

PF13-10-000

CENTERPOINT ENERGY GAS TRANSMISSION COMPANY, LLC

ATTACHMENT 2

Draft Resource Report 10 – Alternatives

PUBLIC

CENTERPOINT ENERGY GAS TRANSMISSION COMPANY, LLC

**CENTRAL ARKANSAS PIPELINE ENHANCEMENT PROJECT
FERC DOCKET NO. PF13-10-000**

**DRAFT RESOURCE REPORT NO. 10
ALTERNATIVES**

PUBLIC

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LINE BT-14 REPLACEMENT PROJECT
FERC DOCKET NO. PF13-10-000

RESOURCE REPORT NO. 10 – ALTERNATIVES	
SUMMARY OF COMMISSION FILING INFORMATION	
INFORMATION	FOUND IN
Address the "no action" alternative. (§ 380.12 (I) (1))	Section 10.2
For large projects, address the effect of energy conservation or energy alternatives to the project. (§ 380.12 (I) (1))	Section 10.3
Identify system alternatives considered during the identification of the project and provide the rationale for rejecting each alternative. (§ 380.12 (I) (1))	Section 10.5
Identify major and minor route alternatives considered to avoid impact on sensitive environmental areas (e.g., wetlands, parks, or residences) and provide sufficient comparative data to justify the selection of the proposed route. (§ 380.12 (I) (3))	Sections 10.6 and 10.7
Identify alternative sites considered for the location of major new aboveground facilities and provide sufficient comparative data to justify the selection of the proposed site. (§ 380.12 (I) (3))	Section 10.9

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ACRONYMS AND ABBREVIATIONS

CEGT	CenterPoint Energy Gas Transmission Company, LLC
CERC	CenterPoint Energy Resources Corporation d/b/a Arkansas Gas
Commission	Federal Energy Regulatory Commission
EIA	U.S. Energy Information Administration
FERC	Federal Energy Regulatory Commission
HDD	Horizontal Directional Drill
MP	Milepost
NRCS	Natural Resources Conservation Service
Project	Central Arkansas Pipeline Enhancement Project
TBS	Town Border Station
U.S.	United States
USGS	U.S. Geological Survey
WRP	Wetland Reserve Program

10.0 INTRODUCTION

CenterPoint Energy Gas Transmission Company, LLC (“CEGT”), in cooperation with its affiliated natural gas distribution business, is proposing the Central Arkansas Pipeline Enhancement Project (“Project”). As part of the Project, CEGT is proposing to construct, own, operate, and maintain approximately 28 miles of 12-inch-diameter natural gas pipeline and ancillary facilities in Pulaski and Faulkner Counties, Arkansas. The proposed pipeline, to be named Line BT-39, will be constructed primarily on new alignment, and will provide replacement transmission service for a portion of two existing CEGT natural gas pipelines (Lines B and BT-14). CEGT will also construct metering and appurtenances at seven new or modified locations along the Line BT-39 pipeline route and tie-in points to the existing Line BT-14 pipeline, as well as two 4-inch diameter laterals (Lines BT-40 and BT-41) to provide natural gas deliveries to its distribution affiliate. As currently proposed, ownership of an approximately 12.4-mile-long segment of the existing Line BT-14 pipeline through the City of Conway would be transferred to CEGT’s distribution affiliate, CenterPoint Energy Resources Corporation d/b/a Arkansas Gas (“CERC”), and an approximately 21-mile-long segment of the existing Line B pipeline, extending from Conway to North Little Rock, would be retired from service (abandoned). Other minor ancillary facilities and small diameter pipelines within the City of Conway (i.e., Lines BM-1, BT-19, and a portion of Line BM-21) would also be retired in association with the proposed Project. Refer to the attached Project location maps for a depiction of the existing and proposed pipeline facilities associated with the Project and Resource Report 1 for a detailed description of the Project.

This Resource Report discusses the alternatives evaluated during development of the Project to determine whether they would be reasonable and environmentally preferable to the proposed action. Alternatives considered include the no-action alternative, alternative energy sources and energy conservation, system alternatives, major route alternatives, and route variations. The following evaluation criteria were used to determine whether alternatives would be reasonable and environmentally preferable:

- significant environmental advantage over the proposed Project;
- ability to meet the proposed Project objectives; and
- technical and economic feasibility and practicability.

10.1 PURPOSE AND NEED

The proposed Project will provide for the continued safe, reliable, and efficient transportation of natural gas to the central Arkansas cities and towns of Conway, Mayflower, Maumelle, North Little Rock, and Little Rock. CEGT currently owns and operates multiple, existing pipelines in this region, but the region has experienced substantial residential and commercial development since the original Line B and BT-14 pipeline facilities were constructed. Multiple residences, subdivisions, golf courses, commercial and industrial areas, the University of Central Arkansas campus, and the Conway Airport now encroach on these existing pipelines. The proposed Project provides CEGT with the opportunity to install new pipeline facilities to more efficiently operate its pipeline system, better serve its current customers, and remediate these encroachment issues, while also laying the groundwork for additional pipeline capacity to meet future growth, as needed.

As part of the Project, CEGT will retire from service some existing pipeline assets, while also transferring ownership of some other existing pipeline infrastructure to its distribution affiliate, CERC. Such realignment and repurposing of existing pipeline infrastructure will provide for cost savings and more efficient delivery of natural gas in the Project area, all of which should benefit end use customers.

10.2 NO-ACTION ALTERNATIVE

Under the no-action alternative, the Project would not be constructed, and the direct environmental impacts associated with construction and operation of the Project would not occur. However, operation and maintenance requirements of the existing, aging pipeline facilities would continue to increase, potentially resulting in integrity concerns and interruptions in gas flow to residences and major industrial users in the Conway and Little Rock area. Although the no-action alternative would avoid the direct environmental impacts associated with the Project, the

objective of the Project, which is to maintain reliable service to the Conway and Little Rock area, might not be met. Unsatisfied demand for natural gas in these areas eventually would need to be met by energy conservation, the use of alternative energy sources, or the construction of additional natural gas facilities on other systems. As discussed in subsequent sections, these alternatives either would not meet the Project's objectives within a reasonable timeframe or likely would result in impacts similar to or greater than those associated with the proposed Project. Therefore, the no-action alternative is not practical and provides no advantage.

10.3 ALTERNATIVE ENERGY SOURCES AND ENERGY CONSERVATION

The proposed Project is designed to meet the needs of natural gas consumers and major industrial users in the Conway and Little Rock area. The use of alternative energy sources is an option that, in theory, might reduce or eliminate the need to build the proposed facilities and thus avoid the associated environmental impacts.

Several alternative energy sources to natural gas currently exist, such as petroleum and coal-based energy, nuclear power, hydropower, and other energy sources, including renewable energy technologies. Petroleum and coal-based energy are commonly used and found throughout the United States; however, relative to natural gas, the use of petroleum or coal-based energy would result in greater emissions of pollutants such as nitrogen oxide, sulfur dioxide, and carbon dioxide (EPA, 2012). Further, the mining and transportation of coal to coal-burning power plants is considered to have additional or more complex adverse environmental impacts than environmental impacts associated with the use of natural gas. Similarly, the environmental impacts associated with processing, transporting, and burning more oil would be greater than environmental impacts associated with the use of natural gas. Therefore, compared to the Project, the use of coal or petroleum based energy would not offer an environmental benefit, and use of these sources of energy would not be preferred alternatives to the Project.

Growth in nuclear generating capacity is estimated to account for approximately 17 percent of total United States generating capacity by 2040 (U.S. Energy Information Administration ("EIA"), 2013). However, regulatory requirements, cost considerations, and public concerns make it unlikely that a new nuclear power plant could be sited and developed to serve the central Arkansas energy market within a timeframe that would meet the objectives of the Project. The expansion and upgrading of hydropower facilities are expected to produce incremental additions of power production in the coming years. However, like nuclear power generation, it is unlikely that significant sources of energy production from hydropower sources serving the Project's target market would be permitted and brought online within the Project timeframe. For this reason, use of nuclear power is not considered to be a preferred or even viable alternative to the Project.

Federal, state, and local initiatives likely will contribute to an increase in the availability and cost effectiveness of non-hydropower renewable energy sources such as wind, solar, tidal, geothermal, and biomass. The EIA projects that the share of generation coming from renewable fuels (including conventional hydropower) will grow from 13 percent in 2011 to 16 percent in 2040 (EIA, 2013). The EIA indicates that this increase in the use of renewable energy sources will be driven by federal tax credits, state-level policies, and federal requirements to use more biomass-based transportation fuels. Arkansas currently does not have a state renewable portfolio standard instituted (EIA, 2012a) and therefore, it is unlikely that adequate renewable energy sources would be available in a timeframe that would meet the Project's purpose and need. In addition, any of these alternatives or combinations of alternatives needed to match the energy provided by the Project would require transmission, distribution, and plant site components, all requiring land, as well as construction and operation. Depending on the locations of the sources, development of these components more than likely would result in impacts similar or greater than those associated with the proposed Project.

Energy conservation could help alleviate some of the nation's growing demand for energy and eventually offset the need for increased natural gas supplies. The reference case in the EIA's Annual Energy Outlook 2012 projects that energy use per capita will decrease slightly between 2013 and 2035, energy use per capita will decline by 0.6 percent per year on average (EIA, 2012b). Despite this per capita decrease, overall energy consumption in the United States is projected to increase by 0.3 percent per year from 2010 to 2035 due to population growth (EIA,

2012b). Arkansas' State Energy Program, which received a grant from the U.S. Department of Energy, includes 13 projects that are designed to increase energy efficiency (Arkansas Energy Office, 2010). Nevertheless, although energy conservation under state energy plans and other energy conservation measures will be important elements in addressing future energy demands in the long-term, energy conservation is not a viable alternative to meet the short-term energy needs of the country in general or the specific needs of the Conway and Little Rock area that will be met by the Project.

In summary, none of the alternative energy sources, either alone or in combination, would offer a significant environmental advantage over the Project. In fact, use and/or development of many, if not most, of the alternative energy sources would be associated with greater environmental impacts than those associated with the Project. Furthermore, many of the potential alternative energy sources could not be developed in time to meet the Project objectives. Since energy conservation also is not a viable alternative for meeting the short-term energy needs of the CEGT's customers, there are no realistic alternatives to the Project for meeting the Project objectives.

10.4 LINE BT-14 REPLACEMENT PROJECT ALTERNATIVE

On April 13, 2012, CEGT filed a Prior Notice request with the Federal Energy Regulatory Commission ("FERC" or "Commission") for authorization to reroute a segment of the Line BT-14 pipeline around the City of Conway, Arkansas (refer to FERC Docket No. CP12-144-000). Subsequently, on July 3, 2012, CEGT withdrew that application, having determined that the desired outcomes of the BT-14 replacement project, encroachment remediation and more efficient operation of Line BT-14, could be achieved by pursuing an alternate project. The currently proposed Central Arkansas Pipeline Enhancement Project represents that alternative project.

Relative to the previously proposed Line BT-14 replacement, the proposed Project offers an overall best solution to provide more reliable, efficient, cost effective, and safe natural gas supply to the central Arkansas region. The proposed Project accomplishes the objectives of the BT-14 replacement, as well as, providing the following benefits:

- The Project pipeline alignment provides the opportunity to avoid heavily congested, residential, commercial, and industrial areas within the City of Conway.
- The new Project pipeline facilities will better serve current customers and lay the groundwork for additional pipeline capacity to meet future growth, as needed.
- Realignment and repurposing of existing pipeline infrastructure provides for cost savings and more efficient delivery of natural gas in the Project area, thereby benefitting end use customers.
- Ownership realignment of a segment of the BT-14 pipeline allows for continued use of a transmission pipeline asset as a low-pressure, natural gas delivery pipeline.
- The proposed asset retirement and realignment strategy has been developed to minimize disruption to local residents and landowners.
- The Project services and directly benefits the traversed and affected communities – Conway, Mayflower, Maumelle, and North Little Rock.
- The Project allows for more efficient operation of CEGT's pipeline system.

10.5 SYSTEM ALTERNATIVES

System alternatives are alternatives to the proposed action that would make use of other existing, modified, or proposed pipeline systems to meet the stated objectives of the Project. A system alternative would make it unnecessary to construct the proposed Project, although some modifications or additions to one or more pipeline systems may be required to fulfill Project objectives. Such modifications or additions would result in environmental impact; however, the impact could be less than, similar to, or greater than that associated with construction of the proposed Project.

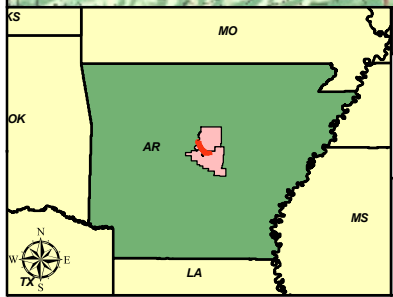
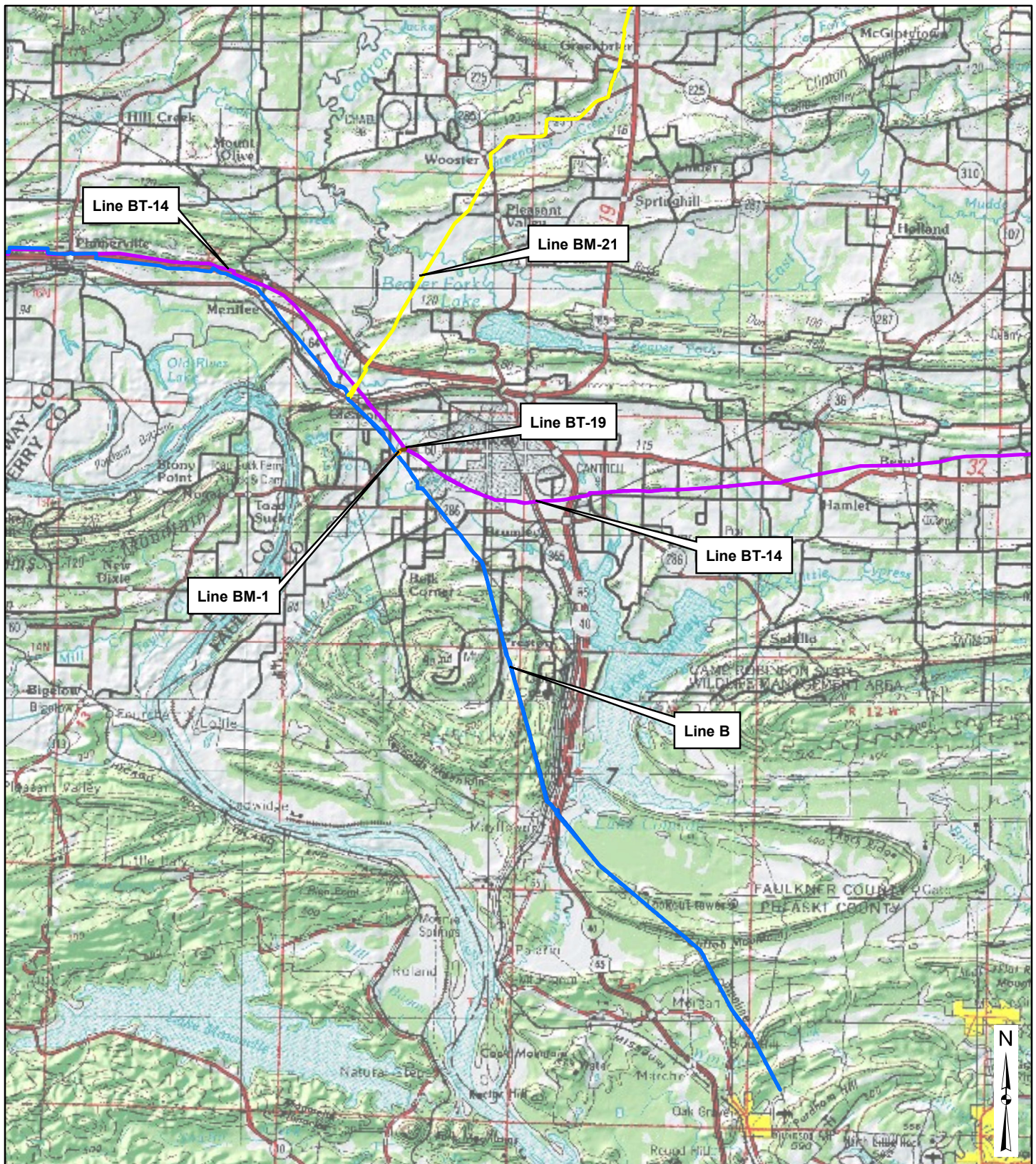
CEGT operates two existing natural gas mainline pipelines, Lines B and BT-14, in central Arkansas, as shown on Figure 10.5-1. These pipelines supply gas to three other smaller diameter CEGT pipelines in the area, including Lines BM-1, BM-21, and BT-19, all of which serve the Conway area. Because the objective of the Project is to

mitigate for encroachment along CEGT's existing pipeline infrastructure and enhance reliability of natural gas transportation in the central Arkansas region, CEGT has proposed the Project facilities, as well as retirement of certain other facilities, to fulfill the Project purpose and need. There are no other existing CEGT pipelines or pipelines of other companies in the Conway area that could reasonably be modified to meet the objectives of the proposed Project.

10.6 MAJOR ROUTE ALTERNATIVE

A major route alternative is one that deviates from the preferred route for an extended distance or is several miles away from the preferred route. Major route alternatives are geographically different and are primarily considered for “new” pipeline projects. Although Line BT-39 is proposed as a replacement for the service to be abandoned on Lines B and BT-14, it is proposed on a new right-of-way, and therefore a major route alternative was evaluated. The evaluated alternative route would follow the existing Line B right-of-way. See Figure 10.6-1 for a depiction of the proposed and alternative routes. A comparison of construction and environmental considerations for the proposed route and the alternative route is presented in Table 10.6-1 and discussed in the sections below.

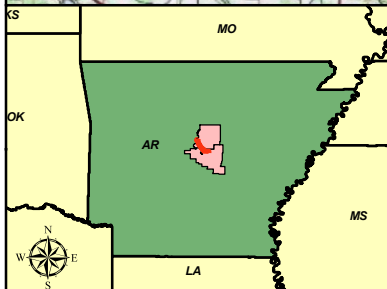
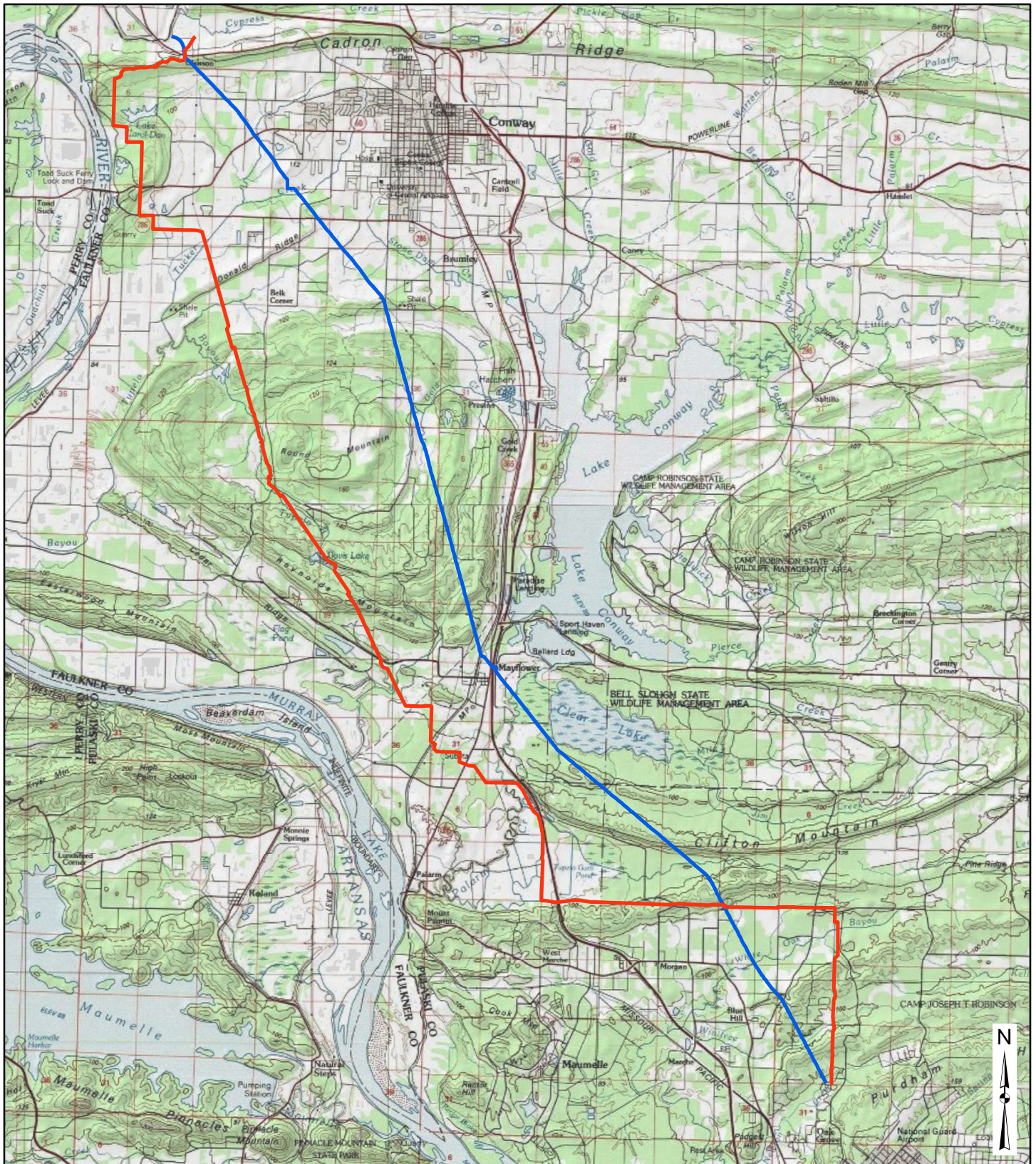
TABLE 10.6-1 COMPARISON OF MAJOR ROUTE ALTERNATIVES			
Evaluation Criteria ^a	Unit	Line B Alternative Route	Proposed Line BT-39 Route ^b
Construction			
Route Length	miles	21.8	28.5
Construction ROW Land Disturbance ^c	acres	198.2	259.1
Permanent ROW Land Disturbance ^c	acres	105.7	138.2
Length Adjacent or Parallel to Existing Easements or other maintained corridors	miles	21.8	17.5
	percent	100	62
Land Use			
Federal Lands	miles	2.9	4.8
Developed Lands Crossed	miles	5.4	0.8
Forest Land Crossed	miles	6.8	16.4
Agricultural Land Crossed	miles	0.2	2.5
Open Lands Crossed	miles	6.5	4.0
Residences within 100 feet of Centerline	Number	228	8
Wetlands and Waterbodies			
Total Wetlands Crossed	miles	1.3	0.2
Forested Wetlands Crossed	miles	1.3	0.1
Open Water Crossed	miles	0.01	0.2
Wetland Reserve Program Land	feet	1,727	0
Total Waterbodies Crossed	number	16 ^d	15 ^d
^a Calculated from USGS topographic maps, national wetland inventory maps, and interpretation of aerial photography. ^b Numbers shown may not agree with numbers presented in other Resource Reports. To facilitate an accurate comparison of all routes considered, publicly available data were used to prepare this comparison table and certain design features of the Proposed route (e.g., impacts avoided by the use of horizontal direction drilling, aboveground facilities, extra temporary workspaces, etc.) were not included. Data provided in other Resource Reports are based on field surveys and the actual proposed Project footprint. ^c Acreages for the Alternative and Proposed Routes were calculated using a nominal 75-foot construction right-of-way width and a 40-foot permanent right-of-way width. ^d Total number of crossings. Some waterbodies may have been crossed twice.			



<p>Drawn On: April 24, 2013</p>	<p>CEGT Existing Pipelines Central Arkansas Pipeline Enhancement Project Faulkner and Pulaski Counties, Arkansas</p>	<p>Figure 10.5-1</p>
<p>0 2.5 5 10 Miles</p>		
<p>Prepared For:</p>	<p>CenterPoint Energy</p>	<p>AK AK Environmental, LLC 5020 Ritter Road Suite 206 Mechanicsburg, PA 17055</p>

Legend

- Line B
- Line BT-14
- Line BT-19
- Line BM-1
- Line BM-21



Drawn On:
April 23, 2013

Major Route Alternatives
Central Arkansas
Pipeline Enhancement Project
Faulkner and Pulaski Counties, Arkansas

0 1.25 2.5 5 Miles

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Figure 10.6-1

Legend

- Proposed Line BT-39
- Existing Line B

Route Description

The Line B Route Alternative would follow the existing Line B right-of-way from beginning to end, as it passes through the cities and suburbs of Conway and Mayflower. The Line B Route Alternative would involve constructing 21.8 miles of new 12-inch-diameter natural gas pipeline, beginning and ending at the same locations as the proposed route for the BT-39 pipeline (Figure 10.6-1).

Construction Analysis

The Line B Route Alternative would be approximately 6.7 miles shorter than the proposed route (Table 10.6-1) and thus would result in corresponding reductions in anticipated construction and operational right-of-way land requirements. The Line B Route Alternative would be entirely co-located with the existing Line B right-of-way, while the proposed Line BT-39 route is co-located with existing linear corridors for 62 percent of its length. However, the proposed Line BT-39 route avoids the heavy congestion and associated constructability issues encountered along the existing Line B route. Issues that would accompany construction of a new pipeline along the Line B Route Alternative include right-of-way reductions in congested areas that would present extreme challenges to construction feasibility, cost, and schedule; and temporary closures of parking lots and roads, disrupting businesses and traffic in a large portion of the Project area. Additionally, the existing Line B pipeline must remain in service until the replacement pipeline is constructed and becomes operational. It would be challenging to construct a replacement pipeline in close proximity to the existing, active pipeline, particularly given the congested construction corridor and confined working space that would be realized along many portions of the route where development has encroached on the existing Line B pipeline right-of-way.

Environmental Analysis

The proposed Line BT-39 route would result in greater impacts on forested and agricultural lands, but would cross less developed lands and would result in less disturbance of NWI-mapped wetlands. Additionally, the Line B Route Alternative crosses a significant Wetland Reserve Program (“WRP”) easement. The Natural Resources Conservation Service (“NRCS”) administers the WRP, which is a voluntary program that offers landowners the opportunity to protect, restore, and enhance wetlands on their property. The private landowner retains title to the lands in the WRP, but the NRCS controls a protective easement over the properties. The program attempts to improve wetland function and wildlife habitat, and to promote long-term conservation through technical and financial assistance. In order for a utility to encroach on an existing WRP easement, the NRCS must issue a subordination agreement to the utility. The NRCS prefers avoidance of these lands and requires a rigorous analysis of alternatives demonstrating that avoidance is not practical before issuing a subordination agreement. The proposed BT-39 route would entirely avoid the WRP parcel easement that would be crossed by the Line B Route Alternative.

The greatest difference between the proposed and Line B Alternative routes is the impact on residential areas, which is evidenced by the number of houses within 100 feet of the centerlines of the two routes. Much of the land surrounding the Line B Alternative route has been developed in recent years, resulting in 220 more residences than would be encountered along the proposed Line BT-39 route, even though it is a longer route.

Conclusion

The Line B Route Alternative is shorter than the proposed route, would disturb less total land than the proposed route, and follows the conventional guidance of co-location with existing rights-of-way. However, the heavy development that has occurred along the existing Line B right-of-way severely limits the constructability and feasibility of that route. Construction of the Line B Route Alternative would pose significant impacts on residential and commercial areas and would not resolve encroachment concerns along the existing pipeline right-of-way. Therefore the Line B Route Alternative was not considered a viable alternative to the proposed Line BT-39 route.

10.7 ROUTE VARIATIONS

Once CEGT determined that the proposed route is preferable to the major route alternative discussed in Section 10.6, CEGT then evaluated and adopted several minor route variations to address localized constructability and environmental issues identified through field surveys and landowner consultations. Figure 10.7-1 provides a depiction of the route variations adopted. Comparisons of the environmental impacts and rationale for adopting each of the route variations are presented in Table 10.7-1. Each route variation is discussed in greater detail below.

10.7.1 Route Variation RV-1 (MPs 0.45 – 2.14)

During project planning, CEGT learned of landowner plans for development of the land south of Arkansas Route 319 and Cadron Ridge near the beginning of the proposed route for Line BT-39. CEGT subsequently developed route variation RV-1 to minimize impact on existing and planned development in that area and to increase pipeline separation from the site of an existing, City of Conway water tower, where a second water tower may be constructed in the future. RV-1 departs the original BT-39 route at MP 0.45 to more closely follow the Arkansas Route 319 roadway, rather than traversing cross country, along the crest of Cadron Ridge. RV-1 proceeds west near the south side of the roadway for a little over a mile, then turns south along property lines, rejoining the original route south of Cadron Settlement Lane. Relative to the originally proposed route, RV-1 minimizes cross-country construction, avoids conflict with planned land development, locates the pipeline away from existing and planned water towers, and is also responsive to landowner requests in the area. For these reasons, RV-1 was adopted as the proposed route in this area.

10.7.2 Route Variation RV-2 (MPs 10.14 – 10.42)

CEGT evaluated and adopted RV-2 to avoid a sensitive cultural resource site identified along the original Line BT-39 route. Additional information is provided in the Phase I Cultural Resources Survey Report for the Proposed Central Arkansas Pipeline Enhancement Project in Faulkner and Pulaski Counties, Arkansas, which will be filed as an attachment to Resource Report 4, Cultural Resources.

10.7.3 Route Variation RV-3 (MPs 10.83 – 10.88)

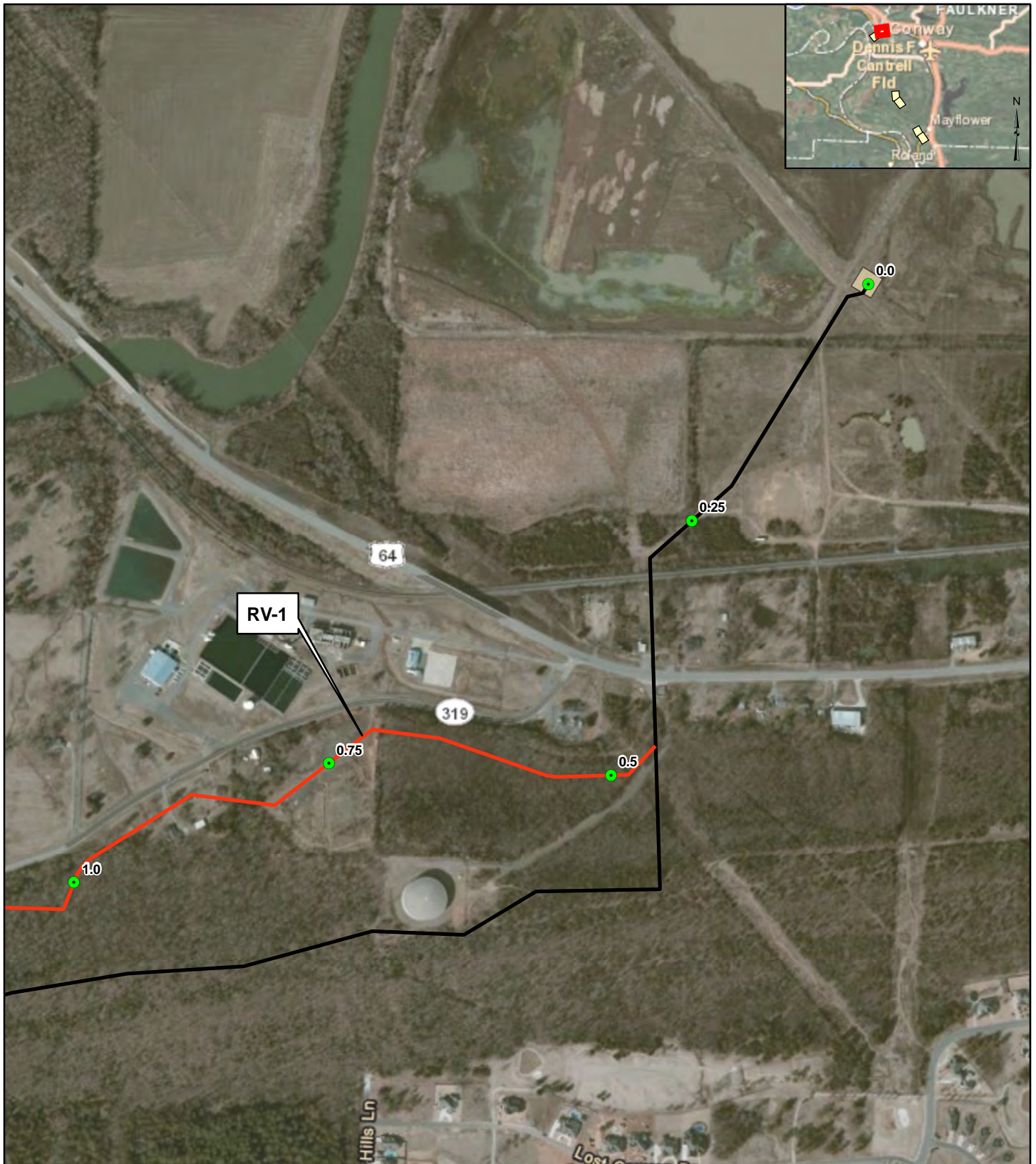
CEGT evaluated and adopted RV-3 to avoid impacting a known, sensitive cultural resource site identified along the original Line BT-39 route. Additional information is provided in the Phase I Cultural Resources Survey Report for the Proposed Central Arkansas Pipeline Enhancement Project in Faulkner and Pulaski Counties, Arkansas, which will be filed as an attachment to Resource Report 4, Cultural Resources.

10.7.4 Route Variation RV-4 (MPs 14.97 – 15.10)

The original BT-39 route in the vicinity of MP 15 deviated slightly east of a straight line to improve the angle of a crossing of Luker Lane. This slight deviation was removed from the route by adoption of RV-4 to straighten the route, allowing for horizontal directional drill construction in this area (see section 10.8 below).

10.7.5 Route Variation RV-5 (MPs 15.18 – 16.41)

RV-5 departs the original route at MP 15.18 and heads due east for about 0.4 mile, then turns due south for about 0.6 mile, before crossing Center Street and a railroad, then rejoining the original route. RV-5 was evaluated and adopted to avoid impacting a sensitive cultural resources site located along the original Line BT-39 route. Additional information is provided in the Phase I Cultural Resources Survey Report for the Proposed Central Arkansas Pipeline Enhancement Project in Faulkner and Pulaski Counties, Arkansas, which will be filed as an attachment to Resource Report 4, Cultural Resources.



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April 23, 2013



Prepared
For:



Project Variations Line B Replacement - Conway to Little Rock

Faulkner and Pulaski Counties, Arkansas

0 300 600 1,200 Feet
1 inch = 600 feet

Figure 10.7-1

Page 1 of 6



Legend

- Line BT-39 Mile Post
- Route BT-39 Variations
- Line BT-39 Original Route
- Line BT-39 Proposed Sites



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<p>Drawn On: April 23, 2013</p>	<p>Project Variations Line B Replacement - Conway to Little Rock Faulkner and Pulaski Counties, Arkansas</p> <p>0 300 600 1,200 Feet</p> <p>1 inch = 600 feet</p>		<p>Figure 10.7-1 Page 2 of 6</p>	<p>Legend</p> <ul style="list-style-type: none"> ● Line BT-39 Mile Post — Route BT-39 Variations — Line BT-39 Original Route — Line BT-39 Proposed Sites
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Project Variations Line B Replacement - Conway to Little Rock

Faulkner and Pulaski Counties, Arkansas

0 300 600 1,200 Feet
1 inch = 600 feet

Figure 10.7-1

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Legend

- Line BT-39 Mile Post
- Route BT-39 Variations
- Line BT-39 Original Route
- Line BT-39 Proposed Sites



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Project Variations Line B Replacement - Conway to Little Rock

Faulkner and Pulaski Counties, Arkansas

0 300 600 1,200 Feet
1 inch = 600 feet

Figure 10.7-1

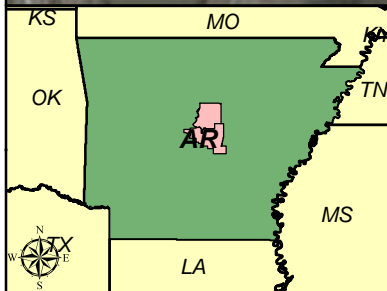
Page 4 of 6

Legend

- Line BT-39 Mile Post
- Route BT-39 Variations
- Line BT-39 Original Route
- Line BT-39 Proposed Sites



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Project Variations Line B Replacement - Conway to Little Rock

Faulkner and Pulaski Counties, Arkansas

0 300 600 1,200 Feet
1 inch = 600 feet

Figure 10.7-1

Page 5 of 6

Legend

- Line BT-39 Mile Post
- Route BT-39 Variations
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0 300 600 1,200 Feet
1 inch = 600 feet

Figure 10.7-1

Page 6 of 6

Legend

- Line BT-39 Mile Post
- Route BT-39 Variations
- Line BT-39 Original Route
- Line BT-39 Proposed Sites



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TABLE 10.7-1

COMPARATIVE ANALYSIS OF ADOPTED ROUTE VARIATIONS

Route Variation/Comparison Factor	Original Route	Route Variation	Comments
RV-1 (MPs 0.45 to 2.14)			
Route Length (feet)	9,301	8,893	Adopted this route variation to locate new pipeline closer to existing roadway, avoid water tower, and avoid area of reported planned development.
Construction Land Requirements (acres)	16.0	15.3	
Operational Land Requirements (acres)	8.5	8.2	
Public Lands Crossed (feet)	1,475	1,313	
Land Uses Crossed (feet)			
- Upland Forest	7,979	7,605	
- Agricultural	0	0	
- Open	1,322	0	
- Maintained Residential		688	
- Industrial/Commercial		600	
Perennial Waterbody Crossings (no.)	0	0	
Wetland Crossings (feet)			
- Forested	0	0	
- Non-forested	0	0	
Residences within 100 feet of Centerline (no.)	0	1	
RV-2 (MPs 10.14 to 10.42)			
Route Length (feet)	1,494	1,487	Adopted this route variation to avoid disturbance of a cultural resources site.
Construction Land Requirements (acres)	2.6	2.6	
Operational Land Requirements (acres)	1.4	1.4	
Public Lands Crossed (feet)	0	0	
Land Uses Crossed (feet)			
- Upland Forest	1,316	1,262	
- Agricultural	0	0	
- Open	0	175	
- Maintained Residential	0	0	
- Industrial/Commercial	178	50	
Perennial Waterbody Crossings (no.)	1	1	
Wetland Crossings (feet)			
- Forested	0	0	
- Non-forested	0	0	
Residences within 100 feet of Centerline (no.)	0	0	

TABLE 10.7-1

COMPARATIVE ANALYSIS OF ADOPTED ROUTE VARIATIONS

Route Variation/Comparison Factor	Original Route	Route Variation	Comments
RV-3 (MPs 10.83 to 10.88)			Adopted this route variation to avoid crossing a known historic road.
Route Length (feet)	268	268	
Construction Land Requirements (acres)	0.5	0.5	
Operational Land Requirements (acres)	0.3	0.3	
Public Lands Crossed (feet)	0	0	
Land Uses Crossed (feet)			
- Upland Forest	70	121	
- Agricultural	0	0	
- Open	198	147	
- Maintained Residential	0	0	
Perennial Waterbody Crossings (no.)	0	0	
Wetland Crossings (feet)			
- Forested	0	0	
- Non-forested	0	0	
Residences within 100 feet of Centerline (no.)	0	0	
RV-4 (MPs 14.97 to 15.10)			Adopted this route variation to straighten centerline to construct segment by horizontal directional drill.
Route Length (feet)	786	732	
Construction Land Requirements (acres)	1.4	0.9	
Operational Land Requirements (acres)	0.7	0.5	
Public Lands Crossed (feet)	0	0	
Land Uses Crossed (feet)			
- Upland Forest	282	260	
- Agricultural	0	0	
- Open	431	399	
- Maintained Residential	0	0	
- Industrial/Commercial	73	73	
Perennial Waterbody Crossings (no.)	1	1	
Wetland Crossings (feet)			
- Forested	334	170	
- Non-forested	106	91	
Residences within 100 feet of Centerline (no.)	0	0	

TABLE 10.7-1

COMPARATIVE ANALYSIS OF ADOPTED ROUTE VARIATIONS

Route Variation/Comparison Factor	Original Route	Route Variation	Comments
RV-5 (MPs 15.18 to 16.41)			Adopted this route variation to avoid a sensitive environmental resource.
Route Length (feet)	4,701	6,483	
Construction Land Requirements (acres)	8.1	11.2	
Operational Land Requirements (acres)	4.3	6.0	
Public Lands Crossed (feet)	0	0	
Land Uses Crossed (feet)			
- Upland Forest	3,247	5,876	
- Agricultural	0	0	
- Open	1,364	519	
- Maintained Residential	0	0	
- Industrial/Commercial	90	88	
Perennial Waterbody Crossings (no.)	0	0	
Wetland Crossings (feet)			
- Forested	698	503	
- Non-forested	0	0	
Residences within 100 feet of Centerline (no.)	1	0	

10.8 ALTERNATIVE CONSTRUCTION METHODS

During development of the route, CEGT evaluated and adopted eight horizontal directional drills (“HDD”s) to enhance constructability and avoid impact on sensitive resources or important infrastructure. Table 10.8-1 presents the proposed HDDs and the resources avoided by each.

TABLE 10.8-1

**CENTRAL ARKANSAS PIPELINE ENHANCEMENT PROJECT
RESOURCES AVOIDED BY HDD**

Drill Location	Milepost		Resources Avoided
	Entry	Exit	
Hwy 64 and Railroad	0.29	0.38	Hwy 64, railroad, wetlands W103FA and W104FA
Tucker Creek	6.13	6.57	Streams S73FA (Tucker Creek), S72FS, wetland W70FA
Luker Lane and Creek	14.97	15.16	Luker Lane, wetland W53FA
Center Street and Railroad	16.23	16.32	Center Street, railroad, wetland W402FA, stream S401FA
Tributary to Palarm Creek	17.31	17.60	Stream S58FS (trib to Palarm Creek, most of wetland W61FA)
Palarm Creek	17.82	18.10	Stream 61PU (Palarm Creek), two cultural resources sites
Borrow Pit	18.47	18.73	Wetland W90PU (borrow pit), stream S63PU
Interstate 40	20.56	20.87	I-40, streams S45PU, S46PU, wetlands W45PU, W46PU

10.9 ABOVEGROUND FACILITIES

The Project includes installation of seven new or modified aboveground facilities, as listed below.

- Highway 64 Town Border Station (“TBS”), located at the origin of Line BT-39;
- Bryant Road TBS, located at the intersection of Line BT-39 with viable natural gas delivery/interconnect points with distribution infrastructure;
- Highway 365 TBS, located at the intersection of Line BT-39 with viable natural gas delivery/interconnect points with distribution infrastructure;
- Morgan TBS, existing facility located at the terminus of Line BT-41;
- James Road TBS, located at the terminus of Line BT-40;
- Oak Grove TBS, existing facility located at the terminus of Line BT-39; and
- Shoemaker Road TBS, located at the terminus of the section of Line BT-14 to be transferred to CERC.

The Morgan, Oak Grove, and Shoemaker Road TBSs represent modifications/expansions of existing facility sites, thus alternative sites were not considered. Because the locations of the other, new aboveground facilities are linked to the location of the proposed new pipelines and viable natural gas delivery/interconnect points, the search for alternatives was constrained to sites located adjacent to the intersection of the replacement pipeline facility and existing natural gas distribution infrastructure. Within these areas, CEGT identified no suitable alternative meter station site locations. Furthermore, because no appreciable environmental impacts will be associated with the selected sites (existing and new) for the proposed aboveground facilities, no alternative sites need be evaluated.

10.10 REFERENCES

Arkansas Energy Office. 2010. State Energy Program. <http://arkansasenergy.org/energy-in-arkansas/energy-policy-and-legislation/recovery-2009/state-energy-program.aspx>. Site accessed April 2013.

Energy Information Administration (EIA). 2013. Annual Energy Outlook 2013 Early Release Overview. Energy Information Administration. Release Date January 2013. [http://www.eia.gov/forecasts/aeo/er/pdf/0383er\(2013\).pdf](http://www.eia.gov/forecasts/aeo/er/pdf/0383er(2013).pdf). Site accessed April 2013.

Energy Information Administration (EIA). 2012a. Renewable Energy Annual 2009. Energy Information Administration. Release Date January 2012. http://www.eia.gov/renewable/annual/pdf/rea_report.pdf. Site accessed April 2013.

Energy Information Administration (EIA). 2012b. Annual Energy Outlook 2012. Energy Information Administration. Release Date June 2012. [http://www.eia.gov/forecasts/aeo/pdf/0383\(2012\).pdf](http://www.eia.gov/forecasts/aeo/pdf/0383(2012).pdf). Site accessed April 2013.

Environmental Protection Agency (EPA). 2012. Air Emissions. <http://www.epa.gov/cleanenergy/energy-and-you/affect/air-emissions.html>. Site accessed April 2013.