Basin Coal Company, LLC	Campbell
Cordero Rojo	Navajo Transitional Energy Company, LLC	Campbell
Dry Fork	Western Fuels WY, Inc.	Campbell
Eagle Butte	Contura Coal West, LLC	Campbell
Grass Creek	Spring Gulch Coal Co (The)	Hot Springs
Haystack	Westmoreland Haystack Mining, LLC	Uinta
Jim Bridger	Bridger Coal Company	Sweetwater
Kemmerer	Kemmerer Operations, LLC	Lincoln
Leucite Hills	Black Butte Coal Company	Sweetwater
North Antelope Rochelle	Peabody Powder River Mining, LLC	Campbell
Rawhide	Peabody Caballo Mining, LLC	Campbell
Seminole II	Arch of WY LLC	Carbon
Stansbury	Rocky Mountain Coal Company	Sweetwater
Synthetic Fuels Mine	Green Bridge Holdings, Inc.	Campbell
Wyodak	Wyodak Resources Development Corporation	Campbell
Youngs Creek	Navajo Transitional Energy Company, LLC	Sheridan

POWER PLANTS

PLANT NAME	COMPANY	COUNTY
Dave Johnston	PacifiCorp	Converse
Dry Fork Station	Basin Electric Power Coop	Campbell
General Chemical	PacifiCorp	Sweetwater
Genesis Alkali	PacifiCorp	Sweetwater
Jim Bridger	PacifiCorp	Sweetwater
Laramie River	Basin Electric Power Coop	Platte
Naughton	PacifiCorp	Lincoln
Neil Simpson II	Black Hills Power Inc	Campbell
Wygen I	Black Hills Power Inc	Campbell
Wygen II	Black Hills Power Inc	Campbell
Wygen III	Black Hills Power Inc	Campbell
Wyodak	Black Hills Power Inc	Campbell