Chief Logan State Park Road Project
Environmental Assessment
Logan County, West Virginia

State Project Number: X323-808-0.00

U.S. Department of Transportation
Federal Highway Administration

U.S. Department of Transportation
Federal Highway Administration

West Virginia Department of Transportation
Division of Highways

WVDOH

June 2013

State Project Number: X323-808-0.00

CHIEF LOGAN STATE PARK ROAD PROJECT
LOGAN COUNTY, WEST VIRGINIA

ENVIRONMENTAL ASSESSMENT

Submitted Pursuant to 42 USC 4332(2)(c)
U.S. Department of Transportation
Federal Highway Administration
and
West Virginia Department of Transportation - Division of Highways

June 6, 2013
DATE OF APPROVAL

Paul D. Mattox, Jr.
FOR WEST VIRGINIA DIVISION OF HIGHWAYS

JUNE 6, 2013
DATE OF APPROVAL

FOR FEDERAL HIGHWAY ADMINISTRATION

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This proposed project will consist of a new low-speed road constructed entirely within Chief Logan State Park. The road will connect the Chief Logan Lodge and Conference Center with the main activity areas of Chief Logan State Park. Comments on this Environmental Assessment are due by 8-12-2013 and should be sent to:

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CHIEF LOGAN STATE PARK ROAD PROJECT
LOGAN COUNTY, WEST VIRGINIA

ENVIRONMENTAL ASSESSMENT

United States Department of Transportation
Federal Highway Administration

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Division of Highways

June 3, 2013

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EXECUTIVE SUMMARY

ES-1 PURPOSE AND NEED

Of all the state's parks and recreation areas, Chief Logan State Park is one of the most popular. Located approximately four miles north of the City of Logan, in Logan County, West Virginia, Chief Logan State Park offers day-use facilities and overnight accommodations. The park is also less than an hour's drive south of Charleston, making it a popular recreation spot from the state capital. Over 800,000 people visit the park each year.

Chief Logan State Park was established in 1960 when former mine land was purchased by the Logan County Civic Association and deeded to the State Conservation Commission (the predecessor to the West Virginia Division of Natural Resources). Originally designated as a recreation area, it gained state park status in 1968. In 2003, the boundary of the park was expanded to include the Earl Ray Tomblin Conference Center (commonly known as the Chief Logan Lodge and Conference Center).

The main entrance to Chief Logan State Park is located on WV 10 near Henlawson while access to the Chief Logan Lodge and Conference Center is from US 119 (Corridor G). US 119 provides an entryway to the lodge and conference center, but there is no direct connection to the park proper, nor are there any public roads within the park that allow access between the lodge and conference center to the other activity areas of the park. Although the lodge and conference center are only about one mile from the main park activity areas, visitors to the lodge or conference center wishing to use any of the other park facilities must travel a distance of 8-10 miles around the park to access them.

The park features a 26-site campground and a 75-room hotel at the lodge and conference center. Approximately 5,000 campers use the park campground each year. The lodge and conference center is open year-round and besides lodging includes a restaurant, banquet facilities, a privately-operated, all-purpose Chief Logan Recreation Center, and more than 20,000 square feet of meeting rooms.

By constructing a public roadway between the Chief Logan Lodge and Conference Center and the park, access will be improved and the attractiveness of the park will be enhanced. Consequently, it has been determined that there is a need to improve connectivity between the major activity areas within Chief Logan State Park and provide additional transportation

infrastructure in Logan County that will support economic development in the area by enhancing the recreational experience of visitors.

ES-2 PRELIMINARY ALTERNATIVES

Several alternatives have been evaluated for the project. They include a No-Build Alternative and five build alternatives. The No-Build Alternative serves as the baseline against which build alternatives are evaluated. The No-Build Alternative incorporates planned improvements in the region from both a transportation and recreation perspective. All of the alternatives are shown on Figure ES-1.

Alternate 1: From the western side of the park Alternate 1 will begin near the recreation center, pass through a slight cut at Crawley Gap, and tie into the existing park roadway system near the swimming pool. This alternative allows connections to be maintained for all existing roadways, but some trails and the disc golf course will be impacted. Alternate 1 was first shown to the public in late 2012 and revised slightly in late winter 2013 following receipt of public comments.

Alternate 2: Alternate 2 will also begin at the recreation center, but use a box cut through Crawley Gap and tie into the park roadway system closer to the campground area. The proposed road would require traffic to drive through the campground and may interfere with its operation. It will also sever the connection to some trails and eliminate access to a communications tower on adjacent land.

Alternate 3: Alternate 3 will construct a new road from the east side of the lodge and conference center area to the vicinity of the park's lake. This alternative follows an old mine road.

Alternate 4: Alternate 4 will construct a new road from the east side of the lodge and conference center to the vicinity of the wildlife exhibit. This alternative follows an old mine road.

Alternate 5: Alternate 5 will upgrade an existing limited-use internal service trail beginning near the recreation center through the ridge to the campground. This alternative would have several switchback curves and steep grades, even if paved and upgraded. It will require traffic to drive through the campground.

ES-3 PREFERRED ALTERNATIVE

The proposed roadway will be two lanes with paved shoulders. Bikes and pedestrians will be permitted to use the shoulders as a travelway. The design, as proposed, allows for 16 percent grades and a 20 mph speed. The roadway will be gated and through-travel prohibited when the park is closed.

Although Alternate 2 is the shortest alternative, Alternate 1 would be the least costly to build at $5 million. Alternate 1 impacts the least amount of land overall and would require the least amount of earthwork. Alternate 1 impacts the fewest trails and connects to all existing trails and private roads, but also impacts the greatest amount of streams. As a result of the preliminary comparison of the impacts, Alternate 1 is being recommended as the preferred alternative. Alternate 1 would generally be the least disruptive of the build alternatives and the least expensive to carry through construction. The preferred alternative is shown on Figure ES-2.

ES-4 TRAFFIC PROJECTIONS

Most of the traffic using the proposed new road will originate within the park or at the lodge and conference center. Because of the proposed speed limit, the geometry of park roads, and existing park traffic, it will take approximately 15 minutes to travel through the park from US 119 to WV 10. The majority of the attractions inside the park will be closer to WV 10 than US 119, even with the new road. Patrons approaching the park from US 119 are unlikely to be local routine users and there will not be any significant diversions of park traffic from US 119. Current trips patronizing the lodge and conference center are generating approximately 300 vehicles per day. Based on a traffic model developed for the project, the improved access for the lodge could generate double that on an annual basis, potentially generating about 600-700 vehicles on the road per day.

ES-5 POTENTIAL IMPACTS

The preferred alternative and the No-Build Alternative were analyzed to determine their potential impact on the environment. The factors considered included socioeconomic characteristics, the natural environment, and potential cultural resources impacts. Table ES-1 summarizes the potential impacts.

TABLE ES-1
Summary of Potential Impacts

Resource/Element	No-Build Alternative	Preferred Alternative
Environmental Justice	Potentially positive or negative	Positive
Tax Base	None	None
Business, Residential, or Community Facilities	0	0
Community Cohesion	None	Positive
Farmlands	0	0
Parks and Recreation	Unlikely	36.5 acres of parkland, including 1,540 feet of trails and the disc golf course
Forested Land	Minimal	28.0 acres
Rare, Threatened, and Endangered Species	Unlikely	None
Streams/Water Quality	Minimal	2,453 feet
Floodplains	Minimal	None
Wetlands	Minimal	0.18 acre
Groundwater	Minimal	None
Air Quality	Consistent with *Clean Air Act* standards	Consistent with *Clean Air Act* standards
Noise	None	None
Potential Hazardous Waste Sites	Minimal	2
Cultural Resources (National Register of Historic Places Listed/Eligible Sites)	0	0
Utilities	Minimal	Communications tower service road, local service lines
Secondary Impacts	Minimal	Minimal
Cumulative Impacts	Likely to be mostly positive	Mostly positive
Temporary Construction Impacts	Yes	Yes
Energy	Most likely positive	Positive
Section 4(f) Resources	0	De minimis
Section 6(f) Resources	0	Sponsor-funded public facility
Cost	Project Dependent	$5,000,000

ES-6 PUBLIC INVOLVEMENT

Information on the project was distributed at Chief Logan State Park during early summer 2012. Brochures were available at the park's main office, the swimming pool, campground, and park museum. In addition, brochures were hand-delivered to businesses along WV 10 and made available on the WVDOH website. Information on the project was also disseminated through a news article appearing in the *Logan Banner* and on WVOW-FM. A public meeting and informational workshop will be scheduled.

1.0 INTRODUCTION

1.0 INTRODUCTION

There are no public roads within the Chief Logan State Park that allow access between the Chief Logan Lodge and Conference Center to other activity areas of the park. Although the lodge and conference center are only about 1 mile from the main park activity areas, visitors to the lodge or conference center wishing to use any of the other park facilities must travel on US 119 and WV 10 to access these facilities, a distance of 8-10 miles depending on whether motorists head south or north after exiting the park property.

This Environmental Assessment (EA) is being prepared by the West Virginia Department of Transportation, Division of Highways (WVDOH), in conjunction with the Federal Highway Administration (FHWA), to fulfill requirements set forth in the *National Environmental Policy Act of 1969* (NEPA) and related transportation development laws. NEPA requires that the potential for environmental impacts be assessed for every federal action that *could significantly affect the quality of the human environment*. Three types of environmental documentation are used to comply with NEPA requirements. They are:

- Environmental Impact Statements (EIS) – Prepared when it is known that projects will have a significant effect on the environment.
- Categorical Exclusions (CE) – Prepared for projects that meets specific definitions in *40 Code of Federal Regulations (CFR) 1508.4* and do not involve significant environmental impacts.
- Environmental Assessments – Prepared when the significance of the potential environmental impact is not clearly established.

Transportation projects vary in their potential to affect the environment WVDOH has tentatively determined that the Chief Logan State Park Road Project will impact the environment, but the significance of its impacts is unclear. Therefore, it is being advanced with an EA.

This EA will be made available to the public for a 45-day review period. A public meeting will be scheduled at the beginning of the review period. A notice of at least 15 days will precede the public meeting. If requested at any time during the review period, a public hearing will be scheduled.

Following the close of the review period, all public and agency comments will be evaluated. Only after all comments have been examined and any necessary analysis to address additional public or agency concerns is completed will a determination of the significance of the impacts be made. If after completing the EA there are no significant impacts associated with the project, a finding of no significant impact (FONSI) will be prepared.

1.1 Project Area Background

The study area for the proposed Chief Logan State Park Road Project is in Logan County, West Virginia. The study area includes the boundaries of Chief Logan State Park and those parts of WV 10 and US 119 immediately adjacent to the park. The study area is shown on Figure 1-1.

Chief Logan State Park was established in 1960 when former mine land was purchased by the Logan County Civic Association and deeded to the State Conservation Commission (the predecessor to the West Virginia Division of Natural Resources [WVDNR]). Originally designated as a recreation area, it gained state park status in 1968. The park currently consists of 4,100 acres. Early park improvements included creek channelization, development of hiking trails, and the establishment of picnic areas. The swimming pool was opened in 1964. By 1976, picnic shelters, restrooms, and an amphitheater were added. In 2003, the boundary of the park was expanded to include the Earl Ray Tomblin Conference Center (commonly known as the Chief Logan Lodge and Conference Center). Also in 2003, the park opened both a wildlife exhibit and history museum.

The project area is primarily forested, but several residential areas are found along WV 10. Communities located along WV 10 near the park entrance include Henlawson, Mitchell Heights, Peach Creek, and West Logan. Together, these communities have about 800 to 1,000 residents. Another 1,500 people live within the US 119 corridor in the vicinity of the park. The total population of Logan County is 36,743 (United States Census Bureau [USCB] 2010).

1.2 Park Access

The main entrance to Chief Logan State Park is located on WV 10 near the small community of Henlawson. WV 10 is a two-lane road with a short left-hand turning lane to the park from the northbound lane. Access to the park is gained from County Route (CR) 10/2. In 2011, annual

average daily traffic (AADT) on WV 10 was 7,900 and AADT on CR 10/2 was 1,000 (WVDOH 2011a). Access to the lodge and conference center is gained from US 119, CR 3/2, and Park Forest Road (PFR) 804. US 119 is a four-lane, limited access facility. Although this major through-route provides the entry to the lodge and conference center, it does not connect to the park proper. A left-hand turning lane to the lodge and conference center facility is provided from the southbound lanes of US 119 and a right-hand turning lane is provided from the northbound lanes. In 2011, AADT on US 119 near the entrance was 10,500 (WVDOH 2011a). This is a decrease of 25 percent from AADTs in 2010 (WVDOH 2010a). Also in 2011, AADT on PFR 804 from US 119 to the facility was 50 (WVDOH 2011a).

1.3 Park Facilities and Usage

The West Virginia State Park system includes 35 state parks, seven state forests, five wildlife management areas, the Greenbrier River Trail, and the North Bend Rail Trail. Figure 1-2 shows the entire system of state parks and recreation areas. Chief Logan State Park is one of West Virginia's most popular parks (WVDNR 2012a). Located approximately four miles north of the City of Logan, the county seat of Logan County, Chief Logan State Park offers both day-use facilities and overnight accommodations. The park is also less than an hour's drive south of Charleston, making it a popular recreation spot for day use from the state's capital city. In 2010, approximately 846,000 people visited the park; the following year, attendance was approximately 801,000 (WVDNR 2012b).

In terms of overnight accommodations, the park features a 26-site campground in the older part of the park and a 75-room hotel at the lodge and conference center. Approximately 5,000 campers use the park campground each year (WVDNR 2012b). The lodge and conference center is open year-round and besides lodging includes a restaurant, banquet facilities, a privately-operated all-purpose recreation center (Chief Logan Recreation Center), and more than 20,000 square feet of meeting rooms.

Besides camping, other park facilities include a swimming pool and water slide, an 8-acre fishing lake, hiking and mountain biking trails, an outdoor amphitheater, a museum, a wildlife center, picnic areas, game courts, and playgrounds. The amphitheater is used primarily for "The Aracoma Story" (an outdoor presentation about a Native American princess and a British soldier) and the Aunt Jennie Wilson Folk Music Festival. Approximately 10,000-11,000 guests

attend amphitheater events each year (WVDNR 2012b). About 16,000-17,000 people use the swimming pool each summer and about 12,000-17,000 park visitors stop by the museum each year (WVDNR 2012b). The park also has an annual Christmas light display beginning in late November and running through January 1st. Figure 1-3 shows the locations of all park facilities.

1.4 Purpose and Need

The purpose of the Chief Logan State Park Road Project is to provide a direct connection between the main activity area of Chief Logan State Park and the Chief Logan Lodge and Conference Center. By constructing a public roadway between these two areas, access within the park will be improved and the attractiveness of the park will be enhanced. Project need has been identified through the evaluation of the existing facilities within Chief Logan State Park, an analysis of traffic conditions on US 119 and WV 10, an analysis of the social and economic conditions of the project area, consultation with state and local officials, and comments received during the public involvement process. Consequently, it has been determined that there is a need to improve connectivity between the major activity areas within Chief Logan State Park. There is also a need to provide additional transportation infrastructure in Logan County that will support economic development in the area by enhancing the recreational experience of visitors.

The proposed project has both independent utility and logical termini. Independent utility requires that a roadway be "usable and be a reasonable expenditure even if no additional transportation improvements in the area are made" (FHWA 1993). Similarly, logical termini are "rational end points for a transportation improvement and rational end points for a review of the environmental impacts" (FHWA 1993). For this project, logical termini have been set on the western end of the project at CR 3/2 near the Chief Logan Recreation Center and on the eastern end of the project at CR 10/2 near the park swimming pool.

1.5 Consistency with Other Plans

The proposed project is consistent with state, regional, and local plans. At the state level, the project is consistent with the *West Virginia Multi-Modal Statewide Transportation Plan* (WVDOH 2010b), West Virginia's principal long-range transportation planning document, and the *West Virginia Statewide Comprehensive Outdoor Recreation Plan* (West Virginia Development Office [WVDO] 2009a). The *West Virginia Multi-Modal Statewide Transportation Plan* is a policy

document that evaluated current needs, revenue, and expenditures across all transportation modes. One of the major goals of this plan is to develop a modern transportation system that supports economic development goals and serves the needs of West Virginia citizens. The *West Virginia Statewide Comprehensive Outdoor Recreation Plan* is a long-range planning document targeting active recreation opportunities as one of the best means for improving public health throughout West Virginia. Two major goals of this plan are to promote park development and to promote the physical and economic health of local communities.

Also at the state level, the project is fully funded in the *Statewide Transportation Improvement Program (STIP) 2013-2018*. The STIP is the state's plan of action for funding transportation projects. It includes a wide variety of projects including roadway, bridge, bicycle, pedestrian, safety and public transportation (transit) projects. The Chief Logan State Park Road Project is listed for all phases in the current STIP in its Appendix C – Nonfederal Aid Project Listings, State-Funded Programs (WVDOH 2013).

At the regional level, the Region II Planning and Development Council, through its *Comprehensive Economic Development Strategy* (2010), has identified improvements to recreation facilities as a major goal of economic development efforts. The Region II Planning and Development Council represent 31 units of government in Cabell, Lincoln, Logan, Mason, Mingo, and Wayne counties. Also at the regional level, the Corridor G Regional Development Authority's *Five Year Strategic Plan* (2009) has specifically encouraged improvements at Chief Logan Lodge and Conference Center as a way of ensuring that southern West Virginia is a tourism destination. The Corridor G Regional Development Authority was created by Senate Bill 527 to promote, develop, and advance the business prosperity and economic welfare of Lincoln, Boone, Logan, and Mingo counties.

At the local level, infrastructure improvements at the park are expected to have a positive impact on economic vitality and the quality of life. Logan County does not have a comprehensive plan or countywide recreation plan, but the project is consistent with the *Logan County Land Use Master Plan* (Logan County Development Authority [LCDA] 2002). That plan is a combined state and local initiative used to assist with countywide development efforts. The plan identified Chief Logan State Park as an important element in the fabric of Logan County.

2.0 ALTERNATIVES

2.0 ALTERNATIVES

Several alternatives were evaluated throughout the course of the project. The alternatives included a No-Build Alternative and five build alternatives. All five build alternatives are shown on Figure 2-1.

2.1 No-Build Alternative

The No-Build Alternative serves as the baseline against which build alternatives are evaluated. The No-Build Alternative incorporates planned improvements in the region from both a transportation and recreation perspective. The No-Build Alternative was carried through the entire planning and environmental processes.

2.2 Build Alternatives

2.2.1 Alternate 1

Alternate 1 will construct a road from PFR 804 to CR 10/2. From the western side of the park it will begin at a disc golf course near the recreation center, pass through a slight cut at Crawley Gap, and tie into the existing park roadway system near the swimming pool. The proposed road is approximately 9,400 feet in length. This alternative allows connections to be maintained for all existing roadways, but some trails will be impacted as well as the disc golf course. All necessary waste and borrow sites fall within the proposed footprint for the project. Alternate 1 is shown on Figure 2-2. The total cost of construction is currently estimated at $5,000,000. Alternate 1 was first shown to the public in late 2012 and revised with a slightly lower design speed in late winter 2013 following receipt of public comments on it. The alternate was not re-named because the revisions were so minor.

2.2.2 Alternate 2

Alternate 2 will also construct a new road from the recreation center, but use a box cut through Crawley Gap and tie into the existing park roadway system closer to the campground area. The proposed road is approximately 4,200 feet in length. Excess earthwork may need to be wasted outside the proposed highway alignment for this alternative. Alternate 2 also requires traffic to

drive through the campground and may interfere with its current operation. This alternative will sever the connection to some existing trails and eliminate access to a cell tower that is on an adjacent tract of land. Alternate 2 is shown on Figure 2-3. The total cost of construction is currently estimated at $12,050,000.

2.2.3 Alternate 3

Alternate 3 will construct a new road from the east side of the lodge and conference center area to the vicinity of the park's fishing pond. This alternative follows an old mine road located on the north side of the park and is approximately 17,500 feet in length. All necessary waste and borrow sites fall within the proposed footprint for the project. Alternate 3 is shown on Figure 2-4. The total cost of construction is currently estimated at $18,475,000.

2.2.4 Alternate 4

Alternate 4 will construct a new road from the east side of the lodge and conference center to the vicinity of the wildlife exhibit. This alternative follows an old mine road on the north side of the park and is 9,800 feet in length. Excess earthwork may need to be wasted outside the proposed highway alignment for this alternative. Alternate 4 is shown on Figure 2-5. The total cost of construction is currently estimated at $12,050,000.

2.2.5 Alternate 5

Alternate 5 will upgrade an existing trail beginning near the recreation center through the ridge to the campground. The trail is not used by the public, but by park personnel as a limited-use internal service road. This alternative is 10,300 feet in length and would have several switchback curves and steep grades, even if paved and upgraded. It will require traffic to drive though the campground and interfere with its current operation. Excess earthwork may need to be wasted outside the proposed highway alignment for this alternative. Alternate 5 is shown on Figure 2-6. The total cost of construction is currently estimated at $9,450,000.

2.3 Highway Design Criteria

The proposed roadway will be two lanes with paved shoulders. Bikes and pedestrians will be permitted to use the shoulders as a travelway. Current design and typical sections were developed from information in the American Association of State Highway and Transportation Officials (AASHTO) publication, *A Policy on the Geometric Design of Highways and Streets* (2011) and the WVDOH *Design Manual and Directives, DD-601, Geometric Design Criteria for Rural Highways* (2006) and National Park Service criteria found in *Park Road Standards* (NPS 1984). The extreme topography within the park will require design exceptions for the proposed horizontal curve at Crawley Gap, typical sections, and shoulder widths. The design, as proposed, allows for 16 percent grades and a 20 mph design speed. Figure 2-7 shows a typical section for the proposed roadway.

2.4 Preliminary Impact Analysis

Utilizing conceptual engineering design and secondary environmental data, the preliminary alternatives were screened for potential impacts and ability to meet the project's purpose and need. This comparison of potential impacts is shown in Table 2-1.

TABLE 2-1
Preliminary Impact Analysis

Element	Alternative					
	Alternate 1	Alternate 2	Alternate 3	Alternate 4	Alternate 5	No-Build
Length	9,400 feet	4,200 feet	17,500 feet	9,800 feet	10,300 feet	0
Design Speed	20 mph	25 mph	25 mph	25 mph	10 mph	N/A
Earthwork	2,000,000 cubic yards	2,000,000 cubic yards	3,000,000 cubic yards	2,000,000 cubic yards	1,500,000 cubic yards	0
Area Impacted	37 acres	30 acres	60 acres	34 acres	35 acres	0
Trail Impacts	1,500 feet	10,300 feet	4,609 feet	10,900 feet	10,300 feet	0
Stream Impacts[1]	0	229 feet	0	550 feet	250 feet	0
Cost	$10,500,000	$12,050,000	$13,500,000	$12,050,000	$9,450,000	0

TABLE 2-1 (cont.)
Preliminary Impact Analysis

Element	Alternative					
	Alternate 1	Alternate 2	Alternate 3	Alternate 4	Alternate 5	No-Build
Comments	Impacts some trails, but allows connection to all existing trails and private roads; requires relocation of disc golf course.	Disturbs campground; does not allow connection to cell tower road; does not allow for use of trails in area.	Follows an old mine road; impacts wildlife management area; disturbs wildlife exhibit; longest and most expensive alternative.	Follows an old mine road; disturbs wildlife exhibit; adds additional traffic to lake area.	Disturbs the campground; Converts existing trail to a roadway; does not meet design criteria.	Does not meet purpose and need of the project.

[1] Stream impacts were based on "blue-line" streams shown on USGS 7.5 Minute Quadrangle topography maps (typically all perennial streams and some larger intermittent streams).

The results of the preliminary screening were made available to the public during the summer of 2012 (see Section 2.7 for additional information on public involvement activities) and comments on the project were solicited from the community. This initial screening of alternatives assessed all five alternatives to gauge their practicality and to broadly measure their potential impact on the environment. The criteria used – length, design speed, amount of earthwork, extent of area impacted, trail Impacts, stream impacts, and estimated cost – reflect critical elements of the proposed project.

The following were incorporated into defining the level of impact for each of those elements:

- Length – The actual length of the proposed improvement as identified on conceptual designs related to each alternative. With all things equal, it was initially assumed that shorter alternatives would require less construction, and, consequently, have less impact on the environment.
- Design Speed – Beginning with 25 mph as an upper level baseline, the most practical design speed associated with each alternative was determined. For some improvements to function properly, the design speed had to be adjusted downward to either 20 mph or 10 mph.
- Amount of Earthwork – The estimated amount of material to be moved or excavated was calculated for each conceptual design. It was assumed that higher amounts of earthwork would likely increase the environmental impacts and estimated costs.

- Area Impacted – The actual acreage or footprint of the proposed alternative was based on the area needed to advance each conceptual design.
- Trail Impacts – Staff at Chief Logan State Park Based provided maps and information on the park's trail system. If any part of an existing trail fell within the footprint of an alternative, it was identified as an impact.
- Stream Impacts – Similar to the analysis of trail impacts, if any part of a stream fell within the footprint of an alternative, it was identified as an impact. Impacts were based on U.S. Geological Survey (USGS) maps that identified perennial streams and some larger intermittent streams (i.e., blue line streams found on USGS 7.5 Minute Quadrangle topography maps). It is important to note that even at this early stage of screening, it was understood by the project team that stream impacts could change after actual field measurements were taken and the ephemeral and intermittent streams were added. Any changes, increases or decreases would likely change at the same ratio from one alternative to another.
- Cost – Engineering and construction costs were based on the conceptual design and the amount of earthwork expected for each alternative.

Following the initial screening, Alternates 2, 4, and 5 were dropped from further consideration. Alternate 2 was dismissed because it would disturb the campground (an area where park visitors expect little traffic), does not allow for a connection to the cell tower, and does not allow for full use of recreational trails or provide good opportunities for trail mitigation. The campground is open from March through November and provides space for 26-units (tents, trailers and recreational vehicles) and a central bathhouse.

Alternate 4 was dismissed because it would disturb the wildlife exhibit and add additional traffic to the lake area. The lake is approximately 7 acres and is used for fishing. Bass, blue gill, and catfish are the most populous species in the lake.

Alternate 5 was dismissed from further consideration because it disturbs the campground and would not meet design standards. Its failure to meet design standards would result in a very low design speed that may not be sufficient to meet the project's purpose and need.

Additional design work was performed on Alternates 1 and 3 followed by preliminary fieldwork on streams and wetlands to further refine the alternatives and reduce the potential impacts. Table 2-2 shows the results of the Phase 2 impact analysis.

TABLE 2-2
Phase 2 Preliminary Impact Analysis

Element	Alternative		
	Alternate 1	Alternate 3	No-Build
Length	9,400 feet	17,500 feet	0
Design Speed	20 mph	20 mph	N/A
Earthwork	200,000 cubic yards	1,150,000 cubic yards	0
Impacts Wildlife Management Area	No	Yes	No
Requires additional fill areas for excavation	No	Yes	No
Area Impacted	37 acres	60 acres	0
Trail Impacts	1,500 feet	4,609 feet	0
Stream Impacts[1]	2,453 feet	2,850 feet	0
Cost	$5,000,000	$11,475,000	0
Comments	Impacts some trails, but allows connection to all existing trails and private roads; requires relocation of disc golf course.	Follows an old mine road; longest and most expensive alternative; does not include any secondary impacts due to excess fill.	Does not meet purpose and need of the project.

[1] Stream impacts were based on field measurements of all perennial, intermittent, and ephemeral streams found in the potential footprint of the project.

The additional design work allowed for a considerable reduction of earthwork for Alternates 1 and 3. The earthwork for Alternate 1 decreased from 2 million cubic yards to 200,000, and Alternate 3 decreased from 3 million cubic yards to 1,150,000 cubic yards. In both cases, there would be approximately 1.8 or 1.9 million cubic yards less earthwork. In addition to reducing the earthwork for the project, the anticipated cost of construction for Alternate 1 was lowered to $5 million and Alternate 3 to $1,150,000.

Having more detailed design also allowed for preliminary fieldwork to begin. The fieldwork began the process of identifying actual environmental impacts, rather than utilizing estimates based on secondary source data. While some impacts remained identical to the earlier screening, impacts to the park's streams and trails changed because actual measurements were taken. During the first screening, only perennial streams found on "USGS quad maps" were identified. During this secondary part of the screening process, however, all streams – including perennial, intermittent, and ephemeral – were identified. Subsequent to this additional

identification of streams, more defined impact calculations were developed. In terms of stream impacts, now that all three types of streams were identified, Alternate 1 could impact 2,453 feet and Alternate 3 could impact 2,850. In terms of trails, Alternate 1 could impact 1,500 feet, the same amount as estimated during the initial screening, and Alternate 3 could impact 4,609 feet.

Following the Phase 2 screening, Alternate 3 was dismissed from further consideration because it would impact the adjacent wildlife management area, would create the potential for additional Section 4(f) impacts, and could introduce noise impacts to the wildlife exhibit. The wildlife exhibit features West Virginia-native animals, including black bears, bobcats, barred owls, red shouldered hawks, wild boars, and reptiles. It is considered an area of the park where there is a reasonable expectation for enhanced serenity. At nearly double the length of Alternate 1, Alternate 3 would be the most expensive to build.

2.5 Recommended Preferred Alternative

As a result of the preliminary comparison of impacts, Alternate 1 is being recommended as the preferred alternative. Alternate 1 would generally be the least disruptive of all the build alternatives and with an estimated cost of $5 million, the least expensive to carry through construction. Alternate 1 would be the least costly to build. Alternate 1 impacts the least amount of land overall and would require the least amount of earthwork. Alternate 1 also impacts the fewest trails and connects to all existing trails and private roads. A plan view of the preferred alternative is shown on Figure 2-8.

2.6 Traffic Projections

A traffic demand model was used to estimate trip production, traffic assignment, and the amount of traffic potentially diverted from existing roadways to a build alternative. It was assumed that the model would accommodate any build alternative under consideration and result in the same projections because the termini are the same for all of the alternatives (i.e., US 119 and WV10). Currently, the lodge has a single entry off of US 119 (CR 3/2 and PFR 804) and the park has a single entry off of WV 10 (CR 10/2). Traffic between the park and the lodge must use the public road system outside the park to access separate activity areas.

To determine the potential for traffic on the new road, three future factors were considered:

- non-park traffic cutting through the park between WV 10 and US 119;
- changes in existing circulation patterns within the park due to the improved connectivity between US 119 and WV 10; and,
- actual traffic between the park and the lodge.

2.6.1 Non-Park Traffic

WVDOH traffic counts (WVDOH 2011a) show current AADT on CR 3/2 at 50 vehicles per day (vpd). The AADT on CR 10/2 is 1,000 vpd. Recent park records show that the park attracts approximately 70,000 patrons per month, with more during summer months and less during winter and early spring (WVDNR 2012b).

Future trips through the park will be at low speeds because of the posted speed limit, the geometry of existing park roads, potential conflicts with park activities and patrons, and park traffic. As such, it is anticipated that it will take approximately 15 minutes to travel through the park from US 119 to WV 10. That same trip can be made in less time by driving around the park to either the north or south, particularly the north, where the travel time around the park is typically less than 10 minutes.

The road will also be closed at dusk with a locked gate. This will prevent any cut-through traffic or access to the interior of the park when the park is closed. If necessary for special nighttime events, the gate can remain open until all exiting traffic is cleared at the end of the event. Some nighttime events, however, such as “Christmas in the Park,” may require that the gates be closed during their activities. Special events can be accommodated to determine which situation – gates open or closed – would be appropriate. Emergency services will be provided with keys or a lock by-pass system.

2.6.2 Changes in Existing Circulation Patterns

It is also assumed that a majority of park patrons originate in the WV 10 corridor on the east side of the park because of the existing travel and residential settlement patterns in the area. Due to the nature of the attractions inside the park and its proximity to Logan, it is anticipated that most of the patrons that use the park on a routine basis are local. There will be no travel

time advantages for patrons on the east side of the park to travel around to the west side to enter via US 119. As such, only a small fraction of existing park traffic would have any potential incentive to change their access patterns.

The majority of the attractions inside the park will be closer to WV 10 than US 119, even with the new road. Patrons approaching the park from US 119 are unlikely to be local routine users. As such, it is unlikely that there will be significant diversions of park traffic from US 119. In terms of developing a traffic projection to account for the few trips that would enter from US 119, about 100 to 200 vpd were assigned in the traffic model as a "special consideration" rather than a direct traffic assignment.

2.6.3 Park-Lodge Traffic

The lodge currently has 75 rooms, a full service restaurant, and conference space. Trip generation was calculated from standard Institute of Transportation Engineers (ITE) tables to project the total number of trips that a facility such as this would generate (ITE 2008). The calculations are as follows: Hotel (Land Use #310); AADT – 75 rooms x 8.17 vehicle trips / room = 613 vpd.

Current trips patronizing the lodge are generating approximately 50 vpd. As such, the improved access for the lodge could generate more traffic overall. The AADT projection for the new road is 600 vpd. This coincides with the top end estimate for a hotel the size of the lodge. Not all lodge traffic will enter the park, and in fact, many of the employee or delivery trips generated by the hotel are highly unlikely to enter the park. However, this is offset by providing an allowance for existing park trips that will be attracted to the new US 119 access. It is anticipated that these flows are both on the order of 100 to 200 vpd. For a summer AADT projection, the monthly attendance figures for the park were examined to compute a seasonal adjustment factor to apply to the annual average. Using the most recent 2011 data, the seasonal adjustment factor is computed as follows: June–August average monthly attendance: 78,628; average for the year = 66,758; seasonal factor = 78,628 / 66,758 = 1.18; summer AADT = 1.18 * 600 = 700 vpd. This vpd will also represent the projected traffic flow, commonly known as average daily traffic (ADT). ADT represents traffic flow over a 24-hour period; vpd are typically the units in which ADT is reported.

2.7 Public Involvement Activities

Information on the project was distributed at Chief Logan State Park during early summer 2012. Brochures were available at the park's main office, the swimming pool, campground, and park museum. In addition, brochures were hand-delivered to businesses along WV 10 and made available on the WVDOH website. Information on the project was also disseminated through a news article appearing in the *Logan Banner* and on WVOW-FM.

Comments will be accepted throughout the project and will be addressed fully in the Final EA. During the initial effort to disseminate information on the project, however, 20 comments were received. Comments were received by mail, by completing a WVDOH comment sheet, by email, and through the WVDOH project website. One individual also took out a paid advertisement in the *Logan Banner* opposing the project. The comments fell into the following three categories:

- those in favor of the project;
- those opposed to the project; and,
- those offering other alternatives or modifications to the project.

Nine people favored construction of a connecting road, ten people were against it, and one offered a modification to Alternate 1 to avoid the disc golf course. Those people voicing concern over the proposed project cited the possibility of the new road becoming a "short-cut" from WV 10 to US 119, being used as a "cruising" road or for illegal activities, potential negative effects on the park's wildlife, or negatively impacting the park with additional traffic. Of those in favor of the project, Alternate 1 was their primary choice. Several people suggested that the road be gated to prevent access to the park after dark and to prevent its use as a short-cut. One person suggested that a low posted speed limit might also deter cut-through traffic. One person also suggested that a new road have accommodations for bicycle use.

The EA will be posted on the WVDOH website and hard copies placed in various locations throughout the local area for public review. A public meeting/workshop will be held to allow local residents, business owners, and public officials an opportunity to comment on the document. The comment period will extend for 45 days.

3.0 ENVIRONMENTAL EFFECTS AND MITIGATION

3.0 ENVIRONMENTAL EFFECTS AND MITIGATION

The information in this chapter provides the analytical basis for comparison of the No-Build Alternative and the preferred alternative. The No-Build Alternative is carried into detailed study as a baseline for establishing the potential impacts of any build alternatives under consideration to important resources. Each section within this chapter identifies the probable impacts to the resources of the project area and proposed mitigation efforts to address the effects on the resources.

The Project Resource Checklist (Table 3-1) provides a brief overview of the environmental effects of the build alternatives. The checklist indicates if a specific feature or resource exists in the project area and includes the methods used to identify them.

TABLE 3-1
Project Resource Checklist

Feature or Resource	Not Present	Present	Method of Identification
Socioeconomics			
Residences, Businesses	X		Field investigation; review of project mapping; and consultation with local officials
Community Facilities		X	Field investigation; review of project mapping; and consultation with local officials
Recreation Facilities		X	Field investigation; review of project mapping; and consultation with local officials
Environmental Justice Populations	X		Field investigation; review of project mapping; U.S. Census data; and consultation with local officials
Major Utilities		X	Field investigation; review of project mapping; and research
Community Cohesion	X		Field investigation; U.S. Census data; and consultation with local officials
Natural Resources			
Wetlands		X	Field identification; research; and National Wetland Inventory (NWI) mapping review
Streams, Rivers & Watercourses		X	Field identification; United States Geological Survey (USGS) map review; research; and agency consultation
Wild or Stocked Trout Streams	X		Field investigation; review of WVDNR background information; and other research
Groundwater Resources (i.e., wells, water supply)	X		Field investigation; consultation with local and state officials; and review of project mapping
Floodplains/Floodways	X		Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map review; review of project mapping; and other research
Navigable Waters	X		Field identification; USGS map review; and other research
Other Surface Waters (lakes, reservoirs, ponds)	X		Field identification; review of project mapping; research; and USGS map review

TABLE 3-1 (Continued)
Project Resource Checklist

Feature or Resource	Not Present	Present	Method of Identification
National/State Scenic Rivers and Streams	X		Review of the National/State Scenic Rivers Inventory
Threatened or Endangered Species	X		Agency consultation
Unique Geological Resources	X		Field identification; USGS map review; and review of state geological data sources
Wildlife & Habitat		X	Agency consultation; field identification; and research
Sanctuaries/Refuges	X		Field identification; WV Atlas & Gazetteer map review; and USGS map review
Farmlands	X		Field identification; United States Department of Agriculture (USDA) soil datamart files; and USGS map review
Land Cover		X	Field investigation; Anderson Land Use/Land Cover review
State Game Lands, Forests, or Parks		X	Field identification; WV Atlas & Gazetteer map review; and USGS map review
Sensitive Air Quality Sites	X		Research; review of project mapping
Sensitive Noise Sites		X	Field review; review of project mapping; and field testing
Waste Sites		X	Field identification; review of project mapping; and research
Cultural Resources			
National Historic Landmarks	X		Field identification and National Park Service (NPS) National Natural Landmarks website review
NRHP-Eligible Sites/Districts	X		Field investigation; review of project mapping; and consultation with the State Historic Preservation Office (SHPO)
Known Archaeological Sites	X		Field investigation; consultation with SHPO; and Phase I archaeological survey
Section 4(f) Resources		X	Field investigation; consultation with SHPO and NPS; and consultation with local officials
Section 6(f) Resources		X	Field investigation; consultation with West Virginia Development Office (WVDO) and NPS; and consultation with local officials

The information in this chapter represents a summary of descriptive and analytical data. Additional information and other reports are found in the Project Technical Support Files. All of the information found in the project files will be available for public viewing during the comment period.

3.1 Socioeconomics

The study area for the project encompasses a small portion of northern Logan County and is generally bounded by US 119, WV 10, and WV 73. The surrounding area is small-town and

rural in nature with many single-family homes and considerable open space. With a 2010 census population of 36,743, Logan County is West Virginia's 15th largest county (USCB 2010). With a population of 1,779, the City of Logan is the largest community and county seat of Logan County. The Town of Chapmanville is the county's second largest place with a population of 1,256 (USCB 2010).

The population of West Virginia during the 2000 U.S. Census was 1,808,344 (USCB 2000). By 2010, the statewide population had grown to 1,852,994 (USCB 2010). The local area is not sharing in this growth, however. Population in Logan County peaked in 1950 when it reached 77,391. According to information from the U.S. Census, the population of Logan County has dropped slightly from 37,710 in 2000 (USCB 2000) to 36,743 in 2010 (USCB 2010). Population projections for the area indicate that the population decline in the area could continue over the next 20-25 years (West Virginia University [WVU] 2011). As a comparison, the population of West Virginia is expected to grow by 1.4 percent to 1,878,802 by the year 2035. Table 3-2 provides a demographic overview of Logan County as it relates to the entire state.

TABLE 3-2
Demographic Overview for the Year 2010

Area	Population Characteristics					Individuals Below Poverty Level		Housing	
	Total Population	White	African Amer.	Other Minority	Age 65 & Over	Total	Percent	Units	Households
Logan County	36,743	35,475	788	480	5,575	7,752	21.1	16,743	14,740
West Virginia	1,852,994	1,739,961	63,002	50,031	296,479	329,833	17.8	881,917	746,419

Source: USCB 2010

Population within the immediate study area is more difficult to determine. The study area lies within parts of two U.S. Census Tracts (CT), CT9561.01 and CT9562, and borders two others, CT9568 and CT9569. Specifically, the study area is comprised of Block Groups (BG) 1, 3, and 4 from CT9561.01 and BG2 from CT9562. Census blocks are areas bounded on all sides by visible features, such as streets, roads, streams, and railroad tracks, and by invisible boundaries, such as city, town, township, and county limits; property lines; and short, logical extensions of streets and roads. Generally, census blocks are small in cities (e.g., a block bounded by city streets), but census blocks in suburban or rural areas may be quite large and irregular in shape. Block groups are clusters of census blocks within the same census tracts. They usually contain between 600 and 3,000 people.

The census block groups within the study area are shown on Figure 3-1. The total population of these blocks is 5,905. There are 2,679 housing units within the study area's block groups, of which 2,387 are occupied. Less than 3 percent of the population (163) of these block groups is African American or a member of another minority. Approximately 16 percent of the population (959) of these block groups is 65 years of age or older.

In addition to the individual block groups, CT9561.01 and CT9562 were analyzed to determine the number of people in the area with incomes below the poverty level. The percentages of persons with incomes below the poverty level within CT9561.01 and CT9562 are 17.2 percent and 20.9, respectively (USCB 2010). Table 3-3 provides relevant demographic information on all of the study area's block groups.

TABLE 3-3
Demographics of the Study Area

Area	Population Characteristics					Individuals Below Poverty Level		Housing Units	
	Total Population	White	African Amer.	Other Minority	Age 65 & Over	Total	Percent	Total	Occupied
CT9561.01 BG1	1,521	1,499	3	19	196	262	17.2	714	620
CT9561.01 BG3	1,457	1,441	1	15	187	251	17.2	627	571
CT9561.01 BG4	1,346	1,298	21	27	321	232	17.2	552	505
CT9562 BG2	1,581	1,504	53	24	255	330	20.9	786	691
Total	**5,905**	**5,742**	**78**	**85**	**959**	**1,075**	**–**	**2,679**	**2,387**

Source: USCB 2010

The number of jobs statewide stood at approximately 750,700 in July 2012 (West Virginia Department of Commerce [WVDC] 2012a). In the year 2000, total unemployment in the state was 5.5 percent. By the year 2011, it had increased to 8.0 percent. Despite the recent economic downturn in the country, long-term projections predict statewide employment will reach over 1 million by the year 2040 (WVDO 2009b). Employment in Logan County has lagged behind statewide trends. In 2000, unemployment was 7.5 percent, considerably higher than statewide figures. By 2011, unemployment had climbed to 8.4 percent (United States Department of Labor 2011).

Traditionally, coal production has been a major employer in Logan County and three of the county's largest employers are coal-related. Although coal remains important, the local economy is shifting to other industries, including health care and retail. Table 3-4 provides a list of the largest employers in Logan County.

TABLE 3-4
Ten Largest Employers in Logan County

Employer	Employees
Logan General Hospital	Over 500
Wal-Mart	200-499
Aracoma Coal Company	200-499
Apogee Coal Company	200-499
Southern WV Community College	100-199
Lightning Contract Services, Inc.	100-199
Logan County Commission	100-199
Lowe's Home Centers	100-199
Trinity Healthcare Services	100-199
Spartan Mining Company	100-199

Source: WVDC 2012b

In terms of per capita personal income, in 2010, per capita personal income was $31,172 in Logan County (WVDC 2012b) and $32,641 in West Virginia. Nationally, per capita personal income was considerably higher, averaging $40,584. Also in 2010, median household income in Logan County was $34,590, in West Virginia it was $38,380, and nationally it was $51,194. In 2010, approximately 21.1 percent of all people in Logan County had incomes below the poverty level, but only 16.8 percent of all West Virginians had incomes below the poverty level. Nationwide that same year, 13.8 percent of all Americans had incomes below the poverty level (USCB 2010).

3.1.1 Environmental Justice

Executive Order 12898 of February 11, 1994, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*, requires that the proposed project be assessed to determine whether or not it will have a disproportionately high impact on minority or low-income populations within the area (Office of the President of the United States of America [OPUSA] 1994). There are three fundamental principles at the core of environmental justice:

- To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations;
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process; and
- To prevent the denial of, reduction in, or significant delay in, the receipt of benefits by minority and low-income populations.

The analysis utilized information from the following U.S. Census units for the year 2010: all of Logan County; BG 1, 3, and 4 from CT9561.01; and, BG2 from CT9562. Information used for the environmental justice screening is found in Table 3-5.

TABLE 3-5
Demographic Information Used
for Environmental Justice Screening

Area	Total Population	White Population	Minority Population	Percent Minority	Persons with Incomes Below Poverty Level	Percent Below Poverty Level
CT9561.01 BG1	1,521	1,499	22	1.4	262	17.2
CT9561.01 BG3	1,457	1,441	16	1.1	251	17.2
CT9561.01 BG4	1,346	1,298	48	3.6	232	17.2
CT9562 BG2	1,581	1,504	77	4.9	330	20.9
Logan County	36,743	35,475	1,268	3.5	7,752	21.1

Source: USCB 2010

The analytical methodology employs a comparative screening analysis that measures potentially impacted populations to determine if an environmental justice population would see a disproportionate impact when compared to the non-environmental justice populations. This methodology identifies a threshold for the study area and compares block group data to that threshold. If block group data exceed the threshold, the potential for disproportionate effects to occur on that block group is judged to be present.

Following the initial screening, the analysis showed that two of the block groups in the study area exceeded the thresholds for minority populations in Logan County. In Logan County, the threshold is 3.5 percent. Both CT9561.01 BG4 and CT9562 BG2 have higher percentages, indicating that there could be an environmental justice impact to minority populations.

The analysis also showed that none of the block groups in the study area exceeded the thresholds for low-income populations. In Logan County, the threshold is 21.1 percent. All of the block groups under study have lower percentages than that, indicating that there is unlikely to be an environmental justice impact to low-income populations. There will be no direct impacts to residential and business properties, however, with the preferred alternative. If minority populations are indirectly impacted by the project, the effect will be improved access within Chief Logan State Park and between US 119 and WV 10. Thus, any impacts to environmental justice populations will be positive.

Mitigation

No mitigation is necessary, but the WVDOH will work to assure that minority populations and low-income individuals have full access to information on the project and understand the potential impacts from construction and operation of improved access through Chief Logan State Park. As the project progresses, positive benefits are expected that could increase family incomes and elevate the local standard of living. These benefits include new employment opportunities from roadway construction, related services, and tourism.

3.1.2 Tax Base

No taxable land will be converted to transportation right-of-way as a result of the project. Thus, there will be no impact on the county's tax base, positive or negative, with either the preferred alternative or the No-Build Alternative.

Mitigation

No mitigation is necessary.

3.1.3 Business Displacements

There will be no business displacements with either the preferred alternative or the No-Build Alternative.

Mitigation

No mitigation is necessary.

3.1.4 Residential Displacements

There will be no residential displacements with either the preferred alternative or the No-Build Alternative.

Mitigation

No mitigation is necessary.

3.1.5 Community Facilities and Services

Police service in the county is provided by the Logan County Sheriff's Department, the West Virginia State Police, the City of Logan, and the towns of Chapmanville, Man, Mitchell Heights, and West Logan. The Mitchell Heights Police Department is the closest to the park. Senior managers at Chief Logan State Park also have law enforcement authority within the park. Fire protection service in the project area is provided by the Chapmanville Volunteer Fire Department (VFD), Cora VFD, Henlawson VFD, Logan Fire Department, and the Verdunville VFD. The Henlawson fire station is the closest to the park, located immediately across from the park's main entrance. Other emergency response services are provided by the Logan County Office of Emergency Services and the Logan Emergency Dispatch Service.

Schools located within the vicinity of the project area include Justice Elementary School and Logan Senior High School. Although both schools are located along the WV 10 corridor, only the elementary school is relatively close to the park. United States Post Offices close to the park are located in Henlawson, Peach Creek, and Pecks Mill. Figure 3-2 shows the locations of nearby community facilities.

The No-Build Alternative will not impact any community facility. Positive impacts to emergency services will result from construction of the preferred alternative, however. By providing an

improved roadway through the area, response times for emergency services will decrease and service will be enhanced with construction of a through-road in the park.

Mitigation

No mitigation is necessary.

3.1.6 Community Cohesion

A community is part of a larger region, having a special characteristic or group of characteristics that make it different from the surrounding area. In its simplest form, it is a group of individuals having common ties and a common identity. Communities can have clear boundaries delineated by existing municipal or physical limits, or less distinct boundaries defined by socioeconomic factors, demographic characteristics, or social and psychological attitudes. For the transportation development process, a community is generally assumed to be a geographic area where local residents have made a commitment to both the physical environment where they live or work and the accompanying social system functioning within that environment.

In past environmental studies, community cohesion has been defined as the interaction among individuals, groups, and institutions. Community cohesion manifests itself as the perception of belonging to a group or having a close bond to a particular area. This perception of a strong community bond is commonly referred to as a “sense of place,” allowing cohesion to be expressed through the patterns of "daily social interaction, the use of local facilities, participation in local organizations, and involvement in activities that satisfy the population's economic and social needs" (FHWA 1996). Although no direct measurement of community cohesion is possible, any impacts potentially caused by a transportation project could interfere with the accessibility of facilities and services. Impacts that cause the displacement of residents and businesses could also result in disruption to community cohesion.

Neither the No-Build Alternative nor the preferred alternative will displace any homes or change existing community travel patterns. Transportation patterns will not be disrupted.

Mitigation

No mitigation is necessary.

3.2 Parks and Recreation

The project area was examined for existing parks, recreation areas, and wildlife refuges during site investigations and by reviewing the USGS Chapmanville, Henlawson, Holden, and Logan 7.5 minute quadrangles (USGS 2010a, 2011a, 2010b, and 2011b, respectively), and the *West Virginia Atlas & Gazetteer* (DeLorme 1997). Besides Chief Logan State Park, there are no public parks in the immediate project area. The only recreational facility located in the project area is a privately-operated fitness center, the Chief Logan Recreational Center, near the western terminus of the proposed roadway.

There will be no impacts to other parks and recreation areas with either the preferred alternative or the No-Build Alternative. The preferred alternative will, however, impact 36.5 acres of the Chief Logan State Park. It will also impact the trail system of the park by altering access to the Wilderness Trail and the Foggy Bottom Trail. In total, approximately 300 feet of the Wilderness Trail and 1,200 feet of the Foggy Bottom Trail will be impacted by the preferred alternative.

The preferred alternative will also displace a disc golf course located at the Chief Logan Recreational Center. Disc golf is a flying disc game in which players throw a flying disc, similar to a Frisbee, at a basket-like target. As with regular golf, these targets are often referred to as holes. The Chief Logan course currently has nine holes, but there are indefinite plans to expand the course to 18 holes. The course is approximately seven acres. It is located on the south side of PFR 804 in close proximity to the recreation center's building and parking lot. If expanded, the most likely location for the "back 9" will be slightly to the east of the original holes. Although the course was constructed by the Chief Logan Recreational Center, park officials approved its location. The course is maintained by the Chief Logan Recreational Center. There is a small fee for playing the course, but any member of the public, not just members of the recreation center, are permitted to use the course. Figure 3-3 shows the locations of recreation facilities in relation to the preferred alternative.

Mitigation

Relocation of access and system continuity for both impacted trails will be required if the preferred alternative is constructed. The WVDOH will incorporate roadway crossings, trail signage, and continuity accommodations, as appropriate, into the preferred alternative. The WVDOH will also allow pedestrian and bicyclists use of the shoulders of the new road. Additionally, the WVDOH will assist the Chief Logan Recreational Center with relocation of the disc golf course. It is anticipated that it can be relocated in the immediate area with relative ease. The WVDOH will work with the park and the recreation center to relocate, replace and enhance the disc golf course.

3.3 Farmlands

The federal *Farmland Protection Policy Act of 1981* (FPPA) requires an analysis of farmlands for any project receiving federal funding. The purpose of the FPPA is to "minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to non-agricultural use." FPPA farmland is determined by the USDA, Natural Resources Conservation Service (NRCS) based upon the underlying soil types as represented in each county's soil survey. The USDA, NRCS defines FPPA farmland as the soil types determined to be prime farmland, statewide important farmland, unique farmland, or locally important farmland. The definitions of these categories are as follows:

- Prime Farmland – Land which has the best physical and chemical characteristics for the cultivation of agricultural products with a minimum of labor, fertilizer, and pesticides. It does not include land in urban development or land used for water storage.
- Unique Farmland – Land other than prime farmland that is used for the production of a specific high-value food or fiber crop.
- Farmland of Statewide Importance – Land other than prime or unique farmland, which has been designated as being of importance for the production of agricultural crops.
- Farmland of Local Importance – Land other than prime, unique, or of statewide importance, which has been designated by local agencies as containing the best characteristics for the production of agricultural crops.

No farmland soil types or farmlands are located within the park and there will be no impacts to farmlands with either the preferred alternative or the No-Build Alternative.

Mitigation

No mitigation is necessary.

3.4 Land Use and Land Cover

Land use and land cover are often confused because of their similarities. Land use is defined by human activities on the land, through the spatial distribution of function and physical improvements (Chapin 1972) while land cover describes the vegetative and artificial constructions that cover the land (Anderson 1976). In its simplest forms, land use can be categorized as residential, industrial, commercial, and open-space, and open space as built-up, agricultural, rangeland, forested, water, or barren.

3.4.1 Land Use

Land use in the study area can be divided into two major categories: built-up and forested. The overall project area is primarily forested, but several residential areas are found adjacent to the park, including the small towns of Henlawson, Mitchell Heights, Peach Creek, and West Logan. The largest municipality in the area is Logan. The WV 10 corridor on the east side of the park has long been a major through-route for the area, and, as a result, exhibits medium densities in terms of development. The US 119 corridor, on the west side of the park, though not has heavily developed as WV 10, is likely to see more development as land becomes available.

Current levels of density are expected to continue for the immediate future. Major commercial developments have already appeared south of the park, especially in the Mt. Gay area along US 119 where a Wal-Mart Super Center and many other businesses have located. In the past, this development would have been more likely to occur along WV 10, the traditional highway corridor for the area, or in Logan and Chapmanville.

The land on which the park sits was formerly a surface mine and evidence of extensive coal mining operations occurring in the past are evident. Little Buffalo Creek, which flows through the park but is just outside the study corridor, has suspected high iron content based on the red color of the water and red staining on the substrate. This indicates that multiple point sources of contaminated water due to mining exist in the park. Utilizing an index of biological integrity (IBI),

the West Virginia Department of Environmental Protection (WVDEP) has rated Little Buffalo Creek as marginal to suboptimal. IDI ratings classify water pollution problems through the anthropogenic influences on a water body with biological activity in the water body (WVDEP 2013). Ratings progress in quality from poor to marginal to suboptimal to optimal. One unnamed perennial stream within the park, which originated from behind an old mining silo in the park, did not appear to have any activity in it. This is often an indicator of poor water quality in perennial watercourses and is a result of the area's past use for coal mining.

Only minimal impacts are expected to land use with either the No-Build Alternative or the preferred alternative. As transportation access in the area is improved, additional land will be available for development. Some of this land could shift from open space to residential or commercial developments.

Mitigation

Developmental pressures are expected to remain low in the area. This in turn is likely to allow population densities and economic activity to remain relatively constant with the present. Impacts to land use can be minimized, however, with proper planning. Although strict land use controls are not currently present in the area, mitigation strategies or future developmental controls could include access management, comprehensive planning, zoning, transfer of development rights, growth management regulations, resource management, resource preservation, conservation easements, and incentives for infill development, among others.

3.4.2 Land Cover

The land cover types found within the project area were identified by reviewing the USGS 7.5 minute quadrangles (USGS 2010a, 2010b, 2011a, and 2011b), the *West Virginia Atlas & Gazetteer* (DeLorme 1997), and through field investigations. Field investigations were performed during August 2012. Upland habitat and land cover types were classified to Level II in accordance with the *Anderson Land Use/Land Cover Classification System* (Anderson *et al.* 1976). Field observations of wildlife included observations and evidence of deer, various small mammals, and many species of birds.

Only minimal impacts are expected to land cover with the No-Build Alternative. Vegetation and wildlife habitat could be impacted during the development of any future project to improve the transportation network in the area. Bridge rehabilitation and renovation, maintenance activities, and minor transportation systems improvements are likely to impact land cover considerably less than construction of new roadways on new alignment.

Impacts to land cover within the preferred alternative are shown in Figure 3-4 and Table 3-6.

TABLE 3-6
Land Cover Impacts

Land Cover Type	Description	Impact (acres)
14. Transportation, Communications, and Utilities	Streets, highways, roads, transmission lines, and related facilities.	0.5
17. Other Urban or Built-Up Land	Typically consists of such land uses as golf driving ranges and urban parks.	8.0
41. Deciduous Forest Land	All forested areas having a predominance of trees that lose their leaves at the end of the frost-free season or at the beginning of a dry season.	28.0
Total		36.5

Mitigation

Mitigation for impacts to land cover will include the placement of temporary protective fence during construction. An approved Erosion and Sedimentation Control Plan will be implemented to minimize impacts to the water quality and habitat of the project area streams. All disturbed areas will be revegetated (utilizing a native seed mixture) and landscaped upon completion of construction.

3.5 Rare, Threatened, and Endangered Species

Threatened and endangered wildlife and plant species are protected under *Section 7* of the federal *Endangered Species Act of 1973* (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq*.). In West Virginia, there is no state threatened and endangered species legislation. Therefore, the species listed as either threatened or endangered in West Virginia are those listed by the United States Fish and Wildlife Service (USFWS) as federally threatened and endangered species.

A survey of potential bat habitat was conducted during the summer months of 2012 to determine the presence or absence of the Indiana bat *(Myotis sodalis*) in the study area. The project area was also surveyed for the presence of caves or abandoned mine portals, landscape features that could provide bat hibernacula. No rare, threatened, or endangered bat species were found in the area, nor were any caves or abandoned mine portals identified. In a project review form dated October 16, 2012, the USFWS indicated that the proposed project would not impact any rare, threatened, or endangered species and no further Section 7 consultation is required. A copy of this form is provided in Appendix A.

3.6 Streams/Water Quality

West Virginia *Title 46 Legislative Rule, Environmental Quality Board, Series 1, Requirements Governing Water Quality Standards (46 Code of State Regulations [CSR] 1)* were reviewed concerning potential impacts to West Virginia waters (West Virginia Secretary of State 2005). Delineations of streams were performed by field personnel in August and September 2012. The surface water investigation consisted of reviewing existing information and field investigations. Existing information utilized for this study included the: USGS 7.5 minute topographical quadrangles; West Virginia *Title 46 Legislative Rule, Environmental Quality Board, Series 1, Requirements Governing Water Quality Standards (46 CSR 1)*; WVDNR *West Virginia Trout Stocking Schedule*. *West Virginia Title 46*; and *West Virginia Surface Mining Rules*.

The following are the definitions for the types of streams, as defined in *West Virginia Title 46 and the West Virginia Surface Mining Rules*:

- *Perennial Streams* – Streams or portions of a stream that flow(s) continuously.
- *Intermittent Streams* – Streams which have no flow during sustained periods of no precipitation and which do not support aquatic life whose life history requires residence in flowing waters for a continuous period of at least six months.
- *Ephemeral (or Wet Weather) Streams* – Streams that flow only in direct response to precipitation or whose channels are at all times above the water table.

The project area streams were analyzed through visual observation of physical characteristics. Sampling of the macroinvertebrate population was conducted by physically overturning and examining substrate, woody debris, and detritus within each of the surveyed streams. Macroinvertebrate taxonomic classification, abundance, and diversity were recorded onto the

surface water hydrology survey data form for each stream surveyed. The taxonomic classification was completed to the Order level (where possible), and the abundance and diversity of each Order were recorded. Finfish sampling was not conducted for this investigation, but if finfish were observed within a stream it was noted.

The project area is situated within two different drainage basins, the South Fork Crawley Creek basin and the Buffalo Creek basin. Both of these streams are tributaries to the Guyandotte River. The designated water use category for South Fork Crawley Creek is for the Propagation and Maintenance of Fish and Other Aquatic Life, Category B1 Warm Water Fishery Streams; the designated water use category for Buffalo Creek is Category B2, Trout Waters. Both streams also carry the designated water use for Water Contact Recreation (Category C). South Fork Crawley Creek is a Tier 1 stream as it is found on the 2010 West Virginia Integrated Water Quality Monitoring and Assessment Report. Buffalo Creek is a Tier 3 stream as identified by the WVDEP.

Many of the project area streams share similar land use and watershed characteristics. Land uses associated with the project study area streams include forested land and recreational land, since the project is located within a state park. Watershed characteristics common to each of these streams include mountainous terrain that is wooded. Open terrain is also a watershed characteristic exhibited by two of the project area streams.

Although the project streams are located in a picturesque park, the streams are not in pristine condition. All of the streams in the park have been affected by past coal mining operations in the area, receiving drainage from coal mine portals, culvert crossings, and remnants of deep mines. Over the years, the WVDNR, WVDEP, and other agencies have worked to improve water quality throughout the park, but stream conditions are still impacted by the environmental legacy of past mining practices.

In early 2013, a jurisdictional determination field review was held with WVDOH and U.S. Army Corps of Engineers (USACE) staff present. At that time, the USACE staff reviewed the preliminary stream findings and made a determination on which streams should be considered waters of the U.S. A jurisdictional determination was issued by the USACE on March 15, 2013. A copy of the issuing letter is found in Appendix A.

Table 3-7 lists the project area streams, their classifications, and the results of the jurisdictional determination.

TABLE 3-7
Project Area Streams

Stream I.D. Number	Name of Stream	Classification	Results of Jurisdictional Determination
S1	UNT to South Fork Crawley Creek	Ephemeral/Intermittent	Unconnected RPW
S2	UNT to South Fork Crawley Creek	Ephemeral/Intermittent	Unconnected RPW
S3	UNT to Buffalo Creek	Ephemeral/Intermittent	Connected RPW
S4	UNT to Buffalo Creek	Ephemeral/Intermittent	Connected RPW
S5	UNT to Buffalo Creek	Ephemeral	Unconnected Non-RPW
S6	UNT to Buffalo Creek	Perennial	Connected RPW
S7	UNT to Buffalo Creek	Ephemeral	Unconnected Non-RPW
S8	UNT to Buffalo Creek	Ephemeral	Connected Non-RPW
S9	UNT to Buffalo Creek	Ephemeral	Erosional Feature/Not a stream
S10	UNT to Buffalo Creek	Ephemeral	Unconnected Non-RPW
S11	Buffalo Creek	Perennial	Connected RPW

RPW = Relatively Permanent Water

S1 and S2 are both unnamed tributaries to South Fork Crawley Creek, though only S1 appears to have a surface connection to this stream. S1 flows on top of a fill and receives drainage from abandoned coal mine portals. Flows for S2 dissipate within an isolated wetland identified as CLW3. There is no defined channel evident downslope of the limits of wetland CLW3.

S3 through S10 are unnamed tributaries of Buffalo Creek. They are crossed by a coal strip road and receive discharges from abandoned deep mine portals that have been reclaimed by the WVDEP. Streams S3, S4, S5, S7, S8, and S10 are all headwaters type, high gradient ephemeral drainages that carry surface water runoff. Stream S6 is a high gradient perennial stream that receives year-round flow from underground mine workings. Abandoned mine drainage is evidenced by a grayish white precipitate coating stream substrates in portions of the channel.

S11 is Buffalo Creek. It is a moderate gradient perennial stream that, like all of the other streams in the park, has been impacted by past coal mining operations. S11 displays a coating of orange-brown precipitate on a majority of the stream substrate.

No impacts are expected to streams with the No-Build Alternative. Approximately 2,870 feet of streams, however, will be impacted with the preferred alternative. The locations of project area

streams impacted by the preferred alternative are shown on Figure 3-5. Table 3-8 summarizes stream impacts for the preferred alternative.

TABLE 3-8
Stream Impacts

Stream	Perennial (feet)	Intermittent (feet)	Ephemeral (feet)	Total
S1 – UNT South Fork Crawley Creek	0	743	0	743
S3 – UNT Buffalo Creek	0	5	85	90
S4 – UNT Buffalo Creek	0	84	63	147
S5 – UNT Buffalo Creek	0	585	0	585
S6 – UNT Buffalo Creek	571	0	0	571
S7 – UNT Buffalo Creek	0	0	161	161
S8 – UNT Buffalo Creek	0	156	0	156
Total	571	1,573	309	2,453

Of the potential impacts for the preferred alternative, 571 feet will be to perennial streams, 1,573 feet to intermittent streams, and 309 feet to ephemeral streams. All impacts will be permanent. A Clean Water Act (CWA) Section 404 permit, issued by the USACE, would be required prior to construction of the preferred alternative. The WVDOH would begin the permit application following the issuance of a *Finding of No Significant Impact* (FONSI) on the proposed project.

Mitigation

In order to avoid and/or minimize potential impacts to water quality/streams, the following best management practices (BMPs) and recommendations will be considered and undertaken, where appropriate, during final design and construction:

- Reduce the amount of aquatic habitat (and riparian vegetation) that would be disturbed by minimizing the linear distance of stream being impacted.
- Design and construct culvert structures that promote the re-establishment of benthic habitat within the culvert.
- Design and implement an approved Erosion and Sedimentation Control Plan to prevent sediment deposition to aquatic habitats.
- Promptly revegetate all disturbed areas to prevent accelerated erosion.
- Minimize the need for in-stream work by heavy equipment.
- Develop project sequencing to facilitate in-stream work during periods of seasonal low flow.

- Designate any equipment fueling and service areas away from aquatic habitats to minimize the potential for accidental spillage of petrochemicals.
- Designate and construct all stormwater management facilities to prevent or minimize runoff resulting in erosion and sedimentation.
- Minimize the amount of vegetative clearing and impervious surface within the right-of-way to reduce volume and thermal increases.
- Minimize the diversion of surface water flow within the cleared portion of the right-of-way to reduce thermal increase.
- Coordinate stream mitigation activities with the natural resource agencies.

3.7 Floodplains

Federal guidelines require the use of available National Flood Insurance Program maps to determine and evaluate the effect the proposed action may have on 100-year floodplains and the risk of flooding. Upon review of the *Digital Flood Insurance Rate Map for Logan County* (FEMA 2012), it was noted that there are no floodplains in the immediate vicinity of the project area.

Mitigation

No mitigation is necessary.

3.8 Wetlands

The wetlands investigation was conducted in accordance with the *United States Army Corps of Engineering* (USACE) *Wetlands Delineation Manual*, *Technical Report Y-87-1* (USACE 1987); the *Interim Regional Supplement to the USACE Wetland Delineation Manual: Eastern Mountains and Piedmont Region*, ERDC/EL TR-10-9 (USACE 2010); and Section 404 of the *Clean Water Act*.

The identification and delineation of jurisdictional wetland habitats were conducted through the use of existing information and field investigations. The existing information utilized included the USGS 7.5 minute topographical quadrangles; USFWS NWI, digital data files (2011); the NRCS

Soil Survey Geographic (SSURGO) database for Logan County, West Virginia (USDA 2011a); and the Soil Datamart tabular data (USDA 2011b).

Due to normal site circumstances, wetland habitats identified during the field investigation were delineated utilizing the routine on-site determination method as described in the *USACE Wetlands Delineation Manual* (1987). Wetland habitats were classified according to the USFWS' *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin *et al.* 1979). Pertinent information, including dominant vegetation, Munsell soil color, hydric soil indicators, signs of hydrology, and types of disturbance was recorded onto a Wetland Determination Data Form tailored to the Eastern Mountains and Piedmont Region for each wetland. The wetland boundaries were marked with surveyor's flagging and surveyed utilizing global positioning system (GPS) equipment accurate to less than one meter.

Wetland functions were assessed in the field following procedures and protocols described in the USACE, New England District's *Highway Methodology Workbook Supplement – Wetland Functions and Values, A Descriptive Approach*, NAEEP-360-1-30a (1999). Wetland functional parameters evaluated include: groundwater recharge/discharge (GRD); floodflow alteration (FA); fish and shellfish habitat (FSH); sediment/toxicant retention (STR); nutrient removal (NR); production export (PE); sediment/shoreline stabilization (SSS); wildlife habitat (breeding, wintering, migration) (WH); recreation (REC); educational/scientific value (ESV); uniqueness/heritage (UH); visual quality/aesthetics (VQA); and, endangered species habitat (ESH).

A review of NWI mapping determined that no NWI wetlands are present in the project study area. A review of the NRCS SSURGO database for Logan County and the Soil Datamart tabular data identified four soil map units within the study area. None of the soil map units are identified as hydric soils.

The project area is situated within two different drainage basins, the South Fork Crawley Creek basin and the Buffalo Creek basin. The topography within the study area is primarily comprised of steep hillsides with some gently sloping areas. Wetland field investigations for this project were conducted between August and October 2012. During the initial field investigations, 11 potential palustrine wetlands were identified and delineated within the project study area. Some of these wetlands, however, were later shown not to be wetlands because they did not meet

hydric soil criteria. Hydric soils are one of the three primary indicators of wetlands and include soils developed under sufficiently wet conditions to support the growth and regeneration of hydrophytic vegetation (another one of the primary indicators of wetlands, the third indicator is hydrology).

The wetlands identified within the study area appear to be groundwater driven systems with overland flow as an additional hydrology source. Many of the wetlands are toe-of-slope type wetlands located on old road cuts associated with past land use within the park. All the delineated wetlands are palustrine emergent (PEM) type systems.

Common functions displayed by a majority of the project area wetlands include GRD, WH, and STR. Functions of SSS and PE were also displayed by several of the project area wetlands.

In early 2013, a jurisdictional determination field review was held with WVDOH and USACE staff present. Staff reviewed background information on each wetland and made a final determination of each site. At that review, most of the sites originally identified as wetlands were determined not to be a wetland or isolated from waters of the U.S.

Table 3-9 lists the vegetative classification and size of each of the wetlands delineated for the project. The results of the jurisdictional determination are also included in the table.

TABLE 3-9
Project Area Wetlands

Wetland	Vegetative Classification	Size (acre)	Results of Jurisdictional Determination
CLW1	PEM	0.05	Isolated Wetland
CLW3	PEM	0.06	Isolated Wetland
CLW4	PEM	0.01	Isolated Wetland
CLW6	PEM	0.01	Isolated Wetland
CLW11	PEM	0.05	Isolated Wetland
Total	**All PEM**	**0.18**	**All Isolated Wetlands**

The No-Build Alternative could have a minimal impact on wetlands, depending on the actual design of current and future programmed projects. Increased travel on existing roads could also result in a variety of transportation and development problems leading to the need to increase highway capacity. Future projects aimed at addressing these needs could impact wetlands in the area. The preferred alternative will not impact any jurisdictional wetlands, but will impact

four isolated wetlands (CLW-3, CLW-4, CLW-6, and CLW-11) that total approximately 0.06 acre. The isolated wetlands impacted range in size from approximately 0.01 acre to 0.03 acre. A WVDEP permit to impact isolated wetlands may be required prior to construction of the preferred alternative. Coordination with the WVDEP and WVDNR is currently on-going to determine if the WVDEP will take jurisdiction over the isolated wetlands within the project's footprint. If a permit is required, the WVDOH would begin the permit application following the issuance of a *Finding of No Significant Impact* (FONSI) on the proposed project. The impacts to the wetlands are shown in Table 3-10 and Figure 3-6.

TABLE 3-10
Wetland Impacts

Wetland	Type	Preferred Alternative (acre)
CLW-3	PEM	0.03
CLW-4	PEM	0.01
CLW-6	PEM	0.01
CLW-11	PEM	0.01
Total	**All PEM**	**0.06**

Mitigation

Mitigation for the loss of project area wetlands will be determined during final design and the permitting process. At that time, measures will be identified that will minimize temporary and permanent impacts.

3.9 Groundwater

The project area is located within the Permian and Pennsylvanian aquifer of the Appalachian Plateau Physiographic (USGS 1997). Most of the water-yielding rocks within this aquifer are sandstones, but coal beds and seams also yield water where they are fractured along joint systems. Bedrock aquifers in the area, however, accept low recharge because the Appalachian Plateau is highly dissected, much of the area is sloping, and soils on slopes are thin. Consequently, fresh ground water generally circulates only to shallow depths (USGS 1997).

Formerly, a 122-foot-deep well supplied water for restrooms in one of the picnic areas in the park (USGS 1995), but that well is no longer in use. Public water service in the park and

surrounding area is now provided through the Logan County Public Service District (LCPSD). No groundwater is drawn from within the bounds of the park and the LCPSD draws all of its water from the Guyandotte River (LCPSD 2012). Consequently, there will no impact to groundwater as a result of the No-Build Alternative or the preferred alternative.

Mitigation

No mitigation is necessary.

3.10 Air Quality

A transportation air quality evaluation is required by *NEPA* and the federal *Clean Air Act* (CAA) of 1990. Logan County is currently in attainment for all six principal pollutants identified in the CAA as "criteria pollutants". These include ozone, particulate matter, sulfur dioxide, carbon monoxide, nitrogen dioxide, and lead. Based on the extremely low traffic volume of 700 ADT during the peak summer season projected for the Chief Logan State Park Road Project, this project is not anticipated to affect the existing air quality or create any new violations to the *National Ambient Air Quality Standards* (NAAQS).

The purpose of this project is to improve connectivity between Chief Logan State Park and the Chief Logan Lodge and Convention Center by constructing a new road between activity areas. Based on the 700 ADT, this project has been determined to generate minimal air quality impacts for CAAA criteria pollutants and has not been linked with any special Mobile Source Air Toxics (MSAT) concerns. As such, this project will not result in significant changes in traffic volumes, vehicle mix, basic project location, or any other factor that would cause an increase in MSAT impacts of the project from that of the no-build alternative.

Moreover, EPA regulations for vehicle engines and fuels will cause overall MSAT emissions to decline significantly over the next several decades. Based on regulations now in effect, an analysis of national trends with EPA's MOVES model forecasts a combined reduction of over 80 percent in the total annual emission rate for the priority MSAT from 2010 to 2050 while vehicle-miles of travel are projected to increase by over 100 percent. This will both reduce the background level of MSAT as well as the possibility of even minor MSAT emissions from this project.

Mitigation

Air quality disturbances during construction of the project will be temporary and will primarily be the result of open burning, emissions from diesel-powered construction equipment, and dust from embankments, stockpiles, and haul roads. All open burning will be done in accordance with all applicable laws, ordinances, and regulations, and will be subject to the regulations of the WVDEP Office of Air Quality.

Slight increases in particulate levels may occur during the construction phase of the project. However, this effect would be minimized by requiring the contractor to adhere to dust control measures as outlined in WVDOH's most current standard specifications. These measures may include:

- Minimization of exposed erodible earth area to the extent possible;
- Stabilization of exposed earth with grass, mulch, pavement, or other cover;
- Periodic sweeping of haulage areas;
- Periodic application of water stabilizing agents to working and haulage areas;
- Covering, shielding, or stabilizing of stockpiled material as necessary, and;
- The use of covered haul trucks.

3.11 Noise

A noise analysis was undertaken to identify and evaluate the potential noise impacts resulting from the proposed project. This analysis identifies the fundamentals of noise, noise-sensitive areas within the project area, noise impact criteria prescribed by federal regulations and WVDOH analysis procedures. The analysis uses quantitative modeling utilizing the FHWA Traffic Noise Model (TNM2.5) to analyze traffic sound levels under the existing and design year (2032) No-Build and preferred alternative. It also identifies areas which exceed the prescribed noise abatement criteria (NAC). Sound level predictions based on future traffic and roadway improvements were compared with the NAC to delineate noise-impacted land uses.

Sensitive receptors are defined as those land uses which are especially susceptible to noise impacts. These may include hospitals, schools, residences, motels, hotels, recreational areas, parks, and places of worship. The sensitive receptors identified within the project study area

are considered Activity Category C as defined by the FHWA traffic noise regulations (23 CFR Part 772). Category C includes the following: active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.

The recently revised *Highway Traffic Noise Policy* (WVDOH 2011b) was used to provide impact thresholds along the proposed route for the varying land uses in the project area in conjunction with Title 23 of the Code of Federal Regulations Part 772 (23 CFR 772). Traffic noise impacts are defined in these documents as "impacts which occur when predicted traffic noise levels approach or exceed NAC, or when the predicted traffic noise levels substantially exceed the existing noise levels." WVDOH defines the approach as 1 dBA less than the NAC and a substantial increase as 15 dBA over existing conditions.

The existing sound levels were estimated based on typical background contributions on rural areas. There are no significant noise sources within the project area aside from recreation facilities. Background levels are assumed to be 45 dBA or less. Based on an existing noise level of 45 dBA and applying the substantial increase condition, all of the receptors analyzed have a 60 dBA NAC.

Noise modeling was performed at six locations along the original Alternate 1 utilizing a 2032 design year. The modeling incorporated traffic volumes, speeds and compositions, terrain and elevation changes, tree zones, building rows, median barriers, as well as the design features. The sensitive receptors are shown on Figure 3-7. The following traffic data were used in the analysis: Design Year ADT - 700; growth factor (K) - 6 percent; directional split (D) - 50/50; and, percentage of trucks – 2 percent. All of the modeling locations were well within the NAC.

There will be no change in the future acoustic environment associated with the No-Build Alternative. Six noise-sensitive receptor sites were analyzed for the preferred alternative, all recreational facilities located in the southern portion of the park. These receptor sites included the mini-golf area, playing courts, swimming pool, and an open field/play area. All of the modeled sites are well within the NAC and no noise impacts are predicted for the future acoustic environment.

Mitigation

No mitigation is required.

3.12 Potentially Hazardous Waste Sites

A preliminary assessment of potentially hazardous wastes sites was completed in the study area in September 2011. The purpose of this investigation was to identify and document potential hazardous materials concerns within the study corridor. Typical contaminants that were expected, but were not limited to include:

- materials containing asbestos;
- lead;
- polychlorinated biphenyls (PCBs);
- potential adverse water quality constituents such as excess iron or aluminum; and
- evidence of pre-law surface and underground coal mining.

The primary concern for the project is that mining has occurred in the area within the past 100 years. Several areas within the corridor displayed evidence of past mining, from abandoned mining materials to potentially contaminated water, as well as an old structure likely associated with mining activities. Based on observation of water color, the streams in the project area are clearly contaminated from past mining activity, some areas showing a white hue, indicative of excess aluminum, and other areas showing red staining on the substrate, indicative of high iron content.

The No-Build Alternative will have minimal impact on potentially contaminated sites.

Potential hazardous materials concerns with the preferred alternative can arise from water contamination associated with historic mining and possible asbestos-containing materials (ACM) associated with two structures. Both of these structures are shown on Figure 3-8. A former coal mining building was identified within the preferred alternative. (See the Cultural Resources section of this EA for additional information on this structure and the silo described in the next paragraph.) The frame of the building is cinderblock with a concrete roof. Pieces of shingles were observed on the ground near the structure and are assumed to have been part of

the roofing at one time. It was common practice to use asbestos in building materials during the construction period of the structure, creating a potential risk of ACM.

A silo associated with historic mining was observed in the park within the easement of the preferred alternative. The construction date of the structure is unknown, but it is assumed to be at least 50 years old. As with the coal mining building, it was common practice to use asbestos in building materials and a potential risk of ACM exists. The exterior of the silo is composed of a concrete-like material with rebar encircling the entire circumference.

Mitigation

Mitigation measures for transportation projects typically include development of a hazardous materials management plan and/or hazardous waste-management related provisions for incorporation into construction bid documents. The proposed project will utilize a similar document to address potential contamination. Additional analysis and testing may need to be conducted as engineering design is advanced. If either of the two structures noted above are demolished during construction, an ACM inspection should be completed prior to any construction activity. Particular attention should be paid to the cementitious exterior of the silo and the shingles associated with the concrete block structure roofing. It is also recommended that all construction equipment be decontaminated should it come in contact with any surface water on site. Due to the nature of the landscape, it is also possible that construction activities could expose former mining features. Careful attention should be paid during all construction activities to maintain worker safety if a mine shaft or opening be exposed.

3.13 Cultural Resources

Cultural resources include pre-contact and historic period archaeological sites and above-ground historic structures and locations. Potential above-ground historic resources are considered to be any standing structure, object, or above-ground cultural feature that is 50 years of age or older. In September 2012, a final Phase I cultural resource survey report was submitted to the WVDOH in partial fulfillment of the requirements for federal undertakings under Section 106 of the *National Historic Preservation Act of 1966*, as amended, its implementing regulations, 36 CFR 800, and Section 4(f) of the *United States Department of Transportation Act of 1966*.

According to 36 CFR 800.16(d), the Area of Potential Effect (APE) for cultural resources investigations consists of "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist." The APE for both the Phase I archaeological survey and the above-ground historic resources survey followed the proposed cut and fill lines for the preferred alternative.

3.13.1 Historic Resources

Above-ground historic resources survey fieldwork was completed during August 2012. Background research included a review of historic maps, atlases, county histories, histories of the West Virginia state park system, newspaper articles on Chief Logan State Park, and the coal history of Logan County. The collections of the West Virginia State Archives in Charleston and the West Virginia & Regional History Collection at West Virginia University were also researched for information specific to Chief Logan State Park. Information was also gathered from the park office and museum.

The field survey was conducted at the east end of the project APE where resources associated with the state park are located. No historic park-related above-ground resources fall within the project APE and none will be affected by the project. Only one historic above-ground resource falls within the APE, a former coal mine building. A second coal related resource is located a short distance to the north of the APE, a coal silo.

The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association (NPS 1997). Historic resources are evaluated based on the following criteria:

- Criterion A – Resources that are associated with events that have made a significant contribution to the broad patterns of our history;
- Criterion B – Resources that are associated with the lives of significant persons in or past;
- Criterion C – Resources that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high

artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

- Criterion D – Resources that have yielded or may be likely to yield, information important in history or prehistory.

The National Register is the nation's inventory of historic places and the national repository of documentation on the variety of historic property types, significance, abundance, condition, ownership, needs, and other information. It is the beginning of a national census of historic properties. The National Register Criteria for Evaluation define the scope of the National Register of Historic Places; they identify the range of resources and kinds of significance that will qualify properties for listing in the National Register (NPS 1997).

State Parks as Historic Resources

A number of West Virginia state parks are listed in the NRHP. Portions of four were listed and 12 others were determined eligible for NRHP listing as part of a 2011 Multiple Property Documentation (MPD) of New Deal Resources in West Virginia State Parks and State Forests (Sweeten 2010).

In addition to the state parks listed under the MPD, three other state parks were listed in the NRHP prior to the MPD: Carnifex Ferry in Nicholas County for its association with the Civil War battle fought there; Watters Smith Memorial State Park in Harrison County for its association with Watters Smith, a pioneer to the region, and with the agricultural history of the area; and, Berkeley Springs State Park in Morgan County for its association with mineral spring resorts.

The four state parks listed as part of the MPD and the other 12 identified as eligible for listing were among the earliest state parks in West Virginia and were associated with Civilian Conservation Corps (CCC) activities in West Virginia. Chief Logan State Park was not one of the parks identified. Chief Logan State Park does not have CCC associations, and it is not an early example of a West Virginia state park. Chief Logan was developed much later than most other state parks, the recreation area in 1961 and the state park in 1969. By that time the West Virginia state park system was well-established. Moreover, the area of Chief Logan State Park within the project APE does not meet the definition of any of the property types established by the MPD. Much of the park was part of an extensive coal mining operation. It is not an example

of managed forests and plantings; natural features characteristic of West Virginia topography and geology; New Deal-era landscaping features, structures, or buildings; or historic sites. As noted, much of the developed area of the park dates to the post-1970s. For these reasons, the state park was recommended not eligible under NRHP Criterion A or C.

There is also no evidence that Chief Logan State Park is associated with a significant person or persons or that it is likely to yield information not available from other sources. Consequently, Chief Logan State Park was recommended as not eligible under NRHP Criterion B or D.

In a letter dated January 10, 2013, the West Virginia Division of Culture and History, the SHPO, concurred with the project recommendations. A copy of that letter is found in Appendix B.

Above-ground Historic Resources

In order to be eligible for listing under NRHP Criterion A, resources must have important associations with events that have made a significant contribution to the broad pattern of history. The storage building and coal silo do not meet that standard either individually or collectively. Although both resources are associated with coal mining in Logan County, an important part of the county's history, the resources do not convey important associations with that history either individually or collectively. The isolated building and structure do not convey the scale or function of Merrill/Gay Coal Company's operations along Little Buffalo Creek, which would have included coal camp housing, mine portals and fan houses, tipples and other coal processing buildings, railroad tracks, and shipping buildings. Additionally, the storage building and coal silo are not particularly important resources in a coal mining operation, like a tipple would be.

The resources do not appear to be significant under NRHP Criterion B. There is no evidence that they were associated with a significant person or persons.

To be eligible under NRHP Criterion C for architecture or engineering, a resource must embody the distinctive characteristic of a type, period, or method of construction, represent the work of a master, possess high artistic value, or be part of a historic district.

The resources do not appear to meet any of these standards. There is nothing distinctive about the storage building, a utilitarian concrete block building. The cylindrical coal silo is an example of a building type used since at least the early twentieth century to store material such as grain and coal to keep it away from moisture. Silos similar to this one are still used to store coal today. There is nothing distinctive about the coal silo's engineering or use; therefore, it was determined that it is not eligible for consideration under NRHP Criterion C.

Resources are eligible under NRHP Criterion D if they have yielded, or may be likely to yield, information important in prehistory or history. Historic coal mining operations in West Virginia have been extensively studied. The utilitarian buildings are not likely to yield information not available through other sources.

Neither the No-Build Alternative nor the preferred alternative will impact any historic resource in the area. The potential historic resources in the park, the concrete block building and the coal silo, were each recommended as not eligible for listing in the National Register of Historic Places (NRHP).

Mitigation

No mitigation is necessary.

3.13.2 Archaeological Resources

A Phase I archaeological survey consisting of background research and field investigations was performed in August 2012. The survey was completed in order to ensure that compliance with all applicable federal and state cultural resource regulations was obtained. Approximately 32 ac of the APE are steeply sloped and approximately 4 ac exhibit previous disturbance.

Visual examination of the entire project APE identified no level areas with intact soils of appropriate age to contain archaeological remains; therefore, no subsurficial surveying was required. Additionally, no rock shelters or archaeological resources visible at the modern ground surface were identified. No cultural material of any kind was identified during the survey, and background research did not identify any previously identified pre-contact or historic period archaeological resources within the project APE.

The No-Build Alternative will not impact any archaeological resource in the area. Based on the lack of previously identified archaeological sites within the project APE, and the low archaeological potential in the project APE, the preferred alternative will not affect any archaeological resources eligible for or listed in the NRHP.

In letter dated October 31, 2012, the SHPO concurred with the project recommendations. A copy of that letter is found in Appendix B. An additional 14.6 acres were also tested during the spring of 2013 to account for slight changes in the preferred alternative. Those areas have been found to be clear of archaeological resources and a supplemental report was submitted to the SHPO. In a letter dated May 22, 2013, SHPO concurred with the project recommendations that no further archaeological work was necessary. A copy of that second letter is also found in Appendix B.

Mitigation

No further archaeological investigations are warranted and no mitigation is necessary.

3.14 Utilities

Utilities found in the project area include electric, water, sanitary sewer, and communications lines. A communications tower is also located in the park in the vicinity of the project. The tower is owned by Hatfield-McCoy Coupons, Inc. of Chapmanville. The coordinates for the tower are 37.889029/-82.040920. It is shown on Figure 3-9 in relation to the preferred alternative. Access to the tower for maintenance is acquired from a gated park service road that originates near the proposed western terminus of the preferred alternative.

There will be no impacts to utilities with the No-Build Alternative. There will, however, be temporary impacts to the communications tower and local service lines. The preferred alternative will take the lower portion of the park service road, potentially eliminating access to the tower from the service road. The upper portion of the service road can be reconnected to the new road, however, to provide improved access for the tower. The preferred alternative will also impact local service lines and require the movement and replacement of some utility poles within the park.

Mitigation

WVDOH will coordinate with the communications tower owner to develop a plan for access during construction. The WVDOH will also incorporate design elements into the new road that will assure permanent access to the structure after construction has been completed. Utility relocations are typically required on most transportation projects and the WVDOH has detailed procedures for coordinating with impacted utilities. The relocation of affected utilities can usually be completed prior to the start of construction with limited inconvenience to the public. Coordination with the utility operators will be required throughout final design and construction of this project. Coordination meetings will be held to discuss the need for additional right-of-way, expansion, or relocation easements; impacts to schedules; construction requirements; and any other special issues.

3.15 Secondary and Cumulative Impacts

Guidelines prepared by the Council on Environmental Quality (CEQ) for carrying out NEPA requirements broadly define secondary impacts as those that are caused by an action and are later in time or further removed in distance, but are still foreseeable (1978). Secondary impacts can be associated with development that may result from the construction of a facility, such as a transportation improvement project, but differ from impacts directly associated with the construction and operation of the facility itself. Generally, these impacts are stimulated by an initial action and comprise a wide variety of indirect effects, such as changes in land use, development patterns, economic activity, population density, and related impacts on air, water, and other natural systems, including ecosystems. Indirect impacts may result in increased development pressure on open space, farmlands, and other natural resources.

Cumulative impacts, on the other hand, result from the incremental consequences of an action when added to other past, present, and reasonably foreseeable future actions (CEQ 1997), regardless of what agency, person, or organization undertakes such actions. Cumulative impacts result from past, present, and future actions. When considered as a whole and in concert with other foreseeable developments and projects, they can result in a combined effect greater than considering separate elements independently.

3.15.1 Secondary Impacts

Secondary impacts are those normally associated with development that may result from the construction of a facility, such as a transportation improvement project, but differ from those impacts directly associated with the construction and operation of the facility itself. Secondary impacts are commonly referred to as induced development. Generally, these impacts are stimulated by an initial action and comprise a wide variety of secondary effects, such as changes in land use, development patterns, economic activity, utility service capacity, and population density. Although secondary impacts may result in increased development pressure on open space and other natural resources, the rural character of the project area limits secondary impacts primarily to areas with some infrastructure in place.

Factors that typically induce secondary, or indirect, development are new access to potential development areas, increased roadway capacity, existing development plans, suitable terrain, and economic incentives. The potential for indirect development to occur in any particular area is determined in great part by individual municipal planning objectives, but the current availability of land and public infrastructure in Logan County indicates that secondary development is most likely to occur along US 119 considerably further south of the park rather than in the immediate vicinity (Logan County Commission [LCC] 2012).

This qualitative assessment included field views, a telephone interview with the Logan County Commission office, and a review of secondary sources. In addition, information was gathered on other major projects in the area.

As determined from existing trends and current plans, commercial or industrial growth is limited in the area. Newer commercial development is concentrated primarily along US 119, but the Logan County Development Authority lists three sites targeted for industrial development: Earl Ray Tomblyn Industrial Park, Three Mile Curve, and McDonald Airfield. The Earl Ray Tomblyn Industrial Park near Holden is approximately 52 acres; Three Mile Curve is a 16-acre site located in Dabney; and McDonald Airfield is a 66-acre site in Taplin along the Guyandotte River (LCC 2009).

Although residential growth could occur almost anywhere, it is constrained by topography and the limits of existing public water and sewer systems. Suitable land, the availability of public

water, the availability of public sewer service, and suitable transportation are typically used as appropriate development features that can be used to predict growth (Kulkarni 1976). The opportunity for induced development is strongest when all four elements are in place and almost nonexistent when none of them are. Economic pressures on the local community, coupled with national trends, are also likely to limit development in the region and growth in the corridor is constrained by the finite availability of flat land and sufficient infrastructure. Thus, development is expected to be limited to where it is currently occurring and remain lower in other areas. Thus, the likelihood of indirect impacts is minimal.

Mitigation

Secondary development would be an economic benefit to the community and supports the project's needs. Avoidance and minimization of the adverse impacts related to induced development will be accomplished primarily through implementation of highway-access controls. Although strict land use controls are not currently present in the area, future developmental controls could include access management, transfer of development rights, growth management regulations, resource management, resource preservation, and conservation easements.

3.15.2 Cumulative Impacts

Taken individually, the impacts from an action may have little effect on the environment. When viewed as a sequence of events, however, different actions may add up to, or cause, additional effects over time. Thus, the cumulative impact may be of more consequence than isolated, individual impacts.

Past projects since 1970 and planned actions through the year 2030 were reviewed to complete a qualitative assessment of cumulative impacts. Primary data sources included a review of comprehensive plans and related programming documents, interviews with local economic development officials, study area field views, and secondary data sources. Consequently, a qualitative analysis rather than a quantitative trends analysis emerged.

Cumulative impacts or effects are a result of the incremental impacts of an action when added to other past, present, and reasonably foreseeable future actions (RFFAs). Cumulative effects

can be difficult to understand because they are not clear cut. They can accrue from similar impacts, from multiple actions, or be the product of unrelated impacts from a variety of actions. In addition, some actions may offset the effects of other actions, lessening the overall impact. Cumulative effects can also arise from actions which may only be connected by their common impacts on similar resources, ecosystems, or human communities.

The identification and analysis of RFFAs present many challenges. Proponents of future actions may be reluctant to reveal information for a number of reasons. Plans may be uncertain and project sponsors, both private and public, may not see a benefit in disclosing them. Furthermore, project sponsors may not completely understand the importance of their plans on other projects, or understand the potential impact inherent in those plans on others. Detailed design and operational information is generally not available for proposed projects. At the preliminary stage of project development, locations may not be set. Project size and magnitude may not have been determined. Usage estimates or projections may not be sufficiently rigorous. Many factors also affect the timing, location, and design of future actions. If programming and funding requirements have not been finalized, future actions may be delayed, downsized, or modified significantly over time. If definitions of future actions are too liberal, future impacts may be predicted as being too high. If definitions are too conservative, future impacts may be underestimated.

There will likely be a cumulative impact to the area as a result of the project because it will improve local transportation and provide better access to the Chief Logan Lodge and Conference Center. This could stimulate growth and result in future impacts. Other actions that have contributed to cumulative effects are shown in Table 3-11.

TABLE 3-11
Major Actions in the Study Area

Activity	Location	Environmental Issues that are Cumulative
Water and sewer system improvements	Throughout Logan County	Land use, water quality, wetlands, traffic, noise, air quality, cultural resources
Build out of existing industrial sites	Earl Ray Tomblin Industrial Park, Logan Manufacturing Facility, McDonald Airfield, and Three Mile Curve	Terrestrial habitat, water quality, noise, air quality, traffic

TABLE 3-11 (cont.)
Major Actions in the Study Area

Activity	Location	Environmental Issues that are Cumulative
Transportation system improvements	Throughout Logan County	Land use, water quality, wetlands, traffic, noise, air quality, cultural resources
Commercial development	Along US 119 corridor at its intersection with WV 73	Terrestrial habitat, water quality, wetlands, noise, air quality, traffic, cultural resources

Once RFFAs were identified, a matrix of probability and potential impact was developed. The matrix connects RFFAs and their anticipated effects on resources so that judgments can be made on the likelihood they will occur. This method was originally developed by the USACE for projects along the Ohio River, but it can serve as a valid method for analyzing any linear project. The use of matrices to analyze cumulative effect is one of the recognized techniques identified by the CEQ for measuring cumulative impacts (CEQ 1997). Matrices provide two-dimensional checklists that quantify interactions between human activities and resources and assess both magnitude and importance.

Analysis of the matrix was based on several things, best illustrated by a series of questions. During what time period will the action occur or how frequently will the RFFA take place? Two time periods were used, including within 10 years and between 10 and 20 years from now. What is the importance, or impact, of the action on the resource? Three rankings were used to determine importance, including high, medium, and low. What is the probability of occurrence of the RFFA? Three rankings were used for occurrence probability, including high, medium, and low. And finally, what are the anticipated effects of the RFFA on the resource? Three rankings were used, including positive, negative, and mixed effects (whereby both positive and negative effects could occur).

The results of the analysis are shown in Table 3-12.

TABLE 3-12
Potential Impact of RFFAs on Resources

RFFA	Time Period	Importance	Occurrence Probability	Water Quality	Wetlands	Terrestrial Habitat	RTE Species	Air Quality	Recreation Resources	Socioeconomics	Cultural Resources
Water and sewer system improvements	1	M	H	+	+	+/-	+/-	+/-	+	+	+/-
Build out of existing industrial sites	2	M	M	+/-	+	-	+/-	+/-	+	+	+/-
Transportation system improvements	1,2	H	H	+/-	+/-	+/-	+/-	+	+	+	+/-
Commercial development	1,2	H	M	+/-	+/-	+/-	+/-	+/-	+	+	+/-
Regulatory environment	1,2	H	+	+	+	+	+	+	+	+	+

Time period: 1 = within 10 years, 2 = between 10 and 20 years from now
Importance/Occurrence probability: H = high, M = medium, L = low.
Impacts: + = positive. - = negative, +/- = mixed effects, 0 = none.

Development projects would have mixed impacts to most resources. Properly functioning water and waste water treatment systems, regardless of type, can encourage economic growth. When public water is available and a community has adequate sewer facilities in place, public health improves and the community becomes more attractive as a place to live or work. When such systems are not in place, however, or not functioning properly, pollution can result. If not replaced or improved, older systems may not be able to accommodate growth and can result in negative impacts to environmental resources.

Development also can affect wetlands, terrestrial habitat, and RTE species by consuming land and infringing on natural ecosystems. Properly designed development can offset negative impacts, however, and assist in preserving valued elements of the landscape.

Additional development could also increase traffic and subsequently cause air quality problems or require future transportation improvements. The potential effects could be mitigated by the design of future developments and the regulatory environment. Positive effects to recreation and socioeconomic resources would be expected, primarily through improved facilities or better access.

Because many actions associated with community development are performed by the private sector, the potential for negative effects on cultural resources exists. Most actions likely to

occur, however, will have some public sector involvement and consideration of cultural resources will be an integral part of those projects.

Increased safety, efficiency, and congestion management are the principal reasons for surface transportation projects. Short-term local income and revenues would increase as a result of future transportation projects, including bridge renovations, highway rehabilitations and upgrades, and new roadways. Significant changes to population, property values, local taxes, and existing land use patterns could occur, however, if roadway locations are changed or shifted.

There could be mixed impacts to water quality, wetlands, terrestrial habitat, and RTE species as a result of converting land to highway use. Effects would be mitigated in various ways, including avoidance, minimization, and replacement.

Effects to air quality, recreation resources, and socioeconomics would be expected to be generally positive. Additionally, although the affects of transportation projects on cultural resources are mixed, these projects are tied to federal funding or permitting and, therefore, are subject to Section 106 and Section 4(f) compliance. These regulatory processes ensure that the significance of individual cultural resources is considered during project development.

Long-term positive impacts would be associated with improved environmental conditions guaranteed through the regulatory environment. These regulations are especially important where there are numerous development opportunities and the potential for threats to the natural environment to occur. All three levels of government (federal, state, and local) have created laws or programs to address negative effects.

A concerted effort by government and the private sector has also occurred over the past 20 to 30 years to bring about economic redevelopment in the area. Several initiatives have contributed in this effort to revitalize the area, including improvements to the transportation system, extensions of public water and sewer systems, construction of new commercial centers, enhancement of recreational facilities, and new residential development. In total, these efforts have enhanced the quality of life for the area's citizens and businesses without imposing an inordinate cumulative impact on the natural, cultural, or socioeconomic environment. While these improvements, when taken as a whole, have had a cumulative effect on the area in the

past and present, with plans in place and the implementation of new development controls, future cumulative effects are expected to benefit the community rather than harm it.

3.16 Temporary Construction Impacts

Construction of the preferred alternative will have short-term impacts to and benefits on the project area. Short-term impacts associated with construction include, but are not limited to, inconvenient traffic conditions, increased noise and particulate air pollution, erosion, and health and safety-related construction issues. Short-term benefits consist of increased construction employment. These temporary conditions will disappear soon after construction is completed.

Construction activities could also result in disruptions to local residents and the traveling public. These disruptions will be temporary, localized, and of short duration, only occurring during the construction period.

Construction activities may also result in increased noise levels during construction of the proposed project. This project will require the use of stationary material-handling and earth-moving equipment. The equipment used will emit peak noise levels greater than normal traffic noise levels. These increased noise levels will be temporary and of short duration.

During construction, the project will have two major effects on air quality: an increase in emissions by heavy construction equipment and an increase in dust. Dust and exhaust particulate emissions from heavy equipment operations will temporarily degrade air quality in the immediate construction zone.

Mitigation

Construction operations will be scheduled to minimize traffic delays. Access to park facilities will be maintained during construction although temporary disruptions may occur. Coordination with all major utility companies prior to and during construction will be initiated to locate and minimize disturbance to utility services.

Traffic control signage and devices will be in accordance with the *Manual of Uniform Traffic Control Devices* (FWHA 2009). Flag persons and warning devices, such as signs, barricades,

channelizing devices, reflection markers, and hazard warning lights, will be provided as necessary for maintenance of traffic and public safety. Design phase partnering will be conducted during final design and construction in order to coordinate project activities and schedules with emergency service providers, local schools, the U.S. Postal Service, and local/state highway maintenance offices.

Every effort will be taken to minimize the noise levels, including the mandatory use of construction equipment with operable mufflers. If blasting is required, it will be controlled so that no property or structural damage occurs. Measures that may be taken include, but are not be limited to, timing of work and laying blast mats. The increase in air pollution particulates will be minimized by the performance of the work in compliance with WVDOH specifications, manuals, and guidelines, and the requirements of the *Air Pollution Control Act* (Act 245-1972, as amended).

An approved Erosion and Sedimentation Control Plan will minimize erosion potential. Appropriate erosion and sedimentation control measures will be implemented in compliance with WVDOH's specifications, manuals, and guidelines. Some of these controls may include, but not be limited to:

- Diverting stormwater originating off-site away from the construction area;
- Channel construction during low-flow months;
- Use of proper materials for temporary stream crossings and causeways;
- Temporary and permanent seeding and mulching;
- Construction of temporary sedimentation ponds; and,
- Use of silt barrier fence and/or hay bales.

In addition, the maximum length of time and amount of unprotected soil that can be exposed will be limited within the contract documents. Rock construction entrances will also be located at all site entrances that exit onto paved roads.

Construction will be performed to comply with all applicable federal, state, and local laws regarding safety, health, and sanitation. All contractors are required to adhere to Occupational Safety and Health Administration guidelines to protect the lives and health of employees, the safety of the public, and the integrity of adjacent properties.

3.17 Energy

Highway design and traffic conditions are directly associated with vehicular energy efficiency. Features that affect energy efficiency include profile, alignment, pavement surface, roadway width, traffic density, access points, at-grade intersections, and length. There would also be an energy expenditure to construct a new roadway. There would be a decrease in energy usage, however, with the new roadway project, because the roadway would reduce travel times between the lodge and conference center and the activity areas of the park.

3.18 Section 4(f) Resources

In accordance with Section 4(f) of the *United States Department of Transportation Act of 1966* (49 U.S. Code [U.S.C], Section 303) and the *Federal Aid Highway Act of 1968* (23 U.S.C., Section 138), the Secretary of Transportation may not approve the use of land from any publicly owned park, recreation area, or wildlife and waterfowl refuge, or any historic site unless a determination is made that there is no feasible and prudent alternative to the use of land from the property and the action includes all possible planning to minimize harm to the property resulting from such use.

There will be no impacts to Section 4(f) resources with the No-Build Alternative. Although the project will impact approximately 36 acres of parkland and cause modifications to the trail system within the park, the WVDOH, WVDNR, and FHWA have tentatively determined that the impact from the preferred alternative on Chief Logan State Park will be *de minimis*. For publicly-owned parks, a *de minimis* impact is one that will not adversely affect the activities, features, or attributes of the property.

De minimis impacts are those that, after consideration of avoidance, minimization, mitigation, or enhancement measures, do not adversely affect the activities, features or attributes of the Section 4(f) property. A *de minimis* determination fulfills all Section 4(f) requirements. When a *de minimis* impact is determined, an evaluation of avoidance alternatives and whether or not they are feasible and prudent is not required. For parks, recreation areas and refuges, a use is considered *de minimis* when, after taking into consideration appropriate mitigation measures, it is determined that:

- The transportation use of the property, with avoidance, minimization, or mitigation incorporated, would not adversely affect the activities, features and attributes that qualify the property for protection under Section 4(f).
- The officials with jurisdiction over the property agree, in writing, that the use will not adversely affect the features and attributes of the property, and they are informed of their intent to make a *de minimis* finding based on that agreement.
- The public has been provided an opportunity to review and comment on the effects of the project on the protected activities, features, and attributes of the Section 4(f) property.

In cooperation with the WVDNR and WVDO, WVDOH has determined that construction of a connecting road would enhance enjoyment of the park by the public and not constitute a conversion of park land. Although an agreement between WVDOH and WVDNR has not been finalized yet, the WVDNR is currently evaluating the use of a park land for the proposed roadway and is expected to approve the project. Additionally, the public will be shown detailed information on the project at a public meeting and informational workshop held at the park, and be provided with information on the WVDOH website, allowing the public opportunities to comment fully on the project.

Mitigation

Mitigation commitments for impacts to park facilities are discussed in Section 3-2.

3.19 Section 6(f) Resources

The *Land and Water Conservation Fund Act* (LWCFA), commonly referred to as Section 6(f), establishes a land and water conservation fund to assist local, state, and federal agencies in meeting the demand for present and future outdoor recreation sites. This is done through grants for land acquisition, park amenities, and other park development costs. Once a city, county, or agency has used Section 6(f) funds, either the land or the park appurtenances cannot be eliminated or acquired without coordination with the NPS and mitigation that replaces the eliminated items. The LWCF Act is administered by the NPS which, in turn, delegates many of

the roles and responsibilities to a department within each state. In West Virginia, that state agency is the WVDO.

Section 6(f) prohibits the conversion of property acquired or developed with LWCF grants to a non-recreational purpose without the approval of the NPS. Section 6(f) further directs the NPS to assure that replacement lands of equal fair market value, location, and usefulness are provided as conditions to such conversions. Consequently, where conversions of Section 6(f) lands are proposed for highway projects, replacement lands could be necessary.

Chief Logan State Park was established in 1960 as the Chief Logan Recreation Area and gained state park status in 1968. Although improvements to the land were begun in 1961 under the *West Virginia Emergency Employment Program*, the majority of the park's facilities were completed after 1970 utilizing LWCFA and state funding. As a result, approximately two-thirds of the preferred alternative falls within the Section 6(f) boundary of the park. Figure 3-10 shows the preferred alternative in relationship to the park's Section 6(f) boundary.

The WVDOH and WVDO, the NPS's delegated state party, initiated coordination with the NPS in early summer 2012 to discuss the proposed road and the potential effects of the project on the function and recreational capacity of park property. The WVDO suggested that the proposed roadway would be a "sponsor-funded public facility" that would enhance enjoyment of the park by the public and not constitute a conversion of park land. The NPS Regional Office concurred with that assessment in July 2012. As a result, it was determined that no replacement lands would be necessary.

A copy of NPS concurrence is included in Appendix C. As requested by the NPS, a copy of the WVDOH's feasibility study for the project is also included in Appendix C.

Mitigation

A copy of the EA and any related, future environmental documentation will be sent to the NPS to satisfy its environmental requirements associated with the LWCFA. Any mitigation associated with construction of the preferred alternative would be also be coordinated with the park, WVDNR, and WVDO.

3.20 Summary of Impacts

This EA evaluated the proposed Chief Logan State Park Road Project, including a No-Build Alternative and a preferred alternative (modified Alternate 1). The potential effects of the alternatives are summarized in Table 3-13. In some cases, qualitative information is provided.

TABLE 3-13
Summary of Impacts

Resource/Element	No-Build Alternative	Preferred Alternative
Environmental Justice	Potentially positive or negative	Positive
Tax Base	None	None
Business or Residential Displacements	0	0
Community Facilities and Services	0	0
Community Cohesion	None	Positive
Farmlands	0	0
Parks and Recreation	Unlikely	36.5 acres of parkland, including 1,540 feet of trails and the disc golf course
Forested Land	Minimal	28.0 acres
Developed Land	Minimal	8.5 acres
Rare, Threatened, and Endangered Species	Unlikely	None
Streams/Water Quality	Minimal	2,453 feet
Floodplains	Minimal	None
Wetlands	Minimal	0.18 acre
Groundwater	Minimal	None
Air Quality	Consistent with *Clean Air Act* standards	Consistent with *Clean Air Act* standards
Noise	None	None
Waste Sites	Minimal	2
Cultural Resources (NRHP-Listed/Eligible)	0	0
Utilities	Minimal	Communications tower service road, local service lines
Secondary Impacts	Minimal	Minimal
Cumulative Impacts	Likely to be mostly positive	Mostly positive
Temporary Construction Impacts	Yes	Yes
Energy	Most likely positive	Positive
Section 4(f) Resources	0	*De minimis*
Section 6(f) Resources	0	Sponsor-funded public facility
Cost	Project Dependent	$5,000,000

4.0 REFERENCES

4.0 REFERENCES

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5.0 LIST OF PREPARERS AND REVIEWERS

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6.0 DISTRIBUTION LIST

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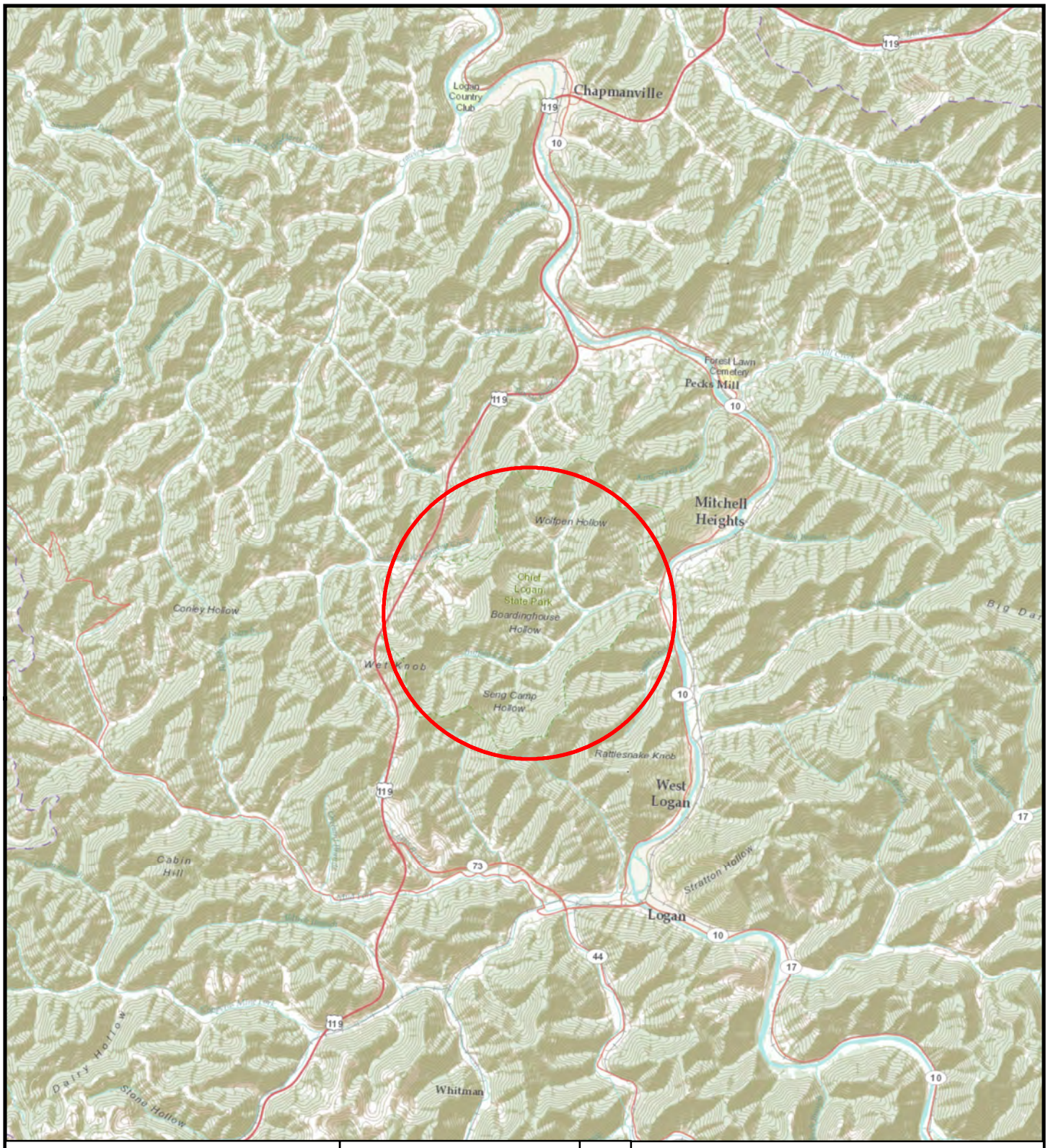
FIGURES



LEGEND

Project Location

SOURCE: ESRI 2012
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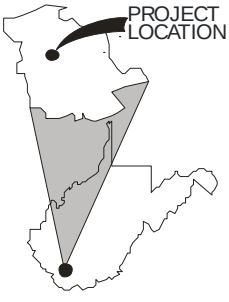
0 2880m
0 8,000' 16,000'



N

WEST VIRGINIA DIVISION OF HIGHWAYS

CHIEF LOGAN STATE PARK ROAD PROJECT
LOGAN COUNTY, WV

PROJECT LOCATION

FIGURE - 1-1

SKELLY and LOY Inc.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING

WEST VIRGINIA DIVISION OF HIGHWAYS

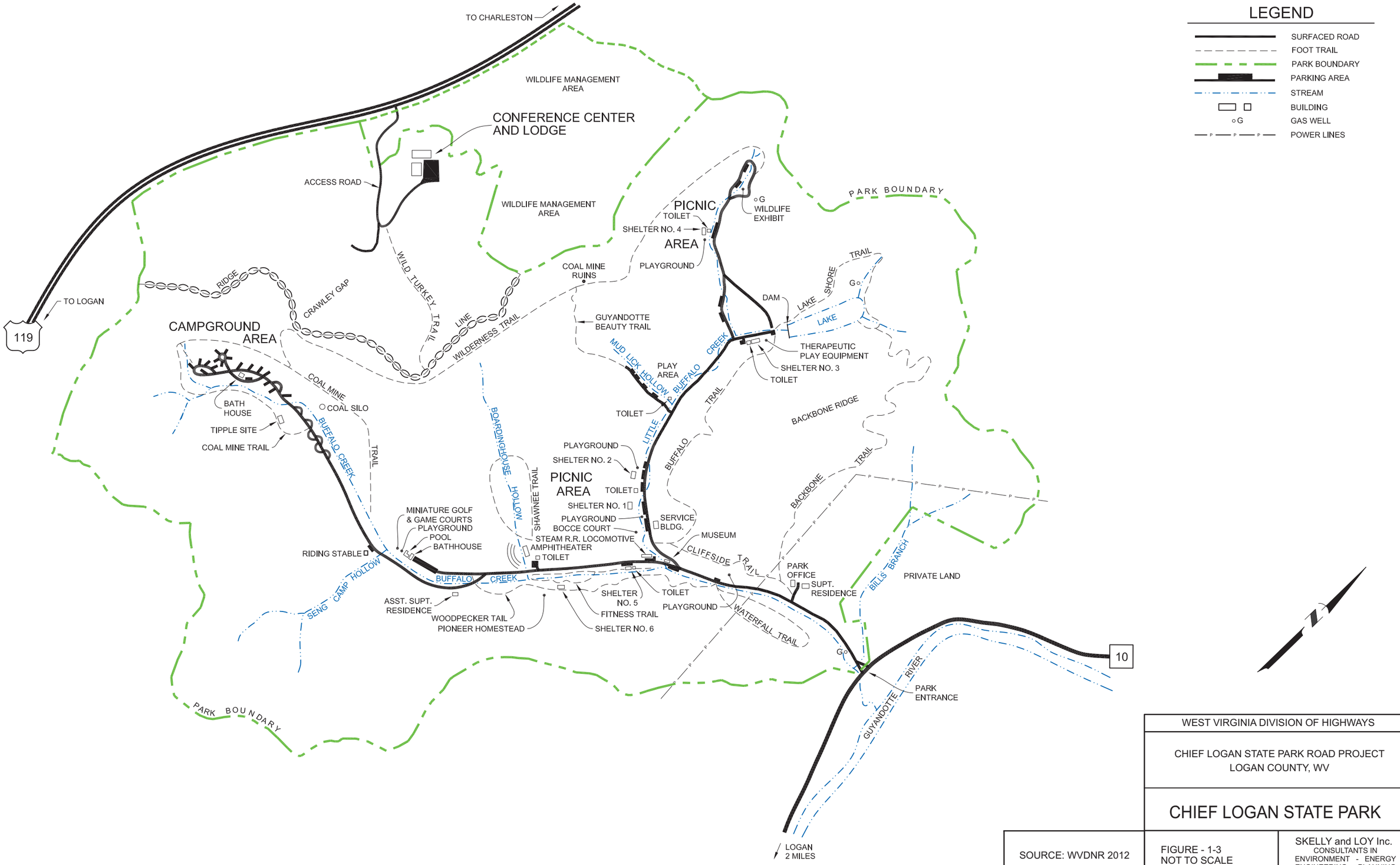
CHIEF LOGAN STATE PARK ROAD PROJECT
LOGAN COUNTY, WV

STATE PARKS AND FORESTS

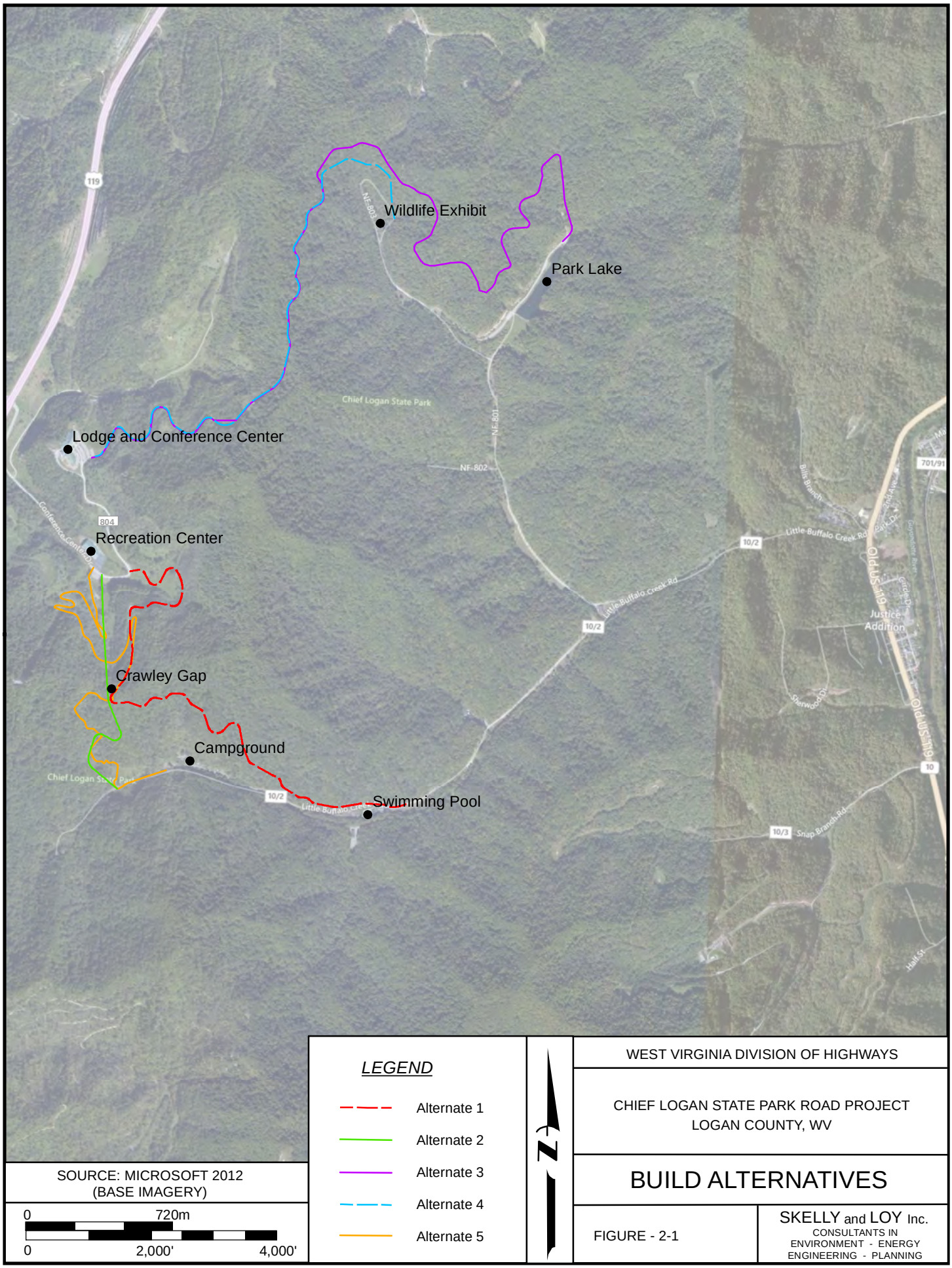
SOURCE: WVDNR 2012

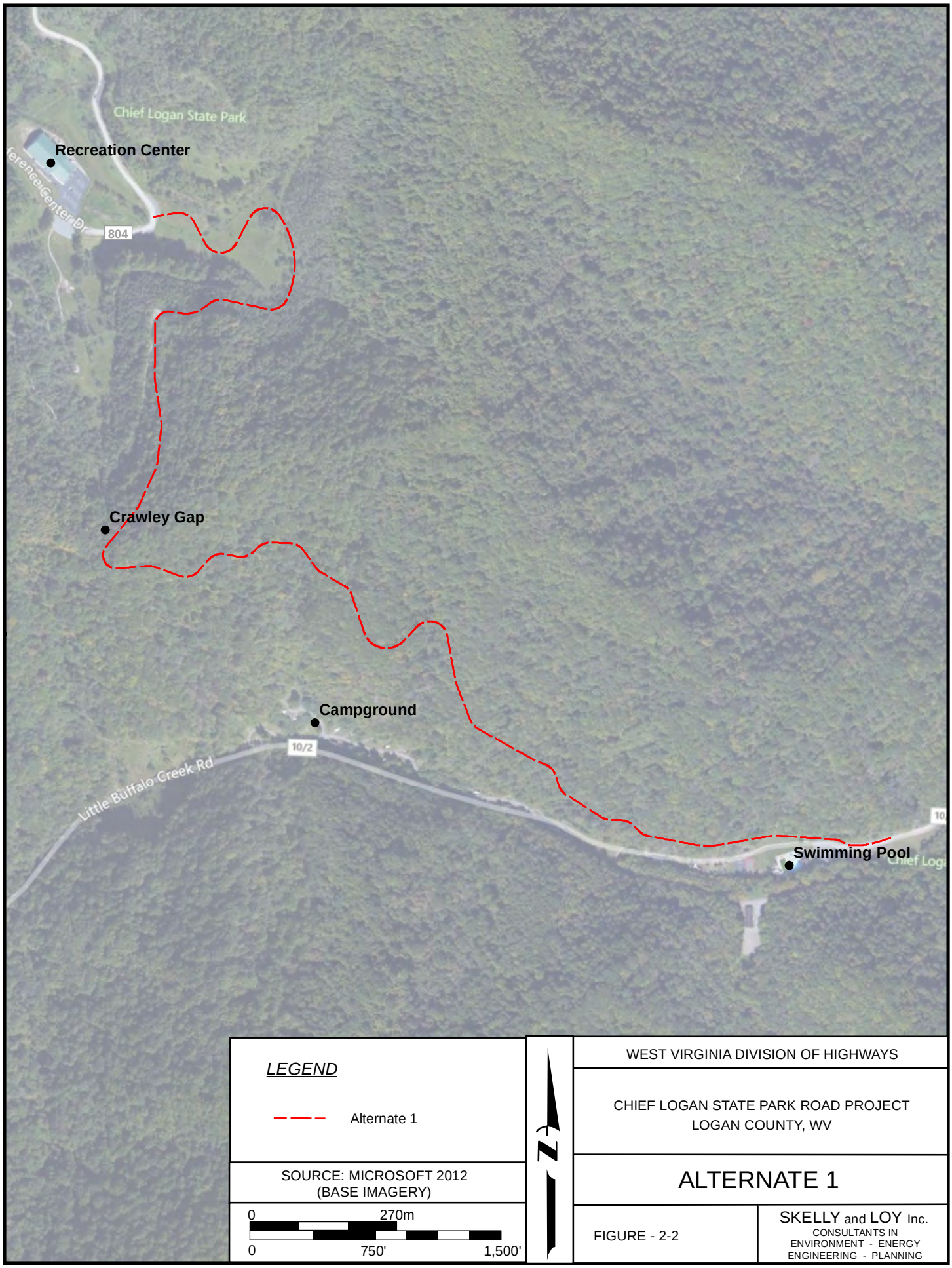
FIGURE - 1-2
NOT TO SCALE

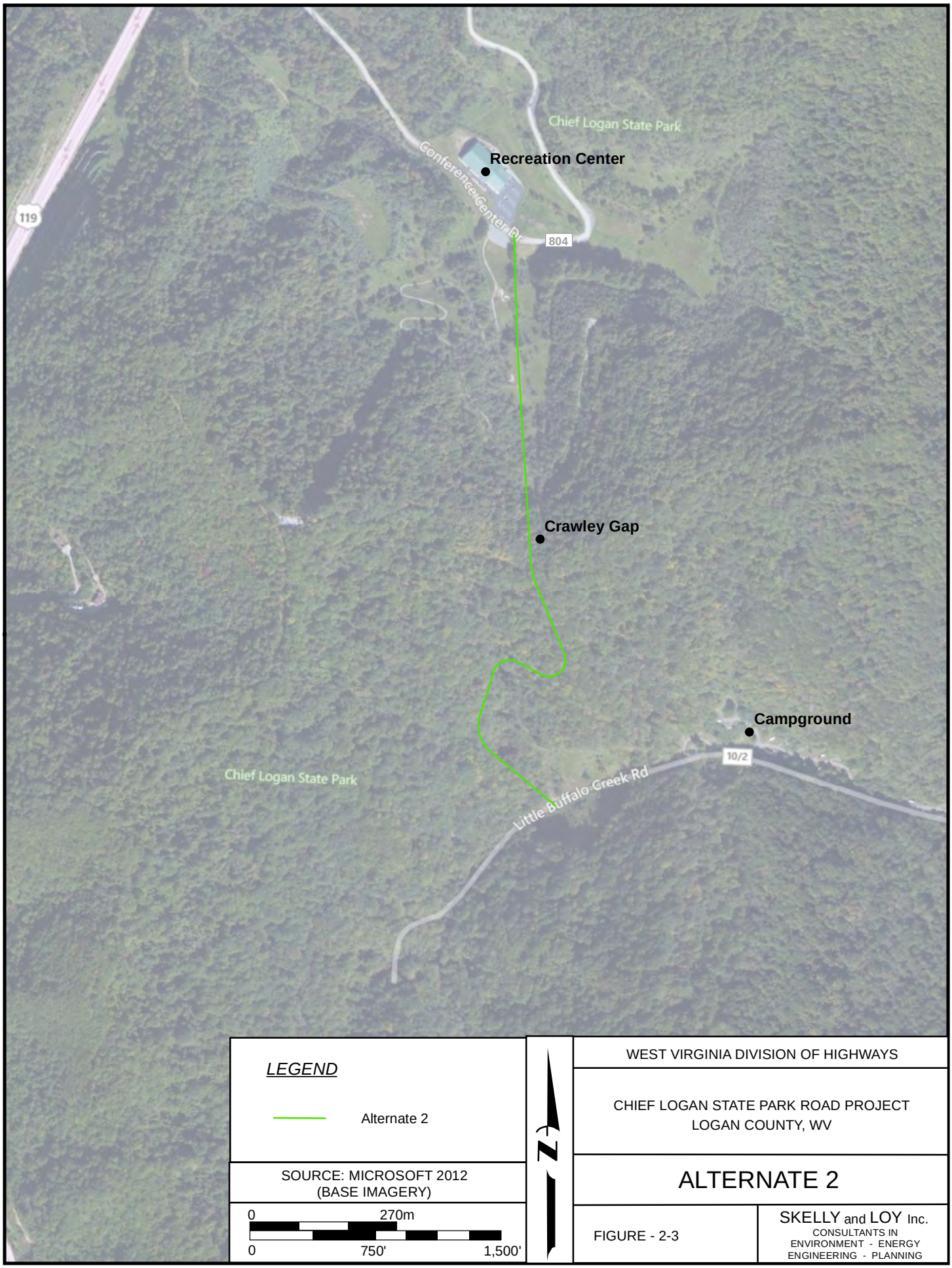
SKELLY and LOY Inc.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING

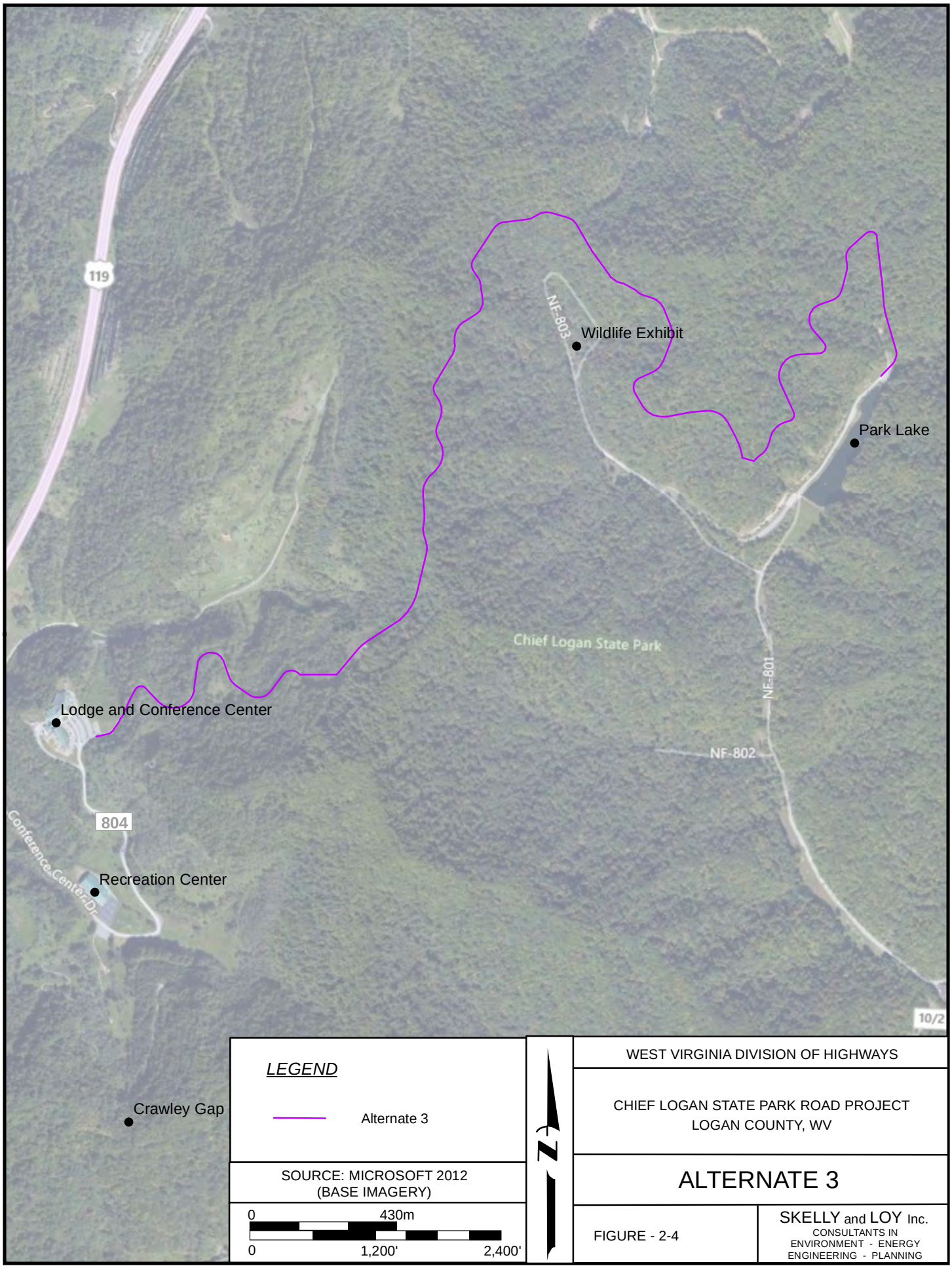


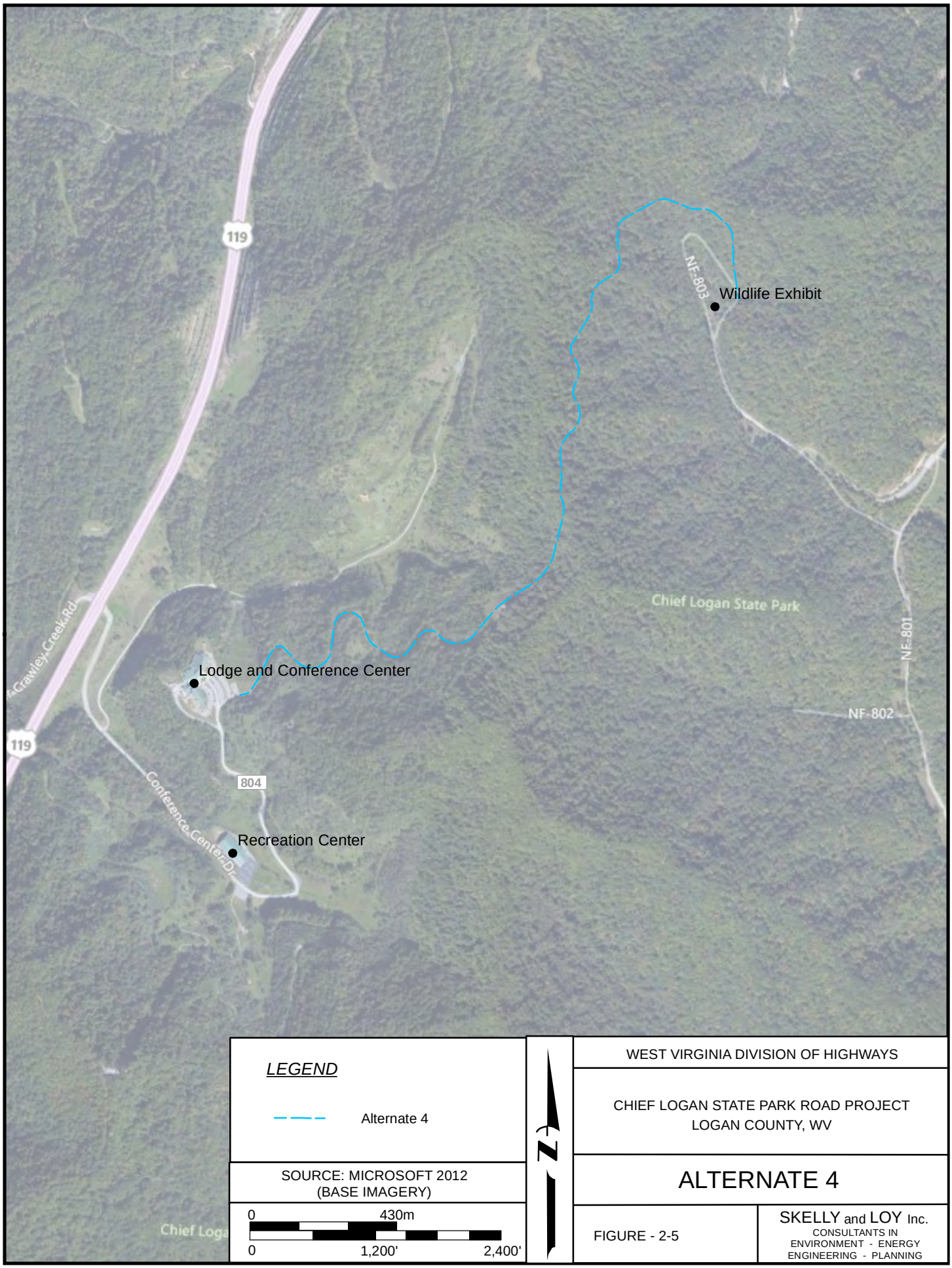
WEST VIRGINIA DIVISION OF HIGHWAYS		
CHIEF LOGAN STATE PARK ROAD PROJECT LOGAN COUNTY, WV		
CHIEF LOGAN STATE PARK		
SOURCE: WVDNR 2012	FIGURE - 1-3 NOT TO SCALE	SKELLY and LOY Inc. CONSULTANTS IN ENVIRONMENT - ENERGY ENGINEERING - PLANNING

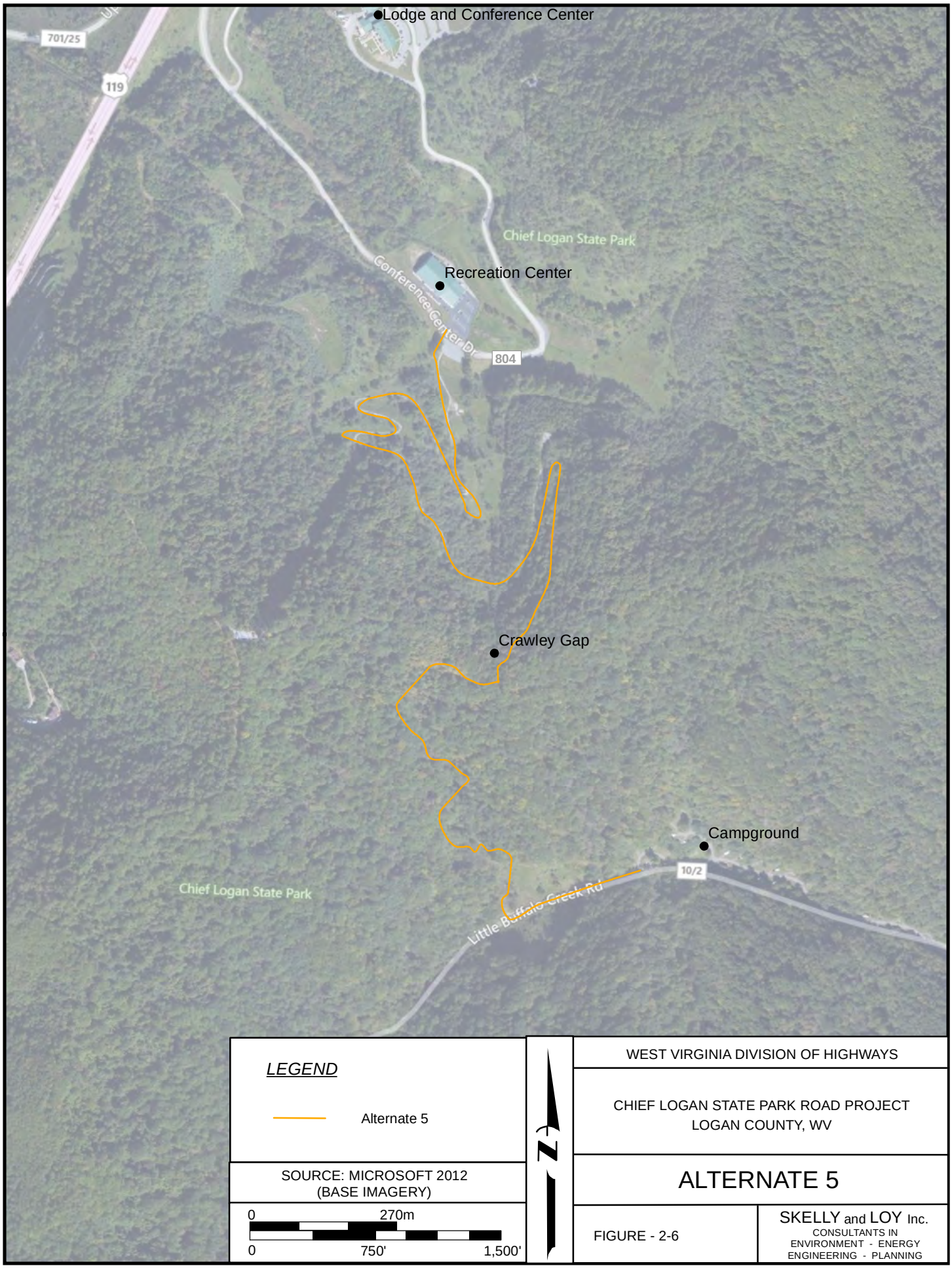

Wildlife Exhibit
Park Lake
Lodge and Conference Center
Recreation Center
Crawley Gap
Campground
Swimming Pool
Chief Logan State Park
NF-802
NF-801
Little Buffalo Creek Rd
Old US 119
Justice
Addition
Snap Branch Rd
119
804
10/2
10/3
10
701/91
LEGEND
Alternate 1
Alternate 2
Alternate 3
Alternate 4
Alternate 5
N
SOURCE: MICROSOFT 2012
(BASE IMAGERY)
0
720m
0
2,000'
4,000'
WEST VIRGINIA DIVISION OF HIGHWAYS
CHIEF LOGAN STATE PARK ROAD PROJECT
LOGAN COUNTY, WV
BUILD ALTERNATIVES
FIGURE - 2-1
SKELLY and LOY Inc.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING


Chief Logan State Park
Recreation Center
804
Crawley Gap
Campground
10/2
Little Buffalo Creek Rd
Swimming Pool
LEGEND
Alternate 1
SOURCE: MICROSOFT 2012
(BASE IMAGERY)
0
270m
0
750'
1,500'
N
WEST VIRGINIA DIVISION OF HIGHWAYS
CHIEF LOGAN STATE PARK ROAD PROJECT
LOGAN COUNTY, WV
ALTERNATE 1
FIGURE - 2-2
SKELLY and LOY Inc.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING


Chief Logan State Park
Recreation Center
Conference Center Dr
804
119
Crawley Gap
Campground
10/2
Chief Logan State Park
Little Buffalo Creek Rd
LEGEND
Alternate 2
SOURCE: MICROSOFT 2012
(BASE IMAGERY)
0
270m
0
750'
1,500'
N
WEST VIRGINIA DIVISION OF HIGHWAYS
CHIEF LOGAN STATE PARK ROAD PROJECT
LOGAN COUNTY, WV
ALTERNATE 2
FIGURE - 2-3
SKELLY and LOY Inc.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING


119
NF-803
Wildlife Exhibit
Park Lake
Chief Logan State Park
NF-801
NF-802
Lodge and Conference Center
804
Conference Center Dr
Recreation Center
Crawley Gap
10/2
LEGEND
Alternate 3
SOURCE: MICROSOFT 2012
(BASE IMAGERY)
0
430m
0
1,200'
2,400'
N
WEST VIRGINIA DIVISION OF HIGHWAYS
CHIEF LOGAN STATE PARK ROAD PROJECT
LOGAN COUNTY, WV
ALTERNATE 3
FIGURE - 2-4
SKELLY and LOY Inc.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING


119
NF-803
Wildlife Exhibit
Chief Logan State Park
NF-801
NF-802
Lodge and Conference Center
Crawley Creek Rd
119
804
Conference Center Dr
Recreation Center
Chief Loga
LEGEND
Alternate 4
SOURCE: MICROSOFT 2012
(BASE IMAGERY)
0
430m
0
1,200'
2,400'
N
WEST VIRGINIA DIVISION OF HIGHWAYS
CHIEF LOGAN STATE PARK ROAD PROJECT
LOGAN COUNTY, WV
ALTERNATE 4
FIGURE - 2-5
SKELLY and LOY Inc.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING



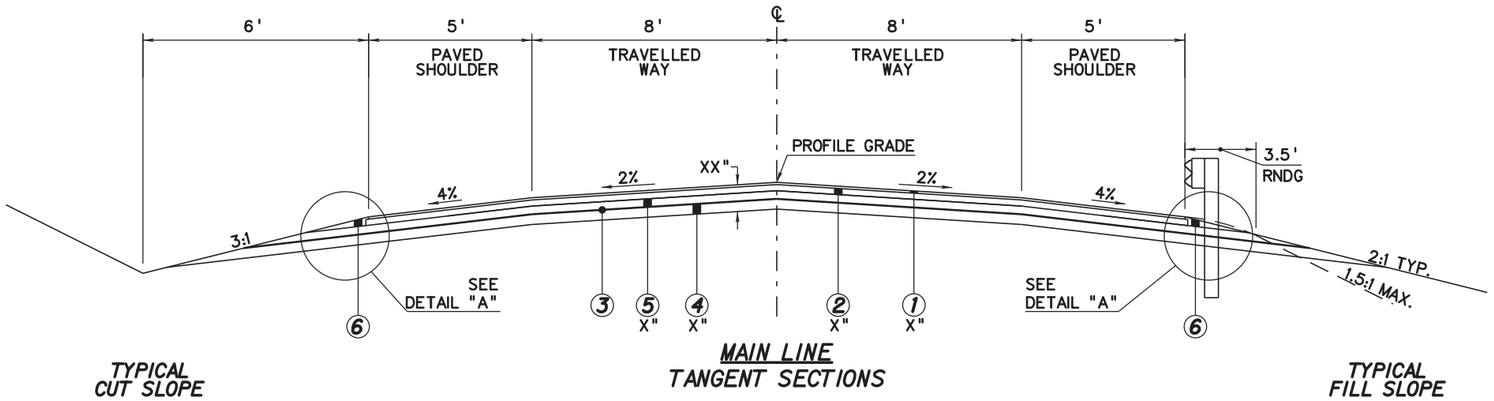
WEST VIRGINIA DIVISION OF HIGHWAYS

CHIEF LOGAN STATE PARK ROAD PROJECT
LOGAN COUNTY, WV

ALTERNATE 5

FIGURE - 2-6

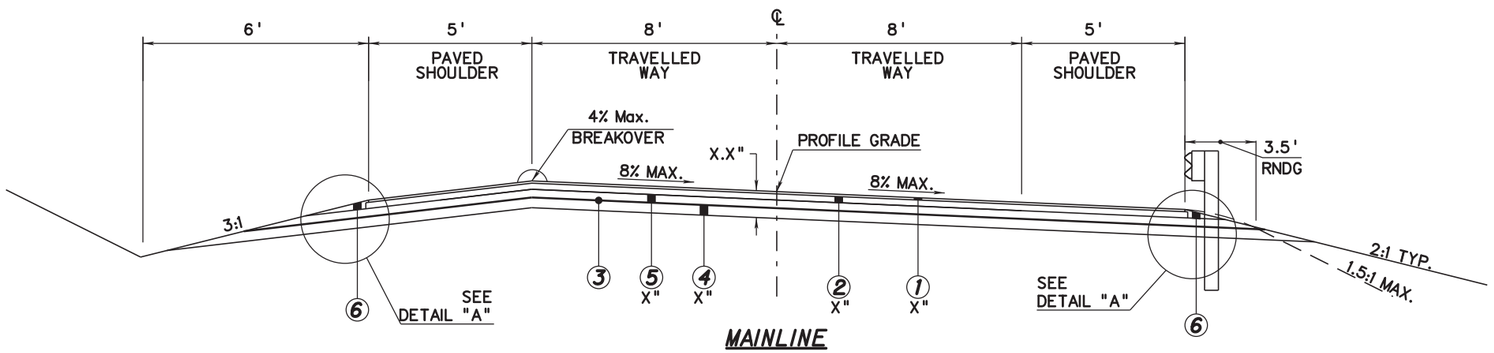
SKELLY and LOY Inc.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING



TYPICAL CUT SLOPE

MAIN LINE TANGENT SECTIONS

TYPICAL FILL SLOPE



TYPICAL CUT SLOPE

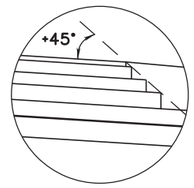
MAINLINE SUPERELEVATED

TYPICAL FILL SLOPE

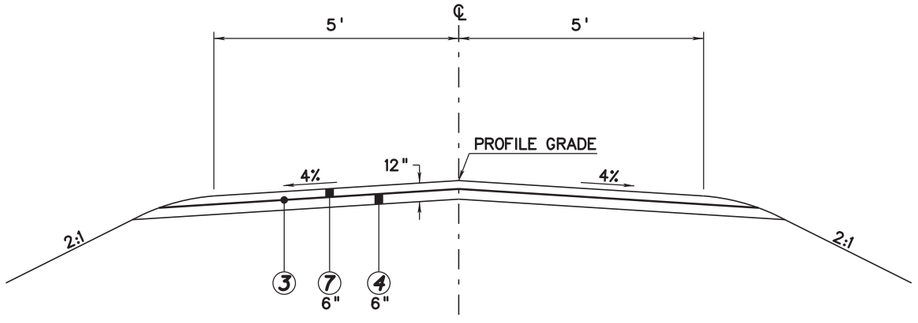
LEGEND

①	ITEM	402001-020	MARSHALL HMA SKID PVT. SG. TY I. TONS
②	ITEM	401001-023	MARSHALL HMA BASE CRSE. SG. TY II. TONS
③	ITEM	207034-000	FABRIC FOR SEPARATION. S.Y.
④	ITEM	207002-000	SUBGRADE. C.Y.
⑤	ITEM	307001-000	CLASS 1 AGGREGATE. C.Y.
⑥	ITEM	307001-000	CLASS 10 AGGREGATE. C.Y.
⑦	ITEM	307001-000	CLASS 3 AGGREGATE. C.Y.

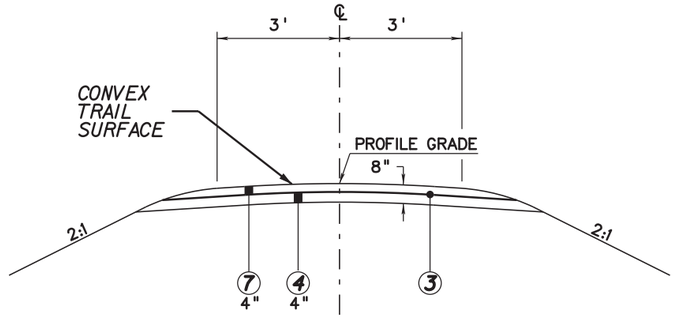
NOTE: PAVEMENT DESIGN MIX TYPE SHALL BE MEDIUM



DETAIL "A"



TYPICAL DRIVEWAY TIE-IN



TYPICAL TRAIL TIE-IN

WEST VIRGINIA DIVISION OF HIGHWAYS

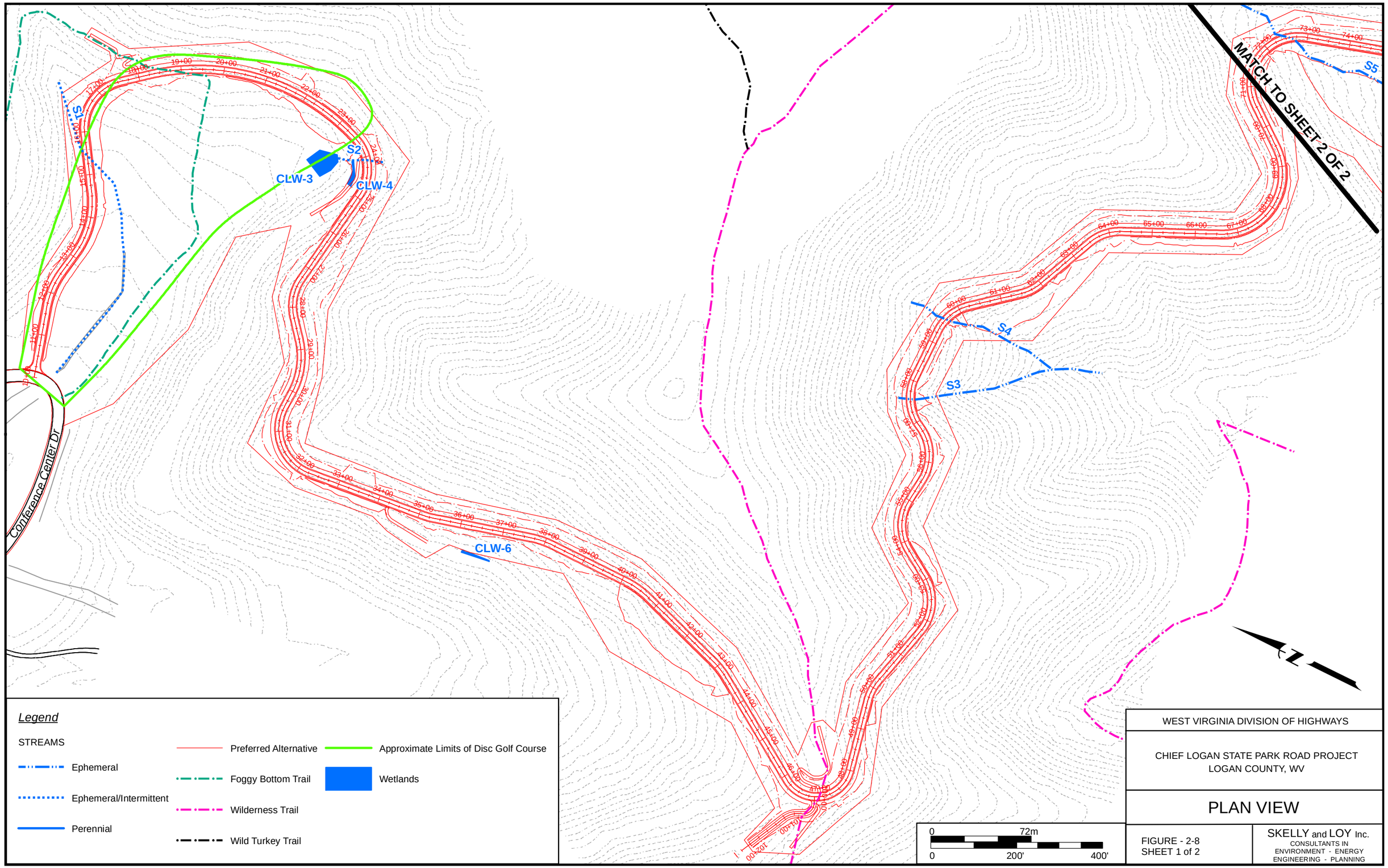
CHIEF LOGAN STATE PARK ROAD PROJECT
LOGAN COUNTY, WV

TYPICAL SECTIONS

SOURCE: WVDOH 2012

FIGURE - 2-7

SKELLY and LOY Inc.
CONSULTANTS IN ENVIRONMENT - ENERGY ENGINEERING - PLANNING



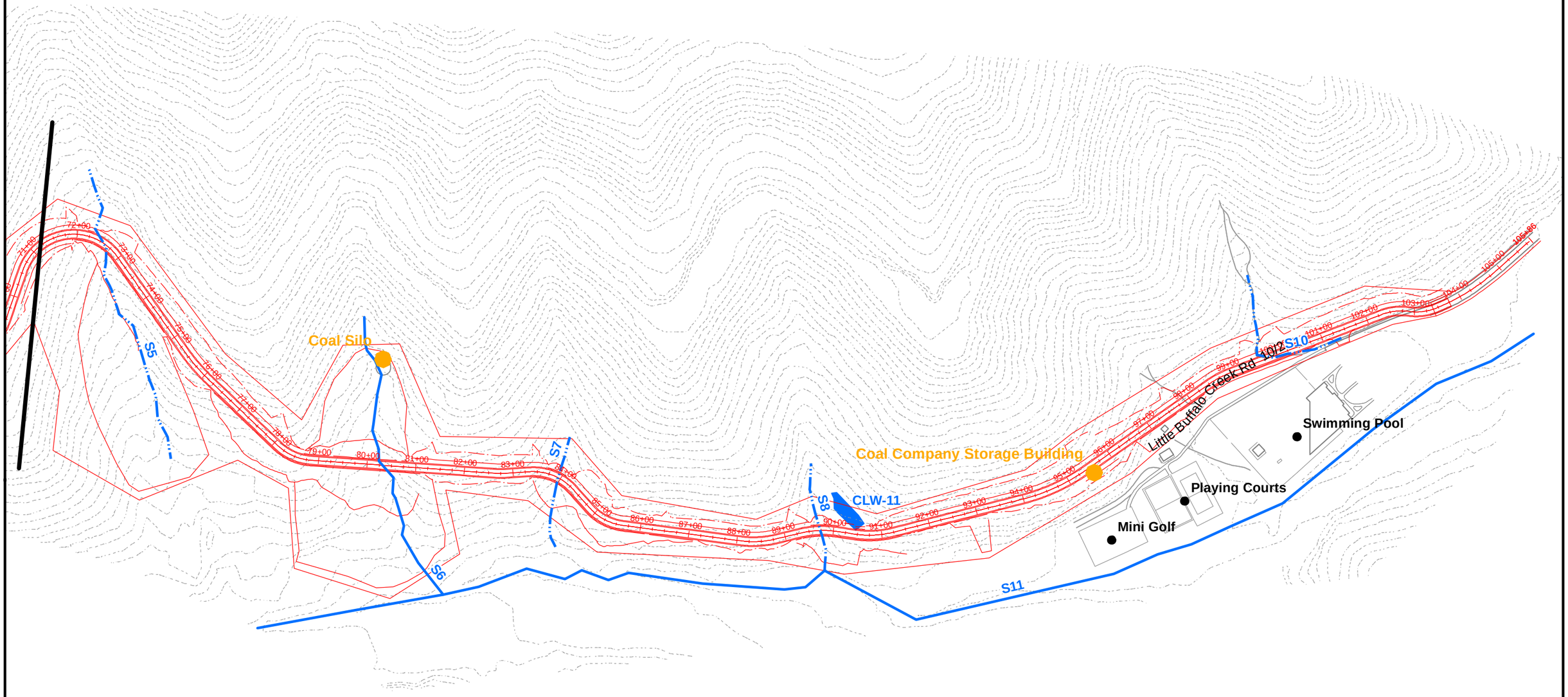
WEST VIRGINIA DIVISION OF HIGHWAYS

CHIEF LOGAN STATE PARK ROAD PROJECT
LOGAN COUNTY, WV

PLAN VIEW

FIGURE - 2-8
SHEET 1 of 2

SKELLY and LOY Inc.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING



Legend

STREAMS

- Ephemeral
- Ephemeral/Intermittent
- Perennial

- Potentially Hazardous Waste Site
- Preferred Alternative
- Wetlands

N

0 72m

0 200' 400'

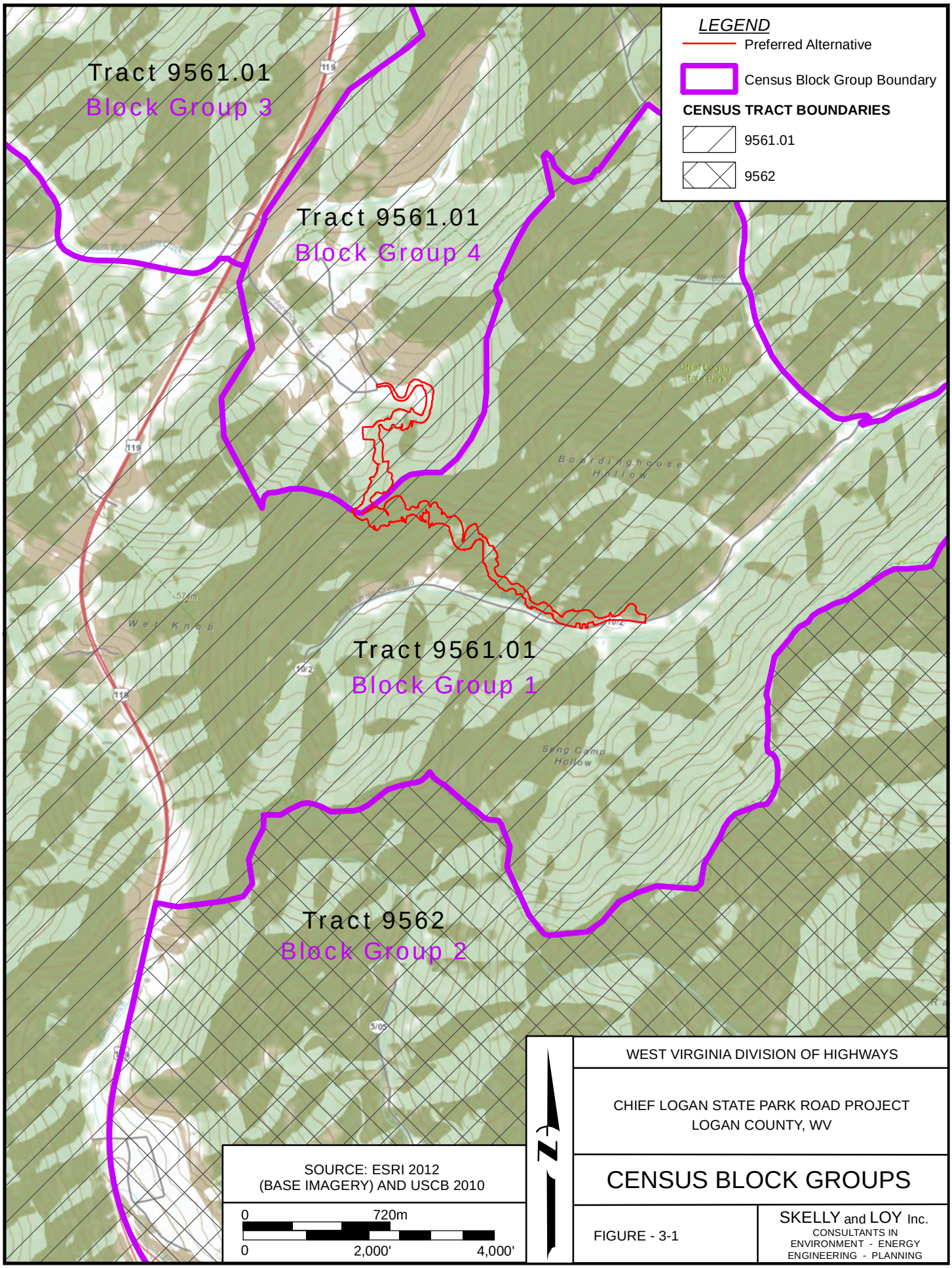
WEST VIRGINIA DIVISION OF HIGHWAYS

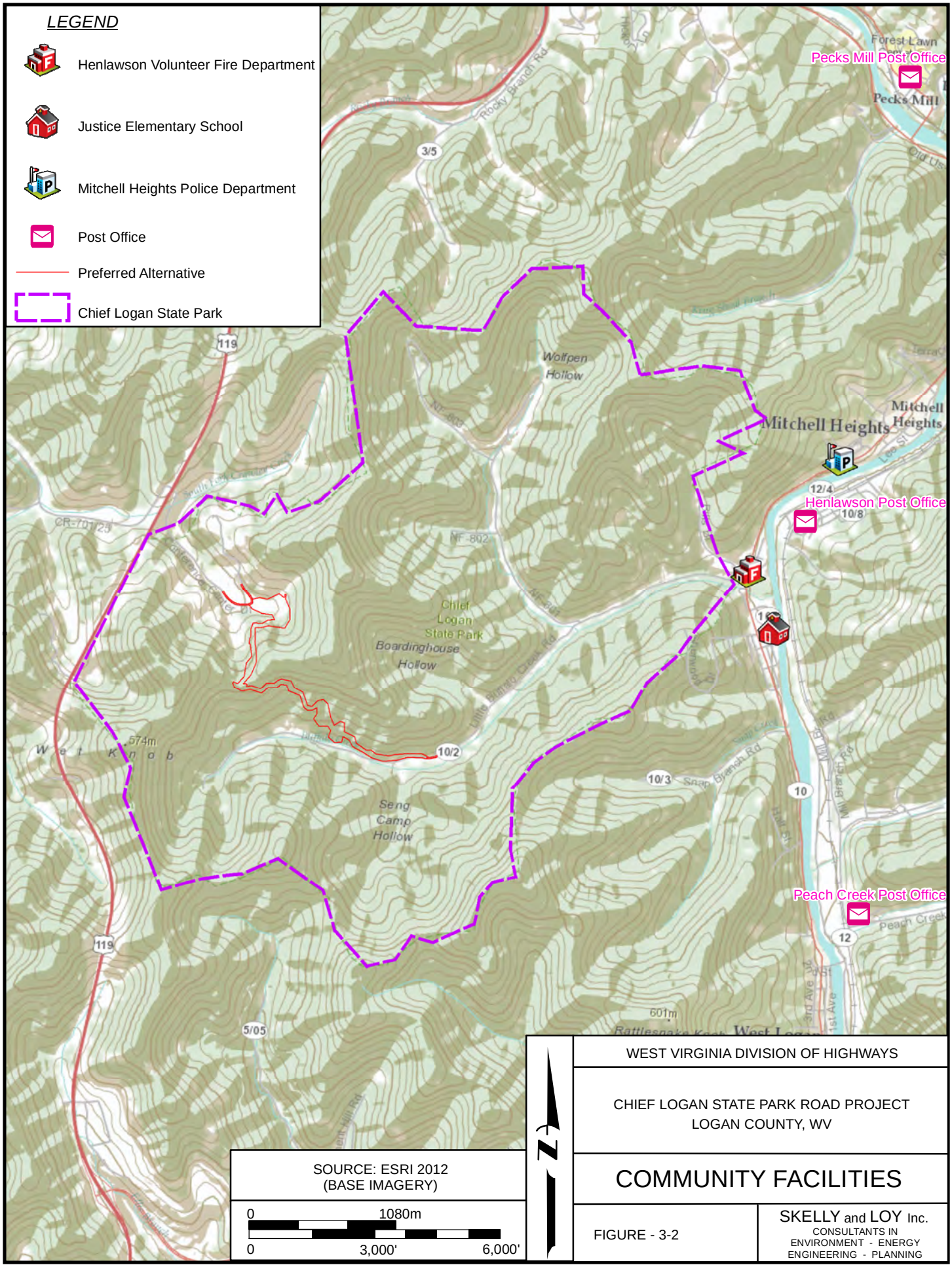
CHIEF LOGAN STATE PARK ROAD PROJECT
LOGAN COUNTY, WV

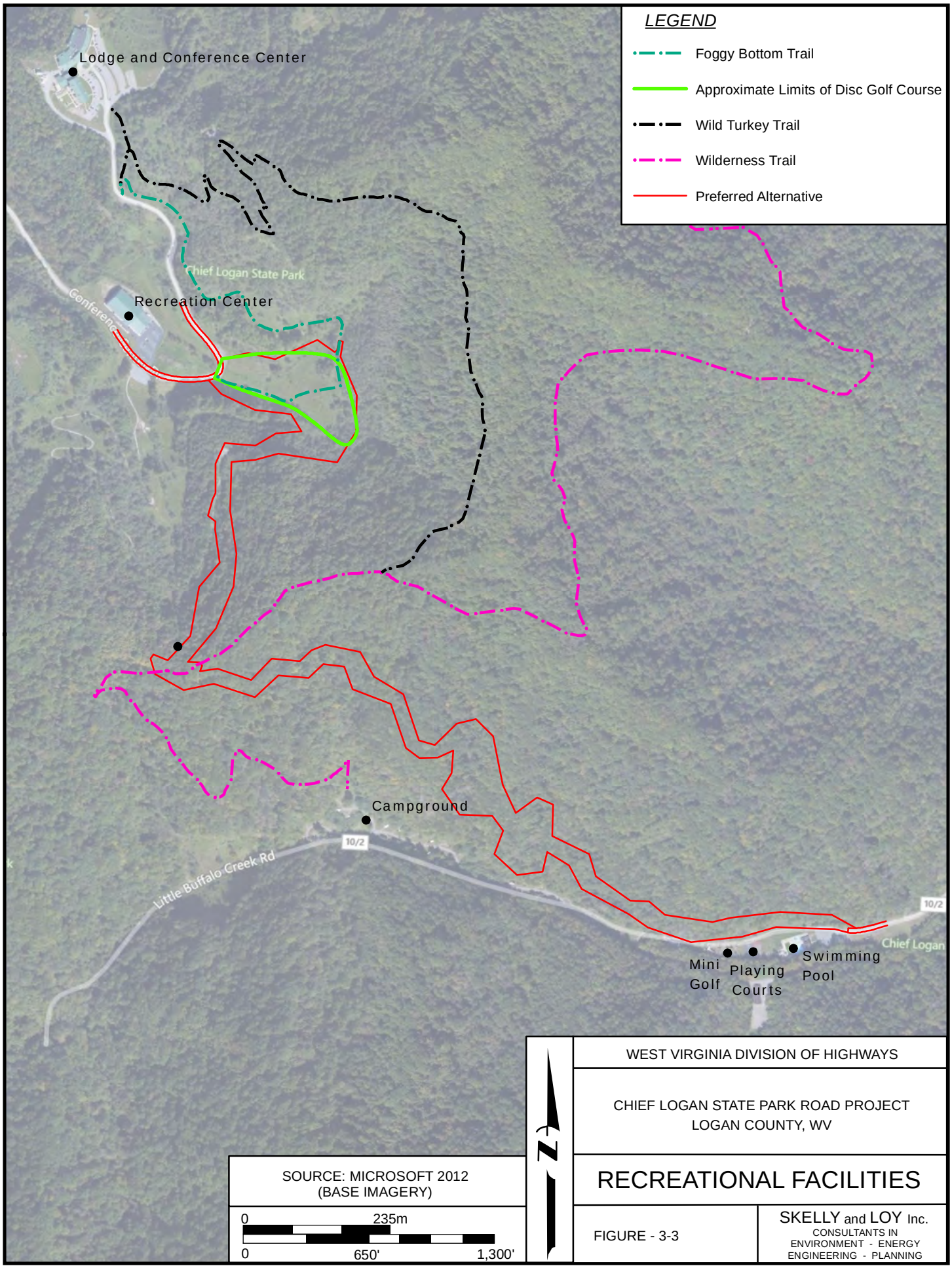
PLAN VIEW

FIGURE - 2-8
SHEET 2 of 2

SKELLY and LOY Inc.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING


LEGEND
Preferred Alternative
Census Block Group Boundary
CENSUS TRACT BOUNDARIES
9561.01
9562
Tract 9561.01
Block Group 3
Tract 9561.01
Block Group 4
Tract 9561.01
Block Group 1
Tract 9562
Block Group 2
Chief Logan State Park
Boardinghouse Hollow
Wet Knob
Sang Camp Hollow
119
10/2
5/05
SOURCE: ESRI 2012
(BASE IMAGERY) AND USCB 2010
0
720m
0
2,000'
4,000'
N
WEST VIRGINIA DIVISION OF HIGHWAYS
CHIEF LOGAN STATE PARK ROAD PROJECT
LOGAN COUNTY, WV
CENSUS BLOCK GROUPS
FIGURE - 3-1
SKELLY and LOY Inc.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING


LEGEND
Henlawson Volunteer Fire Department
Justice Elementary School
Mitchell Heights Police Department
Post Office
Preferred Alternative
Chief Logan State Park
Pecks Mill Post Office
Mitchell Heights
Henlawson Post Office
Peach Creek Post Office
Wolfpen Hollow
Chief Logan State Park
Boardinghouse Hollow
Seng Camp Hollow
West Knob
574m
601m
119
3/5
12/4
10/8
10/2
10/3
10
12
5/05
SOURCE: ESRI 2012
(BASE IMAGERY)
0
1080m
0
3,000'
6,000'
N
WEST VIRGINIA DIVISION OF HIGHWAYS
CHIEF LOGAN STATE PARK ROAD PROJECT
LOGAN COUNTY, WV
COMMUNITY FACILITIES
FIGURE - 3-2
SKELLY and LOY Inc.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING



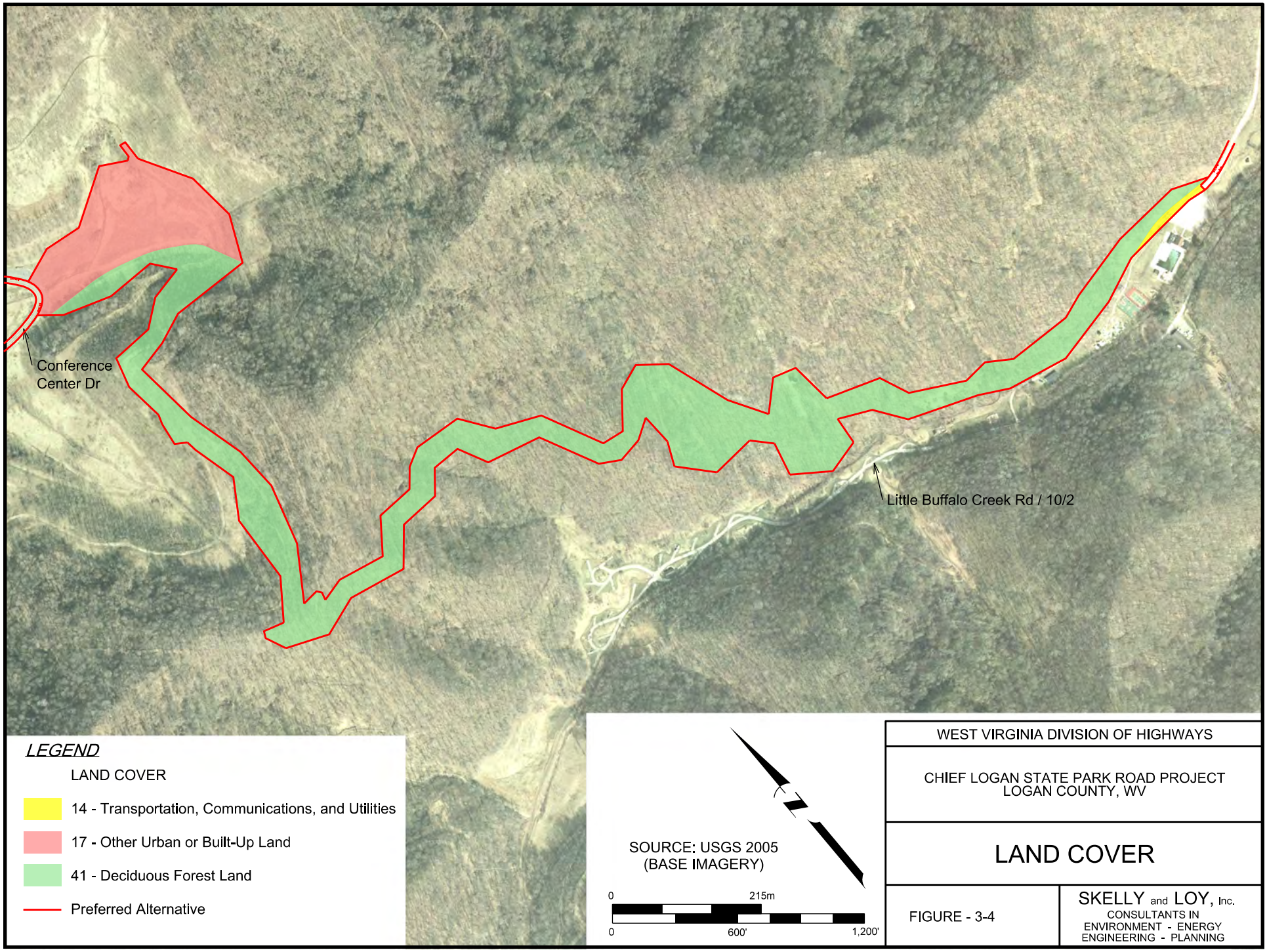
WEST VIRGINIA DIVISION OF HIGHWAYS

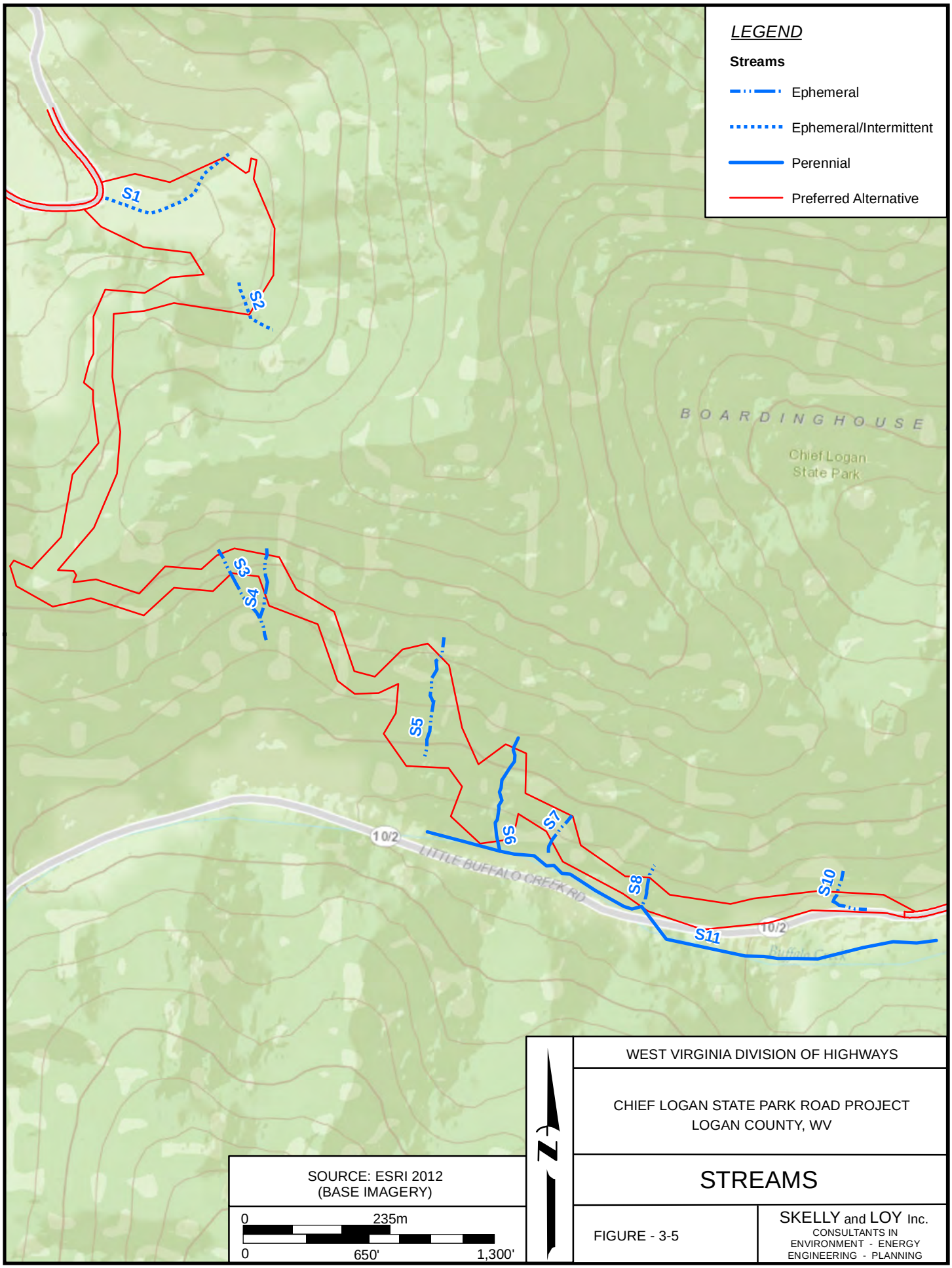
CHIEF LOGAN STATE PARK ROAD PROJECT
LOGAN COUNTY, WV

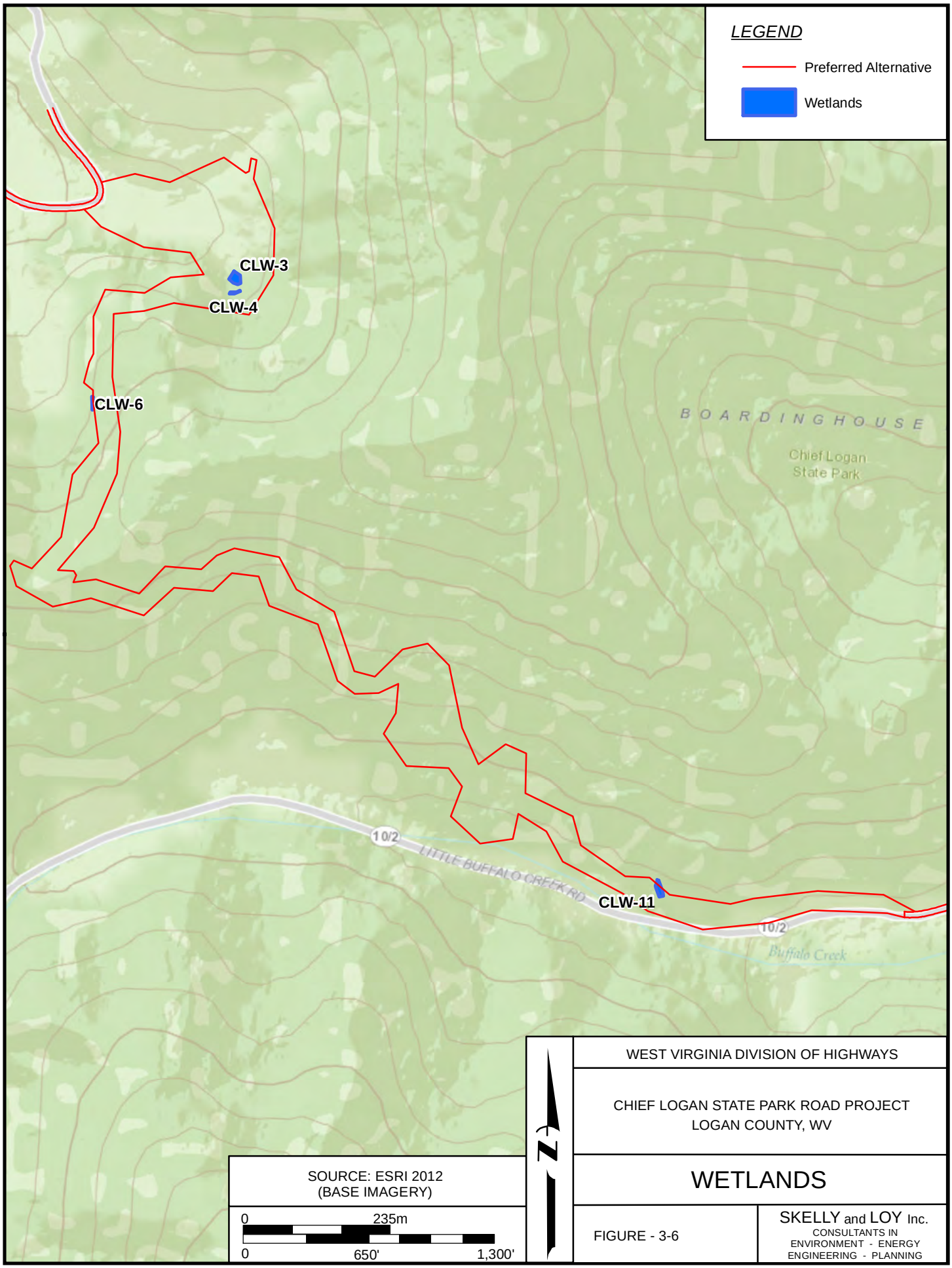
RECREATIONAL FACILITIES

FIGURE - 3-3

SKELLY and LOY Inc.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING


Conference
Center Dr
Little Buffalo Creek Rd / 10/2
LEGEND
LAND COVER
14 - Transportation, Communications, and Utilities
17 - Other Urban or Built-Up Land
41 - Deciduous Forest Land
Preferred Alternative
SOURCE: USGS 2005
(BASE IMAGERY)
0
215m
0
600'
1,200'
WEST VIRGINIA DIVISION OF HIGHWAYS
CHIEF LOGAN STATE PARK ROAD PROJECT
LOGAN COUNTY, WV
LAND COVER
FIGURE - 3-4
SKELLY and LOY, Inc.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING


LEGEND
Streams
Ephemeral
Ephemeral/Intermittent
Perennial
Preferred Alternative
S1
S2
S3
S4
S5
S6
S7
S8
S10
S11
BOARDINGHOUSE
Chief Logan
State Park
10/2
LITTLE BUFFALO CREEK RD
10/2
SOURCE: ESRI 2012
(BASE IMAGERY)
0
235m
0
650'
1,300'
N
WEST VIRGINIA DIVISION OF HIGHWAYS
CHIEF LOGAN STATE PARK ROAD PROJECT
LOGAN COUNTY, WV
STREAMS
FIGURE - 3-5
SKELLY and LOY Inc.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING



WEST VIRGINIA DIVISION OF HIGHWAYS

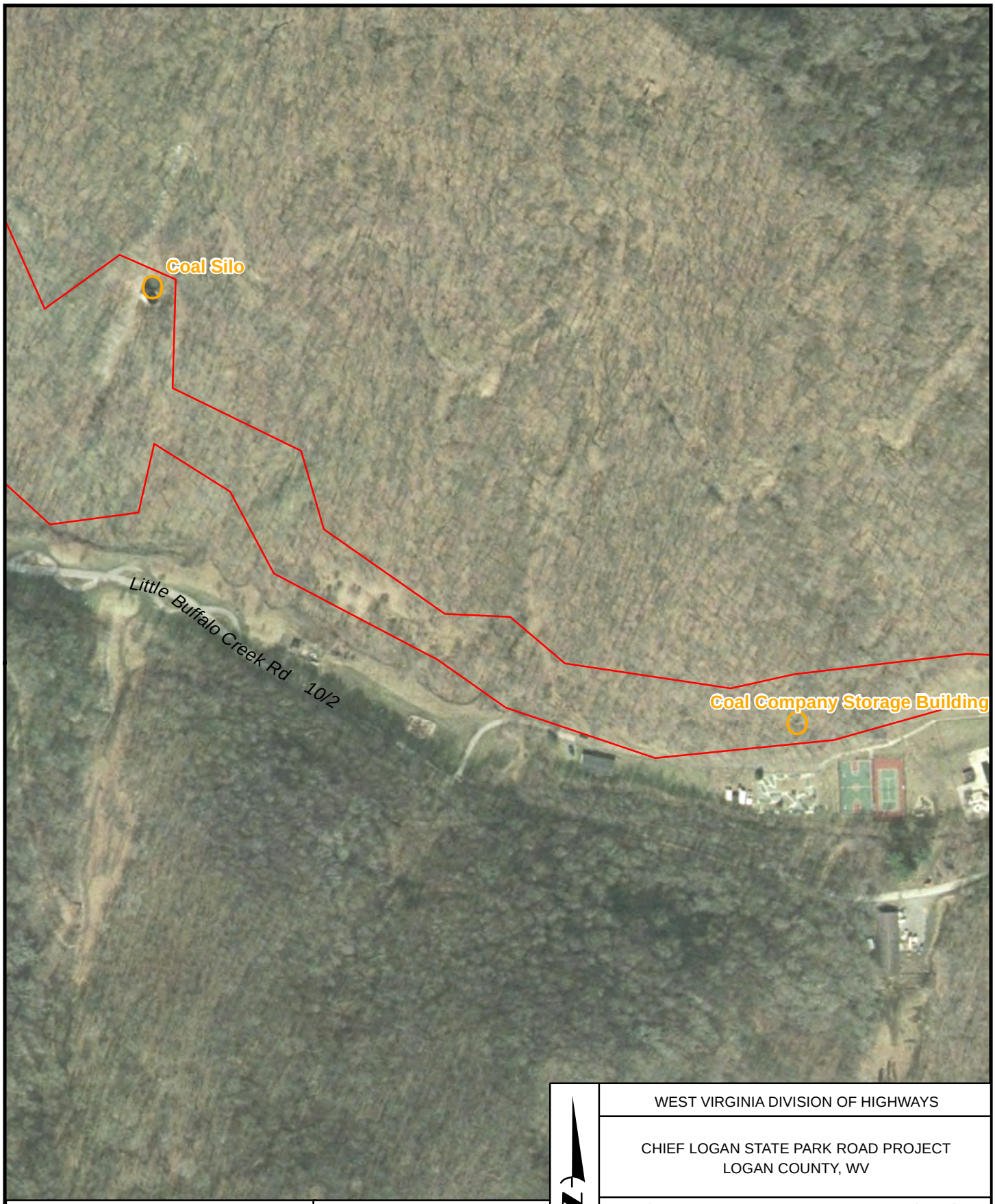
CHIEF LOGAN STATE PARK ROAD PROJECT
LOGAN COUNTY, WV

WETLANDS

FIGURE - 3-6

SKELLY and LOY Inc.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING


94+00
95+00
96+00
97+00
98+00
99+00
100+00
101+00
102+00
103+00
104+00
105+00
106+00
107+00
108+00
108+25
Little Buffalo Creek Rd 10/2
1
2
3
4
5
6
Swimming Pool
Playing Courts
Mini Golf
Legend
Noise Receptors
Preferred Alternative
SOURCE: USGS 2005
(BASE IMAGERY)
0
36m
0
100'
200'
N
WEST VIRGINIA DIVISION OF HIGHWAYS
CHIEF LOGAN STATE PARK ROAD PROJECT
LOGAN COUNTY, WV
NOISE RECEPTORS
FIGURE - 3-7
SKELLY and LOY Inc.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING



SOURCE: USGS 2005
(BASE IMAGERY)

0 90m
0 250' 500'

LEGEND

Potentially Hazardous Waste Site

Preferred Alternative

N

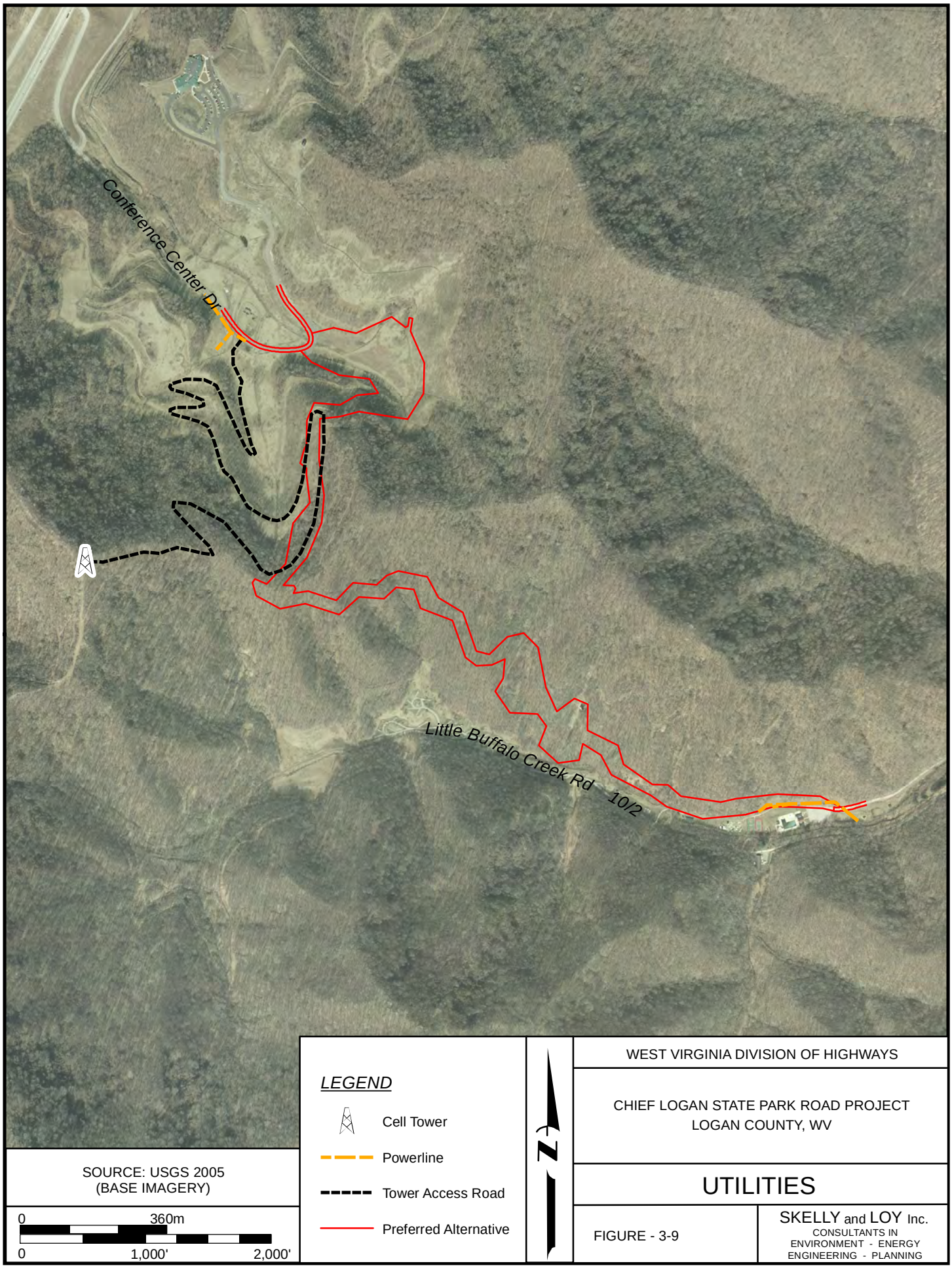
WEST VIRGINIA DIVISION OF HIGHWAYS

CHIEF LOGAN STATE PARK ROAD PROJECT
LOGAN COUNTY, WV

POTENTIALLY HAZARDOUS WASTE SITES

FIGURE - 3-8

SKELLY and LOY Inc.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING



SOURCE: USGS 2005
(BASE IMAGERY)

0 360m
0 1,000' 2,000'

LEGEND

Cell Tower
Powerline
Tower Access Road
Preferred Alternative

N

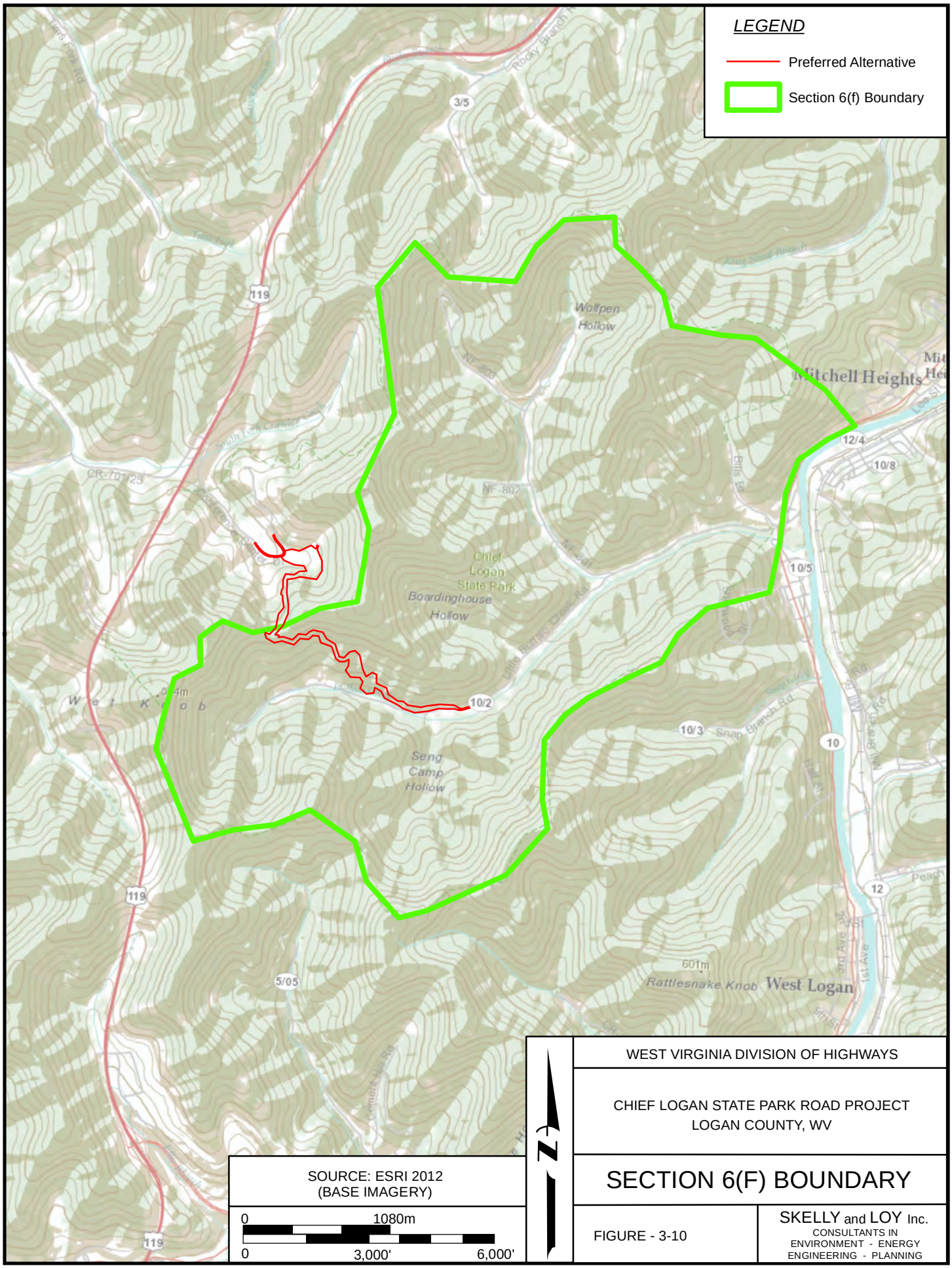
WEST VIRGINIA DIVISION OF HIGHWAYS

CHIEF LOGAN STATE PARK ROAD PROJECT
LOGAN COUNTY, WV

UTILITIES

FIGURE - 3-9

SKELLY and LOY Inc.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING


LEGEND
Preferred Alternative
Section 6(f) Boundary
Wolfpen Hollow
Mitchell Heights
Chief Logan State Park
Boardinghouse Hollow
Seng Camp Hollow
West Logan
Rattlesnake Knob
601m
119
3/5
12/4
10/8
10/5
10/2
10/3
10
12
5/05
SOURCE: ESRI 2012
(BASE IMAGERY)
0 1080m
0 3,000' 6,000'
N
WEST VIRGINIA DIVISION OF HIGHWAYS
CHIEF LOGAN STATE PARK ROAD PROJECT
LOGAN COUNTY, WV
SECTION 6(F) BOUNDARY
FIGURE - 3-10
SKELLY and LOY Inc.
CONSULTANTS IN
ENVIRONMENT - ENERGY
ENGINEERING - PLANNING

APPENDIX A
NATURAL RESOURCES

United States Department of the Interior

FISH AND WILDLIFE SERVICE

West Virginia Field Office
694 Beverly Pike
Elkins, West Virginia 26241

Concurrence Form for Indiana Bat Mist Net Reports

Contact Name: Sidney Morgan, WVDOH

Email Address or Fax Number: Sidney.t.morgan@wv.gov

Project: Chief Logan State Park Road

The U.S. Fish and Wildlife Service has reviewed the report on the bat survey conducted in the proposed project area and submitted on 10/9/2012. The survey followed the protocol outlined in the Draft Indiana Bat Recovery Plan. The survey covered 2.35 acres (kilometers) of potential bat habitat and was conducted at 3 net sites from July 17, 2012 to Aug 3, 2012. No federally-listed bats were captured.

Mist net surveys are considered current for 5 years (the summer they are completed and the following four summer seasons). In this case, the survey will expire on May 15, 2016. If a significant amendment is proposed to change or expand this project, or if timber will be removed after that date, a new survey may be necessary and the Service should be contacted.

Select one of the following three paragraphs and delete the other two (and this sentence):
The area was surveyed for caves and abandoned mine portals and none were found in the action area.

The area was surveyed for caves and abandoned mine portals and 0 were found in the action area. However, these were found to not be suitable for bat hibernacula based on Phase I cave/portal surveys.

The area was surveyed for caves and abandoned mine portals and _____ were found in the action area. Of these, ____ were found to be potentially suitable for bat hibernacula based on Phase I cave/portal surveys. Entrance surveys were conducted from _____ to _____. No federally-listed bats were captured.

Based on the information provided to us, the Service has concluded that no federally-listed endangered and threatened bats are expected to be impacted by the project. Therefore, this project is not likely to adversely affect federally-listed species, and no further consultation under section 7(a)(2) of the Endangered Species Act (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) is required with the Service. Should project plans change or amendments be proposed, or if additional information on listed and proposed species becomes available, this determination may be reconsidered.

If you have any questions regarding these comments, please contact Tamara Lewis at (304) 636-6586 or at the letterhead address.

Tamara S. Lewis Date: 10-19-12
Biologist

Deborah Carter Date: 10/26/2012
Deborah Carter, Field Supervisor

DEPARTMENT OF THE ARMY
HUNTINGTON DISTRICT, CORPS OF ENGINEERS
502 EIGHTH STREET
HUNTINGTON, WEST VIRGINIA 25701-2070

REPLY TO ATTENTION OF

March 15, 2013

Regulatory Division
South/Transportation Branch
LRH-2013-275-GUY, UT Buffalo Creek
Chief Logan State Park Connector

Mr. Lovell Facemire
Project Manager
West Virginia Department of Transportation
1900 Kanawha Boulevard East, Building 5, Room 450
Charleston, West Virginia 25305-0430

Dear Mr. Facemire:

I refer to an Aquatic Resources Report dated November 2012 and received by our office on January 18, 2013. The project area is located near Henlawson in Logan County, West Virginia (37.8875°N, 82.02861°W). Waters in the Preliminary Jurisdictional Determination (PJD) Delineation Boundary flow into the South Fork Crawley Creek and Buffalo Creek. South Fork Crawley Creek and Buffalo Creek are direct tributaries of the Guyandotte River, a traditional navigable water.

An on-site field review was conducted on February 6, 2013 with representatives from the U.S. Army Corps of Engineers (Corps) and the West Virginia Division of Highways (WVDOH). During the field investigation the Corps requested revisions to accurately describe and delineate waters on-site. By email message dated February 28, 2013, you submitted a revised set of Aquatic Resource Maps, sheets 1 through 5 and a revised JD Table. The Corps requested additional revisions to the JD Table and the final JD Table was transmitted by email message dated March 6, 2013.

The Corps authority to regulate waters of the United States (U.S.) is based, in part, on the definitions and limits of jurisdiction contained in 33 CFR 328 and 33 CFR 329. Section 404 of the Clean Water Act (CWA) requires that a Department of the Army (DA) permit be obtained prior to the discharge of dredged or fill material into waters of the U.S., including wetlands. Section 10 of the Rivers and Harbors Act of 1899 requires that a DA permit be obtained for any work in, on, over or under a navigable water.

The information provided identified aquatic resources within the proposed Chief Logan State Park Connector road Temporary Construction Easement (TCE) boundary, which has been identified as the Preliminary Jurisdictional Determination (PJD) Delineation Boundary. Pre-law surface and underground coal mining has occurred within PJD Delineation Boundary and the associated disturbances have permanently altered the hydrology of the area. Seven (7) streams were identified within the PJD Delineation Boundary with a total length of 2,453 linear feet (lf).

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Of the total length of stream, 571 lf exhibit perennial flow, 1,573 lf exhibit intermittent flow and 309 lf exhibit ephemeral flow.

Within the PJD Delineation Boundary, this office has determined that waters identified within this area may be jurisdictional waters of the U.S. in accordance with the Regulatory Guidance Letter for Jurisdictional Determinations issued by the Corps on June 26, 2008 (RGL No. 08-02). This PJD is non-binding and cannot be appealed (33 C.F.R. 331.2), and only provides a written indication that waters of the U.S., including wetlands, may be present within these areas. Table 1 summarizes the waters identified within the PJD Delineation Boundary. Refer to the attached Aquatic Resources Maps, sheets 1 through 5 to locate the waters identified in Table 1.

Because you have declined to exercise the option to obtain an Approved Jurisdictional Determination (AJD) for the PJD Delineation Boundary, the waters listed in Table 1 and described in the attached PJD Form will be evaluated as if they are waters of the U.S. Therefore, the information in Table 1 will be used to calculate impacts to waters of the U.S., and the amount of compensatory mitigation required to offset the respective aquatic resource losses.

Attached please find two (2) copies of the PJD. If you agree with the findings of this PJD and understand your options regarding the same, please sign and date one (1) copy of the form and return it to this office within 30 days of receipt of this letter. You should submit the signed copy to the following address:

Ms. Megan Thompson (LRH-2013-275-GUY, UT Buffalo Creek)
U.S. Army Corps of Engineers, Huntington District
502 8th Street
Huntington, West Virginia 25701

During the field review, it was determined that six (6) PEM wetlands, CLW2, CLW5, CLW7, CLW8, CLW9 and CLW10, did not meet the three (3) parameter wetland criteria; therefore, these six (6) features were determined to be non-wetlands. The remaining five (5) PEM wetlands, CLW1, CLW3, CLW4, CLW6 and CLW11, did met the three (3) parameter wetland criteria; however, none of the wetlands exhibited a hydrologic surface connection to one of the seven (7) streams identified within the PJD Delineation Boundary. Therefore, these five (5) PEM wetlands were determined to be isolated wetlands and four (4) separate Approved Jurisdictional Determination (AJD) areas were established within and adjacent to the PJD Delineation Boundary to identify the isolated wetlands. The attached Aquatic Resource Maps, sheets 1 through 5 identifies the location of the four (4) AJD areas and the isolated wetlands. Table 2 provides a summary of the isolated wetland determinations.

The AJD of the four (4) AJD Areas is valid for a period of five (5) years from the date of this letter unless new information warrants revision of the delineation prior to the expiration date.

If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. **Enclosed** you will find a Notification of Appeal Process (NAP) fact sheet and Request for Appeal (RFA) form. If you request to appeal this determination you must submit a completed RFA form to the Great Lakes and Ohio River Division Office at the following address:

Appeal Review Officer
US Army Corps of Engineers
Great Lakes and Ohio River Division
550 Main Street, Room 10524
Cincinnati, Ohio 45202-3222
Phone: (513) 684-6212; Fax: (513) 684-2460

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR Part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address by May 14, 2013. **It is not necessary to submit an RFA form to the Division office if you do not object to the determination in this letter.**

This determination has been conducted to identify the limits of the Corps Clean Water Act jurisdiction for the particular site identified in this request. Please be advised if your proposed project is unable to avoid waters of the U.S., you must obtain written authorization from this office for any discharge of dredged and/or fill material into these aquatic resources prior to impact. If you have any questions concerning the above information, please contact Megan Thompson at (304) 399-5710 or megan.m.thompson@usace.army.mil.

Sincerely,

Sarah M Workman

Sarah M. Workman
Acting Chief, South/Transportation Branch

Enclosures

Copy Furnish (email only):

Anna Vanderlaan
West Virginia Department of Transportation
anna.m.vanderlaan@wv.gov

Table 1: Preliminary Jurisdictional Determination Summary of Waters

Stream	Perennial	Intermittent	Ephemeral	Total
S1 - UT South Fork Crawley Creek	0	743	0	743
S3 - UT Buffalo Creek	0	5	85	90
S4 - UT Buffalo Creek	0	84	63	147
S5 - UT Buffalo Creek	0	585	0	585
S6 - UT Buffalo Creek	571	0	0	571
S7 - UT Buffalo Creek	0	0	161	161
S8 - UT Buffalo Creek	0	156	0	156
TOTALS	**571**	**1,573**	**309**	**2,453**

Table 2: Approved Jurisdictional Determination Summary of Isolated Wetlands

			Streams/Ditches - linear feet			Wetland acre	Imp/Pond acre
Name	AJD Area	JD	per.	int.	eph.		
CLW1	AJD-1	NON-JD	---	---	---	0.048	---
CLW3	AJD-2	NON-JD	---	---	---	0.061	---
CLW4	AJD-2	NON-JD	---	---	---	0.006	---
CLW6	AJD-3	NON-JD	---	---	---	0.008	---
CLW11	AJD-4	NON-JD	---	---	---	0.046	---
		TOTALS:	**---**	**---**	**---**	**0.169**	**---**

APPENDIX B
CULTURAL RESOURCES

WEST VIRGINIA
Division of Culture and History

The Culture Center
1900 Kanawha Blvd., E.
Charleston, WV 25305-0300
Randall Reid-Smith, Commissioner
Phone 304.558.0220 • www.wvculture.org
Fax 304.558.2779 • TDD 304.558.3562
EEO/AA Employer

RECEIVED
NOV 05 2012
ENGINEERING DIVISION
WV DOH

October 31, 2012

Mr. Gregory Bailey
West Virginia Division of Highways
1900 Kanawha Blvd., East
Building 5, Room 110
Charleston, WV 25305

Re: Chief Logan Connector Project; State Project # X323-210/24-0.00
FR#: 13-22-LG

Dear Mr. Bailey:

We have reviewed the above referenced project to determine its effects to cultural resources. The following comments are offered under West Virginia Code 29-1-8.

Submitted information indicates that the West Virginia Division of Highways is proposing to construct a road within Chief Logan State Park, Logan County, from the Earl Ray Tomblin Conference Center to the roadway system within the original park.

Archaeological Resources
According to the Phase I archaeological report, systematic survey of the proposed project area resulted in the documentation of steep terrain and previous disturbance. Shovel probes were not excavated; however, steep slopes were examined for rockshelters or other evidence of archaeological materials. No cultural materials were identified. As a result, we concur that no further archaeological work is necessary for the proposed project. In our opinion, there are no archaeological properties within the proposed project area that are eligible for inclusion in the National Register of Historic Places.

Architectural Resources
Submitted information indicates that there are two above ground resources within the project's area of potential effect (APE). These include a coal storage building and a coal silo. It is the consultant's opinion that that these two structures are not eligible for inclusion in the National Register of Historic Places. After review of the submitted information, we concur with this assessment. In addition, the submitted information indicates that the Chief Logan State Park is not eligible for inclusion in the National Register. We are unable to concur with this assessment at this time. The current submission included no photographs or a completed Historic Property Inventory (HPI) form for the park. We request that this determination of eligibility occur at this time and that an HPI form for the park occur at this time. Please be sure to include a cd-r of all HPI forms.

We will provide additional comments upon receipt of the requested information.
We appreciate the opportunity to be of service. *If you have questions regarding our comments or the review process, please contact Lora A. Lamarre-DeMott, Senior Archaeologist, or Shirley Stewart Burns, Structural Historian, at (304) 558-0240.*

Sincerely,

Susan M. Pierce
Deputy State Historic Preservation Officer

SMP/LAL/SSB

WEST VIRGINIA
Division of Culture and History

The Culture Center
1900 Kanawha Blvd., E.
Charleston, WV 25305-0300
Randall Reid-Smith, Commissioner
Phone 304.558.0220 • www.wvculture.org
Fax 304.558.2779 • TDD 304.558.3562
EEO/AA Employer

RECEIVED
JAN 14 2013
ENG... W...

January 10, 2013

Mr. Gregory Bailey
West Virginia Division of Highways
1900 Kanawha Blvd., East
Building 5, Room 110
Charleston, WV 25305

Re: Chief Logan Connector Project; State Project # X323-210/24-0.00
FR#: 13-22-LG-1

Dear Mr. Bailey:

We have reviewed the above referenced project to determine its effects to cultural resources. The following comments are offered under West Virginia Code 29-1-8.

Architectural Resources
Thank you for forwarding the requested Historic Property Inventory (HPI) form. It is the consultant's opinion that Chief Logan State Park is not eligible for inclusion in the National Register of Historic Places. After review of the very thorough documentation, we concur with this assessment. The Chief Logan State Park *is not eligible* for inclusion in the National Register of Historic Places. It is our opinion that the proposed project will have no effect to architectural resources eligible for or included in the National Register of Historic Places. No further consultation regarding architectural resources is necessary.

We appreciate the opportunity to be of service. *If you have questions regarding our comments or the review process, please contact Shirley Stewart Burns, Structural Historian, at (304) 558-0240.*

Sincerely,

Susan M. Pierce
Deputy State Historic Preservation Officer

SMP/SSB

WEST VIRGINIA
Division of Culture and History

The Culture Center
1900 Kanawha Blvd., E.
Charleston, WV 25305-0300
Randall Reid-Smith, Commissioner
Phone 304.558.0220 • www.wvculture.org
Fax 304.558.2779 • TDD 304.558.3562
EEO/AA Employer

May 22, 2013

RECEIVED
MAY 24 2013
ENGINEERING DIVISION
WV DOH

Mr. Gregory Bailey
West Virginia Division of Highways
1900 Kanawha Blvd., East
Building 5, Room 110
Charleston, WV 25305

Re: Chief Logan Connector Project; State Project # X323-210/24-0.00
FR#: 13-22-LG-2

Dear Mr. Bailey:

We have reviewed the Phase I Archaeology Addendum Letter Report that was submitted for the above referenced project to determine its effects to cultural resources. The following comments are offered under West Virginia Code 29-1-8.

Archaeological Resources:
According to the addendum to the Phase I archaeological report, design changes were made to the proposed project subsequent to the completion of the Phase I archaeological survey. The design changes involve amendments to the associated cut and fill areas. Systematic survey of these areas indicated the vast majority of the addendum area consists of steep and/or previously disturbed terrain. One small bench within this area was investigated via shovel probe excavation. No cultural materials were identified. As a result, we concur that no further archaeological work is necessary for the proposed design change area. In our opinion, there are no archaeological properties within the proposed project area that are eligible for inclusion in the National Register of Historic Places.

We appreciate the opportunity to be of service. *If you have questions regarding our comments or the review process, please contact Lora A. Lamarre-DeMott, Senior Archaeologist, at (304) 558-0240.*

Sincerely,

Susan M. Pierce
Deputy State Historic Preservation Officer

SMP/LLD

APPENDIX C
SECTION 6(f) RESOURCES

From: McGarrity, John R
Sent: Wed 7/18/2012 12:06 PM
To: Facemire, Lovell R
Cc: Workman, Kelly A; Marshall, James S
Subject: RE: Chief Logan State Park

Lovell...The NPS Regional Office concurs with our assessment of the proposed access road between the Chief Logan Conference Center and Chief Logan State Park as a, 'sponsor-funded public facility,' and not as a conversion requiring replacement property. DoH should proceed with the completion of a required NPS Environmental Screening Form (ESF) to include with, and become part of, a Section 6(f)(3) project area map change to be submitted through our office and the NPS, in turn, for NPS review and approval. ESF forms can be downloaded from either our website or the NPS, <www.wvcommerce.org> or <www.nps.gov>. Major elements in the ESF's required EA are the DoH's feasibility study of the proposed roadway and a SHPO Section 106 Clearance Review, which DoH should develop and coordinate with the Division of Culture & History as soon as practical once R/W and construction easement maps are available to identify any SHPO areas of concern. Please feel free to contact either myself or Jim Marshall of our office if you have any questions or need additional information about this process.

John McGarrity, Senior Planner

West Virginia Development Office

Charleston, West Virginia 25305

(t) 304.558.2234

(e) john.r.mcgarrity@wv.gov

07.18.2012

EXECUTIVE SUMMARY

The Engineering Division of the West Virginia Division of Highways (WVDOH) was requested to evaluate a connector road between the Chief Logan State Park Facilities and the Chief Logan State Park Conference Center. At the time of this report all available information indicates the proposed connector can be constructed within the park boundary. Portions of this property were likely purchased with Land and Water Conservation Funds and the change of use process will have to be approved prior to construction. No Environmental Clearance has been initiated at this time.

Five potential alignments were evaluated; however, all but one is excluded from further consideration due to long term operational considerations and cost. The remaining choice is **ALTERNATE #1** and with an estimated cost **$10,050,000** provided a contract is advertised and awarded through the Division of Highways.

PROJECT DESCRIPTION

This report is to evaluate and determine the most suitable and economical location for the installation of a surface treated roadway serving Chief Logan State Park Facilities in Logan County and generally connecting US 119 (Corridor G) to Logan County Route 10/2 (Little Buffalo Creek Road). This road is proposed to use park service road criteria allowing up to 15% grades and no more than 25 miles per hour design speed.

This study was conducted utilizing information obtained from an initial field visit, aerial survey, and information gathered from various other sources. Major factors taken into consideration were cost comparison of the alternative alignments, safety to all users of the facility, constructability issues, and environmental impacts.

Should the State decide to construct this road as a WV county route an agreement with the mineral owner would have to be executed or the rights purchased. There are 17 potentially minable coal seams and could cost $6,000 per acre.

Alternate #1 (Preferred) would be a little more than 2 miles of road grade from near the Recreation/Fitness Center to the pool with a slight cut through the low gap. Potential earthwork reduction could occur through detailed design better following the contours of the hillside.

Estimated cost for Alternative No.1 is as follows:

2 miles surface w/GR	$ 1,250,000
Incidental Drainage	$ 500,000
Preliminary Engineering	$ 300,000
Excavation (2 million cubic yards)	$ 8,000,000
Right of Way	No Cost
Railroad / Utilities	No Cost
Total	$ 10,050,000

Alternate #2 would be a little less than 2 miles of roadway from the Recreation/Fitness Center through the campground to the remaining park facilities using a box cut through the low gap. This presents less opportunity for on alignment use of

excavated material. The Assistant Park Ranger has expressed concern with any alternates that connect through their campground.

Estimated cost for Alternative No.2 is as follows:

2 miles surface w/GR	$ 1,250,000
Incidental Drainage	$ 500,000
Preliminary Engineering	$ 300,000
Excavation (2 million cubic yards)	$ 10,000,000
Right of Way	No Cost
Railroad / Utilities	No Cost
Total	$ 12,050,000

Alternate #3 would be almost 3.5 miles of roadway from the Conference Center and tie in at the headwater end of the lake. This is the alignment was developed by L.A. Gates for the WV Park Service, but at the direction of the park service assumes volunteer labor to achieve grade and in 2005 was estimated to cost $4,000,000. No provisions to secure agreements to such an end have been located.

Estimated cost for Alternative No.3 is as follows:

3.5 miles surface w/GR	$ 2,200,000
Incidental Drainage	$ 875,000
Preliminary Engineering	$ 400,000
Excavation (3 million cubic yards)	$ 15,000,000
Right of Way	No Cost
Railroad / Utilities	No Cost
Total	$ 18,475,000

Alternate #4 would be a little over 2 miles of roadway from the Conference Center and tie in at the Wildlife Exhibit. This alignment uses 1.5 miles of the L.A. Gates alignment from the Conference Center.

Estimated cost for Alternative No.4 is as follows:

2 miles surface w/GR	$ 1,250,000
Incidental Drainage	$ 500,000
Preliminary Engineering	$ 300,000
Excavation (2 million cubic yards)	$ 10,000,000
Right of Way	No Cost
Railroad / Utilities	No Cost
Total	$ 12,050,000

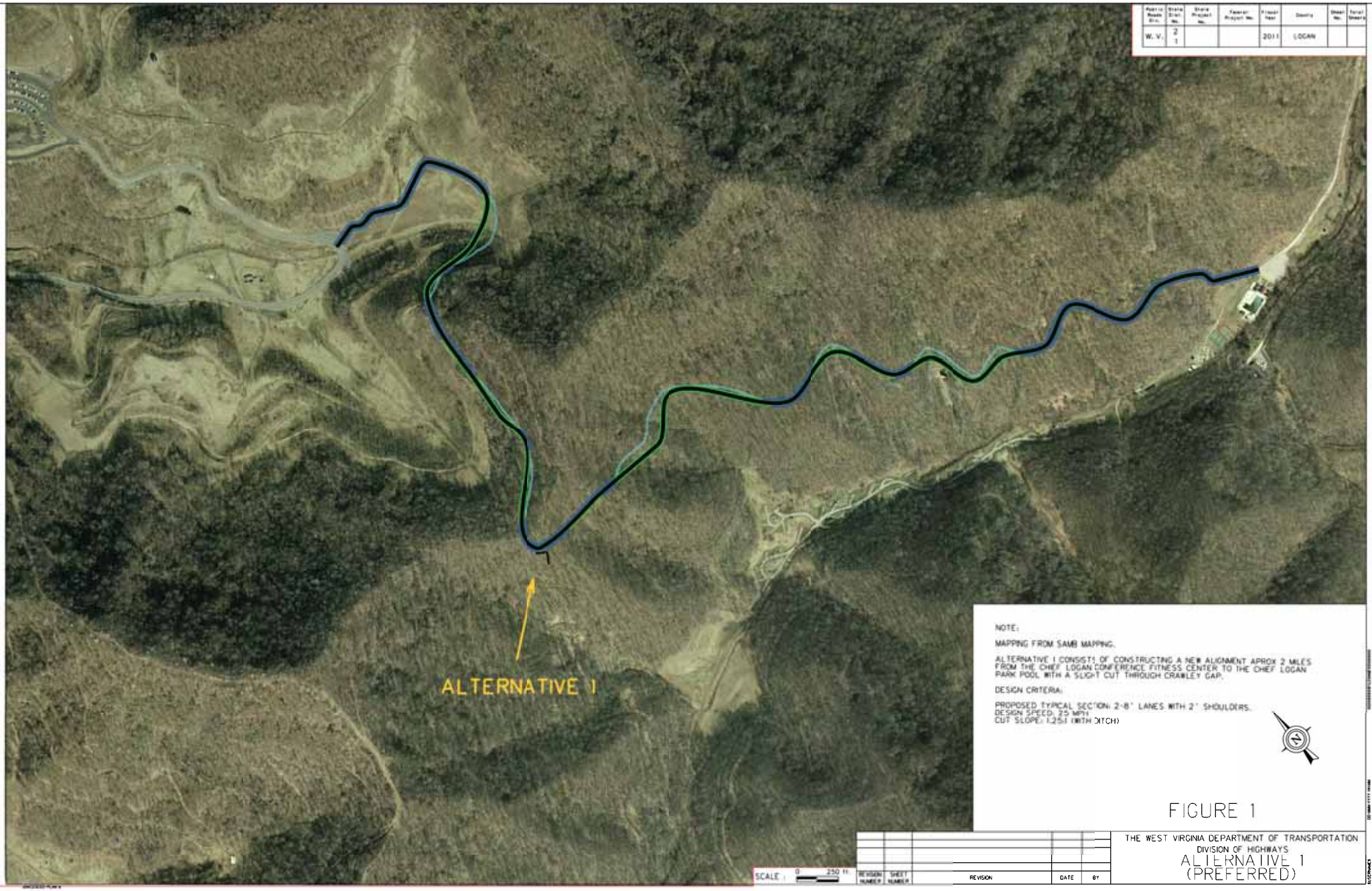
Alternate #5 would be a little over 2 miles of roadway using the existing switchback roads alignments, upgrade the typical and tie in from the Recreation/Fitness Center through the campground to the remaining park facilities. The Assistant Park Ranger has expressed concern with any alternates that connect through their campground.

Estimated cost for Alternative No.4 is as follows:

2 miles surface w/GR	$ 1,250,000
Incidental Drainage	$ 500,000
Preliminary Engineering	$ 300,000
Excavation (1.5 million cubic yards)	$ 7,500,000
Right of Way	No Cost
Railroad / Utilities	No Cost
Total	$ 9,450,000

DESIGN CRITERIA AND GUIDELINES

This area is mountainous terrain and park service criteria.



Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	2 1			2011	LOGAN		

NOTE:

MAPPING FROM SAME MAPPING.

ALTERNATIVE 1 CONSISTS OF CONSTRUCTING A NEW ALIGNMENT APROX 2 MILES FROM THE CHIEF LOGAN CONFERENCE FITNESS CENTER TO THE CHIEF LOGAN PARK POOL WITH A SLIGHT CUT THROUGH CRAWLEY GAP.

DESIGN CRITERIA:

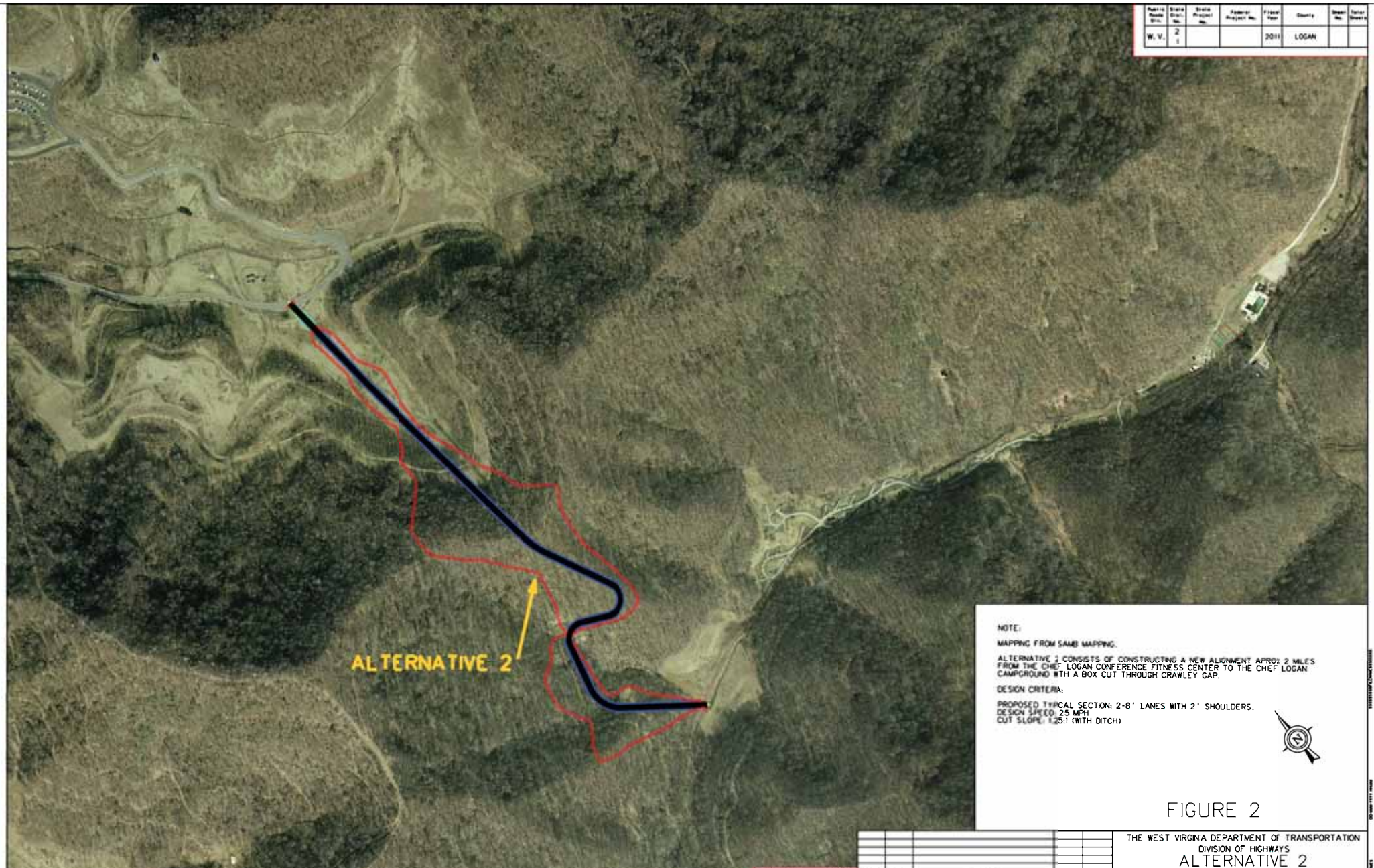
PROPOSED TYPICAL SECTION: 2-8' LANES WITH 2' SHOULDERS.
DESIGN SPEED: 25 MPH
CUT SLOPE: 1.25:1 (WITH DITCH)

FIGURE 1

SCALE : 0 250 ft

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ALTERNATIVE 1
(PREFERRED)



W. V.	2			2011	LOGAN		

NOTE:

MAPPING FROM SAME MAPPING.

ALTERNATIVE 2 CONSISTS OF CONSTRUCTING A NEW ALIGNMENT APROX 2 MILES FROM THE CHIEF LOGAN CONFERENCE FITNESS CENTER TO THE CHIEF LOGAN CAMPGROUND WITH A BOX CUT THROUGH CRAWLEY GAP.

DESIGN CRITERIA:

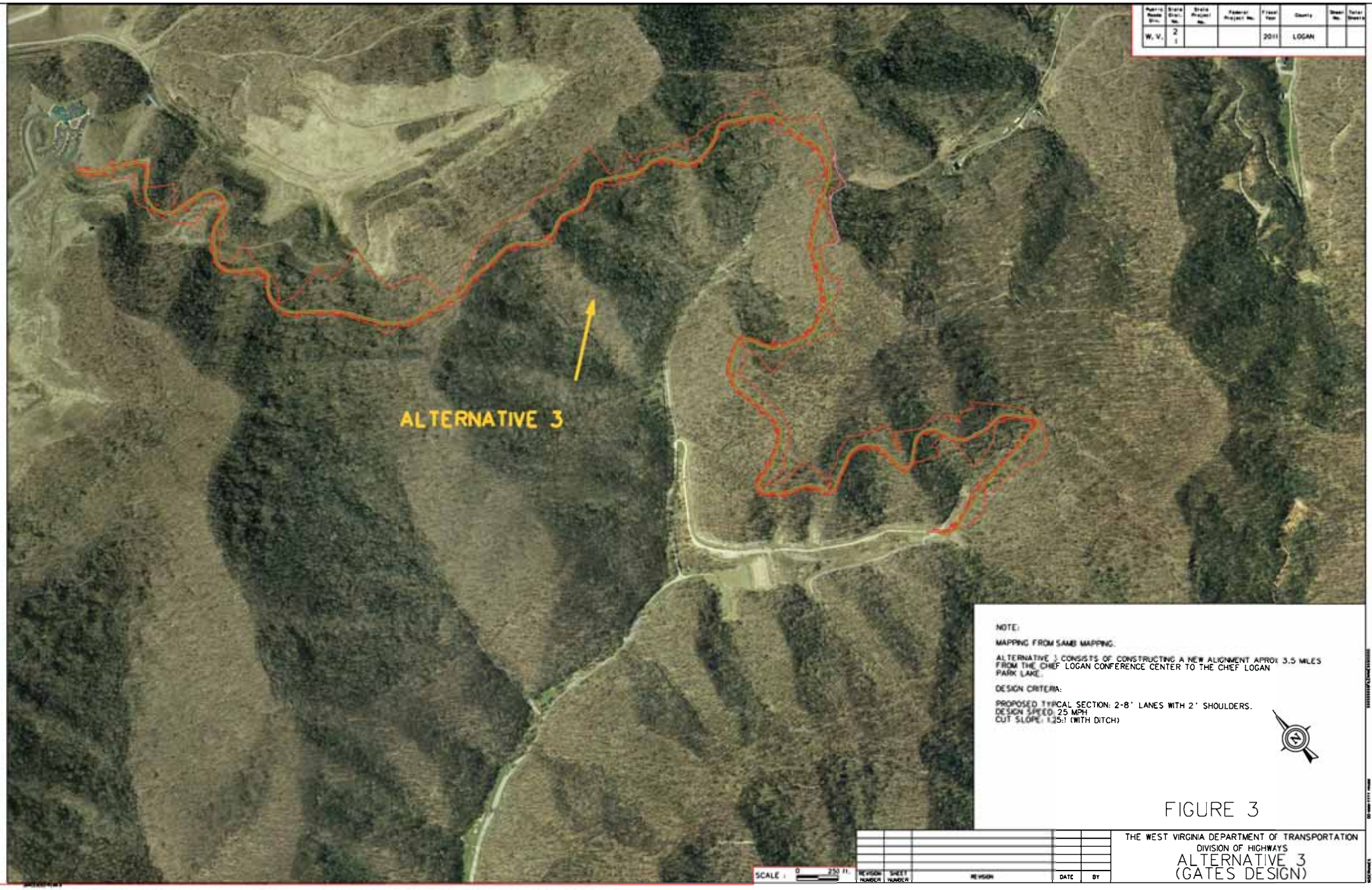
PROPOSED TYPCAL SECTION: 2-8' LANES WITH 2' SHOULDERS.
DESIGN SPEED: 25 MPH
CUT SLOPE: 1.25:1 (WITH DITCH)

FIGURE 2

SCALE : 0 250 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ALTERNATIVE 2



W. V.	2			2011	LOGAN		

NOTE:

MAPPING FROM SAME MAPPING.

ALTERNATIVE 3 CONSISTS OF CONSTRUCTING A NEW ALIGNMENT APPROX 3.5 MILES FROM THE CHIEF LOGAN CONFERENCE CENTER TO THE CHIEF LOGAN PARK LAKE.

DESIGN CRITERIA:

PROPOSED TYPICAL SECTION: 2-8' LANES WITH 2' SHOULDERS.
DESIGN SPEED: 25 MPH
CUT SLOPE: 1.25:1 (WITH DITCH)

FIGURE 3

SCALE : 0 250 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ALTERNATIVE 3
(GATES DESIGN)

W. V.	2			2011	LOGAN		

NOTE:

MAPPING FROM SAME MAPPING.

ALTERNATIVE 3 CONSISTS OF CONSTRUCTING A NEW ALIGNMENT APPROX 2 MILES FROM THE CHIEF LOGAN CONFERENCE CENTER TO THE CHIEF LOGAN PARK WILDLIFE EXHIBIT.

DESIGN CRITERIA:

PROPOSED TYPICAL SECTION: 2-8' LANES WITH 2' SHOULDERS.
DESIGN SPEED: 25 MPH
CUT SLOPE: 1.25:1 (WITH DITCH)

FIGURE 4

SCALE : 0 250 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ALTERNATIVE 4
(GATES MODIFIED)

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	2 1			2011	LOGAN		

NOTE:

MAPPING FROM SAMB MAPPING.

ALTERNATIVE 5 CONSISTS OF UTILIZING THE EXISTING ROADWAYS OF US 119, STATE ROUTE 10, LOGAN COUNTY ROUTE 10-2 AND PARK ROAD 801.

FIGURE 5

SCALE : 0 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ALTERNATIVE 5 (EXISITNG CONDITION)