

## EXECUTIVE SUMMARY

# Mountains to Plains Energy by Design Report to the Colorado State Land Board

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- Colorado Natural Heritage Program: Renee Rondeau, Conservation Planning Team Leader/Ecologist.
- Colorado State Land Board: Bill Gaertner, Inventory Manager/GIS; Mindy Gottsegen, Conservation Services Manager; Pete Milonas, Minerals Director; and Melissa Yoder, External Affairs Officer.
- Larimer County: Jeffrey Boring, Resource Specialist; and Meegan Flenniken, Resource Program Manager.
- The Nature Conservancy: William Burnidge, Grasslands Program Director; Megan Kram, Project Manager; Chris Pague, Senior Scientist; and Jamie Robertson, GIS Manager.

The Nature Conservancy completed this project with and for the Colorado State Land Board, pursuant to Contract #38818 / PO PCA C152179, and in close cooperation with Larimer County and the City of Fort Collins.



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## EXECUTIVE SUMMARY

### INTRODUCTION

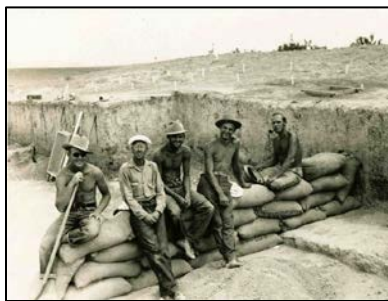
In 2011, the State Land Board (SLB) began seeking a strategy to lease and develop its oil and gas holdings underlying three large, publicly-owned properties in northern Larimer County: Red Mountain Open Space (owned by Larimer County) and Soapstone Prairie Natural Area and Meadow Springs Ranch (owned by the City of Fort Collins). These properties are highly valued by the public for their vast open space and many sensitive resources and unique values, from rare species to ancient cultural artifacts. The City and County properties are considered “split estate” in that the surface is owned by the City and County, while the underlying mineral estate is owned by separate entities including, but not limited to, the SLB. Not only do the SLB and other mineral owners have the right to develop their mineral estate, but the SLB also is charged with generating revenue from its minerals throughout Colorado, primarily to help fund K-12 education.

In keeping with its responsibilities to the citizens of Colorado, yet acknowledging the sensitivities of the Project Area, the SLB sought a process to design an oil and gas leasing plan that would **allow for reasonable energy development while achieving the biological, cultural, scenic and recreational resource conservation goals** of local governments. The SLB contracted with The Nature Conservancy (TNC) to employ its “Energy by Design” (EBD) process (also known as Development by Design) to develop a science-based plan that would identify strategies to avoid, minimize, and mitigate the potential impacts of oil and gas development to biological, cultural, and scenic values. The SLB intends to use this information to create an Oil and Gas Leasing Plan. This project is also a pilot effort for the SLB to explore possible application of the EBD or a similar process to its other holdings in the state.

The SLB, TNC, the City, and the County comprised the “Core Team” that completed the majority of the work on this project. They also solicited input from a “Technical Team” of experts from federal, state, and local government agencies and natural resource management science-based conservation organizations including: Colorado Parks & Wildlife (CPW), Colorado Natural Heritage Program, Colorado State University (CSU), Legacy Land Trust, Natural Resources Conservation Service, Platte River Power Authority, Rocky Mountain Bird Observatory, and the US Fish and Wildlife Service. By involving the surface owners, regulatory authorities, and other stakeholders in this surface use planning process prior to leasing, SLB staff believes this project will streamline leasing and generate revenue from the mineral estate underlying a highly visible asset. The SLB also is supportive of responsible development and stewardship of surface natural values when developing its mineral estate.



Soapstone Prairie Natural Area  
© Charlie Johnson



Archaeological dig at the Lindenmeier site  
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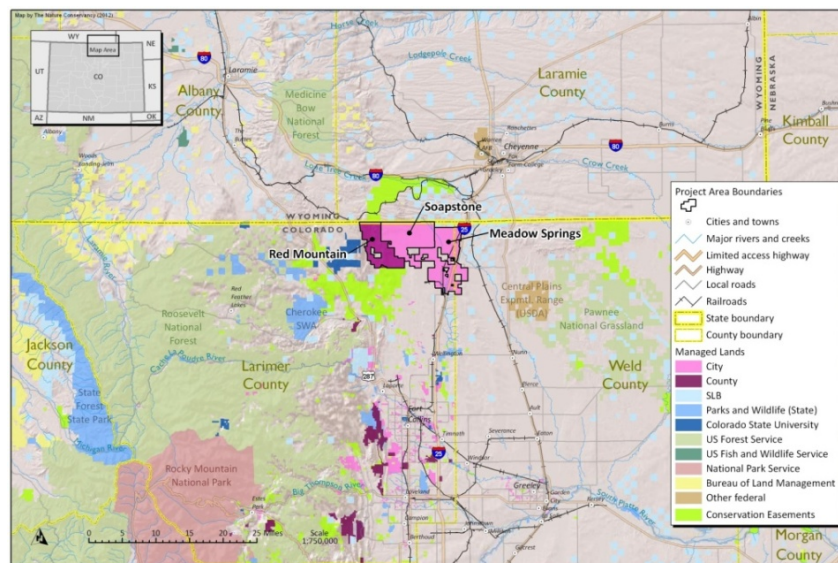
Pronghorn antelope on Soapstone Prairie  
© Meegan Flenniken

## SITE OVERVIEW

The three properties in the Project Area are contiguous and cover over 60,000 acres north of Fort Collins, along the Wyoming border (Map 1). The City and County, together with Great Outdoors Colorado (GOCO; the state lottery-funded open space program), spent several million dollars to acquire the properties as part of a regional conservation effort called the Laramie Foothills Mountains to Plains Project, through which partners are creating a corridor of protected lands to link the Rocky Mountains with the Great Plains. The properties are well-known amongst residents of the City and County and contain many important values:

- Biological values:** From west to east, elevation decreases and vegetation shifts from woodlands up high to grasslands down low. Creeks and streams traverse the area and host a rare fish, the Iowa darter, while wetlands provide habitat for waterfowl and many rare species, including the federally-threatened Colorado butterfly plant. Golden eagles, swift fox, pronghorn, and many other sensitive species inhabit the area too. Meadow Springs surrounds the National Black-footed Ferret Conservation Center owned and managed by the U.S. Fish & Wildlife Service. Although a variety of existing roads (mostly unimproved natural surface roads) cross the landscape and buildings, corrals, and other infrastructure dot it, the biological values throughout the Project Area remain relatively intact and high quality.
- Cultural values:** Soapstone Prairie boasts a National Historic Landmark - the Lindenmeier Archaeological Site - which is more than 12,000 years old and is the most extensive Folsom culture campsite known on the planet. In addition, stone tools, cooking hearths, and other cultural artifacts can be found throughout the Project Area.
- Scenic and recreational values:** In keeping with the objectives of GOCO, Red Mountain and Soapstone Prairie are open to public use and are popular destinations for hiking, biking, horseback riding, and other recreation activities. Visitors to the Project Area enjoy extraordinary views of rolling grasslands, textured shrublands, and the “Big Hole,” a broad sandy wash surrounded by multicolored cliff bands.
- Other values:** Meadow Springs is not open to public use and while protecting important biological and cultural attributes, also serves as the City’s bio-solid application facility, which is a critical component in the City’s wastewater program. All three properties are also managed as working cattle ranches.

**Map 1. Location of the Project Area**





## OIL AND GAS DEVELOPMENT POSSIBILITIES

Energy development is booming in eastern Colorado. Although the plains have been the target of oil and gas development activities for decades, the 2009 discovery of the Jake Well near the Wyoming border (due east of the Project Area by approximately 30 miles) prompted a new explosion of oil leasing and exploration throughout the eastern half of Colorado in a geological layer called the Niobrara Formation. Technological advances in the capture of oil and gas in the Niobrara and other shale formations have further catalyzed leasing and development.

The eastern part of the Project Area lies within the Niobrara Formation. The oil and gas development potential of the Project Area is unproven, but is predicted to increase from west to east, with Meadow Springs having the highest potential based on at least one analysis. According to the Colorado Geological Survey, there may only be one place in the Soapstone Prairie – southeast of Round Butte – where energy companies could successfully explore for oil. Also, oil and gas exploration is not new to this landscape. Over the last 60 years, a number of wells in the area have been drilled (and subsequently plugged and abandoned) according to the Colorado Oil and Gas Conservation Commission (COGCC).

Activity is ramping up once again, as evidenced by oil and gas companies contacting the City with an interest in exploring and developing the area. For example, in March 2012, a seismic company approached the City to study 20,000 acres covering much of Meadow Springs and part of Soapstone Prairie. In May 2012 and pursuant to previous leasing activity, Marathon Oil received approval from the COGCC to expand and establish new drilling and spacing units for 32 wells within and near the Project Area, several of which lie within Soapstone Prairie and Meadow Springs. Marathon also has successfully completed a producing well just a few miles south of the Project Area. In addition, the SLB has received numerous requests to lease its minerals underlying the Project Area, but has refrained from auctioning these tracts to develop a more comprehensive leasing and development strategy.

As stated above, the City and County do not appear to own any of the mineral estate underlying the Project Area. Major mineral owners include the SLB and Anadarko, with the SLB holding approximately 15,000 acres in trust, primarily in the eastern half of the Project Area. Several additional owners/lessees have less substantial mineral holdings throughout the parcels, with Marathon Oil being the major leaseholder at present. The Core Team solicited participation from several operators throughout the project. Marathon participated in one of the Technical Team workshops and hosted a well site visit mid-project. The SLB also has conducted outreach to the Colorado Oil and Gas Association. The Core Team may continue to solicit input and participation from oil and gas companies in subsequent phases of the project (see Implementation of Results).



Well site © Gary Buffington

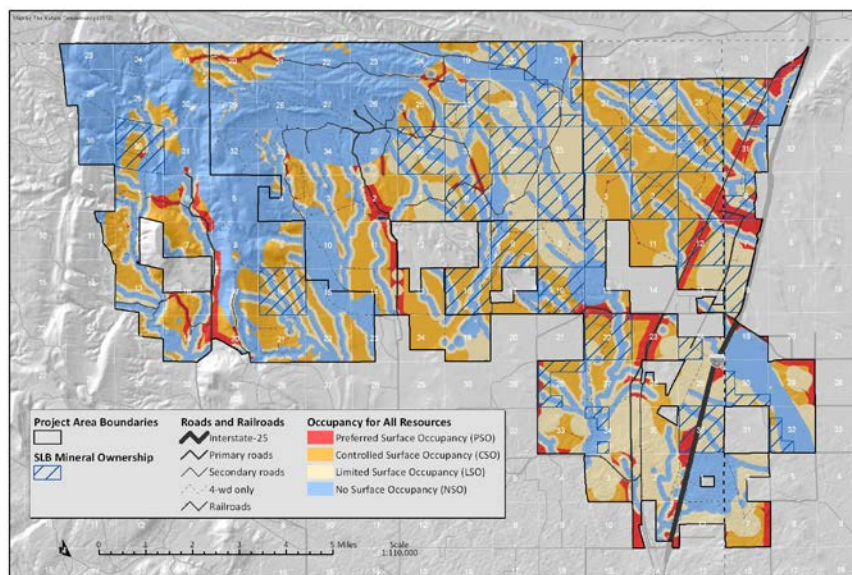
## PLAN RESULTS: SURFACE OCCUPANCY AREAS

The goal of the project is to create a comprehensive plan for oil and gas development in the near term while maintaining important biological, cultural, scenic, and recreational values. To this end, the Core Team (with input from the Technical Team) created a series of recommendations designed to avoid, minimize, and mitigate impacts, with a goal of achieving “no net loss” or “net zero impact” to the conservation values of the project area.

**Surface Occupancy Areas for biological and cultural values** – Based on known locations of biological and cultural values, the Technical Team defined and mapped four types of “surface occupancy areas:” No Surface Occupancy (NSO), Limited Surface Occupancy (LSO), Controlled Surface Occupancy (CSO), and Preferred Surface Occupancy (PSO)(Map 2). The main differences between the areas are (1) the sensitivity of the biological and cultural values for which they were created and (2) compensatory mitigation provisions for biological values. The goal of these tiered areas is to protect key biological and cultural values by providing incentives to operators to develop in the areas where development has the least impact. Examples of NSO areas include wetlands plus a 300’ buffer, golden eagle nests plus a ¼ mile buffer, and the Lindenmeier Archaeological Site plus a one-mile buffer. PSO areas, at the other end of the spectrum, are preferred for development from a biological perspective due to previous and existing disturbances such as roads and utility lines. The precise designation of the surface occupancy areas will be based on site-specific, on-the-ground surveys conducted by the operator prior to development.

Map 2, Surface Occupancy Areas, is a result of an intensive process of identifying and prioritizing key biological and cultural areas for short and long-term protection. This map is intended to guide both surface and mineral owners in the leasing and development of their mineral estate. For the Project Area as a whole, new surface disturbance is prohibited for 44% (NSO) of the land while the remaining 56% falls within the other three categories (LSO, CSO, and PSO). For the SLB mineral ownership, new surface disturbance is prohibited for 27% (NSO), while the remaining 73% falls within the other three categories. Three sections in the northern portion of Soapstone Prairie are designated entirely as NSO due to the Lindenmeier site. Several other sections in the western and northwestern parts of the Project Area fall entirely into NSO designations for biological reasons. All other sections provide access to minerals.

**Map 2. Surface occupancy areas for biological and cultural values**



## PLAN RESULTS: SUPPLEMENTARY RECOMMENDATIONS

**Timing limitations for biological values** – Some species need seasonal restrictions from construction or general human disturbance to support their life cycles. For example, Colorado Parks & Wildlife (CPW) recommends timing limitations of no human encroachment within ½ mile radius of golden eagle nests from December 15-July 15 to prevent nest abandonment, and no post-development well-site visits within critical winter range for mule deer from December 1-April 15 (from 3 p.m.-10 a.m.). The Technical Team incorporated all timing limitations from the COGCC Rules, CPW’s best practices and other sources to identify both legal requirements for timing limitations and additional recommendations as appropriate. As with surface occupancy areas, pre-development surveys must be completed to determine whether timing limitations will apply.

**Surface development standards and mitigation** – The combination of surface occupancy areas and timing limitations identify sensitive natural values, with the ultimate goal of guiding surface development away from these areas. But the mere identification of these areas is not likely to achieve complete avoidance of impacts to the biological and cultural values in the project area. The Core Team created a suite of complementary recommendations for incorporation into the SLB leasing package and the City and County’s Surface Use Agreements. These tools work together like a three-legged stool to support the surface occupancy areas by creating incentives to achieve the plan’s overarching goal: To avoid, minimize, and mitigate the short- and long-term impacts of new disturbance in the Project Area.

- **Disturbance caps** – The Core Team identified two disturbance caps: A long-term disturbance cap of 3% per section (or lease holding) to allow for production on up to four well pads per section, and a temporary disturbance cap of an additional 1.25% per section to allow for the development of one well pad per section before reclamation success is achieved and development of a subsequent well pad can begin.
- **Compensatory mitigation fees** – An operator must participate in a compensatory mitigation program with the Surface Owners by contributing to a mitigation fund. Fees apply to long-term impacts only (not to temporary impacts), and vary based on the number of well pads and surface occupancy areas, ranging from \$2,200/acre in Preferred Surface Occupancy up to \$13,200/acre for a fourth well pad in a section and in a Limited Surface Occupancy area. Mitigation projects will ensure “ecological equivalency” by completing projects that benefit the same conservation values that are impacted. Potential projects include land protection, habitat improvement, or mineral/water rights acquisitions.
- **Reclamation provisions** – Prior to development, an operator must create a reclamation plan and provide a bond of \$10,000 per acre of surface disturbance. Operators must reclaim both temporary and long term impacts over time, according to specified standards. The City and County will return the bond, or applicable portions thereof, to the operator upon successful reclamation of impacts.

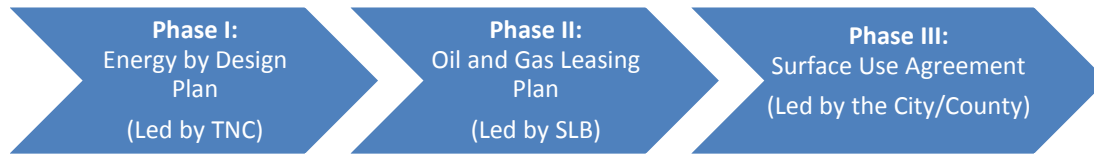
To complement these tools, the City and County are also developing a series of Best Management Practices to address the resources on the property and their importance, by expanding on the COGCC Rules as a basis.

**Scenic and recreational values and cultural resource potential** – To guide energy companies in the placement of well pads and other infrastructure in locations that would have the least visual impact possible, the Technical Team prioritized scenic values from important viewpoints and trails, and CSU developed a predictive model and map showing potential sites for cultural resources such as tools and cooking hearths. These maps can be used in combination with the biological and (existing) cultural resource maps to help select alternative locations for development. However, they do not replace on-the-ground surveys for the final selection of sites.

## IMPLEMENTATION OF RESULTS

This report and its recommendations constitute the first of three phases toward the potential development of oil and gas in the Project Area (Figure 1).

**Figure 1. Project phases.** This report addresses Phase I only.



In Phase II, the SLB will use the Phase I recommendations to create an Oil and Gas Leasing Plan for the SLB minerals in the Project Area. In Phase III, the City and County will create a Surface Use Agreement, which will build on Phases I and II and will be used with all potential operators in the Project Area, including but not limited to those associated with the SLB minerals. Operators can use all of this information in their planning for oil and gas development.

The SLB, City, County, and TNC envision continuing to work together on Phases II and III, and may solicit additional input from the Technical Team as needed. As was the case with Phase I, representatives from the oil and gas industry are welcome and encouraged to participate in the remaining phases of the project. Given the checkerboard subsurface ownership, the plan will only be as effective as the implementation of its recommendations. This plan provides reasonable access to minerals while protecting biological and cultural resources. The implementation of this plan will provide reasonable assurance that if mineral development occurs at Red Mountain Open Space, Soapstone Prairie Natural Area, or Meadow Springs Ranch, critical cultural and biological resources and extraordinary scenic and recreational values will be protected.

## FOR MORE INFORMATION

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Soapstone Prairie Natural Area © Meegan Flenniken