Range Resources
Specialist Report

Garkane Energy Cooperative, Inc.
Tropic to Hatch 138 kV Transmission Line

Prepared For:

US Forest Service – Dixie National Forest
National Park Service – Bryce Canyon National Park
Bureau of Land Management – Kanab Field Office
Bureau of Land Management – Grand Staircase-Escalante National Monument

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RANGE RESOURCES

SPECIALIST REPORT

1.1. INTRODUCTION

Garkane Energy Cooperative, Inc. (Garkane) proposes to construct a 138 kV circuit transmission line supported by wood pole H-frame structures between the communities of Tropic and Hatch in Garfield County, Utah. The proposed new transmission line would replace portions of an existing 69 kV transmission line between the Tropic and Hatch Substations that currently provides service west of Tropic.

1.1.1. Purpose of Specialist Report

The purpose of this Specialist Report is to characterize existing range resources within the Project Area and to analyze and disclose potential environmental effects on range resources that would occur under the Proposed Action and Alternatives as described below. These data and impact analyses will be used to develop an Environmental Impact Statement (EIS) for the Garkane 138 kV Transmission Line proposal.

1.1.2. Proposed Action and Alternatives

1.1.2.1. Alternative A: Proposed Action

Alternative A would be constructed within a right-of-way crossing public lands administered by the U.S. Forest Service (USFS) Dixie National Forest (DNF), Bureau of Land Management (BLM) Kanab Field Office (KFO), and the Grand Staircase-Escalante National Monument (GSENM); Utah State lands administered under the State Institutional Trust Lands Administration (SITLA); and private lands.

The Alternative A 100-foot-wide right-of-way would extend 30.41 miles. The route would begin at the proposed East Valley Substation located east of Tropic and extend northeast to adjoin the Rocky Mountain Power/PacifiCorp 230 kV transmission line right-of-way. The route would then parallel the west side of the Rocky Mountain Power/PacifiCorp transmission line route to the northwest across GSENM land and through Cedar Fork Canyon through a planning window for a utility right-of-way identified in the 1986 Land Resources Management Plan (LRMP). The route would diverge from the 230 kV line access route and extend west across John's Valley and skirt just to the north of the Bryce Canyon Airport. The route would continue west for approximately 4 miles and turn south, crossing SR 12, and extend southwest across the Johnson Bench area, passing to the south of Wilson Peak. The route would continue west down Hillsdale Canyon through a planning window for a utility right-of-way identified in the 1986 LRMP and turn north for approximately 0.5 mile. The route would continue to the west, crossing private property (Sunset Cliffs), and extend west to cross U.S. 89 where it would turn to the southwest for approximately 2 miles to the Hatch Substation. The proposed route would cross 17.35 miles of DNF, 3.31 miles of KFO, 3.68 miles of GSENM, 4.23 miles of SITLA, and 1.84 miles of private lands.

In addition to construction of the proposed transmission line, the proposed project includes the development of a new substation (East Valley) east of Tropic and the expansion of the Hatch Substation. Garkane's existing 69 kV transmission line between the Bryce Canyon Substation and Hatch Mountain Switch Station would be unnecessary once the proposed 138 kV transmission line is operational and would be removed (approximately 16.23 miles) and the right-of-way rehabilitated.

The Proposed Action would involve the development of overland access routes in portions of the right-of-way where a suitable route is not available and where development of an access route is permitted by the authorizing agency. Access to the Rocky Mountain Power/PacifiCorp 230 kV transmission line in the

Cedar Fork Canyon area would need to be improved. In *limited access areas*, the alignment would be accessed via helicopter and/or foot, and there would be no centerline access.

Implementation of the Proposed Action would also require the amendment of the GSENM Management Plan (2000) by changing the designation of a 100-foot-wide 3.68-mile stretch (44.58 acres) of the Primitive Zone to Passage Zone, and within this area, changing the existing Visual Resource Management (VRM) Class designation from Class II to Class III.

1.1.2.2. Alternative B: Parallel Existing 69 kV Route

The Alternative B 100-foot-wide right-of-way would be constructed within a right-of-way crossing public lands administered by the DNF and KFO, National Park Service (NPS) Bryce Canyon National Park (BRCA), and SITLA and private lands. This route would have no surface impacts on the GSENM.

Alternative B would extend 29.11 miles. This alternative route would begin at the proposed East Valley Substation located east of Tropic and extend west through the Tropic Substation (the Tropic Substation would be decommissioned) and then cross SR 12 and continue across BRCA (deviating slightly from the existing right-of-way for approximately 1.5 miles) to a point near the current Bryce Canyon Substation near Bryce Canyon City. For this Alternative, the Bryce Canyon Substation would be decommissioned and a new replacement substation would be built at a new location approximately 1 mile to the west to allow for needed expansion. The route would extend approximately 0.5 mile to the north around Bryce Canyon City, west across SR 63 and then parallel Garkane's existing 69 kV line right-of-way predominately across private and SITLA lands. The alternative 100-foot right-of-way would parallel the existing right-of-way just to the south across the plateau in a northwest direction to Red Canyon, where it would generally follow the existing right-of-way through Red Canyon into Long Valley where it would cross U.S. 89 and continue to the Hatch Mountain Substation. From there the route would follow the existing line south to the Hatch Substation. This route would cross 5.58 miles of DNF, 8.29 miles of KFO, 2.81 miles of BRCA, 3.63 miles of SITLA, and 8.80 miles of private lands.

The proposed project includes the development of a new substation (East Valley) east of Tropic and the expansion of the Hatch Substation. The Tropic Substation would be removed. One new substation would be required in Bryce Valley. The existing Bryce Canyon Substation would be decommissioned, and a new replacement substation to the west of Ruby's Inn would be built. It would be located in one of two new locations (Option 1 on DNF land or Option 2 on private land). Once the proposed 138 kV transmission line is operational, the entire existing 69 kV line from approximately 1 mile east of the existing Tropic Substation to the Hatch Mountain Substation would be removed (approximately 21.57 miles) and the right-of-way rehabilitated.

In addition, under Alternative B approximately 9 miles of distribution lines would need to be constructed primarily on private and SITLA lands in 50-foot rights-of-way in conjunction with the new substations.

A 22.75-mile long two-track access route along the centerline of the proposed right-of-way would provide construction access. Centerline access would not be developed within *limited access areas*, including BRCA and portions of Red Canyon.

Under this alternative the GSENM Management Plan would not be amended.

1.1.2.3. Alternative C: Cedar Fork Southern Route

Like Alternative A, Alternative C would be constructed within a right-of-way crossing public lands administered by the DNF, KFO, GSENM, SITLA, and private lands.

The Alternative C 100-foot-wide right-of-way would extend 29.78 miles. This alternative route would begin at the proposed East Valley Substation located east of Tropic and extend northeast to adjoin the Rocky Mountain Power/PacifiCorp 230 kV transmission line right-of-way. The route would then parallel the west side of the Rocky Mountain Power/PacifiCorp transmission line access to the northwest across

GSENM land and through Cedar Fork Canyon through a planning window for a utility right-of-way identified in the 1986 LRMP. The route would diverge from the 230 kV line access and extend west across John's Valley and follow the south side of State Route (SR) 22 for just under 2 miles and then follow the western boundary of BRCA for approximately 1 mile. The route would then extend west to the north of Bryce Canyon City and across SR 63. The route would continue west across the southern portion of Johnson Bench and to the upper reaches of Right Fork Blue Fly Creek. The route would drop off the plateau at this point and traverse an unnamed canyon to Hillsdale Canyon and would extend south of private property and continue west, crossing U.S. 89, where it would turn to the southwest for approximately 2 miles to the Hatch Substation. This route would cross 13.58 miles of DNF, 3.43 miles of KFO, 3.68 miles of GSENM, 2.06 miles of SITLA, and 7.03 miles of private lands.

In addition to construction of the proposed transmission line, the proposed project includes the development of a new substation (East Valley) east of Tropic and the expansion of the Hatch Substation. Garkane's existing 69 kV transmission line between the Bryce Canyon Substation and Hatch Mountain Switch Station would be unnecessary once the proposed 138 kV transmission line is operational and would be removed (approximately 16.23 miles) and the right-of-way rehabilitated.

The Proposed Action would involve the development of overland access routes in portions of the right-of-way where a suitable route is not available and where development of an access route is permitted by the authorizing agency. Access to the Rocky Mountain Power/PacifiCorp 230 kV transmission line in the Cedar Fork Canyon area would need to be improved. In *limited access areas*, the alignment would be accessed via helicopter and/or foot, and there would be no centerline access.

Alternative C would also require the amendment of the GSENM Management Plan (2000) by changing the designation of a 300-foot-wide 3.68-mile stretch (133.81 acres) of the Primitive Zone to Passage Zone to accommodate both the proposed right-of-way and the existing 230 kV Rocky Mountain Power/PacifiCorp transmission line, as well as provide for future utility needs; and within this area, changing the existing VRM Management Class designation from Class II to Class III.

1.1.2.4. Interconnect Options

The purpose of the interconnect route options is to provide flexibility to decision makers to combine segments of the action alternatives to select the most appropriate route among the various alternatives to minimize impacts to resource values.

The North-South Interconnect option would extend 1.84 miles across DNF land west of Johnson Bench and could connect segments of Alternatives A and C together.

The East-West Interconnect option would extend 3.70 miles across DNF land south of Johnson Bench and could connect segments of Alternatives A and C together.

1.1.2.5. Alternative D: No Action

Though it does not meet the purpose and need statement, the No Action alternative is required under Council of Environmental Quality regulations for implementing the National Environmental Policy Act (NEPA) [40 CFR 1502.14(d)]. For this analysis, the No Action alternative is considered to be the continued operation of the existing 69 kV transmission line and future circumstances that would occur without federal approval of Garkane Energy's proposal to construct and operate a 138 kV transmission line from Tropic to Hatch. Specifically, it means that "no action" would be achieved by any one of the federal agencies declining to grant Garkane permission to build in the agency's respective jurisdiction. Thus, in the case of DNF, "no action" means denying the transmission line easement; for BLM, "no action" means denying approval of the proposed plan amendment and granting of a right-of-way permit for BLM lands; and, for BRCA, "no action" means denying a right-of-way permit. Each agency makes its decision independent of the others, so it is possible that one or more agencies could grant permission for

the proposal while another could deny permission. Thus, if any agency denied permission for the proposed transmission line, it would not be built.

The existing 69 kV transmission line has already passed its life expectancy. To maintain system stability and reliability, Garkane would need to overhaul the line within its existing right-of-way and permit conditions. Overhaul of the existing 69 kV transmission line would involve replacement of conductor and poles. Each pole would be inspected; Garkane estimates as much as 90 percent of the poles would need to be replaced. Overhaul would involve disturbance to the centerline access outside *limited access areas* using vehicles and equipment. Overhaul would require the use of temporary disturbance areas identified in conjunction with Alternative B, as the sites would be needed for pulling and splicing of wire and overall project staging. Total cost would range from 1.4 to 2.1 million dollars.

These activities would increase the amount of trucks, heavy equipment, and crews within the right-of-way far above average annual activity levels.

1.1.3. Impact Inducing Activities on Range Resources

The following activities could cause impacts to grazing livestock, range improvements, or forage resources, which are discussed in this Specialist Report. Effects to vegetation, soils, surface water resources, and wildlife habitat are covered under separate Specialist Reports.

A 100-foot-wide right-of-way would be maintained to allow safe operation of the power line. Depending on the alternative chosen, this right-of-way would cover a total of 353 to 368 acres.

Within the right-of-way, long-term ground disturbance and some long-term loss or gain of forage productivity could occur as a result of the following project activities:

- New access routes would affect approximately 2 acres per mile. The disturbance acreage includes a 10-foot wide access route where existing access does not exist and a 2-foot wide expansion of pre-existing roads where these can be utilized. Approximately 62 acres would be disturbed.
- Installation of permanent erosion control features or new road improvements (0.5 acres per mile; approximately 15 acres total).
- Wood H-Frame structures would be kept clear of vegetation in an area of about 10 feet in diameter (78 ft^2) for each pole (0.0036 acre each two-poled structure; 10 structures per mile, approximately 1.11 acres total).
- One new and one expanded substation would each cover 3 acres on private lands. The existing Bryce Canyon substation would be relocated to the west of Ruby's Inn to one of two new locations. Option 1 would be on DNF land. Option 2 would be on private land. Total disturbance footprint for the relocated substation would be 2 acres. These substations would be fenced and would be unavailable for livestock grazing.
- Re-seeding of disturbed areas using an agency-approved, noxious-weed free seed mix. Depending on timing and environmental conditions, re-seeded areas could be more or less productive than nearby, similar, undisturbed areas.

Temporary ground disturbance would occur only during construction activities and in association with certain maintenance activities. These activities could temporarily displace livestock, make access to water or salt licks more difficult, crush vegetation and decrease forage production, and create openings in fences that allow cattle to wander. These activities include:

- Approximately eight staging areas (2.75 acres per staging area; approximately 22 acres total).
- Conductor pulling sites (1.15 acres at each turning structure or one per 2 to 3 miles; approximately 18 acres total).

- Conductor splicing sites (1.15 acres at each turning structure or 1 per 3 miles; approximately 12 acres).
- Removal of the old 69 kV line.

Once the transmission line was completed, the old 69 kV line would be removed. The ground surface would be restored to its original grade and the wood poles would be hauled away or disposed of at an approved landfill site. Disturbed areas would be re-seeded based on agency management goals and policies. Rubber-tired vehicles, All-terrain vehicles, and pedestrian access would limit the effects of removal on forage resources. Approximately 44 acres would be affected by power line removal.

1.1.4. Range Resource Issue Statement

Transmission line construction activities could reduce resources available for livestock forage.

Right-of-way clearing could result in short-term and long-term loss of forage production on rangelands. Power line construction may temporarily disrupt grazing operations, including water, fences, and grazing systems.

1.2. DESCRIPTION OF AFFECTED ENVIRONMENT

1.2.1. Project and Study Area

The Project Area is in Garfield County, between the communities of Tropic and Hatch in southern Utah. The Project Area includes the following:

- Proposed Action and alternative transmission line right-of-way.
- Temporary work areas.
- Proposed substation sites.
- Proposed access roads and routes, and access improvements.
- Existing 69 kV transmission line right-of-way.

The Study Area provides context for resource effects that may occur within the Project Area in order to quantify the magnitude of effects. The Study Area for range resources includes the grazing allotments that intersect the Project Area. No grazing allotments exist in BRCA, therefore this land area is not discussed in this Specialist Report.

1.2.2. Data Sources

Data came from the management plans of each of the agencies involved and include the DNF LRMP (USFS 1986), the BRCA General Management Plan (NPS 1987), the BLM KFO Final RMP and EIS (BLM 2008a), and the GSENM Management Plan (BLM 2000).

USFS Annual Operation Instructions for grazing permittees provided information regarding vegetation, season of use, number of Animal Unit Months (AUMs; the amount of dry forage one mature cow of approximately 1,000 pounds with a calf requires for one month), and number of permitees on DNF land. This information was accessed via the Forest website (USFS 2008) and through personal contacts. KFO and GSENM RMPs, as well as agency records provided by agency personnel was the source of information for vegetation, season of use, grazing allotments, number of AUMs, and number of permittees on BLM and GSENM lands.

Background information regarding agency direction and historical insight was taken from agency websites, including the BRCA website (NPS 2006), the BLM KFO website (BLM 2008b and 2008c), and, and the DNF website (USFS 2008), as well as each agency's management plan.

1.2.3. Resource Management Direction

The land around the Project Area was settled in the 1860s and 1870s by farmers and ranchers. The number of cattle, sheep, and horses being grazed on public lands outside settled areas increased until the early 1900s. Poor grazing practices resulted in significant harm to rangeland resources on USFS and other federally owned lands. The USFS began regulating and permitting livestock grazing on USFS lands in the area in 1906 (USFS 2008). However, non-forest federal lands (now BLM lands and land contained within the GSENM) continued to be treated as a "commons," in which those who moved their stock onto the range first each season secured the use of new forage growth. After enactment of the Taylor Grazing Act in 1934, grazing allotments were created on non-forest federal lands, and the number and kind of livestock and season of use were established for the area (BLM 2008a).

Livestock use on all federal lands is measured in AUMs, which is the amount of forage one cow or cow-calf pair eats in one month, typically considered around 800 to 1,000 pounds of dry forage plants per month (BLM 2008d).

Livestock management is similar, though not the same, on USFS and BLM lands. The management direction for each of the agencies affected by this project is discussed below. No grazing takes place in BRCA so no impacts would occur to the Range resource.

1.2.3.1. Dixie National Forest Management Direction

Livestock grazing continues to be an appropriate land use on the DNF. The livestock grazing program maintains the long-term productivity of the forage and water resources. Livestock grazing opportunities are supported by a combination of federal and private range. Thus, development of open space is minimized and there is reduced risk of habitat fragmentation caused by future land development. Livestock grazing continues to be an important thread to communities' social fabric (USFS 2006a).

There are 104 grazing allotments on the DNF. As of approval of the 1986 management plan, there were 81 cattle and 23 sheep allotments authorizing grazing of 20,000 head of cattle and their calves, 25,000 head of sheep and their lambs, and approximately 40-60 wild horses.

The DNF management goal is to keep the range resource in an upward trend when it is in less than Good Condition and in a static trend when it is in Good Condition. Maintaining this goal will result in continued improvement of the DNF's range resources; plant composition, ground cover, etc. will be improved; and negative factors such as noxious weed cover will be controlled (USFS 1986).

The DNF has identified rangelands that are "generally suitable" for livestock grazing. There are approximately 770,000 acres of suitable rangeland (about 41 percent) on the DNF. This "general suitability" determination is made at the forest-wide level. Through site-specific analysis, suitability may be further delineated and may differ from the forest-wide determination. Some rangelands are not identified as suitable because they are dedicated to other uses such as administrative sites, campgrounds, designated special areas, or research natural areas.

A suitability determination does not authorize livestock grazing on the Forest, nor does it set livestock grazing capacity or stocking level. Some "unsuitable" areas may be grazed in order to access suitable areas or meet Forest management objectives. Grazing authorization is a site-specific decision made in accordance with the land management plan. (USFS 2006b)

The DNF uses two types of AUMs to manage the forage resource: *permitted* AUMs and *authorized* AUMs. *Permitted* AUMs are the total number of AUMs available within a grazing area, which is defined in each permittees grazing permit. *Authorized* AUMs are the actual number of AUMs the permitee is

authorized to use and is billed for in a given year. The number of authorized AUMs fluctuates based on range conditions. On the DNF between 2001 and 2005, an annual average of 107,000 AUMs were permitted. An average of 87,324 AUMs were authorized annually. Thus, there are typically more AUMs of forage available than are used.

Permitted AUMs have remained relatively stable over the past five years and are expected to remain stable. Authorized AUMs have generally been stable though, as a result of drought conditions, the number of authorized AUMs on the DNF dropped to a low of 68,684 AUMs. The number of permitted sheep has also decreased dramatically (31 percent). The conversion of sheep allotments to cattle allotments has resulted in a 5 percent increase in permitted cattle numbers and a 3 percent increase in cattle AUMs (USFS 2006a).

1.2.3.2. Bryce Canyon National Park Management Direction

BRCA was designated as a monument June 8, 1923 and as a park in September 15, 1928. Grazing was well established at BCNP in the 1920s and dates back to the settlement of the area in the 1870s. Grazing permits for the area were issued by the USFS from 1903 until 1929. The Park Service took over control of grazing with the stipulation that it would refrain from imposing immediate or drastic action on local stockmen. The Park Service undertook a process of gradual reduction of grazing.

By 1936, grazing was eliminated from the north-central area of BCNP. In 1940, there were still over 2,300 sheep and 800 horses and cattle grazing in southern areas of the park. By 1946, sheep grazing was terminated in BCNP. In 1953, there were still about 800 cattle grazing within the park boundaries.

In 1964, grazing was finally eliminated at BCNP. A 13 mile sector of fence was completed to help keep the cattle out (NPS 2006). No livestock grazing occurs in BCNP except for occasional trespassing cattle.

1.2.3.3. Kanab Field Office Management Direction

Range Management in the KFO includes the management of 123 grazing allotments. These allotments are mostly grazed by cattle, although there are some sheep that graze on a few of the allotments. These allotments are scattered from Circleville to Kanab, Utah, and range in size from 1 cow to 200 cows. The overall management objective for grazing management is to improve or maintain existing range condition. To meet this objective, the range staff design and oversee completion of resource improvement projects that are designed to increase plant species diversity along with forage yield. Such projects may include water development, construction of fences to control distribution of livestock, and burning and seeding of sagebrush and/or pinyon-juniper communities in certain areas. Allotment Management Plans (AMPs) are used to guide management of the allotments, and have been developed for have a number of allotments.

Vegetation on the KFO lands consists of sagebrush/grasslands, pinyon/juniper woodlands, and other typical semi-desert and montane plant community types. The understories of these plant communities are interspersed with desert and lower montane grasses, forbs and shrubs. In a few areas, there are open stands of Ponderosa pine (BLM 2008b).

In order to graze livestock on an allotment a permittee needs a grazing permit. Grazing permits require agreement to certain rangeland health standards, and are usually issued for a 10-year period. They can be renewed following a review process. Grazing allotments are monitored periodically to ensure proper stocking rates to prevent overgrazing of forage on allotments using the BLM's *Standards for Rangeland Health* and *Guidelines for Grazing Management for BLM Lands in Utah*. These standards are used to monitor, document, and evaluate rangeland health for proper functioning. By regulation, if the *Standards for Rangeland Health* are not being met, and livestock grazing is determined to be a significant contributing factor, appropriate actions must be taken to improve range conditions within specified time frames.

The BLM uses two types of AUMs to manage the forage resource: *active permitted use*, and *active use*. *Active permitted use*, or the maximum number of AUMs available for use given appropriate conditions, is identified in the permit during this renewal process. *Active use* is the number of AUMs actually used and paid for in a given year.

Although *active permitted use* allows for 18,241 AUMs on all lands administered by the KFO, only 8,895 AUMs of *active use* (49 percent available permitted AUMs) were utilized and paid for during fiscal year 2006. This discrepancy is attributable to several factors including five years of drought, fluctuations in the beef or sheep markets, and/or voluntary nonuse of AUMs by permitees. The majority of forage use is attributed to cattle (more than 97 percent of 116 allotments), with sheep and horses comprising the remainder of domestic livestock use. During the last 13 years, the number of permittees operating out of the KFO ranged from a low of 66 to a high of 97, the total number of cattle and horses ranged from 4,831 to 22,572, and the total number of sheep and goats ranged from 92 to 379. The low year was 2003 (a drought year) and the high year was 1997. As of 2008, BLM allotments are not fully utilized.

Present levels of demand for forage resources are anticipated to continue. In the short term, active use is anticipated to increase because of improving range condition and range recovery from recent drought. In the long term, forage demand is anticipated to continue at current levels (BLM 2008c).

Rangeland health evaluations conducted through 2006 indicate that approximately 93 percent of sites evaluated on the KFO are functioning properly. Of the sites functioning at risk, 62 percent are not improving (static) or are decreasing in condition (static to downward and downward). Downward trends are caused mostly by the encroachment of pinyon-juniper woodlands and the presence of cheatgrass and other invasive species. Lack of species diversity, shrub die-off, and heavy wildlife use are also factors.

The following management assumptions apply to the KFO:

- Livestock grazing will occur throughout the majority of the decision area.
- In the short term, actual forage use in the decision area may increase from current levels due to improving range condition and range recovery from recent drought.
- Over the long term, forage demand may continue at historic levels.
- The goal of range resources management is to improve the condition of the forage, thereby improving grazing management opportunities (BLM 2008c).

1.2.3.4. Grand Staircase Escalante National Monument Direction

The GSENM was established on September 18, 1996 when President William J. Clinton issued a Proclamation under the provisions of the Antiquities Act of 1906. The GSENM is administered by the BLM and was created to protect a spectacular array of historic, biological, geological, paleontological, and archaeological objects and resources.

The Monument includes about 1,870,000 acres of Federal land in south-central Utah in Kane and Garfield counties. There are approximately 15,000 acres of land within the Monument boundary that are privately owned. There is one grazing allotment in the Project Area that is divided into five spring and several summer pastures (16 total) that are used on a two- to three-year rotational basis.

Monument designation does not affect existing permits or leases for, or levels of, livestock grazing. However, allotments are being re-assessed given the new management direction created by monument status, and new allotment management plans are being prepared as a result of monument designation. Grazing is governed by applicable laws and regulations and is currently (BLM 2008a) being managed in a similar manner to other BLM-managed lands in the area. For example, grazing permits or leases specify the types and levels of use authorized, including active livestock grazing and suspended use (land available for grazing but not used due to drought, market conditions, etc.). Grazing permits also include any administrative access granted for operation of the permit, and may include other authorizations (such as overnight camping or group size exceptions) necessary for operation of the permit.

The GSENM management plan goals include promoting healthy, sustainable rangeland ecosystems that provide for livestock forage, recreational opportunities, wildlife habitat, clean air and clean water. It is the intent of GSENM to support a healthy livestock industry that, in turn, supports the local communities and gives land users and stakeholders a meaningful voice in GSENM management decisions. To achieve this, the GSENM has prepared a Monument Management Plan Amendment & Draft Rangeland Health EIS addressing all grazing areas in the Monument. In addition, the GSENM is preparing or updating all Allotment Management Plans (AMPs). The goal of AMPs is to assure the maintenance and improvement of rangeland health for grazing and other uses. The BLM's *Standards and Guidelines for Healthy Rangelands* is used to monitor, document, and evaluate rangeland health using four management goals: proper functioning of watersheds, ecological processes including the hydrologic cycle and energy flow, maintenance of water quality, and maintenance and improvement of habitats for Threatened, Endangered, and Special Status species (BLM 2000).

1.2.4. Baseline Conditions

Figure 1.2-1 shows the proposed transmission line right-of-way alternatives, land ownership and/or management agencies, major highways and communities, substations proposed and existing, grazing allotment boundaries, pasture boundaries (where applicable), water sources and fence lines within 2 miles of the right-of-way, and substation locations.

1.2.4.1. Grazing Allotments

The Project Area includes eleven grazing allotments. Depending on the alternative selected, not all allotments would be disturbed.

Six allotments in the Project Area are on the DNF. Five of these are within the Powell Ranger District, and one is within the Escalante Ranger District. These allotments are used for summer and early fall grazing and are used with pastures in a rotational grazing system. The Hillsdale C&H and Red Canyon allotments on the Powell Ranger District are not active. There are 84 total allotments on the DNF.

Of the 120 allotments managed by the KFO, five allotments are in the Project Area. These allotments are generally used for summer and/or fall grazing. All affected allotments are cattle allotments

Lands affected on the GSENM include one very large grazing allotment, the Upper Paria, and one pasture within this, called the Henderson Pasture. Most grazing in the Upper Paria allotment occurs on areas seeded with crested wheatgrass. The Henderson Pasture is not seeded and thus has a lower forage production per acre than other pastures with seeded areas in the allotment. The Henderson Pasture is used for summer range every two to three years. Because the allotment is so large compared to other allotments within the Project Area, and because there are AUM data available for the pasture itself, analysis in Sections 1.3 and beyond are made for the Henderson Pasture, not the entire allotment. This allotment is managed separately from the KFO allotments, although the National Monument is managed by the BLM.

Figure 1.2-1. Land ownership, Grazing allotments, Pastures, Alternatives, Range Improvements, Major Roads

The number of permittees, cow/calf pairs authorized to graze, and season of use for each allotment within the direct and indirect effects area are listed in **Table 1.2-1**.

Table 1.2-1. Allotment Use Data for USFS, BLM and GSENM Allotments in the Project Area[1, 2]

ALLOTMENTS	FEDERAL ACRES	TOTAL ACRES	# OF PASTURES IN PROJECT AREA & ALLOTMENT	# OF PERMITEES	GRAZING SEASON	ACTIVE AUMS	ALTERNATIVES & SEGMENTS WITHIN THIS ALLOTMENT
Powell Ranger District							
Blue Fly C&H	20,472	20,518	2 of 2	5	June 11- Oct 10	772	A-1, A-2, B, C-1, C-2, C-3, A & C Interconnects, Removal of 69 kV line
East Fork/Crawford	43,187	45,074	1 of 10	4	June 16-Oct 5	1947	B, C-2, Removal of 69 kV line
Pines C&H	27,755	28,288	2 of 4	4	June 1-Oct 10	2011	A-1
Hillsdale C&H	5,713	5,991	NA	0	0	0	A-3, C-3
Red Canyon	9,526	9526	NA	0	0	0	B, Removal of 69 kV line
Escalante Ranger District							
Cameron Wash	14,033	14,192	1 of 3	4	June - October	1068	A-1
KFO							
Hillsdale - 20035	1,483	2,423	1 of 1	1	June 1-Oct 30	140	0
Rock Canyon - 25046	8,281	9,151	1 of 1	2	Oct 1 – Feb 28	484	A-3, B, C-3
Sevier River - 25036	2,308	2,375	1 of 1	1	June 1-Oct 30	340	A-3, C-3
South Canyon - 25044	18,355	19,670	1 of 2	1	June 1-Oct 15	900	B, Removal of 69 kV line
Sunset Cliffs - 04103	2,014	2,141	1 of 1	1	June 1-Dec 1	188	B, Removal of 69 kV line
GSENM							
Upper Paria, Henderson Pasture	10,362	10,362	1 of 16	3	May 1 – Sept 30	150	A-1, C-1

1. Pastures are sub-units of Allotments

2. Sources: USFS 2008; BLM KFO Grazing Files and BLM 2008a; GSENM Grazing Files

1.2.4.2. Range Improvements

There are numerous water supply facilities scattered across the Project Area. Water supply facilities located within two miles of proposed transmission line rights-of-way are shown on **Figure 1.2-1**.

The identification number and legal description (location) of each water supply facility within the different alternative rights-of-way are listed in **Table 1.2-2** below. All but the pond within the Alternative A-1 right-of-way are in good condition. It is in poor condition. There are other water supplies within 0.5 mile of each of these tanks or ponds, except for the pond on the Alternative A-1 right-of-way, where the next closest water is approximately 1.25 miles away. The location and condition of the next closest water supplies are shown in **Table 1.2-2** below. These other water sources include wells, stock tanks, and intermittent drainages.

Table 1.2-2. Water supply facilities within all Alternative Garkane Energy Rights-of-Way

ALTERNATIVE AND SEGMENT	WATER SUPPLY IDENTIFICATION NUMBER	TYPE OF IMPROVEMENT	SERVICEABILITY	LEGAL DESCRIPTION TO QUARTER-QUARTER SECTION	LEGAL DESCRIPTION & SERVICEABILITY OF NEAREST ALTERNATIVE WATER SOURCE
A-1	317420	Pond, earthen	Poor	SE ¼ NE ¼ Section 34 T35S, R4W	T35S, R4W – Section 25, Pond-poor condition (ID 317427)
B	301412	Tank, steel	Good	NW ¼ SE ¼ Section 31, T35S, R4W	T35S, R4W – Section 31, Enclosed Fiberglass tank- good condition (ID 301411)
C-2	301417	Pond, earthen	Good	NW ¼ SE ¼ Section 17, T36S, R4W	T36S, R4W – Section 17: Pond, very poor condition (ID 301418). Section 18 Pond, good condition (ID 301407)
E-W	301401, 341402	Pond, earthen; Trick Tank, steel	Good, Good	NW ¼ NE ¼ Section 13, T36S, R5W	T36S, R4W – Section 13: Pond, good condition (301403). T36S, R5W – Section 18: A spring and trough in poor condition. Enclosed tank in good condition (301203, -205, -206)

There are at least 24 fence crossings within the proposed transmission line rights-of-way recorded in DNF, KFO, and GSENM GIS data. Fence location data is complete for the DNF but may not be complete for BLM or GSENM lands, so there may be more. **Table 1.2-3** below lists the Alternative, allotment and general location of the fence crossings as known as of August 5, 2008.

Table 1.2-3. Fence crossings on all Alternative Garkane Energy Rights-of-Way

ALTERNATIVE & SEGMENT	FENCE TALLY	TYPE OF FENCE AND ALLOTMENT	LEGAL DESCRIPTION/LOCATION
A-1	1-3	Drift fences (3 crossings) on south side of Upper Paria allotment (GSENM) at boundary with private lands	Sec 28, T36S, R2W
A-1	4	Drift fence within the Upper Paria allotment (GSENM)	Sec 17, T36S, R2W
A-1	5	Boundary between north boundary of GSENM and unobligated land on the Escalate RD (DNF)	Sec 18, T36S, R2W
A-1	6	Boundary between unobligated land on the southwest side of the District Cameron Wash allotment (DNF) to the north	Sec 36, T35S, R3W
A-1	7	Boundary between Cameron Wash allotment (DNF) and state land to the west	Sec 34 &35, T35S, R3W
A-1	8, 9	Boundary between South John L. Swale Unit – Pines C&H allotment and private inholdings (DNF)	Sec 34, T35S, R4W
A-1	10	Boundary between South John L. Swale Unit – Pines C&H allotment and North Unit - Blue Fly C&H allotment (DNF)	Sec 33, T35S, R4W
A-2	11	Blue Fly C&H allotment, drift fence boundary between North and South Units (DNF)	Sec 12, T36S, R5W
A-3	12	Boundary between Sevier River allotment (BLM) and Hillsdale C&H allotment (DNF)	Sec 8, T36S, R5W; and Sec 13, T36S R6W
B	1	Drift fence within North Unit - Blue Fly C&H allotment	Sec 36, T35S, R5W
C -1	1-3	Drift fences (3 crossings) on south side of Upper Paria allotment (GSENM) at boundary with private lands	Sec 28, T36S, R2W
C -1	4	Drift fence within Upper Paria allotment (GSENM)	Sec 17, T36S, R2W
C -1	5	Boundary between north boundary of GSENM and unobligated land on the Escalate RD	Sec 18, T36S, R2W
C -1	6	At, and east of, the Bryce 1 and Bryce 2 substation locations, at the north end of East Fork/Crawford allotment, Dave's Hollow pasture (DNF)	Sec 13 & 14, T36S, R4W
C -1	7-9	Three pasture fences at the north end of East Fork/Crawford allotment, Dave's Hollow pasture (DNF)	Sec 15, T36S, R4W
C -1	10	Boundary between South Unit - Blue Fly C&H allotment (DNF) and private land to the east	Sec 16, T36S, R4W
C-2	11	None	Not Applicable
N-S Interconnect	1	Boundary between Blue Fly allotment North Unit and South Unit (DNR)	Sec 7, T36S, R4W
E-W Interconnect	0	None	Not Applicable

* Data taken from interpretation of GIS maps

1.2.4.3. Vegetation and Forage Production

The Vegetation Technical Report discusses plant communities and species within the proposed powerline rights-of-way and includes discussion of invasive plant species. A summary of major vegetation types across the GSENM, DNF, and BLM lands is included below.

Vegetation in the GSENM (Alternative segments A-1 and C-1) is dominated by sagebrush grasslands, with areas of greasewood and shadscale shrublands near the south end of the right-of-way, and Pinyon-Juniper woodlands near the north end of the right-of-way. Scattered rock-dune areas occur throughout the right-of-way. The most productive livestock grazing lands are those that are seeded with crested wheatgrass, and/or smooth brome. None of the proposed rights of way are located on seeded lands within the BLM lands. DNF lands have been seeded in the distant past, as early as the 1950s and, each of the proposed rights-of-way pass through portions of seeded lands. Rock-dune areas are very unproductive.

Vegetation on the Escalante RD (Alternative segments A-1 and C-1) is dominated by Pinyon-Juniper woodlands with Ponderosa pine forests to the north and west. Rock-dune areas are scattered throughout the right-of-way.

Vegetation on the Powell RD (Alternative segments A-1, A-2 and A-3, B, C-2 and C-3) is a mix of sagebrush grasslands and Ponderosa pine forests. Ponderosa pines are more common along A-2 and A-3 and C-2 and C-3.

A more specific summary of vegetation types found across the DNF is contained in the Blue Fly Allotment Management Plan. This plan explains that there are five main land/vegetation types. These are: 1) Bench and toe slopes on gravelly loams dominated by ponderosa pine, juniper, black sage, big sage, Indian ricegrass, mutton bluegrass, and seeded smooth brome in certain areas. 2) Fans and flood plains on silt loams dominated by big sagebrush, rabbitbrush, sedges, western wheatgrass, blue grama, and blue grass. 3) Mesas and benches with gravelly loam soils dominated by ponderosa pine, pinyon-juniper stands bitterbrush, Manzanita and some Indian ricegrass. 4) Steep colluvial slopes with gravelly loam soils located below mesa tops that are generally unsuitable for livestock grazing and support mixed timber species. And 5) Rough broken land with highly dissected slopes and numerous rock outcrops, generally classified as very gravelly silt loams. These areas are unsuitable for grazing and support a sparse vegetation cover of ponderosa pine, Manzanita, bristlecone pine and limber pine.

Vegetation on BLM lands (Alternative segments A-3, B, and C-3) are dominated by Pinyon-Juniper woodlands and sagebrush grasslands at lower elevations on BLM and GSENM managed lands to Ponderosa pine forests and open grasslands at higher elevations on the DNF.

The number of acres per AUM, by allotment or pasture, within each right-of-way area was determined by dividing total acres in each allotment by the number of AUMS in the allotment. **Table 1.2-4** below lists AUM information by Alternative and allotment.

Table 1.2-4. Acres/AUM on All Federal Lands for Alternatives A, B, and C Right-of-way, by Allotment

ALLOTMENTS	FEDERAL ACRES	TOTAL ACRES	ACTIVE AUMS	ACRES PER AUM	ALTERNATIVES & SEGMENTS WITHIN THIS ALLOTMENT
Powell Ranger District					
Blue Fly C&H	20,472	20,518	772	27	A-1, A-2, B, C-1, C-2, C-3, N-S and E-W Interconnects, A&C Removal of 69 kV line
East	43,187	45,074	1947	23	B, C-2, A&C Removal of 69

ALLOTMENTS	FEDERAL ACRES	TOTAL ACRES	ACTIVE AUMS	ACRES PER AUM	ALTERNATIVES & SEGMENTS WITHIN THIS ALLOTMENT
Fork/Crawford					kV line
Pines C&H	27,755	28,288	2011	14	A-1
Hillsdale C&H	5,713	5,991	0	N/A	A-3, C-3
Red Canyon	9,526	9,526	0	N/A	B, Removal of 69 kV line
Escalante Ranger District					
Cameron Wash	14,033	14,192	1068	13	A-1
KFO					
Hillsdale – 20035	1,483	2,443	17	46	0
Rock Canyon - 25046	8,281	9,151	484	19	A-3, B, C-3
Sevier River - 25036	2,308	2,375	340	7	A-3, C-3
South Canyon - 25044	18,355	19,670	900	22	B, Removal of 69 kV line
Sunset Cliffs - 04103	2,014	2,141	188	11	B, Removal of 69 kV line
GSENM					
Upper Paria – Henderson Pasture[1]	10,362	10,362	150	69	A-1, C-1

AUM and use data from DNF, BLM, and GSENM grazing files. Acreage data from agency GIS files.

1.This table includes information for only the Henderson Pasture of the Upper Paria allotment (both acreage and AUMs). See section 1.2.3.1.

1.3. IMPACT ANALYSIS

1.3.1. Direct and Indirect Effects

The Proposed Action and Alternatives outlined in previous sections may cause, directly or indirectly, changes in the human environment. This report assesses and analyzes these potential changes for inclusion in the EIS prepared for this proposal.

The terms “effect” and “impact” are synonymous under NEPA. Effects may refer to adverse or beneficial ecological, aesthetic, historical, cultural, economic, social, or health-related phenomena that may be caused by the Proposed Action or Alternatives (40 CFR 1508.8). Effects may be direct, indirect, or cumulative in nature. A direct effect occurs at the same time and place as the action (40 CFR 1508.8(a)). Indirect effects are reasonably foreseeable effects that occur later in time or are removed in distance from the action (40 CFR 1508(b)). In this report, direct and indirect effects are discussed in combination.

1.3.1.1. Indicators and Methods of Analysis

In this Technical Report, effects will be described using indicators developed for each resource. Using the environmental conditions described in Section 1.2 as a baseline, indicators are used to predict or measure change in a resource related to effects of the Alternatives. Some indicators are quantitative and measure effects based on numerical thresholds, while other indicators involve a narrative to qualitatively describe any changes relevant to baseline conditions. Measurement indicators used for analysis included:

- Number of acres in each grazing allotment that would be affected during the short- and long-term under each alternative.
- The estimated change in available forage, measured as available AUMs, on disturbed areas under each alternative, by allotment or timber area, during the short- and long-terms.
- Effects to range improvements that would be affected under each alternative, and the number and type of range improvements affected.
- Presence or absence of alternative allotments or pastures that could be used to provide additional forage resources for livestock displaced by construction, operation, or maintenance activities.

The terms used to describe the quality, magnitude, and duration effects of the various Alternatives for the Garkane Energy EIS are listed in **Table 1.3-1** below.

Table 1.3-1. Summary of Terms Used to Describe Effects in this EIS

ATTRIBUTE OF EFFECT		DESCRIPTION RELATIVE TO RANGE RESOURCES
Quality	Beneficial	An improvement in current conditions.
	Adverse	A degradation in current conditions.
Magnitude	Negligible	Changes in acres per AUM, functioning of range improvements, and/or cattle distribution are not noticeable or measurable.
	Minor	Changes in acres per AUM, functioning of range improvements, and/or cattle distribution are measurable but the change is temporary. Changes in overall forage production for the affected area are within typical yearly fluctuation ranges. Any changes in cattle distribution requires very little planning or time for relocation.
	Moderate	Changes in acres per AUM, functioning of range improvements, and/or cattle distribution are measurable. Changes in overall acres per AUM are beyond expected yearly fluctuations. Changes to cattle distribution result in short-term shifts in pasture and/or allotment use that requires measurable planning and time for relocation and extends over more than one season or rotation of use.
	Major	Changes to large portions of the vegetation community of the affected allotment or pasture occur, and either eliminate or improve acres per AUM so that there can be a long-term change in the livestock use of the affected allotment or pasture.
Duration	Short-term	One to five years in duration.
	Long-term	More than five years in duration.

The number of acres in each grazing allotment that would be affected during the short- and long-term under each alternative was determined using GIS mapping of the proposed and alternative routes. Because actual transmission pole locations are not known at this time, the average distance between poles

and disturbance area per pole for short-term and long-term disturbances were figured based on information in the Plan of Development. These numbers were multiplied by the linear distance of the powerline corridor to determine affected acreage.

The number and type of range improvements affected under each alternative was determined by reviewing DNF, BLM, and GSENM data and GIS maps. BRCA data was not reviewed because there is no grazing within this park. A list was tallied (focusing on water supply facilities and fencing), and the magnitude of the potential effect was evaluated based on the proximity of remaining range improvements and the topography of the site in question. Range improvements outside of the project right-of-way were not considered in the impact analysis because impacts from construction and operation would be localized and the likelihood of impacts spreading beyond the right-of-way is minute.

A general picture of forage production was determined for lands within the Garkane Energy Project Area for the right-of-way, short-term and long-term disturbance areas by allotment, and by pasture within these allotments where applicable. This was accomplished by dividing the total acreage of the allotment or pasture by the available AUMs in that allotment or pasture to get acres per AUM. The change in available forage was measured by the change in total AUMs available due to construction or operation disturbance. This was determined by dividing total acres affected due to project development by the number of acres per AUM in that allotment or pasture.

Presence or absence of alternative grazing allotments or pastures that could be used to provide additional forage resources for displaced livestock was determined by map interpretation and discussion with the appropriate KFO, DNF.

1.3.1.2. Direct and Indirect Effects by Alternative

Impacts Common to All Action Alternatives

Construction

Tables displaying AUMs lost during construction do not include the effects of re-seeding the powerline right-of-way after construction is complete. Forage volumes could increase if seeded areas grew in well, which would decrease the acres required per AUM. However, such an increase would be negligible compared to the total amount of forage produced per acre, the number of acres required to provide one AUM of forage, and the total number of AUMs supported in each allotment.

Because livestock utilize each allotment for only part of the year (see **Table 1.2-1** for Season of Use), livestock may not be on affected allotments while construction activities are occurring, thus, no impacts would occur. If livestock were utilizing allotments while construction took place, Garkane would be required to coordinate construction activities and dates with existing permitees so that cattle could be moved to other areas (if necessary). Effects of construction activities on livestock would be negligible.

Removal of 69kV Transmission Line

There are no grazing allotments within BRCA or east of BRCA, therefore impacts to range resources from removal of the 69kV line would result from removal of the line west of BRCA, and would be the same for all action alternatives.

Table 1.3-2 includes a summary of the disturbance acreage that would occur in each allotment and pasture for the 100-foot right-of-way and the short-term disturbance area if one of two other combined right-of-way options were chosen. No structures would be left in place under this option, and work sites associated with powerline removal would be re-seeded if required by the managing agency.

Table 1.3-2. Disturbance Acreage for 69kV Transmission line Removal

Allotment	Total Acres	Disturbance (Acres)[1]		Percent of Total Acres	
		Alt A	Alt C	Alt A	Alt C
Blue Fly, North Unit - DNF	6,034.4	4.82	7.25	.08	.12
Red Canyon – DNF	9,526.0	2.27	2.27	.02	.02
South Canyon – BLM	19,670.1	5.15	5.15	.03	.03
Sunset Cliffs - BLM	2,140.8	3.21	3.21	.15	.15
Total DNF	**22,237.9**	**31.70**	**12.70**	**.14**	**.06**
Total BLM	**21,810.9**	**8.36**	**8.36**	**.04**	**.04**

Acreage data from agency GIS files

[1] A portion of the acres affected could include pre-existing two-track or gravel roads. These roads generally would provide less forage than nearby, un-roaded acres. The effective acres of forage lost in each allotment is slightly *less* than stated in this table, although the decrease would be negligible..

[2] Disturbance would be limited to short-term disturbance associated with transmission line removal. No long-term disturbances are anticipated

Re-seeded areas would generally re-establish vegetative cover within one to five years of planting. Depending on the success of re-seeding efforts, long-term effects could be either an increase or a decrease in the forage produced per acre. The change in forage production would be affected mostly by the number of acres seeded and the precipitation occurring in the years around when seeding took place.

Removal of the 69kV transmission line would have negligible impacts on range resources. There would be no adverse long-term impacts from powerline removal. Temporary disturbance on the DNF would include 31.7 acres under Alternative A and 12.70 acres under Alternative C, affecting less than 0.2 percent of any allotment. Temporary disturbance on BLM lands would include 8.36 acres under either alternative. Less than 0.2 percent of any allotment would be affected.

The amount of forage lost due to removal of the 69 kV transmission line would be the equivalent of less than one AUM, except on the East Fork/Crawford allotment; where just over 1 AUM of forage would be lost. Effects would be negligible. Beneficial impacts to range resources could result if forage volumes increased from seeded areas growing in well. However, such an increase would be negligible compared to the total amount of forage produced, and the total number of AUMs supported in each allotment.

There is one water supply facility on the existing 69kV right-of-way in the north-central portion of the North Unit of the Blue Fly C&H allotment (Water Supply Facility 301412, see **Table 1.2-2**). It is on a pipeline that connects numerous water supply facilities in the Blue Fly and Pines allotments. The flexibility inherent in electric transmission line construction allows avoidance of small ponds, water tanks, and other water sources. It is expected that this water supply facility can be avoided. Effects to water supply facilities would be negligible.

The right-of-way parallels a fence located in the northwest side of the Blue Fly C&H Allotment – North Unit. Range improvements (e.g., fences, water developments, corrals, cattle guards) would be identified and protected from any damage associated with project activities. Garkane is required to provide timely repair of all structures affected by it activities. If fences are repaired in a timely manner, effects would be negligible.

Alternative A: Proposed Action

Construction

Table 1.3-3 includes a summary of the disturbance acreage in each allotment and pasture for the 100-foot right-of-way, short-term disturbance, and long-term disturbance areas for Alternative A, Segments A-1, A-2, and A-3. The percent of affected land in each pasture for each allotment is also shown. An analysis of the effects of the project on DNF, KFO, and GSENM rangelands follows **Table 1.3-3**.

Table 1.3-3. Disturbance acreage for Alternative A by Transmission Line Segment and Allotment

Alt Seg.	Allotment	Total Acres	Short-term Disturbance (Acres)	Percent of Total Acres	Long -term Disturbance (Acres)	Percent of Total Acres
A-1	Upper Paria, Henderson Pasture - GSENM	10,361.90	23.27	0.22%	6.76	0.07%
A-1	Cameron Wash, Dipping Vat Unit - DNF	6,100.20	3.26	0.05%	0.50	0.01%
A-1	Pines, So. John L. Swale Unit – DNF	8,182.30	21.30	0.26%	6.04	0.07%
A-1	Pines, Berry Springs Unit – DNF	7,047.60	6.75	0.10%	1.67	0.02%
A-1	Blue Fly, North Unit - DNF	6,304.40	19.29	0.31%	4.25	0.07%
A-1	Subtotal	37,996.40	73.86	0.19%	19.23	0.05%
A-2	Blue Fly, North Unit - DNF	6,304.40	11.36	0.18%	2.11	0.03%
A-2	Blue Fly, South Unit - DNF	14,213.30	3.47	0.02%	0.38	0.00%
A-2	Subtotal	20,517.70	14.83	0.07%	2.49	0.04%
A-3	Blue Fly, South Unit, DNF	14,213.30	1.81	0.01%	1.68	0.01%
A-3	Hillsdale C&H – DNF	5,991.40	28.34	0.47%	4.87	0.08%
A-3	Sevier River – BLM	2,375.40	15.84	0.67%	3.33	0.14%
A-3	Rock Canyon – BLM	9,151.40	7.45	0.08%	1.64	0.02%
A-3	Subtotal	31,731.50	53.44	0.17%	11.53	0.04%
	Total DNF	47,839.20	95.58	0.20%	21.50	0.04%
	Total BLM	11,526.80	23.29	0.20%	4.98	0.03%
	Total GSENM	10,361.90	23.27	0.05%	6.76	0.05%

Alt Seg.	Allotment	Total Acres	Short-term Disturbance (Acres)	Percent of Total Acres	Long -term Disturbance (Acres)	Percent of Total Acres
	Total	69,727.90	142.13	0.20%	33.24	0.05%

Acreage data from agency GIS files.

Acreage for each segment, grazing allotment, and pasture are listed in the table above. Three allotments and five pastures would be affected. Less than 0.3 percent of any of the land units listed would be affected. The effect of these losses would be negligible.

On KFO lands, the transmission line right-of-way for Alternative A would cover approximately 36.8 acres. Temporary disturbance to construct Alternative A would affect 23.29 acres on two allotments. Less than 0.1 percent of each allotment would be affected. The effect of these losses would be negligible.

On GSENM lands, the transmission line right-of-way for Alternative A would cover approximately 44.6 acres. Temporary disturbance would affect 23.27 acres. Less than 0.1 percent of the allotment would be affected. The effect of these losses would be negligible.

The change in available forage for Alternative A is shown in **Table 1.3-4.** In most cases, less than one AUM is lost during construction activities.

Table 1.3-4. AUM Loss During Construction – Alternative A

Alternative Segment	Allotment	Acres per AUM	Total Acres affected [1]	Total AUMs Lost
A-1	Upper Paria (GSENM)	69	23.27	<1
A-1	Cameron Wash (DNF)	13	3.26	<1
A-1	Pines C&H (DNF)	14	28.05	2
A-1	Blue Fly C&H (DNF)	27	19.29	<1
A-2	Blue Fly C&H (DNF)	27	14.83	<1
A-3	Blue Fly C&H (DNF)	27	1.81	<1
A-3	Hillsdale C&H (DNF)	Not suitable	28.34	Not grazed
A-3	Sevier River (BLM)	7	15.84	2.3
A-3	Rock Canyon (BLM)	19	7.45	<1

This table is based on information in **Tables 1.2-4 and 1.3-2**.

[1] A portion of the acres affected could include pre-existing two-track or gravel roads. These roads generally would provide less forage than nearby, un-roaded acres. The effective acres of forage lost in each allotment is slightly *less* than stated in this table, although the decrease would be negligible.

In the Hillsdale C&H allotment, in particular, the right-of-way is located on unproductive lands that are not suitable for grazing. Construction disturbance would be short-term (generally one growing season or less) and forage production would be very likely to return to near pre-disturbance levels in one to five years. Less than one AUM of forage would be lost in all cases. Effects would be negligible.

There is one water supply facility on Alternative A on Segment A-1 (Water Supply ID 317420), and none on Segments A-2 or A-3. The flexibility inherent in electric transmission line construction allows avoidance of small ponds, water tanks, and other water sources. It is expected that this water supply facility can be avoided. Effects to water supply facilities would be negligible.

There are 12 fence crossings on the Alternative A right-of-way, shown on **Figure 1.2-1**. Range improvements (e.g., fences, water developments, corrals, cattle guards) would be identified and protected from any damage associated with project activities. Garkane is required to provide timely repair of all structures affected by construction Operation and maintenance. With installation of stock gates at fence crossings, effects would be negligible.

Operation and Maintenance

The acreage analyzed as disturbed during operation and maintenance includes only newly disturbed lands and does not include pre-existing roadways or other disturbances. Long-term disturbance associated with Alternative A on DNF-managed land would affect approximately 21.5 acres on six allotments, or approximately 0.08 percent of the acreage of the allotments affected in all segments.

On BLM lands, long-term disturbance would affect approximately 5 acres in two allotments. Percentage of allotment acres affected for all segments and all disturbance types is less than 0.14 percent on each allotment. The effect of these losses would be negligible.

On GSENM lands, long-term disturbance would affect 6.8 acres, or 0.07 percent of lands in the Upper Paria allotment. The effect of this loss would be negligible.

Operations and maintenance under the Proposed Action would impact seven allotments. Each segment would only result in loss of less than 1 AUM per allotment. In total, the Blue Fly C&H allotment could lose less than 3 AUMs under the Proposed Action as it would be impacted by all three segments. This loss would be negligible. In addition, there would be no anticipated effects to water developments or fences during operation. There would be no anticipated need to find alternate grazing lands; thus there would be no effect on livestock.

Alternative B: Parallel Existing 69 kV Route

Table 1.3-5 includes a summary of the disturbance acreage in each grazing allotment and pasture for the 100-foot right-of-way, short-term disturbance, and long-term disturbance areas for Alternative B. The percent of affected land in each pasture for each allotment is also shown. BRCA is not included in this analysis because there is no livestock grazing in the park, thus there would be no effect to livestock-related range resources. An analysis of the effects of the project on DNF, KFO, and GSENM rangelands is included below the table.

Table 1.3-5. Disturbance acreage for Alternative B by Allotment

Allotment	Total Acres	Short-term Disturbance (Acres)[1]	Percent of Total Acres	Long-term Disturbance (Acres)[1]	Percent of Total Acres
Blue Fly – North Unit - DNF	6,304.40	19.53	0.12%	3.23	0.05%
East Fk/Crawford, Dave's Hollow - DNF	6,407.50	30.63	0.48%	6.14	0.10%
Red Canyon - DNF	9,526.00	13.63	0.02%	0.3	0.00%
Sunset Cliffs – BLM	30,016.40	12.13	0.01%	2.6	0.01%
South Canyon - BLM	19,670.10	25.94	0.03%	5.5	0.03%

Allotment	Total Acres	Short-term Disturbance (Acres)[1]	Percent of Total Acres	Long-term Disturbance (Acres)[1]	Percent of Total Acres
Rock Canyon - BLM	9,151.40	7.26	0.03%	1.2	0.01%
Total DNF	**22,237.9**	**63.80**	**0.19%**	**8.2**	**0.04%**
Total BLM	**58,837.9**	**45.34**	**0.02%**	**9.3**	**0.02%**
TOTAL	**81,075.80**	**109.13**	**0.07%**	**17.5**	**0.02%**

Acreage data from agency GIS files.

[1] A portion of the acres affected could include pre-existing two-track or gravel roads. These roads generally would provide less forage than nearby, un-roaded acres. The effective acres of forage lost in each allotment is slightly *less* than stated in this table, although the decrease would be negligible.

Construction

On the DNF, the transmission line right-of-way for Alternative B covers approximately 82.3 acres. Temporary disturbance would affect 63.8 acres. Acreage for each segment, allotment, and pasture are listed in the table above. Three allotments would be affected. The percentage of each allotment affected would be less than 0.6 percent in all cases. The effect of this loss would be negligible. On BLM lands, the transmission line right-of-way for Alternative B would cover approximately 92.3 acres. Temporary disturbance would affect 45.34 acres on two allotments. The percentage of each allotment affected would be less than 0.1 percent in all cases. The effect of this loss would be negligible. Alternative B does not pass through GSENM lands, thus there would be no effects.

Total number of AUMs lost during construction for each segment in each allotment is shown in **Table 1.3-6**. The amount of forage lost would be less than one AUM except in the East Fork/Crawford Allotment, Dave's Hollow Pasture, where approximately 1.5 AUMs of forage would be lost during construction.

Table 1.3-6. AUM Loss During Construction – Alt B

Allotment	Acres per AUM	Construction Acreage affected[1]	Total AUMs LOST
Blue Fly, North Unit – DNF	27	19.53	<1
East Fk/Crawford, Dave's Hollow - DNF	23	30.63	1.3
Red Canyon - DNF	N/A	13.63	0
Sunset Cliffs –BLM	11	12.13	1.1
South Canyon - BLM	22	25.94	1.2
Rock Canyon - BLM	19	7.26	<1

This table is based on information in **Tables 1.2-4 and 1.3-5**

1 A portion of the acres affected could include pre-existing two-track or gravel roads. These roads generally would provide less forage than nearby, un-roaded acres. The effective acres of forage lost in each allotment is slightly less than stated in this table, although the decrease would be negligible.

The Red Canyon allotment is not currently grazed. Construction disturbance would be short-term (generally one growing season or less) and forage production would be very likely to return to near pre-disturbance levels in one to five years. The total AUMs lost would be less than one in all allotments

except for the East Fork/Crawford, Dave's Hollow, where 1.5 AUMs would be lost. Effects of forage loss would be negligible.

There is one water supply facility on Alternative B in the north-central portion of the North Unit of the Blue Fly C&H allotment (Water Supply ID 301412 [Transcon 2008]). It is on a pipeline that connects numerous water supply facilities in the Blue Fly and Pines allotments. The flexibility inherent in electric transmission line construction allows avoidance of small ponds, water tanks, and other water sources. It is expected that this water supply facility can be avoided. Effects to water supply facilities would be negligible.

There is one fence crossing at the east boundary of the Blue Fly C&H allotment and none-forest private land to the east. It is located in Section 36, T35S, R5W (Transcon 2008), and shown on **Figure 1.2-1**. Range improvements (e.g., fences, water developments, corrals, cattle guards) would be identified and protected from any damage associated with project activities. Garkane is required to provide timely repair of all structures affected by construction Operation and maintenance. With installation of stock gates at fence crossings, effects would be negligible.

Substation Distribution Lines

Construction of distribution lines in conjunction with removal of the existing Tropic Substation would not disturb any identified pastures or grazed areas, therefore there would be no impacts to range resources. Identified land uses on private lands potentially crossed by distribution lines to be constructed in conjunction with either of the new Bryce Substation options included pasture, which could potentially impact range resources on private lands. The number of AUMs that these pastures support is unknown. Given the minimal amount of long-term ground disturbance associated with transmission line construction as discussed under Construction above, impacts to these range resources should not be significant.

Operation and Maintenance

None of the allotments crossed by the Proposed Project under Alternative B would see more than approximately 0.1 percent of the total acreage affected, which is less than 1 AUM worth of forage in each allotment. The effect of these losses would be negligible.

In addition, there would be no anticipated effects to water developments or fences during operation. There would be no anticipated need to find alternate grazing lands; thus there would be no effect on livestock.

1.3.1.3. Alternative C: Cedar Fork Southern Route

Construction

Table 1.3-7 includes a summary of the disturbance acreage in each allotment and pasture for the 100-foot right-of-way, short-term disturbance, and long-term disturbance areas for Alternative C: Segments C-1, C-2, and C-3. The percent of affected land in each pasture for each allotment is also shown. An analysis of the effects of the project on DNF, KFO, and GSENM rangelands is included below the table.

Table 1.3-7. Disturbance acreage for Alternative C by Transmission Line Segment and Allotment

Alt Seg	Allotment	Total Acres	Short-term Disturbance (Acres)[1]	Percent of Total Acres	Long-term Distur-bance (Acres)[1]	Percent of Total Acres
C-1	Upper Paria, Henderson Pasture - GSENM	10,361.9	23.27	0.07%	6.73	0.06%
C-1	East Fk. Crawford, Dave's Hollow Unit - DNF	6,407.5	42.76	0.50%	3.96	0.06%
C-1	East Fk. Crawford, East Creek Unit	3,814.98	1.57	0.04%	0.59	0.02%
C-1	Blue Fly, South Unit - DNF	14,213.3	5.40	0.03%	0.57	0.00%
C-1	**Subtotal**	**30,982.7**	**73.00**	**0.14%**	**11.85**	**0.03%**
C-2	Blue Fly, South Unit - DNF	14,213.3	21.67	0.08%	3.92	0.03%
C-2	**Subtotal**	**14,213.3**	**21.67**		**3.92**	**0.03%**
C-3	Blue Fly, South Unit - DNF	14,213.3	10.71	0.02%	3.15	0.02%
C-3	Hillsdale – DNF	5,991.4	30.36	0.27%	3.86	0.06%
C-3	Sevier River – BLM	2,375.4	12.16	0.32%	3.53	0.15%
C-3	Rock Canyon – BLM	9,151.4	7.44	0.03%	1.64	0.02%
C-3	**Subtotal**	**31,731.5**	**60.67**	**0.09%**	**12.18**	**0.04%**
C-1, 2, 3	**TOTAL DNF**	**26,612.2**	112.47	**0.25%**	15.45	0.03%
C-1, 2, 3	**TOTAL BLM**	**11,526.8**	**19.60**	**0.09%**	**5.17**	**0.04%**
C-1, 2, 3	**Total GSENM**	**10,361.9**	**23.27**	**0.07%**	**6.73**	**0.06%**
C-1, 2, 3	**TOTAL**	**48,500.9**	155.34	**0.17%**	27.36	0.03%

Acreage data from agency GIS files.

[1] A portion of the acres affected could include pre-existing two-track or gravel roads. These roads generally would provide less forage than nearby, un-roaded acres. The effective acres of forage lost in each allotment is slightly *less* than stated in this table, although the decrease would be negligible.

On the DNF, the transmission line right-of-way for Alternative C, Segments C-1, C-2, and C-3 would cover approximately 212.5 acres. Temporary disturbance would affect approximately 112.47 acres for Alternative C. The right-of-way and short-term disturbance would affect three allotment and one pasture in each allotment. No pasture or allotment would see more than 0.5 percent of its acreage affected. The loss of this acreage would have negligible effect on range resources. On BLM lands, the transmission line right-of-way for Alternative C, Segments C-1, C-2, and C-3 would cover approximately 38.2 acres. Temporary disturbance would affect 112.47 acres on two allotments. No pasture would see more than 0.5 percent of its acreage affected. The loss of this acreage would have negligible effect on range resources. On GSENM lands, the transmission line right-of-way for Alternative C, Segments C-1, C-2, and C-3 would cover approximately 44.6 acres. Temporary disturbance would affect 23.27 acres. This would affect less than 0.1 percent of the pasture. The loss of this acreage would have negligible effect on range resources.

The total number of AUMs lost during construction for each segment in each allotment is shown in **Table 1.3-8** below.

Table 1.3-8. AUM Loss During Construction – Alt C

Alternative Segment	Allotment	Acres per AUM	Construction Acreage affected[1]	Total AUMs Lost
C-1	Upper Paria, Henderson Pasture - GSENM	69	23.27	<1
C-1	East Fk. Crawford,	23	44.33	1.9
C-1	Blue Fly C&H - DNF	27	5.40	<1
C-2	Blue Fly C&H - DNF	27	21.67	<1
C-3	Blue Fly, South Unit - DNF	27	10.71	<1
C-3	Hillsdale C&H – DNF	Not used	30.36	0
C-3	Sevier River – BLM	7	12.16	1.7
C-3	Rock Canyon – BLM	19	7.44	<1

This table is based on information in **Tables 1.2-4 and 1.3-7.**

[1] A portion of the acres affected could include pre-existing two-track or gravel roads. These roads generally would provide less forage than nearby, un-roaded acres. The effective acres of forage lost in each allotment is slightly *less* than stated in this table, although the decrease would be negligible.

Construction disturbance would be short-term (generally one growing season or less) and forage production would likely approach, and could slightly exceed, pre-disturbance levels in one to five years. Forage loss would not exceed one AUM except on the East Fork/Crawford allotment (1.9 AUMs) and the Sevier River allotment (1.7 AUMs). These effects would be negligible to allotment resources.

There is one water supply facility on Alternative C on Segment C-2 (Water Supply ID 301417) and none on Segments C-1 or C-3. The flexibility inherent in electric transmission line construction allows avoidance of small ponds, water tanks, and other water sources. It is expected that this water supply facility can be avoided. Effects to water supply facilities would be negligible.

There are 11 fence crossings on Alternative C shown on **Figure 1.2-1**. Range improvements (e.g., fences, water developments, corrals, cattle guards) would be identified and protected from any damage associated with project activities. Garkane is required to provide timely repair of all structures affected by construction Operation and maintenance. With installation of stock gates at fence crossings, effects would be negligible.

Operation and Maintenance

Long-term disturbance associated with Alternative C on DNF land would affect approximately 15.5 acres on three allotments. The percentage of each allotment affected is 0.06 percent or less. The effect of these losses to allotment acreage would be negligible. On BLM lands, long-term disturbance would affect approximately 5.2 acres in two allotments. The percentage of each allotment affected is 0.15 percent or less. The effect of these losses to allotment acreage would be negligible. On GSENM lands, long-term disturbance would affect 6.7 acres, or 0.06 percent of lands in the Upper Paria allotment. The effect of these losses to allotment acreage would be negligible.

The change in available forage due to right-of-way disturbances would be long-term; however, in each case the loss would be the equivalent of less than 1 AUM. This loss would be negligible.

There would be no anticipated effects to water developments or fences during operation. There would also be no anticipated need to find alternate grazing lands; thus there would be no effect on livestock.

Interconnect Options

Construction

Table 1.3-9 includes a summary of the disturbance acreage in each allotment and pasture for the 100-foot right-of-way, short-term disturbance, and long-term disturbance areas for the interconnect options. The percent of affected land in each pasture for each allotment is also shown. An analysis of the effects of the project on DNF (as the interconnects are exclusively on DNF managed lands) rangelands is in **Table 1.3-9**.

Table 1.3-9. Disturbance acreage for Interconnect Options by Allotment

Interconnect	Allotment	Total Acres	Short-term Disturbance (Acres)	Percent of Total Acres	Long -term Disturbance (Acres)	Percent of Total Acres
North-South Interconnect	Blue Fly, North Unit - DNF	6,034.4	6.53	0.11%	1.12	0.02%
North-South Interconnect	Blue Fly, South Unit - DNF	14,213.3	7.25	0.05%	1.79	0.01%
North-South Interconnect	**Subtotal**	**20,247.7**	**13.78**	**0.07%**	**2.91**	**0.01%**
East-West Interconnect	Blue Fly, South Unit - DNF	14,213.3	24.97	0.18%	5.85	0.04%
East-West Interconnect	**Subtotal**	**20,204.7**	**24.97**	**0.18%**	**5.85**	**0.04%**

Acreage data from agency GIS files.

The total number of AUMs lost during construction for interconnect option in each allotment is shown in **Table 1.3-10**.

Table 1.3-10. AUM Loss During Construction – Interconnect Options

INTERCONNECT	ALLOTMENT	ACRES PER AUM	CONSTRUCTION ACREAGE AFFECTED[1]	TOTAL AUMS LOST
North-South Interconnect	Blue Fly – DNF	27	6.53	<1
East-West Interconnect	Blue Fly - DNF	27	7.25	<1
East-West Interconnect	Blue Fly - DNF	27	24.97	<1

This table is based on information in **Tables 1.2-4 and 1.3-9.**

[1] A portion of the acres affected could include pre-existing two-track or gravel roads. These roads generally would provide less forage than nearby, un-roaded acres. The effective acres of forage lost in each allotment is slightly *less* than stated in this table, although the decrease would be negligible.

There are no water supplies on the North-South Interconnect. There are two water supply facilities on the East-West Interconnect (Water Supply IDs 301410, 341402). The flexibility inherent in electric transmission line construction allows avoidance of water sources. It is expected that these water supply facility can be avoided. Effects to water supply facilities would be negligible.

There would be one fence crossing for the North-South Interconnect. With installation of stock gates at fence crossings, effects would be negligible.

Operation and Maintenance

Long-term disturbance associated with the North-South Interconnect would be approximately 2.9 acres on one allotment. Long-term disturbance associated with the East-West Interconnect would be approximately 5.9 acres in one allotment. The effect of these losses to allotment acreage would be negligible.

Alternative D: No Action

The BLM and DNF both predict that permitted livestock use will remain stable. The GSENM goal is to "Support a healthy livestock industry that, in turn, supports the local communities" (BLM 2000). There is no grazing within BRCA. Under the No Action Alternative there would be no change to livestock distribution or forage resources associated with the construction and operation of an electric transmission line. No range improvements would be impacted by access routes or structures. There would be no change in the number of people or vehicles accessing remote rangelands that can occur when a backcountry road is upgraded to allow access to an installation such as the electric transmission line.

The existing transmission line would be overhauled including the possible replacement of conductor wire and the majority of the poles. Ground disturbance and resulting impacts to range resources would be similar to, but somewhat less than, that described above for construction under Alternative B. Future maintenance and line operations would be similar to current levels. With routine operation and maintenance of the line, range conditions would remain similar to what they are today, or with proper range and livestock management as committed to in the agencies' management plants, range conditions would continue to slowly improve.

Conversely, no re-seeding would occur on the transmission line right-of-way created by the project. While not certain to occur, it is possible that the re-seeding associated with reclamation work could improve forage production on some weedy or degraded rangelands that the right-of-way passes over. This would be a potential positive effect from the project that would not occur if the project did not go through.

1.3.2. Summary

The proposed Garkane Energy project would pass through four DNF grazing allotments if Alternative A were chosen and three allotments if Alternatives B or C were chosen. The project would pass through two KFO grazing allotments if Alternative A or B were chosen, and three allotments if Alternative C were chosen. One grazing allotment in the GSENM would be affected if the A or C Alternative were chosen. Alternative B does not pass through the GSENM. There is no grazing in the BRCA.

Under each alternative, less than 1 percent of the land area within each allotment, and less than 1 percent of the forage in each allotment would be affected by construction or operation of the Garkane Energy project. Permittees would be contacted prior to any activities and livestock and would not likely be present within allotments when construction activities take place. Operations and maintenance activities would be infrequent and transient and similar in nature to activities that typically occur on open rangelands.

Resource protection measures specified in **Appendix B** should adequately protect the small acreage of rangeland that would be affected by the project.

The magnitude of effects of project construction and operation on range resources and livestock would be negligible, with minor effects possible only if cattle were utilizing the same area at the same time as construction crews.

1.3.3. Cumulative Effects

This section addresses potential cumulative effects that would result from the effects of the Proposed Action or Action Alternatives when combined with the effects of other past, present, and reasonably foreseeable future projects. Cumulative effects are incremental in nature. They can result from individually minor, but collectively significant, actions taken over a period of time.

1.3.3.1. Cumulative Effects Area

The general cumulative effects area (**Figure 1.3-1**) for the project for all resources except wildlife, special status species, and socioeconomics includes all HUC 12 (6^{th} level) watersheds that come within 0.5 mile of the project components. The cumulative effects area encompasses 237,010 acres (**Table 1.3-11**). Land management agencies responsible for managing a range of uses on 204,559 acres of public land are the DNF Powell and Escalante Ranger Districts, the KFO and GSENM, BRCA, and SITLA. Private land ownership accounts for 13.7 percent (32,451 acres) of land within the cumulative effects area.

Table 1.3-11. Cumulative Effects Area – Acreage by Land Ownership/Management

LAND OWNERSHIP/MANAGEMENT	ACRES
U. S. Forest Service - DNF	121,852.4
Bureau of Land Management – KFO	35,133.9
Bureau of Land Management – GSENM	11,981.5
National Park Service – BRCA	17,067.3
SITLA	18,524.1
Private	32,450.9
Total	***237,010.1***

1.3.3.2. Past, Present, and Reasonably Foreseeable Actions

National Forest lands and BLM lands administered by KFO are managed for multiple resource values and uses. In the cumulative effects area, past and present uses include timber and woodland product harvest; livestock grazing; and recreation uses including hunting, fishing, camping, picnicking, hiking, back country driving, and mountain biking. Lands are also available for mining, oil and gas development, and production of mineral materials (building stone and sand and gravel). Roads, transmission lines, pipelines, and communication sites are located on National Forest and other public lands. While these types of uses have resulted in an unknown amount of surface or subsurface disturbance and placement of human-made structures on the landscape, the National Forest and public lands still retain a largely undeveloped appearance. These lands are not characterized by urban or commercial development that is typical of cities and towns.

The GSENM is managed for a variety of resource values and uses, with a mandate from the Presidential Proclamation that established the Monument to protect myriad historic and scientific resources. To meet this objective, BLM manages the Monument to protect its primitive frontier state and safeguard its remote and undeveloped character. Further, BLM manages the Monument to provide opportunities for study of scientific and historic resources. Within this management focus, past and present uses of public lands in the Monument include livestock grazing, recreation, and realty actions. While the Monument is closed to mining and oil and gas development, roads, transmission lines, pipelines, and communication sites are located on these public lands. These uses have resulted in an undetermined amount of surface and subsurface disturbance and placement of human-made structures on the landscape, but public lands in the Monument still retain a largely undeveloped appearance.

BRCA, on the other hand, is managed with an emphasis on protection and enhancement of its unusual scenic beauty and its value for science and education, and for the benefit and enjoyment of the public. Even with this focus on protection and preservation, some past and present development has occurred in the Park for management of visitor use and the protection of Park resources. A paved access road runs the length of the Park, providing access to many sites and facilities, including administrative offices and buildings, Bryce Canyon Lodge, campgrounds, trails, interpretive sites, and others. Other infrastructure, including transmission lines, is also present. Garkane's existing 69 kV transmission line crosses the northern end of the park, as does SR 12. However, even with this development, the vast majority of the Park in the cumulative effects area is undeveloped, and presents a natural landscape.

State lands in the cumulative effects area are managed by SITLA to produce revenue for the State school system. State lands are managed for a variety of uses that produce revenue, and past and present uses include livestock grazing, recreation uses, roads, highways, utility lines, and other commercial uses. Lands are occasionally sold for private development. As with federal lands, these uses result in surface disturbances, but generally, State lands retain an undeveloped appearance. The current amount of surface and subsurface disturbance is unknown.

Private lands in the cumulative effects area are used and developed for a variety of purposes, including residential, commercial, and industrial development in and adjacent to cities and towns. Many acres of private land are in farmland production, including irrigated pastures, range pastures, and hay, grain, and alfalfa.

Figure 1.3-1. General Cumulative Effects Area

Reasonably foreseeable future actions within the cumulative effects area that are currently planned or under review include activities that fall into several broad categories:

- Energy and communications
- Transportation
- Vegetation and fire fuels management
- Habitat improvement
- Land use and management
- Recreation
- Mining
- Miscellaneous

Table 1.3-12 shows activities currently planned, under review, or in permitting in Garfield County that may be pertinent to cumulative effects for one or more resource areas. Projects within Garfield County but outside the cumulative effects area for all resources (except socioeconomics) are labeled "socio only." The table is organized generally by project type (energy, transportation, forest fuels management, etc.), but many of the entries could easily fit into more than one classification.

Table 1.3-12. Reasonably Foreseeable Future Actions in the Cumulative Effects Areas

PROJECT (LEAD AGENCY)	LOCATION	DESCRIPTION	ESTIMATED DISTURBANCE (IF AVAILABLE)
Energy & Communications			
Designation of Energy Corridors (USFS)	Forest-wide	Would designate energy corridors on the DNF and other federal land in 11 western states. Corridor 116-206 would be west of U.S. 89 in the cumulative effects area.	
Geothermal Leasing Programmatic EIS (USFS)	Forest-wide	USFS and BLM are preparing a joint programmatic EIS to analyze leasing of federal lands with moderate to high potential for geothermal resources in 11 western states	
Oil and Gas Leasing Analysis (USFS)	Forest-wide	EIS to evaluate all BLM and USFS administered lands for oil and gas leasing	
Panguitch Lake Power Line Realignment (DNF)	Cedar City RD (Socio only)	Authorization to PacifiCorp for the relocation of 1.2 miles of 12.5 kV power line. Work would involve construction of a new overhead power line and removal of the old line. Area is approximately 17 miles southwest of Panguitch.	
South Central Utah Telephone Association (SCSRA) I-15 to U.S. 89 Fiber Optic Line (BLM)	(Socio only)	Fiber optic line from I-15 in Iron County to U.S. 89 in Garfield County 7.5 miles north of Panguitch requiring BLM right-of-way	

PROJECT (LEAD AGENCY)	LOCATION	DESCRIPTION	ESTIMATED DISTURBANCE (IF AVAILABLE)
Oil and Gas Lease Sales (BLM)	BLM	Ongoing BLM program to lease lands suitable for oil and gas development, including lands in Garfield County classified as having high potential for oil & gas development	
Transportation			
DNF Motorized Travel Plan (DNF)	Forest-wide	To identify changes to the motorized travel system (roads) to meet administrative, fire, recreational, and resource needs; will generally prohibit cross-country (off-road) motorized travel on the Forest, but would remain open to hiking, horseback riding, cross-country skiing, and snowmobile use.	
Mammoth Highway Easement (DNF)	Cedar City RD (Socio only)	Issuance of a right-of-way easement to Garfield and Kane Counties for Mammoth Highway (Forest Road 068), northeast of Duck Creek Village, between State Highways 14 and 143.	
Tropic Canyon Highway Stabilization Project (BRCA)	BRCA	Repair and stabilize SR 12 and introduce water diversion into Tropic Wash, west of Tropic	210 linear feet of road shoulder; 5 stream barbs in Tropic Wash
SR-12 Environmental Study (UDOT, FHWA, GSENM)	Escalante to Boulder (Socio only)	EA for project to obtain over 14 miles of right-of-way from BLM and generally upgrade SR 12	
SR-12 Scenic Byway Improvements (UDOT, GSENM)	SR 12 throughout Garfield County	Improve overlooks, interpretive sites, and gateway features	
SR-12 Corridor Management Plan Implementation (UDOT, GSENM)	SR 12 throughout Garfield County	Corridor Management Plan Implementation	
US-89 from SR-14 to Hatch (UDOT)	SR-14 to Hatch	Bituminous pavement, reconstruction, widen shoulders	
Notom Road (UDOT)	(Socio only)	Engineering and environmental study, preparatory to road improvements	

PROJECT (LEAD AGENCY)	LOCATION	DESCRIPTION	ESTIMATED DISTURBANCE (IF AVAILABLE)
Vegetation and Fire Fuels Management			
Aerial application of fire retardant (DNF, KFO, GSENM)	Forest-wide	The USFS proposes to continue the aerial application of fire retardant to fight fires on National Forest System lands, including the DNF.	
Right-of-way Lakes Timber Management (DNF)	Freemont River RD (Socio only)	Fuels Management Reduction on approximately 600 acres of forested land to reduce the impacts of insects and disease	600 acres
Stump Springs Fire Treatments (DNF)	Escalante RD (Socio only)	Project uses prescribed fire treatments to disturb vegetation, slowly moving heterogeneous patches towards a fine-grained landscape that is more resistant and resilient to fire and other disturbance.	Approximately 5,400 acres over 9 years
Clayton Salvage (DNF)	Escalante RD (Socio only)	Timber salvage of 248 acres of dead and dying spruce on the Griffin Top Plateau.	248 acres (2008)
Pockets Vegetation Management (DNF)	Escalante RD (Socio only)	The Project is designed to reduce bark beetle risk and improve habitat for northern goshawk. It would include commercial timber harvest, pre-commercial stand treatment, fencing, and travel management. The Project covers an area of 8,564 acres and would include commercial timber harvest on 4,721 acres of conifers and 2,647 acres of aspen, including 82 acres along the Antimony Creek drainage. Smaller areas would receive additional treatments. In addition, 9 miles of new roads would be required, 7.0 miles of unauthorized roads would be designated NFS roads, and 13.4 miles of existing NFS roads would be improved.	8,564 acres 9 miles of new roads 7.0 miles added to system roads
Toad Salvage (DNF)	Escalante RD (Socio only)	Salvage of dead and dying ponderosa pine within the perimeter of a Wildland Fire Use burn area. September 2007, 1400 acres burned.	230 acres
Boulder Town Fire Protection (DNF)	Escalante RD (Socio only)	Boulder was identified as a community at risk and a Community Wildland Fire Protection Plan was developed. 65 acres of prescribed burns and 186 acres of vegetative treatments are planned to provide community protection.	251 acres
Bug Lake Salvage Project (DNF)	Escalante RD (Socio only)	Timber Salvage of dead and dying spruce on the Aquarius plateau will use existing Forest roads with approximately 1 mile of road reconstruction.	228 acres (2007)

PROJECT (LEAD AGENCY)	LOCATION	DESCRIPTION	ESTIMATED DISTURBANCE (IF AVAILABLE)
Dugout/Tarantula Mesa Veg. Project (BLM)	Richfield FO (Socio only)	Utilize mechanical (chainsaw, handsaws, etc.) to cut, lop, and scatter the pinyon and juniper trees that have encroached into the existing chainings that were established in the 1960s	
North Wash Tamarisk Control Project (BLM)	Richfield FO (Socio only)	Removal and chemical control of 20 acres of tamarisk (salt cedar) approximately 30 miles southeast of Hanksville in the Fiddler Butte Wilderness Study Area	
Bear Creek Fire Salvage and Reforestation, DNF, CE	Garfield County (Socio cumulative effects area only)	Salvage fire killed and damaged trees within the 1400-acre Bear Creek burn area	
Corn Creek Salvage and Reforestation, DNF, EA	Garfield County (Socio cumulative effects area only)	Salvage dead and dying timber and reforest areas within burn with inadequate stocking in a 2270-acre burn	
Paunsaugunt Aspen Vegetation Management, DNF, EA	Powell Ranger District	Manage aspen stands to increase aspen regeneration, reduce conifer encroachment, and develop multi-aged aspen stands	
GSENM Plan Amendment & Rangeland Health EIS	GSENM	The GSENMManagement Plan Amendment and Rangeland Health EIS describes and analyzes alternatives for management of livestock grazing on public lands administered by the BLM.	2,168,726 acres (GSENM, Glen Canyon NRA, & KFO)
Habitat Improvement			
Cooperative Fisheries Enhancement Projects (DNF)	Powell RD	In cooperation with UDWR, re-establish native trout populations in 2 streams on the DNF (also 8 streams on the Fishlake National Forest)	
Marshall Canyon Pinyon-Juniper Removal (DNF)	Powell RD (Socio only)	The Proposed Action is to treat up to 900 acres within an existing chained area to improve wildlife habitat on the western portion of the Sevier Plateau (Mt. Dutton). The Proposed Action consists of the following actions: Remove pinyon pine and juniper mechanically on approximately 900 acres using a skid steer (bobcat) or other tractor type device, or through hand thinning with chainsaws. Broadcast seed into seedbed using forbs and grass mixture. Where needed, native seed will be part of this mixture.	900 acres

PROJECT (LEAD AGENCY)	LOCATION	DESCRIPTION	ESTIMATED DISTURBANCE (IF AVAILABLE)
Antelope Springs Draw Sagebrush Steppe Habitat Enhancement (DNF)	Escalante RD[1] (Socio only)	Mow or brushbeat 500 acres of dense even-aged sagebrush and interseed a native grass and forb mixture.	500 acres
Dipping Vat Habitat Improvement Project (DNF)	Escalante RD	Project would include the thinning of pine forests and the mechanical treatment of sagebrush for habitat improvement and fuels reduction in Johns Valley, approximately 7 miles north of Tropic. The Project would affect approximately 1,132 acres.	1,132 acres (2010)
Boulder Creek Wildlife Habitat Improvement (DNF)	Escalante RD (Socio only)	Removing encroaching conifers to restore Aspen Grove wildlife habitat	
Aquatic Monitoring Amendment, DNF	Forest-wide	Proposal to amend the Aquatic Management Indicator Species (MIS) in the DNF LRMP	
East Fork Boulder Creek Fish Passage Improvement DNF, CE	Garfield County (Socio cumulative effects area only)	Replace a culvert that is inhibiting fish passage on Road 166 with a new span designed for high and low flow maintenance of all aquatic species	
Land Use and Management			
Resources Management Plan (BLM)	Richfield Field Office BLM (Socio only)	Comprehensive Resource Management Plan for public lands and resources managed by the BLM Richfield Field Office	
Resources Management Plan (KFO)	KFO BLM	FEIS and Resource Management Plan for public lands and resources managed by the KFO	
First Annual Centennial Strategy for Bryce Canyon National Park (BRCA)	BRCA	Reduce private vehicle use by providing public transportation for park visitors; planning addition of a bicycle transportation system in park; restore historic buildings; treat 193 acres of exotic weed infestation; inventory and assess condition of 224 identified archaeological sites	
Panguitch Lake Resort	Panguitch Lake (Socio only)	RV timeshare resort around Panguitch Lake that is under development	
Incorporation of Ruby's Inn	Ruby's Inn	Ruby's Inn was incorporated as Bryce Canyon City. Ruby's Inn has a single land owner. The intention of incorporating is to prepare for subdivision and growth.	

PROJECT (LEAD AGENCY)	LOCATION	DESCRIPTION	ESTIMATED DISTURBANCE (IF AVAILABLE)
Recreation			
Red Canyon bike trail extension (DNF)	Powell RD	Extend existing bike trail along SR 12 3.1 miles east to the East Fork of the Sevier River Road.	
Canaan Mountain Reroute (DNF)	Escalante RD (Socio only)	The Canaan Mountain Loop Trail approximately 14.5 miles southwest of Escalante would be rerouted to move it off a waterline, reduce its grade, and provide for improved maintenance.	
Mossy Cave Trail Rehabilitation and Resource Protection (BRCA)	BRCA	Large boulders from Water Canyon adjacent to the trail will be moved to stabilize areas where the trail has eroded and footbridge abutments	
Grandview Trail Re-route (DNF)	Powell Ranger District	Construct several sections of non-motorized trail to eliminate dual use by motorized and non-motorized recreationists	
King Creek Campground Non-commercial Thinning DNF, CE	Powell Ranger District	Thin heavily stocked ponderosa pine to improve vigor and forest health in a developed recreation area	
Mining			
Boulder Gravel Pit (DNF)	Escalante RD (Socio only)	A gravel pit will be developed and managed to provide gravel for county and Forest needs.	< 5 acres
Troy M Mine Phase Two (BLM)	Richfield FO, near Ticaboo (Socio only)	Extend existing underground workings; construct mine shaft and waste rock storage area; construct ventilation shafts and expand existing evaporation pond for mine dewatering	
Phase II, Abandoned Mine Reclamation, (GSENM)	GSENM	EA to address potential environmental impacts associated with the Phase II Abandoned Mine Reclamation Project, which includes the Henrieville Prospect Site east of Tropic	
Reopening of Ticaboo uranium mill and mine	Ticaboo/Bullfrog (Socio only)	Garkane has been contacted regarding service to the Ticaboo/Bullfrog area for planned re-opening of the uranium mill; the mine has been re-opened and is supplying its own power with diesel generators	

PROJECT (LEAD AGENCY)	LOCATION	DESCRIPTION	ESTIMATED DISTURBANCE (IF AVAILABLE)
Miscellaneous			
Wild and Scenic River Suitability Study – Utah (USFS)	Pine Valley, Cedar City, and Escalante RDs	A draft EIS has been prepared analyzing the suitability of 86 Utah river segments, including 8 on the DNF in Garfield County, for inclusion in the National Wild and Scenic River System	
West Dixie Water Improvement (DNF)	Powell RD	No Information	3,000 acres (2007) 2,000 acres (2008) 2,000 acres (2009) 2,000 acres (2010)
West Deer Creek Grazing Allotment (DNF)	Escalante RD (Socio only)	Proposal to re-authorize livestock grazing on the West Deer Creek Allotment north of Boulder, Utah east of SR 12	
Ohio University Dinosaur Collection (GSENM)	GSENM	Proposal to excavate and remove remains of a horned dinosaur from GSENM	
McGath Lake Dam (DNF)	Escalante RD (Socio only)	The McGath Lake Dam is deteriorating and in need of repair. Without action the dam is likely to fail and destroy an important fishery. McGath Lake is located approximately 16 miles north of Escalante.	
Dinosaur Documentary Film (BLM)	GSENM & BLM	Various locations within the GSENM, Wolverine Petrified Forest, The Blues Area, Red Canyon, Cocks Comb Road, etc,	

1.3.3.3. Cumulative Effects

Although other past, present, or future actions within the cumulative effects area or within allotments affected by any of the Action Alternatives could have effects to range resources in and of themselves (e.g., removal or improvement of a large portion of the forage resource, elimination or addition of specific water supplies), the combined effect of any of the Action Alternatives and any single other action would be very unlikely to cause cumulative effects because the effect of the Garkane project on range resources is so small as to be negligible for all alternatives.

However, the effects of multiple future actions within the cumulative effects area or allotments already affected by any of the Action Alternatives could become cumulative, even if all effects individually were small or negligible. For example, although less than 1 percent of forage resource is estimated to be affected by some of the Action Alternatives on each of the allotments within the Project Area, if ten projects occurred that affected 1 percent of the forage resource within one of the allotments in the Project Area, 10 percent of the forage resource would be affected. This could be a noticeable effect if the projects

were closely spaced either temporally or geographically, and could cause a measurable change to the forage resource even if, on a per project basis, effects were negligible.

It is most likely that projects would occur over a span of time, allowing some areas to recover after the initial disturbance. In addition, range improvement, reclamation, and reseeding efforts often have variable results due to climatic inconsistency, so it is likely that some lands affected by different projects would be positively affected (desirable forage production *increased* once the project was completed) while some affected lands would be negatively affected (desirable forage production *decreased* once the project was completed). Because present and future projects will most likely occur over a span of years under a variety of climatic conditions, the cumulative effects on range resources of this project combined with other projects over time would likely be negligible.

Under the No Action Alternative, overhaul of the existing 69 kV transmission line would contribute negligibly at most to cumulative impacts to range resources as the existing right-of-way is already disturbed; little or no additional disturbance to range resources would be anticipated from the overhaul effort.

1.4. PLAN CONSISTENCY

Livestock grazing is considered a legitimate use of public lands, according to the BLM KFO Resource Management Plan and Final EIS (BLM 2008a), the existing DNF LRMP (1986), and the GSENM Management Plan (BLM 2000). Lands within the BRCA are not used for livestock grazing.

Construction of the transmission line for the Garkane Energy project could reduce rangeland resources available for livestock forage. Specifically, right-of-way clearing could result in short-term and long-term loss of vegetation and forage production on rangelands, although re-seeded areas could see improved forage productivity under favorable environmental conditions. Powerline construction could also temporarily disrupt range improvements (called “grazing operations” in the Scoping Report), including livestock water developments, fences, and grazing systems.

However, as discussed in **Section 1.3** above, these effects would be negligible and not jeopardize the ability of livestock to effectively graze on these public lands. Development of the Garkane Energy project would be consistent with the range resource management goals set forth in the management plans noted above.

1.5. COMPLIANCE WITH OTHER LAWS AND REGULATIONS

The Taylor Grazing Act of 1934 (43 USC 315), signed by President Roosevelt, was intended to "stop injury to the public grazing lands [excluding Alaska] by preventing overgrazing and soil deterioration; to provide for their orderly use, improvement, and development; [and] to stabilize the livestock industry dependent upon the public range" (USDI 1988). This Act was pre-empted by the Federal Land Policy and Management Act of 1976 (FLPMA) (BLM 2008e). This EIS supports the underlying management goals and policies of this law.

The National Forest Management Act of 1976 (16 U.S.C. 1600(note)) Public Law 94-588. This act updated the previously authorized Forest and Rangeland Renewable Resources Planning Act of 1974 (88 Stat. 476; 16 U.S.C. 1601-1610). These laws together provided the basis for the modern USFS planning process, including the requirement to create forest plans, requirements for public involvement in the planning process, and the use of research and field assessments to evaluate forest health. (USFS Undated). This EIS is written in compliance with this law.

The Federal Land Policy and Management Act (FLPMA) of 1976, Title II, Section 202. This act consolidated and articulated BLM's management responsibilities. Many land and resource management

authorities were established, amended, or repealed by FLPMA, including provisions on Federal land withdrawals, land acquisitions and exchanges, rights-of-way, advisory groups, range management, and the general organization and administration of BLM and the public lands (BLM and Office of the Solicitor 2001). This EIS is written in compliance with this law.

Utah State Law 63j-4-401 defines the duties of the Utah State Planning Coordinator, whose job is to work with local, state, and federal offices and managers to assure, among other resource concerns, the maintenance and effective management of rangeland resources for the long-term use of these resources by livestock (USL 2008). This EIS is includes consideration of state and local issues and is thus in compliance with this law.

Executive Order 13112, 1999. Invasive species. William J. Clinton. 3 February. This Executive Order requires federal agencies to prevent the introduction of invasive species and provide for their control in order to minimize the economic, ecological, and human health impacts of invasive species. The Garkane Energy project would include BMPs to minimize the potential for introducing invasive species to the affected lands. See also Federal Noxious Weed Act (1975) -- Public Law 93-629 (7 U.S.C. 2801 et seq.; 88 Stat. 2148) (USDA-NAL 2008). This EIS is written in compliance and consideration of this law.

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Appendix A – General Project Acreage Tables

Project Area Calculations (Acres)

Alt Segment	Acres						
	Private	State	BLM	GSENM	USFS	NPS	TOTAL
A-1	21.19	41.48		50.58	153.14		266.39
A-2					26.65		26.65
A-3	13.93	14.4	51.45		61		140.78
A TOTAL	**35.12**	**55.88**	**51.45**	**50.58**	**240.79**	**0**	**433.82**
B Removal	27.44	3.94	8.37		9.89		49.64
A TOTAL + B Removal	62.56	59.82	59.82	50.58	250.68	0	483.46
B	146.04	45.84	115.61	0	76.33	34.44	418.26
C-1	118.44	14.63		50.58	92.86		276.51
C-2					38.71		38.71
C-3	4.97	14.4	53.71		78.5		151.58
C TOTAL	**123.41**	**29.03**	**53.71**	**50.58**	**210.07**	**0**	**466.80**
B Removal	6.35	3.94	8.37		9.89		28.55
C TOTAL + B Removal	**129.76**	**32.97**	**62.08**	**50.58**	**219.96**	**0**	**495.35**
E-W					48.65		48.65
N-S					27.24		27.24

Total Long-Term Disturbance* Area (Acres)

Alternative	Long-Term Disturbance (Acres)						
	Private	State	BLM	GSENM	USFS	NPS	Total
A-1	5.31	5.01	0.00	6.74	17.72	0.00	34.78
A-2	0.00	0.00	0.00	0.00	2.87	0.00	2.87
A-3	2.67	1.68	5.23	0.00	5.88	0.00	15.47
A Total	***7.97***	***6.70***	***5.23***	***6.74***	***26.47***	***0.00***	***53.12***
B (Bryce 1 Substation on USFS land)	***19.36***	***5.74***	***13.12***	***0.00***	***6.59***	***1.04***	***45.85***
B (Bryce 2 Substation on Private land)	***21.30***	***(same)***	***(same)***	***(same)***	***4.52***	***(same)***	***45.62***
C-1	13.97	1.58	0.00	6.74	9.12	0.00	31.41
C-2	0.00	0.00	0.00	0.00	3.92	0.00	3.92
C-3	2.22	1.68	5.42	0.00	7.00	0.00	16.33
C Total	***16.19***	***3.26***	***5.42***	***6.74***	***20.04***	***0.00***	***51.66***
North-South Interconnect	0.00	0.00	0.00	0.00	2.91	0.00	2.91
East-West Interconnect	0.00	0.00	0.00	0.00	5.85	0.00	5.85

Alternative	Long-Term Disturbance (Acres)						
	Private	State	BLM	GSENM	USFS	NPS	Total
Interconnect Total	***0.00***	***0.00***	***0.00***	***0.00***	***8.76***	***0.00***	***8.76***

*Includes permanent disturbance associated with power poles (estimated), substations, substation access roads, existing access road upgrades, and 10-foot wide centerline access roads.

Total Short-Term Disturbance Area by Alternative Segments and Land Ownership*

Alternative	Short-Term Disturbance (Acres)						
	Private	State	BLM	GSENM	USFS	NPS	Total
A-1	8.76	18.14	0.00	23.27	70.55	0.00	120.72
A-2	0.00	0.00	0.00	0.00	14.21	0.00	14.21
A-3	9.19	6.96	28.14	0.00	23.08	0.00	67.37
A Total	***17.94***	***25.10***	***28.14***	***23.27***	***107.84***	***0.00***	***202.29***
B	***75.38***	***20.19***	***54.08***	***0.00***	***18.48***	***0.78***	***168.91***
C-1	68.72	7.23	0.00	23.27	48.30	0.00	147.52
C-2	0.00	0.00	0.00	0.00	21.69	0.00	21.69
C-3	1.74	6.95	29.34	0.00	36.19	0.00	74.22
C Total	***70.47***	***14.18***	***29.34***	***23.27***	***106.18***	***0.00***	***243.44***
North-South Interconnect	0.00	0.00	0.00	0.00	13.78	0.00	13.78
East-West Interconnect	0.00	0.00	0.00	0.00	24.97	0.00	24.97
Interconnect Total	***0.00***	***0.00***	***0.00***	***0.00***	***38.75***	***0.00***	***38.75***

*Includes short-term disturbance associated with pulling sites, laydown areas, and power pole (H-structure) installation. Some overlap between disturbance areas exists because a single area could be used for multiple alternatives. "Limited Access" areas not analyzed for short-term disturbance associated with pole installation.

Appendix B – Resource Protection Measures

Resource Protection Measures

The following resource protection measures are considered part of the Proposed Action and other Action Alternatives and would be carried out in the course of construction, operation, and maintenance activities as specified below.

Soils

- Ingress and egress to pole locations would be on the same path to minimize disturbance to soil and biological soil crusts, especially in sparsely vegetated areas.
- Soil from pole and guy wire hole excavations would be used to refill the hole and any remainder evenly distributed over the disturbance area around the hole. In sensitive visual areas where different soil colors could distract from the view, excess soils would be removed from the site.
- Herbicide use would be applied in accordance with label requirements and comply with the BLM Vegetation Treatments Using Herbicides Final Programmatic EIS (BLM 2007) and the DNF Environmental Assessment for Noxious Weed Management (USFS 2000).
- Where temporary minor changes in contours occur during construction along the route, the area would be returned to near pre-construction contours through reshaping, as required by the authorizing agency. On BRCA lands, the soil would be re-contoured using hand tools to minimize erosion.
- If any areas outside the *limited access areas* have slopes greater than 35 percent, tractor/equipment operation would not be permitted. This measure limits surface disturbance and keeps surface runoff water from concentrating. This practice restricts tractor operation to slopes where corrective measures for proper drainage such as water bars are easily installed and effective. Criteria that may be used to determine slope restrictions are soil stability, mass stability, infiltration rate, and soil water holding capacity. These data may be interpreted from soil and land type inventories, geologic maps, and climatic and hydrologic information. Subsequent field verification may be necessary.
- Tractor/equipment operation would be limited during times of high soil moisture levels to minimize soil compaction, puddling, rutting, and gullying with resultant sediment production and loss of soil productivity. This measure minimizes surface disturbance during high soil moisture conditions which would result in compaction, puddling, rutting, and gullying problems. This practice reduces the need to correct these soil and water resource problems later. High soil moisture conditions will be defined and evaluated during construction by USFS Contract Inspectors in concert with representatives from affected cooperating agencies.

Weeds

- A pre-construction weed inventory would be required, and early treatment of weeds would occur prior to construction vehicles entering infested areas.
- To minimize the potential for the spread of noxious weeds, all equipment used during construction would be power washed off-site to remove all soil and plant material prior to entering the Project Area.
- Ongoing monitoring and treatment of noxious and invasive species would be incorporated into the Operation and Maintenance Plan. Garkane would bi-annually (during the growing season) survey and treat, if necessary, the right-of-way for noxious weeds for the first 10 years following end of construction, and submit bi-annual reports to lead and cooperating agencies as requested.
- Control and follow-up treatment of invasive species specific to this project within the right-of-way would be the responsibility of Garkane.

- If chemical weed control is used, only agency-approved chemicals would be used by certified applicators.

Revegetation

- Where re-contouring is not required, vegetation would be left in place wherever possible to avoid excessive root damage and allow for re-sprouting.
- Re-vegetation of the Project Area, where necessary, would be Garkane's responsibility and would be coordinated with the appropriate affected agency's resource division.
- Areas identified by the agency or landowner would be seeded following construction activities using an agency-approved seed mixture and adhering to standards recommended by the specific agency for that portion of the right-of-way. Seed mixes used for rehabilitation purposes would be certified noxious weed free. Revegetation of the Project Area would be subject to agency monitoring and inspection (at agency discretion) to ensure adequate revegetation establishment. Based on these findings, the affected agency may require additional revegetation from Garkane if agency revegetation objectives are not adequately met. Agencies would provide revegetation objectives to Garkane prior to project initiation.
- Reseeded areas within grazing allotments may require additional measures to assure effective revegetation. Reseeded areas around structures and other disturbances within grazing allotments may attract cattle to graze on new growth. Herding, salting, and placement of water sources may be used to attract cattle away from revegetated areas to allow vegetation to mature and become established. Larger reseeded areas (such as lay-down yards or pulling sites) may require temporarily fencing cattle out to allow for effective revegetation.

Fire

- Blasting along with use of mechanical equipment may be limited/restricted during drought conditions if fire restrictions are implemented. A waiver may be granted if Garkane can provide required mitigation measures such as hours of work, available water, and fire lookouts.

Wildlife

- If a federally listed species is located within the Project Area, work would be immediately halted to allow the appropriate federal agency to respond. Consultation with the USFWS would be initiated immediately upon species discovery and additional mitigation measures may be applied where necessary.
- Construction, demolition, and maintenance activities would be subject to species-specific temporal restrictions to address wildlife concerns. These restrictions would be set based on consultation and coordination with the USFWS and Utah Division of Wildlife Resources.
- Pre-construction/demolition raptor/nesting bird surveys may be required if project implementation occurs more than 2 years from the decision in accordance with USFS and other agency guidelines.
- With the exception of emergency repair situations, right-of-way construction, demolition, restoration, maintenance, and termination activities in designated areas would be modified or discontinued during sensitive periods (e.g., nesting and breeding periods) for candidate, proposed, threatened, endangered, or other sensitive animal species. The list of sensitive periods would be approved in advance by the authorized officer of the appropriate land management agency.
- Timing limitations for timber clearing and right-of-way vegetation maintenance would be in agreement with Migratory Bird Treaty Act (MBTA) protocol.

- Construction and demolition activities within active raptor nesting areas would be allowed in compliance with the appropriate temporal and spatial buffers as set forth by the management agency.
- Structures would be designed in accordance with the Avian Protection Plan Guidelines developed by the USFWS' Avian Power Line Interaction Committee (2006) to minimize avian conflicts.
- Raptor perch deterrents/discouragers would be used on poles to minimize perching in areas inhabited by Utah prairie dogs, greater sage grouse, and pygmy rabbits as required by each land management regulating agency.

Additional wildlife mitigation measures may be required if areas where habitat improvement projects have been conducted would be disturbed.

Cultural Resources

- Should any of the following be discovered during construction, such activities would cease in the immediate area of discovery and the appropriate agency representative would be notified immediately: (1) previously unidentified surface or subsurface cultural resources and/or (2) human remains and/or objects or materials subject to the Native American Graves Repatriation and Protection Act, as amended. An evaluation of the discovery would be made by the lead USFS authorized officer or relevant cooperating agency representative to determine appropriate actions and avoidance measures that would prevent the loss of any significant cultural or scientific values. The authorized officer would make any decisions pertaining to mitigation measures after consulting with appropriate agencies. No operations would resume in the immediate area of the discovery until written authorization to proceed is issued by the USFS or appropriate agency.
- Cultural resources would be protected by limiting access to known archaeological sites, educating employees about the importance of cultural resources, and implementing a strict management policy restricting collection of artifacts.

Paleontology

- Construction- or maintenance-related activities that require significant ground disturbance (greater than 12 inches deep) should be surveyed and monitored when conducted in areas of bedrock outcrop for the following geologic units: Tropic Shale, Dakota Formation; the Tibbet Canyon, Smoky Hollow and John Henry members of the Straight Cliffs Formation; and the Wahweap and Kaiparowits formations.
- Should any paleontological resources be found during construction, work would be halted and the appropriate agency representative would be notified immediately. The authorized officer would make any decisions pertaining to mitigation measures after consulting with appropriate agencies. No operations would resume in the immediate area of the discovery until written authorization to proceed is issued by the USFS or appropriate agency.

Visual

- To the extent possible, placement of access routes and points of ingress and egress would be situated to minimize visual intrusion and to obscure views from local highways and county roads.
- No paint or permanent discoloring agents would be applied to rocks or vegetation to indicate limits of survey or construction activity.
- Non-reflective wire would be used within USFS High SIO areas, BLM VRM Class II areas, and in the GSENM as required by the Management Plan.
- When use of wood pole structures is not practicable, and the use of fiberglass or steel structures is approved, dark colored, non-reflective surfaces would be used.

- To the extent practicable, siting of individual structures would take advantage of both topography and vegetation as screening devices to restrict views of structures from visually sensitive areas.
- Where practicable, the siting of structures would avoid ridgelines, summits, or other prominent locations and use topography as a backdrop to avoid skylining.
- The transmission line alignment would cross linear features (e.g., trails, roads, rivers) at right angles whenever possible to minimize viewing area and duration.
- Vegetation openings for facilities, structures, routes, etc., would mimic the size, shape, and characteristics of naturally occurring openings to the extent practicable.
- Vegetation clearing design in highly visible forested areas could include feathering of right-of-way edges, i.e., progressive, selective thinning of trees from the edge of the right-of-way inward, mixing tree heights from the edge of the right-of-way, and creation of an irregular vegetation outline.
- Lighting for facilities would not exceed the minimum required for safety and security while not affecting wildlife behavior, and designs would be selected that minimize upward light scattering (light pollution).
- Visual impact mitigation objectives and activities would be discussed with equipment operators prior to commencement of construction activities.
- Methods for disposal of slash from vegetation removal would be site dependent. Slash may be mulched and spread to cover fresh soil disturbances (preferred), hauled off site for disposal, or buried.
- Restoration activities specified here or in project-related documents would be undertaken by Garkane immediately after disturbances.
- Disturbed areas would be covered with stockpiled topsoil or mulch and revegetated using a mix of native species selected for visual compatibility with existing vegetation.
- Edges of revegetated areas would be feathered (strategically removing vegetation along the margins of the right-of-way at agency direction) to reduce form and line contrast with existing landscape.
- Excess fill material would not be wasted down slope to avoid color contrast with existing vegetation/soils.

Water

- Water needed during construction would be limited to that needed for dust control. The conditions of the Storm Water Pollution Prevention Plan would be imposed on all construction activities to avoid or limit sedimentation to surface waters.
- Equipment operation would be excluded from wetlands, floodplains, stream channels, and wet meadows to limit soil damage, turbidity, and sediment production resulting from compaction, rutting, runoff concentration, and subsequent erosion. This practice is designed to prevent soil puddling, compaction, and displacement, and the concentration of surface water and soil erosion, which may lead to rill or gully erosion and subsequent water quality degradation. This measure is intended to prevent or reduce the need for corrective measures to solve water concentration problems due to equipment use.
- When applying pesticides, an untreated 300-foot buffer strip from each side of surface water, wetlands, or riparian areas will be left to minimize the risk of a pesticide entering surface or subsurface waters or affecting riparian areas, wetlands, and other non-target areas.

Land Use

- Range improvements (e.g., fences, water developments, corrals, cattle guards) would be identified and protected from any damage associated with project activities.
- Proper signage would be posted in affected areas prior to and during construction if temporary road closures or restricted access were anticipated.
- In the event of property damage caused by construction and operations activities, Garkane and/or the agency would quickly investigate and reasonably attempt to settle with the party who incurred property damages.

Additional Construction and Operations Standards (as required by BRCA)

The following construction and operations standards would be in addition to those listed above and would be implemented during construction, operation, and maintenance activities in BRCA for Alternative B.

General

- If a reclamation bond is posted, holes within BRCA would be dug primarily by a mini-excavator that would be flown to within 50 feet of the hole location. Hand tools (e.g., hand auger, shovels, picks) may also be used. As noted below, all equipment would be transported in by helicopter or foot. Use of generators and gasoline-powered hand augers would be allowed. Precautions to prevent gasoline spills, such as a tray to hold equipment, must be implemented.
- In BRCA, wheelbarrow use is only allowed at pole locations to transport soil within a 100-foot radius. Any visible tracks must be raked out.
- The Park Superintendent must approve the use of explosives to excavate holes within BRCA. The Superintendent must be notified at least three days before explosives use is planned.
- Collection of plants, rocks, fossils, wildlife, artifacts, or any items or materials from BRCA is prohibited.
- If the 69 kV transmission line is de-energized and removed from BRCA, the guy wires would be removed, the poles would be "flush cut" at or slightly below ground level, the portion of the pole remaining in the ground would be covered with soil, and the area where the pole was removed would be re-vegetated. Poles would be removed by helicopter.
- Garkane would provide BRCA with informational material (project overview and activities) for distribution to the public during periods of project construction.

Access

- *Limited access areas* would also include all of BRCA.
- No road building would occur within BRCA.
- Construction access would be allowed for the rim pole on the west boundary of BRCA.

Helicopter Use

- All equipment used in BRCA would be transported by helicopter or foot.
- Helicopter use within BRCA must follow the terms and conditions stipulated in the existing Right-of-Way Permit (RW 1330-05-001) for the approved transmission lines.
- When work is conducted within BRCA, Garkane would notify the Chief Ranger at the beginning of each week regarding the work plan for the week and approximate number of overflights expected.

- Helicopter flights over trails and heavily used areas within BRCA would be limited to the right-of-way. Flights over the Mossy Cave Trail would be limited to the extent practicable. Garkane would provide public notice of proposed times and places in local newspapers or other media outlets.
- A “Letter of Authorization to Use Bryce Canyon Radio Frequencies” would be required prior to helicopter use in BRCA.

Addendum to

Range Resources Specialist Report

dated December 2009

Prepared For:

US Forest Service – Dixie National Forest
National Park Service – Bryce Canyon National Park
Bureau of Land Management – Kanab Field Office
Bureau of Land Management – Grand Staircase-Escalante National Monument

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This addendum updates the Range Resources Specialist Report dated December 2009 by expanding the report to include the Agency Preferred Alternative and providing errata to expand on or correct data previously presented.

Agency Preferred Alternative

The Agency Preferred Alternative was developed through a joint effort of all agencies (USFS, BLM, and NPS) taking into consideration the impacts of all of the resources along the Action Alternatives. Alternative E is the Agency Preferred Alternative because it attains the project's purpose and need while still being sensitive to other resource concerns within the Project Area, and the missions and management objectives of the various land management agencies responsible for the public lands that would be crossed by the Agency Preferred Alternative.

The 100-foot-wide right-of-way for Alternative E, the Agency Preferred Alternative route (**Figure 1**) would begin with Segment C1 (17.36 miles), the East-West Interconnect option (3.70 miles), and a combination of portions of Segments A-3 and C-3 (referred to as E-3). Alternative E contains the segment combining portions of Alternatives A and C called E-3. Segment E-3 begins where the East-West Interconnect joins the Alternative A route and terminates at the Hatch Substation. Segment E-3 would follow Segment A-3 for 1.6 miles to the point where it intersects Segment C-3 and would follow the remainder of Segment C-3, terminating at the Hatch Substation for 6.76 miles. The total length of the preferred route would be 29.41 miles.

Approximately 16.23 miles of the existing 69 kV transmission line infrastructure from the Bryce Canyon Substation to the Hatch Mountain Substation would be removed.

Alternative E, the Agency Preferred Alternative, would also require the amendment of the GSENM MP (BLM 2000) by changing the designation of a 300-foot-wide 3.68-mile stretch (133.74 acres) of the Primitive Zone to Passage Zone, and within this area, changing the existing VRM Management Class designation from Class II to Class III.

Figure 1. Alternative E, Agency Preferred Alternative Route

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Resource Impacts

Alternative E, the Agency Preferred Alternative route, is comprised of segments or portions of segments analyzed under Alternatives A and C, which are fully analyzed in the original Specialist Report dated December 2009. Resource specific disturbance acreages and other data specific to Alternative E, the Agency Preferred Alternative, are provided in the table below.

RANGE RESOURCES	ALTERNATIVE E: PREFERRED ALTERNATIVE		69 KV LINE REMOVAL, ALTERNATIVE E
	Short-term	Long-term	
Number of Allotments Impacted	6		
Grazing allotment acres lost (acres/percent)	148.047 0.18%	23.61 0.03%	DNF: 0.5%, BLM: 0.1%
AUMs lost – long- and short-term	<6.6		<2 AUM short-term loss; long-term negligible beneficial impacts from restoration
Effects to range improvements	1 water supply which can be avoided; 11 fences which would be repaired		1 water supply, which can be avoided
General	Impacts determined to be negligible for all action alternatives		No adverse long-term impacts

Errata

Some changes, clarification and updates to resource-specific data and analysis were made as a result of the comments received on the Draft Environmental Impact Statement. The errata below update the original Specialist Report dated December 2009.

Page 3

The second paragraph under the heading **1.1.2.2 Alternative B: Parallel Existing 69 kV Route** should read:

The Alternative B Route would generally parallel the existing 69 kV line right-of-way, but must be separated from the existing 69 kV line right-of-way for constructability and safety reason, in order to safely build and energize the line prior to removal of the existing line. Alternative B would extend 29.11 miles. This alternative route would begin at the proposed East Valley Substation located east of Tropic and extend west through the Tropic Substation (the Tropic Substation would be decommissioned) and then cross SR 12 and continue across BRCA (deviating slightly from the existing right-of-way for approximately 1.5 miles) to a point near the current Bryce Canyon Substation near Bryce Canyon City. For this Alternative, the Bryce Canyon Substation would be decommissioned and a new replacement substation would be built at a new location approximately 1 mile to the west to allow for needed expansion. The route would

extend approximately 0.5 mile to the north around Bryce Canyon City, west across SR 63 and then parallel Garkane's existing 69 kV line right-of-way predominately across private and SITLA lands. The alternative route would parallel the existing right-of-way just to the south across the plateau in a northwest direction to Red Canyon, where it would generally follow the existing right-of-way through Red Canyon into Long Valley where it would cross U.S. 89 and continue to the Hatch Mountain Substation. From there the route would follow the existing line south to the Hatch Substation. This route would cross 5.58 miles of DNF, 8.29 miles of KFO, 2.81 miles of BRCA, 3.63 miles of SITLA, and 8.80 miles of private lands.

Appendix A:

The tables below detail the land management, and long- and short-term disturbance associated with Alternative E, the Agency Preferred Alternative, and should be added to the tables presented in Appendix A of the Specialist Report of December 2009.

Agency Preferred Alternative Project Area

Alternative E Segments	Project Area* (Acres)						
	Private	SITLA	KFO	GSENM	DNF	BRCA	Total
Segment C-1	118.44	14.63	0.00	50.58	92.86	0.00	276.51
East-West Interconnect	0.00	0.00	0.00	0.00	48.65	0.00	48.65
Segment E-3	6.30	14.85	54.24	0.00	52.40	0.00	127.79
69 kV Line Removal – Alternative E	6.35	3.94	8.37	0.00	9.89	0.00	28.55
Alternative E Total	***131.09***	***33.42***	***62.61***	***50.58***	***203.80***	***0.00***	***481.50***

*The Project Area contains the 100-foot right-of-way, substation sites and their associated access roads; all temporary work spaces outside the right-of-way; and the disturbance area associated with the existing 69 kV transmission line removal.

Agency Preferred Alternative 100-foot Right-of-Way Encumbrances*

Alternative E Segments	Right-Of-Way (Acres)						
	Private	SITLA	KFO	GSENM	DNF	BRCA	Total
Segment C-1	83.11	12.59	0.00	44.58	70.42	0.00	210.70
East-West Interconnect	0.00	0.00	0.00	0.00	44.99	0.00	44.99
Segment E-3	2.56	12.86	40.71	0.00	44.87	0.00	101.00
Alternative E Total	***85.67***	***25.45***	***40.71***	***44.58***	***160.28***	***0.00***	***356.69***

*Buffer of 50 feet on each side of transmission line. Not all acres would be disturbed within the right-of-way, but the right-of-way is considered to be long-term encumbrance for the duration of the permit.

Agency Preferred Alternative Total Long-Term Surface Disturbance and Land Ownership/Management

Alternative E Segments	Long-Term Disturbance* (Acres)						
	Private	SITLA	KFO	GSENM	DNF	BRCA	Total
Segment C-1	13.97	1.58	0.00	6.74	9.12	0.00	31.41

Alternative E Segments	Long-Term Disturbance* (Acres)						
	Private	SITLA	KFO	GSENM	DNF	BRCA	Total
East-West Interconnect	0.00	0.00	0.00	0.00	5.85	0.00	5.85
Segment E-3	2.24	1.68	5.42	0.00	4.19	0.00	13.54
Alternative E Total	***16.21***	***3.26***	***5.42***	***6.74***	***19.16***	***0.00***	***50.80***

*Includes long-term disturbance associated with power poles, substations, substation access roads, existing access road upgrades, and a 10-foot-wide centerline access route.

Agency Preferred Alternative Total Short-Term Surface Disturbance and Land Ownership/Management

Alternative E Segments	Short-Term Disturbance* (Acres)						
	Private	SITLA	KFO	GSENM	DNF	BRCA	Total
Segment C-1	68.72	7.23	0.00	23.27	48.30	0.00	147.52
East-West Interconnect	0.00	0.00	0.00	0.00	24.97	0.00	24.97
Segment E-3	1.74	6.95	30.32	0.00	22.54	0.00	61.55
Alternative E Total	***70.46***	***14.18***	***30.32***	***23.27***	***95.81***	***0.00***	***234.04***

*Includes short-term disturbance associated with pulling and splicing sites, lay-down areas, and power pole (H-structure) installation. Some overlap between disturbance areas exists because a single area could be used for multiple alternatives. *Limited access areas* were not analyzed for short-term disturbance associated with pole installation. Alternative B also includes short-term disturbance associated with removal of the existing 69 kV transmission line.

Short-Term Disturbance Associated with Removal of Existing 69 kV Line (Parallel to Alternative B)

Short-Term Disturbance* (Acres)						
Private	SITLA	KFO	GSENM	DNF	BRCA	Total
27.44	3.94	8.36	0.00	9.89	0.00	49.63

*This short-term disturbance area includes lay-down yards and pulling and splicing sites needed for the existing 69 kV line removal. For analysis, short-term surface disturbance for line removal is assumed to include all of the short-term disturbance areas (i.e., lay-down areas, pulling/splicing sites) that are included under Alternative B. This effectively reduces the amount of disturbance shown for Alternative B as these areas are the same as those counted for the installation of the 138 kV line. In reality these areas needed for removal would be very similar to, but slightly offset from, the installation sites.

Appendix B:

The first bullet after the heading **Water** should read:

Water needed during construction would be limited to that needed for dust control (See Appendix C, Dust Management Plan).

Appendix C, Dust Management Plan should be inserted after Appendix B, Resource Protection Measures.

Appendix C: Fugitive Dust Management Plan

A control strategy or strategies for fugitive dust are listed for each activity proposed under the Action Alternatives described in the Environmental Impact Statement. The strategies are listed in a staged approach, meaning that if the first approach of control, Stage 1, is not satisfactory, then the next approach of control, Stage 2 will be attempted.

ACTIVITY	ACTIVITY DETAILS	CONTROL STRATEGIES	
Material Storage	Storage of materials required for road widening.	Stage 1:	Inherent moisture with water sprays only on an as-needed basis.
		Stage 2:	Increase use of water sprays until fugitive dust is controlled.
Material Handling, Transfer, Hauling, Loading or Dumping	Placing fill material along roadside for widening.	Stage 1:	Inherent moisture with water sprays only on an as-needed basis.
		Stage 2:	Increase use of water sprays until fugitive dust is controlled.
Haul Roads, Roadways, or Yard Areas	Existing FS roads, centerline access; pulling, splicing and laydown yards	Stage 1:	Water sprays only on as-needed basis.
		Stage 2:	Increase use of water sprays until fugitive dust is controlled.
Clearing, Leveling	Pulling, splicing, laydown yards; area at pole locations	Stage 1:	Inherent moisture with water sprays only on an as-needed basis.
		Stage 2:	Increase use of water sprays until fugitive dust is controlled.
Earth Moving, Excavation	Foundation construction in certain locations	Stage 1:	Inherent moisture with water sprays only on an as-needed basis.
		Stage 2:	Increase use of water sprays until fugitive dust is controlled.
Construction, Demolition	Constructing and erecting new pole structures; removal of existing pole structures	Stage 1:	Water sprays only on an as-needed basis.
		Stage 2:	Increase use of water sprays until fugitive dust is controlled.

Consideration of Best Available Science

The techniques and methodologies used in this analysis consider the best available science. The analysis includes a summary of the credible scientific evidence that is relevant to evaluating reasonably foreseeable impacts. In addition, the analysis also identifies the methods used and references the scientific sources relied on. When appropriate, the conclusions are based on a scientific analysis that shows a thorough review of relevant scientific information, a consideration of responsible opposing views, and the acknowledgment of incomplete or unavailable information, scientific uncertainty, and risk.

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1/11/2011

Date