3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 INTRODUCTION

Each potential impact area within this section contains information related to the affected environment, environmental consequences, and mitigation. A general discussion for each of these areas follows.

3.1.1 Affected Environment

The affected environment discussions describe the existing social, economic, natural, and physical environment in the project area. This information establishes the baseline conditions for each resource category against which to evaluate potential impacts from the proposed project.

3.1.2 Environmental Consequences

The environmental consequences discussions will assess the potential impacts (positive and negative) of the proposed alignment alternative. The information will include all direct, indirect and cumulative impacts along with any mitigation measures that might be warranted.

Direct Impacts. Direct impacts are caused by the proposed project and occur at the same time and place. These effects are directly linked to the project and are highly predictable.

Indirect Impacts. Indirect impacts are caused by the proposed project and occur later in time or are farther removed in distance, but they are still reasonably foreseeable. Types of indirect impacts related to transportation projects fall under the following three broad categories (NCHRP, 2002):

- Alteration of the behavior and functioning of the affected environment caused by project encroachment on the environment.
- Project-influenced development effects (land use effects).
- Effects related to project-influenced development effects (i.e., effects of the change in land use on the human and natural environment).

Cumulative Impacts. Cumulative impacts are direct and indirect impacts of the project in association with past, present, and reasonably foreseeable future actions of other parties in the surrounding area. The Council on Environmental Quality has outlined the following eight principles for cumulative impact analysis:

- Cumulative impacts are caused by the aggregate of past, present, and reasonably foreseeable future actions.
- Cumulative impacts are the total impact, including both direct and indirect impacts, on a given resource, ecosystem, and human community of all actions taken, no matter who has taken the actions.
- Cumulative impacts need to be analyzed in terms of the specific resource, ecosystem, and human community being affected.
- It is not practical to analyze the cumulative impacts of an action on the universe; the list of environmental impacts must focus on those that are truly meaningful.
- Cumulative impacts on a given resource, ecosystem, and human community are rarely aligned with political or administrative boundaries.
- Cumulative impacts may result from the accumulation of similar impacts or the synergistic interaction of different impacts.
- Cumulative impacts may last for many years beyond the life of the action that caused the impacts.
- Each affected resource, ecosystem, and human community must be analyzed in terms of its capacity to accommodate additional impacts, based on its own time and space parameters.

Reasonably foreseeable actions in this project area could include activities within Camp Robinson, residential and commercial development, and transportation projects. Transportation projects are the only one of these actions that can be predicted with enough

certainty to be included in cumulative impact assessments related to the North Belt Freeway project. The following are the transportation projects likely to occur within the project area that will be used for cumulative impact analysis:

Highway 107 Widening from 2 lanes to 5 lanes

Bear Paw Drive - Brockington Road (1.7 miles) (2.7 kilometers)

Jacksonville Cato Road - Bayou Meto (0.9 miles) (1.4 kilometers)

Brockington Road Widening from 2 lanes to 4 lanes

Maryland Avenue - Highway 107 (1.2 miles) (1.9 kilometers)

Jacksonville Cut-off Reconstruction

Highway 107 - Bayou Meto (1.5 miles) (2.4 kilometers)

3.1.3 Mitigation

Agencies are required to identify and include in their project all relevant and reasonable mitigation measures that could decrease or eliminate potential impacts, even if the impacts are not considered to be significant. The Council on Environmental Quality has included the following actions in the definition of mitigation:

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or environments.

3.2 LAND USE AND LAND COVER

3.2.1 Affected Environment

Land use and land cover are dictated by the interplay between the physiography of the landscape and the manmade environment. Infrastructure expansion can only occur at the expense of land cover, while infrastructure changes can occur without any land cover impacts. These interrelationships can be evaluated only after a basic understanding has been obtained related to the project area's underlying physiography and overlying flora and infrastructure.

3.2.1.1 Physiography

The project is primarily in the Ouachita Mountains Ecoregion of Arkansas, with just the eastern section in the Mississippi Alluvial Plain Ecoregion (Woods *et al.*, 2004).

The United States Geological Survey (USGS) and Arkansas Geological Commission (Haley *et al.*, 1993) have mapped the geology of the project area into three formations, the Jackfork Sandstone Formation, the Atoka Formation, and Holocene Alluvium. The majority of the project will be on the Jackfork Sandstone Formation, with the eastern terminus on Alluvium of the Mississippi Alluvial Plain. The northernmost alignment alternative crosses onto the lower part of the Atoka formation.

Soils are highly related to ecoregions and geology. Soils are mapped into four soil associations on the general soil map in the *Soil Survey of Pulaski County* (Haley *et al.*, 1975). Soils on the Jackfork Sandstone Formation and the lower Atoka Formation are mapped in the project area as the Linker-Mountainburg association and the Leadvale-Gutherie-Linker association. The Linker-Mountainburg association is composed of well drained, gently sloping to steep, moderately deep and shallow, loamy and stony soils on hills, mountains, and ridges. The Leadvale-Gutherie-Linker association is composed of poorly to well drained, level to gently sloping, deep and moderately deep, loamy soils in valleys and on tops of low mountains. Soils on alluvium are mapped as the Perry-Norwood association. These are composed of poorly to well-drained, level, deep, clayey and loamy soils on bottomlands. The fourth soil association, the Amy-Rexor association, is mapped along Kellogg Creek and Fears

Lake. These are composed of poorly to well drained, level to gently undulating deep, loamy soils on floodplains of local drainages.

A variety of mineral deposits have been mined in the Ouachita Mountains. Mineral deposits reported in Pulaski County include bauxite, quartz, lead, zinc, copper, and silver. Known mineral deposits in the project area include the Kellogg Mines and the Jeffrey Quarry. The Kellogg Mines are south of Kellogg Creek and east of Kellogg Acres Road between Alignment Alternatives Ba and C. The Jeffrey Quarry is at Crystal Hill, north of Highway 365 and south of the Common Alignment.

The Kellogg Mines operated intermittently from about 1847 to 1926. Mining began after Benjamin Kellogg discovered mineral lead in a tributary of what is now named Kellogg Creek. It was found that the ore was difficult to smelt due to the presence of silver, so the material was crushed, hauled to the Arkansas River and sent to England for processing. The modern city of North Little Rock was originally named Argenta, which is Latin for *silver*. The California Gold Rush of 1849 ended the first period of activities at the Kellogg Mines. The Confederate Army opened another shaft during the Civil War, which was later destroyed by the Union Army. Various leases operated the mines sporadically over the years, evidently with little economic success, until the main shaft flooded and mining was abandoned. Many of the abandoned Kellogg Mines tunnels and shafts have since collapsed. Assays of cores taken by the Arkansas Geological Commission indicate trace amounts of silver, lead, copper, and zinc (Stuart-Leslie, 2003).

The Jeffrey Quarry Construction Company began operations in the late 1950s and operated through the 1960s, primarily to quarry sandstone road-fill for the construction of Interstate 40. During and following the active years of the quarry, many mineral specimens particularly quartz crystals, were removed by collectors and geologists. Minerals described from the quarry include rectorite, quartz, ankerite, apatite, and cookeite (Newsom, 1978). The quarry is presently filled with water.

3.2.1.2 Infrastructure

Development outside of Camp Robinson is largely residential, with the exception of an agricultural field at the eastern terminus of the proposed project. Undeveloped property in the project area includes both uplands and bottomlands.

Much of the land in the project area is occupied by Camp Robinson. Camp Robinson is a 32,000-acre (13,000 hectare) Army National Guard training facility. The camp provides facilities for training Arkansas Army National Guard, the Air National Guard, and Army, Navy, and Marine reserves. The original 6,000 acres (2,400 hectares) were acquired by the United States for an encampment called Camp Pike. The camp was renamed Camp Robinson in 1937. The camp expanded to 48,000 acres (19,400 hectares) during World War II and was used for basic training and to house German prisoners of war. Following the war, the camp was declared surplus. Although the largest portion was distributed to the Military Department of the State of Arkansas, smaller portions were distributed to the City of North Little Rock for an airport and a park, to Central Baptist College, and to several private ownerships. Thirty-one acres (12.5 hectares) were retained by the Department of Defense as the US Army Reserve Center Camp Pike.

Incorporated city properties in the project area include North Little Rock, Sherwood, and Jacksonville. Unincorporated communities include Crystal Hill and Gravel Ridge. See Section 3.6.1.2 for additional information on communities and Section 1.4.4 for more information about existing road networks in the project area.

3.2.1.3 Flora

Three natural plant communities were identified in the project area: Oak-Hickory, Mixed Oak-Pine, and Bottomland. Aside from developed property, natural plant communities have in some places been displaced with grasses or agricultural crops.

OAK-HICKORY – Post oak is the dominant species in uplands of the project area. Dry ridges north and south of the Kellogg Creek valley are covered by nearly pure stands of post oak. Eastern red cedar and winged elm are spotty throughout these uplands and are more prominent in areas of natural disturbance. Blackjack oak is a co-dominant species with post

oak and black hickory on dry slopes primarily south of Camp Robinson. In valleys between ridges and on north-facing slopes, southern red oak is co-dominant with post oak, along with mockernut hickory. Smooth sumac is the most common shrub in areas where oak-hickory woodland has been harvested.

MIXED OAK-PINE – Shortleaf pine replaces oak-hickory woodland in areas that have been heavily disturbed by human activities, particularly by military activities on Camp Robinson. Shortleaf pine is usually mixed with oak-hickory forest, especially with post oak, but there are a few nearly pure stands. Loblolly pine has been planted in a few areas.

BOTTOMLAND – The most diverse plant communities in the project area are the bottomlands of Bayou Meto, Kellogg Creek, and Fears Lake. Common species in the bottomland of Bayou Meto, for example, include cow oak, water oak, Shumard oak, willow oak, and sweetgum, with bald cypress or tupelo in the channel, and white oak, southern red oak, and shagbark hickory in drier areas. Bald cypress and buttonbush are the dominant woody species in the Fears Lake portion of Kellogg Creek. Herbaceous wetlands in the Kellogg Creek valley are predominantly wool grass, cattails, and smartweed. Non-native species such as Chinese privet and Japanese honeysuckle have invaded some upper reaches of Kellogg Creek.

PASTURE – A few pastures in the project area have native grasses, especially broomsedge and bluestem, but most have been converted to modern pasture using introduced species, primarily tall fescue.

FIELD – Fields delineated inside Camp Robinson were distinguished in this analysis from pasture outside of the camp. These fields serve a number of purposes including security zones, storage areas, firing ranges, and training grounds.

AGRICULTURAL CROP – Former bottomlands at the eastern terminus of the project have been cleared for agriculture with soybeans as the primary crop.

3.2.2 Environmental Consequences

The primary direct impact to land use and land cover is the conversion to highway right of way. Land use and land cover categories were determined using aerial imagery interpretation and were digitized into a geographic information system (GIS). Land use and land cover impacts were calculated in the GIS platform using an estimated average right of way width of 300 feet (91 meters) and 40-acre (16-hectare) interchanges. Since this analysis is based on the most recent aerial imagery interpretation, it does not include proposed new subdivision developments. New subdivisions may exist by the time the facility is constructed. Direct impacts on potential new development could be minimized by inclusion of this facility in future planning by developers and communities. Detailed results of the land use and land cover evaluations are available in Appendix B.

3.2.2.1 No-Action Alternative

Direct Impacts. Because no activities related to the proposed project would occur under the No-Action Alternative, there would be no direct impacts to land use or land cover.

Indirect Impacts. Because no activities related to the proposed project would occur under the No-Action Alternative, there would be no indirect impacts to land use or land cover.

Cumulative Impacts. Because no activities related to the proposed project would occur under the No-Action Alternative, there would be no cumulative impacts to land use or land cover related to this project. However, transportation infrastructure improvements throughout the project area could occur at a faster rate, and these improvements could have impacts on land use and land cover.

3.2.2.2 Common Alignment

Direct Impacts. The Common Alignment would impact 412 acres (167 hectares) overall. It would impact 151 acres (61 hectares) on Camp Robinson and 190 acres (77 hectares) of undeveloped land. Additionally, it would impact 19 acres (eight hectares) of residential property and two acres (one hectare) of commercial property at Crystal Hill/Jeffery. The

Batesville Pike road relocation would require nine acres (four hectares) of property owned by the new Arkansas State Veteran's Cemetery, but would not impact any graves.

The Common Alignment would convert approximately 230 acres (93 hectares) of mixed oak-pine woodland to highway right of way. This forest type is primarily limited to the Common Alignment and is dominant due to the history of human disturbance to the environment associated with Camp Robinson. It would also impact 73 acres (30 hectares) of the oak-hickory woodland, 22 acres (nine hectares) of fields on Camp Robinson, and five acres (two hectares) of pasture. Most of the oak-hickory woodland is on the steep slopes southwest of Camp Robinson and north of the Kevin McReynolds Baseball Complex in Sherwood.

Indirect Impacts. Indirect impacts to existing land use and land cover can occur following construction due to increased accessibility and visibility. Property adjacent to proposed interchanges is especially likely to be developed following construction, and generally for commercial uses.

Through most of the Common Alignment, indirect impacts to land use and land cover are expected to be minor. Access to Camp Robinson from the proposed facility would be restricted. Although an interchange is planned with access to Highway 365, much of the existing land use on Highway 365 is commercial, so additional commercial land use would not be a new land use conversion. The Batesville Pike road relocation and a planned interchange with the new road would provide accessibility and visibility to property south of the existing Batesville Pike road. Residential and commercial development of this property is expected to follow soon after construction of the project.

Additional indirect impacts to natural plant communities include the spread of invasive species onto the new highway corridor, and potentially into natural areas. Transportation corridors are the principal means for the distribution of invasive plant species. Potentially invasive non-native species noted in the project area include Japanese honeysuckle, Chinese privet, mimosa tree, Callery pear, and China-berry tree. Many roadside weeds, Johnson grass for example, generally do not invade undisturbed natural communities.

Cumulative impacts. Because the majority of the Common Alignment is within Camp Robinson, the greatest potential for cumulative impacts would exist related to activities within the Camp. At this time, no cumulative impacts to land use or land cover related to the Common Alignment are anticipated. Actions within Camp Robinson are subject to NEPA regulations, so it is anticipated that any cumulative impacts with regards to the Camp's future actions would be outlined within the associated environmental documentation.

3.2.2.3 Alignment Alternatives A and Ab

Direct Impacts. Alignment Alternative A would convert approximately 306 acres (124 hectares) of property to highway right of way, including 17 acres (seven hectares) of residential property and 179 acres (72 hectares) of undeveloped land. Alignment Alternative Ab would convert approximately 319 acres (129 hectares) of property to highway right of way, including 31 acres (13 hectares) of residential property and 170 acres (69 hectares) of undeveloped land. Without an interchange at Oneida Street, there would be approximately five acres (two hectares) less impact to residential property on Alignment Alternative A and 14 acres (six hectares) less on Alignment Alternative Ab.

Both alignment alternatives impact development at Hidden Creek and Windridge subdivisions and avoid impacts to Miller's Crossing subdivision by crossing to the north side of Highway 107. Alignment Alternative A avoids new residential development at Northlake Estates subdivision by placing the alignment alternative through the bottomlands of Fears Lake. Alignment Alternative Ab impacts the new development by avoiding the bottomlands.

Alignment Alternative A would impact 112 acres (45 hectares) of oak-hickory woodland and 59 acres (24 hectares) of bottomland. Alignment Alternative Ab would impact 113 acres (46 hectares) of oak-hickory woodland, 21 acres (eight hectares) of mixed oak-pine woodland, and 36 acres (15 hectares) of bottomland.

Indirect Impacts. Much of the land along Highway 107 would likely be developed as residential property regardless of which alignment alternative is selected. The interchange

planned at Highway 107 and Brockington Road would likely attract commercial development.

Indirect impacts to land cover would be similar to those outlined for the Common Alignment, including the potential for spread of invasive species.

Cumulative Impacts. Cumulative impacts in the project area would be related to other planned transportation projects that are reasonably foreseeable. These projects are outlined in Section 3.1.2. These projects would convert additional, largely undeveloped, property to a transportation use.

3.2.2.4 Alignment Alternatives B, Ba, Bb, and Bab

Direct Impacts. The B Alignment Alternatives would convert approximately 315 acres (127 hectares) to 330 acres (134 hectares) of property to highway right of way, including 14 acres (six hectares) to 33 acres (13 hectares) of residential property and 182 acres (74 hectares) to 201 acres (82 hectares) of undeveloped land. Without an interchange at Oneida Street, there would be approximately five acres (two hectares) fewer impacts to residential property on Alignment Alternatives B and Ba, and 14 acres (six hectares) less on Alignment Alternatives Bb and Bab.

Alignment Alternative B avoids residential development at Hidden Creek subdivision but impacts residences, a business and a transmission tower at Oakdale subdivision. Alignment Alternative Ba avoids several of the residences, the business, and the tower. Alignment Alternatives Bb and Bab are similar to Alignment Alternatives B and Ba, except that they avoid the bottomlands of Fears Lake, thus impacting residential development at Northlake Estates subdivision.

Alignment Alternative B would impact 122 acres (50 hectares) of oak-hickory woodland and 60 acres (24 hectares) of bottomland. Alignment Alternative Ba would impact 133 acres (54 hectares) of oak-hickory woodland and 60 acres (24 hectares) of bottomland. Alignment Alternative Bb would impact 123 acres (50 hectares) of oak-hickory woodland

and 37 acres (15 hectares) of bottomland. Alignment Alternative Bab would impact 134 acres (55 hectares) of oak-hickory woodland and 37 acres (15 hectares) of bottomland.

The larger of the oak-hickory woodlands occur on a ridge north of Oakdale Road and south of Kellogg Creek. Alignment Alternatives Ba and Bab impact additional oak-hickory woodlands by avoiding development at Kellogg Acres. Alignment Alternatives Bb and Bab minimize impacts to bottomland at Fears Lake.

Indirect Impacts. The B Alignment Alternatives in part follow an undeveloped ridge north of Oakdale Road. Construction of any of these alignment alternatives with an interchange at Highway 107 would likely encourage residential development on these uplands and commercial development near the interchange.

Additional indirect impacts to land cover, including the spread of invasive species, would be similar to those outlined for the Common Alignment.

Cumulative Impacts Cumulative impacts in the project area would be related to other planned transportation projects that are reasonably foreseeable. These projects are outlined in Section 3.1.2. These projects would convert additional, largely undeveloped, property to a transportation use.

3.2.2.5 Alignment Alternative C

Direct Impacts. Alignment Alternative C would convert approximately 444 acres (180 hectares) of property to highway right of way, including 24 acres (ten hectares) of residential property and 323 acres (131 hectares) of undeveloped land.

Alignment Alternative C requires over 100 acres (41 hectares) more of right of way conversion than any other alignment alternative. Except for a small residential development north of Gravel Ridge, it is largely undeveloped land. It also impacts slightly more agricultural land, impacting approximately 63 acres (25 hectares) adjacent to Highway 167. All of the other alignment alternatives would impact approximately 59 acres (24 hectares) of agricultural land.

Alignment Alternative C would impact 239 acres (97 hectares) of oak-hickory woodland and 63 acres (25 hectares) of bottomland. Alignment Alternative C impacts approximately 100 acres (40 hectares) more of oak-hickory woodland than the other alignment alternatives. Additionally, it impacts 14 acres of pasture.

Impacts to large oak-hickory woodlands occur west and north of Gravel Ridge, and along a long ridge north of Bayou Meto. Alignment Alternative C crosses Kellogg Creek and Bayou Meto, as well as the large bottomlands formed by these streams east of Northlake. These bottomlands are of higher quality and are less disturbed than the bottomlands of Fears Lake.

Indirect Impacts. Construction of Alignment Alternative C would likely encourage residential development west and northeast of Gravel Ridge. All of the interchanges would be constructed on what are presently undeveloped areas. Highway 107 especially is likely to attract commercial development as well.

Additional indirect impacts to land cover, such as the spread of invasive species, would be similar to those outlined for the Common Alignment.

Cumulative Impacts. Cumulative impacts in the project area would be related to other planned transportation projects that are reasonably foreseeable. These projects are outlined in Section 3.1.2. These projects would convert additional, largely undeveloped, property to a transportation use.

3.2.3 Mitigation Summary

Impacts to developed property will be avoided and minimized to the extent practicable. Excess right of way outside of the safety zone will be allowed to revegetate naturally. A post-construction survey for invasive plant species will be conducted in order to identify possible problem areas and species.

3.3 VISUAL ENVIRONMENT

3.3.1 Affected Environment

From Camp Robinson eastward to Kellogg Creek, a distance of eight miles (13 kilometers), the alignment alternatives are largely on the massive Purdham Hill. Purdham Hill is not actually a single hill but a series of ridges. The general landscape setting in the project area is rolling hills and bluffs with valleys at Kellogg Creek and Bayou Meto, with a local relief of 50 - 100 feet (15 - 30 meters). At its western terminus, among low hills near the Arkansas River Valley, the corridor is at an elevation of about 350 feet (107 meters) above mean sea level. The corridor elevation rises quickly up the west side of Purdham Hill to about 550 feet (168 meters) above mean sea level and from this perspective Pinnacle Mountain and other Arkansas River Valley hills can be seen to the south and west. Bayou Meto cuts through additional ridges north of Kellogg Creek. Kellogg Creek and Bayou Meto merge into bottomlands on the eastern side of the project area, some of which have been converted to agriculture.

Natural vegetation in the project area consists mostly of forested uplands. Mixed oak-pine woodlands predominate in the western portion of the project area. Post oak and shortleaf pine are the dominant trees. Shortleaf pine is largely distributed on disturbed places, particularly at Camp Robinson. Less disturbed woodlands are oak-hickory. Post oak is nearly always a dominant species, often with blackjack oak, black oak, southern red oak, black hickory, and mockernut hickory. These uplands have a moderate to high visual quality, and during some years, fall foliage is particularly attractive. At Fears Lake, bottomland vegetation inhabits the floodplain of Kellogg Creek. Much of what was formerly hardwood forest is standing dead timber so that the visual character is only moderate. However, wetland vegetation is established and Fears Lake is now in the early stages of natural reforestation into a bald cypress community. Bottomlands of Bayou Meto are largely undisturbed and of fair visual quality. Former bottomlands near the eastern terminus have been converted to agriculture.

In addition to Fears Lake at Kellogg Creek and Bayou Meto, water resources adjacent to the corridor include Engineers Lake in Camp Robinson, Indianhead Lake, Northlake, and a new

lake under construction between Indianhead Lake and Northlake. These manmade lakes are visual features of moderately high quality.

Manmade development includes Camp Robinson, the North Little Rock Municipal Airport, Sylvan Hills High School, the Kevin McReynolds Baseball Complex, and numerous residential communities. Much of the immediate area of the proposed project lies outside major urban development and the overall visual character is rural, largely forested uplands. However, residential development continues to alter much of the present rural character of the corridor.

There are no visually sensitive resources in the project area. Viewers of the road would be primarily residential and military. Viewers from the road would include local, commuter, and commercial traffic.

3.3.2 Environmental Consequences

3.3.2.1 No Action Alternative

Direct Impacts. The No-Action Alternative would not involve new construction, thus no visual impacts would occur.

Indirect Impacts. No indirect impacts to the visual environment are anticipated as a result of the No-Action Alternative.

Cumulative Impacts. Because no activities related to the proposed project would occur under the No-Action Alternative, there would be no cumulative impacts to the visual environment related to this project. However, transportation infrastructure improvements throughout the project area could occur at a faster rate, and these improvements could have impacts on the visual environment.

3.3.2.2 Common Alignment

Direct Impacts. The north portion of Crystal Hill neighborhood would be impacted by the Common Alignment, and the facility would be visible from a number of residential properties. There is an automobile salvage yard on Bruce Lane. Through Camp

Robinson, the Common Alignment avoids the main camp facilities and the National Guard Airport. Engineers Lake would be visible from the roadway for a short distance, adding visual interest (Figure 3.3-1). Additional developments that would be viewed from the road include the North Little Rock Municipal Airport and two concrete water tanks at Central Arkansas Water (Figure 3.3-2). The Batesville Pike relocation would be adjacent to the State Veteran's Cemetery. Southbound traffic on the common alignment alternative would encounter visually interesting views of the Arkansas River Valley towards the western terminus of the project (Figure 3.3-3).

Figure 3.3-1 View from the north side of Engineers Lake on Camp Robinson.

Figure 3.3-2 View to the northeast at Batesville Pike and Maryland Avenue on the east side of Camp Robinson.

Figure 3.3-3 View to the southwest from Trapp Road south of Camp Robinson.

Indirect Impacts. Indirect impacts to the visual environment occur primarily from indirect impacts to land use. The Batesville Pike relocation would encourage residential development in that area. Residential development east of the relocated roadway and north of the Kevin McReynolds Baseball Complex may expose the complex to views of the new transportation facility and residential development. Restricted access to Camp Robinson would prevent additional indirect impacts.

Cumulative impacts. Because the majority of the Common Alignment is within Camp Robinson, the greatest potential for cumulative impacts would exist related to activities within the Camp. At this time, no cumulative impacts to the visual environment related to the Common Alignment are anticipated. Actions within Camp Robinson are subject to NEPA regulations, so it is anticipated that any cumulative impacts with regards to the Camp's future actions would be outlined within the associated environmental documentation.

3.3.2.3 Alignment Alternatives A and Ab

Direct Impacts. The A Alignment Alternatives encounter residential properties and on-going residential construction at Hidden Creek, Windridge, and Amber Oaks subdivisions west of Highway 107 (Figure 3.3-4). These alignment alternatives then parallel Highway 107 through Sherwood to an interchange at Brockington Road (Figure 3.3-5). The viewshed is largely oak-hickory forested slopes, aside from a view of the front side of Miller's Crossing subdivision south of Highway 107. Fears Lake is largely herbaceous and scrub-shrub wetlands. Additional residential development is encountered on the east side of Fears Lake north of Indianhead Lake (Figure 3.3-6). All alignment alternatives cross agricultural fields to the eastern terminus with Highway 67.

Indirect Impacts. Much of the property along the A Alignment Alternatives is slated for future residential development. The viewshed along the A Alignment Alternatives can be expected to be altered from vegetated slopes to suburban, and perhaps at a faster rate than would be true with the other alignment alternatives.

Cumulative Impacts. Cumulative impacts in the project area would be related to other planned transportation projects that are reasonably foreseeable. These projects are outlined in Section 3.1.2. These projects will result in cumulative impacts due to additional urbanization of the visual environment.

3.3.2.2 Alignment Alternatives B, Ba, Bb, and Bab

Direct Impacts. Like the A Alignment Alternatives, much of the viewshed of the B Alignment Alternatives is oak-hickory woodland, the herbaceous and scrub-shrub wetlands of Fears Lake, and agricultural land. Residential development is encountered at Kellogg Acres and at the Northlake Estates subdivision.

Figure 3.3-4 New residential development at Sherwood on the A Alignment Alternatives.

Figure 3.3-5 Intersection of Brockington Road and Highway 107.

Figure 3.3-6 View of Indianhead Lake and Indianhead Lake Estates subdivision. The A and B Alignment Alternatives cross near this location.

Indirect Impacts. The B Alignment Alternatives would place the Highway 107 Interchange north of Brockington Road. This would likely encourage residential development along Oakdale Road (Figure 3.3-7) and commercial development near the interchange.

Cumulative Impacts. Cumulative impacts in the project area would be related to other planned transportation projects that are reasonably foreseeable. These projects are outlined in Section 3.1.2. These projects will result in cumulative impacts due to additional urbanization of the visual environment.

3.3.2.3 Alignment Alternative C

Direct Impacts. Alignment Alternative C is both longer and further north than the other alignment alternatives and most of that additional viewshed is oak-hickory woodland. A couple of pastures are also in the viewshed. The bottomlands of Bayou Meto east of Northlake are less disturbed than the bottomlands of Fears Lake. Residential development is encountered at Kellogg Acres north of Sherwood and at Gravel Ridge. There is an automobile salvage yard off Hatcher Road at Gravel Ridge. Although quite subjective, Alignment Alternative C would provide the overall highest visual quality (Figure 3.3-8).

Indirect Impacts. Land use changes, including commercial development, can be expected adjacent to the interchange locations.

Cumulative Impacts. Cumulative impacts in the project area would be related to other planned transportation projects that are reasonably foreseeable. These projects are outlined in Section 3.1.2. These projects will result in cumulative impacts due to additional urbanization of the visual environment.

3.3.3 Mitigation Summary

Excess right of way outside of safety zones will be allowed to revegetate naturally. AHTD's Standard Specifications include native wildflowers in the permanent seeding mix. Automobile salvage yards will be purchased or screened.

Figure 3.3-7. View of oak-hickory forest along Oakdale Road, south of the B Alignment Alternatives.

Figure 3.3-8. View south on Highway 107 from Alignment Alternative C of oak-hickory forest and the bridge over Bayou Meto.

3.4 AIR QUALITY

3.4.1 Affected Environment

Ambient air monitoring is conducted at various locations throughout Arkansas by the State and Local Air Monitoring Stations and the National Air Monitoring Stations programs. Based on historical monitoring data, the existing air quality of the county encompassing the project area (Pulaski) is designated as being in attainment for the National Ambient Air Quality Standards for carbon monoxide, ozone (both the 1-Hour and the 8-Hour), particulate matter (fine and course), nitrogen dioxide, sulfur dioxide and lead. Attainment areas are those areas identified by the Environmental Protection Agency (EPA) as being in compliance with the National Ambient Air Quality Standards.

3.4.2 Environmental Consequences

The primary mobile sources of air pollution emissions associated with this project are the motor vehicles that would be utilizing the proposed highway facility. Consequently, an air quality assessment was performed in order to estimate the degree of air quality impacts that would result from the associated air pollutant emissions from these motor vehicles. This assessment was conducted by following the guidelines established by the AHTD, the FHWA, and the EPA. The assessment methods and results are outlined in Appendix C.

3.4.2.1 No-Action Alternative

Direct Impacts. The No-Action Alternative is anticipated to result in both beneficial and adverse effects for some residents located within the project area. With no new highway facility nearby, residents would not be exposed to the additional air pollution associated with this new roadway, such as fine particulate matter, carbon monoxide and ozone precursors (hydrocarbons and nitrogen oxides). However, without the proposed facility, there would be an increase in traffic congestion on existing Interstate 40, Highway 365, Highway 107, Highway 67 and the local street network due to increases in traffic volumes. This increase in congestion would lead to a reduction of traffic speeds. As a consequence, residences along these existing roadways would likely be exposed to an increase in air pollution, such as fine particulate matter, carbon monoxide and ozone precursors.

Indirect Impacts. With or without the implementation of the proposed project, there would be associated additional development, which would continue to increase over time. This would result in rising levels of background air pollution, such as fine particulate matter, carbon monoxide and ozone precursors (hydrocarbons and nitrogen oxides). With additional fine particulate matter and ozone precursor emissions, there would be an associated contribution to the formation of a regional haze and also a rise in ground-level ozone levels. Consequently, individuals, particularly those with sensitive respiratory systems such as asthmatics, would be inclined to limit the amount of time they spend in outdoor activities in order to compensate. Also, with additional contributions to the formation of a regional haze, the visibility of an area would decline.

Cumulative Impacts. Because no activities related to the proposed project would occur under the No-Action Alternative, there would be no cumulative air quality impacts related to this project. However, transportation infrastructure improvements throughout the project area could occur at a faster rate, and these improvements could have air quality impacts.

3.4.2.2 Alignment Alternatives

Direct Impacts. Based on the results of the analysis, it has been determined that the proposed facility, regardless of which alignment alternative was chosen, would have minimal impacts on air quality as related to carbon monoxide concentrations (See Analysis Results in Appendix C). However, increases in pollutant levels are anticipated for fine particulate matter, carbon monoxide and ozone precursors (hydrocarbons and nitrogen oxides).

Indirect Impacts. Indirect impacts would be similar to those outlined for the No-Action Alternative, including increases in air pollution due to additional development.

Cumulative Impacts. Cumulative impacts in the project area would be related to other planned transportation projects that are reasonably foreseeable. These projects are outlined in Section 3.1.2. Cumulative impacts on air quality will be minimal.

3.4.3 Mitigation Summary

Based on the microscale analysis results, no mitigation measures are required for the proposed facility. Furthermore, the project is located in an area, which is in attainment status for all transportation pollutants and where there are no transportation control measures. Therefore, this project is not subject to transportation conformity requirements. However, during the construction of the proposed facility, air quality impacts will be minimized by the selected contractor through a combination of fugitive dust control, equipment maintenance and compliance with state and local regulations.

3.5 NOISE QUALITY

3.5.1 Affected Environment

3.5.1.1 Noise Terminology

Noise is a form of vibration that causes pressure variations in elastic media such as air and water. The ear is sensitive to this pressure variation and perceives it as sound. The intensity of these pressure variations causes the ear to discern different levels of loudness. These pressure differences are most commonly measured in decibels (dB), the unit of measurement for noise.

The decibel scale audible to humans spans from zero to approximately 140 dB. A level of zero decibels corresponds to the lower limit of audibility, while 140 decibels produces a sensation more akin to pain than sound. The decibel scale is a logarithmic representation of the actual sound pressure variations. Therefore, a 26% change in the energy level only changes the sound level one dB. The human ear would not detect this change except in an acoustical laboratory. A doubling of the energy level would result in a three dB increase, which would be barely perceptible in the natural environment. A tripling in energy level would result in a clearly noticeable change of five dB in the sound level. This would be perceived as a doubling of the apparent loudness.

The human ear has a non-linear sensitivity to noise. To account for this in noise measurements, electronic weighting scales are used to define the relative loudness of different frequencies. The “A” weighting scale is widely used in environmental analysis

because it closely resembles the non-linearity of human hearing. The unit of A-weighted noise is dBA.

Time-varying characteristics of environmental noise are analyzed statistically to determine the duration and intensity of noise exposure. In an urban environment, noise is made up of two distinct parts. One is ambient or background noise. Wind noise and distant traffic noise make up the acoustical environment surrounding the project. These sounds are not readily recognized, but combine to produce a non-irritating ambient sound level. This background sound level varies through the day, being lowest at night and highest during the day. The other component of urban noise is intermittent, higher in pitch, and louder than the background noise. Transportation noise and local industrial noise are examples of this type of noise. Sounds of this nature can be very disturbing, while brief and intense noises can interrupt, annoy or startle. It is for these reasons that environmental noise is analyzed statistically.

The L_{eq} is the equivalent steady-state sound having the same A-weighted sound energy as that contained in the time-varying sound over a specific period of time. The time period considered for traffic noise is one hour. The abbreviation then becomes L_{eq} (h), which correlates reasonably well to the effects of noise on people. All traffic noise levels in this analysis will be expressed in dBA L_{eq} (h).

3.5.1.2 Current Noise Levels

Ambient noise levels in the study area are a function of traffic volume and daily activities of the general populace. The primary source of background noise is the traffic on Interstate 40, Highway 365, Highway 107, Highway 67, the local street network, and the local airports.

Ambient noise measurements were taken at 24 sites along the proposed project alignment alternatives representing noise sensitive receptors that would likely be affected by the proposed project. Based upon ambient noise readings within the study area, background noise levels range from 43 to 70 dBA L_{eq} (h). Detailed information about noise analysis procedures and results are available in Appendix D.

The current aural environments of the study area vary considerably depending on location and proximity to the existing roadway system. Since existing Interstate 40, Highway 365, Highway 107 and Highway 67 are the predominant roadways within the study area and have the highest traffic volumes and truck percentages, the areas adjacent to these roadways and the associated commercial activity centers have the highest ambient noise levels.

3.5.2 Environmental Consequences

FHWA's Traffic Noise Model version 2.5 (TNM) was utilized as the highway traffic noise prediction computer program to project future design-hour traffic noise levels for the year 2030. The number of impacted noise receptors was estimated by utilizing the 66 dBA Leq (h) contour (the "approach" level for the FHWA's Noise Abatement Criteria Activity Category B) and also the 10 dBA or greater ("substantial" increase from existing) contour. In addition, the noise impacts of the proposed Oneida Street Interchange were evaluated based on the projected changes in traffic volumes associated with both the presence and the absence of the proposed Oneida Street Interchange. The total noise receptors estimated for both noise contours for each alignment alternative are presented in Figure 3.5-1.

3.5.2.1 No-Action Alternative

Direct Impacts. The No-Action Alternative would result in overall beneficial noise effects for the residents in the project area. This alternative would result in increases in traffic congestion on existing Interstate 40, Highway 365, Highway 107, Highway 67 and on the local street network. This increased congestion would cause lower speeds, thereby resulting in a reduction in noise levels on these existing roadways. In addition, with no new highway facility nearby, residents in the project area would be exempt from exposure to increases in ambient noise levels.

Indirect Impacts. No indirect noise impacts are anticipated due to the No-Action Alignment.

Cumulative Impacts. Because no activities related to the proposed project would occur under the No-Action Alternative, there would be no cumulative noise impacts related to

this project. However, transportation infrastructure improvements throughout the project area would occur at a faster rate, and these improvements could have noise impacts.

3.5.2.2 Common Alignment

Direct Impacts. The construction of the Common Alignment is anticipated to adversely impact noise receptors at both the 66.0 dBA Leq (h) and the 10 dBA or greater noise levels. The total noise receptors impacted ranges between five and six for the Common Alignment regardless of which alignment alternative it is combined with. All these noise receptors are in the vicinity of Highway 365 at the very western end of the project.

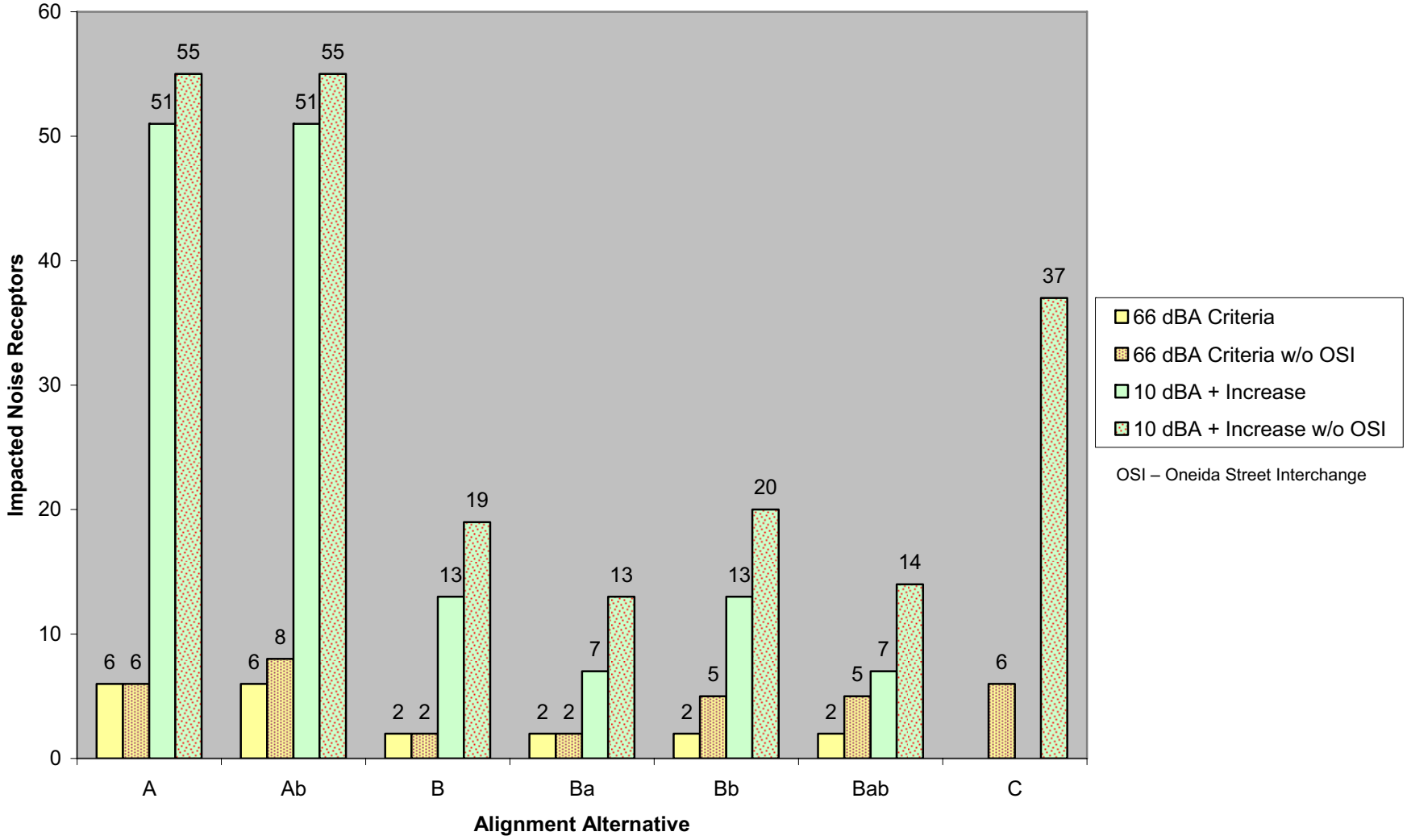
Indirect Impacts. Once the Common Alignment has been constructed, traffic volumes on the new facility would continue to increase over time, which would result in rising background noise levels. Additionally, new commercial and residential development around interchange areas could increase local traffic volumes. Consequently, the character of a neighborhood can be altered with increasing background noise levels. Individuals who reside in areas with low background noise, such as most rural locations, tend to spend more time outdoors and non-enclosed. However, with rising background noise levels, day-to-day activities, such as conversations, get louder in order to compensate. People tend to provide themselves refuges in their own personal space such as sunrooms versus open patios.

Cumulative Impacts. Because the majority of the Common Alignment is within Camp Robinson, the greatest potential for cumulative impacts would exist related to activities within the Camp. At this time, no cumulative noise impacts related to the Common Alignment are anticipated. Actions within Camp Robinson are subject to NEPA regulations, so it is anticipated that any cumulative impacts with regards to the Camp's future actions would be outlined within the associated environmental documentation.

3.5.2.3 Alignment Alternatives A and Ab

Direct Impacts. The construction of the A Alignment Alternatives is anticipated to adversely impact noise receptors, at both the 66.0 dBA Leq (h) and the 10 dBA or greater

Figure 3.5-1 Estimated Noise Receptors



noise levels. The range of impacted noise receptors for Alignment Alternatives A and Ab is 6 – 8 for the 66.0 dBA Leq (h) and 51 – 55 for the 10 dBA or greater noise levels. Alignment Alternative Ab has the same or slightly higher noise receptor impacts than Alignment Alternative A. The number of impacted noise receptors is the same or slightly higher for the A Alignment Alternatives without an interchange at Oneida Street versus with an interchange. The vast majority of the noise impacts related to the A Alignment Alternatives occur in the dense residential developments close to the Highway 107 and Kellogg Road intersection.

Indirect Impacts. The indirect impacts of the A Alignment Alternatives would be similar to those outlined for the Common Alignment, including rising noise levels due to increasing traffic volumes associated with new development around interchange areas. With an Oneida Street Interchange, the projected increase in traffic volumes on Oneida Street, as indicated on Table 2.6-2, would substantially increase noise impacts on the Northlake Estates subdivision.

Cumulative Impacts. Cumulative impacts in the project area would be related to other planned transportation projects that are reasonably foreseeable. These projects are outlined in Section 3.1.2. Cumulative impacts to noise receptors are expected to be minimal.

3.5.2.4 Alignment Alternatives B, Ba, Bb, and Bab

Direct Impacts. The construction of the B Alignment Alternatives is anticipated to adversely impact noise receptors, at both the 66.0 dBA Leq (h) and the 10 dBA or greater noise levels. The range of impacted noise receptors for the four Alignment Alternatives is 2 – 5 for the 66.0 dBA Leq (h) and 7 – 20 for the 10 dBA or greater noise levels. Alignment Alternative Bb has slightly higher noise impacts than the other B Alignment Alternatives. Noise receptor impacts are generally higher without the proposed Oneida Street Interchange versus with the interchange. The majority of the noise impacts related to the B Alignment Alternatives occur in the Kellogg Acres neighborhood area.

Indirect Impacts. The indirect impacts of the B Alignment Alternatives would be similar to those outlined for the Common Alignment, including rising noise levels due to increasing traffic volumes associated with new development around interchange areas. With an Oneida Street Interchange, the projected increase in traffic volumes on Oneida Street, as indicated on Table 2.6-2, would substantially increase noise impacts on the Northlake Estates subdivision.

Cumulative Impacts. Cumulative impacts in the project area would be related to other planned transportation projects that are reasonably foreseeable. These projects are outlined in Section 3.1.2. Cumulative impacts to noise receptors are expected to be minimal.

3.5.2.5 Alignment Alternative C

Direct Impacts. The construction of Alignment Alternative C is anticipated to adversely impact noise receptors. Six noise receptors were identified by the 66.0 dBA Leq (h) criteria and 37 noise receptors were identified by the 10 dBA or greater noise levels. The vast majority of the impacted noise receptors are located in the Kellogg Valley subdivision.

Indirect Impacts. The indirect impacts of Alignment Alternative C would be similar to those outlined for the Common Alignment, including rising noise levels due to increasing traffic volumes associated with new development around interchange areas.

Cumulative Impacts. Cumulative impacts in the project area would be related to other planned transportation projects that are reasonably foreseeable. These projects are outlined in Section 3.1.2. Cumulative impacts to noise receptors are expected to be minimal.

3.5.3 Mitigation Summary

Various methods of mitigation are available to minimize the potential noise impacts of the proposed facility. Among these are reduction of speed limits, restriction of truck traffic to specific times of the day and a total prohibition of trucks. Also, the alteration of horizontal

and vertical alignment alternatives, property acquisition for construction of noise barriers or berms, property acquisition to create buffer zones (to prevent development that could be adversely impacted) and noise insulation of public use or nonprofit institutional structures can be considered. In addition, the utilization of berms and sound barriers can also be considered.

Restriction or prohibition of trucks would not be consistent with the project's stated purpose and need. Reduction of speed limits, although acoustically beneficial, is seldom practical due to the resulting reduction of the system's operational efficiency. Design criteria and recommended termini for the proposed project prevent substantial horizontal and vertical alignment alternative shifts that would produce significant changes in the projected acoustical environment. Normally, the desire to purchase a limited amount of right of way prohibits the acquisition of buffer zones or the construction of earth berms; however, where opportunities occur to incorporate earth berms as part of the highway construction and placement of excavated waste materials, they will be evaluated as part of the design phase of the selected alignment alternative. Therefore, the construction of noise barriers and/or earth berms is considered the only prudent noise mitigation measure for this proposed facility.

For all areas where noise impacts would be most notable, noise abatement (i.e., barriers) would have to be constructed between the road and the receiver in order to effectively abate the noise produced by traffic. These areas are located in the more dense residential developments in the study corridor and would be reviewed to determine the reasonableness and feasibility of noise mitigation in future studies.

AHTD's Policy of Reasonableness and Feasibility will be applied to the residential areas near the selected alignment alternative that are identified as having the potential to be impacted by noise. Based upon the preliminary data related to noise contour information, the following areas warrant additional and detailed studies for noise barrier analysis if the adjacent alignment alternative is chosen as the Selected Alternative:

- The Windridge subdivision

- The Hidden Creek subdivision
- The Amber Oaks subdivision
- The Oakdale subdivision
- The Kellogg Valley subdivision

This detailed noise mitigation analysis will be conducted as part of the design phase of the Selected Alternative. The focus of this analysis will be in the areas that currently have existing and/or expanding residential development. The current residential development within the study area is increasing the number of sensitive receptors on a continuing basis. These changes will be evaluated and considered during the noise barrier feasibility evaluation.

3.6 SOCIOECONOMIC

3.6.1 Affected Environment

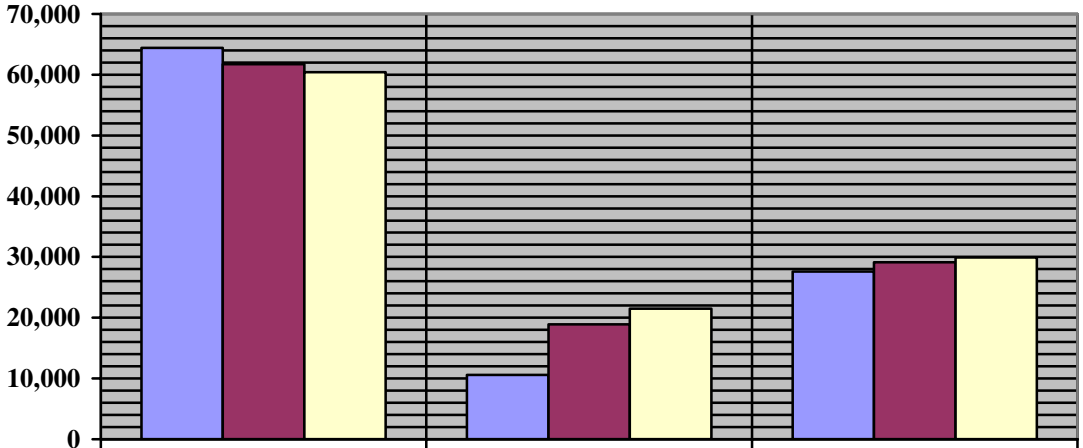
3.6.1.1 Populations

The geographic area considered for analysis of existing social conditions and environmental consequences consists of a one-county region (Pulaski County). The project study area involves three cities – North Little Rock, Sherwood, and Jacksonville. Over the recent years, the region has experienced significant population growth outside of North Little Rock, as shown in Table 3.6-1. The majority of this growth was concentrated in the Sherwood area. Detailed census information is available in Appendix E

Pulaski County is geographically located in the center of the State of Arkansas and is the most populated county in the state, with a population total of 361,474 in the year 2000. According to the 2000 US Census, the population within the project area totaled 115,092, making up 32% of the Pulaski County population. North Little Rock has the largest population of the cities in the project area, but had a 2% decrease in population between 1990 and 2000.

Although North Little Rock has declined in population, the region's population grew slightly between 1990 and 2000 due to the continued growth of Sherwood and Jacksonville. Sherwood is a smaller city located between North Little Rock and Jacksonville that grew 8.8% between 1990 and 2000. Jacksonville is located along Highway 67, between Sherwood and Cabot. Jacksonville was once a fast growing suburban area of Little Rock and North Little Rock, but its population increase has now slowed to less than 3% between 1990 and 2000.

Table 3.6-1 Population Totals



	North Little Rock	Sherwood	Jacksonville
1980	64,419	10,586	27,589
1990	61,741	18,893	29,101
2000	60,433	21,511	29,916

Population density reflects the degree of urbanization. Over time, urban growth and urban services within the study area have expanded and settlement patterns have increased in density. Between 1990 and 2000, a majority of the communities in the study area increased in population density per square mile.

The lowest densities are generally along the northern edges of the study area. Population densities increase closer to North Little Rock. Areas with higher densities within the study area include some of the smaller residential areas, such as Kellogg Valley and Runyan Acres. The highest densities generally border the larger urban centers to the south. Unincorporated

areas that are exceptions to this pattern are found in the Gravel Ridge community, which has areas that show both positive and negative population growth.

3.6.1.2 Communities

AHTD has identified two dimensions of community, *territorial* and *relational*. The *relational* dimension of community has to do with the nature and quality of relationships in that community, and these communities may have no defined territorial boundaries. A sense of community (relational) is the perception of similarity to others, an acknowledged reliance on mutual assistance, support, cooperation, or interaction with others; a willingness to maintain this reliance by giving to or doing for others, and the feeling that one is part of a larger dependable and stable structure. There are four elements of a relational community:

- Safety
- Membership
- Influence
- Integration and fulfillment of needs

Other communities seem to be defined primarily according to *territorial* existence, as in the case of neighborhoods, but even in such cases, proximity or shared territory cannot by itself constitute a sense of community.

The most common usage of the word *"community"* indicates a large group living in close proximity. Examples of local communities include:

- *Neighborhood Community* – A neighborhood community is a geographically localized community, often within a larger city or suburb. Neighborhood communities are normally stabile in age, culture, race, and the length of time its citizens remain.
- *Planned Neighborhood Community* (*Subdivision)* – A planned neighborhood community, commonly referred to as a subdivision, is one that was designed and

built more or less following the plan. These types of neighborhoods normally differ in behavior patterns, sense of socialization, and individuality.

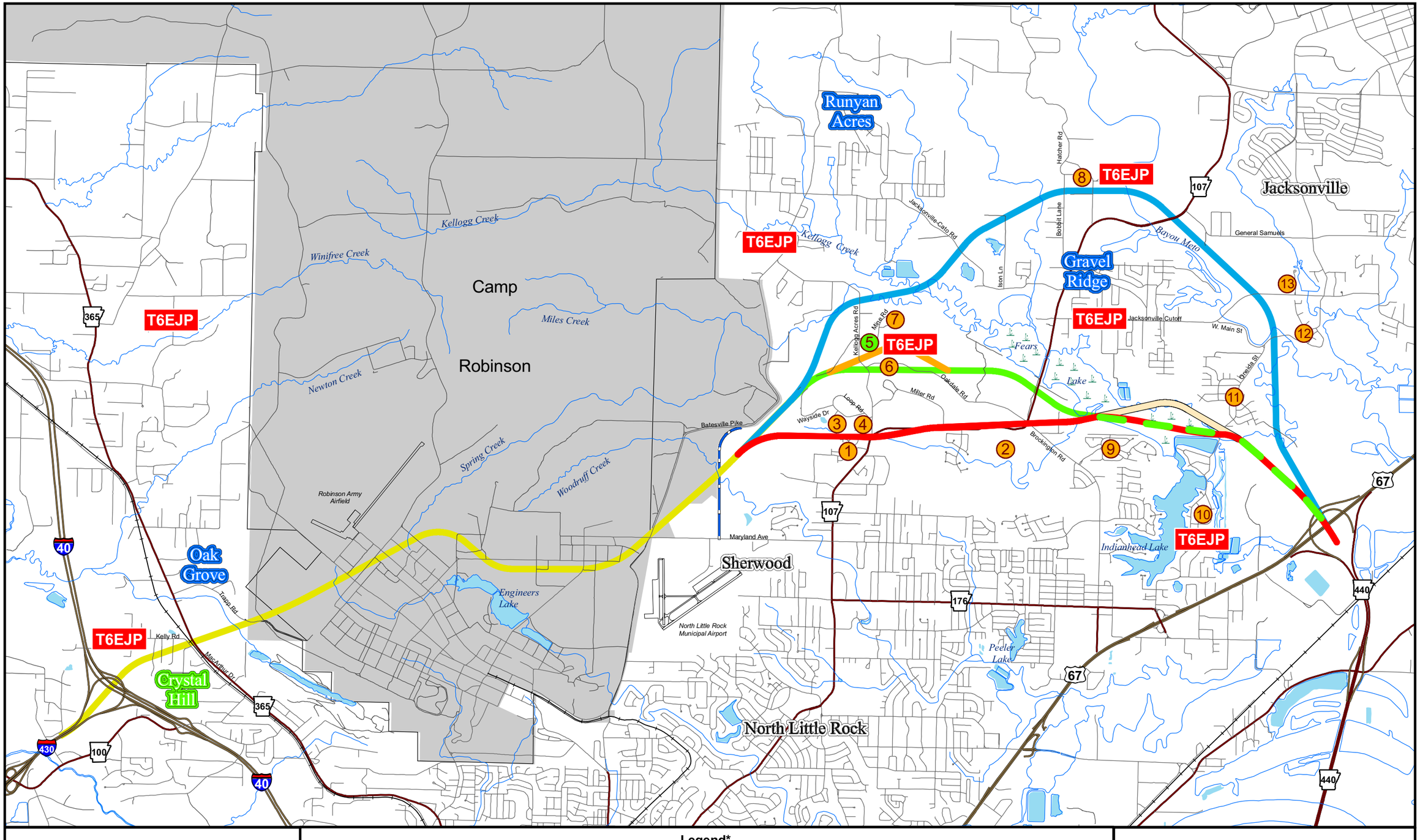
There are 17 areas identifiable as communities in and around the project area, as shown in Figure 3.6-1. These communities are categorized into relational communities and territorial communities. The territorial communities can be further subdivided into neighborhood communities and planned neighborhood communities.

The relational communities include Gravel Ridge, Runyan Acres, and Oak Grove. The territorial communities include the neighborhood communities of Crystal Hill and Kellogg Acres and the planned neighborhood communities (subdivisions) of Windridge, Miller's Crossing, Hidden Creek, Amber Oaks, Oakdale, Silver Springs, Kellogg Valley, Gap Creek, Indianhead Lake Estates, Northlake Estates, Tara Mount, and Pennpoint Estates. Detailed community descriptions are included in Appendix E.

3.6.1.3 Title VI and Environmental Justice

Illegal discrimination based on race, color, age, and national origin can limit the opportunity for minorities to gain equal access to services and programs. Title VI of the Civil Rights Act of 1964 is the federal law that protects individuals and groups from discrimination on the basis of their race, color, age and national origin in programs and activities that receive federal financial assistance.

Presidential Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations, directs federal agencies to make environmental justice part of their mission by identifying and addressing the effects of all disproportionately high and adverse human health or environmental effects of their programs, policies and activities on "minority populations and low-income populations." In order to comply with this order, the FHWA in association with the AHTD, must appropriately address the concerns of those populations potentially affected by their activities. Those individuals must be appropriately involved in the development of projects with the best fit possible within their communities without sacrificing safety or mobility.



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12/12/2006

Miles
0 0.25 0.5 1 1.5 2
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Kilometers

Legend*

- Common Alignment
- Alignment Alternative A
- Alignment Alternative B
- Alignment Alternative C
- Segment a
- Segment b
- Relocated Batesville Pike
- Camp Robinson
- 1 Windridge
- 2 Miller's Crossing
- 3 Hidden Creek
- 4 Amber Oaks
- 5 Kellogg Acres
- 6 Oakdale
- 7 Silver Springs
- 8 Kellogg Valley
- 9 Gap Creek
- 10 Indianhead Lake Estates
- 11 Northlake Estates
- 12 Tara Mount
- 13 Pennpoint Estates
- Relational Community
- Neighborhood Community
- Planned Community (Subdivision)
- T6EJP Title 6 / Environmental Justice Populations

*Colored Lines Represent a 300 ft. Wide Corridor

Figure 3.6-1
Communities and Title 6 / Environmental Justice Populations

North Belt Freeway

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Minorities are made up of non-Caucasians and are simplified into five different categories: African-Americans, Hispanic-American/Latinos, American Native Americans/Alaska Natives, Asian Americans, and Native Hawaiian/Pacific Islanders. According to the US Census Bureau, elderly populations are considered as ages 65 and older. A low-income community or population was classified in the year 2000 as having an aggregated mean annual income level for a family of four correlating to $17,463, which compares to $18,850 in the year 2004 (adjusted for inflation). Data for these populations are presented in Table 3.6-2 for Pulaski County and the project area. Base upon field observations, there were seven areas within the project area that may contain Title VI and/or Environmental Justice populations. See Figure 3.6-1 for information on locations.

Table 3.6-2
Title VI and Environmental Justice Populations

	Pulaski County	Project Area
Total Population	361,474	10,839
Minority Population (% of Total)	121,265 (34)	1,575 (15)
Hispanic or Latino Population (% of Total)	8,816 (2)	281 (3)
65 and Older Population (% of Total)	41,425 (11)	1,004 (9)
Low-Income Population (% of Total)	10,009 (10)	878 (7)

3.6.1.4 Economic Characteristics

Housing and Income Levels

Pulaski County has a higher median household income than the state average of $33,445. Some comparative data on age, household income and the median home value for the state, Pulaski County and the cities in the project area are listed in Table 3.6-3.

Table 3.6-3
Age, Household Income and Median House Value Information

Place	Median Age	Median Household Income	Median House Value
Arkansas	37.0	$33,445	$72,800
Pulaski County	35.0	$38,120	$85,300
Jacksonville	29.5	$35,460	$73,100
North Little Rock	36.5	$35,578	$76,500
Sherwood	35.9	$44,838	$91,700

The housing market continues to be strong in the Little Rock/North Little Rock Metropolitan Statistical Area (MSA) based on the number of single family housing unit permits issued over the last ten years. During each of the last three years, the number of permits has exceeded 3,000 with many of those permits for homes in Maumelle, Sherwood and Jacksonville, which will be directly served by the North Belt Freeway. Table 3.6-4 shows the strength of the housing market of the area.

Table 3.6-4
Single Family Housing Unit Permits Issued
Little Rock/North Little Rock MSA

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Total	2,007	1,867	1,759	2,064	2,280	2,001	2,197	2,459	3,160	3,075	3,396

The lack of housing over-valuation in central Arkansas, the region's affordability advantage, and local economic vitality has enabled the construction activity to remain robust through the end of 2005. Regional housing construction has so far defied the deceleration that normally accompanies rising interest rates.

Labor Force

For the year 2005, the total labor force in Pulaski County was estimated to be 195,400 with total employment of 186,425. As shown in Table 3.6-5, the total unemployment rate of 4.6% compares favorably with the state average of 5.5% and the national average of 5.7 %.

Table 3.6-5
Employment Figures for Year 2005

Place	Labor Force	Employment	Unemployment Rate
Pulaski County	195,400	186,425	4.6%
Jacksonville	13,677	12,900	5.7%
North Little Rock	32,118	30,704	4.4%
Sherwood	12,960	12,575	3.0%

The percentage of the Pulaski County labor force in each of the major employment sectors is shown in Table 3.6-6:

Table 3.6-6
Industry Percent of Labor Force

Educational, health and social services	22.8
Retailing	12.1
Manufacturing	8.6
Administrative, professional, scientific	8.5
Finance and insurance	7.7
Arts, entertainment, recreation, food services	6.9
Public administration	6.9
Transportation and warehousing	6.1
Construction	5.6

The employment sectors are diverse and serve as a good foundation for employment in the area.

Industrial Parks and Sites

Three major industrial parks- Galloway, Springhill and Rose City- are located in North Little Rock, as are a number of developed sites not situated within parks. Pulaski Industrial Park and the Little Rock Air Force Base have attracted industrial development in the Jacksonville area. All of these industrial parks and the Air Force Base would benefit from the improved access resulting from the construction of the North Belt Freeway.

Office Development

North Little Rock has experienced substantial growth in office development over the last decade and office complexes now offer a combined total of nearly one million square feet of net leaseable area. Also affected by this proposed project is the significant expansion of office development in western Little Rock that is accessed from Interstate 430. The proposed North Belt Freeway would connect directly to Interstate 430.

Retail Development

Retailing remains a major portion of the economy in central Arkansas. In 2002, retailing accounted for 35,300 jobs in the region, or about 12% of total employment. The Little Rock/North Little Rock MSA accounts for 23% of the state's population but had 29% of the value of all retail sales. For the ten-year period of 1992-2002, retail sales increased 61.3% in the USA, 60.8% in the state and 64.4% in the Little Rock/North Little Rock MSA.

North Little Rock is of special significance as it offers an impressive variety of retail facilities that draw customers from all over the state. Three of the 20 largest malls and shopping centers in the state are located in North Little Rock. The three facilities are McCain Mall, Lakewood Village, and McCain Plaza.

Conclusion

The Little Rock/North Little Rock MSA benefits from being connected by good highways to all parts of the state and serves as a hub for many economic activities with a wide array of retail, manufacturing, educational, and medical facilities. The overall economy of the project

area is strong and vibrant. Growth in several economic indicators such as population, housing, employment and retail sales has been steady over the last 15 years, and this trend is expected to continue.

3.6.2 Environmental Consequences

Transportation projects can affect communities in a variety of ways - both positively and negatively. Transportation projects may be developed without attention to the surrounding area, thereby disrupting or dividing stable and unified neighborhoods, damaging community character, promoting urban sprawl, or disrupting pedestrian mobility. Or, transportation projects can be shaped to help revitalize business districts, stimulate economic development, improve access, reinforce growth management goals, and enhance community character.

Public Involvement is one method to assure that transportation projects are developed with full consideration of their impacts on people and their communities by affirming the following goals:

Responsive Coordination: Promote citizen involvement and response on community-sensitive decision-making in planning and developing transportation projects that embrace community concerns such as land use issues, environmental preservation, or economic development. Responsive Coordination seeks to minimize conflict, and works to help solve community problems by assisting to promote livable and stable communities by placing priority on preserving or enhancing community character, neighborhood cohesion, social interaction, safety, and general quality of life.

Nondiscrimination: Ensures that decision-makers are alerted to environmental justice issues by recognizing impacts on all segments of society and avoiding disproportionate impacts on specific populations.

3.6.2.1 Social and Community Impacts

Social impacts are all social and cultural consequences of public or private actions that alter the ways in which people live, work, and play, relate to one another, organize to meet their needs, and generally cope as members of society.

This wide-ranging definition for describing the nature of social impacts may be outlined as changes in one or more of the following:

- Way of life – the way people live, work, play, and interact with one another on a day-to-day basis;
- Culture – shared beliefs, customs, and values;
- Community – its cohesion, stability, character, services, and facilities; and
- Quality of the environment – the quality of air and water, the level of dust and noise experienced, safety and fears about security, etc.

This, in terms of the individual or household, may become a:

- Reduction in perceived quality of life;
- Change in status or type of employment;
- Worsening of economic situation, level of income, property values;
- Disruption in everyday life (having to do things differently); and
- Changed attitude towards local community or level of satisfaction with the neighborhood.

Due to the proximity of the alignment alternatives within the study area, they are expected to have similar social impacts. Social impacts may not necessarily be dictated by the precise physical location of the proposed highway, but rather by the presence of the proposed highway through the local area, regardless of the particular alignment alternative location.

Before or during the construction period of the project, temporary increases in traffic congestion, disruption of traffic patterns, and changes in access may occur. Access impacts can be caused by road closures, roadway relocations, or driveway relocations. Access changes can affect homeowners and businesses by increasing or decreasing travel times to

destinations. In some cases, the initial inconvenience of new routes might be substantial, however roadway plans will be designed to minimize these impacts. These types of impacts occur to varying degrees with all of the alignment alternatives.

The proposed project will not sever any subdivisions or urban neighborhoods. The project may affect individuals or clusters of homes and businesses. Some relocations and loss of access to homes and businesses may occur to citizens along each of the alignment alternatives. The proposed highway project could affect property values of homes that are in proximity to the proposed freeway. Thus, community cohesion will likely not be adversely impacted by implementation of the proposed project.

3.6.2.2 Title VI and Environmental Justice Populations Impacts

The project area was evaluated to determine if there is a potential for disproportionate and adverse impacts to low-income, elderly or minority populations. Using US Census data, the Health & Human Services Poverty Guidelines and field observations, it was determined that the Crystal Hill and Gravel Ridge areas will receive the largest impacts to minority and low-income populations within the project area. Field evaluations determined that minor impacts, if any at all, will occur to the minority populations in Indianhead Lake Estates, Gap Creek, Windridge, and in the vicinity of Jacksonville Cato Road and Highway 107 in Gravel Ridge. Additional studies and information show minor impacts to the elderly in the communities of Gap Creek, Oakdale and Kellogg Acres. For more information about Environmental Justice requirements and procedures see Appendix E.

Based on the environmental justice analysis conducted by the AHTD, the proposed project does not have the potential to exert a high and/or adverse impact upon minority, elderly, or low-income populations within the vicinity of this project. While some impacts may be borne by minority and low-income residents, the level of impact would not be disproportionately high and, therefore, would not be considered specifically as an environmental justice impact.

3.6.2.3 Relocations

Relocation of homes and businesses affects people in many different ways. The individual's income, race, and age, among other factors, influence a person's ability to adjust to relocation and that person's attitude towards it. To some degree, most people who are relocated will experience some psychological adjustment problems. In most cases, these problems are minor, and the individuals successfully re-adjust. However, some of these psychological problems can lead to a behavior that may be disruptive to their life, therefore every effort is made to minimize relocations in the planning and design of highway facilities.

Table 3.6-7 provides a general listing of the numbers of residences and businesses that will be relocated by each alignment alternative. Special attention will be given to all relocatees to ensure that replacement housing will be obtained within their monetary means. Also, special relocation advisory services and assistance services will be administered commensurate with all relocatees' needs.

Table 3.6-7
Relocation Impacts

	Alignment Alternatives				
	Common	A & Ab	B & Bb*	Ba & Bab*	C
Total Relocations	**33**	**37**	**22**	**14**	**41**
Residential Owners	20	30	12	6	27
Residential Tenants	3	7	8	8	14
Businesses	8	0	1	0	0
Non-Profit Businesses	0	0	0	+0	0
Total Minorities	0	0	0	0	0
Total Elderly	3	0	4	2	0
Total Low-Income	0	2	2	3	0

*Residential tenant relocations will be reduced by seven if a grade separation is utilized at Oneida Street instead of an interchange.

In terms of age and ability to adjust to relocation, there is some evidence indicating that the elderly and low-income usually suffer more from relocation than do any other category of citizens. The elderly and the low-income citizens may rely heavily on long established travel

patterns and access to transportation and relocation can disrupt their established patterns of travel and their working habits.

For lower income persons, relocation can become a major problem if the new housing obtained as a result of relocation costs more to maintain. Also, as a result of higher population densities in lower income neighborhoods, there may be a higher degree of interaction between neighborhoods, and therefore a greater degree of attachment to the older neighborhoods. Conversely, some people of the lower income may welcome the opportunity to depart from their neighborhood and environments.

Appendix E contains a Conceptual Stage Relocation Statement and Housing Inventory that was compiled with the cooperation of local real estate companies and newspapers. The housing inventory provides an estimate of the available housing and is an indication of the state of the market for this area. This information will be further refined when the project is designed and right of way is purchased.

3.6.2.4 No-Action Alternative

Direct Impacts. Because no activities related to the proposed project would occur under the No-Action Alternative, there would be no direct impacts on Title VI/Environmental Justice populations or communities.

Indirect Impacts. Because no activities related to the proposed project would occur under the No-Action Alternative, there would be no indirect impacts on Title VI/Environmental Justice populations or communities.

Cumulative Impacts. Because no activities related to the proposed project would occur under the No-Action Alternative, there would be no cumulative social impacts related to this project. However, transportation infrastructure improvements throughout the project area would occur at a faster rate, and these improvements could have social impacts.

3.6.2.5 Common Alignment

Direct Impacts. The Common Alignment would potentially displace 20 residential owners, three residential tenants, and eight businesses (22 employees). Based on field observations, three of the 20 residential owners appear to be elderly families. All the residential and business relocations occur within the Crystal Hill neighborhood. Direct adverse impacts could result from traffic related noise and visual effects associated with the new facility.

Indirect Impacts. The proposed highway could accelerate current development trends. The use of public services such as police, fire, and emergency medical, may be impacted during construction. The proposed highway could encourage commercial/residential development at or near this project, particularly near the proposed interchange/grade separation at Highway 365 near the Crystal Hill area. The outcome of a new highway interchange in an urbanized area is difficult to predict. Some interchanges, depending on the location and environmental structure, are clearly essential in turning around distressed areas and encouraging economic growth. Others do little to stimulate growth and revive a struggling economy, and some have a mix of significant positive and negative impacts.

No two situations are ever identical. There are, however, important lessons to be learned from the experiences of communities elsewhere with major highway infrastructure projects. In general, the following can occur:

- Interchanges between two highways most notably have an effect on an area's access to nearby business and commercial markets. Likewise, the area around a new interchange is more readily accessible from other regional markets. Improved accessibility can generate development pressures. Natural and other land use limitations, as well as zoning regulations, can channel where and if such development occurs.

- Areas that are distressed will not necessarily experience an economic upswing as a result of an interchange. Some interchanges give developers a reason to build heavily in the area. Others have no effect on economic growth in struggling areas.

- The design of an interchange can have important implications for development potential in its vicinity. Sites adjacent to an interchange may suffer from aesthetic harm caused by a particularly large or poorly located interchange.

Cumulative Impacts. Because the majority of the Common Alignment is within Camp Robinson, the greatest potential for cumulative impacts would exist related to activities within the Camp. At this time, no cumulative socioeconomic impacts related to the Common Alignment are anticipated. Actions within Camp Robinson are subject to NEPA regulations, so it is anticipated that any cumulative impacts with regards to the Camp's future actions would be outlined within the associated environmental documentation.

3.6.2.6 Alignment Alternatives A and Ab

Direct Impacts. The A and Ab Alignment Alternatives would potentially displace 30 residential owners and seven residential tenants (apartment building). Based on field observations, two of the seven residential tenants appear to be low-income families. If a grade separation were to be built at Oneida Street instead of an interchange, there would be seven less residential tenant relocations.

The A and Ab Alignment Alternatives are adjacent to the south side of the Hidden Creek, Amber Oaks, and Northlake Estates subdivisions and the northern side of the Windridge subdivision. These alignment alternatives are just to the north of the Miller's Crossing, Gap Creek, and Indianhead Lake Estates subdivisions. Residential relocations would be required within the Hidden Creek, Amber Oaks, and Windridge subdivisions. There would be damages to vacant residential lots in the Northlake Estates subdivision. Direct adverse impacts could result from traffic related noise and visual effects associated with the new facility.

Indirect Impacts. The A Alignment Alternatives would have similar indirect impacts as outlined for the Common Alignment, particularly at the proposed interchange near Highway 107 and Brockington Road and near Oneida Street.

Cumulative Impacts. Cumulative impacts in the project area would be related to other planned transportation projects that are reasonably foreseeable. These projects are outlined in Section 3.1.2. Cumulative socioeconomic impacts are expected to be minimal.

3.6.2.7 Alignment Alternatives B, Ba, Bb, and Bab

Direct Impacts. Alignment Alternatives B and Bb would potentially displace 12 residential owners, eight residential tenants (seven in a single apartment building), and one business (three employees). Based on field observations, four of the 12 residential owners appear to be elderly families and two of the eight residential tenants appear to be low-income families. If a grade separation is built at Oneida Street instead of an interchange, the apartment building would not be impacted resulting in seven less residential tenant relocations.

Alignment Alternatives B and Bb would run adjacent to the south side of the Kellogg Acres neighborhood and the Oakdale and Northlake Estates subdivisions. These alignment alternatives would run just north of the Gap Creek and Indianhead Lake Estates subdivisions. Residential relocations would be required within the Kellogg Acres neighborhood. Additionally, residential relocations and one business relocation would be required in the Oakdale subdivision. There would be damages to vacant residential lots in the Northlake Estates subdivision.

Alignment Alternatives Ba and Bab would displace six residential owners and eight residential tenants (seven in one apartment building). Based on field observation, two of the six residential owners appear to be elderly families. Based on field observation, three of the eight residential tenants appear to be low-income families. If a grade separation is built at Oneida Street instead of an interchange, the apartment building would not be impacted, resulting in seven less residential tenant relocations.

Alignment Alternatives Ba and Bab would go between the Kellogg Acres neighborhood and the Oakdale subdivision and run adjacent to the south side of the Silver Springs and Northlake Estates subdivisions. These alignment alternatives would run just north of the Gap Creek and Indianhead Lake Estates subdivisions. Residential relocations would be

required within the Kellogg Acres neighborhood. There would be damages to vacant residential lots in the Northlake Estates subdivision. Although these alignment alternatives would run between Kellogg Acres neighborhood and Oakdale subdivision, a grade separation at Kellogg Acres Road would allow for a connection between the two communities to remain.

Indirect Impacts. The B Alignment Alternatives would have similar indirect impacts as outlined for the Common Alignment, particularly at the proposed interchanges near Highway 107 and near Oneida Street

Cumulative Impacts. Cumulative impacts in the project area would be related to other planned transportation projects that are reasonably foreseeable. These projects are outlined in Section 3.1.2. Cumulative socioeconomic impacts are expected to be minimal.

3.6.2.8 Alignment Alternative C

Direct Impacts. Alignment Alternative C would displace 27 residential owners and 14 residential tenants. Alignment Alternative C bisects the Kellogg Valley subdivision. It will go just to the north of the Kellogg Acres neighborhood and the Silver Springs subdivision, to the west of Pennpoint Estates and Tara Mount subdivisions, and east of the Northlake Estates subdivision. Residential relocations would be required within the Kellogg Valley subdivision. The majority of the residential tenants occupy mobile homes located in Kellogg Valley Mobile Home Park. Based on field observation, none of the relocatees appear to be elderly, minorities, or low-income families. Direct adverse impacts could result from traffic related noise and visual effects associated with the new facility.

Indirect Impacts. Alignment Alternative C would have similar indirect impacts as outlined for the Common Alignment, particularly at the proposed interchanges near Jacksonville-Cato Road and Jacksonville Cutoff.

Cumulative Impacts. Cumulative impacts in the project area would be related to other planned transportation projects that are reasonably foreseeable. These projects are outlined in Section 3.1.2. Cumulative socioeconomic impacts are expected to be minimal.

3.6.2.9 Economic Impacts

The Little Rock-North Little Rock MSA has historically had a balanced economy that insulates the area from large booms and busts. The employment sectors are diverse and serve as a good foundation for employment in the area.

For the year 2005, the total labor force in Pulaski County was estimated to be 195,400 with total employment of 186,425. The total unemployment rate of 4.6% compares favorably with the state average of 5.5% and the national average of 5.7 %. Table 3.6-8 shows the number of jobs in each of the area's major communities and the jobs held by city residents as reported to the 2000 census. Note that just slightly more than one-third (37%) of the total jobs are in cities north of the Arkansas River and nearly the same percent (36%) are held by residents of the same city. These figures indicate a great deal of commuting across northern Pulaski County as well as into the southern part of the county and into Faulkner County.

Three of the 20 largest malls and shopping centers in the state are located near each other in North Little Rock. These and other smaller centers in the Highway 67 corridor in the vicinity of McCain Boulevard attract large number of employees and shoppers from long distances throughout central Arkansas and beyond. All employment centers would benefit from improved access provided by the construction of the North Belt Freeway. This is emphasized by the cross-county commuting indicated by the statistics in Table 3.6-8. Improved traffic operations should enhance business opportunities and no negative impacts are expected due to diverted traffic, as the remaining traffic should easily support highway-oriented businesses.

In addition to the benefits of enhanced traffic operations and improved accessibility, the short-term benefits include highway construction jobs and the related indirect benefit of jobs for material supplies.

Table 3.6-8
Employment by City 2000
Little Rock-North Little Rock Metropolitan Statistical Area

City	Total Jobs by Place of Work	% of Total	Total Jobs Held by City Residents	% Jobs Held by City Residents
Cabot	5,077	2	1,730	34
Conway	30,410	11	14,240	47
Jacksonville	14,946	6	6,680	45
Maumelle	4,862	2	950	20
North Little Rock	37,948	14	11,035	29
Sherwood	6,903	3	1,825	26
Totals	100,146	37	36,460	36
Benton	10,140	4	4,225	42
Bryant	3,507	1	845	24
Little Rock	153,866	57	72,090	47
Totals	167,513	63	77,160	46

Source: 2000 Census Transportation Planning Package, Part III from *Metrotrends*, Metroplan, December 2005.

Site-specific economic impacts by the proposed project are expected to be limited. Only a few commercial relocations are anticipated as the proposed alignment alternative corridors pass through largely undeveloped or residential areas.

Both of the large military installations in the area are expected to benefit from improved access. The Little Rock Air Force Base would have its access improved by the Highway 107 Interchange, especially the location proposed by Alignment Alternative C. All the alignment alternatives should take some pressure off the congested Vandenberg Boulevard Interchange on Highway 67. Camp Robinson would also be well served by the proposed interchanges on Batesville Pike and on Highway 365. Although all proposed alignment alternatives pass through Camp Robinson, care has been taken to coordinate with Camp officials to maintain the continuity of interior roads through the proposed construction of grade separations along the proposed project.

The North Little Rock Airport is another important economic engine in the project area that is expected to benefit from enhanced accessibility. The airport is home to approximately 180 corporate and private aircraft and is used extensively by the business community with over

56,000 operations occurring per year. The airport is also home to the national Weather Service and has two fixed based operators. The location of the Batesville Pike Interchange just to the north of the airport would enhance the airport's accessibility dramatically with no negative impacts expected.

The intersection of Highway 107 and Brockington Road in Sherwood is an area slated for commercial development by the city's long-range land use plan. The presence of a North Belt Freeway Interchange would be expected to ensure that this would occur and perhaps enhance the area's retailing significance by the improvement in accessibility.

The No-Action Alternative could be expected to have a negative economic effect due to increased congestion and less direct connections between economic centers in the region.

3.6.3 Mitigation Summary

Residents and business owners within the proposed right of way for the project will be eligible for relocation assistance in accordance with Public Law 91-646. It is the policy of the AHTD that adequate replacement housing be made available, or built if necessary, before any person is required to move from their occupied dwelling. It is required that relocation specialists conduct relocation studies and available housing inventories for all replacement housing and businesses.

Businesses are an integral part of the make-up of a neighborhood, particularly when the wage earner is employed within one of the businesses. A commercial property inventory indicated there are ten commercial properties available in the project area. At the time of displacement, another inventory of available units in the area will be obtained and an analysis of the market will be performed in order to ensure that these units are adequate to meet the needs of the relocatees. Any businesses displaced should have an opportunity to relocate. However, in the case of single proprietorship businesses, a special problem arises. Most of these are small neighborhood businesses that usually rely on neighborhood patronage. If relocation necessitates moving out of the neighborhood, a small business may fail if this property is outside of the neighboring area. In this case, in order to assist the displaced businesses in relocating within the local area, AHTD will explore all possible sources of funding or other

resources that may be available to businesses. Sources that will be considered include but are not limited to: state and local entities, the Department of Housing and Urban Development, the Economic Development Administration, the Farmers Home Administration, the Small Business Administration and other federal agencies.

All displaced persons, businesses, and nonprofit organizations are eligible for reimbursement for actual moving costs. These persons may also be eligible for re-establishment cost payments or payments in lieu of moving. These payments are made according to a fixed schedule or through bids received by AHTD. The relocatees have the option of which method they will use in order to move their personal property or business.

Appropriate measures will be taken to ensure that the businesses to be displaced are fully aware of their benefits and entitlements, course of action, and any special provisions designed to encourage businesses to relocate within the same community.

At the moment, there are no other identified unusual conditions involved with this project. Further steps to minimize relocations will be considered during the final design of the project. Where avoidance is not possible, as in the case with the Common Alignment, the acquisition and relocation process will be conducted in accordance with the Uniform Relocation Assistance and Real Property Policies Act of 1970. Relocation resources are made available to all residents and businesses without discrimination and are comparable to the needs of the relocatees.

It is the AHTD's policy that fair housing and replacement of businesses be offered to all affected persons regardless of race, color, age, religion, sex, or national origin. Construction of these projects will not begin until decent, safe, and sanitary replacement housing is in place and offered to all affected persons.

Existing housing resources within the areas of North Little Rock, Sherwood, Gravel Ridge, and Jacksonville may be necessary for relocation of the displaced households and businesses in the project area. Current vacant housing in the area may be utilized for this purpose. The displaced residences may be relocated in housing of higher quality and value than their existing residence under the policies and guidelines of the Uniform Relocation Assistance

and Real Property Acquisition Act of 1970. The displaced residential tenants will also be provided assistance through the Relocation Program, and emphasis will be given to provide relocation counseling to elderly, low-income, and businesses that are in need. The provision of suitable and acceptable replacement housing, combined with adequate relocation payments, can be expected to minimize adverse relocation impacts resulting from project implementation.

3.7 HYDROGEOLOGY AND GROUNDWATER

3.7.1 Affected Environment

The project area is located near the boundary of two physiographic regions, the Ouachita Mountains and the Mississippi Alluvial Plain. Most of the project area is located within the Ouachita Mountains region, except for a small area near the project's eastern terminus at Highway 67.

Groundwater in the Ouachita Mountains is obtained from a thick sequence of sandstone, shale, slate, chert and novaculite. The materials in the weathered zone are more porous and permeable than the original unweathered rock with water storage occurring between the individual soil particles. The maximum thickness of these sequences is 20 feet (6 meters). Weathering has not affected the rock below the water table; and groundwater generally occurs only in secondary openings such as joints, fractures, and solution channels. This significantly affects the potential groundwater production capacity of the unweathered rock.

Groundwater moves in the direction of the slope of the water table. In the weathered zone, this slope generally follows the topography, however in the unweathered zone, the slope of the water table is controlled mainly by geologic structure with groundwater generally moving toward the synclinal axes and away from the anticlinal axes.

Permeabilities are relatively low in the Ouachita Mountains strata. Wells drilled into these rocks seldom yield more than 5 - 10 gallons (19 - 38 liters) per minute. Maximum water-level fluctuations normally do not exceed 10 - 20 feet (3 - 6 meters) during a given year, although the levels in certain wells may fluctuate as much as 80 feet (24 meters) in a six month period (Plebuch and Hines, 1967). The drilling of dry holes is common in this

Ouachita Mountains region. When a water well is developed in this region, usually its quantity is inadequate and its quality is poor. Water production is generally between 5 - 10 gallons (19 - 38 liters) per minute with iron ranging from 0.01 to 0.74 parts per million (ppm) and total dissolved solids from 72 - 414 ppm.

The abandoned Kellogg Mining area lies within the project area in the Interior Highlands region. Some of these mine shafts are known to reach depths of 100 feet (30 meters) or more. These mines can allow for a direct connection of surface water with the groundwater resulting in limited filtration of the surface water by the soil.

A small portion of the project area is located in the Mississippi Alluvial Aquifer, which has prolific groundwater production. This area is a wedge section abutting the Ouachita Mountains and is relatively thin, reducing the relative production capacity and quality of any aquifer identified. The aquifer is an alluvium aquifer that normally has poor water quality and minimal domestic value, but important agricultural value.

The predominant characteristic of the alluvium is the change from gravel or coarse sand at the base of the aquifer to fine material at the top. The alluvium may generally be divided into two parts: a lower part consisting of gravel and sand with minor amounts of silt and clay, and an upper part consisting of silt and clay with minor amounts of sand. The portion of alluvium affected by the alignment alternatives is relatively thin and predominately clay with sand near the base. The groundwater available from this aquifer is of relatively poor quality with its primary value as irrigation water for agricultural purposes.

Depths to water in wells in the alluvium ranges from 10 - 40 feet (3 - 12 meters) below land surface. Annual fluctuations of water levels rarely exceed 10 feet (3 meters) (Plebuch and Hines, 1967) and normally are caused by seasonal changes in irrigation pumpage rates more than from variations in the rates of recharge from precipitation. These water wells generally yield calcium bicarbonate-type water with dissolved mineral constituents and a variety of physical properties. Iron concentrations in 90 samples ranged from 0.1 - 52 ppm, dissolved solids in three samples from 242 - 327 ppm, and hardness in 76 samples from 6 - 505 ppm. (Plebuch and Hines, 1967).

3.7.2 Environmental Consequences

Road construction and maintenance can impact groundwater through flow modification and water quality impacts. Water table levels in the immediate area of a roadway can be lowered due to road excavation and drainage. Embankments and structures can cause an increase in water table levels. Groundwater quality can be affected when impaired surface water seeps underground. Surface water can become impaired by the construction and maintenance of roadways through increased sedimentation, spills of chemicals and pollutants, and salting of roadways. Chronic surface water impairment along high traffic volume roads can occur from exhaust emissions, pavement tire wear, petroleum drippage, and corrosion of metals. These impacts on groundwater quantity and quality can have effects on vegetation growth, susceptibility of soil to erosion, loss of water for drinking and agricultural use, and habitat changes for fish and wildlife.

3.7.2.1 No-Action Alternative

Direct Impacts. The No-Action Alternative would not involve new construction, thus no impacts on groundwater would occur due to construction activities.

Indirect Impacts. No indirect impacts on groundwater are anticipated as a result of the No-Action Alternative.

Cumulative Impacts. No cumulative impacts on groundwater are anticipated as a result of the No-Action Alternative. However, increased traffic volumes on the existing network would result in increasing amounts of pollutants in highway runoff, decreasing safety levels, and a greater potential for hazardous materials spills that could impact the groundwater.

3.7.2.2 Alignment Alternatives

Direct Impacts. Groundwater resources in the Ouachita Mountains of Pulaski County are not considered a reliable and significant groundwater resource. Also, the availability of public water supplies in the study area minimizes the value of the Ouachita Mountains aquifers as a significant groundwater resource. Only minor portions of Mississippi

Alluvial Plain alluvial aquifer are affected by the alignment alternatives. This aquifer is considered important for agriculture irrigation purposes, but has limited value for domestic purposes due to the water quality of the aquifer and the availability of public water supplies. For the reasons outlined above, it is anticipated that only minor impacts would result to groundwater from construction and maintenance of any of the alignment alternatives.

Indirect Impacts. No indirect impacts on groundwater are anticipated as a result of this project.

Cumulative Impacts. Cumulative impacts in the project area would be related to other planned transportation projects that are reasonably foreseeable. These projects are outlined in Section 3.1.2. No cumulative impacts to groundwater are anticipated.

3.7.3 Mitigation Summary

During the alignment alternative refinement process, alignment alternatives through the known extent of the Kellogg Mine area were dropped from consideration due to the environmental, engineering, and cultural resources concerns associated with the area.

Special provisions and actions will be required during the design and construction phase to protect groundwater in the vicinity of the Kellogg Mines. These commitments will include ditch paving through highly vulnerable areas, including areas where conduits directly leading to the groundwater are discovered during construction. Coordination with state and federal agencies involved with groundwater quality protection will be conducted as needed when concerns are identified.

3.8 SURFACE WATER QUALITY AND QUANTITY

3.8.1 Affected Environment

3.8.1.1 Surface Water Quality

Arkansas has six major river basins: Arkansas River, Mississippi River, Ouachita River, Red River, St. Francis River, and White River. All of the waters within the proposed project area fall in the Bayou Meto and Tributaries segment of the Arkansas River Basin. The waters

within this segment have been designated as suitable for the propagation of fish and wildlife, primary and secondary contact recreation and public, industrial and agricultural water supplies (ADEQ, 2002).

Bayou Meto is currently on the 303(d) list of impaired waters based on the presence of priority organics resulting from industrial pollution within the watershed. Although the source of the contamination has been eliminated, one organic pollutant, dioxin, has been detected in fish tissues collected from Bayou Meto, and a fish consumption advisory has been issued. Other threats to water quality in the watershed include irrigation for agricultural purposes (ADEQ, 2002).

The Federal Water Pollution Control Act declares the discharge of any pollutants into the waters of the United States from any point source is unlawful, except under the terms and conditions of a permit issued under the National Pollutant Discharge Elimination System (NPDES). Any construction disturbing an area of one acre (0.4 hectare) or more in Arkansas is required to obtain an NPDES permit for storm water discharge from the Arkansas Department of Environmental Quality (ADEQ). As of 2002, ten facilities within the proposed project area had been issued NPDES permits (ADEQ, 2002).

3.8.1.2 Floodplains and Floodways

The protection of floodplains and floodways is required by Executive Order 11988, *Floodplain Management*; US DOT Order 5640.2, *Floodplain Management and Protection*; and 23 Code of Federal Regulations 650. The intent of these regulations is to avoid or minimize, where practicable, highway encroachments within the 100-year (base) floodplain and to avoid supporting land use development that is incompatible with floodplain values.

Floodplains have many natural and beneficial values. These values include, but are not limited to fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural moderation of floods, water quality maintenance and groundwater recharge.

In order to provide a national standard without regional discrimination, the 100-year flood has been adopted by the Federal Insurance Administration as the base flood for purposes of floodplain management measures. The 500-year flood is used to indicate additional areas of flood risk in the community. Encroachment on floodplains, such as placement of fill material, reduces the flood-carrying capacity, increases the flood heights of streams, and increases flood hazards in areas beyond the encroachment itself. Under the concept used by the National Flood Insurance Program (NFIP), the area of the 100-year flood is divided into a floodway and a floodway fringe. The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment in order that the 100-year flood may be carried without substantial increases in flood heights. Minimum standards of the NFIP limit such increases in flood heights to 1.0 foot (0.3 meter), provided that hazardous velocities are not produced.

Pulaski County, as well as Sherwood and Jacksonville, all participate in the NFIP. Flood Insurance Rate Maps and Flood Hazard Boundary Maps were obtained for these communities. Within this study area, the largest floodplain areas occur along Bayou Meto and Kellogg Creek (Figure 3.8-1).

3.8.2 Environmental Consequences

3.8.2.1 Water Quality

Runoff related to permanent operation of the facility can contribute an array of pollutants to surface and groundwater resources. Highway runoff may contain solids, heavy metals, nutrients, petroleum products, bacteria, and other pollutants. They accumulate on highway surfaces, roadside areas, and rights of way from sources such as highway use, maintenance, natural sources, and deposition of air pollution. Highway pollutants, such as solids, heavy metals, and organics (found in fuels and motor oils) have been found to relate directly with traffic volume. Traffic-related pollutants are better controlled using site-specific measures. Other pollutants (herbicides and nutrients) are found in highway runoff mainly as a result of highway maintenance activities and adjacent land use contributions. Maintenance related pollutants are better controlled through the use of general measures, such as herbicide and fertilizer application management.

The impacts of highway runoff pollution on aquatic ecosystems are extremely site and runoff-event specific. Although all highway runoff contains pollutants, the pollutant loading does not always constitute a problem for receiving waters.

Stream crossings and types of structures along each proposed alignment alternative are shown on Figures 3.8-2 and 3.8-3. None of the streams have been designated as Extraordinary Resource Waters, Ecologically Sensitive Waterbodies, or Natural and Scenic Waterways (APCEC, 2004).

Potential surface water quality impacts were compared for the alignment alternatives using a method developed by AHTD. The alignment alternatives were plotted on USGS topographic quadrangle maps to determine which streams might be impacted. Any intermittent or perennial streams traversed or closely paralleled by an alignment alternative were defined as potentially impacted for this analysis. Two parameters were determined for each stream crossing, and a rating system devised to calculate a crossing specific water quality index (WQI). Intermittent streams received a Flow Rating = 1, and perennial streams received a Flow Rating = 2. A stream which had a perpendicular crossing by the main lanes received an Impact Area Rating = 1.

A stream which had a linear impact by the main lanes received an Impact Area Rating = 2. Streams which would be impacted by both the main lanes and ramps in an interchange received an Impact Area Rating = 3. The equation Flow Rating x Impact Area Rating = WQI was used to get scores for each stream crossing along the alignment alternatives. The average WQI scores were computed for each alignment alternative (Table 3.8-1). The higher the WQI score, the more potential exists for water quality impacts. Additional information about the WQI method, WQI scores, and specific details of each crossing are included in Appendix G.

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7/17/2006

Miles
0 0.125 0.25 0.5 0.75 1
Approximate Scale
0 0.2 0.4 0.8 1.2 1.6
Kilometers

Legend

- 100 Year Floodplain
- Alignment Alternatives
- Interchange
- Grade Separation
- Camp Robinson Boundary
- Relocated Batesville Pike
- Interchange or Grade Separation (...to be determined)

Photography Date: 2/11/2005

Figure 3.8-1
Floodplains
North Belt Freeway

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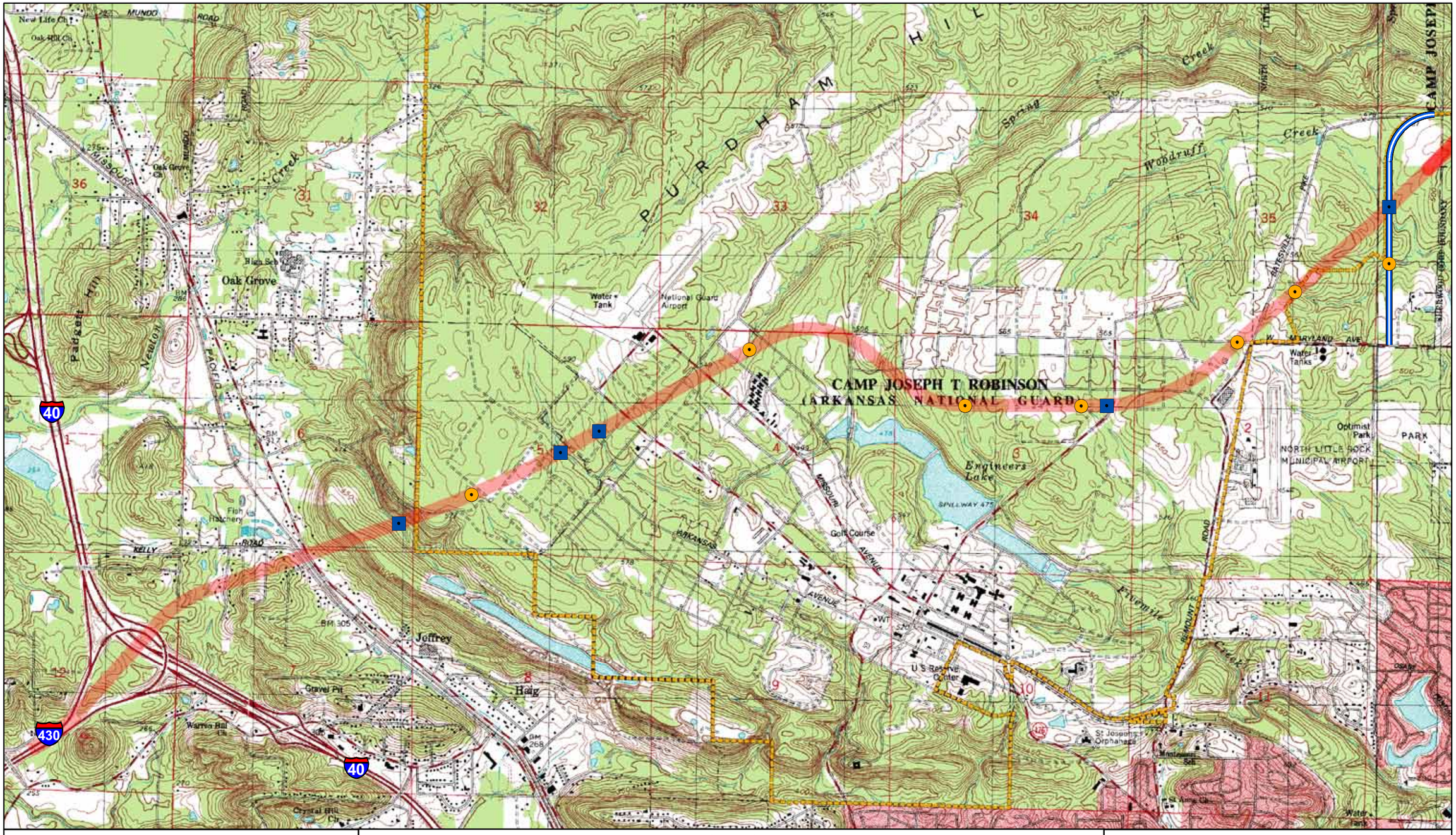

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Miles
0 0.125 0.25 0.5 0.75 1

Approximate Scale

0 0.2 0.4 0.8 1.2 1.6
Kilometers

Legend

- Common Alignment
- Camp Robinson Boundary
- Relocated Batesville Pike
- Box Culvert
- Pipe Culvert

NLR, Cato, Olmstead, and McAlmont USGS Topographic Maps (1988)

3.8-2
Common Alignment
Waters of the US Crossings
North Belt Freeway

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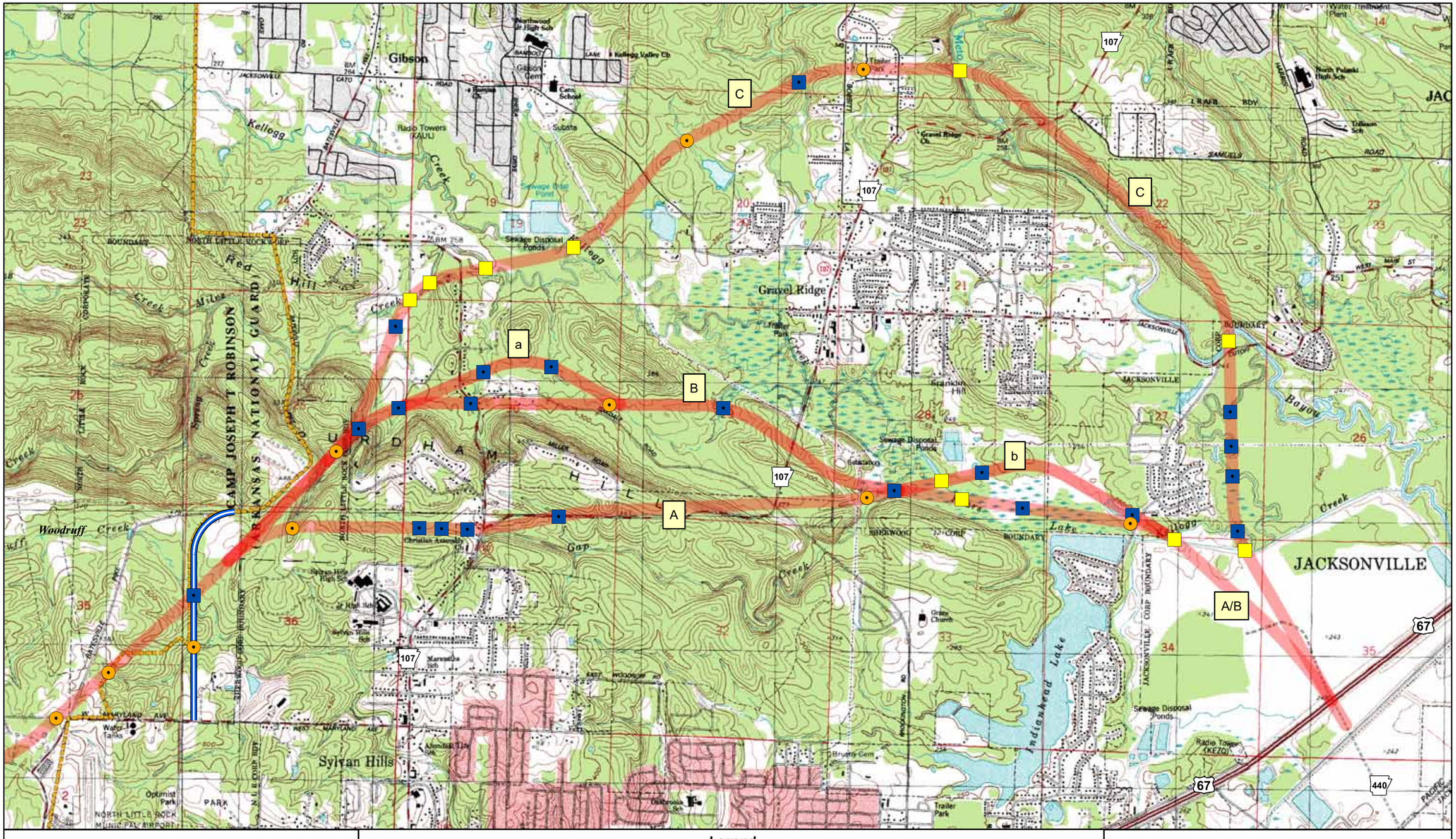

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7/17/2006

Miles
0 0.125 0.25 0.5 0.75 1
Approximate Scale
0 0.2 0.4 0.8 1.2 1.6
Kilometers

Legend

- Alignment Alternatives
- Camp Robinson Boundary
- Relocated Batesville Pike
- Bridge*
- Box Culvert
- Pipe Culvert

(Symbol represents apprx. centerpoint; bridges may be longer than depicted)

NLR, Cato, Olmstead, and McAlmont USGS Topographic Maps (1988)

Figure 3.8-3
Alignment Alternatives
Waters of the US Crossings
North Belt Freeway

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Table 3.8-1
Stream Crossings and Average Water Quality Index Ratings

Alignment Alternative	Stream Crossings	Average WQI Rating
Common	12	1.2
A	11	2.9
A w/o OSI*	11	2.5
Ab	11	2.9
Ab w/o OSI	11	2.5
B	11	2.8
B w/o OSI	11	2.5
Ba	12	2.7
Ba w/o OSI	12	2.3
Bb	11	2.8
Bb w/o OSI	11	2.5
Bab	12	2.7
Bab w/o OSI	12	2.3
C	17	2.9

* OSI = Oneida Street Interchange

3.8.2.2 Floodways and Floodplains

The Federal Emergency Management Agency delineates zones within the floodplain and demonstrates these on Flood Insurance Rate Maps. A summary of floodplain and floodway impacts is shown in Table 3.8-2, and detailed information concerning floodplain and floodway impact assessments is included in Appendix G.

Table 3.8-2
Floodplain Impacts
Linear Feet (Linear Meters)

Alignment	SFHA*	Floodway
Common	0 (0)	0 (0)
A	12,700 (3,780)	0 (0)
Ab	13,200 (4,023)	0 (0)
B	13,100 (3,993)	0 (0)
Ba	13,100 (3,993)	0 (0)
Bb	13,600 (4,145)	0 (0)
Bab	13,600 (4,145)	0 (0)
C	9,400 (2,865)	4,000 (1,219)

*Special Flood Hazard Areas Inundated by 100-year Flood

3.8.2.3 No-Action Alternative

Direct Impacts. Because no activities related to the proposed project would occur under the No-Action Alternative, there would be no direct impacts to water quality or quantity.

Indirect Impacts. Because no activities related to the proposed project would occur under the No-Action Alternative, there would be no indirect impacts to water quality or quantity.

Cumulative Impacts. Because no activities related to the proposed project would occur under the No-Action Alternative, there would be no cumulative impacts to water quality and quantity. However, transportation infrastructure improvements throughout the project area could occur at a faster rate, and these improvements could have water quality and quantity impacts.

3.8.2.4 Common Alignment

Direct Impacts. The Common Alignment through Camp Robinson would cross 12 intermittent and perennial streams. The alignment alternative has an average WQI rating

of 1.2. None of the stream crossings within the Common Alignment have been identified as Special Flood Hazard Areas. Construction of the drainage structures along the Common Alignment could temporarily increase stream sediment loads and impact water quality.

Indirect Impacts. Water quality impacts could migrate outside the immediate vicinity of this project. After construction is completed, stream water quality should return to normal if Best Management Practices (BMPs) are followed for sediment and erosion control.

Cumulative Impacts. Because the majority of the Common Alignment is within Camp Robinson, the greatest potential for cumulative impacts would exist related to activities within the Camp. At this time, no cumulative impacts to water quality and quantity related to the Common Alignment are anticipated. Actions within Camp Robinson are subject to NEPA regulations, so it is anticipated that any cumulative impacts with regards to the Camp's future actions would be outlined within the associated environmental documentation.

3.8.2.5 Alignment Alternatives A and Ab

Direct Impacts. Alignment Alternatives A and Ab cross 11 intermittent and perennial streams and have an average WQI rating of 2.9 with an interchange at Oneida Street and 2.5 without an interchange.

Alignment Alternative A would impact 12,700 linear feet (3,870 linear meters) of Zone A floodplains. Alignment Alternative Ab would impact 13,200 linear feet (4,023 linear meters) of Zone A floodplains.

If an interchange rather than a grade separation is built at Oneida Street, there would be a greater potential for direct impacts to water quality and quantity.

Indirect Impacts. Water quality impacts could migrate outside the immediate vicinity of this project. After construction is completed, stream water quality should return to normal if BMPs are followed for sediment and erosion control. Additionally, new commercial

and residential development around the interchange areas could have impacts to water quality and quantity.

Cumulative Impacts. Cumulative impacts in the project area would be related to other planned transportation projects that are reasonably foreseeable. These projects are outlined in Section 3.1.2. Expected cumulative impacts include increased turbidity and pollutant concentrations associated with the construction and maintenance of these projects. Overall, the cumulative impacts to water quality and quantity would be minimal.

3.8.2.6 Alignment Alternatives B, Ba, Bb, and Bab

Direct Impacts. Alignment Alternatives B and Bb cross 11 streams and have an average WQI rating of 2.8 with an interchange at Oneida Street and 2.5 without an interchange. Alignment Alternatives Ba and Bab cross 12 streams and have an average WQI rating of 2.7 with an interchange at Oneida Street and 2.3 without an interchange.

Alignment Alternatives B and Ba would impact 13,100 linear feet (3,993 linear meters) of Zone A floodplains. Alignment Alternatives Bb and Bab would impact 13,600 linear feet (4,145 linear meters) of Zone A floodplains.

If an interchange rather than a grade separation at Oneida Street is built, there would be a greater potential for direct impacts to water quality and quantity.

Indirect Impacts. Water quality impacts could migrate outside the immediate vicinity of this project. After construction is completed, stream water quality should return to normal if BMPs are followed for sediment and erosion control.. Additionally, new commercial and residential development around the interchange areas could have impacts to water quality and quantity.

Cumulative Impacts. Cumulative impacts in the project area would be related to other planned transportation projects that are reasonably foreseeable. These projects are outlined in Section 3.1.2. Expected cumulative impacts include increased turbidity and pollutant concentrations associated with the construction and maintenance of these projects. Overall, the cumulative impacts to water quality and quantity would be minimal.

3.8.2.7 Alignment Alternative C

Direct Impacts. Alignment Alternative C has 17 stream crossings with average WQI ratings of 2.9. Alignment Alternative C would impact 9,400 linear feet (2,865 linear meters) of Zone A floodplains and 4,000 linear feet (1,219 linear meters) of regulatory floodway.

Indirect Impacts. Water quality impacts could migrate outside the immediate vicinity of this project. After construction is completed, stream water quality should return to normal if BMPs are followed for sediment and erosion control.. Additionally, new commercial and residential development around the interchange areas could have impacts to water quality and quantity.

Cumulative Impacts. Cumulative impacts in the project area would be related to other planned transportation projects that are reasonably foreseeable. These projects are outlined in Section 3.1.2. Expected cumulative impacts include increased turbidity and pollutant concentrations associated with the construction and maintenance of these projects. Overall, the cumulative impacts to water quality and quantity would be minimal.

3.8.3 Mitigation Summary

3.8.3.1 Water Quality

The AHTD will comply with all requirements of the Clean Water Act, as Amended, for the construction of this project. This includes Section 401; Water Quality Certification, Section 402; NPDES, and Section 404; Permits for Dredged or Fill Material.

Impacts to streams within the project area will be minimized by constructing the project to the minimum width necessary to meet design safety standards. The project will be constructed on new alignment, thus minimizing temporary impacts associated with detours.

The AHTD will prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) in accordance with the requirements of the permit. Before construction begins, AHTD will file the requisite Notice of Intent with ADEQ. The SWPPP will include all specifications and BMPs needed for control of erosion and sedimentation. This will be prepared when the

roadway design work has been completed in order to best integrate the BMPs with the project design.

General measures to be used to manage stormwater runoff include litter control, proper usage of deicing chemicals and herbicides, establishment and maintenance of vegetation, and reducing direct discharges to receiving waters when practicable.

Specific measures to be considered and used for management of potential pollution problems include grassed channels, overland flow through vegetation, wet detention basins, and wetlands.

During construction, or after the facility is operating, runoff impacts may be caused by spills of materials. If a material spill should occur during construction, clean-up procedures are followed as outlined in the Standard Specifications for Highway Construction. Measures taken to ensure accidental spill and runoff control while the facility is operating are coordinated by the Arkansas State Police, the Arkansas Highway Police, AHTD, and a contracted hazardous spill containment team. The State Emergency Operations Center's HAZMAT Hot Line is notified for official notification and response.

3.8.3.2 Floodways and Floodplains

Local ordinances typically prohibit any new construction within the boundaries of any identified regulatory floodway(s) that would cause any increase in flooding depths on upstream, or adjacent properties. Similarly, the local ordinances require that the cumulative effects of all construction within any identified 100-year floodplain or Zone A Special Flood Hazard Area may not cause more than one foot (0.3 meter) increase in flooding depths anywhere within the community.

The AHTD's own internal policy is to design projects within these areas so that any permanent construction within an identified 100-year floodplain or Zone A Special Flood Hazard Area, may not cause an increase in flooding depths during passage of the 100-year flood if there are any existing insurable buildings within the boundaries of the floodplain with floor elevations below the current 100-year flood elevation. The increase in flooding depth

caused by any new construction may not cause other insurable buildings to be flooded during passage of the 100-year flood.

All of the floodplain and floodway encroachments will be designed to comply with the respective communities' local flood damage prevention ordinance. During project design, hydraulic data and construction plans will be submitted to the communities for review, approval and/or permitting as specified by their ordinance.

3.9 WETLANDS AND WATERS OF THE UNITED STATES

3.9.1 Affected Environment

The western end of the project area is located in the Ouachita Mountains Ecoregion characterized by steep hillsides and streams that are rocky and fast flowing. Soils are moderately permeable, and consequently, wetlands are almost non-existent in this region.

The eastern end of the project area is located in the Mississippi Alluvial Plain Ecoregion. The land in this region is flat and the waterways are meandering and entrenched. Soils are often almost impermeable, and wetlands are much more prevalent in this region. All wetlands were delineated using the 1987 Corps of Engineers Wetlands Delineation Manual.

3.9.1.1 Fears Lake

Fears Lake Wetland is located on the southwestern boundary of Jacksonville and just south of Gravel Ridge. Kellogg Creek flows through the wetland from west to east and empties into Bayou Meto approximately one-half mile (0.8 kilometer) downstream from the wetlands eastern boundary. Gap Creek flows into Fears Lake from the south, entering approximately in the center of the wetland.

Fears Lake Wetland is in an early successional stage and still appears to be expanding. Presently, mature bald cypress and swamp tupelo occur along the channel while much of the remainder is dead hardwood timber and shrubby vegetation. Numerous small bald cypress and swamp tupelo are beginning to grow throughout the lake, and many types of emergent vegetation have become established. Figure 3.9-1 shows a typical view of Fears Lake.

There are some wetlands located toward the east end of Fears Lake, bounded by upland ridges and sewer treatment ponds to the north and Fears Lake to the south. The wetlands are old creek channels and low areas that are permanently to seasonally flooded. Buttonbush, bald cypress, and various rushes dominate the low areas.

It appears that as recently as 32 years ago, most of what is wetland today was a hardwood floodplain forest. Wetland vegetation was restricted primarily to a narrow strip along the creek channel. Apparently a rise in water level killed much of the hardwood timber in the floodplain, and the construction of multiple subdivisions and levees may be related directly and/or indirectly to the wetland expansion. Increased beaver and nutria activity within the lake has also contributed to the rising water level.

3.9.1.2 Palustrine Forested Wetlands

Palustrine forested wetlands occur along Kellogg Creek just downstream of Fears Lake. They are bounded on the south side by cultivated land and the north by upland hardwoods. Part of this wetland system is an oxbow formed by Kellogg Creek that is about eight acres (three hectares) in size. The remainder of the wetlands consists of old creek channels and low areas that are permanently to seasonally flooded. Vegetation in the lower areas is dominated by bald cypress and swamp tupelo while the remainder is dominated by lowland oaks and hickories. Figure 3.9-2 shows a typical view of these wetlands.

There is another palustrine forested wetland associated with Kellogg Creek just upstream of Fears Lake. This wetland is bounded on the north by upland ridges and sewer treatment ponds and Silver Springs subdivision to the south. The wetlands consist of creek channels and low areas that are seasonally flooded. Lowland oaks and hickories dominate the low areas.

Other palustrine forested wetlands occur along with Bayou Meto and its tributaries east of the Northlake Estates subdivision. They are bounded by upland ridges to the north and cultivated agricultural fields to the south. The wetlands consist of bottomland hardwoods that are seasonally flooded. They are dominated by willow oak, overcup oak, sweet gum, and shagbark hickory. Figures 3.9-3 and 3.9-4 show typical views of these wetlands.

3.9.1.3 Scrub/Shrub Wetland

This wetland is located in the northwest corner of a cultivated field, just south of the Kellogg Creek wetland. The area is grown up in wet weeds, saplings, sedges, rushes, and shrubs. The area appears to be quickly reverting to a palustrine forested wetland. Figure 3.9-5 shows a typical view of this wetland.

3.9.1.4 Cypress Brake Wetland

This wetland is located northeast of Indianhead Lake adjoining the farmed agricultural ground on the east end of the project. This wetland is dominated by bald cypress, swamp tupelo, and buttonbush. This wetland is flooded for most of the year average. Figure 3.9-6 shows a typical view of this wetland.

3.9.1.5 Waters of the United States

The stream crossings on the eastern end of the project are located in the Mississippi Alluvial Plain Ecoregion Level III and the Grand Prairie Ecoregion Level IV. These streams are primarily perennial streams that are influenced by ground-water and precipitation runoff. The streams are meandering and entrenched and are located within broad alluvial floodplains. The stream crossings on the northern, southern, and western end of the project are located in the Ouachita Mountain Ecoregion Level III and the Fourche Mountain Ecoregion Level IV. These streams are primarily intermittent headwater streams with a couple of perennial streams that are influenced by precipitation runoff. These streams are located in narrow valleys and have gravel and shale bedrock substrates.

Figure 3.9-1 Fears Lake Wetland

Figure 3.9-2 Kellogg Creek Palustrine Bottomland Hardwood Wetland

Figure 3.9-3 Bayou Meto Palustrine Bottomland Hardwood and Cypress Wetland

Figure 3.9-4 Palustrine Forested Wetland

Figure 3.9-5 Scrub-Shrub Wetland

Figure 3.9-6 Cypress Brake Wetland

3.9.2 Environmental Consequences

Impacts to wetlands and waters of the US are summarized in Table 3.9-1. Wetland locations are shown on Figure 3.9-7. Waters of the US crossings are shown on Figures 3.8-2 and 3.8-3.

Table 3.9-1

US Army Corps of Engineers Section 404 Impacts

Alignment Alternative	Stream Crossings			Wetland Impacts acres (hectares)			
	Intermittent	Perennial	Total	Palustrine Forested	Fears Lake	Scrub/Shrub	Total
Common	12	0	12	0 (0)	0 (0)	0 (0)	0 (0)
A	8	3	11	6.4 (2.6)	36.3 (14.7)	9.7 (3.9)	52.4 (21.2)
Ab	9	2	11	6.4 (2.6)	0 (0)	23.1 (9.4)	29.5 (11.9)
B	8	3	11	8.1 (3.3)	37.3 (15.1)	9.9 (4.0)	55.3 (22.4)
Ba	9	3	12	8.1 (3.3)	37.3 (15.1)	9.9 (4.0)	55.3 (22.4)
Bb	9	2	11	8.1 (3.3)	1 (0.4)	23.3 (9.4)	32.4 (13.1)
Bab	10	2	12	8.1 (3.3)	1 (0.4)	23.3 (9.4)	32.4 (13.1)
C	6	11	17	26.1 (10.6)	0 (0)	4.2 (1.7)	30.3 (12.3)

3.9.2.1 No-Action Alternative

Direct Impacts. Because no activities related to the proposed project would occur under the No-Action Alternative, there would be no direct impacts to wetlands or waters of the US.

Indirect Impacts. Because no activities related to the proposed project would occur under the No-Action Alternative, there would be no indirect impacts to wetlands or waters of the US.

Cumulative Impacts. Because no activities related to the proposed project would occur under the No-Action Alternative, there would be no cumulative impacts to wetlands or waters of the US related to this project. However, transportation infrastructure

improvements throughout the project area could occur at a faster rate, and these improvements could impact wetlands and waters of the US.

3.9.2.2 Common Alignment

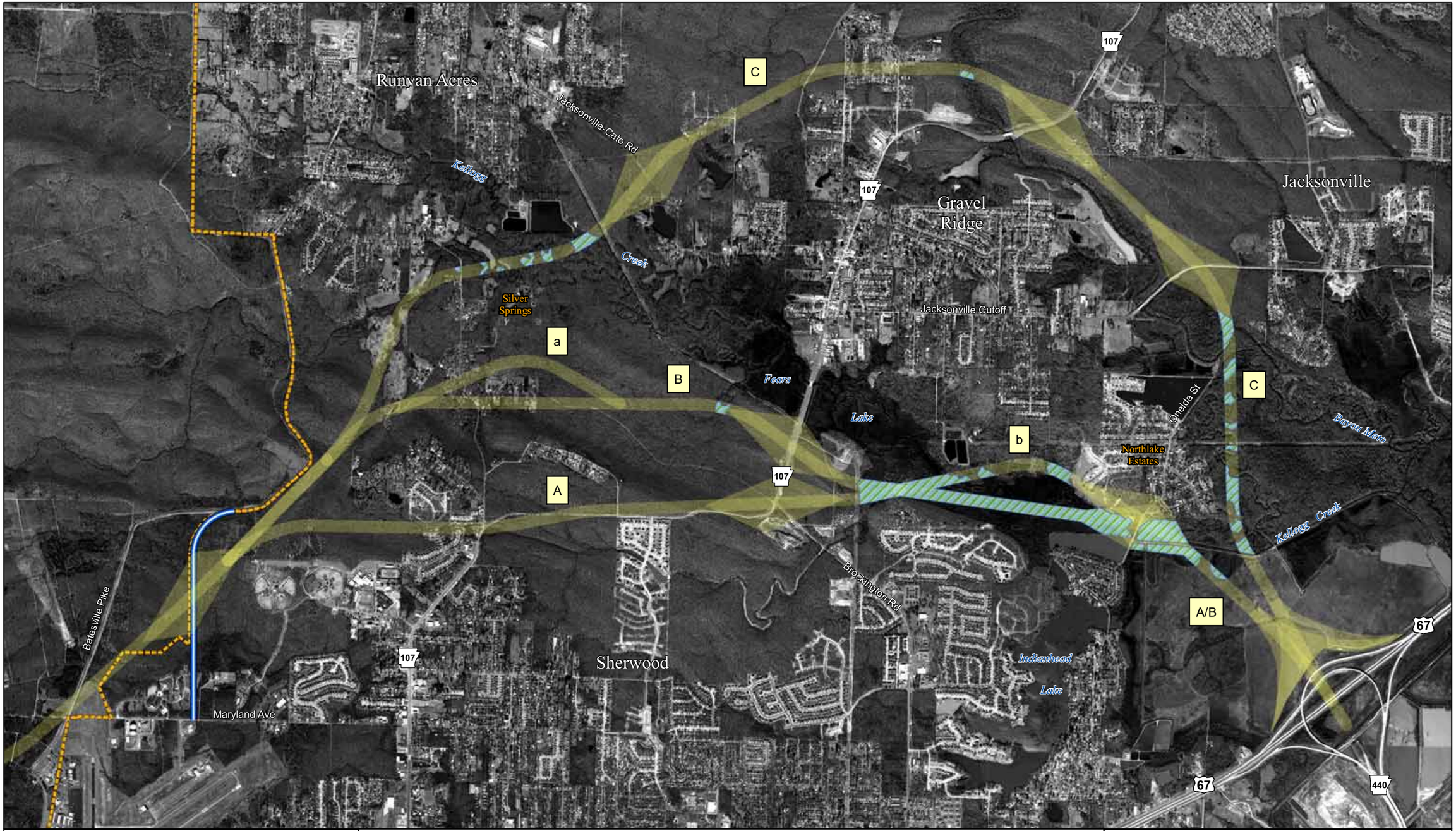
Direct Impacts. There are no wetland impacts located along the Common Alignment. There would be 12 structures that cross waters of the US with pipe or box culverts along the common alignment. The streams that would be impacted are intermittent headwater streams. See Figure 3.8-2 for stream crossing locations.

Indirect Impacts. Construction of the drainage structures along the Common Alignment could temporarily increase stream sediment loads. These sediments could deposit in wetlands or waters of the US outside the immediate vicinity of this project. After construction is completed, stream sediment loads should return to normal levels if BMPs are followed for sediment and erosion control.

Cumulative Impacts. Because the majority of the Common Alignment is within Camp Robinson, the greatest potential for cumulative impacts would exist related to activities within the Camp. At this time, no cumulative impacts to wetlands from the Common Alignment are anticipated. Actions within Camp Robinson are subject to NEPA regulations, so it is anticipated that any cumulative impacts with regards to the Camp's future actions would be outlined within the associated environmental documentation.

3.9.2.3 Alignment Alternatives A and Ab

Direct Impacts. Alignment A would impact approximately 52.4 total acres (21.2 hectares) of wetlands without an interchange at Oneida Street. The eastern end of this alignment alternative longitudinally crosses Fears Lake, and it would impact scrub/shrub and palustrine forested wetlands. There are no other wetlands to the west beyond Fears Lake. There would be 11 structures (2 bridges and 9 pipes or box culverts) that cross waters of the US. The two bridges would be for Kellogg Creek crossings. See Figure 3.9-7 for wetland locations.



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Job R60101
AHTD - Environmental GIS - Farrell
7/17/2006

Miles
0 0.125 0.25 0.5 0.75 1
Approximate Scale
0 0.2 0.4 0.8 1.2 1.6
Kilometers

Legend

- Wetlands
- Alignment Alternatives
- Conceptual Interchange Footprint
- Camp Robinson Boundary
- Relocated Batesville Pike

Photography Date: 2/11/2005

3.9-7
Wetlands Impacted
North Belt Freeway

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Segment "b" is a small section of alignment alternative that runs north of Fears Lake and minimizes impacts to the lake (wetlands). Alignment Alternative Ab would impact a total of 29.5 acres (11.9 hectares) of wetlands. It would have 11 drainage structures (two bridges and nine pipe or box culverts) that cross waters of the US. The bridges would span the Kellogg Creek crossings.

If an interchange is constructed at the Oneida Street crossing for Alignment Alternative A or Ab, there would be approximately 15 additional acres (six hectares) of wetlands impacted.

Indirect Impacts. Construction of the drainage structures along the A Alignment Alternatives could temporarily increase stream sediment loads. These sediments could deposit in wetlands or waters of the US outside the immediate vicinity of this project. After construction is completed, stream sediment loads should return to normal levels if BMPs are followed for sediment and erosion control. If an interchange at Oneida Street is constructed, there could be additional impacts to wetlands due to new commercial and residential development around the interchange area.

Cumulative Impacts. Cumulative impacts in the project area would be related to other planned transportation projects that are reasonably foreseeable. These projects are outlined in Section 3.1.2. Overall, the cumulative impacts to wetlands and/or waters of the US would be minimal.

3.9.2.4 Alignment Alternatives B, Ba, Bb, and Bab

Direct Impacts. Alignment Alternative B would impact approximately 55.3 total acres (22.4 hectares) of wetlands without an interchange at Oneida Street. The eastern end of this alignment alternative longitudinally crosses Fears Lake, and it would impact scrub/shrub and palustrine wetlands (bottomland hardwood, bald cypress). There is a small patch of bottomland hardwood wetland in a creek bottom located west of Highway 107 and south of the western end of Fears Lake.

There would be 11 drainage structures (two bridges and nine pipe or box culverts) that cross waters of the US. The two bridges would be for Kellogg Creek crossings.

Alignment Alternative Bb would impact a total of 32.4 acres (13.1 hectares) of wetlands. It would have 11 drainage structures (two bridges and nine pipe or box culverts) that cross waters of the US. The two bridges would span the Kellogg Creek crossings.

Alignment Alternative Ba would impact a total of 55.3 acres (22.4 hectares) of wetlands. This alignment alternative will longitudinally crosses Fears Lake. It would have 12 drainage structures (two bridges and 10 pipe or box culverts) that cross waters of the US. The two bridges are for Kellogg Creek crossings.

Alignment Alternative Bab would impact approximately 32.4 total acres (13.1 hectares) of wetlands. It would have 12 drainage structures (two bridges and 10 pipe or box culverts) that cross waters of the US. The two bridges are for Kellogg Creek crossings.

If an interchange complex is constructed at the Oneida Street crossing for the B Alignment Alternatives, there would be approximately 15 additional acres (six hectares) of wetlands impacted.

Indirect Impacts. Construction of the drainage structures along the B Alignment Alternatives could temporarily increase stream sediment loads. These sediments could deposit in wetlands or waters of the US outside the immediate vicinity of this project. After construction is completed, stream sediment loads should return to normal levels if BMPs are followed for sediment and erosion control. If an interchange at Oneida Street is constructed, there could be additional impacts to wetlands due to new commercial and residential development around the interchange area. Additionally, the proposed interchange for the B Alignment Alternatives at Highway 107 could have impacts on Fears Lake wetlands due to new commercial and residential development around the interchange.

Cumulative Impacts. Cumulative impacts in the project area would be related to other planned transportation projects that are reasonably foreseeable. These projects are

outlined in Section 3.1.2. Overall, the cumulative impacts to wetlands and/or waters of the US would be minimal.

3.9.2.5 Alignment Alternative C

Direct Impacts. Alignment Alternative C would impact approximately 30.3 total acres (12.3 hectares) of wetlands. The eastern end of this alignment alternative would impact palustrine wetlands (bottomland hardwood, bald cypress) and scrub/shrub wetlands. The western end of this alignment alternative would impact small tracts of palustrine forested wetlands. There is also a small tract of palustrine forested wetland on the northern segment of this alignment alternative near Bayou Meto. The eastern end of this alignment alternative extends through the Kellogg Creek/Bayou Meto floodplain. The floodplain impact area between Bayou Meto and Kellogg Creek is approximately one mile (1.6 kilometer) in length. This area would most likely be bridged to reduce the risk of upstream flooding.

There would be 26 drainage structures constructed for this alignment alternative. Alignment Alternative C would have 17 drainage (four bridges and 13 pipe or box culverts) structures that cross waters of the US. The Bayou Meto/Kellogg Creek floodplain area would most likely be bridged along with a northern Bayou Meto crossing, Kellogg Creek crossing, and Miles Creek crossing. The pipe or box culvert crossings would be for unnamed intermittent and perennial tributary streams.

Indirect Impacts. Construction of the drainage structures along Alignment Alternative C could temporarily increase stream sediment loads. These sediments could deposit in wetlands or waters of the US outside the immediate vicinity of this project. After construction is completed, stream sediment loads should return to normal levels if BMPs are followed for sediment and erosion control.

Cumulative Impacts. Cumulative impacts in the project area would be related to other planned transportation projects that are reasonably foreseeable. These projects are outlined in Section 3.1.2. Overall, the cumulative impacts to wetlands and/or waters of the US would be minimal.

3.9.3 Mitigation Summary

AHTD's standard commitments to minimize impacts to wetlands and waters of the U. S. can be found in Section 4.8. The AHTD proposes to mitigate the unavoidable wetland impacts associated with this project at the Rixey Bayou Wetland Mitigation Area. The Vicksburg District Corps of Engineers permitted the Selected Alignment in the FEIS on December 19, 1994, under Individual Permit Number CELMK-OD-FE14-PBH-G13-1. This permit expired on June 21, 2000. This permit required 50 acres (20 hectares) of mitigation from the Rixey Bayou Wetland Mitigation Area. If additional wetland mitigation is required for the alignment alternative selected in this document, additional mitigation acres are available at the Rixey Bayou Wetland Mitigation Area. The Rixey Bayou Wetland Mitigation plan is located in Appendix N of the 1994 FEIS.

3.10 DRINKING WATER SUPPLIES

3.10.1 Affected Environment

All of the domestic water used in the project area comes from Central Arkansas Water, except for a small area at the western end of the project area that is supplied by Jacksonville Waterworks. The water sources for Central Arkansas Water are Lake Maumelle (western Pulaski County) and Lake Winona (northern Saline County). Jacksonville Waterworks obtains its water from a series of wells east of Jacksonville.

There may be some rural residents in the project area who have chosen to stay on private sources of water for their domestic and/or agricultural purposes. These private sources of water may come from wells or surface waters. Wells are typically installed in the first water bearing rock formation encountered during drilling.

The Safe Drinking Water Act of 1986 requires identification and protection of sole source aquifers and the establishment of wellhead protection areas. No sole source aquifers or wellhead protection areas are located within the study area.

3.10.2 Environmental Consequences

The potential ways road construction and maintenance can impact public drinking water supplies depends upon the water source type. Surface water sources can be affected by the construction and maintenance of roadways through increased sedimentation, spills of chemicals and pollutants, and salting of roadways. Chronic water quality impacts along high traffic volume roads can occur from exhaust emissions, pavement tire wear, petroleum drippage, and corrosion of metals, and this could potentially impact public drinking water supplies originating from surface water sources. Groundwater sources could also be affected by these water quality impacts with migration of the surface water into the subsurface. However, the biggest threats to water wells are vibrations caused by earth moving activities during road construction. These actions, including blasting, can cause impacts ranging from short-term water quality impairments to permanent damage to the water well.

Although public water is available throughout the project area, some residents may have chosen to remain on private water supplies for their domestic and/or agricultural purposes. Because of the low potential for use of private water sources in this area and the difficulty in assessing the recharge areas for private wells, no assessment of impacts on these systems was performed.

3.10.2.1 No-Action Alternative

Direct Impacts. The No-Action Alternative is not within a public drinking water wellhead protection area. However, increased traffic volumes on the existing facility would result in greater amounts of pollutants in highway runoff and a greater potential for hazardous waste spills due to decreased safety levels. Because of these reasons, the No-Action Alternative could increase the potential for direct impacts to private drinking water sources.

Indirect Impacts. Because no activities related to the proposed project would occur under the No-Action Alternative, there would be no indirect impacts to public drinking water supplies.

Cumulative Impacts. Because no activities related to the proposed project would occur under the No-Action Alternative, there would be no cumulative impacts to public drinking water supplies related to this project. However, transportation infrastructure improvements throughout the project area could occur at a faster rate, and these improvements could have cumulative impacts.

3.10.2.2 Alignment Alternatives

Direct Impacts. No direct impacts to public drinking water supplies are anticipated as a result of any of the alignment alternatives.

Indirect Impacts. No indirect impacts to public drinking water supplies are anticipated as a result of any one of the alignment alternatives.

Cumulative Impacts. No cumulative impacts to public drinking water supplies are anticipated as a result of any one of the alignment alternatives.

3.10. 3 Mitigation Summary

If any permanent impacts to private drinking water sources occur as a result of this project, the AHTD will mitigate these impacts by providing an alternative water source, either by drilling a new well or connecting the residents to a community water system.

3.11 TERRESTRIAL AND AQUATIC COMMUNITIES

3.11.1 Affected Environment

3.11.1.1 Terrestrial Fauna

As previously stated, dominant habitat types within the project area include oak-hickory uplands, mixed pine-oak uplands, bottomlands, croplands, pasture, and fields. Although a few species such as white-tailed deer, coyote, and raccoon can utilize a variety of habitats, the vast majority of species are adapted to very specific habitat types. State and county faunal records were compared to known habitat preferences to prepare lists of mammals, birds, reptiles, and amphibians expected to occur within the project area (GBMC & Associates and

GEC, 2004, 2005a, 2005b) (Sealander and Heidt, 1990) (Trauth *et al*., 2004). These lists can be found in Appendix J.

Oak-hickory uplands, the most common habitat type throughout the project area, are home to a wide variety of animals. Common mammals occurring in these forests include the gray squirrel, gray fox, white-footed mouse, and red bat. Birds such as the Black-and-White Warbler, Wood Thrush, and Brown Creeper are also common. Reptiles and amphibians expected to occur with these uplands include the southern copperhead and Great Plains rat snake as well as Fowler's toad.

Mixed pine-oak uplands, which are mainly centered around areas of human disturbance, are also a common habitat type throughout the project area. Common mammals associated with this habitat type include the fox squirrel, eastern chipmunk, and nine-banded armadillo. Bird species such as Pine Warbler, Pileated Woodpecker, and Sharp-shinned Hawk are also likely to occur here. The three-toed box turtle, eastern garter snake, and northern fence lizard are common reptiles observed in these mixed forests.

Bottomlands, which include bottomland hardwood forests as well as scrub-shrub wetlands, often contain the greatest diversity of animals of any habitat type. Many mammals such as the beaver, mink, and southern bog lemming are adapted specifically to life in these moist environments. Many species of waterfowl rely on these habitats for foraging and nesting. Other species of birds are also common throughout these bottomlands including Red-shouldered Hawk, Belted Kingfisher and American Woodcock. Bottomland habitats are also home to a vast array of reptiles and amphibians including the red-eared slider, western cottonmouth, and western slimy salamander.

Croplands typically support the least of diversity of any of the habitats. The regular cycles of disturbance prohibit their use other than as foraging areas. Animals such as the white-tailed deer, deer mouse, and mourning dove are often observed feeding on grain from the various crops. Predators such as the Red-tailed Hawk, red fox, and coyote often follow their prey into these areas.

Pastures and fields, like bottomlands, are home to a large number of species. This results from the "edge effect" created by the open habitats of the pastures and fields and adjacent woodlands. Many species of mammals, including mice, rats, and striped skunks, prefer these habitats. Bird species such as Meadowlark, Indigo bunting, and Eastern Bluebird are common. Reptiles such as the eastern coachwhip and ground skink are well adapted to these habitats.

3.11.1.2 Aquatic Fauna

Numerous bayous, streams, ponds, lakes, and wetlands occur throughout the proposed project area. Each of these habitats contains a variety of aquatic organisms. Lists of aquatic macroinvertebrates and fishes likely to occur within the area have been prepared and are included in Appendix J (GBMC and GEC, 2005a) (Robison and Buchanan, 1988). Many species of amphibians, birds, mammals, and reptiles also utilize the waterbodies.

3.11.1.3 Threatened and Endangered Species

Pursuant to Section VII of the Endangered Species Act of 1973 as currently amended, a record check of the Arkansas Natural Heritage Commission database of sensitive species was performed to determine the presence of federally listed threatened or endangered species or state sensitive species in the project area. Their records indicate that no federally listed or state sensitive species are known to occur within the project area.

3.11.2 Environmental Consequences

3.11.2.1 No-Action Alternative

Direct Impacts. Because no activities related to the proposed project would occur under the No-Action Alternative, there would be no direct impacts to terrestrial or aquatic communities.

Indirect Impacts. Because no activities related to the proposed project would occur under the No-Action Alternative, there would be no indirect impacts to terrestrial or aquatic communities.

Cumulative Impacts. Because no activities related to the proposed project would occur under the No-Action Alternative, there would be no cumulative impacts to terrestrial or aquatic communities related to this project. However, transportation infrastructure improvements throughout the project area could occur at a faster rate, and these improvements could impact terrestrial and aquatic communities.

3.11.2.2 Common Alignment

Direct Impacts. Although some mortality would occur to the less mobile species, habitat loss remains the primary impact to terrestrial communities associated with the construction of the proposed project. The Common Alignment, which passes through Camp Robinson, has already been heavily impacted by human activities. Impacts to terrestrial communities within this alignment alternative should be minimal.

Impacts to the aquatic communities associated with this alignment alternative would be limited to intermittent streams and small ponds. As with the terrestrial communities, direct mortality would be limited to those less mobile species such as aquatic macroinvertebrates and amphibians.

Indirect Impacts. Indirect impacts to terrestrial communities as the result of highway construction include increases in vehicle-animal collisions and the continued loss of habitat due to commercial and residential development. Vehicle-animal collisions are density dependent; that is, as the density of animals within a particular area increases, the rates of collisions would also increase. The construction of the proposed project would inevitably increase the collision rates in the area by reducing the amount of available habitat and increasing the traffic volume to the area. Additional habitat loss as the result of residential and commercial development around the interchange areas would occur.

Indirect impacts to aquatic communities are also expected near all proposed interchanges due to commercial and residential development. Habitat isolation may result at various stream crossings where culverts are used. Temporary impacts resulting from changes in water quality during construction could occur. Increases in sedimentation rates can clog gill filaments of fish and macroinvertebrates, potentially leading to disease or even death.

Pollution from highway runoff could also have detrimental effects on aquatic communities.

Cumulative Impacts. Because the majority of the Common Alignment is within Camp Robinson, the greatest potential for cumulative impacts would exist related to activities within the Camp. At this time, no cumulative impacts to terrestrial or aquatic communities related to the Common Alignment are anticipated. Actions within Camp Robinson are subject to NEPA regulations, so it is anticipated that any cumulative impacts with regards to the Camp's future actions would be outlined within the associated environmental documentation.

3.11.2.3 Alignment Alternatives A, Ab, B, Ba, Bb, Bab, and C

Direct Impacts. As with the Common Alignment, habitat loss remains the primary impact to terrestrial communities. Direct mortality may occur in less mobile species, such as amphibians and reptiles, and to young individuals or those species that utilize dens or burrows. Habitat loss can reduce the amount of available forage or nesting sites, thus increasing densities of the resident populations or forcing some individuals to leave in search of more desirable habitats. This results in increased competition for resources and decreases the total carrying capacity of the surrounding habitats.

Impacts to aquatic communities associated with these alignment alternatives would include intermittent and perennial streams, small ponds, wetlands, and reservoirs. As with the terrestrial communities, direct mortality would be limited to those species with limited mobility such as aquatic macroinvertebrates and amphibians.

Conversion of habitat to highway right of way would also impact native communities. Streams are often channelized to accommodate highway crossings. During the channelization process, natural substrates are changed, riparian vegetation is removed, and stream sinuosity is removed which increases stream flow, thus reducing the amount of available habitat. Due to the larger footprint created by a proposed interchange at Oneida Street versus a grade separation, there is a greater potential for direct impacts with an interchange.

Indirect Impacts. Indirect impacts result from the increase of urban development that would inevitably occur around the freeway upon completion of the project. Developers are attracted to these areas due to the increased accessibility of the area. Because the North Belt Freeway would function as a controlled access facility, the areas surrounding the proposed interchanges have the greatest potential for further development. With an interchange at Oneida Street, there would be a greater potential for indirect impacts to terrestrial and aquatic communities than would exist without an interchange.

Additional indirect impacts are expected due to habitat fragmentation. The construction of the project has the potential to isolate small tracts, which may limit use by certain species. These areas may provide suitable habitat, but because they have been isolated from other similar habitats, they may no longer be accessible.

Cumulative Impacts. Cumulative impacts in the project area would be related to other planned transportation projects that are reasonably foreseeable. These projects are outlined in Section 3.1.2. Expected cumulative impacts include a conversion of habitat to highway right of way. Overall, the cumulative impacts to terrestrial and aquatic communities would be minimal.

3.11.3 Mitigation Summary

Impacts to terrestrial and aquatic communities will be minimized by limiting construction to the minimum width necessary to meet design safety standards. Additional measures can be utilized to minimize impacts, including the use of fencing to redirect animals away from the roadway. The use of culverts and bridges as safe animal crossings has also shown to be effective in areas where animals exhibit regular migration routes.

Properly timed construction of bridges and culverts can also minimize impacts to aquatic communities by disturbing those areas only during dry periods, especially for intermittent streams that do not have continuous flow. Temporary impacts will be minimized by constructing the project on a new alignment, eliminating the need for detours. The use of bridges or properly sized and placed culverts can allow construction to occur across water bodies without hindering the movements of aquatic organisms. Erosion control methods will

also be used to decrease the amount of sediments and pollutants entering the stream during construction.

3.12 SECTIONS 4(f) AND 6(f) RESOURCES

No designated natural areas, existing or proposed parks/recreation areas, Wild and Scenic Rivers or streams listed on the Nationwide Rivers Inventory will be impacted by any of the alignment alternatives. Alignment Alternative A avoids the Kevin McReynolds Baseball Complex at Sylvan Hills High School. A pedestrian survey and correspondence with Arkansas Department of Parks and Tourism and local municipalities failed to disclose any other existing park or recreational area in proximity to the project alignment alternatives. Therefore, Section 4(f) of the USDOT Act of 1966 concerning the use of public recreation lands and Section 6(f) of the Land and Water Conservation Act do not apply.

There are potential Section 4(f) cultural resources that could be impacted by the Common Alignment. These resources are detailed in the following section.

3.13 CULTURAL RESOURCES

3.13.1 Affected Environment

This section presents information on archeological and architectural resources located within the project area. These resources have been analyzed using an estimated 300-foot (91-meter) wide corridor as an area of potential effect (APE) along each alignment alternative, with expanded right of way estimates at the interchange locations. Additionally, a 0.5-mile (0.8 kilometer) wide buffer zone (0.25 mile - 0.4 kilometer on each side of the centerline) was considered to allow for any possible shifts in design. The APE and buffer zone, when combined, make up the cultural resources project study area. The methodology and processes used to make these determinations are discussed in detail in Appendix L.

3.13.1.1 Archeological Resources

Of the 28 sites identified in the study area during the records check, nine sites are within the APE and 19 sites are within the buffer zones for the alignment alternatives. When a final design is approved, an archeological survey will be conducted to identify other archeological

resources. Detailed information regarding the archeological sites identified along each alignment alternative is described in Appendix L.

3.13.1.2 Historic Resources

A review of historic maps revealed segments of three historic roads in the study area (see Figure 3.13-1). One of the roads was used from 1832 - 1849 as the Bell Route of the Trail of Tears during the relocation of numerous Native American tribes through Arkansas.

Seventy-seven structures were identified during the Architectural Resources Survey (see Figure 3.13-1). These structures were submitted to the State Historic Preservation Officer (SHPO) to be evaluated for eligibility to the National Register of Historic Places. Of the 77 structures submitted to the SHPO, five are outside of the study area and 72 are located within the study area of the SDEIS.

Six structures were determined to be eligible for the National Register. One is located within the APE (the only eligible structure within Camp Robinson to be potentially impacted), four are located within the buffer zone, and one is located outside of the study area. Of the 67 structures determined not eligible, 13 structures are located within the APE and 54 structures are located in the buffer zones of the alignment alternatives. Detailed information regarding the historic structures identified along each alignment alternative is described in Appendix L.

Of the 12 historic bridges in Pulaski County currently listed on, or eligible to, the National Register, 11 are located outside of the project study area. One bridge was identified during the architectural survey of the project within the APE and determined eligible to the National Register by the SHPO. Detailed information regarding historic bridges identified along each alignment alternative is described in Appendix L.

3.13.2 Environmental Consequences

3.13.2.1 No-Action Alternative

Direct Impacts. Because no activities related to the proposed project would occur under the No-Action Alternative, there would be no direct impacts to cultural resources.

Indirect Impacts. Because no activities related to the proposed project would occur under the No-Action Alternative, there would be no indirect impacts to cultural resources.

Cumulative Impacts. Because no activities related to the proposed project would occur under the No-Action Alternative, there would be no cumulative impacts to cultural resources related to this project. However, transportation infrastructure improvements throughout the project area could occur at a faster rate, and these improvements could impact cultural resources.

3.13.2.2 Common Alignment

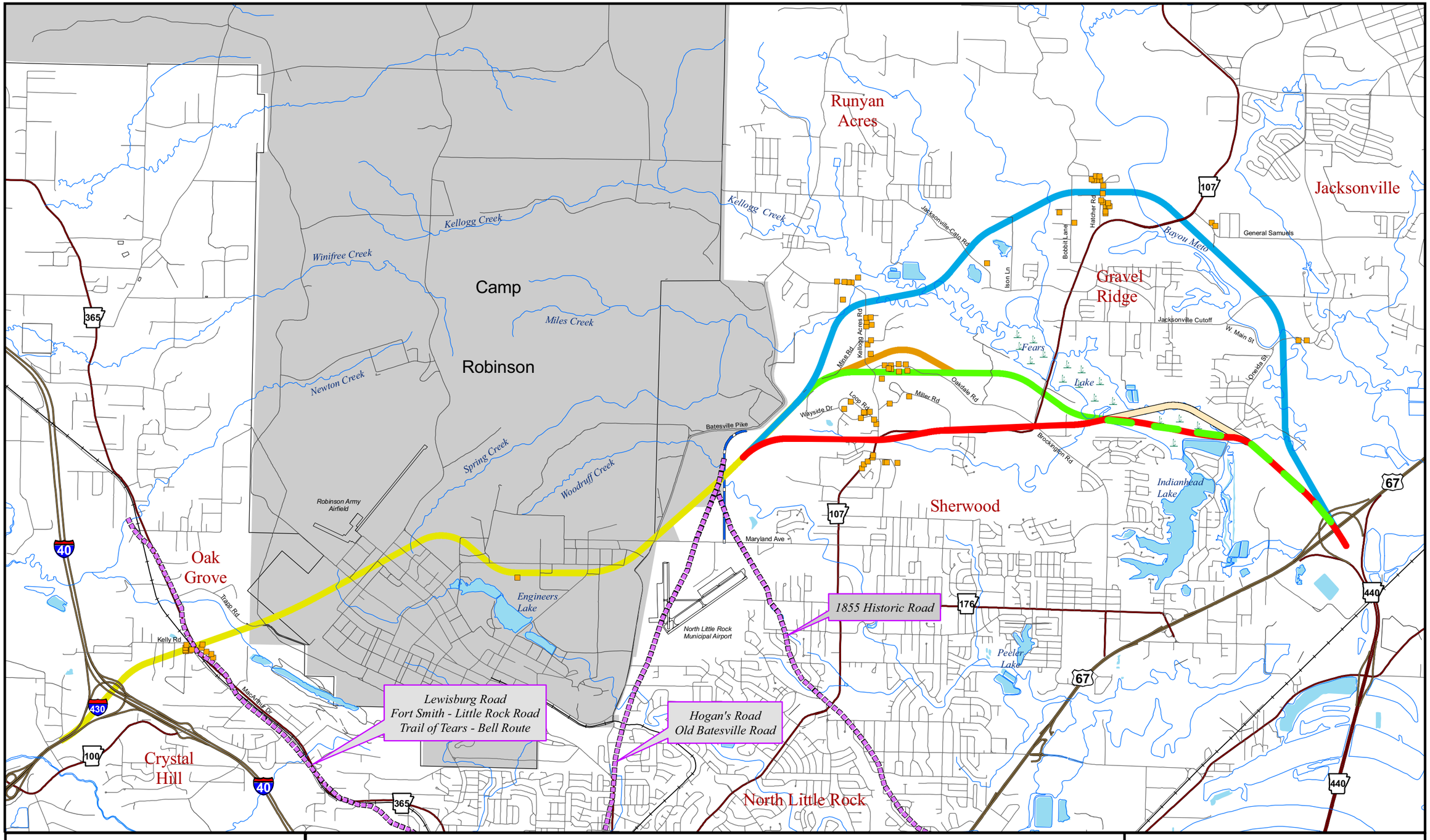
Direct Impacts. The Common Alignment would result in impacts to four archeological sites that require testing to determine if they are eligible to the National Register, ten structures that have been determined not eligible to the National Register, one historic bridge and three historic roads, (one of which carried the Bell Route of the Trail of Tears).

Indirect Impacts. Future development in the area surrounding the proposed Common Alignment could result in additional impacts to the cultural resources found in the buffer zone and undiscovered resources located outside it. The most likely area for future development is the area around the proposed interchanges. However, because it is not known where the development might occur or the nature of the development in these areas, it is not possible to determine impacts to the known or undiscovered resources in the buffer zone.

Cumulative Impacts. Because the majority of the Common Alignment is within Camp Robinson, the greatest potential for cumulative impacts would exist related to activities within the Camp. Actions within Camp Robinson are subject to NEPA regulations, so it is anticipated that any cumulative impacts with regards to the Camp's future actions will be outlined within the associated environmental documentation.

3.13.2.3 Alignment Alternatives A and Ab

Direct Impacts. Alignment Alternative A would result in impacts to one archeological site that does not require further testing. Alignment Alternative Ab would result in



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0 0.25 0.5 1 1.5 2
0 0.4 0.8 1.6 2.4 3.2
Kilometers

Legend

- Historic Structure
- Historic Roads
- Relocated Batesville Pike
- Camp Robinson
- Common Alignment
- Alignment Alternative A
- Alignment Alternative B
- Alignment Alternative C
- Segment a
- Segment b

Figure 3.13-1
Historic Structures and Roads
North Belt Freeway

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impacts to two archeological sites that require further testing to determine if they are eligible to the National Register. Impacts to cultural resources will be the same with or without an interchange at Oneida street.

Indirect Impacts. Future development in the area surrounding the proposed A Alignment Alternatives could result in additional impacts to the cultural resources found in the buffer zone and undiscovered resources located outside it. The most likely area for future development is the area around the proposed interchanges. However, because it is not known where the development might occur or the nature of the development in these areas, it is not possible to determine impacts to the known or undiscovered resources in the buffer zone.

Cumulative Impacts. Cumulative impacts in the project area would be related to other planned transportation projects that are reasonably foreseeable. These projects are outlined in Section 3.1.2. Cumulative impacts to cultural resources are expected to be minimal.

3.13.2.4 Alignment Alternatives B, Ba, Bb, and Bab

Direct Impacts. Alignment Alternative B would result in impacts to one site that does not require further testing and two structures that have been determined not eligible to the National Register. Alignment Alternative Ba would result in impacts to one archeological site that requires further testing to determine if it is eligible to the National Register and one archeological site that does not require further testing. Alignment Alternative Bb would result in impacts to two archeological sites that do not require further testing and two structures that have been determined not eligible to the National Register. Alignment Alternative Bab would result in impacts to one archeological site that requires further testing to determine if it is eligible to the National Register and two archeological sites that do not require further testing. Impacts to cultural resources will be the same with or without an interchange at Oneida street.

Indirect Impacts. Future development in the area surrounding the proposed B Alignment Alternatives could result in additional impacts to the cultural resources found in the buffer

zone and undiscovered resources located outside it. The most likely area for future development is the area around the proposed interchanges. However, because it is not known where the development might occur or the nature of the development in these areas, it is not possible to determine impacts to the known or undiscovered resources in the buffer zone.

Cumulative Impacts. Cumulative impacts in the project area would be related to other planned transportation projects that are reasonably foreseeable. These projects are outlined in Section 3.1.2. Cumulative impacts to cultural resources are expected to be minimal.

3.13.2.5 Alignment Alternative C

Direct Impacts. Alignment Alternative C would result in impacts to one archeological site that requires further testing to determine if it is eligible to the National Register and one structure determined not eligible to the National Register.

Indirect Impacts. Future development in the area surrounding the proposed Alignment Alternative C could result in additional impacts to the cultural resources found in the buffer zone and undiscovered resources located outside it. The most likely area for future development is the area around the proposed interchanges. However, because it is not known where the development might occur or the nature of the development in these areas, it is not possible to determine impacts to the known or undiscovered resources in the buffer zone.

Cumulative Impacts. Cumulative impacts in the project area would be related to other planned transportation projects that are reasonably foreseeable. These projects are outlined in Section 3.1.2. Cumulative impacts to cultural resources are expected to be minimal.

3.13.3 Mitigation Summary

It appears the proposed project will have a negligible impact to the Bell Route of the Trail of Tears. Once a final alignment alternative has been selected, an intensive cultural resources

survey will be conducted of the entire route. Particular attention will be given to any sites or old roadbeds that could be associated with the Trail.

Prior to and during cultural resources survey fieldwork, consultation between the FHWA and any appropriate Native American tribes will be maintained according to 36 CFR part 800.4(a) of the National Historic Preservation Act. All phases of the fieldwork, site evaluation, and report production will conform to the Secretary of the Interior's "Standard and Guidelines for Archeology and Historic Preservation" (48 CFE 44716) and the "A State Plan for the Conservation of Archeological Resources in Arkansas" (1994); and all other pertinent state or federal laws and regulations. A full report documenting the results of the survey and the recommendations of AHTD will be submitted to the SHPO for review. All sites identified will be evaluated to determine if Phase II testing is required.

All eligibility determinations will be made by the FHWA in consultation with the SHPO and any appropriate Native American tribes. Should any sites be determined eligible for nomination to the National Register and avoidance is not possible, site-specific treatment plans will be submitted to the SHPO and appropriate Native American tribes for review and comment. A corresponding Memorandum of Agreement (MOA) between the SHPO, the FHWA and the appropriate Native American tribes will be implemented, and the appropriate treatment plan will be carried out at the earliest practicable time.

The Camp Robinson Bridge #2 has been determined a Section 4(f) property. If avoidance of the bridge is impossible, the bridge will be marketed to the public as per the Surface Transportation & Uniform Relocation Assistance Act of 1987, Historic Bridges Section 123. If a new owner is found for the bridge, a MOA and Historic Bridge Covenant will be produced that is acceptable to FHWA and SHPO. If the bridge must be demolished, a MOA, Programmatic Section 4(f) for Historic Bridge document, and any other required documentation will be produced that is acceptable to FHWA and SHPO.

Should other sites be found to qualify as Section 4(f) properties, there should be enough flexibility within the study corridor to modify final roadway designs to consider avoidance of all but the very largest sites. If avoidance proves impossible, an Individual Section 4(f)

statement in will be prepared for the qualifying sites as per 49 USC Section 303 and Title 23 USC Section 138.

3.14 FARMLAND

3.14.1 Affected Environment

Agriculture is important to the economy of eastern Pulaski County, as is timber management in the western part of the county. Much of the agriculture activities are restricted to the flatter grounds adjacent to Bayou Meto and Kellogg Creek on the eastern end of the proposed project. Most of the farming activity on the eastern end is now crops, such as soybeans and rice. The upland areas on the remainder of the project have a mixture of hardwood and pines. Some small farms and open fields are also located in the uplands.

3.14.2 Environmental Consequences

The impacts of highway construction upon prime and unique farmland have become an important consideration in highway planning. The US Soil Conservation Service, in corporation with the Arkansas Agriculture Experimental Station, published a soil survey of Pulaski County in 1975. This survey was used to determine the number of acres of prime farmland that would be converted to highway right of way. The Farmland Conversion Impact rating is located in Appendix I. There is no unique farmland or farmland of statewide importance located in the project area. After coordinating with the District Conservationist of the Soil Conservation Service in Pulaski County, it was determined that the main impact would be the severance of farmland and disruption of farming activities. The loss of prime farmland is not expected to have a significant impact on agriculture in the area. Agriculturally, the eastern end of the proposed project is more conducive to intense agricultural activity because of level land use and the fertility of the soil. This area is where the major impact upon agriculture will occur.

3.14.2.1 No-Action Alternative

Direct Impacts. The No-Action Alternative would not involve new construction, thus no impacts on prime farmland would occur due to construction activities.

Indirect Impacts. No indirect impacts on prime farmland are anticipated as a result of the No-Action Alternative.

Cumulative Impacts. No cumulative impacts on prime farmland are anticipated as a result of the No-Action Alternative.

3.14.2.2 Alignment Alternatives

Direct Impacts. The Common Alignment would not impact any prime farmland. Alignment Alternatives A and Ab would impact between 111 - 139 acres (45 - 56 hectares) of prime farmland. Alignment Alternatives B, Ba, Bb, and Bab would impact between 97 - 114 acres (39 - 46 hectares) of prime farmland. Alignment Alternative C would impact 108 acres (43 hectares) of prime farmland.

Right of way acquisition for the proposed facility will reduce the amount of land held by some farmers, and it may become less economical for some to continue farming. Bisection of these farms will not only convert farmland to highway right of way, but also result in the disruption of some farm operations. Irrigation patterns, if existing, will be disrupted and may have to be changed.

With an interchange at Oneida Street instead of a grade separation, there would be slightly more impacts on prime farmlands.

The construction of the new facility will also result in certain positive impacts on farm operations. Access to an improved road would provide the following benefits:

(1) Farm-to-market will be made more accessible to farmers and

(2) Farm supplies can be transported more easily.

Indirect Impacts. Indirect impacts on prime farmland could occur due to land use changes around the Oneida Street interchange.

Cumulative Impacts. Cumulative impacts in the project area would be related to other planned transportation projects that are reasonably foreseeable. These projects are outlined in Section 3.1.2. No cumulative impacts to prime farmland are anticipated.

3.14.3 Mitigation Summary

The location of the facility near property lines can minimize farm severance. Farm severance can be mitigated through the construction of frontage roads and overpasses, or severance damages can be paid to affected owners if damages are established through the appraisal process. The construction of any frontage roads must be economically feasible. Frontage roads will allow farming to continue as usual but may encourage urban development.

Any severance payments, as determined by the appraisal process, will compensate farm owners for their lack of access to the severed portion of the farm. Severed farmland is expected to remain in production through lease or sale to adjacent farm owners.

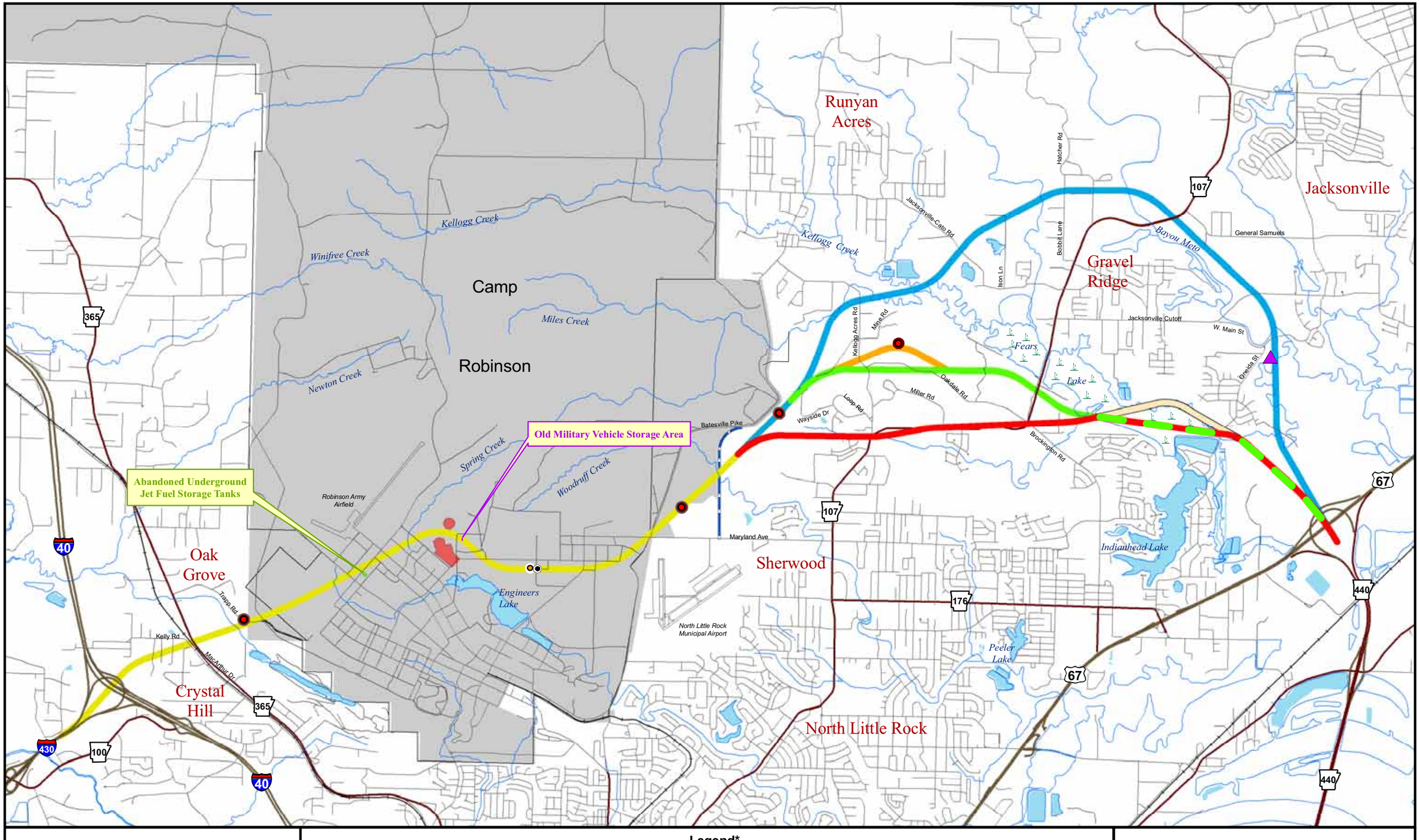
3.15 HAZARDOUS MATERIALS

3.15.1 Affected Environment

Environmental Site Assessment investigational methods were utilized to identify hazardous materials in the project area. A database query and field investigations identified 18 EPA sites, 58 permitted facilities, 98 permitted sites, seven illegal dumps, three illegal landfills and two non-permitted underground storage tanks within a one-mile (1.6-kilometer) buffer along each side of the alignment alternative centerlines. Information regarding hazardous waste regulations and investigation procedures are presented in Appendix H.

3.15.2 Environmental Consequences

Hazardous materials sites within 150 feet (46 meters) of the proposed centerline of the alignment alternatives are considered to be potentially impacted by the project. Figure 3.15-1 shows the sites identified along the alignment alternatives. Detailed information about these hazardous materials sites is available in Appendix H.



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Kilometers

Legend*

- Common Alignment
- Alignment Alternative A
- Alignment Alternative B
- Alignment Alternative C
- Segment a
- Segment b
- Relocated Batesville Pike
- Camp Robinson
- Demolition Debris
- Illegal Dump
- Landfill
- Landfill Sites 2C and 2D
- Tire Storage

*Colored Lines Represent a 300 ft. Wide Corridor

Figure 3.15-1
Hazardous Materials Sites

North Belt Freeway

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3.15.2.1 No-Action Alternative

Direct Impacts. No direct impacts to hazardous materials sites would occur due to the No-Action Alternative since no right of way acquisition would occur.

Indirect Impacts. No indirect impacts to hazardous materials sites would occur due to the No-Action Alternative.

Cumulative Impacts. Because no activities related to the proposed project would occur under the No-Action Alternative, there would be no cumulative impacts to hazardous materials related to this project. However, transportation infrastructure improvements throughout the project area could occur at a faster rate and these improvements could impact hazardous materials.

3.15.2.2 Common Alignment

Direct Impacts. A total of nine sites were identified as having a potential to be impacted by the Common Alignment: two illegal dumps, two landfills, two underground storage tanks, an old vehicle storage site, a demolition debris site, and a tire storage area.

Indirect Impacts. Future residential and commercial development could occur around the interchange areas proposed for this project. These future developments could have additional impacts to hazardous material sites.

Cumulative Impacts. Because the majority of the Common Alignment is within Camp Robinson, the greatest potential for cumulative impacts would exist related to activities within the Camp. At this time, no cumulative impacts to hazardous materials from the Common Alignment are anticipated. Actions within Camp Robinson are subject to NEPA regulations, so it is anticipated that any cumulative impacts with regards to the Camp's future actions would be outlined within the associated environmental documentation.

3.15.2.3 Alignment Alternatives A and Ab

Direct Impacts. No hazardous materials were found in the immediate area of the A Alignment Alternatives. No hazardous waste or materials were identified in the database query or in the field survey within the proposed interchange area at Oneida Street.

Indirect Impacts. Future residential and commercial development could occur around the interchange areas proposed for this project. These future developments could have additional impacts to hazardous material sites.

Cumulative Impacts. Cumulative impacts in the project area would be related to other planned transportation projects that are reasonably foreseeable. These projects are outlined in Section 3.1.2. No cumulative hazardous materials impacts are anticipated.

3.15.2.4 Alignment Alternatives B, Ba, Bb, and Bab

Direct Impacts. Two illegal dumps were identified along the B Alignment alternatives. One is common to all the B Alignment alternatives at their western end, and one occurs along Segment a. No hazardous waste or materials were identified in the database query or in the field survey within the proposed interchange area at Oneida Street.

Indirect Impacts. Future residential and commercial development could occur around the interchange areas proposed for this project. These future developments could have additional impacts to hazardous material sites.

Cumulative Impacts. Cumulative impacts in the project area would be related to other planned transportation projects that are reasonably foreseeable. These projects are outlined in Section 3.1.2. No cumulative hazardous materials impacts are anticipated.

3.15.2.5 Alignment Alternative C

Direct Impacts. One illegal dump and one illegal landfill were identified along Alignment Alternative C.

Indirect Impacts. Future residential and commercial development could occur around the interchange areas proposed for this project. These future developments could have additional impacts to hazardous material sites.

Cumulative Impacts. Cumulative impacts in the project area would be related to other planned transportation projects that are reasonably foreseeable. These projects are outlined in Section 3.1.2. No cumulative hazardous materials impacts are anticipated.

3.15.3 Mitigation Summary

The project will require acquisition and demolition of standing structures along the proposed alignment alternatives. An asbestos survey will be conducted on each building prior to the development of demolition plans. If the survey detects the presence of any asbestos-containing materials, plans will be developed to accomplish the safe removal of these materials prior to demolition. All asbestos abatement work will be conducted in conformance with ADEQ, EPA and Occupational Safety and Health Administration (OSHA) asbestos abatement regulations.

The probability of impacting a known hazardous material or waste site is reduced due to the preliminary investigations conducted to avoid such sites. If a hazardous waste site is identified, observed or discovered during construction within the right of way area, it will be AHTD's responsibility to determine the type and extent of the contamination. The AHTD will determine the remediation and disposal methods to be employed for that particular type of contamination. Any required remediation work will be conducted in conformance with ADEQ, EPA and OSHA regulations.

The AHTD's *Standard Specifications for Highway Construction* that will be utilized during the construction of the project requires the contractor to employ best management practices to prevent pollution by spills; proper use, storage, and disposal techniques; and to limit the amount of hazardous materials stored on-site.

3.16 ENERGY

Energy consumed in the construction of the facility would be a fixed cost related to the production and placement of materials (asphalt, structures, cut, fill, etc.). This cost would be offset over the life of the project by the energy efficiencies gained with the use of an improved transportation facility. In most situations, fuel efficiencies would be improved because of higher levels of service including uniform speeds, less congestion, and free flow of traffic.

The new facility would provide better service and minimize indirections, thereby reducing energy consumption. As traffic is diverted to the new facility, old and previously congested segments of the area's street system would experience decreases in congestion. Consequently, an improvement in operating efficiency would likely occur in all segments of the system. No major arterials or streets would be severed by the facility, therefore minimal increase of indirections would occur. These minimal indirections would have insignificant impact upon energy consumption. The construction of this freeway would complete an exterior loop around the Little Rock/North Little Rock metropolitan area thereby minimizing congestion and delays especially for northbound traffic (Highway 67) and reducing the energy consumption associated with any existing traffic congestion related to the existing street/arterial system.

Decreased operating efficiency caused by congestion would increase the use of energy resources for the No-Action Alternative.

3.17 POLLUTION PREVENTION MEASURES

In keeping with Executive Order (EO) 12856 – Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements (August 1993), EO 12873 – Federal Acquisition, Recycling, and Waste Prevention (October 1993) and EO 12902 – Energy Efficiency and Water Conservation at Federal Facilities (March 1994) and other supporting Environmental Laws, the AHTD has implemented pollution prevention measures over the years that address pollution at its source.

EO 12902-Energy Efficiency and Water Conservation at Federal Facilities (March 1994) does not apply to this project, since it includes requirements for buildings and structures that are constructed, renovated or purchased for use by the federal government.

EO 12873-Federal Acquisition, Recycling, and Waste Prevention (October 1993) directs the federal government to more efficiently use natural resources by maximizing recycling and preventing waste whenever possible, and to "serve as a model in this regard for private and other public institutions."

EO 12856-Federal Compliance with Right-to-Know Law and Pollution Prevention Requirements (August 1993) includes commitments that the federal government "should become a leader in the field of pollution prevention through the management of its facilities, its acquisition practices, and in supporting the development of innovative pollution prevention programs and technologies."

The Community Right-to-Know Act of 1986 was signed into law as part of the Superfund Amendments and Reauthorization Act. This act establishes reporting and emergency notification requirements for companies that use, manufacture, or process any of approximately 1,500 chemicals. The act also requires that companies maintain a current file of Material Safety Data Sheets (MSDS) for each hazardous chemical in their facility and that companies provide information about these chemicals in reports submitted to the local fire department, the local emergency planning committee, and the state emergency response commission. The AHTD follows these regulations and keeps a copy of all MSDS sheets for all materials that would be used in the construction process.

The impacts of road construction are initially seen as a severe and detrimental force, changing the project area from a common visual element into a new and unfamiliar landscape. As time progresses, the public gradually accepts these impacts. Interstate construction requires clearing and grubbing, relocating streams, demolishing and/or removing existing structures, erosion and sediment controls, excavation and placement of fill materials, construction of bridges and box culverts, drainage improvements, storing materials and equipment, access improvements, compaction control, road bed construction, and erecting highway support

structures such as signs, signals, signal poles and their accompanying traffic control facilities. It is the intention of the AHTD to lessen these environmental impacts through pollution prevention measures that have been incorporated into the AHTD's *Standard Specifications for Highway Construction, Edition of 2003*. In order for the AHTD to incorporate pollution prevention measures, the AHTD requires the contractor to comply with pollution prevention measures. Standard Construction Specifications (Appendix K) address responsibilities of the AHTD's contractors as they relate to pollution prevention; issues such as how to lessen impacts to temporary rights of way; applicable environmental permits, licenses and taxes; Section 404 permits; and ways to reduce or eliminate point and non-point sources of pollution.

Pollution prevention is comprised of reducing, reusing and recycling materials in a cost effective manner that would greatly reduce the potential for pollutants to enter the environment from the work zone. By not using certain chemicals, components or ingredients known to be of a toxic nature, the AHTD is reducing possible environmental consequences. A responsibility of the AHTD is to ensure that the contractor reduces the use of potentially hazardous materials during construction of this project.

Re-use of materials during construction is a financial incentive to the contractor. The movement of soils from one area to another is a prime example of reuse. The contractor can re-use excavated material from one area as fill material in another area.

Another aspect of pollution prevention is the use of recyclables in road building applications. The AHTD will allow the usage of recyclable materials in road construction where they yield economic, engineering and environmental benefits. If the contractor wishes to use recyclable materials, a written statement of the type, quantity and location the material is to be used is submitted to the AHTD for approval.

The AHTD allows the addition of fly ash in cement mixes. Fly ash is a waste product of coal-fired electric generation plants. Certain classes of concrete can accept 15% by weight of fly ash added to the concrete mix. Granulated blast furnace slag (25%), a waste product of

steel production, is also accepted in certain types of cement mixes. The addition of rubber to asphalt in hot-mix asphalt pavement containing crumb rubber modifiers is sometimes used.

The AHTD allows up to 15% recycled asphalt pavement and up to 30% recycled asphalt to be added to virgin asphalt. Mulch tackifiers are made from recycled newsprint or other paper products. Rubblized concrete has been used as a substitution for aggregate by the AHTD in past Interstate rehabilitation projects. The feasibility of using rubblized concrete for this project is limited since it is a new facility with minimal pavement to be rehabilitated.

Although the project area has been surveyed for the presence of hazardous materials, pollution prevention should also address discovery situations of hazardous materials that sometimes occur. As discussed previously in Section 3.15.3, in these instances immediate action is taken to assure that pollutants are immediately contained and remediated using the Standard Specifications for Highway Construction to address the hazard (see Appendix K).

The AHTD's specifications concerning pollution prevention guide the AHTD and contractors in preventing unwanted environmental problems. By limiting the pollution generated by construction and having measures in place to address unforeseen accidents, the AHTD will be striving to preserve, protect and beautify the affected environment.

3.18 CONSTRUCTION IMPACTS

Impacts to the environment will occur during construction of the proposed facility with most being classified as temporary or short-term. The most common impacts associated with highway construction include temporary air and water quality degradation; noise; temporary disruption of traffic including safety, control, and maintenance; the storage and disposal of construction materials; and the establishment, maintenance, and use of haul roads, borrow and waste areas. Air, noise and water quality impacts are discussed in greater detail in other portions of this Affected Environment and Environmental Consequences Section. Although the noise associated with construction activities cannot be eliminated, it can be reduced by the establishment of reasonable working hours. Sensitive noise areas, such as residential neighborhoods will be identified and work restricted to daylight hours in these areas as much as practicable. The dust associated with construction can be reasonably controlled with a

watering program, and erosion from construction sites will be controlled using standard practices as described in the AHTD Erosion and Sediment Control Design and Construction Manual. Traffic disruption should be minimal due to the small number of residential and commercial units affected and because the entire route would be on new location.

The No-Action Alternative would not cause construction impacts.

3.19 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Environmental relationships are complex. Not only are natural and physical elements involved, but a wide range of social issues add to the complexity of these environmental relationships.

The highway-planning goal is to create a facility that fulfills traffic service needs, which is environmentally acceptable and compatible with present land uses, and enhances potential land use decisions. The conversion of residential, business, and agricultural land uses to transportation uses can be viewed as an exchange of one long-term productive resource for another. It is the AHTD's responsibility to balance these trade-offs.

In order to fully realize the planned and forecasted growth of the study area and to benefit the region through efficient traffic transportation, the proposed facility is needed. It is the AHTD's position that the short-term disruption due to the construction of this facility should enhance the long-term productivity of the cities in the study area, the urbanized area, and the State of Arkansas.

3.20 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Some elements, which are invested in a highway improvement, require irreversible commitments. These elements include space, land and land uses, construction materials and equipment, and future maintenance commitments.

Space offers some possibilities for multiple uses. Although between 704 - 842 acres (285 - 341 hectares) would be committed to highway use, this land can serve non-highway

functions. For instance, maintenance and enhancement of surface water drainage around and under the highway would be a design feature of the project. Also, wildlife habitat would be provided on the right of way as natural vegetation becomes reestablished.

The commitment of land use is practically irreversible and irretrievable. Development at interchanges and along access roads is inevitable and almost impossible to reverse.

Although petroleum products would be irretrievably committed in construction activities, the increase in efficiency of operation of motor vehicles using the new roadway would offset this commitment. Thousands of man-hours of labor would be irretrievable and irreversibly committed to the project. Construction materials would be irreversibly and irretrievably committed due to the expense and impracticality of recycling such materials.

Construction of the project commits future public expenditures for maintenance. Although millions of dollars would be expended in the construction of this project, the project is expected to improve traffic efficiency in the northern half of the metro area. The preceding discussion indicates that none of these commitments are significantly adverse and they are in the best public interest.

3.21 IMPACT SUMMARY

Impacts to the social, economic, natural, and cultural environment would result from construction of any of the alignment alternatives evaluated in this document. Many of the perceived benefits that are related to the purpose and need of the project cannot be measured, and are therefore listed below.

- Provide a highway directly connecting the rapidly growing northeast and northwest parts of Pulaski County;
- Increase safety by decreasing congestion on existing streets and highways, especially on Highway 67 and Highway 107;
- Provide improved traffic service for local traffic demands, and

- Provide a highway facility consistent with the Central Arkansas Regional Transportation Study and related plans by providing a facility which:
    - Serves as a bypass for through traffic in northern Pulaski County.
    - Provides improved access to northern Pulaski County.
    - Completes the northern link in the Little Rock/North Little Rock metro area's circumferential highway network.

Table 3.21-1 displays the major advantages and disadvantages for each alignment alternatives. Eight of the most important adverse impact areas as measured and detailed earlier in the Affected Environment and Environmental Consequences Section are summarized for each alignment alternative in Table 3.21-2. A summary of the measures to minimize harm is located in the Commitments Section, Section 4.

Table 3.21-1

Alignment Alternative Comparison

The Preferred Alternative is highlighted in yellow

Alignment Alternative	Advantages	Disadvantages
Common	• Approved route through Camp Robinson	• Bisects Crystal Hill neighborhood
A	• Shortest alignment alternative • Lower cost estimates • Highest traffic volume	• High number of relocatees • High number of noise receptors • Impacts several subdivisions • Higher wetland impacts • Highest prime farmland impacts
Ab	• Lowest cost estimates • Lowest wetland impacts • Highest traffic volume	• High number of relocatees • High number of noise receptors • Impacts several subdivisions
B	• Lower number of relocatees • Lower number of noise receptors • Lower prime farmland impacts	• Highest wetland impacts • Impacts one subdivision
Ba	• Lowest number of relocatees • Lowest number of noise receptors • Lowest impact on commercial/ residential land • Lowest prime farmland impacts	• Highest wetland impacts • Separates Kellogg Acres neighborhood from Oakdale subdivision
Bb	• Lower number of relocatees	• Highest impact on commercial/ residential land • Impacts two subdivisions
Bab	• Lowest number of relocatees • Lowest number of noise receptors • Lower wetland impacts	• Separates Kellogg Acres neighborhood from Oakdale subdivision
C	• Lowest wetland impacts	• Longest and most expensive alignment alternative • Most relocatees • Impacts one subdivision • High floodplain and stream crossing impacts resulting in greatest potential for water quality impacts • Lowest traffic volume

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Table 3.21-2
Alignment Alternative Impact Summary†

The Preferred Alternative is highlighted in yellow

Alignment Alternative	Length	Acreage	Total Cost	Weighted Traffic Volume# (2030)	Existing Land Use Converted to Highway Right of Way					Cultural Resources-Direct Impacts				Noise Impacts*	Hazardous Materials Impacts		
					Commercial/ Residential	Military Base	Miscellaneous††	Undeveloped/ Agricultural	Prime Farmland	Recorded Archeological Sites	Historic Structures	Historic Bridges	Historic Roads		Illegal Dumps	Landfills	Underground Storage Tanks
	miles (kilometers)	(hectares)	(in million $)	vehicles per day	acres (hectares)	acres (hectares)	acres (hectares)	acres (hectares)	acres (hectares)					Estimated Receptors 2030 Traffic			
Common	6.9 (11.1)	398 (161)	135	-	21 (8)	151 (61)	49 (20)	190 (77)	0	4	10	1	3	5-6**	5	2	2
A	5.3 (8.5)	305 (123)	136	36,216	17 (7)	0	51 (21)	238 (96)	139 (56)	1	0	0	0	51	0	0	0
Ab	5.4 (8.7)	319 (129)	131	36,216	31 (13)	0	58 (23)	229 (93)	111 (45)	2	0	0	0	51	0	0	0
B	5.7 (9.2)	315 (127)	146	34,978	19 (8)	0	47 (19)	249 (101)	98 (39)	1	2	0	0	13	1	0	0
Ba	5.8 (9.3)	318 (129)	146	34,978	14 (6)	0	43 (17)	260 (105)	97 (39)	2	0	0	0	7	2	0	0
Bb	5.7 (9.2)	326 (132)	141	34,978	33 (13)	0	52 (21)	241 (98)	110 (44)	2	2	0	0	13	1	0	0
Bab	5.8 (9.3)	330 (134)	141	34,978	28 (11)	0	50 (20)	252 (101)	114 (46)	3	0	0	0	7	1	0	0
C	7.9 (12.7)	444 (180)	205	32,315	24 (10)	0	34 (14)	386 (156)	108 (43)	1	1	0	0	37	1	1	0

Continued	Relocations							Floodplain Impacts		USACE Section 404 Impacts			Surface Water Quality Impact Ratings
	Residential Owners	Residential Tenants	Businesses	Total	Minority Households	Elderly Households	Low-Income Households	Special Flood Hazard Area	Floodway	Stream Crossings		Wetlands	
								linear feet (linear meter)	linear feet (linear meter)	Intermittent	Perennial	acres (hectares)	
Common	20	3	8	31	0	3	0	0	0	12	0	0	1.2
A	30	7	0	37	0	0	2	12,700 (3,870)	0	8	3	52 (21)	2.5
Ab	30	7	0	37	0	0	2	13,400 (5,000)	0	9	2	30 (12)	2.5
B	12	8	1	21	0	4	2	13,100 (4,000)	600 (183)	8	3	55 (22)	2.5
Ba	6	8	0	14	0	2	3	13,100 (4,000)	0	9	3	55 (22)	2.3
Bb	12	8	1	21	0	4	2	13,600 (4,150)	0	9	2	32 (13)	2.5
Bab	6	8	0	14	0	2	3	13,600 (4,150)	0	10	2	32 (13)	2.3
C	27	14	0	41	0	0	0	9,400 (2,900)	4000 (1,200)	6	11	30 (12)	2.9

† For alignments A, Ab, B, Ba, Bb, and Bab, the traffic and impacts outlined in the table are with an interchange at Oneida Street. With a grade separation at Oneida Street, the traffic and impacts would vary slightly. These differences are outlined in Sections 2 and 3.
†† Miscellaneous includes railroads, cemeteries, roadways, utility right of ways, ponds, reservoirs, borrow areas, sewage ponds, levees, ditches, and towers.
*10 dBA level receptors and receptors that approach the noise abatement criteria (66 dBA).
** A range is indicated because the receptor count changes based upon which alignment is combined with the Common Alignment.
# Traffic volumes are for the entire alignment alternative including the common alignment section.

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