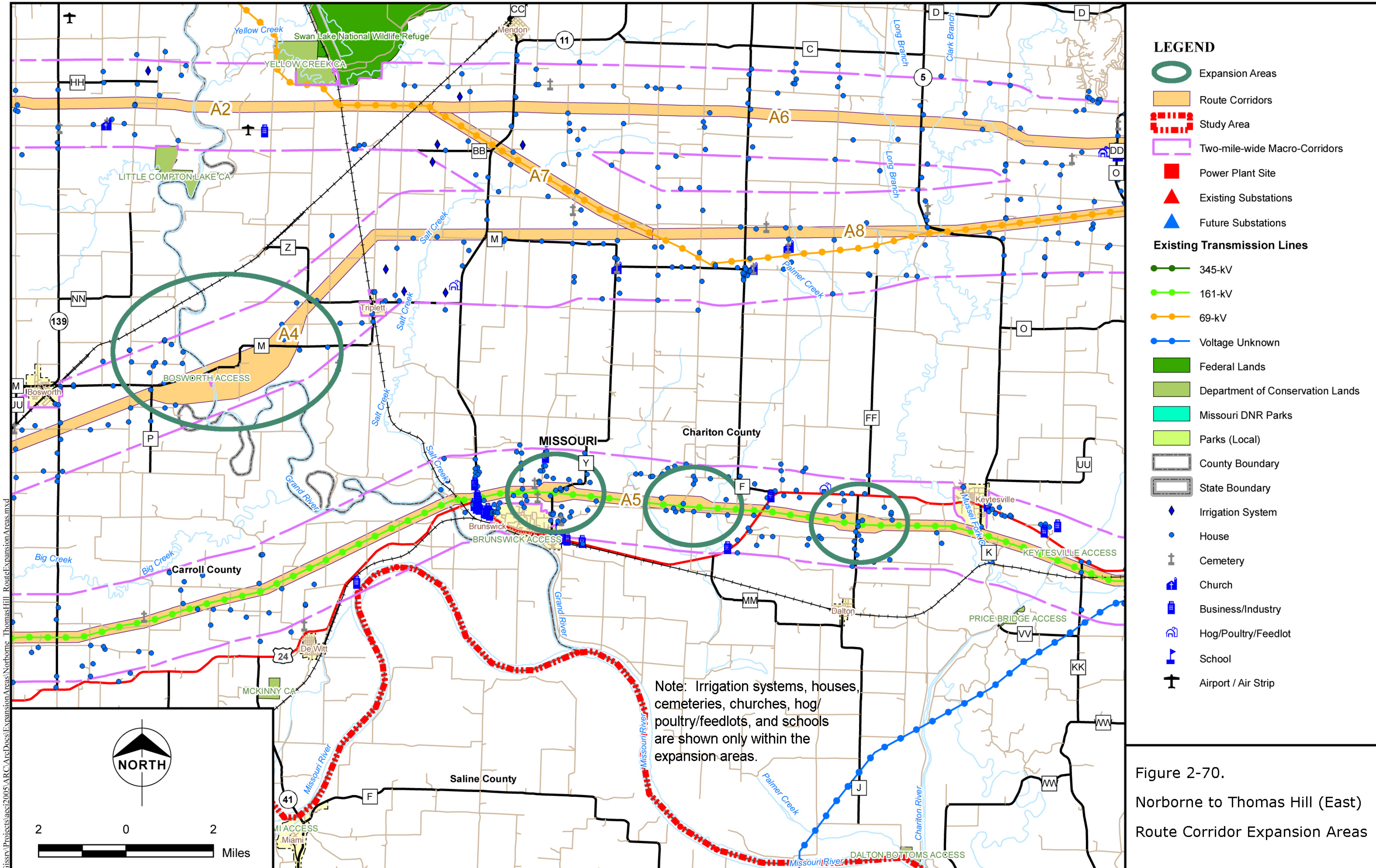

Figure 2-70.
Norborne to Thomas Hill (East)
Route Corridor Expansion Areas

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Disclaimer: Existing transmission lines are shown to the extent they could be verified within the project study areas using aerial photography, topographic maps, and NW and Central Cooperative's system planning maps. They are not necessarily complete or represent all existing transmission lines in the area.

Source: AECI, 2005e

Segments A1 and A3 were expanded to approximately 1.5 miles in width near the Norborne site to provide some flexibility in identifying a route that would avoid homes in the vicinity (Figure 2-69). A compounding factor in this area is rough terrain. A route utilizing this expanded area could minimize visibility and impacts to residences, but may also be slightly more expensive than a more direct route within the original quarter-mile route-corridor because of added angles and length of the route. Along Segment A3, the route-corridor was expanded southeast of the intersection of Missouri Routes E and OO to allow for route alignments that would best minimize impacts to residences along Missouri Route EE (Figure 2-69). On Segment A4, the route-corridor was expanded from just west of Missouri Route EE to U.S. Highway 65 (Figure 2-69). This expansion was added to assist in minimizing impacts to residences and a feedlot located within the route corridor. Segment A4 was also expanded just east of U.S. Highway 65 along Missouri Route UU (Figure 2-69). A number of residences occur along Missouri Route UU and because the road turns repeatedly within the quarter-mile route-corridor, the expansion provides options to avoid the residences and possible repeated crossings of Missouri Route UU.

Segment A4 was also expanded at the crossing of the Grand River near Missouri Route M to allow for the development of routes that minimize impacts to wetlands and optimize access for construction of the line across the river (Figure 2-70). Segment A5 has three expansion areas between the towns of Brunswick and Keytesville to allow for potential reductions in impacts to residences (Figure 2-70) (AECI, 2005e).

Identification of Proposed Route

The evaluation criteria data are summarized in the Table 2-21 below.

Table 2-21. Route Corridor Data: Norborne to Thomas Hill

Route Corridor	Segments	Total Length (miles)	Residences Within 200 ft	Businesses Within 200 ft	Public Facilities Within 200 ft	Crop-land Crossed (acres)	Wood-land Crossed (acres)	Wet-lands Crossed (acres)	Length Parallel To Existing Transmission Lines (Miles)	Perennial Waterways Crossed (number)
NT1	A1-A2-A6	69.8	1	0	0	5491	1327	334	15.5	15
NT2	A1-A2-A7-A8	70.6	1	0	0	5517	1206	317	28.4	19
NT3	A1-A3-A4-A8	61.9	2	0	0	5010	694	290	7.7	18
NT4	A1-A8-A5	67.2	2	1	0	5761	803	247	54.2	14

Seven combinations were evaluated from Norborne to Thomas Hill (NT), with NT3 the shortest and NT2 the longest. NT3 had the lowest acreages of cropland and woodland crossed, and the second lowest acreage of wetland crossed. Residences and businesses near the centerline were low for all alternatives, and none had public facilities within 200 feet of the centerline. The resulting weighted scores for Norborne to Thomas Hill are as follows:

- NT1—57
- NT2—58
- NT3—40
- NT4—57

Based on this evaluation, Route Corridor NT3 was identified as the proposed route corridor for this section for the Norborne site. Other route corridors are eliminated from further evaluation.

Norborne to Sedalia/Mt. Hulda Transmission Line

Study Area

The study area AECI identified for locating the Norborne to Sedalia/Mt. Hulda transmission lines is shown in Figure 2-71. Just south of the Norborne Site, a Missouri River crossing would be required. The south part of the study area borders on the Truman Reservoir/Lake of the Ozarks area.

Larger public lands within this study area include:

- Lafayette County: a portion of the Big Muddy NWR and nearby Baltimore Bend CA, both located on the south side of the Missouri River; Maple Leaf CA, and the Confederate Memorial State Historic Site in Higginsville.

- Saline County: Grand Pass CA, adjacent to the Missouri River, and nearby Van Meter State Park; Blind Pony Lake CA; Blue Lick CA; and Marshall Junction CA. The 114-acre Van Meter Forest NA is located within Van Meter State Park (MDC, 1996). Also within Van Meter State Park is the 80-acre Van Meter Marsh, one of only three marshes in Missouri designated as Outstanding State Resource Waters.

- Johnson County: Perry Memorial CA, Kearn Memorial Wildlife Area, Whiteman Air Force Base (AFB), and Knob Noster State Park.

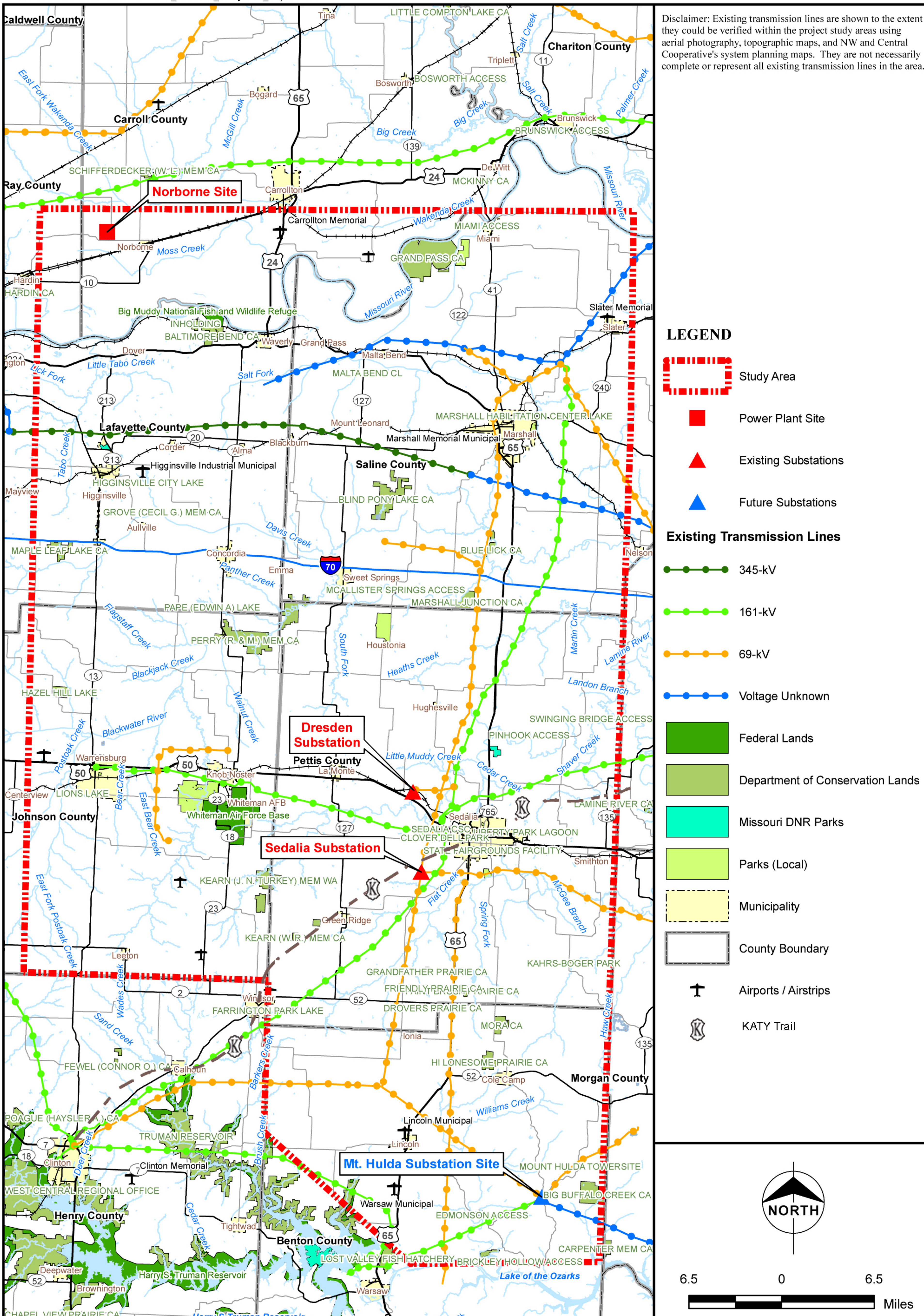

Figure 2-71.

Norborne to Sedalia/Mt Hulda Study Area

Sources: AECI, 2005a; MoDOT, 2006

- Pettis County: Bothwell Lodge State Historic Site, located on the north side of US 65 north of Sedalia, Perry Memorial CA and Paint Brush Prairie CA. A 74-acre portion of the Paint Brush Prairie CA has been designated as the Paint Brush Prairie NA (MDC, 1996).

- Benton County: Mora CA, Hi Lonesome Prairie CA, Big Buffalo Creek CA, and a small portion of Truman Reservoir property. A 40-acre portion of the Big Buffalo Creek CA has been designated as the Big Buffalo Creek Fen NA (MDC, 1996). Also, 1.5 miles of Big Buffalo Creek within the CA has been designated as an Outstanding State Resource Water.

The KATY Trail State Park, a 220-mile long rails-to-trail conversion that begins in Clinton, Missouri and ends in St. Charles on the Missouri River near St. Louis, crosses the southern part of the study area diagonally.

From Clinton at the southwest of the study area, it travels northeast through Sedalia and out of the study area (Figure 2-71). There are also a number of smaller parks, CAs, and MDC river access areas within the study area.

Land use in the study area consists of large areas of timber and open grassland with scattered cities and towns. The northern and central portions of the study area are generally flat to rolling with large areas of open grassland. The southern portion, near the Mt. Hulda Substation, is dominated by woodlands. Residential and commercial development is generally sparse throughout the less-developed parts of the study area and more concentrated within and near incorporated communities (AECI, 2005a)

Towns in the study area with 2000 census population over 1,000 are summarized in Table 2-22 (AECI 2005a).

Table 2-22. Towns in Study Area

Town	2000 Population
>20,000	
Sedalia	20,339
10,000 to 20,000	
Warrensburg	16,340
Marshall	12,433
1,000 to 5,000	
Higginsville	4,682
Whiteman AFB	3,814
Windsor	3,087

Table 2-22. Towns in Study Area

Town	2000 Population
	(97 in Pettis County)
Knob Noster	2,462
Concordia	2,360
Slater	2,083
Sweet Springs	1,628
Cole Camp	1,028
Lincoln	1,026

As shown in Figure 2-71, there are a number of highways, small private airports, and transmission lines within the study area.

Almost all of the land in the study area is considered prime farmland, prime farmland if drained or not flooded, or farmland of statewide importance (AECI, 2005a).

Wetlands are found scattered over the entire Norborne to Mt. Hulda study area. Wetlands in the study area include numerous small isolated wetlands associated with farm ponds and larger communities associated with rivers, streams and lakes. (AECI, 2005a).

Macro Corridors

Corridor lengths for this segment ranged from about 76 to 90 miles (Figure 2-72.

Between Norborne and Sedalia, the middle route deviates from a straight line only to avoid public lands and communities, and is the most direct. It does not use any existing transmission line corridors. The western route heads generally south, moving around public lands and communities, then turns east to pass Knob Noster State Park and Whiteman AFB on the north. From the east side of Whiteman, it follows an existing transmission line most of the way to the Sedalia Substation. The eastern corridor trends southeast from Norborne, passing east of the Big Muddy NWR and between Blind Pony Lake CA and the city of Marshall, to connect with a north-south transmission corridor which it then follows to the Sedalia Substation. An east-west connector corridor near the north part of the study area allows for combinations of segments, using an existing east-west transmission corridor.

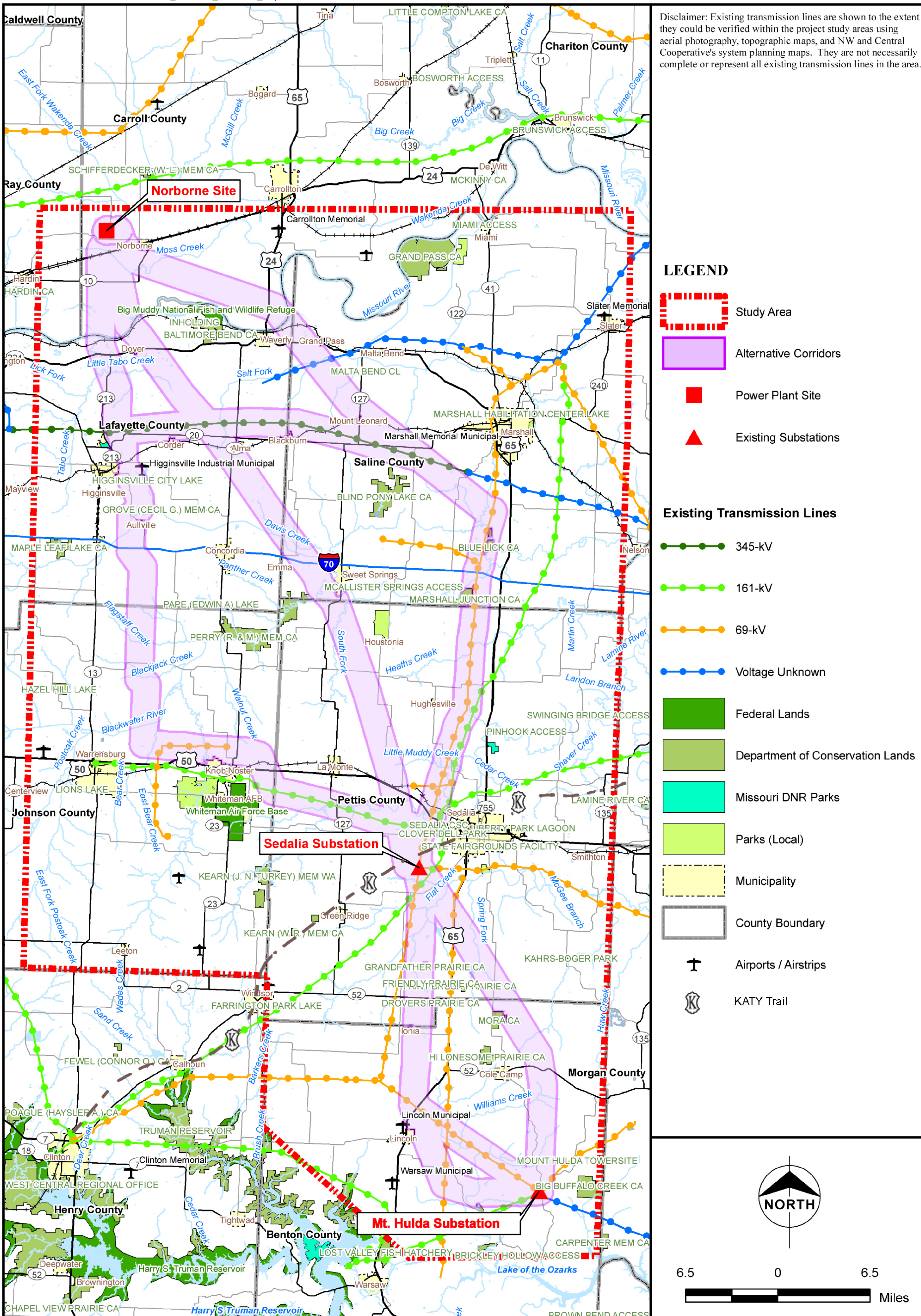

Figure 2-72.

Norborne to Sedalia/Mt Hulda Alternative Macro Corridors

Sources: AECI, 2005a; MoDOT, 2006

There is a cluster of several small CAs between the Sedalia and the Mt. Hulda Substations: one corridor goes to the east of these CAs and one to the west. The western corridor has a sub-alternative that allows the use of an existing transmission corridor.

A cultural resources study done in 2006 found an NRHP property located within the eastern macro corridor, the General David Thomson House, located south of Hughesville. No other sites on or eligible for the National Register were identified in any of the macro corridors. There are several archaeological sites scattered throughout the macro corridors for which eligibility has not been determined. There were no recorded sites for the Sedalia to Mt. Hulda macro corridors (AECI, 2006l).

Route Corridors

Route corridors are shown in Figure 2-73 and expansion areas are shown in Figures 2-74 (north) and 2-75 (south). The expansion area around the Norborne Plant is to incorporate the plant property, to allow more flexibility in routing in this area. Segment B1 was also expanded just north of US Highway 24 and south of the Missouri River to provide some flexibility in developing routes around or within an orchard, while also minimizing residential impacts (Figure 2-74).

There are four expansions in the Sedalia vicinity (Figure 2-75). Segment B6 near Knob Noster was expanded in an area of relatively high housing density, to allow flexibility for potential reductions in impacts on residences. Segment B8 was expanded at Missouri Route D to provide routing options for avoiding a substation and related equipment, a cemetery, center-pivot irrigation systems, and residences in the vicinity. Around the Sedalia Substation area, Segments B10, B12, and B13 were expanded west approximately 1.5 miles for several reasons. First, because the area around the substation is rapidly developing, a wider corridor allows for development that may occur before the line is approved and ready for construction. Should the new substation be located adjacent to the existing Sedalia Substation, the wider corridor increases routing option for reaching the substation that would also avoid a residential growth area. Second, a substation at Dresden was identified as an alternative to Sedalia, and expansions were made to allow for this option.

Disclaimer: Existing transmission lines are shown to the extent they could be verified within the project study areas using aerial photography, topographic maps, and NW and Central Cooperative's system planning maps. They are not necessarily complete or represent all existing transmission lines in the area.

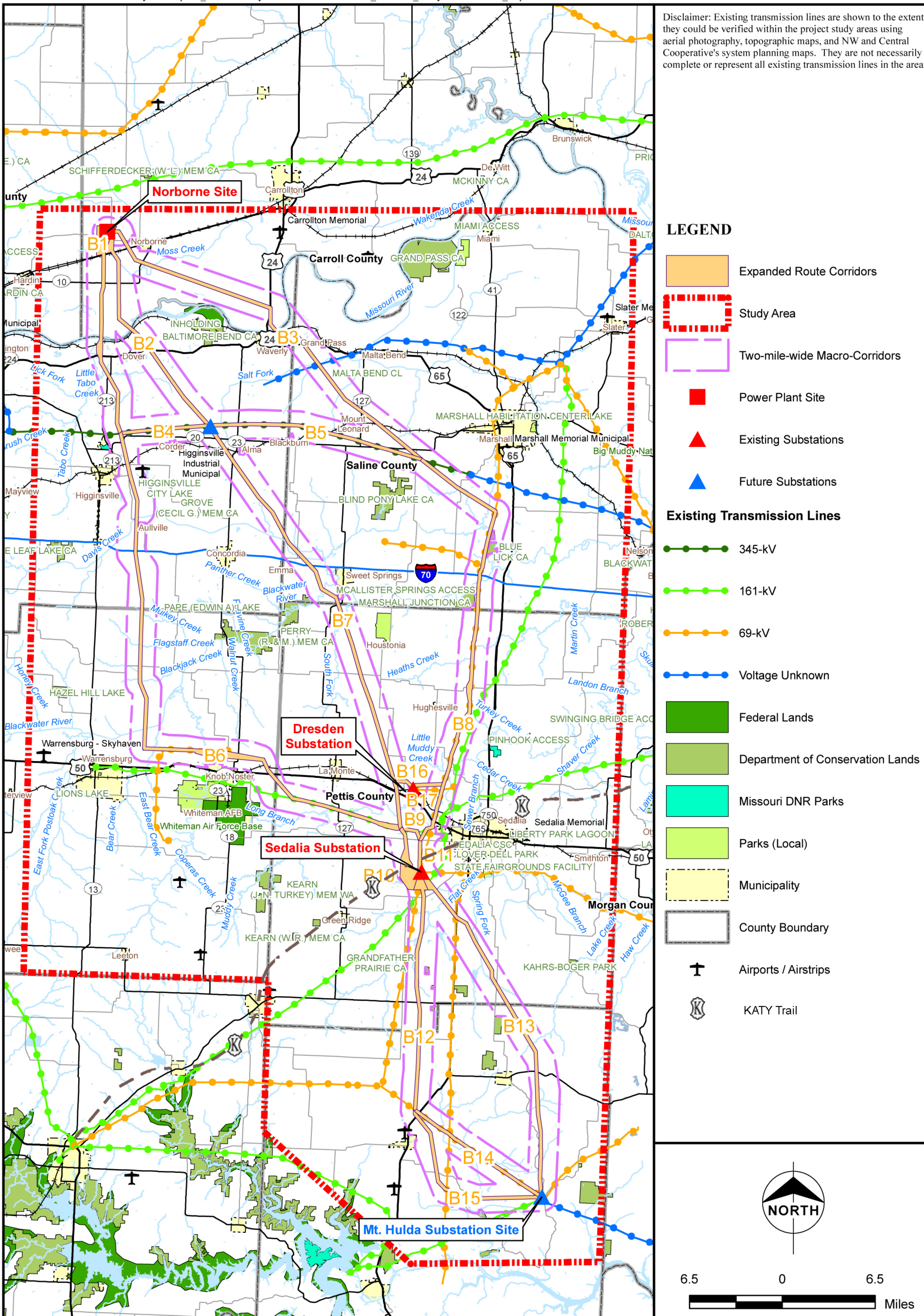

Figure 2-73.

Norborne to Sedalia/Mt Hulda

Alternative Route Corridors

Sources: AECI, 2005a; MoDOT, 2006

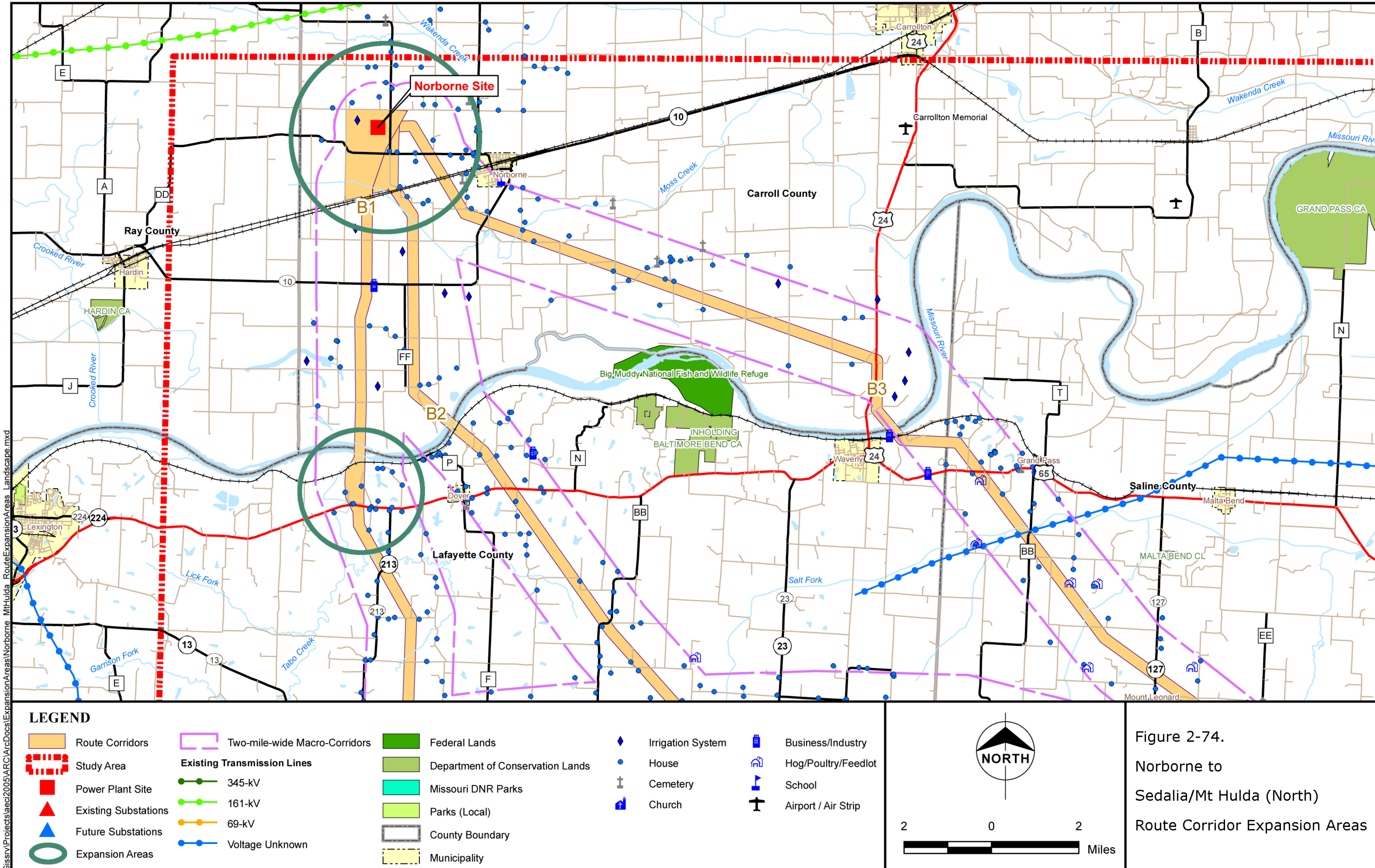

Figure 2-74.
Norborne to
Sedalia/Mt Hulda (North)
Route Corridor Expansion Areas

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Disclaimer: Existing transmission lines are shown to the extent they could be verified within the project study areas using aerial photography, topographic maps, and NW and Central Cooperative's system planning maps. They are not necessarily complete or represent all existing transmission lines in the area.

Source: AECI, 2005e

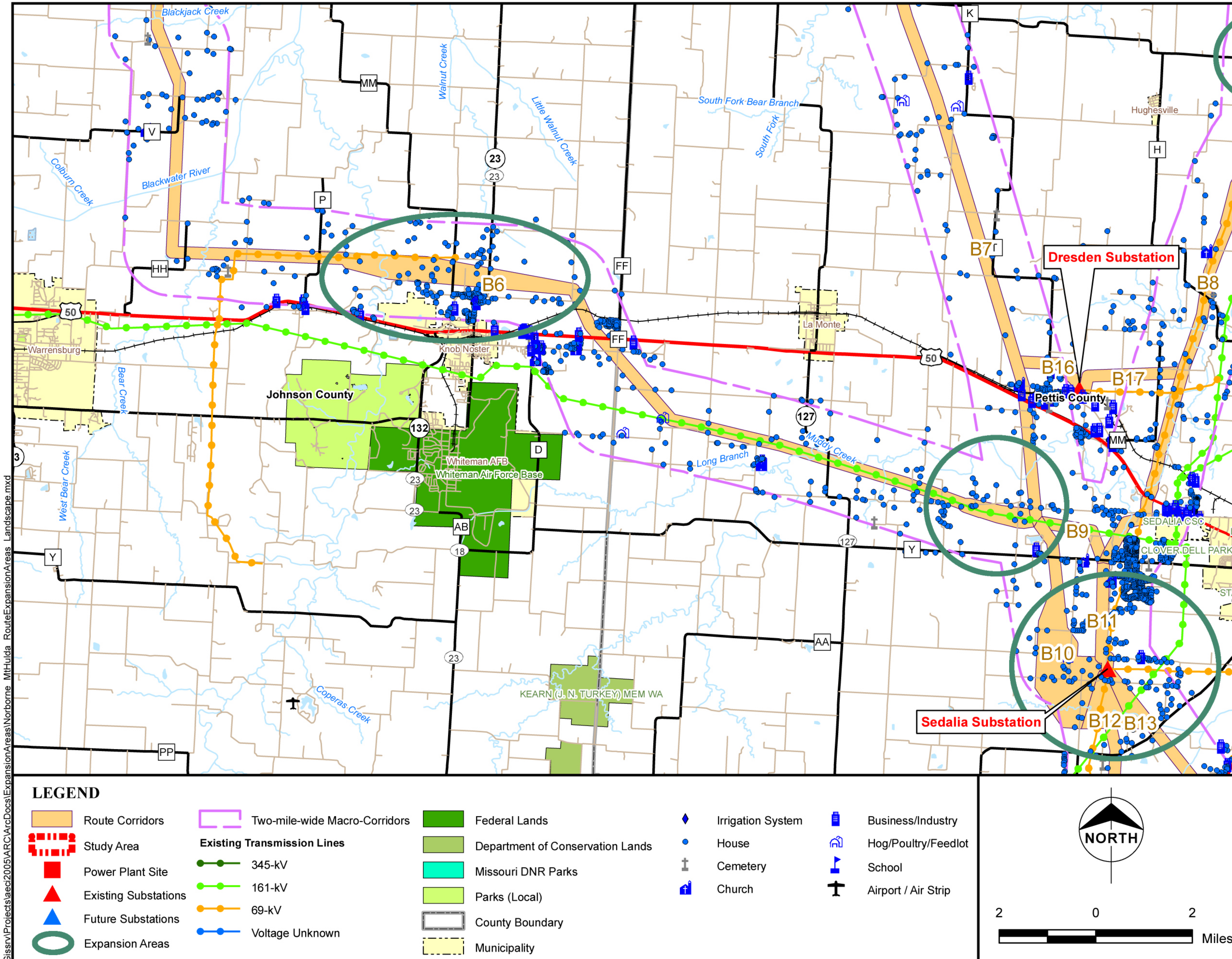


Figure 2-75.
Norborne to
Sedalia/Mt Hulda (South)
Route Corridor Expansion Areas

Disclaimer: Existing transmission lines are shown to the extent they could be verified within the project study areas using aerial photography, topographic maps, and NW and Central Cooperative's system planning maps. They are not necessarily complete or represent all existing transmission lines in the area.

Source: AECI, 2005e

Should the new substation be constructed at the Dresden site, the transmission line would no longer need to connect to the Sedalia Substation, but would need to continue south to Mt. Hulda. To make use of the existing route-segments B12 and B13, the expanded corridors allow routes to be identified connecting to these segments that maximize the distance from the rapidly developing area around the Sedalia Substation and east. The area around the existing Mt. Hulda Substation was expanded slightly south of the quarter-mile corridors to allow for the identification of a new site for the proposed substation near the existing substation.

Identification of AECI Proposed Route

The evaluation criteria data are summarized in the Table 2-23 below. Note that the option of bringing the line through the Sedalia or Dresden substation was still undergoing engineering evaluation at the time of this study. Therefore, both alternatives were evaluated though only one would be built.

Table 2-23. Route Corridor Data: Norborne to Sedalia / Mt. Hulda

Route Corridor	Segments	Total Length (miles)	Residences Within 200 ft	Businesses Within 200 ft	Public Facilities Within 200 ft	Crop-land Crossed (acres)	Wood-land Crossed (acres)	Wet-lands Crossed (acres)	Length Parallel to Existing Transmission Lines (Miles)	Perennial Waterways Crossed (number)
Norborne to Sedalia (NS)										
NS1	B1-B6-B10	60.5	1	0	1	5123	1084	195	10.3	14
NS2	B1-B6-B9-B11	60.8	1	0	1	5093	1031	194	11.8	14
NS3	B1-B4-B7-B10	56.7	0	0	0	6181	726	228	6.2	10
NS4	B1-B4-B7-B9-B11	57.0	0	0	0	6151	672	228	7.7	10
NS5	B1-B4-B5-B8-B11	69.0	1	0	0	6689	965	212	44.3	20
NS6	B2-B7-B10	52.0	0	0	0	5676	675	189	0	7
NS7	B2-B7-B9-B11	52.3	0	0	0	5646	622	189	1.5	7
NS8	B2-B5-B8-B11	64.2	1	0	0	6484	914	173	38.1	17
NS9	B3-B6-B11	61.6	1	0	0	6234	911	229	22.9	18
Sedalia to Mt. Hulda (SMT)										
SMT1	B12-B14	27.5	1	0	1	1229	1169	127	11.1	12
SMT2	B12-B15	29.7	0	0	1	1125	1446	108	0.7	8

Table 2-23. Route Corridor Data: Norborne to Sedalia / Mt. Hulda

Route Corridor	Segments	Total Length (miles)	Residences Within 200 ft	Businesses Within 200 ft	Public Facilities Within 200 ft	Crop-land Crossed (acres)	Wood-land Crossed (acres)	Wet-lands Crossed (acres)	Length Parallel to Existing Transmission Lines (Miles)	Perennial Waterways Crossed (number)
SMT3	B13	25.2	0	0	1	782	1213	22	0	7
Dresden Alternatives (DA)										
DA1	B16	1.6	0	0	0	223	0	0	0	0
DA2	B17	2.3	0	0	0	236	28	0	0	0

Nine combinations were evaluated from Norborne to Sedalia (NS), with NS6 the shortest and NS5 the longest. None of the route corridors had more than one residence or public facility within 200 feet of the centerline, and none had businesses within 200 feet of the centerline. The resulting weighted scores for Norborne to Sedalia are as follows:

- NS1—121
- NS2—116
- NS3—85
- NS4—77
- NS5—141
- NS6—53
- NS7—45
- NS8—116
- NS9—130

As shown, NS7 scored lowest, with NS6 slightly higher. As shown in Table 2-23, both have very similar impacts based on the evaluation criteria. Alternative NS7, however, passes closer to Sedalia and through a developing area. This was not addressed in the scoring, but based on this negative aspect of NS7 compared to NS6, and their similarity otherwise, NS6 was selected as the proposed route for Norborne to Sedalia. Other route corridors are eliminated from further evaluation.

Scores for the Sedalia to Mt. Hulda (SMT) route corridors are as follows:
- SMT1—51
- SMT2—47
- SMT3--29

STM3 scored lower than or equal to the other route corridors in all categories and was identified as the proposed route. For the Dresden Alternative (DA), DA1 scored 24 and DA2 scored 35. Other than crossing cropland, DA1 had no other potential impacts in the evaluation criteria.

2.2.12.5 Summary of Transmission Corridor Evaluation

As part of its Alternatives Study, AECI identified study areas for each of the major required transmission route segments. Within these study areas constraints were identified and macro corridors about 2 miles wide were selected. In a later study that focused only on the transmission corridors, AECI narrowed the macro corridors and eliminated all but one route corridor for both the Norborne and Big Lake Sites. The second study incorporated comments from public scoping held in 2005. The final route corridors were identified based on ranking the corridors on environmental and engineering criteria, and were generally a quarter-mile wide except for locations that were expanded to allow avoidance options.

Norborne Site. For the Norborne Plant, AECI determined that two 345-kV transmission lines and related new and upgraded substation facilities would be required to provide adequate outlet capacity for the plant. First, a line from the Norborne Substation (located east of the proposed plant site) to the Thomas Hill Substation in Randolph County (approximately 60 miles) would be built. A second 345-kV line would be built from Norborne to Central Electric Power Cooperative's (Central) Sedalia Substation in Pettis County (approximately 50 miles) and then to the Mt. Hulda Substation in Benton County (approximately 24 miles).

Big Lake Site. To provide adequate outlet capacity for the Big Lake Plant, a new double-circuit 345-kV transmission line would be needed from the site to the existing Fairport Substation in DeKalb County, a distance of approximately 57 miles. A single-circuit 345-kV transmission line would be needed south from the Fairport Substation to a new 345/161-kV substation located near the town of Orrick in Ray County (approximately 53 miles distance). From Orrick, two new 161-kV transmission lines would need to extend to the existing Missouri City Substation in Clay County and to the existing Eckles Road Substation in Jackson County.

2.3 ALTERNATIVES ASSESSED IN DETAIL

2.3.1 Introduction

Based on the considerations described above, a limited set of alternatives emerged. These are the alternatives described above that were not eliminated from further consideration. They include:

- No action,
- An alternate project site near Big Lake Missouri, and
- Use of an IGCC unit to produce the required power.

Each of these alternatives to the Proposed Action is described briefly below.

2.3.2 No Action

CEQ regulations require evaluation of the No Action Alternative, to provide an environmental baseline against which impacts of the Proposed Action and alternatives can be compared. Under the No Action Alternative, a plant would not be constructed to meet the purpose and need discussed in *Section 1, Introduction*. The railroad connections, well field, water line, and transmission lines would also not be built. However, it would still be necessary for AECI to meet the electrical energy requirements of its members, so other actions would need to be taken to provide the energy, just not the action described in this document.

2.3.3 Alternate Site—Big Lake

If constructed at Big Lake, the project would be very similar to the Norborne project, as described in *Section 2.4, Description of the Proposed Action*. Only one rail connection, to the BNSF line north of the plant, is currently under consideration for this site. The water source would probably be wells at the Missouri River, same as for Norborne, but this was not evaluated in detail. A double-circuit 345-kV transmission line would be constructed from the plant to the existing Fairport Substation (Figure 2-54), and a single circuit transmission line would be constructed from Fairport to a new substation that would be constructed near Orrick. From Orrick, two new 161-kV lines would be built: one to the Missouri City Substation and one to the Eckles Road Substation (Figure 2-60).

2.3.4 Integrated Gasification Combined Cycle (IGCC) Coal

IGCC power production is based on an old technology being used in a new manner that is emerging as a potential way to produce power with less impact on the environment. This alternative involves use of an IGCC power plant in place of a SCPC power plant, which is the Proposed Action. An IGCC power plant could be built at either the proposed Norborne site or at the alternate Big Lake Site. If this IGCC were chosen, it would affect only the means to produce power. The IGCC would still require transmission corridors to deliver the power, which would be identical to those required by the Proposed Action. Coal would be used to produce the power for either alternative.

2.3.5 Proposed Action

The Proposed Action is to construct, operate and maintain a 660 MW net SCPC-fired baseload plant at a site near Norborne, Missouri, and includes other actions needed to supply fuel and water to the plant, to transmit the energy generated by the plant, and to dispose of waste. The Proposed Action is described below.

2.3.6 Comparison of Alternatives Evaluated in Detail

Table 2-24 summarizes the environmental consequences of the alternatives evaluated in detail.

2.4 DESCRIPTION OF THE PROPOSED ACTION

This section describes the Proposed Action as it is currently envisioned. AECI's Proposed Action has been identified as USDA/RD's Preferred Alternative. Specifics of the proposed power plant and associated facilities are subject to change during final design and construction. However, no environmental impacts beyond those assessed in this document are anticipated. If future changes to the design of the proposed power plant that constitute a federal action create the potential for impacts not assessed in this EIS, USDA/RD would conduct additional environmental reviews pursuant to NEPA.

TABLE 2-24
Summary of Environmental Consequences by Alternative

Affected Environment	Proposed Action	Big Lake Alternative Site	IGCC Alternative Technology	No Action
Air Resources	Power plant operation would result in the release of various pollutants, but there would be no significant impacts from the operation with implementation of the pollution control measures and devices included in the Proposed Action. The analysis indicates no exceedances of any National Ambient Air Quality Standards (NAAQS) or maximum allowable Prevention of Significant Deterioration (PSD) increments; no discernable impairment to visibility in nearby Class I areas, and no threat to the surrounding community from mercury emissions. Construction activities in all locations would result in release of particulates and exhaust gases, but effects would be short term and would occur over a small area at one given time, resulting in a minor level of impact. Dust control measures included in the Proposed Action would help limit impacts to less than significant levels. Conclusion: No significant impacts are expected with implementation of proposed actions to reduce or prevent adverse impacts.	Same Proposed Action.	The IGCC alternative has the potential of having somewhat different impacts than the Proposed Action. Emissions of pollutants for which there are NAAQS would be similar to those from the Proposed Action, though SO_2 emissions could be somewhat lower. As with the Proposed Action, ambient air quality impacts would not cause or significantly contribute to a violation of the NAAQS. Emissions of SO_2 could be as low as one third of those from the Proposed Action, lessening any potential impact on acid rain. However, it should be noted that the EPA's Clean Air Interstate Rule is	No impacts

TABLE 2-24
Summary of Environmental Consequences by Alternative

Affected Environment	Proposed Action	Big Lake Alternative Site	IGCC Alternative Technology	No Action
			designed to reduce nationwide SO_2 emissions to below levels required under the CAA acid rain program. Emissions of CO_2 could be ten to twenty percent lower than from the Proposed Action. CO_2 emissions could more easily be captured and this provides the potential to treat or store those emissions so that they do not reach the atmosphere. Emissions of mercury and mercury deposition would be similar to that related to the Proposed Action.	

TABLE 2-24
Summary of Environmental Consequences by Alternative

Affected Environment	Proposed Action	Big Lake Alternative Site	IGCC Alternative Technology	No Action
Geology and Soils	There would be no significant impacts on any area of regional geological importance (none is present). Groundwater withdrawal would not result in formation of sinkholes. Loess soils found in parts of the Project are highly erodible and care must be taken in implementation of erosion control measures to avoid impact. Conclusion: No significant impacts are expected with implementation of proposed actions to reduce or prevent adverse impacts.	If this site were selected, to avoid impacts care would need to be taken in identifying locations for borrow and the landfill so as not to impact the McCormack Loess Mound CA and any comparable geologic resources that may be present in the Deep Loess Hills east of the site. Otherwise, same as the Proposed Action.	Same as Proposed Action	No impacts
Ground-water	Pumping of an average of 5,600 gpm from the Missouri River aquifer would result in depression of groundwater in the vicinity of the well field. Aquifer testing and groundwater modeling indicate negligible impact on other groundwater users. Construction dewatering of a deep excavation for a coal car unloading system would result in a short-term depression of groundwater levels at the proposed plant site, which may result in short-term negative impacts to nearby groundwater users. AECI would provide alternate water supply for wells with adverse impacts, if necessary. During operation, solid waste disposal activities and use of chemicals and fuels have potential for impact, but would be	Because of the similar setting, pumping from the Missouri River aquifer would likely be the means of obtaining water at the Big Lake Site. Impacts would be expected to be similar to Proposed Action, but site-specific studies were not done.	Same as Proposed Action.	The groundwater production and monitoring wells used to identify and test the aquifer would remain.

TABLE 2-24
Summary of Environmental Consequences by Alternative

Affected Environment	Proposed Action	Big Lake Alternative Site	IGCC Alternative Technology	No Action
	avoided by implementation of environmental regulations. Conclusion: No significant impacts are expected with implementation of proposed actions to reduce or prevent adverse impacts.			
Surface Water	Large area of disturbed soil during construction creates potential for impacts to streams and other surface water bodies, but would be avoided by implementation of storm water controls through the storm water permit that would be required. During operation, use of chemicals and fuels has potential for impact, but would be avoided by implementation of environmental regulations. Waste ponds and similar facilities have potential for release during major floods. Conclusion: No significant impacts are	Similar to Proposed Action	Same as Proposed Action	No impacts.

TABLE 2-24
Summary of Environmental Consequences by Alternative

Affected Environment	Proposed Action	Big Lake Alternative Site	IGCC Alternative Technology	No Action
	expected with implementation of proposed actions to reduce or prevent adverse impacts and with implementation of suggested mitigation measures.			
Floodplains	The power plant, south rail connector, and well field are all located in the 100-year floodplain of the Missouri River. The power plant is located at the edge of the floodplain, about six miles from the river, where 100-year flood depths would be around two feet. Part of the north rail connector is located in the floodplain of Wakenda Creek. Transmission line corridors cross several floodplains that cannot be spanned, and supports would need to be placed in floodplains. For the plant at least, an analysis would need to be done to demonstrate that the construction, along with other projects in the floodplain, would not cause a rise in flood elevation of more than one foot at locations upstream of the site. <u>Conclusion</u>: No significant impacts are expected with implementation of proposed actions to reduce or prevent adverse impacts.	The plant site would be much closer to the river, and very close to the regulatory floodway. Flood depths for the 100-year flood could be up to nine feet, requiring much more fill than the Proposed Action, and more impact.	Same as Proposed Action	No impacts

TABLE 2-24
Summary of Environmental Consequences by Alternative

Affected Environment	Proposed Action	Big Lake Alternative Site	IGCC Alternative Technology	No Action
Farmland	The site is located in agricultural land, almost all of which is classified as prime farmland or prime farmland if drained. The site would occupy about 1,750 acres of farmland, approximately 750 of which would be leased back for agricultural use. Avoidance to center-pivot irrigation systems can be achieved by placement of supports. Conclusion: No significant impacts are expected with implementation of proposed actions to reduce or prevent adverse impacts.	The site is not completely defined, but conditions are the same as the Proposed Action and impacts would be expected to be the same.	Same as Proposed Action.	No impacts.
Land Use	Essentially all land impacted is agricultural. Existing surrounding land use is all zoned agricultural and is expected to remain so. Conclusion: No significant impacts are expected with implementation of proposed actions to reduce or prevent adverse impacts.	Same as Proposed Action.	Same as Proposed Action.	No impact.

TABLE 2-24
Summary of Environmental Consequences by Alternative

Affected Environment	Proposed Action	Big Lake Alternative Site	IGCC Alternative Technology	No Action
Public Lands, Recreation and Visual Resources	There are no public lands or recreation areas close to the Proposed Action. No significant adverse impacts on recreation, public lands, or visual resources would be anticipated under the Proposed Action. There would be some adverse visual impacts to residences within a mile or two of the facility, both during the day and at night, from the lights, and within about a half-mile of transmission lines,. Conclusion: No significant impacts are expected with implementation of proposed actions to reduce or prevent adverse impacts.	Because there are public lands much closer to the site (Big Lake State Park is within two miles), impacts would be greater; public perceptions of negative impacts on public lands due to the presence of a power plant are greater for the Big Lake Site, based on scoping comments. Impacts on residences are greater because of two communities near the site. There would be a visual impact on a National Historic Register site.	Same as Proposed Action.	No impacts.
Vegetation	No areas of high quality native vegetation were identified within the plant site. There would some impact to riparian corridors with construction of the north rail connector, and there is some potential for impact at major stream crossings of transmission lines, particularly at the Grand River. Conclusion: No significant impacts are expected.	Similar to Proposed Action.	Same as Proposed Action.	No impacts.

TABLE 2-24
Summary of Environmental Consequences by Alternative

Affected Environment	Proposed Action	Big Lake Alternative Site	IGCC Alternative Technology	No Action
Wetlands	A total of 3.56 acres of jurisdictional Waters of the United States and 3.14 acres of potential wetlands were identified on the plant and landfill site and within the well field. A Section 404 permit may be required if these areas would be disturbed, however, it appears probable that the wetlands can be avoided. Delineation of the rail connectors would be required when the alignments are finalized, but no more than about one acre of impact is expected. Transmission lines can generally span wetlands and thus avoid impact, expect for wooded wetlands, which must be cleared. A delineation of any impacted wetlands along the transmission corridor would be required after the final alignment is selected. Conclusion: No significant impacts are expected with implementation of proposed actions to reduce or prevent adverse impacts, and implementation of mitigation that may be required under the Section 404 permit.	Wetlands were not delineated, but the impact is expected to be similar to the Action.	Same as Proposed Action.	No impacts.
Fisheries and Wildlife	There is potential to impact migratory birds, which are protected under the Migratory Bird Treaty Act and an executive order, primarily by collisions with transmission lines, and to a lesser extent the power plant stack and taller structures, especially when these structures are lit at night. Conclusion: No significant impacts are	Construction and operation of a power plant at the Big Lake Site, which is close to the Squaw Creek NWR, and the presence of a transmission line adjacent to the Squaw Creek NWR, could potential cause	Same as Proposed Action.	No impact.

TABLE 2-24
Summary of Environmental Consequences by Alternative

Affected Environment	Proposed Action	Big Lake Alternative Site	IGCC Alternative Technology	No Action
	expected with implementation of proposed actions to reduce or prevent adverse impacts, and implementation of suggested mitigation.	significant impacts to the large populations of migratory birds that use the refuge. These impacts could be caused by collisions with the plant stack or other buildings, especially when lit at night, or by collisions with transmission lines. Migratory birds, including raptors, are protected under the Migratory Bird Treaty Act and the Executive Order on Protection of Migratory Birds.		
Threatened and Endangered Species	There is some potential for habitat for bald eagles, Indiana bats, and the eastern massasauga rattlesnake on certain wooded parts of the project area (but not at the plant site). <u>Conclusion</u>: No significant impacts are expected with implementation of proposed actions to reduce or prevent adverse impacts, and implementation of suggested mitigation.	Most impacts would be similar for the Big Lake Site, except there is not potential for impacts to the eastern massasauga rattlesnakes, but there would be potential for additional impacts related to the presence of Big Lake and Squaw Creek NWR. According to the FWS the Squaw Creek NWR has some of the largest concentrations of wintering bald eagles in the Midwest, and bald eagles have historically	Same as Proposed Action.	No impacts.

TABLE 2-24
Summary of Environmental Consequences by Alternative

Affected Environment	Proposed Action	Big Lake Alternative Site	IGCC Alternative Technology	No Action
		nested at Big Lake (AECI, 2005d). The proximity of a new power plant and transmission line to these areas could potentially result in significant impacts primarily from collisions with transmission lines.		
Cultural Resources	Phase I and Phase II efforts were completed for the area within the facility boundary, and desktop studies were done for the rail corridors and transmission lines. Additional investigation would be required when final alignments are selected. No significant resources were identified. <u>Conclusion</u>: No significant impacts.	If the Big Lake Site were selected, the potential visual impact of the plant on the NRHP-listed Rulo Bridge on US 159 would need to be assessed. The bridge is located immediately north of the site. The potential impact of the transmission line on the Absolom Riggs House near Weatherby would also need to be assessed.	Same as Proposed Action.	No impact.
Socio-economic	The anticipated benefits in jobs and payments in lieu of taxes are expected to outweigh small negative impacts from additional traffic and pressure on social resources. <u>Conclusion</u>: No significant impacts are expected with implementation of proposed actions to reduce or prevent adverse impacts.	Similar to Proposed Action, except that, based on comments, perceived impacts to quality of life would be greater because of proximity of Big Lake.	Same as Proposed Action.	No impact.

TABLE 2-24
Summary of Environmental Consequences by Alternative

Affected Environment	Proposed Action	Big Lake Alternative Site	IGCC Alternative Technology	No Action
Environ-mental Justice	No low income or minority populations would be disproportionately adversely impacted.	The community of Rulo, Nebraska is only a mile from the Big Lake site and would be visually impacted, but, since the community is not in Holt County, it would not receive any monetary benefit. The population of Rulo is 24 percent American Indian, and 28 percent of individuals live below the government poverty level. Also, the Iowa Indian Reservation is directly across the river from the plant, to the south. There is potential for environmental justice impacts with this alternative. This would have to be addressed.	Same as Proposed Action.	No impact.
Public Safety and Services	There is little impact on public safety and services. There would be some delays at new at-grade rail crossings. There was concern about electric and magnetic fields (EMF) expressed in comments, but there are no documented health impacts. Transmission lines were placed away from residences as much as practicable; there are only two residences within 200 feet of	Similar to Proposed Action.	Same as Proposed Action.	No impact.

TABLE 2-24
Summary of Environmental Consequences by Alternative

Affected Environment	Proposed Action	Big Lake Alternative Site	IGCC Alternative Technology	No Action
	the transmission route centerline. <u>Conclusion</u>: No significant impacts are expected with implementation of proposed actions to reduce or prevent adverse impacts.			
Noise	Noise from construction (especially pile driving) and operation would affect a few isolated residences near the plant and rail lines. <u>Conclusion</u>: No significant impacts are expected with implementation of proposed actions to reduce or prevent adverse impacts.	Similar to Proposed Action.	Similar to Proposed Action.	No impact.
Waste Management	The major wastes generated at the plant would be ash and flue gas desulfurization waste, which would be disposed of in an on-site permitted utility waste landfill. Disposal of other wastes on site would be governed by applicable federal and state regulations. <u>Conclusion</u>: No significant impacts are expected with implementation of proposed actions to reduce or prevent adverse impacts.	Similar to Proposed Action.	IGCC generates waste materials that are potentially more marketable than those generated by the Proposed Action. The major waste generated by IGCC would be slag, which would be potentially marketable. Sulfur removed from the syngas would also be potentially marketable.	No impact.

The primary components of the Proposed Action include the following:

- Power plant and associated facilities and operations, including the plant cooling system, waste management operations, lighting, fire protection, safety, and other systems.

- 345-kV substation, with associated transmission line modifications and communications facilities.

- New and modified substations.

- Approximately 134 miles of new 345-kV transmission lines to connect with AECI's existing network.

- Water supply system consisting of groundwater wells and associated pipeline.

- Solid waste storage disposal facility.

- New rail access from existing mainline railroads.

- Actions to reduce or prevent environmental impacts.

2.4.1 Location

The Norborne site is located in western Carroll County, Missouri, Township 52 North, Range 25 West, approximately 2.5 miles northwest of the town of Norborne (Figure 2-76). The site includes most of Section 17, the southeast quarter of Section 8 plus a small part of the southwest quarter of Section 8, the western quarter of Section 16, most of Section 20 outside the northeast quarter, and parts of Sections 19, 21, 29, and 30. The site area shown in Figure 2-76 is approximately 1,800 acres. The plant would be located primarily within Section 17, which is bordered by Missouri Route DD on the south and Missouri Route JJ on the east. The waste disposal facility would be in the southeast quarter of Section 8. The plant itself would be located in an area where the current elevations are approximately between 675 and 689 feet above MSL (AECI, 2005f). Site photographs are shown in Figures 2-77 and 2-78. Figures 2-79 and 2-80 show the preliminary arrangement of key facilities on the Norborne site.

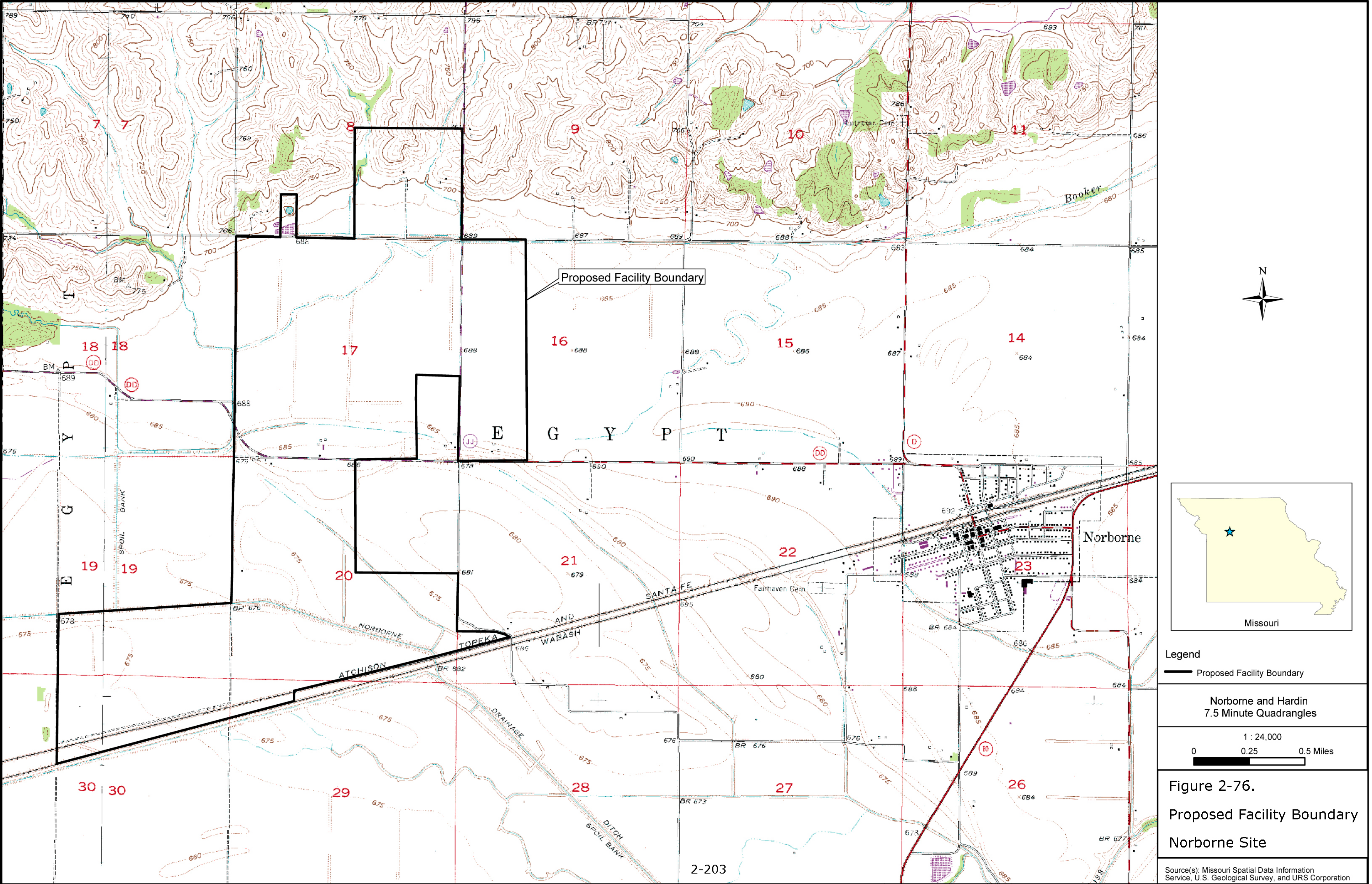


Figure 2-76.
Proposed Facility Boundary
Norborne Site

Source(s): Missouri Spatial Data Information Service, U.S. Geological Survey, and URS Corporation

Figure 2-77. Norborne Site Viewed from the Northwest Facing Southeast

Figure 2-78. Norborne Site Viewed From the Southwest Corner Facing East

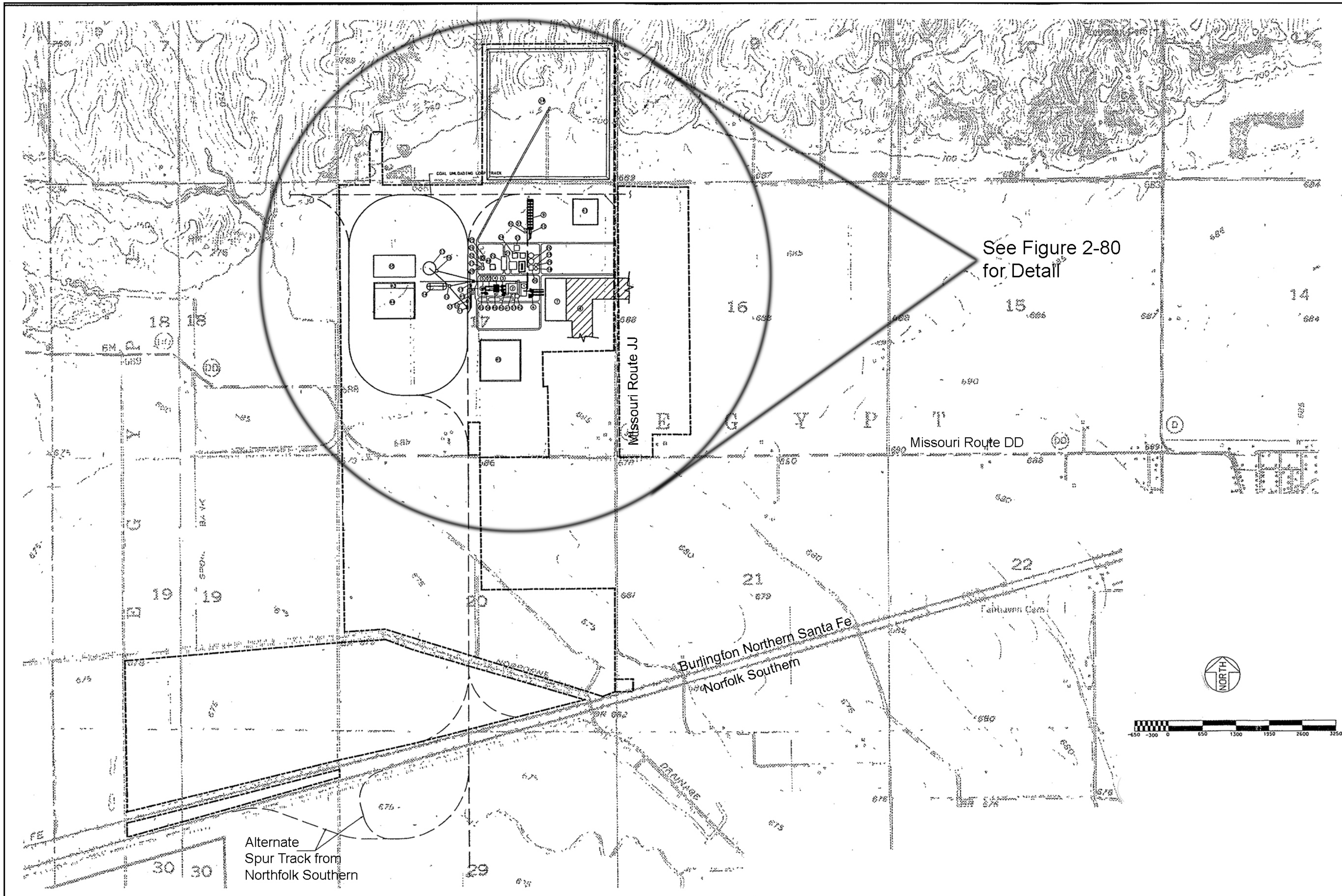
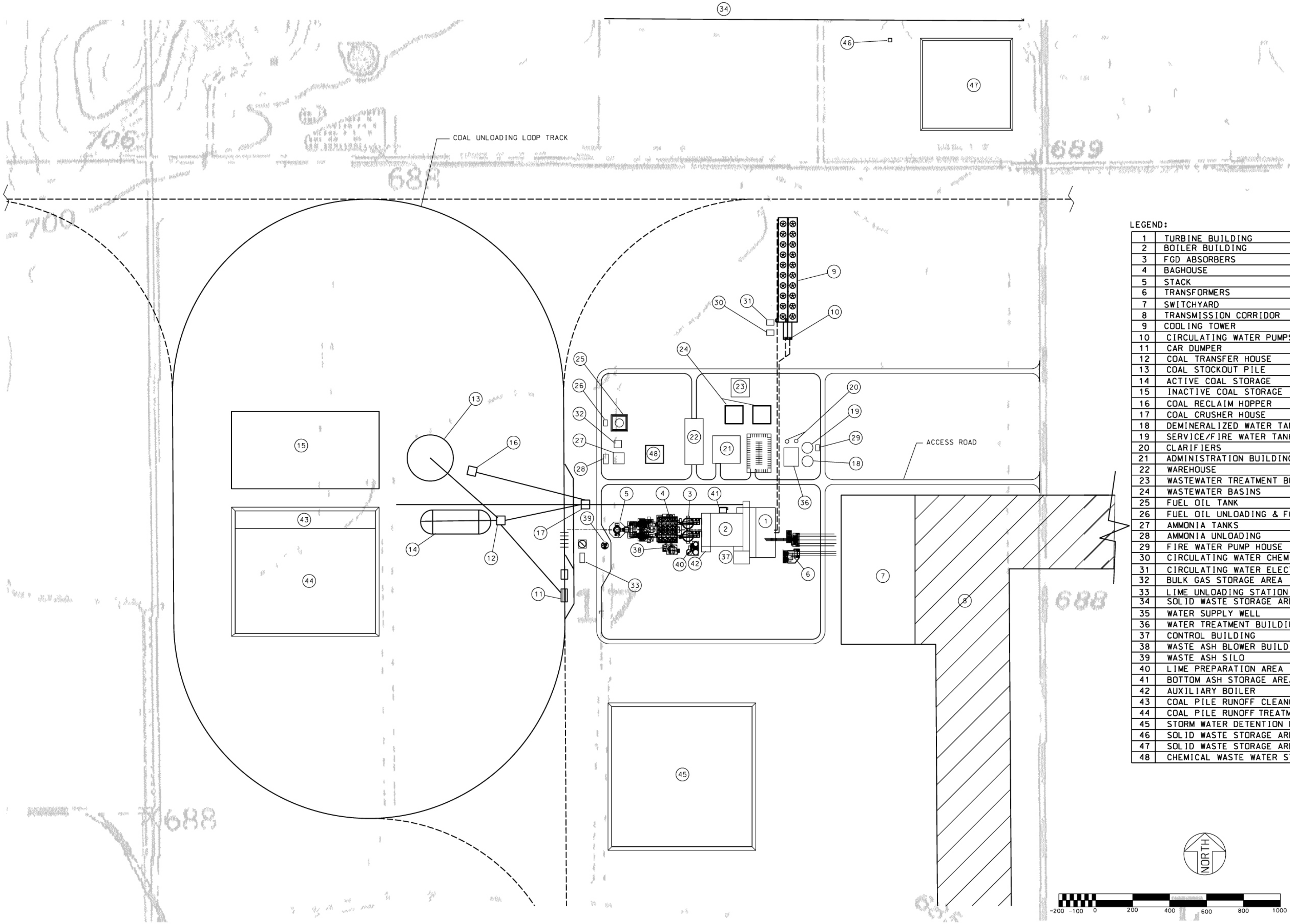


Figure 2-79. Norborne Preliminary Site Plan.

Source: AECI, 2005f



LEGEND:

1	TURBINE BUILDING
2	BOILER BUILDING
3	FGD ABSORBERS
4	BAGHOUSE
5	STACK
6	TRANSFORMERS
7	SWITCHYARD
8	TRANSMISSION CORRIDOR
9	COOLING TOWER
10	CIRCULATING WATER PUMPS
11	CAR DUMPER
12	COAL TRANSFER HOUSE
13	COAL STOCKOUT PILE
14	ACTIVE COAL STORAGE
15	INACTIVE COAL STORAGE
16	COAL RECLAIM HOPPER
17	COAL CRUSHER HOUSE
18	DEMINERALIZED WATER TANK
19	SERVICE/FIRE WATER TANK
20	CLARIFIERS
21	ADMINISTRATION BUILDING/MAINTENANCE SHOP
22	WAREHOUSE
23	WASTEWATER TREATMENT BUILDING
24	WASTEWATER BASINS
25	FUEL OIL TANK
26	FUEL OIL UNLOADING & FORWADING PUMPS
27	AMMONIA TANKS
28	AMMONIA UNLOADING
29	FIRE WATER PUMP HOUSE
30	CIRCULATING WATER CHEMICAL FEED BUILDING
31	CIRCULATING WATER ELECTRICAL BUILDING
32	BULK GAS STORAGE AREA
33	LIME UNLOADING STATION & BLOWER BUILDING
34	SOLID WASTE STORAGE AREA
35	WATER SUPPLY WELL
36	WATER TREATMENT BUILDING
37	CONTROL BUILDING
38	WASTE ASH BLOWER BUILDING
39	WASTE ASH SILO
40	LIME PREPARATION AREA
41	BOTTOM ASH STORAGE AREA
42	AUXILIARY BOILER
43	COAL PILE RUNOFF CLEANOUT BASIN
44	COAL PILE RUNOFF TREATMENT AREA
45	STORM WATER DETENTION POND
46	SOLID WASTE STORAGE AREA LEACHATE COLLECTION SUMP
47	SOLID WASTE STORAGE AREA RUNOFF POND
48	CHEMICAL WASTE WATER STORAGE BASIN

Source: AECI, 2005f

Figure 2-80. Norborne Plant--General Arrangement of Power Block.

The well field that would be used for water supply would be located adjacent to the Missouri River about seven miles south of the site, connected to the site by an underground water supply line (Figure 2-81). Approximately 134 miles of 345 kV transmission lines and new and upgraded substation facilities would be required between the plant and Thomas Hill (about 60 miles, Figure 2-83) and between the plant and Sedalia/Mt. Hulda (about 74 miles, Figure 2-84). A rail connector for coal delivery would be made to the BNSF line north of the plant, and a second rail connector for construction and other heavy equipment would be made to the BNSF line south of the plant. A second rail connector for coal delivery may be built to the NS line south of the proposed plant site. Proposed rail connectors are shown in Figure 2-85.

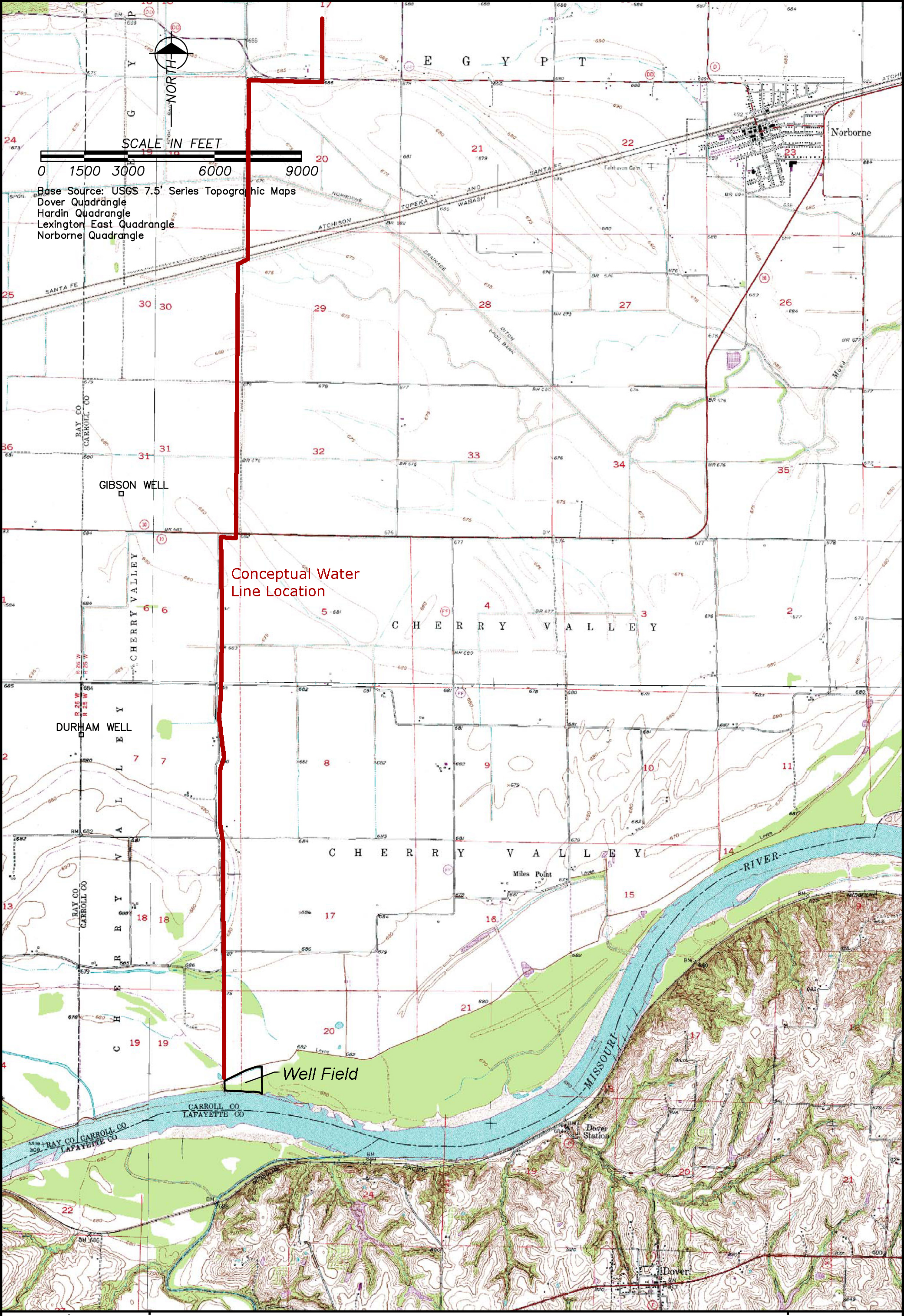
2.4.2 Generation

The facility would be designed to have a net electrical output of 660 megawatts during design summer conditions, combusting PRB coal. The design would include one supercritical single reheat coal-fired steam generator with a conventional four-flow steam turbine unit. The turbine building and boiler building are numbered 1 and 2 on Figure 2-80. Main condenser cooling would be provided via a rectangular fiberglass mechanical draft cooling tower and circulating water pumps (numbered 9 and 10). The generator unit would have a step up transformer to step up the generator voltage to the switchyard voltage. A separate closed loop cooling water system with demineralizers would be needed for cooling the generator stator (AECI, 2005f).

2.4.3 Fuel Supply

The plant would be designed to accommodate coal with the characteristics of any one of 14 PRB coal mines, or any combination of coal from those mines. AECI has evaluated the design range fuel analyses for each of these potential sources. Parameters quantified include proximate analysis, ultimate analysis, sulfur forms, and mineral analysis of ash. (AECI, 2005f)

Number 2 fuel oil would be used for startup of the boiler and for flame stabilization and shutdown. It would also be used to fuel the auxiliary boiler (numbered 42 on Figure 2-80), emergency generator, and fire water pump. The fuel oil tank and unloading area and forwarding pumps are located in the northwest corner of the main building area, and are numbered 25 and 26 on Figure 2-80. The fuel oil unloading, piping, and storage system would be



Scale: 1" = 3000'

Figure 2-81. Well Field Site and Conceptual Water Line Location

Sources: AECI, 2006j; AECI, 2006k

provided with containment and leak detection as required by Title 40 of the Code of Federal Regulations, Section 112 (40 CFR 112), Oil Pollution Prevention; and would comply with National Fire Protection Association (NFPA) codes (AECI, 2005f).

2.4.4 Water Supply

Water for cooling and other facility needs (except possibly potable water, which may be provided from an existing local source) would be supplied by wells located adjacent to the Missouri River approximately seven miles south of the facility. Water requirements are estimated to average 5,600 gallons gpm, peaking to 7,400 gpm during the summer. AECI's 2006 hydrogeologic investigation found that under low river conditions, two collector wells would probably be needed to yield 7,400 gpm (AECI, 2006j). The preliminary design for each collector well includes a 16-foot diameter caisson with six radial arms, each about 200 feet long. The radial arms (laterals) would be 12-inch diameter well screens (AECI, 2006j).

The well location at the river would require construction of approximately seven miles of pipeline across the Missouri River floodplain. The well field site and conceptual location of the water line from the well field to the plant area are shown in Figure 2-81.

2.4.5 Water Treatment

Treatment for cooling tower makeup water (circulating water) would consist of lime/soda softening for the removal of hardness and alkalinity from the raw well water. Higher quality is needed for makeup water for the steam cycle, which undergoes additional treatment after the initial softening. The makeup water treatment system for the steam cycle would consist of filtration, reverse osmosis, and mixed bed demineralization systems. Chemicals needed for the process include sulfuric acid, caustic, and sodium bisulfate. The sulfuric acid and caustic would be stored in minimum 5,000-gallon tanks. A separate condensate polishing system would have its own neutralization system and regeneration system, with its own minimum 5,000-gallon sulfuric acid and caustic tanks (AECI, 2005f). The water treatment building, clarifiers, demineralized water tank and service/fire water tank would be located south of the cooling tower and are numbered 36, 20, 18, and 19 on Figure 2-80.

The supercritical boiler would require oxygenated water, which would be achieved through the use of an ammonia feed system and an oxygen feed system. The ammonia tank and unloading area would be just south of the fuel oil storage area and are numbered 27 and 28 on Figure 2-80. Specific capacities for these items have not yet been estimated.

Four chemical feed systems would be required for the cooling water: scale inhibitor, corrosion inhibitor, sulfuric acid, and sodium hypochlorite. The scale inhibitor tank and corrosion inhibitor tanks would be 5,000-gallon capacity; the sulfuric acid and sodium hypochlorite tanks tank capacities would be sized for a 30-day capacity (actual size not noted). The tanks and pumps for the cooling water feed systems (numbered 30 on Figure 2-80, designated circulating water chemical feed building) would be located indoors adjacent to the cooling towers (AECI, 2005f).

There would be another feed system for dechlorination of cooling tower blowdown prior to discharge. This would be accomplished using sodium bisulfate, which would be stored in drums or totes (AECI, 2005f).

The chemical truck unloading stations would be provided with secondary containment; the unloading areas and containment would be provided with metal roofing (AECI, 2005f).

2.4.6 Wastewater Collection and Treatment

Figure 2-82 is a preliminary storm water and wastewater flow diagram for the facility. The discussion below follows the items in the flow diagram.

2.4.6.1 Utility Waste Landfill

Storm water runoff from the active areas of the utility waste landfill and leachate would be directed to a leachate collection pond. This wastewater would be primarily used for dust suppression in the landfill, or it would be pumped to the plant wastewater treatment system for other plant uses. The utility waste landfill leachate collection pond would be sized to retain flow from a 50-year, 24-hour rainfall over the largest open active area of the landfill during the lifetime of the landfill. The pond would have a low-permeability clay liner; hydraulic conductivity of less than 1×10^{-7} cm/sec.

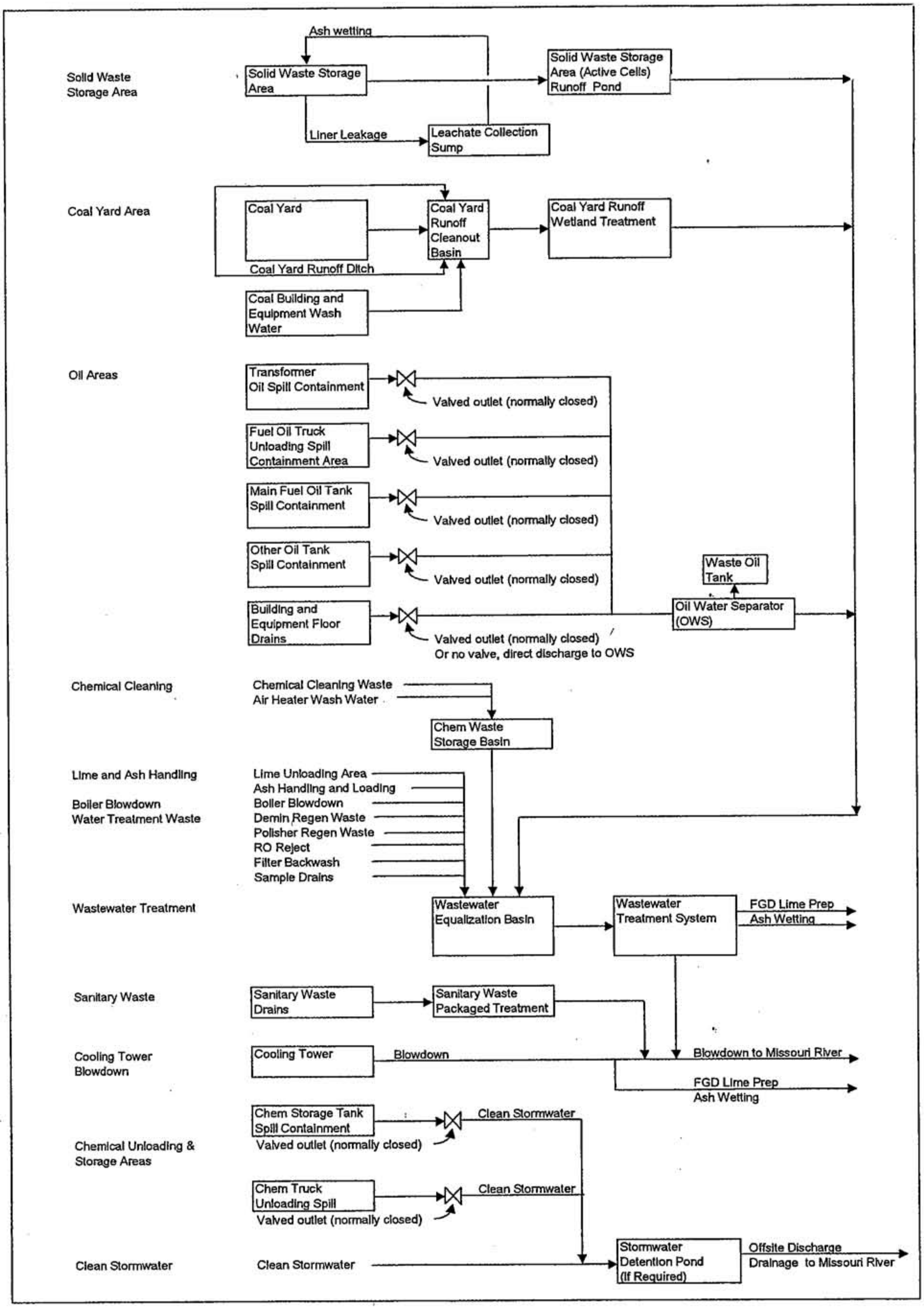


Figure 2-82. Preliminary Storm Water and Wastewater Flow Diagram

Source: AECI, 2005f

2.4.6.2 Coal Yard Areas

The coal pile runoff treatment area would be located within the coal dump track loop. Coal area washdown water would be sent to the coal pile runoff treatment facility. Runoff from the coal piles would be conveyed through concrete ditches to a coal pile runoff cleanout basin (numbered 43 on Figure 2-80). The ditches would be constructed of 12-inch thick reinforced concrete, with a minimum bottom width of 8 feet to allow cleanout using heavy equipment. The cleanout basin would also receive all washdown wastewater from coal handling structures and equipment and would be designed for primary settlement and removal of solids. The basin would be constructed of 12-inch thick reinforced concrete with equipment ramps to allow for cleanout using heavy equipment. The discharge from the cleanout basin would flow to the coal pile runoff treatment pond (numbered 44 on Figure 2-80). The treatment area would be designed for removal of fine suspended solids. The pond would be constructed with a low-permeability liner less than 1×10^{-7} cm/sec hydraulic conductivity, and would be equipped with a pump to transfer the effluent to the wastewater treatment plant as needed (AECI, 2005f).

2.4.6.3 Oil Areas

In accordance with the Spill Prevention, Control, and Countermeasure (SPCC) Plan that would be required, an oily water system would be provided to collect discharges from areas that have potential for oily contamination, including the following:

- Floor and equipment drains from all buildings and structures
- All transformer spill containment compounds
- Fuel oil spill and other oil tank spill containment areas, and fuel oil unloading area

The oil-contaminated runoff would be directed by gravity to an oil separator. Oil separator effluent would be routed to the wastewater ponds. A separate tank would be provided for the skimmed oil (AECI, 2005f).

2.4.6.4 Chemical Cleaning

Figure 2-82 shows chemical cleaning waste and air heater wash water being sent to the chemical waste storage basin, one of the two wastewater basins numbered 24 on Figure 2-80. The diagram shows this basin leading to the wastewater equalization basin (the other basin numbered 24).

2.4.6.5 Waste from Water Treatment, Lime and Ash Handling, Boiler Blowdown

The list of wastes from lime and ash handling, boiler blowdown, and water treatment, shown in Figure 2-82, would all be conveyed to the wastewater equalization basin. Water from the wastewater equalization basin would be sent to the wastewater treatment plant.

2.4.6.6 Wastewater Treatment

Treated wastewater not recycled or evaporated would be pumped to the circulating water system blowdown pipeline, which would discharge at a single NPDES[28] outfall at the Missouri River (AECI, 2005f). Discharges would meet the requirements of 40 CFR 423, Effluent Guidelines and Standards, Steam Electric Power Generating Point Source, and Missouri effluent limitations.

2.4.6.7 Sanitary Sewer Waste

Sanitary sewer waste would be discharged to either a packaged sanitary wastewater treatment system located on-site, or piped offsite to a municipal sanitary wastewater treatment system.[29] Treated effluent from an on-site package plant would be directed to the plant blowdown discharge pipe.

2.4.6.8 Chemical Unloading and Storage Areas

Storm water from the chemical unloading and storage areas would be considered clean and would be directed to a storm water detention pond, numbered 45 on Figure 2-80 (AECI, 2005f).

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[28] National Pollutant Discharge Elimination System, permitting under the Clean Water Act

[29] A small, standardized treatment unit used for treating relatively small volumes of sanitary waste; commonly used for residential developments that do not have access to a major municipal system.

2.4.6.9 Cooling Tower Blowdown

Non-contact cooling tower blowdown water would be used for the dry FGD system and for dust suppression as much as practicable. Pursuant to 40 CFR 423, this water would probably need to be regulated only for pH and chlorine.

2.4.6.10 Clean Storm Water

The main plant area would have a storm sewer system to convey clean storm water to a detention basin, which would drain offsite to a nearby receiving stream to the Missouri River (AECI, 2005f). The following areas would be drained by the clean storm sewer system:

- Power block area within loop road around equipment
- Main parking lot
- Water treatment plant and building areas
- Truck unloading and storage areas for chemicals (discussed above)
- Building roof drains
- Cooling tower area

2.4.7 Coal Handling System and Coal Piles

The coal handling system would have consideration for three 600 MW coal-fired units but will be installed for the single unit that is the subject of the Proposed Action. It would be designed for PRB coal delivered by 150 car unit trains with approximately 17,000 tons of coal per train. A coal unloading loop, shown in Figure 2-80, would be provided for train standby and coal unloading. Coal storage areas are located within the loop. The rail cars would be unloaded with a rotary car dumper into underground hoppers. The dumper is numbered 11 on Figure 2-80. The unloading system would be designed to unload and stack out coal at the rate of 4,000 tons per hour (tph). From the underground hoppers, the coal would be transferred by conveyor to the coal transfer house (numbered 12), then to either the coal stockout pile or directly to the coal crusher house (numbered 13 and 17). The coal stockout pile would be sized for three days capacity, which is approximately 25,000 tons. The inactive coal storage area (numbered 15) would be sized for a 60-day capacity, which is approximately 450,000 tons at a 90 percent capacity factor for the unit. Figure 2-80 also shows an active coal storage area, numbered 14. The crusher house would be enclosed and would include two 600 tph crushers. The design would include a fire protection system for the coal handling system and a washdown water system (AECI, 2005f).

The crushed coal would be conveyed to silos at the boiler, where it would be pulverized in mills and pneumatically fed to the boiler.

The coal piles would be located within the looped rail unloading track, at the west side of Figure 2-80. A minimum two-foot layer of clay would be provided beneath the piles to prevent leaching into the ground (AECI, 2005f).

2.4.8 Ash and Flue Gas Desulfurization (FGD) Waste Handling

2.4.8.1 Fly Ash and FGD Waste Handling

The fly ash and FGD waste collection and disposal system would transfer PM collected from the boiler flue gas to either a waste ash silo (numbered 39 on Figure 2-80) for unloading into trucks for disposal or to a recycle material feed bin for use in the FGD system, depending on the source of the material. Fly ash and FGD waste entrained in the boiler flue gas would be removed using a pulsejet baghouse. Ash would also be collected throughout the flue gas system. Ash and FGD waste would be conveyed pneumatically using a vacuum system equipped with filters. FGD waste collected from the baghouse hoppers would be conveyed to the FGD recycle bin. Fly ash and other FGD waste would be conveyed to the waste storage silo. Mixers would add water to the material for conditioning prior to loading onto trucks, which would transport the material to the solid waste storage area (landfill) (numbered 34 on Figure 2-80). The waste storage silo would also be equipped with an unloading spout and dust collection system for dry truck loading (AECI, 2005f). With the dry FGD technology, the fly ash is not segregated from the FGD waste and is not suitable for sale to concrete manufacturing or other industries (AECI, 2005g).

2.4.8.2 Bottom Ash Handling System

Bottom ash would be conveyed to a concrete bunker, where it would be loaded onto trucks for disposal in the landfill (AECI, 2005f).

2.4.8.3 Utility Waste Landfill

The features of the utility waste landfill shown on Figure 2-80 are the landfill, located north of the main plant, and the leachate collection pond. The landfill would be designed and constructed in accordance with the Rules of the MDNR, Division 80, Solid Waste Management, Chapter 11, Utility Waste Landfill. Missouri's classification of fly ash, bottom ash, and FGD waste as solid waste is consistent with federal regulations, which specifically classifies these materials as solid waste and exempt from classification as hazardous waste (40 CFR 261.4(b)(4)).

The Missouri utility waste regulations require a landfill liner that is constructed with a combination of a compacted soil with a hydraulic conductivity equal to or less than 1 X 10^{-5} cm/sec plus a synthetic liner. Hydraulic conductivity is a measure of the ease with which a liquid flows through a medium.

The waste disposal facility would include a groundwater monitoring system, which, in accordance with the Missouri regulations and the permit AECI would be required to obtain for the landfill, would be designed to detect groundwater impacts from the waste disposal facility. AECI would be required to implement corrective action to restore groundwater if it is impacted.

The solid waste disposal facility would be designed for a 50-year plant life. The 142-acre landfill would be divided into 20-25 acre cells, each with its own liner and leachate collection system. Two cells would be constructed initially, each with a perimeter dike to prevent inflow of storm water. Within each cell, leachate would be collected through a sand or geonet filter and directed to a leachate collection pond. Missouri regulations require dust control as needed for safety purposes and to prevent a nuisance to the surrounding area. During heavy rainfall periods where dust suppression is not required, wastewater could be pumped to the plant wastewater treatment system for use in other systems.

The final cover for the landfill would include a soil liner with a hydraulic conductivity of less than 1 X 10^{-5} cm/sec geomembrane liner with soil cover and topsoil to support grass. The maximum slope would be 4H:1V (horizontal: vertical) (AECI, 2005f). Missouri regulations require restoration of borrow areas used for cover.

In accordance with the permit that MDNR would issue for the landfill, it would be used only for disposal of plant wastes generated at the site excluding trash and refuse.

2.4.9 Emissions Control Systems

2.4.9.1 Gaseous Emissions

Gaseous emissions from coal burning include NO_X, SO_2, volatile organic compounds (VOC), and GHGs, mainly CO_2. These pollutants would be generated at the facility in the boiler, auxiliary boiler, emergency generator, and the fire water pump through the combustion of coal and fuel oil. NO_X and VOC would be controlled in all sources through use of good combustion practices and proper maintenance. Additionally, in the main boiler low NO_X burners, overfire air and SCR would be used to control NO_X. SO_2 is controlled at all sources by limiting the amount of sulfur in the fuel (either Number 2 fuel oil or a low sulfur PRB coal). SO_2 emissions from the main boiler would also be controlled through a dry FGD system. The dry FGD system would use a lime spray. The FGD absorbers, baghouse, and stack are numbered 3, 4, and 5, respectively, on Figure 2-80. Carbon monoxide would be controlled at every combustion source by implementing good combustion practices. GHGs are not currently regulated.

2.4.9.2 Particulate Matter (PM)

Particulate matter would be generated at a number of point sources (boiler, cooling towers, etc.) and non-point fugitive sources (coal piles, coal handling facilities, landfill, etc.). All coal, ash, and lime conveyance and storage areas would be controlled using dust suppression, covered conveyors, and a fabric filter system. The PM generated by the main boiler, FGD, SCR, and possibly mercury control systems would be controlled using a pulse jet fabric filter baghouse. PM at the emergency generator, fire water pump, and auxiliary boiler would be limited by using good combustion practices. The control of fugitive sources of PM is an operation and maintenance issue and control requirements would be determined in the Best Available Control Technology (BACT) analysis. These requirements would become a part of the air quality permit for the facility.

2.4.9.3 Hazardous Air Pollutants (HAPs)

The hazardous air pollutant (HAP) of greatest concern is mercury. An activated carbon injection system for mercury control would be an option (AECI, 2005f). This option involves the injection of powdered activated carbon before the dry FGD system. The activated carbon fixes the mercury to its surface and is then removed from the exhaust gas in the main boiler's baghouse. Mercury emissions would be limited to standards set by EPA (40 CFR Part 60 subpart HHHH).

2.4.10 Railroads

As discussed in *Section 2.2.11.2, Norborne Site*, two rail connection route corridors are proposed: one to the south of the plant that would connect with the BNSF intermodal line, for delivery of construction materials (Figure 2-50), and a line to the north to be used for coal delivery that would connect with a BNSF line that is currently used for coal delivery (Figure 2-51). The southern connection route corridor could also potentially be used for a coal delivery connection to the NS line that lies to the south of the BNSF intermodal line. This connection would require a bridge over the BNSF line, as discussed in *Section 2.2.11.2, Norborne Site*.

2.4.11 Transmission Lines

As discussed in *Section 2.2.12, Transmission Routing Alternatives*, a 345-kV line from Norborne to the Thomas Hill Substation would be required. The proposed route corridor for this line is shown in Figure 2-83. A second 345-kV line would be built from Norborne to either Sedalia or Dresden, and potentially another 345-kV line would extend from Sedalia (or Dresden, if selected) to Mt. Hulda (Figure 2-84). Note that the Dresden option requires a short connector to and from the main route of the transmission corridor.

2.4.12 Construction Timetable

The EIS process, culminating in the publication of a Record of Decision (ROD) that would identify and describe the approved project, is expected to be completed in late 2007. Assuming the planned EIS schedule is met, construction would begin no sooner than early 2008. Major contracts cannot be signed and construction cannot begin until the ROD is signed and published.

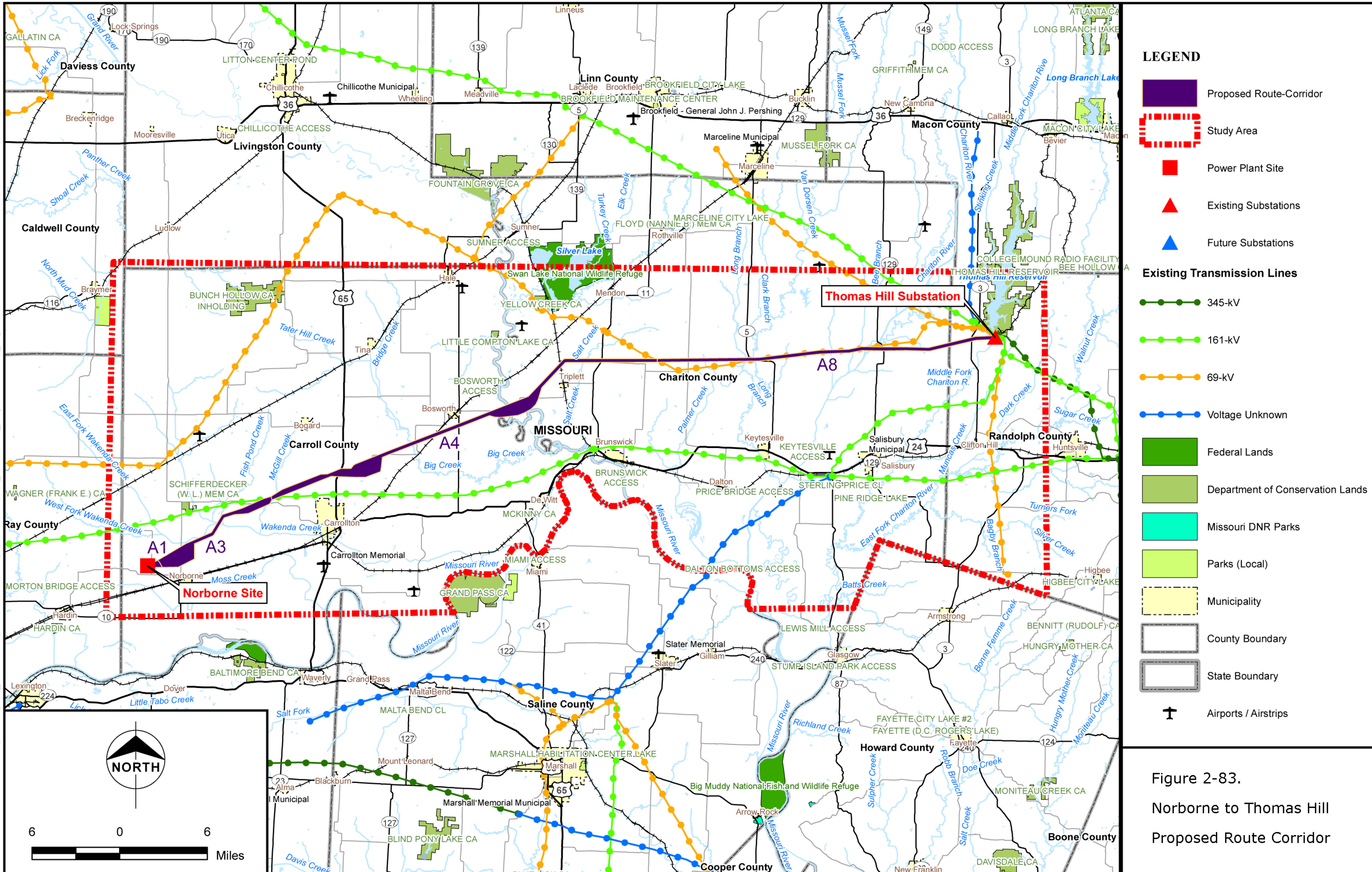


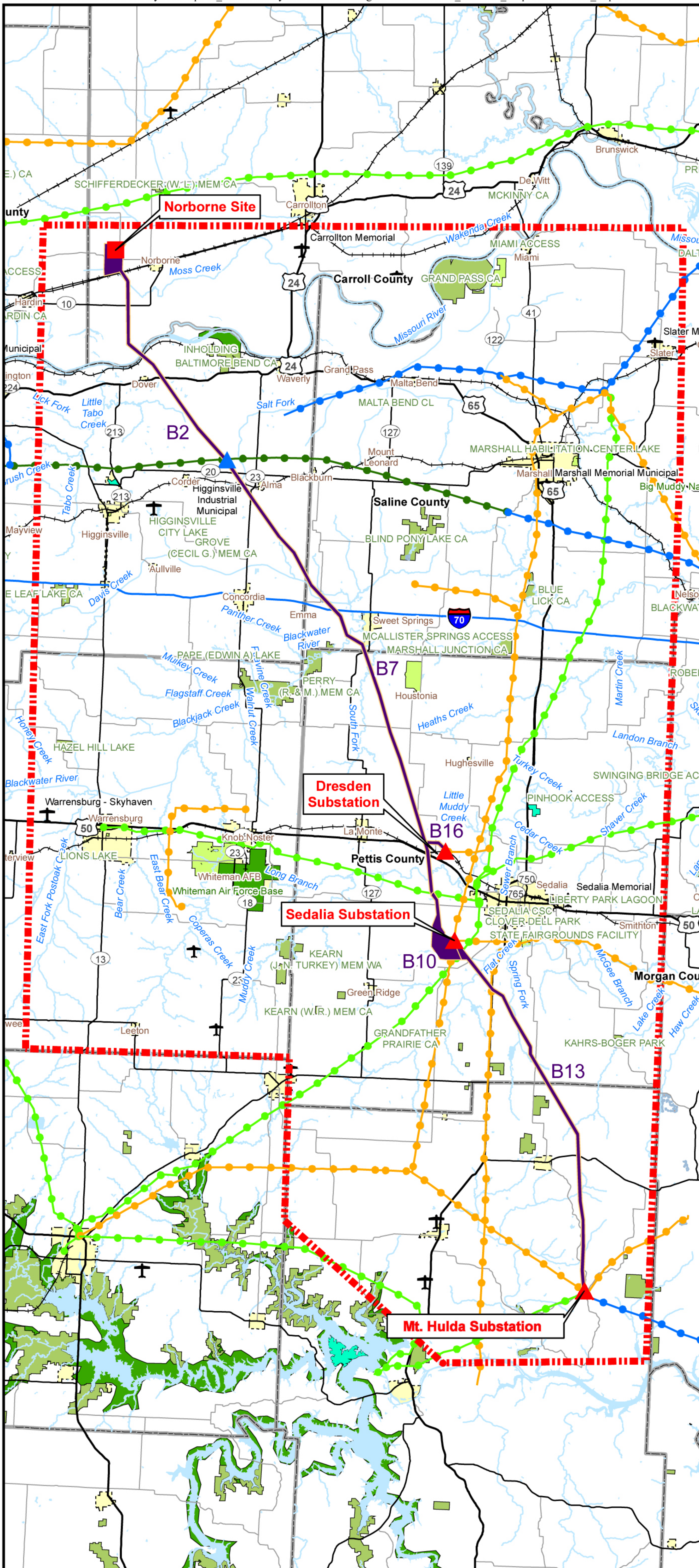
Figure 2-83.
Norborne to Thomas Hill
Proposed Route Corridor

U:\aeci2005\ARCArcDocs\StudyAreaReports_051031\Study Area Corridors\Figure 7-23 Norborne_ThomasHill_ProposedCorridors_Report.mxd

Disclaimer: Existing transmission lines are shown to the extent they could be verified within the project study areas using aerial photography, topographic maps, and NW and Central Cooperative's system planning maps. They are not necessarily complete or represent all existing transmission lines in the area.

Source: AECI, 2005e

Disclaimer: Existing transmission lines are shown to the extent they could be verified within the project study areas using aerial photography, topographic maps, and NW and Central Cooperative's system planning maps. They are not necessarily complete or represent all existing transmission lines in the area.



LEGEND

- Proposed Route-Corridor
- Study Area
- Power Plant Site
- Existing Substations
- Future Substations

Existing Transmission Lines

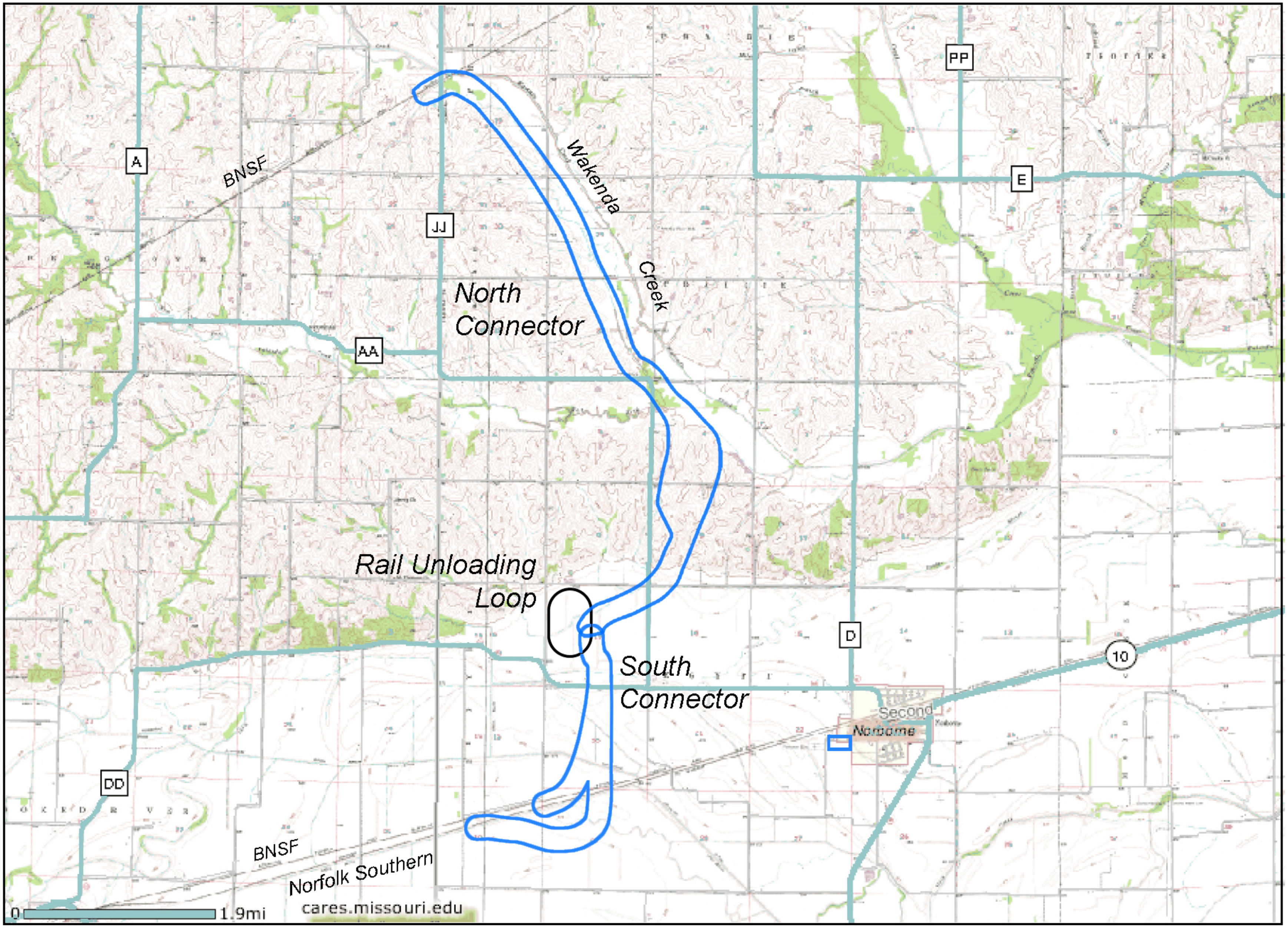
- 345-kV
- 161-kV
- 69-kV
- Voltage Unknown
- Federal Lands
- Department of Conservation Lands
- Missouri DNR Parks
- Parks (Local)
- Municipality
- County Boundary
- Airports / Airstrips

NORTH

6.5 0 6.5 Miles

Figure 2-84.
Norborne to Sedalia/Mt. Hulda
Proposed Route Corridor

Source: AECI, 2005e



Source: *AECI, 2006i*

Figure 2-85. Proposed Rail Connector Corridors--Norborne Site

Construction activities expected to be completed within about the first year of construction include installing water wells and associated piping, constructing the south rail connector to the BNSF line, pile-driving, general site clearing and regrading, installation of other foundations, and fabrication and delivery of the steel for the boiler.

Within about a year and a half, the installation of the underground utilities and chimney would be complete. Completion of boiler erection, the turbine building, the cooling tower, the air quality control system, and the north rail connector would be expected by the end of 2010.

The construction schedule for this proposed Project is periodically reviewed by AECI to determine if the assumptions supporting the schedule remain correct. The schedule that is used in this document envisions substantial completion of the project, including transmission line and substation construction, construction of the landfill, and completion of any required mitigation would occur by mid-2012, with final completion by the end of 2012. The most recent evaluation of the schedule that was done by AECI suggested that the completion of the project would likely be in 2013 rather than 2012.