Transportation
Specialist Report

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

Prepared For:

U.S. 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

Prepared By:

JBR

creating solutions for today's environment

8160 South Highland Drive

Sandy, Utah 84093

December 2009

Transportation
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 the Specialist Report

The purpose of this Specialist Report is to characterize existing transportation land uses within the Project Area and to analyze and disclose potential environmental effects on land use 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 and 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

Alternative B 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.

The Alternative B 100-foot-wide right-of-way 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.

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 Transportation Resources

The following activities have the potential to cause impacts to local and regional roads and highways and circulation and transportation corridors:

- Transmission line construction and construction vehicle movement would potentially result in temporary disruption of transportation corridors.
- Movement of equipment and construction supplies would potentially result in temporary road closures or detours.

Operation of the proposed transmission line would require ongoing maintenance vehicle movement. Vehicles used for trimming of trees along the right-of-way, and the periodic maintenance of transmission lines and transmission infrastructure may impact traffic corridors and circulation.

1.1.3.1. Construction

Construction of the proposed transmission line would result in increased traffic associated with delivery and removal of materials and workers, both to and from lay-down areas and the project right-of-way. In conjunction with transmission line construction in the right-of-way, existing access roads may be improved to support the project.

1.1.3.2. Operations and Maintenance

Operation and maintenance of the new transmission line should not result in an increase in traffic as these activities are currently taking place for the existing 69kV line. However, as the new transmission line would be located differently from the existing line, transportation-related impacts may shift in location. The two-track access route that would remain along the centerline of the transmission line upon completion of construction would be retained for administrative use within the right-of-way. While the new administrative road would not be designated a Forest Road for public use (and would be maintained by the proponent), it would not be blocked or gated, therefore public access to previously inaccessible areas would be possible.

1.1.3.3. 69 kV Line Removal

Upon completion of the proposed 138 kV line, the existing 69 kV line would be removed from portions of the existing right-of-way (vary by alternative). Line removal would result in increased traffic associated with worker travel to and from the right-of-way and removal of materials from the project right-of-way. The existing two-track centerline access routes, in conjunction with the existing transmission line, would be rehabilitated, however this road provides administrative access to the existing line only and is not open for public use.

1.1.3.4. Abandonment and Removal

Upon completion of the life of the proposed 138 kV line, the authorization for the right-of-way would be terminated and the line components removed. Impact-inducing activities would be similar to those described for the 69 kV line removal, however the centerline administrative access road would be removed.

1.1.4. Transportation Resource Issue Statement

No transportation-related issues were raised during the scoping process.

1.2. DESCRIPTION OF AFFECTED ENVIRONMENT

1.2.1. Project 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.

1.2.2. Data Sources

The DNF LRMP (1986) outlines a strategy for maintaining the existing road system. In the future, transportation resources on the DNF will be managed under the DNF Motorized Travel Plan, currently in draft (2008). GIS maps provide road numbers and approximate distances used to evaluate impacts to transportation resources on the Forest. The GSENM Management Plan (1999) was utilized for guidance on transportation and access management issues within the Monument. The KFO Resource Management Plan (2008) provides guidance on management of transportation resources for Project Area BLM lands outside the GSENM. Information on transportation resources within BRCA came from the NPS Management Policies (2006) and the Right-of-Way permit issued to Garkane for the existing 69 kV transmission line that transects BRCA (2005). Data regarding state highway traffic volumes were obtained from the Utah Department of Transportation (UDOT) website. These data are used to determine traffic levels on various segments of roads and relative proportions of use of truck traffic. The data are used to determine the effect of construction and operational travel in relation to existing traffic levels. Information on management of roads on or crossing SITLA lands was obtained from Mr. Lou Brown of the SITLA Richfield office. Information about Garfield County Roads as they relate to the proposed project was obtained from Brian Bremner, Garfield County Roads Department. The information is used to estimate the level of use and determine county requirements for use of county roads for construction of the project.

1.2.3. Resource Management Direction

1.2.3.1. Dixie National Forest

The DNF LRMP (1986) outlines a strategy for maintaining the road system existing in 1986 as it was then, in approximately the same scope and condition. The plan envisions maintaining approximately 20 percent of the road system annually and predicts overall gradual deterioration of the system.

The DNF Motorized Travel Plan (2009) identifies existing roads and roadless areas, how access on the Dixie NF is managed, and the level of development and maintenance various routes would receive.

1.2.3.2. Kanab Field Office

The BLM manages lands within the Project Area that fall under the administrative management of the GSENM and the KFO. The Proposed Action and Alternative C would traverse the GSENM in an area designated for management as a primitive zone. The primitive zone is intended to provide an undeveloped, primitive, and self-directed visitor experience without motorized or mechanized access. Some administrative routes are included in this zone to allow very limited motorized access (BLM 2000).

The KFO Resource Management Plan and Final EIS (2008) describe existing transportation resources for the area managed and policies regarding Off Highway Vehicle (OHV) use. An appendix to the RMP outlines the travel management/route designation process.

1.2.3.3. Bryce Canyon National Park

The NPS Management Policies 2006 state that NPS administrative off-road motor vehicle use will be limited to what is necessary to accomplish essential maintenance, construction, and resource protection activities that cannot be accomplished reasonably by other means. The existing right-of-way permit specifies that no motorized or wheeled vehicles will be used to access poles and line within BRCA except where they are accessible by road. Access to poles and line in roadless areas will be by foot or air (NPS 2005).

1.2.3.4. SITLA

Mr. Lou Brown of the SITLA Richfield office (Personal Communication, July 29, 2008) indicated that there would be no access issues on SITLA lands potentially impacted by the project and that there would be no maintenance requirements. If SITLA lands were crossed it would be under a negotiated ROW.

1.2.3.5. Garfield County

Garfield County ordinances provide management direction for Garfield County roads.

1.2.4. Transportation

Figure 1.3-1 details locations of various transportation routes that would be impacted by the proposed project.

Transportation routes that would be impacted by the proposed project are located in a remote and sparsely populated area. The primary economic driver within the Project Area is tourism (see Socioeconomics Specialist Report), and the way tourists reach popular destinations in and around the Project Area is by automobile accessing the area via primary and secondary roads. Impacts to recreation are addressed in the Recreation Resources Specialist Report.

There are four major roads within the Project Area: U.S. Highway 89 and SRs 12, 22, and 63. In addition there is one county road and a number of Forest Roads.

1.2.4.1. U.S. Highway 89 (U.S. 89)

U.S. 89 runs north and south in the western portion of the Project Area east of and parallel to the existing 69 kV line running from the Hatch Substation to the Hatch Mountain Substation. The existing 69 kV transmission line turns east-northeast from the Hatch Mountain Substation and crosses U.S. 89 approximately 6.5 miles north of the Hatch Substation.

Figure 1.3-1. Affected Transportation Routes

1.2.4.2. Utah Highways (Secondary Roads)

SR 12, a secondary road, traverses the Project Area east and west, joining U.S. 89 north of Hatch. SR 12 crosses through and provides the main access to BRCA from U.S. 89. From BRCA, SR 12 continues east and north through the communities of Tropic and Boulder to connect to SR 24, which provides access to Capitol Reef National Park. The existing 69 kV transmission line runs nearly parallel to SR 12 northeast of Tropic and crosses the highway approximately 1.5 miles north of Tropic. SR 12 is designated an All American Road.

Utah Highway 22 (SR 22), a secondary road, provides access from Utah Highway 62 (UT 62) to the north, connecting to SR 12 just west of the BRCA boundary. This road is also known as Johns Valley Road or the Great Western Trail (SR 22 and 63).

SR 63 travels south from its junction with SR 12, terminating at the BRCA park boundary. At this point the road becomes Rt-010-Main Park Road, providing a driving tour through BRCA and terminating at Rainbow Point within the park. The existing 69 kV transmission line crosses SR 63 approximately 0.5 mile south of the intersection with SR 12.

1.2.4.3. County Roads

Garfield County Road (CR) 7960, otherwise known as Henderson Canyon Road, travels east-northeast from its junction with SR 12 just north of Tropic, providing access to East Valley. The existing 69 kV transmission line terminates approximately 4 miles east-northeast of Tropic at a junction with CR 7960.

1.2.4.4. Other Roads

Numerous Forest Roads would provide access from U.S. 89, SR 12 and SR 22 to the alignments, and the interconnects for the Proposed Action and its alternatives. The Forest Roads that would provide access to the alignments are roads suitable for high clearance vehicles, Maintenance Category 2. Passenger car traffic is not a consideration on these roads. Traffic is normally minor, usually consisting of one or a combination of administrative, permitted, dispersed recreation, or other specialized uses. Log hauling may occur at this level (USFS 2008). As these roads are currently designated for high clearance vehicle use and receive minimal maintenance to allow for that access, the roads are anticipated to be only lightly used. Heavier seasonal use may occur during the summer or hunting seasons.

Two existing roads, Rim Road and East Valley Road, would likely require improvements in order to service the project. Forest Roads 31485 and 30419 diverge from SR 22 on state lands approximately 3 miles north of its junction with SR 12 and then converge to become Rim Road approximately 1.5 miles southeast of SR 22. Rim Road terminates approximately 1.75 miles east of the junction of the two Forest Roads within the Dixie NF.

The Rocky Mountain Power/PacifiCorp transmission line access diverges from CR 7960 approximately 4.5 miles from the junction of CR 7960 and SR 12, then travels approximately 4 miles northwest within the GSENM, and terminates within the Dixie NF, approximately 2.7 miles from the boundary between Dixie NF and GSENM.

The portion of GSENM traversed by the Rocky Mountain Power/PacifiCorp transmission line access is designated a primitive area by the GSENM Management Plan (2000). Within the primitive zone, some administrative routes are included that could allow very limited motorized access (BLM 2000). Currently, East Valley Road is closed to public within GSENM, but is open for administrative use for maintenance of an existing powerline. The east side of East Valley Road within the primitive zone of GSENM is the western boundary of The Blues Wilderness Study Area.

The Rocky Mountain Power/PacifiCorp transmission line access continues onto DNF after it leaves the boundaries of GSENM. The area of the DNF containing both East Valley Road and Rim Road contains

Shakespear Point and Table Cliffs – Henderson Canyon Inventoried Roadless Areas (IRAs). This access traverses the Powell Ranger District between the two IRAs within an acceptable planning window.

1.2.5. Traffic Statistics

The UDOT publishes annual traffic reports for Utah's highways providing Annual Average Daily Traffic (AADT) and truck percentages for specific road sections. Statistics are compiled from automated recording devices and short-time counts (UDOT 2006a) in order to annualize and average traffic estimates.

Truck percentages are the percentage of AADT that is truck traffic, including all trucks that are greater than a two-axle, four-tire single unit (such as buses and trucks with more than four tires or two axles) (UDOT 2006b).

Traffic volume estimated for Utah highways within the Project Area is summarized in **Table 1.2-1**.

Table 1.2-1. Annual Average Daily Traffic and Truck Percentages*

ROAD SEGMENT	AADT	TRUCK PERCENTAGE
U.S. 89, Hatch to SR 12 Junction	2,185	28
SR 12 between Junction with U.S. 89 and SR 63	2,455	11
SR 63 (BRCA)	5,075	5
SR 12 between Junction with SR 63 and Tropic	1,805	13

Source: UDOT 2007b.

*Data are averages of use, however actual use includes major seasonal fluctuations between heavy summer traffic associated with tourism, and light winter use.

1.3. IMPACT ANALYSIS

1.3.1. Direct and Indirect Effects

The Proposed Action and Alternatives outlined in previous sections may cause direct or indirect 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)). Direct and indirect effects are discussed in combination under each affected resource. 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

The following indicators would demonstrate the impact of the proposed project on transportation within the Project Area:

- Estimated current level of use of affected roadways (vehicles per day).
- Potential level of service (LOS) changes at critical intersections and along critical travel routes.
- Estimated number of miles of new access road to be constructed.

- Miles of local and USFS road repair/rehabilitation/reconstruction (long- and short-term).

Table 1.3-1 describes the range of aspects of quality, magnitude, and duration of any impacts resulting from the proposed project.

Table 1.3-1. Description of Impact Levels

ATTRIBUTE OF EFFECT		DESCRIPTION RELATIVE TO TRANSPORTATION RESOURCES
Magnitude	Negligible	No measurable change in current conditions.
	Minor	A small, but measurable change in current conditions.
	Moderate	A moderate, measurable change in current conditions.
	Major	A big, easily measurable change in current conditions.
Duration	Short-term	10 years or less.
	Long-term	More than 10 years.

Analysis was performed by comparing existing traffic levels, including truck traffic, with projected amounts of construction-related traffic and consistency of proposed effects with management policies for the various transportation routes. Numbers and locations of crossings of various roads were considered in evaluating effects. Linear distances of roads impacted were estimated from GIS maps.

1.3.1.2. Direct and Indirect Effects by Alternative

Impacts Common to All Action Alternatives

Construction

As indicated in **Table 1.2-1**, traffic volume is measured on an annual basis as represented by the Annual Average Daily Traffic (AADT); however, actual traffic volume has major seasonal fluctuations, resulting in high traffic volumes in the summer and relatively light traffic volumes in the winter. Therefore, the relative impacts of Alternative A on traffic and transportation would vary by what season the work would be conducted in. In the winter, construction traffic would have an overall greater change on traffic volumes as winter traffic volumes are generally light. In the summer, the overall change in volume would be less, but because the volume is tourist related, motorists may be more sensitive to the increases, particularly increases in heavy truck traffic. Impacts to recreational experiences are addressed in the Recreation Resources Specialist Report.

Under all three Action Alternatives, the centerline two-track route would remain upon completion of construction and would be used by Garkane for operations and maintenance of the new 138 kV transmission line. Any culverts or low water crossings constructed would be maintained by the proponent in order that the route could continue to be used for maintenance and operations use only. There would be no new public access. All fence crossings would be replaced by locked gate thus restricting cross country travel by unauthorized users. The length of the route would vary by alternative, ranging from 26.88 miles under Alternative A, to 22.75 under Alternative B, to 27.80 miles under Alternative C. While the route would facilitate the proponent's management and repair of the transmission line within the right-of-way, there would be no benefit realized for overall transportation resources as there would be no public access. There would be no adverse impact to transportation resources from the route as the land management agencies would have no maintenance responsibilities for the route.

Under all three alternatives the existing two-track centerline access routes in conjunction with the existing 69 kV transmission line would be rehabilitated and the area restored to natural conditions. However, this

route provides access to the existing line only and is not open for public use. Therefore removal of this route would have no impact on transportation resources.

Operations and Maintenance

Maintenance and operation of the proposed 138 kV line under all Action Alternatives would be similar to the maintenance and operation of the existing 69 kV line and would be accomplished by existing crews. No new impacts to transportation resources would result from any of the Action Alternatives.

Alternative A: Proposed Action

Construction

Calculations of estimated round trips of both passenger vehicle and heavy truck traffic associated with construction are included in **Appendix A**. The estimated increase in traffic would be assumed to affect U.S. 89, Utah highways, and Project Area roads equally.

U.S. 89. Alternative A is estimated to generate approximately 6,800 construction-related round trips within the Project Area, during a construction period of approximately 18 months. This level of use equates to 13,600 single vehicle counts contributing to AADT, approximately 38 additional trips per day (thus increasing AADT). This would represent an increase in AADT of approximately 1.7 percent.

Alternative A is estimated to generate approximately 292 construction-related round trips of truck traffic within the Project Area. This would equate to approximately 1.6 trips per day over the course of an estimated construction period of 18 months. **Table 1.2-1** indicates that 28 percent of the AADT of 2,185 was truck traffic, equating to 612 trips. Additional construction-related truck traffic would represent an increase in truck traffic of approximately 0.3 percent. However, because proportionally the increase in passenger vehicle traffic is much greater than that of truck traffic, the overall proportion of truck traffic would remain approximately 28 percent.

Aside from construction-related traffic increases, Alternative A would directly affect U.S. 89 in two ways: (1) By construction vehicles turning onto and off U.S. 89, and (2) by construction of lines crossing U.S. 89. Construction vehicles would be turning onto and off U.S. 89 at the Hatch Substation site, at the intersection of the access road to the existing Hatch Mountain Substation, and at least three other points to access the proposed right-of-way. Based on traffic estimates prepared for the project, the vast majority of additional traffic volume would be from passenger vehicles. Entrance and exit of heavy trucks onto/off U.S. 89 would be infrequent, averaging less than two per day. If intersections of side roads with U.S. 89 are well developed, no mitigation measures would be required to manage construction-related traffic. In areas of short sight distances or where intersections aren't fully developed, standard construction procedures such as cautionary signage could be implemented to warn vehicles on U.S. 89 of merging construction traffic.

Under Alternative A, the new 138 kV line would be constructed across U.S. 89 approximately 2 miles north of the Hatch Substation. During preparation of the right-of-way and construction of the proposed line, traffic on U.S. 89 could be impacted in both directions. Construction work immediately adjacent to the roadway may result in single-lane traffic if the work would encroach upon the roadway. During the actual stringing of the line across the roadway, traffic would be stopped in both directions for approximately 30 minutes. The Utah Department of Transportation would require an encroachment permit for the line crossing the highway. The permit would specify project requirements and mitigation required (Personal Communication with Steve Kunzler, August 21, 2008). Standard construction practices such as marking work areas with cautionary signs, and using flaggers to control traffic would be implemented. Any damage to state highways would be repaired upon project completion.

While the estimated amount of construction traffic is measurable in terms of effects to AADT, the anticipated effect on transportation on U.S. 89 under Alternative A is so small as to not be quantifiable

and would be considered negligible. Direct construction impacts to transportation on U.S. 89 would be short-term and negligible.

Utah Highways (Secondary Roads). AADT on SR 12 would be anticipated to increase by 38 trips due to construction-related traffic over an estimated construction period of 18 months. For the segment of SR 12 between the junction with U.S. 89 and SR 63, this would represent a 1.5 percent increase in AADT. For the segment of SR 12 between the junction with SR 63 and Tropic, this would represent an increase in AADT of 2.0 percent.

An addition of 292 construction-related truck traffic round trips would result in an increase of 584 trips over an estimated construction period of 18 months. **Table 1.2-1** indicates that 11 percent of the traffic between the junction with U.S. 89 and SR 63 would be truck traffic. The addition of approximately 1.6 truck trips per day would represent an increase in truck traffic of 0.6 percent; however, the overall percentage of truck traffic of AADT would remain approximately 11 percent.

From the junction of SR 12 and SR 63 and the town of Tropic, an addition of an average of 38 trips per day over an 18-month construction period would represent a 2.0 percent increase in AADT. The addition of an average of 1.6 trips of truck traffic would increase truck traffic by 0.7 percent; however, the overall percentage of truck traffic of AADT would remain approximately 13 percent.

Numerous forest roads along SR 12 could provide access to the right-of-way for Alternative A. The effect of construction traffic ingress and egress off SR 12 would be the same as that described for U.S. 89.

The proposed 138 kV line would cross SR 12 approximately 5 miles west of the junction of SR 12 with SR 22 and SR 63. Impacts to transportation on SR 12 would be similar to those described for U.S. 89. As an additional measure to standard construction practices and mitigation measures specified above, work in this area would be scheduled to minimize impacts to summer tourist traffic accessing BRCA (prior to Memorial Day or after Labor Day) as resource constraints allow.

Increases in AADT and truck traffic levels on Utah highways associated with project construction under Alternative A would be negligible. With standard construction practices and mitigation, construction impacts to Utah highways would be short-term, minor, and adverse given potential for ingress and egress issues and traffic stoppages.

County Roads. Under Alternative A, CR 7960 would be used to access the proposed East Valley Substation site and the Rocky Mountain Power/PacifiCorp transmission line. The proposed 138 kV transmission line would be constructed along and crossing CR 7960. Traffic volumes, including heavy truck traffic, would increase on CR 7960 during construction, and may result in deterioration of road surface conditions. Traffic slow-downs and/or stoppages may occur during construction of the transmission line crossings of the road. County ordinance as stipulated by the county engineer would require an encroachment permit for CR 7960 and, upon completion of construction, repair to a condition equal to or better than prior to construction by the utility. All traffic control on CR 7960 would be required to be in compliance with the Manual of Uniform Traffic Control Devices. Should the transmission line need to be relocated in the future, relocation would be at the utility's expense (Personal Communication, Brian Bremner, Garfield County Road Department, August 11, 2008). CR 7960 is minimally used; therefore, with implementation of standard construction practices and mitigation, short-term adverse impact to county roads would be negligible to minor. There would be no long-term impacts to county roads from construction.

Other Roads. Numerous forest roads would be used throughout the Project Area to access the proposed right-of-way. Increased levels of traffic would be expected on these roads in conjunction with the proposed project; however, the level of use of individual roads would not be anticipated to reach the levels estimated for U.S. 89 or Utah highways. While fewer numbers of individuals would be anticipated to be affected by use of these roads, the effects to the users would be greater than the effects to users of U.S. 89 or SR 12. Travelers on primary and secondary roadways expect to encounter traffic including a

certain amount of heavy truck traffic. Tourists during the main tourist season expect a certain amount of congestion on roadways. However, users of forest roads are expecting to access less-used areas and a more primitive experience that would be compromised to a certain extent by encountering construction traffic and heavy equipment in these areas. Impacts to recreational experiences are addressed in the Recreation Resources Specialist Report.

Standard construction practices would be implemented with regard to construction impacts to forest roads. All roads affected by the proposed project would be adequately signed, warning users of construction activities and traffic when construction is underway in the area. Some segments of these roads parallel the proposed right-of-way and may be closed during construction in the immediate area. Closed areas would be signed and adequate temporary barriers erected to assure that entry by unauthorized individuals would be prohibited, in order to protect inadvertent exposure of individuals to construction area hazards. Signs would include estimated length of closure. In order to maintain necessary access for pickup trucks and equipment, some maintenance and repair of these roads may be required over the course of the project. Forest roads would be maintained or returned to their preconstruction maintenance level or better. Potential beneficial impacts to road conditions could result from the project.

Forest Road 30419 and the Rocky Mountain Power/PacifiCorp transmission line access would be widened to allow equipment into the Project Area. However, the transmission line access within GSENM which provides access for maintenance of an existing transmission line per the GSENM Management Plan (2000) is not open to public motorized travel. Therefore these road improvements would have no effect on transportation resources. Effects of improvements to Forest Road 30419 and the Rocky Mountain Power/PacifiCorp transmission line access, as they are located in a corridor between IRAs, are discussed in the Distinctive Land Areas Specialist Report.

Helicopter Use. Two segments of the right-of-way under Alternative A would not allow access improvement activities or creation of a centerline road, possibly requiring use of a helicopter for delivery and removal of materials. The section of the right-of-way with *limited access areas* located between the Rocky Mountain Power/PacifiCorp transmission line access and Forest Road 30419 is approximately 0.82 mile long. The segment of the right-of-way from the western end of the East-West Interconnect to Forest Road 30223 is approximately 0.71 mile long and would have limited access. Construction and operating standards specific to helicopter use on the project are included below. Under Alternative A, no construction activities would occur within BRCA; however, use of helicopters for construction in *limited access areas* could infringe on the park and therefore general construction and operating standards would be specified.

With implementation of both general and park-specific construction and operation standards, helicopter use in conjunction with construction under Alternative A would have a short-term negligible impact on transportation resources.

Removal of 69 kV Transmission Line

U.S. 89. Under Alternative A, the existing 69 kV line would be removed between the Bryce Canyon Substation and the Hatch Mountain Substation. The existing 69 kV line would be removed by existing Garkane crews in 2- to 3-month increments after the construction and electrification of the 138KV line during the summer season. Because the work would be accomplished by existing crews already working in the area, this would not represent an increase in traffic. Therefore no impacts to AADT on U.S. 89 are anticipated from removal.

Because the work to remove the existing 69 kV line would be accomplished during the summer season and the roads that would be impacted in conjunction with the project are popular routes to tourist destinations, additional mitigation may be required. Work that would directly impact primary or secondary transportation routes, such as removal of the existing line where it crosses roadways, would be scheduled to occur when traffic on the roadway would be at a minimum. Impacts to recreational experiences are addressed in the Recreation Resources Specialist Report.

The existing 69 kV line crosses U.S. 89 approximately 6.5 miles north of the Hatch Substation. During removal of the line, traffic on SR 12 could be impacted in both directions. Temporary traffic stoppages to allow for movement of equipment or removal of line, for example, may be required, as described above for construction. Standard construction practices, such as marking work areas with cautionary signs and use of flaggers to control traffic, would be implemented. Stoppages would be held to less than 30 minutes. With implementation of standard construction practices and mitigation, impacts to U.S. 89 from removal of the existing 69 kV line would be short-term, negligible to minor, and adverse.

Utah Highways (Secondary Roads). Under Alternative A the existing 69 kV line would be removed west of the existing Bryce Substation. The only place the 69 kV line crosses SR 12 is north of Tropic, east of the substation; therefore there would be no impacts to transportation on Utah highways from line removal. Impacts to AADT on Utah Highways from removal of the 69 kV line would be the same as those described for U.S. 89.

SR 63 terminates within BRCA; therefore the vast majority of traffic on this road would be expected to be tourist traffic. The AADT for this road in **Table 1.2-1** is noticeably higher than those for the surrounding Utah highways. One factor to consider is that because the road terminates within the park all traffic must leave the road the way it came in, via SR 12. The figure of AADT increased by 38 trips resulting from construction-related traffic would not be an appropriate estimate for SR 63 as heavy equipment would only be allowed one time access to one area of the right-of-way within the Park, and the only other traffic on this segment of road would be to deliver workers to the right-of-way. While some increase from construction-related traffic cannot be estimated or quantified, that increase would be anticipated to be less than estimated for other Utah highways. No other construction-related impacts to SR 63 would be anticipated.

County Roads. Under Alternative A, removal of the existing 69 kV line would not impact CR 7960 as the CR is east of the existing Bryce Canyon Substation.

Other Roads. Several forest roads would be used to access the existing 69 kV line right-of-way in order to remove the line west of Bryce Substation. Impacts to other roads from line removal would be the same as those discussed under **Construction**, except Forest Road 30419 and the Rocky Mountain Power/PacifiCorp transmission line access would not be used for removal work.

Helicopter Use. The existing 69 kV line right-of-way roughly between Forest Roads 30113 and 30644, a total of approximately 3.55 miles, is designated a *limited access area* and may require use of a helicopter for removal of materials from the right-of-way. Construction and operation standards for, and impacts to, transportation resources from helicopter use under “Construction” would also apply for helicopter use for removal.

Alternative B: Parallel Existing 69 kV Route

Construction

U.S. 89. Alternative B is estimated to generate approximately 8,700 construction-related round trips within the Project Area. Over an estimated construction period of 18 months, this would equate to 17,400 single vehicle counts contributing to AADT, approximately 48 additional trips per day (thus increasing AADT). This would represent an increase in AADT of 2.2 percent. This alternative has the highest estimated number of construction round trips and thus the greatest impact on AADT of the three Action Alternatives, primarily due to the need for construction of the new Bryce Substation, which would not be required under either of the other Action Alternatives.

The alternative is estimated to generate approximately 271 construction-related round trips of truck traffic within the Project Area. This would equate to approximately 1.5 trips per day over the course of an estimated construction period of 18 months. **Table 1.2-1** indicates that 28 percent of the AADT of 2,185 was truck traffic, equating to 612 trips. Additional construction-related truck traffic would represent an increase in truck traffic of approximately 0.25 percent. However, because proportionally the increase in

passenger vehicle traffic is much greater than that of truck traffic, the overall proportion of truck traffic would remain approximately 28 percent.

The new 138 kV line would be constructed across U.S. 89 approximately 6.5 miles north of the Hatch Substation, and approximately 0.75 mile south of the intersection of U.S. 89 and SR 12, parallel to the existing 69 kV line. Direct construction and overall impacts to transportation on U.S. 89 from this alternative would be the same as those described under Alternative A.

Because of the proximity of the road crossing to the intersection of U.S. 89 and SR 12, any traffic slow-downs or stoppages could impact the intersection should construction occur during periods of heavier traffic (traditionally during the summer months due to area tourism). Should stopped traffic build up to the point of impeding the intersection, additional mitigation measures, such as signage or flaggers, may be required at the intersection to allow the flow of traffic to continue from U.S. 89 onto SR 12.

Utah Highways (Secondary Roads). AADT on SR 12 under Alternative B would be anticipated to increase by 48 trips due to construction-related traffic over an estimated construction period of 18 months. For the segment of SR 12 between the junction with U.S. 89 and SR 63, this would represent a 1.9 percent increase in AADT.

An addition of 271 construction-related truck traffic round trips would result in an increase of 542 trips over an estimated construction period of 18 months. **Table 1.2-1** indicates that 11 percent of the traffic between the junction with U.S. 89 and SR 63 would be truck traffic. The addition of approximately 1.5 truck trips per day would represent an increase in truck traffic of 0.6 percent; however, the overall percentage of truck traffic of AADT would remain approximately 11 percent.

Traffic stoppages on U.S. 89 from the construction of the transmission line crossing the highway south of the intersection of U.S. 89 and SR 12 could back up traffic north of the intersection, impede the flow of traffic from SR 12 southbound onto U.S. 89, and cause traffic backups on SR 12. Additional mitigation measures such as signage or flaggers may be required on SR 12 or at the intersection. Should the work in this vicinity occur during the main tourist season (summer months), traffic stoppages should be planned for periods of minimum traffic flow (early morning or late evening).

From the junction of SR 12 and SR 63 and the town of Tropic, an addition of an average of 48 trips per day over an 18-month construction period would represent a 2.6 percent increase in AADT. The addition of an average of 1.5 trips of truck traffic would increase truck traffic by 0.6 percent; however, the overall percentage of truck traffic of AADT would remain approximately 13 percent.

From the junction of SR 12 and SR 63 to its terminus within BRCA, an addition of an average of 48 trips per day over an 18-month construction period would represent a 1.9 percent increase in AADT. The addition of an average of 1.5 trips of truck traffic would increase truck traffic by 0.6 percent; however, the overall percentage of truck traffic of AADT would remain approximately 5 percent.

The new 138 kV line would be constructed across SR 63 approximately 1 mile south of the intersection of SR 63 and SR 12. As stated under the 69 kV Line Removal above, SR 63 terminates within BRCA; therefore the vast majority of traffic on this road would be expected to be tourist traffic that must enter and leave the park both by SR 63. Direct impacts to transportation on SR 63 from construction of the line crossing would be similar to those described previously for U.S. 89 under Alternative A. As SR 63 terminates within BRCA, construction in this area would mostly affect park visitors. In addition to standard construction practices and mitigation measures listed above, work in this area would be scheduled to minimize impacts to summer tourist traffic accessing BRCA (prior to Memorial Day or after Labor Day) as resource constraints allow. In addition, Alternative B would cross SR 12 approximately 2 miles north of the town of Tropic. This segment of SR 12 has the lowest AADT of all road segments analyzed, and thus would impact the least number of travelers.

Numerous forest roads along SR 12 could provide access to the right-of-way for Alternative B. The effect of construction traffic ingress and egress off SR 12 would be the same as that described for U.S. 89 under Alternative A.

Overall impacts to Utah highways from this alternative would be slightly less than those described under Alternative A as the crossing of SR 12 would occur in an area of lower AADT; however, those impacts would still be expected to be short-term, minor, and adverse.

County Roads. CR 7960 would be impacted by this alternative as the proposed East Valley Substation would be located on the southeast side of CR7960, with the proposed 138 kV line crossing the road in a northeasterly direction. Some utilization of the CR for transport of workers and equipment would occur but would be less than the other alternatives. Standard construction practices and mitigation measures specified for Alternative A would apply to this alternative as well.

Other Roads. Several forest roads would be used to access the proposed right-of-way for Alternative B. Impacts to other roads from project construction would be the same as those discussed under Alternative A, except Forest Road 30419 and the Rocky Mountain Power/PacifiCorp transmission line access would not be used for access.

Helicopter Use. Under Alternative B, there are two *limited access areas* that may require helicopter use totaling 6.07 miles. Construction and operation standards for transportation resources from helicopter use would be specified; however, more helicopter use would be required for construction of the transmission line under this alternative than either of the other Action Alternatives. Impacts to transportation resources from helicopter use in conjunction with construction under this alternative would be short-term and negligible to minor.

Substation Distribution Lines

Construction of distribution lines in conjunction with removal of the existing Tropic Substation would primarily impact CR 7960 as this road provides access from the area of the proposed East Valley Substation to the town to Tropic, where the Tropic Substation is located. Construction-related traffic would also impact SR 12 with transportation of supplies and project labor to the Project Area. Given that the scale of the project for construction of the distribution lines is smaller than that of the proposed 138 kV transmission line, and the proposed transmission line project would only have negligible effects on transportation, similar or fewer effects could be expected from the construction of the distribution lines.

Construction of distribution lines in conjunction with either of the new Bryce Substation options would be anticipated to primarily impact SR 63 as the distribution lines would need to cross this road to access either of the proposed substations from the existing Bryce Substation. SR 12 would also be impacted through the transportation of supplies and project labor to and from the construction area. Given that the scale of the project for construction of the distribution lines is smaller than the proposed 138 kV transmission line, and the proposed transmission line project would only have negligible effects on transportation, similar or less effects could be expected from the construction of the distribution lines.

Removal of 69 kV Transmission Line

Under Alternative B, the existing 69 kV line would be removed from approximately 1 mile west of the Tropic Substation to the Hatch Mountain Substation. A portion of this alternative lies within BRCA, and removal activities would be consistent with the requirements of the existing right-of-way. Within BRCA all access would be by foot or helicopter; thus no impacts to transportation resources beyond those detailed under Alternative A would be anticipated. Therefore, impacts to transportation resources from removal of the existing 69 kV line upon completion of the proposed 138 kV line would be similar to those described for removal of the 69 kV line under Alternative A. Under this alternative, helicopter use for removal would be greater than under the other two Action Alternatives as helicopter use would be required within BRCA.

Alternative C: Cedar Fork Southern Route

Construction

U.S. 89. The Alternative C Route is estimated to generate approximately 6,700 construction-related round trips within the Project Area. Over an estimated construction period of 18 months, this would equate to 13,400 single vehicle counts contributing to AADT, approximately 37 additional trips per day (thus increasing AADT). This would represent an increase in AADT of 1.7 percent.

The alternative is estimated to generate approximately 312 construction-related round trips of truck traffic within the Project Area. This would equate to approximately 1.7 trips per day over the course of an estimated construction period of 18 months. **Table 1.2-1** indicates that 54 percent of the AADT of 2,085 was truck traffic, equating to 1,126 trips. Additional construction-related truck traffic would represent an increase in truck traffic of approximately 0.2 percent. However, the overall proportion of truck traffic would remain approximately 54 percent.

The new 138 kV line would be constructed across U.S. 89 in the same location as Alternative A. Direct construction and overall impacts to transportation on U.S. 89 from this alternative would be the same as those described under Alternative A.

Utah Highways (Secondary Roads). AADT on SR 12 under Alternative B would be anticipated to increase by 37 trips due to construction-related traffic over an estimated construction period of 18 months. For the segment of SR 12 between the junction with U.S. 89 and SR 63, this would represent a 1.5 percent increase in AADT.

An addition of 312 construction-related truck traffic round trips would result in an increase of 624 trips over an estimated construction period of 18 months. **Table 1.2-1** indicates that 11 percent of the traffic between the junction with U.S. 89 and SR 63 would be truck traffic. The addition of approximately 1.7 truck trips per day would represent an increase in truck traffic of 0.6 percent; however, the overall percentage of truck traffic of AADT would remain approximately 11 percent.

From the junction of SR 12 and SR 63 and the town of Tropic, an addition of an average of 37 trips per day over an 18-month construction period would represent a 2.0 percent increase in AADT. The addition of an average of 1.7 trips of truck traffic would increase truck traffic by 0.7 percent; however, the overall percentage of truck traffic of AADT would remain approximately 13 percent.

The Alternative C route would cross SR 63 in the same location as the Alternative B route. In addition, this route would cross SR 12 approximately 1 mile east of the junction of SR 63 and SR 12. Direct construction impacts to Utah highways would be the same as those described for the Alternative B route. Should the potential exist for traffic to back up and impede the intersection of SR 12 and SR 63, additional measures such as signage or flaggers may be required (similar to those described for intersections on U.S. 89 under Alternative B above).

County Roads. Impacts to county roads would be the same as those described for Alternative A.

Other Roads. Impacts to other roads along Alternative C from project construction would be the same as those discussed under Alternative A.

Helicopter Use. Under Alternative C there are three areas totaling 1.98 miles where centerline access would be prohibited and that may require helicopter use. Construction and operation standards for transportation resources from helicopter use under Alternative A would also apply for helicopter use under this alternative; however, less helicopter use would be required for construction of the transmission line under this alternative than either of the other Action Alternatives. Impacts to transportation resources from helicopter use in conjunction with construction under this alternative would be short-term and negligible.

Removal of 69 kV Line

Impacts to transportation resources from removal of the existing 69 kV line under Alternative C would be the same as those described for removal of the 69 kV line under Alternative A.

Interconnect Options

Access to the vicinity of the interconnect options would be from SR 12 approximately 4 miles west of the junction with SR 63/22, then taking various forest roads. As impacts to AADT under all alternatives are negligible, utilization of either interconnect option would make no change to the level of impact. Selection of either interconnect option would not involve additional crossing of primary or secondary roadway and therefore would not create any additional impact to transportation resources from that angle.

Alternative D: No Action

Under the No Action Alternative the proposed 138 kV transmission line and associated new infrastructure would not be constructed. The existing 69 kV transmission line would continue to function in its current location and would continue to provide service west of Tropic, to the Hatch area. In order to maintain system stability and reliability Garkane would need to overhaul the line, increasing the amount of trucks and heavy equipment utilizing roads and access routes during the period of time the line is being overhauled. Local traffic associated with future routine line maintenance and repair would be anticipated to continue at current levels. Impacts to transportation would be similar to those described for construction under Alternative B.

1.3.1.3. Summary

Table 1.3-2 provides a comparison of the three action alternatives.

Table 1.3-2. Summary of Transportation Impacts

Analysis Element	Alternative A	Alternative B	Alternative C	North-South Interconnect	East-West Interconnect	69 kV Transmission Line Removal
Approx. miles of additional centerline route[1, 2]	27.9	22.8	27.8	1.84	3.70	NA
Approx. miles of route widened[2]	7.8	0	7.8	0	0	0
Percentage increase in U.S. 89 AADT	1.7	2.2	1.7	Same as Alts. A & C	Same as Alts. A & C	0
Percentage increase in SR 12 AADT – Junction with U.S. 89 to junction with SR 63	1.5	1.9	1.5	Same as Alts. A & C	Same as Alts. A & C	0
Percentage increase in SR 12 AADT – Junction with	2.0	2.6	2.0	Same as Alts. A & C	Same as Alts. A & C	0

Analysis Element	Alternative A	Alternative B	Alternative C	North-South Interconnect	East-west Interconnect	69 kV Transmission line Removal
SR 63 and Tropic						
Number of crossings of U.S. 89	1	1 (near a critical intersection)	1	0	0	1
Number of crossings of SR 12 in area of higher AADT	1	0	0	0	0	0
Number of crossings of SR 12 in area of lower AADT	0	1	1 (near a critical intersection)	0	0	1
Number of crossings of SR 63 (access to BRCA)	0	1	1	0	0	1
Number of crossings of SR 22	1	0	0	0	0	0

[1]Does not include *limited access areas*.
[2]Does not increase public access.

Alternative A crosses SR 12 in an area of relatively higher AADT (compared with the other area of SR 12 for which AADT figures are available), and SR 22. Alternative B and Alternative C cross SR 12 in an area of relatively lower AADT but also cross SR 63, which would impact BRCA visitors accessing the park. In terms of transportation, all three alternatives would have similar levels of impact to transportation. Alternative B and Alternative C may impact fewer individuals as they would involve areas of lower AADT. However, these alternatives would have a greater impact on a user group that is potentially more sensitive, visitors to BRCA.

1.3.2. 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.

1.3.2.1. Cumulative Effects Area

The general cumulative effects area (**Figure 1.3-2**) 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 1.3-3**). 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 1.3-3. 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***

1.3.2.2. 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.

Figure 1.3-2. General Cumulative Effects Area

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.

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 1.3-4 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 1.3-4. 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	

PROJECT (LEAD AGENCY)	LOCATION	DESCRIPTION	ESTIMATED DISTURBANCE (IF AVAILABLE)
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	
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	

PROJECT (LEAD AGENCY)	LOCATION	DESCRIPTION	ESTIMATED DISTURBANCE (IF AVAILABLE)
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	
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

PROJECT (LEAD AGENCY)	LOCATION	DESCRIPTION	ESTIMATED DISTURBANCE (IF AVAILABLE)
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)
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 GSENM Management 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)	

PROJECT (LEAD AGENCY)	LOCATION	DESCRIPTION	ESTIMATED DISTURBANCE (IF AVAILABLE)
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
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	FEIS and Resource Management Plan for public lands and resources managed by the KFO	

PROJECT (LEAD AGENCY)	LOCATION	DESCRIPTION	ESTIMATED DISTURBANCE (IF AVAILABLE)
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.	
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	

PROJECT (LEAD AGENCY)	LOCATION	DESCRIPTION	ESTIMATED DISTURBANCE (IF AVAILABLE)
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	
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,	

1.3.2.3. Cumulative Effects

Overall short-term cumulative effects to transportation would be governed by the timing of many of the projects in the cumulative impacts scenario. It is probable that some level of road improvement and stand

treatment could take place concurrent with the proposed project, in which case the construction traffic from the proposed project would contribute to a minor cumulative effect to transportation. The proposed project would contribute to long-term impacts to transportation.

Exploration for and development of oil, gas, and geothermal resources in this rural and relatively remote area of southern Utah would result in an increase in traffic, most of which would be construction/development-related in the short term. Slight volume increases and presence of different types of vehicles would be noticeable to local residents who use the transportation system routinely, but when combined with the minor transportation effects from the Proposed Action or Action Alternatives, would not be expected to result in adverse impacts to transportation.

Improvements to roads within the cumulative effects area, such as the Tropic Canyon Highway stabilization project and the reconstruction of U.S. 89, would either prevent deterioration of transportation resources or have beneficial impacts to transportation in the long term by making improvements to road surfaces and widths. In the short term, adverse effects to transportation could be anticipated in the form of construction traffic and possibly delays. Should these projects be conducted within the same timeframe as construction of the Proposed Action or Action Alternatives, minor cumulative effects to transportation could result as construction traffic and delays would be compounded.

Incorporation of Ruby's Inn as Bryce Canyon City may result in subdivision and growth in the area that could result in additional traffic utilizing the transportation system within the cumulative effects area. Construction in the area would precede population growth; thus short-term impacts to transportation would be increases in construction traffic, while long-term effects would be increases in passenger vehicle traffic. Should incorporation and development be concurrent with construction under Alternative A, cumulative effects in terms of compounding of volumes of construction traffic could occur.

Under the No Action Alternative, overhaul of the existing 69 kV transmission line may contribute to short-term cumulative effects to transportation systems due to vehicles and equipment traveling the roadways to access the existing right-of-way; however, the intensity of the overall short-term cumulative effect would depend on what other projects are occurring in the same time and space. Overhaul of the existing 69 kV transmission line would not contribute to long-term cumulative impacts to transportation as ongoing maintenance would be anticipated to continue at current levels.

1.4. PLAN CONSISTENCY

Transportation aspects of the proposed project would comply with all federal, state, and local transportation management plans for areas contained within the Project Area.

1.5. COMPLIANCE WITH OTHER LAWS AND REGULATIONS

The proposed project and its resultant impacts on transportation resources would be compliant with the laws governing transportation on federal lands, including:

- The Forest and Rangeland Renewable Resources Planning Act of 1974.
- The National Forest Management Act of 1976.
- The Federal Land Policy and Management Act of 1976.

1.6. LITERATURE CITED

BLM. 2008. Kanab Field Office Resource Management Plan and Final EIS. July 2008.

____. 2000. Grand Staircase-Escalante National Monument Management Plan.

NPS. 2006. Management Policies 2006. www.nps.gov/policy/MP2006.pdf. Accessed June 30, 2008.

____. 2005. Right-of-Way Permit No. RW 1330-05-001, Right-of-Way Permit for Garkane Energy Inc. May 17, 2005.

UDOT. 2006. Traffic Volume Map, Utah. http://www.udot.utah.gov/main/f?p=100:pg:1061049696760320:::V,T:,1852.

____. 2007a. Traffic on Utah Highways. http://www.udot.utah.gov/main/f?p=100:pg:4940575310323448:::1:%,V:2105.

____. 2007b. Truck Traffic on Utah Highways. http://www.udot.utah.gov/main/f?p=100:pg:4940575310323448:::1:%,V:2105.

USFS. 1986. Dixie National Forest Land and Resource Management Plan (LRMP).

____. 2008. Dixie National Forest draft Motorized Transportation Plan. May 2008.

Appendix A – Estimated Traffic Types and Volumes for Activities Associated with Garkane's Proposed Construction of a New 138 kV Transmission Line in Garfield County, Utah

Activity	Contribution to AADT (Round Trips)			Contribution to Truck Percentage (Round Trips)		
	Alt A	Alt B	Alt C	Alt A	Alt B	Alt C
Surveying and Staking						
Worker Transport Assume 2 workers, 1 pickup truck Assume 60 working days	60	60	60			
Access Roads, Fencing, Gates and Clearing						
Worker Transport Assume 4 workers, 2 pickup trucks Assume 30 working days – Rim Road and East Valley Road Assume 60 working days – All other, misc.	180	120	180			
Equipment Transport* (1 each grader, bulldozer, backhoe) Assume 3 round trips per piece of equipment.				9	9	12
Preparing Substation Sites, Construction Yards						
Worker Transport Assume 8 workers; pickup trucks, flatbed trucks – 2 each Assume 30 working days each for preparation of the East Valley Station, expansion of the Hatch Station, new Bryce Assume 30 working days each for site rehab at Hatch Mountain, Tropic, old Bryce	480	720	480			
Equipment Transport (1 dozer/grader) Assume 3 round trips per site (6 substations, 2 construction yards)				18	24	18
Materials Hauling						
Worker Transport Assume 8 workers, 2 pickup trucks Assume 30 working days per construction yard (2) Assume 30 working days per lay-down area (A-7; B-4; C-8)	120 210	120 120	120 240			
Equipment Transport* (2 tractor-mounted cranes) Assume 3 round trips per construction yard/lay-down area per piece of equipment				12 36	12 24	12 48

Activity	Contribution to AADT (Round Trips)			Contribution to Truck Percentage (Round Trips)		
	Alt A	Alt B	Alt C	Alt A	Alt B	Alt C
Poles Assume 40 poles per truck				16	16	16
Other Components Assume 3 semi-trucks loads delivered per construction yard (2) Assume 5 flatbed truck loads delivered to each lay-down area (A-7; B-4; C-8)				6 35	6 20	6 40
Vegetation Clearing						
Worker Transport Assume 4 workers, 1 pickup truck Assume 5 working days per mile of right-of-way (A-30.41; B-29.11; C-29.78) Assume 1 working day per pulling site (A-32; B-24; C-40) Assume 1 working day per lay-down area (A-7; B-4; C-8)	152 32 7	146 24 4	149 40 8			
Equipment Transport* (1 each tracked feller buncher, bulldozer, chipper; 2 skidders, 4 logging trucks) Assume 1 round trip per piece of equipment Assume 6 round trips per mile of timber for log trucks to remove timber				5	5	5
Foundation Excavation						
Worker Transport Assume 4 workers, 2 pickup trucks Assume 30 working days per substation Assume 15 pole holes augered per day	120 86	180 82	120 84			
Equipment Transport* Truck-mounted auger device: Assume 1 round trip Backhoe: Assume 2 round trips				3	3	3
Concrete Placement						
Worker Transport Assume 5 workers, 2 pickup trucks Assume 30 working days per substation	120	180	120			

ACTIVITY	CONTRIBUTION TO AADT (ROUND TRIPS)			CONTRIBUTION TO TRUCK PERCENTAGE (ROUND TRIPS)		
	ALT A	ALT B	ALT C	ALT A	ALT B	ALT C
Equipment Transport* Mixer trucks – Assume 200 cy of concrete delivered, assume 10 cy per truck trip				20	20	20
Structure Assembly and Substation Equipment Placement/Removal						
Worker Transport Assume 8 workers and 6 pickups Assume 5 H-frame structures assembled per day Assume 365 days (240 working days) each for substation equipment placement at Hatch (expansion), East Valley, new Bryce Canyon Assume 60 days each for substation equipment removal at Hatch Mountain, Tropic, Bryce Canyon	384 2880 720	372 4320 1080	378 2880 720			
Equipment Transport* (3 each hydraulic cranes and flatbed trucks; assume compressor trailered behind a pickup) Each piece of equipment: Assume 20 round trips				120	120	120
Structure Erection						
Worker Transport Assume 8 workers, 2 pickup trucks Assume 5 structures erected per day	128	124	126			
Equipment Transport* Crane: Assume 1 round trip				1	1	1
Wire Stringing						
Worker Transport Assume 15 workers, 6 pickup trucks Assume 0.25 mile of wire strung per day	732	702	714			
Equipment Transport* (2 each pullers, tensioners, dozers; assume reel stringing trailers towed behind pickups; 1 materials truck) For each piece of equipment: Assume 1 round trip				7	7	7

Activity	Contribution to AADT (Round Trips)			Contribution to Truck Percentage (Round Trips)		
	Alt A	Alt B	Alt C	Alt A	Alt B	Alt C
Cleanup						
Worker Transport Assume 4 workers, 1 pickup truck Assume 90 days	90	90	90			
Equipment Transport* (1 each bulldozer w/ ripper, grader, front-end loader, tractor/harrow/disk) For each piece of equipment: Assume 1 round trip				4	4	4

*Assume equipment would stay on site for duration of work in each location.

Activity	Contribution to AADT (Round Trips), Passenger/Small Vehicles			Contribution to Truck Percentage (Round Trips)		
	Alt A	Alt B	Alt C	Alt A	Alt B	Alt C
Total Trips (From estimated volume table)	6501	8444	6389	292	271	312
Round trips per day average	18.06	23.46	17.75	0.81	0.75	0.87
Trips per day average	36	47	35	1.6	1.5	1.7
Above calculations assume a construction period of 18 months, equating to 360 working days.						
Total Project AADT Round Trips- Passenger Vehicles and Trucks			**Truck %**			
Alt A Total	6793		4.49%			
Alt B Total	8715		3.21%			
Alt C Total	6701		4.88%			
Road Segment	**AADT**	**Truck Percentage**	**# Trucks**			
Segment 1 - U.S. 89, Hatch to SR 12 Junction	2,185	28	612			
Segment 2 - SR 12 between Junction with U.S. 89 and SR 63	2,455	11	270			
SR 63 (Bryce Canyon NP)	5,075	5	254			
Segment 3 - SR 12 between Junction with SR 63 and Tropic	1,805	13	235			
Alternative	**Seg 1**	**Seg 2**	**Seg 3**	**SR 63**		
Alt A						

Activity	Contribution to AADT (Round Trips), Passenger/Small Vehicles			Contribution to Truck Percentage (Round Trips)		
	Alt A	Alt B	Alt C	Alt A	Alt B	Alt C
Project AADT	38					
Total AADT	2,223	2,493	1,843			
Total number trucks	613	272	236			
Percent Increase in AADT	1.70%	1.51%	2.05%			
Percent Increase in trucks	0.27%	0.60%	0.69%			
Total percent trucks	27.60%	10.90%	12.82%			
Alternative	**Seg 1**	**Seg 2**	**Seg 3**	**SR 63**		
Alt B						
Project AADT	48					
Total AADT	2,185	2493	1853	2586		
Total number trucks	613	272	236	128		
Percent Increase in AADT	2.22%	1.94%	2.61%	1.87%		
Percent Increase in trucks	0.25%	0.56%	0.64%	0.59%		
Total percent trucks	28.07%	10.89%	12.74%	4.96%		
Alt C						
Project AADT	37					
Total AADT	2,222	2492	1842	2575		
Total number trucks	614	272	236	129		
Percent Increase in AADT	1.68%	1.49%	2.02%	1.45%		
Percent Increase in trucks	0.28%	0.64%	0.74%	0.68%		
Total percent trucks	27.61%	10.91%	12.83%	5.00%		

Explanation of Calculations

Calculations assume an 18-month construction period for a total of 360 construction days.

Round Trips Per Day Average – Total number of trips divided by 360 (construction days)

Total Trips Per Day – Round Trips per day multiplied by 2

Trucks – AADT multiplied by the percentage of trucks to reach a number of trucks for the road segment

Project AADT – Total Project AADT multiplied by 2 (to reach total trips), divided by 360 (construction days)

Total AADT – AADT for the road segment plus project AADT

Total Number Trucks - # Trucks for a segment plus trips per day for trucks for an alternative

Percent Increase in AADT – Project AADT divided by Total AADT

Percent Increase in Trucks – # Trucks for a segment divided by the number of truck trips per day average

Total Percent Trucks – Total AADT divided by the Total Number of Trucks

Appendix B – 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 temporary 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 temporary disturbance associated with pole installation.

Addendum to

Transportation 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

Prepared By:

JBR
creating solutions for today's environment

8160 South Highland Drive
Sandy, Utah 84093

This addendum updates the Transportation 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

THIS PAGE INTENTIONALLY LEFT BLANK.

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.

TRANSPORTATION		ALTERNATIVE E: PREFERRED ALTERNATIVE	69 KV LINE REMOVAL, ALTERNATIVE E
Number line crossings	US 89	1	1
	SR-12 (US 89 to SR-63)	0	0
	SR-12 (SR-63 to Tropic)	1	1
	SR-63	1	1
	SR-22	0	0
Miles new access route		33.02	N/A
Miles route widening		7.80	0.00

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 B:

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 B 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
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.

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.

SUSAN BAUGHMAN

Name (Printed)

Signature

1-7-11

Date