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Black Hills National Forest

Revised Forest Assessment:

Renewable and Non-Renewable Energy and Mineral Resources



Gold Mountain Mine, with a standing mill frame. Black Hills National Forest.
(photo courtesy of the U.S. Forest Service).

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Chapter 1. Introduction

What is an Assessment Report?

The Black Hills National Forest is managed by the U.S. Forest Service, an agency of the U.S. Department of Agriculture. The mission of the Forest Service is to sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations. The National Forest Management Act requires the Forest Service to develop a land and resource management plan (forest plan) for all national forests to guide management actions and decisions. The current forest plan for the Black Hills National Forest was approved in 1997 and has been amended twice. The National Forest Management Act requires that these forest plans be periodically updated. To revise the current forest plan, the Forest Service has identified and evaluated existing information about relevant ecological, economic, and social conditions, trends, and sustainability, and how those conditions relate to management direction in the forest plan. The results of the evaluation are documented by resource area in assessment reports.

This assessment report documents the current known renewable and non-renewable energy and mineral resources and uses in the Black Hills National Forest, or the "plan area."

Chapter 2. Conditions and Trends

Importance of Renewable and Non-Renewable Energy and Mineral Resources

National Forest System lands provide access for commercial development of a variety of mineral resources. This includes locatable minerals (such as silver and gold), salable minerals (such as stone, sand, and gravel) and leasable minerals (such as coal, oil, and gas). In the seven counties that the Black Hills National Forest overlays (which includes but is not limited to the Black Hills National Forest), the mining industry (including fossil fuels) has provided 1,000 to 1,500 jobs over the last two decades (U.S. Department of Commerce 2021). People benefit from opportunities for recreational mineral collection on these lands through panning, dredging, sluice-box, and metal detector use. In 2015, the top three minerals by sales value in the Black Hills National Forest were dimension stone, crushed stone (common variety), and construction sand and gravel (USDA Forest Service 2018). Salable minerals are the primary source of revenue from mineral production activities in the Black Hills National Forest, based on the available information. However, the possibility for mining remains open for all mineral resources.

National Forest System lands provide renewable and non-renewable resources used to generate energy. These include hydropower, biomass, coal, oil, and natural gas. In addition, National Forest System lands are valued for the access and leasing of lands that may provide energy generation, which include solar, and wind energy facilities.

Development of renewable energy on National Forest System lands will help implement Executive Order (EO) 14057 of December 8, 2021, *Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability*. EO 14057 was issued with the intent to help the United States achieve a carbon pollution-free electricity sector by 2035, and a net-zero emission economy by 2050.

Access to these renewable and non-renewable resources is important to local communities, as evidenced by public input in previous planning efforts that have indicated concern that designations of research natural areas would adversely affect access to or development of locatable mining claims or minerals leases (USDA Forest Service 2005, 2010).

Best Available Scientific Information

This assessment considers direction and requirements of applicable statutes, laws, regulations, and Forest Service manuals and handbooks. Information regarding the renewable and non-renewable energy and mineral resources of the Black Hills National Forest is based on information from numerous sources including State of South Dakota and Wyoming data, Black Hills National Forest project and permit files, Black Hills National Forest schedule of proposed actions, Bureau of Land Management minerals information, Office of Natural Resources Revenue, U.S. Geological Survey published documents and maps, and other literature. The Office of Natural Resources Revenue and the Bureau of Land Management keep official records on leasable minerals and unpatented mining claims on public lands. Current records are kept in the Office of Natural Resources Revenue natural resource revenue database and the Bureau of Land Management Mineral and Land Records System. These records are the source for the documentation of leasable minerals and unpatented mining claims in the Black Hills National Forest.

Specific files and records used for this assessment include:

- 1997 Black Hills National Forest plan, as amended (USDA Forest Service 2006) and Final Environmental Impact Statement and Record of Decision (USDA Forest Service 2005)
- [Black Hills National Forest monitoring and evaluation reports](#) (USDA Forest Service 2023b)
- Management direction as provided in the [Forest Service Manual and Handbooks](#)
- Forest Service Annual Energy and Mineral Commodities Report
- Publicly available information as referenced in the *References* section
- Forest Service corporate geographic information system data such as mineral rights, mineral withdrawal, and geology
- Bureau of Land Management geographic information system data such as the National Land Status Database

Data Gaps Identified

A preliminary list of identified data gaps is provided below.

- An updated Analysis of Renewable Energy Potential on U.S. National Forest Lands (Zvolanek et al. 2013) would provide a more current assessment of renewable energy potential. Since the evaluation was done in 2013, nearly a decade ago, it would be informative to re-evaluate the renewable energy potential now given improved remote sensing and imaging capabilities along with updated information on land use and other projects that have begun or been completed since this study was done.
- There was no information about the potential for new hydropower in the Black Hills National Forest.
- Periodic monitoring is required by the forest plan. While several elements relating to commodity production are included in the monitoring plan (Monitoring Items 13-17), the most recent effort did not include any renewable or non-renewable energy or mineral resources development sites (USDA Forest Service 2013).
- The future need or demand for development of renewable and non-renewable energy and mineral resources on and near the Black Hills National Forest is uncertain.

The following additional resources exist or may exist but were not summarized at this time:

- Black Hills National Forest staff is currently developing an expanded database of abandoned mine lands and hazards that was not complete at the time of this report.
- More recent than 2017 mineral sale values.

- The volume or value of free use materials to local governments.
- Recent LiDAR may provide information about Abandoned Mine Lands Hazards but was not ready in time for this report.
- Wyoming guidelines for wind and solar development and for oil and gas development.
- South Dakota Department of Revenue and Research Council.
- Updates to the most current account of mining claims, active and proposed mining projects, including exploration.
- Crook County Natural Resource Management Plan (December 2020).

Current Conditions and Trends

Type And Location of Non-renewable Energy and Minerals Activities

A variety of mining activities occurs within the administrative boundary of the national forest (including in the Black Hills National Forest), ranging from recreational gold panning and sluicing to open-pit mines with either heap-leach or conventional milling to recover precious metals or minerals (USDA Forest Service 2005). Future exploration and development of currently unknown mineral resources salable may occur in the Black Hills National Forest.

Locatable Minerals

Locatable minerals and products are those that are subject to exploration, development, and production. The Mining Law of 1872 (The Mining Law) is the major Federal law governing locatable minerals. It allows U.S. citizens the opportunity to explore for, discover, and purchase certain valuable mineral deposits on Federal lands that are open for mining claim location (public domain lands). These mineral deposits include most metallic mineral deposits and certain nonmetallic, and “uncommon variety” industrial minerals. Where these minerals occur on acquired lands, they are considered leasable minerals. The law sets general standards and guidelines for claiming the right to possess a valuable mineral deposit discovered during exploration. The Mining Law allows for the enactment of state laws governing location and recording to mining claims and sites that are consistent with Federal law.

Some lands have been subject to mineral withdrawal and are not available for mineral entry under The Mining Law. Withdrawals may be permanent or temporary. Notably these include lands to preserve the unique cave resources surrounding Jewel Cave National Monument; in the Sturgis watershed, in Inyan Canyon, at developed recreation areas, in the Norbeck area, and in the Upper Pine Creek Natural Area. Other withdrawals for U.S. Bureau of Reclamation projects, such as roadside zones, and power-generating purposes may also affect mineral development.

Locatable minerals are an important source of history and economic activity in the Black Hills (USDA Forest Service 2006). Locatable mineral resources include gold, silver, quartzite, uranium, feldspar, beryl, lithium, and mica, among others (Dewitt et al. 1986). As of the last publicly produced Mineral Summary (Holm et al. 2008), a report on the production, exploration, and environmental issues in South Dakota, gold and silver are still the primary mineral commodities. Mining claims for metals such as gold and silver have historically been and continue to be located over large areas in the northern half of the Black Hills National Forest. In more recent years, rare earth minerals (e.g., lanthanum and cerium) are under location over large areas, as well. An example of recent interest in rare earth minerals is the Bear Lodge Project (Bull Hill Mine), located in northeastern Wyoming and partially within the Black Hills National Forest that, if developed, would target critical mineral rare earth elements. See discussion of critical minerals below.

Numerous mining claims exist in the Black Hills National Forest. Exploration is also ongoing and the number of authorizations for exploration varies from year to year. It is unknown how many exploration projects may develop into production or when and where new projects may be proposed because locatable mineral development is proponent-initiated. Mineral production is expected to continue in accordance with The Mining Law. A review of the Black Hills National Forest Schedule of Proposed Actions (USDA Forest Service 2023a) shows continued interest in the exploration and development of locatable and other minerals. From April through June 2023, seven projects are listed on the Schedule of Proposed Actions list for Minerals and Geology for prospecting and mining purposes (USDA Forest Service 2023a). Current projects under review include three locatable mineral exploration projects, including two that occur on the Northern Hills Ranger District and one that occurs on the Hell Canyon Ranger District. The remaining four are currently listed as “on hold” until further notice. One of these projects occurs on the Hell Canyon Ranger District and three occur on the Mystic Ranger District (USDA Forest Service 2023).

Leasable Minerals

The Bureau of Land Management manages the Federal mineral estate leasable mineral resources and has specific authorities and expertise in managing Federal minerals. Depending on the type and amount of mineral resource occurrence in the plan area, coordination with the Bureau of Land Management during the assessment is warranted.

According to the Black Hills National Forest Land and Resource Management Plan (USDA Forest Service 2006), the only known leasable minerals in the Black Hills National Forest are oil, gas, and some rare earth elements. Currently, there are no producing wells on National Forest System lands in the Black Hills. Oil and gas exploration occurred in the southern and northwestern portions of the Black Hills National Forest in Fall River County, southern Custer County, and Cook County, but all wells are currently plugged or inactive (SDDANR 2022, Wyoming State Geological Survey 2022). There are no current leases issued by the Bureau of Land Management for leasable minerals in the Black Hills National Forest (BLM 2022). Based on current, available resources, oil and gas are not in great abundance in the Black Hills National Forest, but exploration is ongoing.

Leasable minerals also include coal and geothermal resources, for which potential is low (see the *Geothermal Energy* section). Geothermal energy is a renewable energy resource that makes up only about 2 percent of renewable energy sources and 0.2 percent of the energy used in the United States annually. While the overall use of geothermal energy is low, it can still provide a valuable source of renewable energy. The Black Hills National Forest contains 122,200 acres of land with medium to high potential for geothermal energy (Zvolanek et al. 2013).

Salable Minerals

Salable minerals, also referred to as mineral materials, include resources such as gravel, crushed rock, landscape material, rip rap, and clay. Salable minerals are governed by the Federal Materials Act of 1947. Since July 23, 1955, common varieties of sand, gravel, and stone were removed from the Mining Law and placed under the Materials Act of 1947. Use of salable minerals requires either a sales contract or a free-use permit. In 2015, the top three minerals by sales value in the Black Hills National Forest were dimension stone, valued at \$38,000, crushed stone (common variety) valued at \$3,000, and construction sand and gravel valued at \$200 (USDA Forest Service 2018). In 2017, mineral material sale included dimension stone, valued at \$30,900; rip rap, valued at \$21,500; landscape rock, valued at \$2,854; and sand and gravel, valued at \$250. Additionally, the Black Hills National Forest provides free salable minerals, such as crushed stone, to local governments under “free use” permits.

Critical Minerals

Critical materials include non-fuel minerals, elements, substances, or materials that have a high risk of supply chain disruptions and serve an essential function in one or more energy technologies, including technologies that produce, transmit, store, and conserve energy; or are a critical mineral. Critical minerals are any mineral, element, substance, or material designated by the Secretary of the Interior (excluding fuels, water, and common variety minerals like sand and gravel). Under the Energy Act of 2020, the Department of the Interior maintains a list of critical minerals. The current list includes 50 minerals (2022 Final List of Critical Minerals, 87 Fed. Reg. 10381 [February 24, 2022]), including rare earth elements that occur within the Black Hills National Forest.

Although there are no current operations developing critical or rare earth minerals in the Black Hills National Forest, the Bear Lodge Project, if developed, would target critical rare earth minerals in the Black Hills National Forest. A Plan of Operations was accepted from the developer in 2014, which was the basis for a draft environmental impact statement released in 2016. Subsequently, however, the proponent suspended the project during the public comment period on the draft environmental impact statement. The project remains suspended while the proponent continues to develop its rare earth element processing and separation demonstration facility outside the boundaries of the Black Hills National Forest.

Renewable Energy

Renewable energy projects that may be developed on National Forest System lands include hydroelectricity (hydropower), wind power, solar power, geothermal energy, or energy derived from biomass. None of these resources are currently being developed in the Black Hills National Forest.

Non-Renewable Energy

Non-renewable energy sources include coal, oil, and gas. These are discussed in the *Leasable Minerals* section.

Non-energy Leasable Minerals

Non-energy leasable minerals include minerals such as gilsonite, phosphate, sodium, potassium, and sulfur. Valuable hardrock minerals like those described in the *Locatable Minerals* section are considered leasable when they are located outside of public domain lands on acquired lands. The likelihood of development of non-energy leasable minerals is low and is expected to remain low in the near future.

Potential for Renewable Energy

Renewable energy includes solar power, wind power, hydropower, biomass, and geothermal energy. In cooperation with the Forest Service, the Argonne National Laboratory completed an assessment of solar, wind, biomass, and geothermal energy resources on public lands managed by the Forest Service (Zvolanek et al. 2013). The analyses used available geographic information system data and included relevant factors for evaluating the usable amount of each resource as well as minimum levels of each resource to be considered viable. The primary criteria for determining a site as having potential for a given renewable resource is the availability and quality of the given resource. For example, solar energy is more available in locations such as the southwestern United States where there are more clear sky days throughout the year compared to the northwestern United States.

The amount of land area determined by Zvolanek et al. (2013) with potential for each renewable resource was compared to a previous analysis performed by the National Renewable Energy Laboratory (NREL

2005). The land areas with potential determined by Zvolanek et al. (2013) were generally much fewer than the land areas with potential determined by NREL (2005) because of the additional suitability criteria used by Zvolanek et al. (2013), such as access to roads and powerlines, and buffers around waterways. Because of the additional criteria used by Zvolanek et al. (2013), the land area estimates are on the low side, but are more realistic for estimating the potential land area that could be developed to provide renewable energy.

There is potential for renewable energy sourced from wind power, biomass, and geothermal energy within the plan area. Currently, however, there are no renewable energy projects in the Black Hills National Forest (USEIA 2021a).

Solar Power

Solar power is generated by solar collectors, including photovoltaic cells, which collect solar energy and convert it directly into electricity. Several photovoltaic technologies exist, including solar cells made from silicon, thin-film, and III-V (made from gallium, indium, arsenic, and antimony), with more technologies in development to help improve cost, efficiency, and longevity. In 2020, solar power accounted for 11 percent of renewable energy and 2.3 percent of total energy used (USEIA 2021b).

The criteria used for determining solar potential for photovoltaic cells included factors such as areas that receive greater than 5.8 kWh/m²/day, flat (less than 1-percent slope), proximity to transmission lines, roads, contiguous land area, open and not heavily forested, and not on protected lands or within floodplains or wetlands. Given these criteria, Zvolanek et al. (2013) did not find any substantial potential for solar power in the Black Hills National Forest.

Wind Power

Wind power is generated by turbines that convert the kinetic energy from the velocity of the air (wind) to mechanical energy to electricity. Commercial wind turbines are defined as those that generate 100 kilowatts of electricity or more, while small-scale wind turbines generate 100 kilowatts of electricity or less. In 2020, wind power accounted for 26 percent of renewable energy and 8.4 percent of total energy sources used (USEIA 2021b).

The criteria used to determine wind power suitability included wind power class, less than 20-percent topographic slope; near transmission lines and access roads; and outside of urban and protected lands. The analysis performed by Zvolanek et al. (2013) determined that the Black Hills National Forest is among the National Forest System lands with the most total land area for wind power potential, with an estimated 28,000 acres having potential.

Hydropower

Hydropower is a long-established technology that converts the energy of water into electricity. According to the U.S. Energy Information Administration, hydropower accounted for 7.3 percent of the total energy generation in the United States, and 22 percent of the total renewable electricity generation in the United States in 2020 (USEIA 2021b). The amount of energy in water is based on its fall (potential energy) and/or velocity (kinetic energy). Hydropower that is generated from the fall potential of water is generated when water is stored behind a dam, enters a penstock, and flows through the penstock, where its energy turns a turbine that spins a generator. From the generator, electricity can be sent to a transmission line. Hydropower can also be generated by the velocity of water, also called hydrokinetic, when the velocity of water is extracted from turbines (similar to the way wind turbines collect energy from the velocity of air). Hydrokinetic systems are typically used on marine systems to harness energy from tidal and wave flow, or on smaller rivers.

Zvolanek et al. (2013) did not evaluate the potential for areas to support hydropower because the complexity of the evaluation was beyond the data available for a geographic information system analysis and would include factors such as surface water flow and flow changes, elevation differentials, and geologic setting. According to the U.S. Department of Energy U.S. Energy Mapping System (USEIA 2021a), there are no hydropower facilities or projects in the Black Hills National Forest; but because the Zvolanek et al. (2013) report could not evaluate potential for hydropower, the potential for this source of energy in the Black Hills National Forest is unknown.

However, the Spearfish Hydroelectric project, located outside the boundaries of the Black Hills National Forest, draws water from Spearfish Creek at the Maurice intake via a 5-mile-long diversion tunnel. The City of Spearfish purchased the system in 2004 and currently operates the system under a Federal Energy Regulatory Commission license (City of Spearfish 2022). Approximately 57 acres of National Forest System lands within the Black Hills National Forest are affected by the Spearfish Hydroelectric project (City of Spearfish 2008).

Biomass

Biomass is matter from plants and animals that can be used for energy production (Zvolanek et al. 2013). Trees and woody crops are traditional materials used for biofuel, but other growing sources include crop residue, landfill waste, manure, sanitary wastewater, animal waste from slaughterhouses, grease from restaurants, and forest residue (Zvolanek et al. 2013). Sometimes crops are grown specifically for biofuel, either to make biofuels or to be converted into biodiesel. Corn and sugarcane are examples of crops that are used to make biofuels, while soybeans, sunflowers, rapeseed, and castor beans are among the crops used to create biodiesel (Zvolanek et al. 2013). In 2020, biomass accounted for 39 percent of renewable energy and 1.4 percent of total energy used (USEIA 2021b).

Areas with biomass potential were designated using county-level biomass estimates and areas with topographic slopes of less than 12 percent, proximity to roads or waterways, and outside of protected areas and wetlands. Areas with biomass potential were also ranked as high, medium, or low. The Black Hills National Forest is among the National Forest System lands in the nation with the largest total land area suitable for biomass with 68,000 acres of low suitability, 611,000 acres of land with medium suitability, and 324,000 acres of land with high suitability (Zvolanek et al. 2013).

Geothermal Energy

Geothermal energy is typically heat energy derived and harnessed from naturally occurring heat sources in the Earth (Zvolanek et al. 2013). Steam vents, geysers, mud pots, and hot springs are some sources of naturally occurring heat energy that occur close to the surface of the Earth. Geothermal energy that occurs deeper than one mile below the surface of the Earth is called a geothermal reservoir. Typically, wells are drilled to access hot water from geothermal reservoirs, and the heat energy is used to spin turbines and drive generators that generate electricity (Zvolanek et al. 2013). In 2020, geothermal power accounted for 2 percent of renewable energy and 0.4 percent of total energy used (USEIA 2021b).

Areas with geothermal energy potential were defined by the National Renewable Energy Laboratory (NREL 2009) as areas with a topographic slope of less than 12 percent, proximity to roads, outside urban or densely populated areas, outside of protected areas, and within 20 miles of a surface water source. Lands with potential for geothermal development were further classified into suitability of low, medium-low, medium, medium-high, and high. The Black Hills National Forest was determined to contain 78,500 acres with medium suitability, 32,000 acres of medium-high suitability, and 11,700 acres of high suitability for geothermal energy development (Zvolanek et al. 2013).

The Economic Contribution of Renewable and Non-renewable Energy and Minerals

In the seven counties¹ that the Black Hills National Forest overlays, the mining industry (including fossil fuels) has provided 1,000 to 1,500 jobs over the last two decades (U.S. Department of Commerce 2021). Between 2010 and 2020, there was an increase of 26 mining jobs in these seven counties (U.S. Department of Commerce 2021). In 2020, mining accounted for 1.1 percent of the total employment (U.S. Department of Commerce 2021).

The Bureau of Land Management states that in 2015, oil and gas leased on 3.5 million acres in the Missouri Basin Region (Region 5), which includes Montana, North and South Dakota, Nebraska, and Kansas, yielded \$200 million for federal, state, and tribal economies (BLM 2021). There was no data specifically for the Black Hills National Forest.

Renewable and Non-renewable Energy and Mineral Resources

Since the 2006 update to the 1997 forest plan, the Forest Service has developed National Core Best Management Practices guidance (USDA Forest Service 2012). Chapter 2 of the forest plan, *Conformance with Guidance*, could be updated to refer to this guidance.

Minerals

Mining on National Forest System lands is governed by regulations in 36 CFR 228. Subpart A refers to locatable minerals. In 2020, the Forest Service announced intent to revise the regulations at 36 CFR 228, Subpart A. However, the revision has been postponed and it is unknown if or when it may be resumed. No change is recommended at this time.

Renewable and Non-Renewable Energy

Planning for development of renewable resources, including renewable energy resources, would be consistent with the goals of the Forest Service Strategic Energy Framework (USDA Forest Service 2011) and direction in the 2012 Planning Rule (36 CFR 219 Part A, 291.10(2)).

The Black Hills National Forest has a high potential for wind energy development. Wind energy is generally good for multiple use areas because land can be used for any number of other activities in addition to wind energy. Care should be taken when considering additional roads that may be necessary for a wind farm and the increased erosion risk that could result, as well as the potential fire hazard of additional transmission lines.

Biomass should be considered for developing integrated resource management planning. The extent to which biomass provides economic benefit and renewable energy should be weighed against forest health and fire reduction initiatives. The amount of traditional biomass sources in the Black Hills National Forest, such as trees and woody debris, is currently greater than it was pre-fire suppression, but could decrease in order to increase forest health. However, currently the cost of hauling biomass to facilities is a major factor in the viability of using forest biomass versus other materials. If woody debris biomass decreases and biomass is considered a desired renewable energy source it could, perhaps, be developed

¹ Crook County, Wyoming; Weston County, Wyoming; Custer County, South Dakota; Fall River County, South Dakota; Lawrence County, South Dakota; Meade County, South Dakota; Pennington County, South Dakota.

from crops, forest waste, animal waste, sanitary wastewater, or another organic waste source rather than the traditional form of trees and woody debris.

Noncommercial Mineral Collecting Activities

Collection of small rocks and minerals (including those that may contain fossils), termed *rockhounding*, is permitted in the Black Hills National Forest without a formal permit, so long as it is for personal use and collection is not on historical sites within the national forest. People benefit from opportunities for recreational mineral collection on these lands through panning, dredging, sluice-box, and metal detector use (USDA Forest Service 2018). The Black Hills and surrounding area are home to numerous fossils and paleontological discoveries that serve as an attraction to the Black Hills National Forest and surrounding areas. Within miles of the Black Hills National Forest boundaries are the Petrified Forest, near Piedmont, South Dakota, and the Mammoth Site, an active paleontological dig site and National Natural Landmark located in Hot Springs, South Dakota. Questions about where rockhounding is permitted should be directed to the local ranger district office.

Management

In addition to Federal and State mining and environmental laws and regulations, management of mineral resources in the Black Hills National Forest is directed by the 1997 forest plan, as revised. The forest plan recognizes that the Black Hills National Forest is the “setting for some of the richest mineral deposits in the world” and that trends in minerals prices may affect management and use of the national forest.

Relevant goals and objectives for minerals management include:

- Goal 1: Protect basic soil, air, water, and cave resources.
 - Objective 113. Apply for mineral withdrawals to protect significant cave ecosystems and resources. (I-4)
- Goal 3: Provide for sustained commodity uses in an environmentally acceptable manner.

“The Forest Service is committed to multiple use management while being sensitive to the environmental effects when commodities are produced. Commodities, including wood products, livestock, minerals, and other products, contribute to the economies of local and regional communities. Ecosystem management can be more cost-effective when commercial benefits can result.

Sustainable economic activity depends upon sustainable ecosystems. Attention is focused on providing an acceptable combination of resources and management practices, including the amount of clearcutting and road construction, the management of livestock grazing, mine waste clean-up and mined land reclamation.

Congress has recognized the importance of sustainable commodity use in laws including the Multiple-Use, Sustained-Yield Act, the National Forest Management Act, the Organic Act, and the 1872 Mining Act.” (I-13)

- Objective 308: Mineral exploration, development, and production is facilitated in accordance with regulations in 36 CFR 228.

Chapter 2 of the forest plan requires conformance with direction, specifically naming best management practices for South Dakota, best management practices for Wyoming, best mineral management practices, and oil and gas, surface operating standards for oil and gas exploration and development (Gold Book, USDO and USDA 2007).

Forestwide mineral and energy direction (Chapter 2, Standards and Guidelines 1501 through 1521) are applied to projects as they are proposed by those seeking to develop mineral and energy resources.

When mineral or energy projects are proposed in certain management areas, specific management guidance is applied based on management area direction. Additional limitations are applied when required. These may include mineral withdrawal, prohibitions or limitation on surface occupancy, prohibition of mineral material sales, or more restrictive requirements to protect resources. These are defined in chapter 3 of the forest plan.

Additional Forest Service management direction can be found in the Forest Service Strategic Energy Framework (USDA Forest Service 2011) and Forest Service Handbook and Manual direction².

Actions of Others

Renewable and non-renewable and mineral and energy operations in the Black Hills National Forest are driven by market conditions and proponent developed plans of operations or lease applications. These can be expected to change over time and may increase or decrease development of these resources.

There is currently a bill (Gilt Edge Mine Conveyance Act), introduced in 2021, under consideration by the U.S. Congress that would convey approximately 266 acres of National Forest System lands administered by the Black Hills National Forest within the Gilt Edge Mine Superfund site boundary to the state of South Dakota. The Gilt Edge Mine in Lawrence County, South Dakota, within the Black Hills National Forest boundary, is an inactive gold mine that was abandoned in 1999 and placed on the National Priorities List in 2000. The Environmental Protection Agency is the lead agency for developing and implementing the remedy for the Superfund-financed cleanup at the site.

Likewise, it is uncertain how renewable and non-renewable and mineral operations will be developed outside of the Black Hills National Forest and how development of those projects will affect the demand or need for these resources in the national forest.

Chapter 3. Conclusions

Where it occurs, current or future development of renewable and non-renewable energy and mineral resources can occur sustainably, recognizing that the extraction of non-renewable minerals is inherently consumptive. Implementation of future development of renewable energy resources in the Black Hills National Forest could offset the loss of non-renewable energy resources such as coal, oil, and gas (through extraction and use or loss due to economic constraints).

Updates to the forest plan could include developing plan components specific to renewable and non-renewable energy development and identifying lands that are suitable or not suitable for such uses. Chapter 2 of the forest plan, *Conformance with Guidance*, could be updated to refer to the “National Best Management Practices for Water Quality Management on National Forest System Lands Volume 1: National Core BMP Technical Guide” (USDA Forest Service 2012) that was implemented after the 2006 update to the 1997 forest plan.

While not directly related to renewable and non-renewable energy and minerals management, other potential updates to the forest plan identified through internal review and discussion related to geology and paleontology include:

² The [Forest Service Manual and Handbooks](#) are available online.

- National Landslide Preparedness Act of 2021 (P.L. 116-323). The National Landslide Preparedness Act established a national program to identify and reduce losses from landslide hazards and established an interagency committee including the Department of Agriculture, among other actions. It also requires the Departments of Interior, Commerce, and Homeland Security to expand the early warning system for post-wildfire debris flows to include recently burned areas across the Western United States, such as National Forest System lands.
- The Paleontological Resources Preservation Act. The primary legislation pertaining to fossils from National Forest System and other Federal lands is the Paleontological Resources Preservation Act of 2009 (16 U.S.C. 470aaa 1-11). The Department of Agriculture implemented direction in the Act by promulgating the Paleontological Resources Preservation Rule at 36 CFR 214, 261, and 291. This Rule provides for the preservation, management, and protection of paleontological resources on National Forest System lands and ensures that these resources are available for current and future generations to enjoy as part of America's national heritage. The Rule addresses the management, collection, and curation of paleontological resources from National Forest System lands including management using scientific principles and expertise, collecting of resources with and without a permit, curation in an approved repository, maintaining confidentiality of specific locality data, and authorizing penalties for illegal collecting, sale, damaging, or otherwise altering or defacing paleontological resources.
- Compliance with the Paleontological Resources Preservation Act and its implementing regulations should be considered for addition to the forest plan where it discussed conformance with laws and regulations (currently chapter 1), and the current Forestwide standards and guidelines for paleontological resources should be reviewed and, if needed, expanded to include plan components consistent with the Paleontological Resources Preservation Act.

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Appendix A. Definitions

Critical Mineral. Any mineral, element, substance, or material designated as critical by the Secretary of Interior.

Geothermal Resources. Resourcing consisting of or relating to the heat of the earth's interior.

Leasable Minerals. Those minerals or materials designated as leasable under the Minerals Leasing Act of 1920. They include coal, phosphate, asphalt, sulfur, potassium, sodium minerals, and oil and gas. Geothermal resources are also leasable under the Geothermal Stream Act of 1970.

Locatable Minerals. Minerals or mineral materials subject to claim and development under the Mining Law of 1872, as amended. Generally, includes metallic minerals, such as gold and silver, and other materials not subject to lease or sale, like some bentonites, limestone, talc, zeolites, etc.

Location (Minerals). Perfecting the right to a mining claim by discovery of a valuable mineral, monumenting the corners, completing discovery work, posting a notice of location, and recording the claim.

Mineral Development. The activities and facilities associated with extracting mineral deposits.

Mineral Entry. Claiming public lands administered by the Forest Service under the Mining Law of 1872 for the purpose of exploiting minerals. May also refer to mineral exploration and development under the mineral leasing laws and the Material Sale Act of 1947.

Mineral Withdrawal. The exclusion of locatable mineral deposits from mineral entry on areas required for administrative sites by the Forest Service and other areas highly valued by the public (e.g., research natural areas, national recreational areas, special interest areas such as "scenic", "botanical", and "geologic", national historical sites, and "scenic" and "recreation" segments of wild and scenic rivers). Public lands withdrawn from entry under the General Mining Laws and/or the Mineral Leasing Laws.

Mining Claims. That portion of the public estate held for mining purposes in which the right of exclusive possession of locatable mineral deposits is vested in the locator of a deposit.

Mining Law of 1872. Provides for claiming and gaining title to locatable minerals on public lands. Also referred to as the "General Mining Law" or "Mining Law."

Non-energy Leasable Minerals. Certain solid minerals such as phosphate, sodium, potassium, sulfur, and gilsonite on public and other Federal lands. In addition, some hardrock minerals, depending on their location, may be considered leasable. The Bureau of Land Management may also lease these minerals on certain private lands, provided the mineral rights are owned by the Federal government. Most of the minerals leased under this program are used to make fertilizer or feed stock (mineral supplement for livestock) or have other industrial processes.

No Surface Occupancy (NSO) (Oil and Gas). Stipulation A fluid mineral leasing stipulation that prohibits occupancy or disturbance on all or part of the land surface to protect special values or uses. The NSO stipulation includes stipulations that may have been worded as "No Surface Use/Occupancy," "No Surface Disturbance," "Conditional NSO" and "Surface Disturbance or Surface Occupancy Restriction by Location." The lessee may exploit the oil-and-gas or geothermal resources under leases restricted by this stipulation through use of directional drilling from sites outside the no-surface-occupancy area.

Rare earth elements. Seventeen elements commonly considered to be rare earth elements include, 15 within the lanthanoid group of elements including lanthanum (La), cerium (Ce), praseodymium (Pr), neodymium (Nd), promethium (Pm), samarium (Sm), europium (Eu), and gadolinium (Gd), terbium (Tb), dysprosium (Dy), holmium (Ho), erbium (Er), thulium (Tm), ytterbium (Yb), and lutetium (Lu), as well as yttrium (Y) and scandium (Sc).