Chapter III
Affected Environment/Consequences

This chapter provides a description of the existing social, economic and natural environmental characteristics present in SIU 6. This inventory serves as a baseline for assessing the possible impacts of the proposed actions. In addition, this chapter describes the potential environmental consequences of the No-Build and Build Alternatives described in Chapter II.

A. Social and Economic Setting

Social and economic data were collected for both Montgomery and Callaway Counties to provide insight into the study corridor population. Such insights may reveal populations that are at risk for impacts by the proposed action and allow comparisons among different population groups both within and outside the study corridor. Data were collected from the 1990 and 2000 United States Census of Population and Housing to establish current conditions and to determine population characteristic trends.

1. Demographic Conditions

a. Population

According to the 2000 U.S. Census, Callaway County has a population of 40,766. This represents a 24 percent increase from the 1990 population of 32,809. Nearly 30 percent (12,128) of the county's residents live in Fulton, located about 15 miles south of Kingdom City. Callaway County is one of the largest counties in the state, consisting of 839 square miles. Population density in the county is 48.6 persons per square mile. The county is approximately 52 percent male and 48 percent female, while 92 percent of the inhabitants are white. The median age in Callaway County is 34.7 years old and 74.6 percent of the population is over 18 years old.

Table III-1: SIU 6 – Population Characteristics (2000)

Location	Callaway County	Montgomery County	Kingdom City
Population	40,766	12,136	121
Under 18	10,371	3,085	26
18 to 64	25,921	6,960	73
65 and Older	4,474	2,091	58
Female	19,634	6,126	58
Male	21,132	6,010	63
Households	13,699	4,641	51

Source: U.S. Bureau of the Census, Census 2000

Kingdom City is the only incorporated city located within the I-70 Study Corridor in Callaway County. Kingdom City is located at the intersection of U.S. 54 and I-70. The year 2000 population for Kingdom City was 121, up 8 percent from 1990 Census figures. The village is 52

percent male and 48 percent female, while 91 percent of the inhabitants are white. The median age in Kingdom City is 45.1 years old and 78.5 percent of the population is over the age of 18.

Montgomery County's 2000 census population was 12,136 - nearly seven percent greater than the 1990 population. The county is comprised of 537 square miles and contains 22.6 persons per square mile. The county is approximately 50 percent male and 50 percent female, with over 96 percent of the inhabitants being white. Montgomery County's median age is 39.4 years old and nearly 75 percent of the population is over 18 years of age.

Table III-2: SIU 6 Minority Demographics

	Callaway County	Montgomery County
Total Population	40,766	12,136
One Race	40,273	11,981
White	37,420	11,647
Black/African American	2,307	248
American Indian/Alaska Native	210	29
Asian	210	31
Native Hawaiian/Pacific Islander	5	1
Other	121	25
Two or More Races	493	155
Hispanic or Latino (of any race)	377	94

Source: U.S. Bureau of the Census, Census 2000

b. Housing

There are a total of 13,699 households in Callaway County. The average household size in the county is 2.56 people. Of these 13,699 households in Callaway County, 77 percent are owner-occupied and 23 percent are renter-occupied. According to 2000 Census figures, 67 percent of the total housing units are one-unit detached homes while 22 percent are mobile homes. In terms of age, 21 percent of the structures were built between 1970 and 1979 and 17.5 percent were built between 1980 and 1989. There was also a spike in housing growth between 1995 and 1998 with 13 percent of the total housing units in Callaway County being built during this time. Finally, the median value for owner occupied units in Callaway County was $85,800 in the year 2000 and median rent was $418 per month.

There are 51 total households located in Kingdom City with an average household size of 2.37 people per household. Of the occupied housing units in Kingdom City 82 percent are owner-occupied and 18 percent are renter-occupied. Meanwhile, 60 percent of the total housing units are one-unit, detached structures while 37 percent are mobile homes. According to the 2000 Census the median value for owner-occupied units in Kingdom city was $85,000.

Finally, there are a total of 4,641 households in Montgomery County with an average size of 2.47 people per household. Of the 4,641 occupied housing units in Montgomery County, 78.5 percent are owner-occupied and 21.5 percent are renter-occupied. According to 2000 Census figures, 77 percent of the total housing units are one-unit, detached structures and 17 percent are mobile homes. Over 25 percent of the housing units were built prior to 1939, representing the greatest percentage for any time period represented by the Census. In 2000, the median value of all owner-occupied units in Montgomery County was $59,300 and median rent was $385 per month.

2. Economic Conditions

Callaway County's economy consists of a mixture of education, industry, agriculture and business. The educational, health and social service sectors account for 25 percent of county employment. Other industries with large employment numbers include public administration, retail trade and manufacturing. In 1999, the median household income was $39,110 and the per capita income was $17,005. In Kingdom City, the median household income was $35,417 in 1999 and the per capita income was $16,978. Also, in 1999, six percent of the families in Callaway County lived below the poverty level. The 2001 unemployment rate for Callaway County was 3.5 percent. This percentage marked an increase from 2000 levels, but still below the unemployment rates that were prevalent in the early 1990's.

The economy of Montgomery County is consistent with that of the surrounding counties. Twenty-four percent of those employed work in the manufacturing industry. Other industries with large employment numbers include education, health and social services, retail trade and construction. According to 1999 figures, the median household income was $32,772 and the per capita income was $15,092. Also, in 2000, there was a 3.8 percent unemployment rate in Montgomery County and 8.4 percent of the families lived below the poverty rate.

Table III-3: Employment by Industry

	Callaway County	Montgomery County
Agriculture & Mining	506	301
Construction	1,756	426
Manufacturing	2,070	1,323
Wholesale	496	161
Retail	2,252	622
Transportation & Warehousing	1,131	370
Information	442	69
Education, Health, Social Services	4,923	972
Public Administration	2,411	307
Other	3,732	968
Total	19,719	5,519

Source: U.S. Bureau of the Census, Census 2000

Table III-4: Income and Poverty

	Callaway County	Montgomery County
Median Household Income	$39,110	$32,772
Per Capita Income	$17,005	$15,092
Number Families in Poverty	624	281
Percent Families in Poverty	6.0%	8.4%

Source: U.S. Bureau of the Census, Census 2000

Most of the employment centers and generators in the two counties are located in or near Fulton. There are several state government employers based in Fulton including the Fulton State Hospital, a long-term, inpatient mental health facility, the Fulton Reception and Diagnostic Center, which processes inmates and determines where they should be located in the prison system and finally, the Missouri School for the Deaf. Other large employers include county government, Westminster College, the Ameren UE nuclear power plant near the town of Reform in southeastern Callaway County, the University of Missouri-Columbia and state government offices in Jefferson City.

3. Land Use

a. Affected Environment

Following the First Tier Study methodology, existing land use was divided into two categories: developed land and undeveloped land. Within SIU 6, undeveloped land mainly consists of agricultural land. Developed land lies primarily within municipal boundaries. There are exceptions to each case, for example, the community of Danville is unincorporated, but would still be considered developed land. Likewise, properties within the municipal boundaries of Kingdom City are undeveloped, but would likely become developed in the future.

The majority of the land in Callaway and Montgomery counties, 99 and 98 percent respectively, is undeveloped land. Kingdom City, located in Callaway County, is the only incorporated community whose boundaries lie within the study area. There are two unincorporated communities whose boundaries lie within the study area: Williamsburg and Danville. Neither Callaway nor Montgomery counties have formal zoning laws. Therefore, land use information was obtained from field inventories, analysis of aerial photography and interviews with local officials.

Callaway County has a total area of 542,355 acres (219,484 hectares). Other than the county seat of Fulton, Callaway County is a predominately rural county. Undeveloped property in the county is primarily devoted to agricultural activities with crops such as corn, soybeans, wheat and sorghum. According to the 1997 Census of Agriculture, the amount of land devoted to farming decreased three percent from 339,372 acres in 1992 to 330,471 acres in 1997. Coinciding with the decrease in acreage was a decline in the average size of Callaway County farms and the number of full-time farms. The average size of farms decreased five percent from 261 acres in 1992 to 247 acres in 1997 and the number of full-time farms decreased two percent from 512 farms in 1992 to 502 farms in 1997.

There is developed land located at each of the three interchanges located in the county. The most developed area is Kingdom City, a village located at the crossroads of U.S. 54 and I-70. The interchange is a major stopping point for I-70 travelers destined for Jefferson City and the Lake of the Ozarks. Most of the development in Kingdom City is commercial, travel-related businesses located immediately adjacent to the interchange. There are several gas stations, truck stops, restaurants and hotels located south of the interchange. There is similar development north of the interchange, including the Heart of Missouri Tourism Center and the adjacent Missouri Firefighters Memorial which was opened in 2002. Residential units are also located north of the interchange. There is limited developed land in the immediate vicinity of the interchanges at mile marker 155, near Calwood and mile marker 161 near Williamsburg.

Montgomery County borders Callaway County on the east and is located in the east central portion of the state. Montgomery County consists of 346,701 acres (104,305 hectares). There is one developed area within the Montgomery County portion of the study area. The community, Danville is unincorporated. Danville is predominantly residential, with very limited commercial and industrial development. There are two businesses at the Danville interchange at mile marker 170 as well as a quarry located in the southeast quadrant. Undeveloped property in the county is of a predominantly agricultural nature. The 1997 Census of Agriculture identified 247,776 acres devoted to farming, a 10 percent increase from the 1992 census. The average size of farms increased four percent from 313 acres to 324 acres. However, the number of full-time farms decreased 17 percent from 383 farms in 1992 to 316 farms in 1997. The primary agricultural crops sold by Montgomery County farms include corn, soybeans, wheat and sorghum.

Neither the counties, nor the communities located within the study area have developed formal plans or zoning to guide development. There is little county or municipal regulation leaving land owners the ability to develop land as they see fit. Because there is no formal zoning in Kingdom City, the only means for the village to formally guide development is to acquire and develop property directly. The village has purchased and assembled several parcels of land for development purposes in the northwest quadrant of the interchange. The Heart of Missouri Tourism Center and the adjacent Missouri Fire Fighters Memorial are located on property formerly owned by the village and donated to the Missouri State Fire Fighters Association for their development.

b. Environmental Consequences

The No-Build alternative would have no impact on land use policies and decisions within SIU 6. Under the recommended preferred alternative, since neither the counties, nor the communities within SIU 6 utilze zoning and planning, I-70 improvements would have little, if any impact to community land use plans and policies. Property that Kingdom City owns and plans to develop would experience a change in access under either Kingdom City interchange alternative. However, interchange improvements could increase the potential for future conversion of agricultural or undeveloped land to commercial or industrial uses at the interchanges.

4. Community Facilities

Communities/Neighborhoods

Callaway County was founded in 1820 and named in honor of Captain James Callaway who was the grandson of Daniel Boone. Railways played a large role in the early history of the county and many current communities exist where rail stations were once located. There are two communities, Kingdom City and Williamsburg, located within or near the SIU 6 study area in Callaway County. Otherwise development along the I-70 Corridor in Callaway County is rural in nature, consisting of farms and non-farm residences.

Kingdom City is a village that is based on its relationship with I-70 and the accompanying businesses. Located in Callaway County in central Missouri, Kingdom City is situated at the crossroads of I-70 and U.S. 54. A popular exit point for motorists accessing Jefferson City and the Lake of the Ozarks area, Kingdom City is home to many travel-related businesses. There are several gas stations, truck stops, restaurants and hotels located in Kingdom City. Also, north of I-70 are the Heart of Missouri Tourism Center and the adjacent Missouri Firefighters Memorial which was opened in 2002. Commercial development is focused in the areas immediately north and south of the interchange. There is a small pocket of residential development approximately one-half mile north of the interchange along Old U.S. 40.

The community of Williamsburg is also located in the immediate vicinity of the study corridor. Williamsburg is located approximately one-half mile north of the Route YY/I-70 interchange. There is a truck stop located in the southwest quadrant of the Williamsburg interchange and a MoDOT maintenance facility located in the northwest quadrant. Development in Williamsburg includes a cluster of residential units, Williamsburg Elementary school, the Williamsburg Cemetery and a general store.

Montgomery County, founded in 1818, was named in honor of General Richard Montgomery of Revolutionary War fame. Montgomery County is more sparsely populated than Callaway County. The community of Danville, located north of I-70 at the interchange with Route 161, is the only community within the SIU 6 study corridor in Montgomery County. Outside of Danville, several rural farm and non-farm residences are located within the SIU 6 study area.

Danville was founded in 1834 and for a number of years was the Montgomery County seat. However, a majority of the town was burned during a Civil War raid in 1864. Today Danville primarily consists of a few homes and a gas and convenience store located north of the interchange. The historic Baker Plantation Home, a fully preserved Greek revival, southern-style plantation house that was built in 1853, is also located in Danville.

Schools

The SIU 6 study area in Callaway County is part of the North Callaway R-1 School District. North Callaway High School is located approximately two miles north of the I-70/U.S. 54 interchange near Kingdom City. Williamsburg Elementary School is located on Route D, approximately 0.5 mile north of the Williamsburg interchange. Also, Westminster College and William Woods University are located in nearby Fulton. In Montgomery County, the SIU 6 study area is part of the Montgomery County R-II school district. None of the schools in this district are located near the study area. The proposed SIU 6 improvements would not impact any existing school.

Churches and Cemeteries

There are several churches located in Callaway and Montgomery Counties near the study area, however all are located outside the study area. The planned I-70 improvements would not affect these churches.

There are several small, family cemeteries that are located near the I-70 Corridor. Many of these cemeteries have several generations of family members located there and are more than 150 years old. There are two small cemeteries located in close proximity to the Kingdom City directional ramp, about one-half mile south of Kingdom City, off U.S. 54. The Houf Family cemetery, located east of U.S. 54, occupies an area that is approximately 20’ x 20’ and contains five family members. On the west side of U.S. 54 in this area, a single grave marker stands in the middle of an actively farmed field on the Terrell Atkinson property. The Williamsburg Cemetery, located approximately one-half mile north of the Williamsburg interchange is also located in close proximity to the study limits. Other cemeteries include a family cemetery approximately 1.5 miles east of the Calwood interchange, a family cemetery approximately 1.0 mile west of the Loutre River crossing and the Seven Gates Cemetery, located just west of the Route N overpass in Montgomery County. The planned I-70 improvements would not directly impact any of these known cemeteries.

Pedestrian and Bicycle Facilities

An inventory of the existing bicycle and pedestrian facilities within the SIU 6 study area was conducted. It was determined that there are no bicycle or pedestrian facilities that are located within the construction limits of an expanded I-70 in SIU 6. Graham Cave State Park contains two trails in the park campground area. The Loutre River Trail is a two-mile loop and the Indian Glade Trail is a one-mile, one-way trail. Both trails contain hilly terrain with neighboring savannas, sandstone bluffs, glades and waterfalls during the wet season. Neither of these trails is expected to be affected by I-70 expansion. The Katy Trail also runs through southern Callaway and Montgomery Counties, but is located far south of the I-70 Corridor. Though not a primary purpose, the provision of continuous frontage roads could provide a continuous bicycle facility across the state. The frontage road shoulders could also serve as bike lanes with appropriate signage and delineations.

Emergency Services

Police services in and around the SIU 6 study area in Callaway County are provided by the Callaway County Sheriff's Department, headquartered in Fulton. In Montgomery County, police services are provided by the Montgomery County Sheriff's Department, headquartered in Montgomery City. Incidents that occur on I-70 in both Callaway and Montgomery Counties are handled by the Missouri State Highway Patrol, Troop F, based out of Jefferson City.

Fire protection for the SIU 6 study area in Callaway County is provided by the North Callaway Fire Protection District, based in Kingdom City. Ambulance service is provided by the Callaway County Ambulance Service, which is based in Fulton. Fire protection in Montgomery County is handled by the Montgomery Fire Protection District. Their headquarters are based in Montgomery City and they currently house a fire truck at the Community Center in Mineola. The Fire Protection District has jurisdiction over the interstate and is considering building a new building to house their equipment near the Danville interchange. The final design of the Danville interchange would play a role in determining where this new building is located.

The Callaway Community Hospital, located in Fulton, is a general medical and surgical hospital that provides such services as general medical and surgical care, general intensive care, obstetrics and an emergency department. Larger hospitals in Columbia, located west of the study area, also provide services to residents in the SIU 6 study area.

Since the proposed I-70 improvements would be constructed along the existing alignment, no reduction in emergency service accessibility is envisioned. Improvements to the interchange in Kingdom City are expected to reduce congestion and travel time. The eventual construction of the directional ramps would also assist in accessibility. The Fire District in Montgomery County was concerned about the impact the Far North alternative would have on accessibility to property in that area and were in favor of maintaining the existing facility.

Community Cohesion/Accessibility

The expansion and improvement of I-70 would not substantially alter community cohesion or existing accessibility to and from I-70. Existing land use patterns in the corridor would not change and no segments of land would be cut off from other areas that they currently have access to. Due to the rural nature of SIU 6, very few residences or businesses would be displaced. As a result, no neighborhoods or pocket of residences would become isolated from other residences or services due to I-70 improvements.

Accessibility to certain areas would be increased with the construction of new frontage roads on both sides of I-70 through the Auxvasse Creek area and on the south side of I-70, west of Williamsburg. Existing travel patterns along I-70 would remain relatively unchanged.

Public Services and Utilities

Currently, several utility lines follow the path of I-70 through SIU 6. With expansion of I-70 to the north of existing from the western terminus of SIU 6 to east of Williamsburg and south of existing I-70 from Danville to the eastern terminus of SIU 6, several utility lines would be affected. Currently, in Callaway County, phone lines belonging to the Kingdom Telephone Company follow the path of I-70 from east of the Calwood interchange to east of the Williamsburg interchange. These lines run along the north side of I-70 and follow Route D in the Williamsburg area. At two points, the lines cross I-70. One point is where Route D crosses I-70 in between the Calwood and Williamsburg exits and the other point follows Route YY in between the Williamsburg exit and the Callaway/Montgomery County line.

There are two water utilities and a municipal water and sewer utility located in the SIU 6 study area. The Montgomery County Public Water District #1 has no water utilities that cross or run adjacent to I-70 in the SIU 6 study area. The Callaway County Public Water District #2 serves the Callaway County portion of the SIU 6 study area except for Kingdom City. The Public Water District's water utility lines follow parallel to I-70 outer roads at the following:

- Route JJ overpass to Calwood interchange along the south side of I-70.
- Immediately west of Calwood interchange along the north side of I-70.
- Immediately east of the Route D overpass along both sides of I-70 and west of the overpass on the north side of I-70.
- Along the south side of I-70 west of Williamsburg.

Additionally, I-70 crosses district water utility lines near the Route D overpass, west of Williamsburg and at the Route JJ overpass, east of Kingdom City. Kingdom City has municipal water and sewer utilities. There is one I-70 crossing of the municipal utility line on the east side of town immediately south of Kingdom City's new sewage treatment plant.

The Callaway Electrical Cooperative has numerous utility lines that cross I-70 throughout Callaway County. They also have utility lines that run near the I-70 right of way in both Callaway and Montgomery Counties. Also, the Central Electric Power Cooperative has three transmission lines that intersect with I-70 in Callaway County. The locations of these lines are:

- West of Kingdom City
- Immediately east of Kingdom City, and,
- Between the Danville and Williamsburg interchanges.

AT&T has cable running along the north side of I-70 the length of the SIU 6 Corridor. DTI has fiber optic lines running parallel to I-70. East of the Danville interchange, the fiber optic lines are on the north side, within state right of way. For the remainder of SIU 6, the lines run on the south side of I-70, within the state right of way. DTI has an agreement with MoDOT that MoDOT pays the cost of any required relocation, even though DTI is on state right of way.

5. Economic Development

The only substantial center for economic activity within the SIU 6 study area is in the vicinity of the I-70 and U.S. 54 interchange at Kingdom City. The business sector of Kingdom City consists mainly of restaurants and fast food stops, gas and service stations and hotels. With the exception of the newly constructed Missouri Firefighters Memorial, Kingdom City does not possess what would be considered a primary tourist destination.

a. Affected Environment

The Community Policy Analysis Center (CPAC) at the University of Missouri was commissioned to prepare a report on the economic impact proposed changes to the I-70/U.S. 54 interchange would have on Kingdom City businesses and the local economy in general. Their study focused on the overall economic development impact the businesses contribute without focusing on specific interchange alternatives. The conclusion of their study included:

- Businesses located in Kingdom City directly support over 600 jobs with an estimated payroll of over $7.7 million dollars.
- These businesses generate an additional 143 jobs in Callaway County through indirect and induced effects.
- Kingdom City businesses increase the personal income of Callaway County residents by an amount of over $10.3 million.

- Through the survey conducted by CPAC, most local business owners estimate that anywhere from 90 to 95 percent of their sales are generated by the interchange and traffic from Highway 54 and I-70.
- Total county revenues of $420,000 can be attributed to Kingdom City.
- If businesses in Kingdom City were suddenly removed from the economy, Callaway County would see a loss of almost $20 million in retail sales. This $20 million accounts for 7.4 percent of total retail sales in the County.
- Assessed property values would decrease by a total of $13 million dollars in the county, a vast majority of which would occur directly in the Kingdom City area.

Accessibility and visibility are the two key factors in the ability of a business to attract patrons. Drive-by type establishments (hotels, restaurants, service stations) typically have a much higher percent of their business from people driving by their business and deciding to stop. Visibility of that business is important to attract that type of patronage. In addition, the ability to get to that business in an efficient manner is also critical as people tend to patronize businesses that are closer. Both these factors were integral in the overall evaluation of the likely economic development implications of the various interchange options developed in Kingdom City.

b. Environmental Consequences

No-Build

Based on the future traffic forecasts in and around the Kingdom City interchange, doing nothing over the course of the next 30 years would result in a substantial increase in traffic congestion and inability of patrons, especially trucks, to efficiently access the economic development opportunities in the Kingdom City area. Therefore, the No-Build alternative would hinder accessibility of existing economic development opportunities, as well as the ability to attract and retain new development opportunities.

Build Alternative

There are several competing factors that must be evaluated before a true understanding of the likely economic development impacts can be fully understood and evaluated. Those factors include:

- **Visibility** – Several of the preliminary build alternatives called for the realignment of either I-70 or U.S. 54 and would have had a substantial impact on the visibility of the Kingdom City businesses. The final recommended preferred alternative replaces the existing interchange in its present location and would maintain the same level of visibility that currently exists. The only exception to that statement is the potential future construction of the directional ramps in the southwest quadrant of the interchange that would divert a portion of the trips away from the existing interchange. These ramps have been located as close to the Kingdom City businesses as possible and would still maintain some visibility.
- **Accessibility** – Maintaining the interchange in its present location helps maintain accessibility to the existing Kingdom City businesses. The access management plan being implemented throughout the I-70 Corridor would require the existing at-grade intersections both north and south of the interchange to be relocated further away from the ramp termini. The result is further out-of-distance travel for most patrons and some reduction in accessibility.
- **Construction Impacts** – During construction it might be necessary to temporarily modify access points to various businesses or close lanes in certain directions, all of which could result in a short-term reduction in the ability to access certain

establishments. The act of construction also brings short term economic benefits to local businesses as construction workers are hired and materials are purchased resulting in additional disposable income being spent in the area.

- **Travel Efficiencies** – After construction is complete most areas experience an upturn in economic activity related to improved ability to maneuver through the interchange with fewer delays.

The study team concluded that there would be a limited short-term economic decline during construction if the interchange was reconstructed at its existing location. However, economic opportunities would improve after the interchange has been reconstructed.

The construction of the directional ramps when traffic levels warrant would result in a reduction of drive-by business. However, the economic development ramifications of this construction would be minimal because:

- The ramps would be constructed when the traffic levels warrant, thereby ensuring more traffic even after the ramps are built than currently exist today.
- The majority of the traffic that would use the directional ramps is through trips that had no intention of stopping. Those that intended to stop would continue to use the new interchange.
- The new ramps would provide an opportunity to access the Kingdom City businesses for those patrons that realized they wanted to stop after they had already entered the directional ramp.

6. Residential and Business Displacements

a. Displacements

Through the expansion of I-70 along the existing highway, several residences and businesses stand to be displaced in SIU 6. The additional right of way that would be required for I-70 improvements would be a cause for relocation for existing households, businesses and other facilities within the corridor. Also, several parcels of land in the SIU 6 Corridor would suffer from a partial taking. Property acquisition would include the purchase of vacant land, farm land, residential land, business land and other such land adjacent to the existing right of way.

The recommended preferred alternative for an improved I-70 would require the acquisition of 13 residential properties that contain a total of 16 residential structures. These properties are generally single family houses on farms. Several properties contain more than one single family house on the property. There are eight properties containing businesses that would need to be relocated. The types of stand alone businesses displaced by the recommended preferred alternative include a business office for a commercial trucking company, an antique mall, a thrift store, a woodworking shop and a small implement dealer. Three of the the properties are one-room buildings adjacent to large billboards. Three properties which were private residences that contained home based businesses, were included in the residential taking total. These properties are scattered out across the entire SIU 6 Corridor. While areas near interchanges tend to have more properties that would need to be acquired, there are no clusters of development that would be affected by I-70 expansion. **Table III-5** provides more information in regards to the numbers and costs of displacements as a result improvements to I-70 in SIU 6. The maps in **Appendix C** display the exact location of each displaced residence and business.

Table III-5: Displacements, Property Acquisitions and Right of Way Costs – SIU 6

Alternative Sub-area	Number of Homes[1]/ Residents	Number of Businesses[2]/ Employees	Total Acres (HA)	Number of Acquisitions Total/Partial	Right of Way Cost	Structure Cost[3]	Relocation Cost	Total ROW Costs
Kingdom City Sub-area	10/25	6/15	696 (282)	3/107	$8,451,000	$2,380,000	$1,624,000	$12,455,000
Mineola Hill Sub-area	6/15	2/4	135 (55)	3/82	$9,210,000	$1,750,000	$1,644,000	$12,604,000

Source: Wilbur Smith Associates, 2004
[1]The number of homes that would require total relocation.
[2]The number of businesses that would be impacted, not necessarily requiring relocation.
[3]The cost of purchasing any impacted structures, including outdoor advertising

As mentioned, residential, business and agricultural properties must be purchased to complete I-70 improvements. Such displacements can cause hardships for those uprooted from their homes. The Missouri Department of Transportation's right of way acquisition and relocation program is carried out in compliance with the Uniform Relocation Assistance and Real Properties Acquisition Policies Act of 1970 (Uniform Act), as amended in 1987 (42 U.S.C. 4601). The Uniform Act, as well as Missouri law, requires that just compensation be paid to the owners of private property taken for public use. An appraisal of fair market value is the basis for determining just compensation to be offered the owner for the property to be acquired. The Uniform Act defines an appraisal as a written statement independently and impartially prepared by a qualified appraiser setting forth an opinion of defined value of an adequately described property as of a specific date, supported by the presentation and analysis of relevant market information.

The Missouri Department of Transportation's right of way acquisition and relocation program is designed to provide uniform and equitable treatment for those persons who are displaced from their residences, businesses or farms. The program is carried out without discrimination and in compliance with Title VI, the President's Executive Order on Environmental Justice, Limited English Proficiency and the ADA. It provides advisory assistance to owners and tenants who are displaced and relocation assistance payments designed to compensate displaced persons for costs which have been imposed on them by a MoDOT highway project. Relocation assistance under this program is made available to all affected parties without discrimination.

Any displaced owner-occupant or tenant (of a dwelling) who qualifies as a displaced person is entitled to payment of his or her actual moving and related expenses, as MoDOT determines to be reasonable and necessary. A displaced owner-occupant who has occupied an affected dwelling for at least 180 days is also eligible to receive up to $22,500 for a replacement housing payment, which includes the amount by which the cost of a replacement dwelling exceeds the acquisition cost of the affected dwelling, increased interest costs and incidental costs. A displaced owner-occupant who has occupied an affected dwelling for at least 90 days but less than 180 days or a tenant who has occupied an affected dwelling for at least 90 days is entitled to a payment not to exceed $5,250 for either a rental or down payment assistance.

Any displaced business, farm operation or nonprofit organization which qualifies as a displaced person is entitled to payment of actual moving and related expenses, as MoDOT determines to be reasonable and necessary. In addition, a business, farm or nonprofit organization may be eligible to receive a payment, not to exceed $10,000, for expenses incurred in reestablishing the business, farm operation or nonprofit organization at a replacement site.

A displaced business may be eligible to choose to receive a fixed payment in lieu of the payments for actual moving and related expenses and actual and reasonable reestablishment expenses. The payment amount for this entitlement alternative is based on the average net

earnings of the business. This fixed payment amount cannot be less than $1,000 or more than $20,000.

The Uniform Act requires that comparable, decent, safe and sanitary replacement housing within a person's financial means be made available before the person may be displaced. Should this project include persons who cannot readily be moved using the regular relocation program benefits and procedures (i.e., when there is a unique housing need or when the cost of available comparable housing would result in payments in excess of the $22,500 or $5,250 statutory payment limits), MoDOT's relocation policy commits to utilizing housing of last resort. Housing of last resort involves the use of payments in excess of statutory maximums or the use of other unusual methods of providing comparable housing. The Missouri Department of Transportation will utilize housing of last resort as needed on a case-by-case basis.

The Missouri Department of Transportation relocation program is designed to ease the property transition for the property owner or renter who is displaced. The Missouri Department of Transportation's relocation agents work closely with relocates, as needed or requested, and provide the needed guidance to relocate any eligible party. Housing of last resort will be provided as needed but the local residential and commercial property market is expected to more than absorb the displacements associated with this project.

Current vacancy rates for both Callaway and Montgomery Counties indicate an adequate supply of replacement housing. Recently, approximately 275 housing units have been for sale over a two-month period in Callaway County. A majority of these homes fall into the $50,000 to $100,000 range. In Montgomery County, approximately 100 housing units were available during this same time period. The majority of the housing in Montgomery County for sale falls into the $50,000 to $100,000 range or the greater-than-$150,000 range.

b. Tax Base Impacts

Through the recommended preferred alternative expansion of I-70, some structures along the interstate would be displaced. The taking of these structures and their property would lessen the tax base in their respective county. The existing Callaway County tax base in 2003 was $603,993,998. The recommended preferred alternative would displace approximately 17 properties. The 2003 assessed value of those properties in and around the Kingdom City area (six properties) was $146,260. Along mainline I-70 from east of Kingdom City to east of Williamsburg (nine properties) the assessed value was $149,230. In the Mineola Hill area that is in Callaway County, two properties would be displaced at an assessed value of $19,840. The total loss in assessed value to the Callaway County property tax base would be $315,330.

The 2003 tax base in Montgomery County was $9,557,523. A total of three residential properties in the Mineola Hill area and one property east of the Danville interchange would be displaced. The 2003 total assesed value of the properties in the Mineola Hill area was $42,670 while the assessed value for the property west of Danville was $31,990. The loss in assessed value to the Montgomery County tax base would be $74,660.

7. Environmental Justice

a. Affected Environment

Executive Order 12898: *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations* attempts to address disproportionate high and adverse human health or environmental impacts created by Federal government sponsored or funded programs and projects. The Executive Order focused attention on Title VI of the 1964 Civil Rights Act by ordering each Federal agency to make environmental justice part of its

mission and to identify and address the effects of its programs, policies and activities on minority and low-income populations. In support of the Executive Order 12898, the US DOT issued an Order on Environmental Justice in 1997. That order was followed by a FHWA Order on Environmental Justice in 1998. In short, environmental justice is a policy goal that has three major components:

- Avoid, minimize, or mitigate disproportionate high and adverse human health or environmental effects, including social and economic effects, on minority populations and low-income populations.
- Ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.
- Prevent the denial of, reduction in, or substantial delay in the receipt of benefits for minority populations and low-income populations.

The main goals of environmental justice as it relates to transportation projects are to prevent adverse impacts from disproportionately falling to minority and low-income populations, to assure those populations receive their equal share of benefits from a project and the ability to provide input into the decision-making process. In earlier transportation projects, many of the negative social, economic and environmental impacts associated with transportation improvements have fallen to minority and low-income populations. Adverse impacts of transportation projects often affected minority populations and low-income populations for several reasons. Those reasons include locations of those populations' neighborhoods near central business districts and other high profile destination areas, typically lower property values in those neighborhoods and a perceived lack of political power and representation.

For the analysis of environmental justice in transportation projects, such as this project, minority persons are defined as any person who is Black, Hispanic, Asian American, American Indian, or Alaskan Native. Low-income populations are those households with incomes at or below the Department of Health and Human Services poverty guidelines of $18,500 for a family of four.

A socio-economic analysis of the SIU 6 Corridor was performed using Census tract and block group-level income and race data into a geographical information system (GIS) to identify any minority or low-income populations. The resulting analysis did not identify any minority or low-income populations in the SIU 6 Corridor due to the rural character of the corridor and general lack of residential groupings. The main residential population centers of Kingdom City, Williamsburg and Danville are located well off the I-70 mainline and are not part of the study corridor.

One issue that has been raised periodically is that of Graham Rock, also known as Picnic Rock and more recently referred to as Slave Rock. Graham Rock is located in the median of I-70 now, north of Graham Farmstead and south of Graham Cave State Park. The large sandstone rock is first mentioned in historical records as being the site for the Fourth Settler's Reunion in 1884. It was used as a destination picnic site for the area's residents and visitors. In 1951 Graham Rock became a roadside park when old U.S. 40 was constructed adjacent to the rock. The area was leased to the State Highway Commission and used as a roadside park until 1963 when I-70 was constructed, isolating Graham Rock in the median of the Interstate Highway. There is a persistent oral tradition of Graham Rock being used for slave auctions in the pre-Civil War days. Although there is no documentary evidence to support this, it has been mentioned enough that Graham Rock or Picnic Rock is now referred to as Slave Rock in many circles. The belief that slave auctions were held at Graham Rock is persistent and could be considered as a potential issue of particular significance to African-American's cultural heritage in Missouri.

b. Environmental Consequences

No-Build Alternative

The No-Build Alternative would have no impact upon the existing socio-economic structure of the SIU 6 Corridor as no additional right of way would be required. Existing community cohesion would not be substantially altered, nor would any adverse impacts to minority or low income populations occur. No minority or low income populations were identified in the SIU 6 Corridor through socio-economic analysis at the Census tract and block group levels. Also, due to the preservation of the existing alignment of the roadway, the No-Build Alternative would not impact Graham Rock.

Build Alternative

The recommended preferred alternative would displace a total of 17 residential dwelling units and eight businesses. The residential and business displacements are dispersed along the 27-mile study corridor, thereby not disrupting any organized community group. Due to the dispersed rural population in the corridor and the lack of minority or low-income populations, no undue and unfair impacts would occur.

The recommended preferred alternative would not impact Graham Rock. Improvements to I-70 would bring travel lanes closer to Graham Rock, but would not require additional fill around the rock, nor would it require blasting or removal of portions of the outcropping.

B. Environmental Setting

1. Physiography and Climate

The project area is located within the Lower Missouri Valley II Section of the Glaciated Plains Natural Division and falls within the general physiographic region known as the Northeast Prairie. The Glaciated Plains Natural Division covers the northern third of the state, stretching from Iowa to the Osage Plains and the Ozark Border Natural Divisions. The Lower Missouri Valley is characterized by loess and glacial till-derived upland soils and much of the division is moderately dissected. Upland and flood plain presettlement vegetation was equally divided between deciduous forests and prairie. Deciduous forests, wet prairies and marshes were found along the major rivers such as the Missouri.

The modern climate of Callaway and Montgomery Counties is midcontinental, with hot summers, cold winters and frequent, often extreme, changes in temperature, winds, cloud cover and humidity. Mean precipitation is 35 inches (90 cm) in Callaway County and 38 inches (96 cm) in Montgomery County. Average seasonal snowfall is 21 inches (53 cm) in Callaway and 28 inches (70 cm) in Montgomery. Average winter temperature is 29.6 degrees F (-1.3 degrees C) and summer average temperature is 74.7 degrees F (23.7 degrees C) in Callaway County and the highest recorded temperature is 116 degrees F (46.7 degrees C). On average, thunderstorms occur on approximately 50 days each year, primarily from May to August.

2. Soils and Geology

SIU 6 is located within the Glaciated Plains Physiographic Province and is near the southern limit of glaciation. Unconsolidated continental Quaternary sediments deposited within the last two million years overlay the bedrock. These sediments consist of the following:

- loess, or wind-deposited material
- glacial till, or ice-deposited material
- alluvium, or water-deposited material

Residual soils, or residuum, are also present and are formed from three kinds of parent bedrock material, shale, limestone and sandstone, alone or in combination.

The age of the bedrock within the SIU 6 study area ranges from Ordovician, or 500 million years old, to Pennsylvanian, or 290 million years old. The older bedrock units that are Ordovician to Mississippian, are predominantly shallow marine limestone and dolomite, which include chert lenses and nodules in some areas. Shale and sandstone are less abundant. The Pennsylvanian sediments are primarily composed of shale with layers of limestone, sandstone and occasional seams of coal.

As defined, the surface soils within SIU 6 consist of loess, glacial till and residuum. These near surface soils are made up of the following USDA Soil Conservation Service associations:

- Mexico-Armstrong,
- Keswick-Lindley-Gorin,
- Lindley-Hatton,
- Goss-Gasconade,
- Armster-Cobbly,
- Hatton-Keswick-Marion,
- Goss-Gasconade-Chilhowie,
- Nodaway-Moniteau-Dockery, and
- Mexico-Amster-Putnam.

The Goss soils are residual soils that typically consist of lean fat clays (CL and CH, as define by the Unified Soil Classification System) that can contain gravel to sand size limestone and chert pieces. The Armstrong, Putnam and Mexico soils are composed of fat clays (CH). The other surface soils noted by the USDA consist of loess and glacial till and mixtures of these two soils. These soils are typically lean clays (CL) but can also contain silts, fat clays and sands (ML, CH, SM and SP) and with occasional cobbles and boulders in the till. The alluvial soils in the creek and river valleys are typically derived from the loess, till and residuum that have eroded from the upland areas and slopes.

Most of the Kingdom City portion of SIU 6 consists of the Mexico-Armstrong association. In the Calwood area, from Highway JJ to Highway Z, there is a section of the Mexico-Armstrong association between the east bank of Auxvasse Creek and the west bank of Whetstone Creek. In the Williamsburg area, there are Mexcio-Armstrong soils between the east bank of Whetstone Creek all the way to State Route D. Mexico-Amster-Putnam soils exist for the entire segment between Danville and New Florence. The surface soils throughout the remainder of the corridor include variable areas of the previously described soils.

Within the corridor karst topography and conditions are possible, but not predominant. Karst conditions occur where limestone deteriorates by solution activity in the rock, resulting in karstic features in the bedrock such as pinnacled bedrock surface, widened joints, sinkholes and caves. The only obvious evidence of karst within the highway corridor is Graham Cave.

3. Water Quality/Resources

Level III Investigations, as defined by the United States Army Corps of Engineers 1987 Wetland Delineation Manual, were performed for water resource areas within the study corridor. The Level III investigations included collecting published data from the United States Fish and Wildlife Service, National Wetland Inventory (NWI) maps, United States Geological Survey Topography Map, NRCS Food Security Act (FSA) wetland inventory and the United States Department of Agriculture (USDA) Soil Conservation Service Survey Maps and Hydric Soils Lists. This data was combined with field investigations looking for hydrophytic vegetation, hydric soils and wetland hydrology to determine areas exhibiting jurisdictional wetland characteristics. Level I investigations were performed at sites where access was either denied or not obtained. Level I delineations were performed using published recorded data only. No field investigations were performed on these sites.

Section 404 of the Clean Water Act prohibits the discharge of dredged or fill material into "Waters of the U.S." unless exempted or authorized by the U.S. Army Corps of Engineers (USACE). Section 404 is the primary Federal statute that implements federal regulatory policies concerning the protection of wetlands and other waters of the U.S. as specified in various orders and regulations.

On January 9, 2001 the U.S. Supreme Court ruled that federal authority under the Clean Water Act does not extend to "isolated," intrastate waters. The decision known as the SWANCC ruling, does not allow the USACE to us it's "migratory bird rule" to extend its jurisiction over these waters (including isolated wetlands). The "migratory bird rule" asserted that section 404 of the Clean Water Act covers isolated waters that could be used as habitat by migratory birds that cross state lines. In general, a water/wetland is considered isolated if it is not adjacent to another water of the U.S., not located within a floodplain, or otherwise not hydrologically connected to a water of the U.S. Waters (including wetlands) that were not determined to be isolated are considered "jurisictional" and subject to Section 404 of the Clean Water Act.

In general, all rivers and streams were identified using MoDOT's *Protocol for Identifying and Delineating Wetlands and Stream Impacts for the Interstate 70 Corridor Second Tier Environmental Documents and Preliminary Jurisdictional Wetland Determinations*, dated January 2002. ArcView, a Geographical Information Systems (GIS) program, was used to spatially overlay the alignments on the USGS blue-line and field-delineated streams and channels, which then calculated the impacts. Any channel with an ordinary high-water mark (OHWM) was considered a jurisdictional "Water of the U.S." whether or not the channel carried flow on a perennial or intermittent basis. To calculate the impacts to individual streams, the OHWM was located and an average width was determined. The length of the impact was then determined using GIS. Other characteristics such as channel, bank and adjacent vegetation descriptions were also recorded. A complete Wetland Delineation Report for SIU 6 was prepared and is available for review upon request.

a. Wetlands

The Palustrine System includes all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 percent. It also includes wetlands lacking such vegetation, but with all of the following four characteristics:

- Area less than 20 acres (8 hectares),
- Active wave-formed or bedrock shoreline features lacking,
- Water-depth in the deepest part of basin less than 6.6 feet (2 m) at low water, and

- Salinity due to ocean-derived salts less than 0.5 percent.

Classes under the Palustrine System wetlands that occur within the study corridor include: Emergent, Forested and Scrub-Shrub. Unconsolidated bottom wetlands (ponds) are discussed in the Ponds subsection. The Emergent class is characterized by erect rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Perennial plants usually dominate these wetlands. All water regimes are included except subtidal and irregularly exposed. In areas with relatively stable climate conditions, Emergent Wetlands maintain the same appearance year after year. The Forested class indicates a dominance of woody vegetation over 20 feet tall. The Scrub-Shrub class indicates dominance of woody vegetation less than 20 feet tall. The following tables present the wetlands identified within the study area for this project, organized by the individual wetlands and summarized by wetland classification. **Table III-6** displays the type, location and area of each of the wetlands found in or near the SIU 6 project area. The following indicates the total acres of each type of wetlands in or near SIU 6:

- Palustrine Emergent – 10.57 acres
- Palustrine Forested – 22.64 acres
- Palustrine Scrub-Shrub – 0.03 acres

Dominant vegetation observed in wetland areas were: Rice Cutgrass (*Leersia oryzoides*), Wool-Grass (*Scirpus cyperinus*), Black Willow (*Salix nigra*), Sedges (*Carex spp.*), Broad-Leaf Cattail(*Typha latifolia*), Narrow-Leaf Cattail (*Typha angustifolia*), Barnyard Grass (*Echinochloa crusgalli*), Reed Canary Grass (*Phalaris arundinacea*), Least Spikerush (*Eleocharis acicularis*), Swamp Smartweed (*Polygonum hydropiperoides*), Straw-Color Flat Sedge (*Cyperus strigosus*), Eastern Cotton-Wood (*Populus deltoids*), and Silver Maple (*Acer saccharinum*).

In addition to delineating the wetlands presented in the table above, the study team field checked and identified NWI mapped wetlands that have been disturbed since publication of the NWI maps and are no longer wetlands. The former NWI wetlands were removed from the inventory of existing wetlands.

Wetland Reserve Program (WRP)

The Wetland Reserve Program, per Section 1237 of the Food Security Act of 1985, is a voluntary program that provides technical and financial assistance to eligible landowners to restore, enhance and protect wetlands. Landowners have the option of enrolling eligible lands through permanent easements, 30-year easements, or restoration cost-share agreements. This program offers landowners an opportunity to establish, at minimal cost, long-term conservation and wildlife habitat enhancement practices and protection. Through coordination with the NRCS it was determined that no WRP properties currently exist within the SIU 6 study corridor and, therefore, the proposed improvements would not impact any WRP land.

Table III-6: Wetlands in or Near SIU 6

ID	Station	Type	Area (acres)
sw-48	2409+50	Emergent	0.07
sw-49	2396+00	Emergent	0.41
sw-19	1920+00	Emergent	0.01
sw-52	2268+00	Emergent	0.01
sw-90	1880+50	Emergent	0.07
sw-28	1723+50	Emergent	0.16
sw-27	1743+00	Emergent	0.08
sw-74	1878+00	Emergent	0.26
sw-35	1548+00	Emergent	0.08
sw-36	1526+00	Scrub-shrub	0.03
sw-37	1522+50	Emergent	0.04
sw-76	1526+00	Emergent	0.01
sw-77	1525+00	Forested	0.12
sw-22	1513+50	Emergent	0.09
sw-68	1339+00	Forested	3.24
sw-21	1981+50	Emergent	0.03
sw-62	2110+00	Forested	10.44
sw-60	2123+00	Forested	6.14
sw-57	2116+00	Emergent	1.08
sw-55	2119+50	Emergent	0.91
sw-56	2092+00	Emergent	0.82
sw-54	2123+00	Forested	2.70
sw-89	1920+00	Emergent	0.01
sw-63	1743+50	Emergent	1.03
sw-25	1673+00	Emergent	0.97
sw-24	1665+50	Emergent	0.17
sw-23	1641+00	Emergent	0.03
sw-67	1364+50	Emergent	0.04
sw-69	1147+50	Emergent	0.03
sw-103	2129+50	Emergent	0.37
sw-34	1148+00	Emergent	0.04
sw-40	1219+00	Emergent	0.18
sw-32	1142+00	Emergent	1.20
sw-41	1224+00	Emergent	0.58
sw-4	1044+00	Emergent	0.27
sw-79	1190+00	Emergent	0.68
sw-80	1204+00	Emergent	0.46
sw-33	1151+50	Emergent	0.38

Source: Shannon and Wilson, 2004

Environmental Consequences

The recommended preferred alternative would impact approximatley 7.27 acres (2.9 hectares) of existing wetlands, exempt wetlands and former NWI mapped wetlands. The wetland impacts are associated with filling emergent wetlands and bridge and culvert expansion impacts to forested and emergent wetlands. **Table III-7** displays each impacted wetland in the study corridor by impact types imposed by the recommended preferred alternative. The recommended preferred alternative would impact approximately 5.77 acres of emergent wetlands, 1.46 acres of forested wetlands and 0.04 acres of scrub-shrub wetlands.

The majority of wetlands impacted are small, poor quality wetlands. These wetlands provide limited wildlife and fish habitat. These wetlands provide limited groundwater recharge and little aesthetic value. The most prevalent wetland function lost due to destruction of these wetlands would be sediment/nutrient retention and flood storage (water detention/retention).

Applying best management practices could minimize the wetlands impacts. For example, proper installation and maintenance of siltation barriers down-gradient of any proposed excavation or clearing can minimize these impacts. The implementation of the Build alternative would result in wetland losses that cannot be reasonably avoided. Mitigation for these wetlands would ensure that wetland acreage and functional value would not be decreased.

Table III-7: Recommended Preferred Alternative Wetland Impacts

Wetland ID	Station	Side	NWI/FSA	Soil Mapping	Impact Type	Wetland Type and Impact (in acres)			Water of the U.S. Comment
						Emergent	Scrub-Shrub	Forested	
sw-103	1206+00	South	none	NH	Fill	0.14	-	-	
sw-4	1044+00	North	none	NH	Fill	0.28	-	-	
sw-32	1142+00	North	none	NH	Fill	1.15	-	-	
sw-34	1148+00	North	none	NH	Fill	0.05	-	-	
sw-33	1151+50	North	PUBGh	NH	Fill	0.39	-	-	NRCS Jurisdiction
ex-3	1166+50	North	none	NH	Fill	-	-	-	Sewage Pond
sw-79	1190+00	North	none	NH	Fill	0.12	-	-	
fnwi-1	1192+50	North	PUBGh	NH	Fill	-	-	-	NW
sw-80	1204+00	North	none	NH	Fill	0.20	-	-	
sw-40	1219+00	North	none	NH	Fill	0.18	-	-	
sw-41	1224+00	North	none	NH	Fill	0.57	-	-	
fnwi-11	1338+00	North	none	NH	Bridge expansion	-	-	-	
sw-68	1339+00	South	PFO1A	NH	Bridge expansion	-	-	1.22	
sw-67	1364+50	South	none	NH	Fill	0.04	-	-	
sw-66	1439+50	South	none	NH	Fill	-	-	-	Isolated
sw-22	1513+50	North	none	NH	Fill	0.09	-	-	
fnwi-6	1515+00	North	PUBGh	NH	Fill	-	-	-	NW
sw-37	1522+50	South	none	NH	Fill	0.04	-	-	
sw-77	1525+00	North	none	NH	Fill	-	-	0.07	
sw-76	1526+00	North	none	NH	Fill	0.01	-	-	
sw-36	1526+00	South	none	NH	Fill	-	0.04	-	
sw-35	1548+00	South	none	NH	Fill	0.09	-	-	
sw-23	1641+00	North	none	NH	Fill	0.03	-	-	NRCS Jurisdiction
sw-24	1665+50	North	none	NH	Fill	0.11	-	-	NRCS Jurisdiction
fnwi-7	1670+00	South	PEMA	NH	Fill	-	-	-	NRCS Jurisdiction
sw-25	1673+00	North	none	NH	Fill	0.80	-	-	
sw-28	1723+50	South	none	NH	Fill	0.09	-	-	NRCS Jurisdiction

Table III-7: Continued

Wetland ID	Station	Side	NWI/FSA	Soil Mapping	Impact Type	Wetland Type and Impact (in acres)			Water of the U.S. Comment
						Emergent	Scrub-Shrub	Forested	
sw-27	1743+00	North	none	NH	Fill	0.08	-	-	
sw-63	1743+50	North	none	NH	Fill	0.07	-	-	NRCS Jurisdiction
sw-2	1753+00	South	PEMCx	H	Fill	-	-	-	NRCS Jurisdiction - isolated
sw-3	1759+00	South	none	H	Fill	-	-	-	Isolated
fnwi-12	1761+50	North	PEMCx	H	Fill	-	-	-	NW
sw-74	1878+00	North	none	NH	Fill	0.26	-	-	
sw-90	1880+50	South	none	NH	Fill	0.04	-	-	
sw-89	1920+00	North	none	NH	Fill	0.01	-	-	
sw-19	1920+00	North	none	NH	Fill	0.02	-	-	
sw-21	1981+50	South	none	NH	Fill	0.03	-	-	
sw-56	2092+00	North/ South	none	NH	Bridge expansion	0.11	-	-	
sw-62	2110+00	South	PFO1A	NH	Fill	-	-	0.12	
sw-57	2116+00	North	none	NH	Bridge expansion	0.30	-	-	
sw-55	2119+50	North/ South	none	NH	Bridge expansion	0.21	-	-	
sw-54	2123+00	North	none	NH	Bridge expansion	-	-	0.05	
sw-59	2166+00	South	none	NH	Fill	-	-	-	Fringe on Isolated Pond
sw-52	2268+00	South	none	NH	Fill	0.01	-	-	
fnwi-2	2314+50	South	PUBFh	NH	Fill	-	-	-	NW
sw-49	2396+00	South	none	NH	Fill	0.25	-	-	NRCS Jurisdiction
sw-48	2409+50	South	none	NH	Fill	-	-	-	Isolated
TOTAL						**5.77**	**0.04**	**1.46**	
Total wetland impact (in acres) = 7.27									

Source: Shannon and Wilson, 2004
Note: NW indicates a NWI-mapped wetland determined not to be present.
NH = Non-hydric soil

Operational and Secondary Impacts

Operational impacts to wetlands include impacts resulting from de-icing salts, roadway runoff, highway maintenance activities and generalized motorist use. These impacts currently exist to wetlands within the study area. Other operational impacts would be minimal in comparison to conditions already existing within the study corridor. Once the areas disturbed during construction re-establish vegetative ground cover, siltation barriers may be removed and no further construction-related impacts are expected.

Secondary impacts are subjective and not easily quantified. These impacts are usually associated with, but not the direct result of, the proposed project. Secondary impacts can be associated with change of land use or activity near the wetlands, but not the result of direct filling or draining of these areas. No secondary impacts on wetlands are expected as a result of implementing any of the alternatives.

b. Ponds

Wetlands classified in the Palustrine classification system as “Unconsolidated Bottom” are commonly referred to as ponds, sewage lagoons and detention basins. The Unconsolidated

Bottom class includes all wetland and deepwater habitats with at least 25 percent cover of particles smaller than stones and a vegetative cover less than 30 percent. Water regimes are restricted to subtidal permanently flooded, intermittently exposed and semipermanently flooded. Unconsolidated bottoms are characterized by the lack of large stable surfaces for plant and animal attachment. Approximately 6.9 acres (2.76 hectares) of palustrine unconsolidated wetlands are found in or near the SIU 6 study corridor. Exempt NWI wetlands such as sewage lagoons and sewage ponds were not included in the impacts. **Table III-8** displays the type, location and area of each of the ponds found in or near the SIU 6 project area. **Table III-9** identifies both the total acres for the six impacted ponds, as well as the total impact area (1.72 acres/0.70 hectares) for the recommended preferred alternative.

Table III-8: Ponds in or Near SIU 6

ID	Station	Type	Area (acres)
Pond-2	1278+50	Pond	1.79
Pond-6	1282+00	Pond	0.25
Pond-1	1513+00	Pond	1.57
Pond-3	2166+00	Pond	0.07
Pond-4	2203+50	Pond	0.02
Pond-5	2251+00	Pond	3.20
ex-2	2074+00	Sewage lagoon	1.13
ex-3	1166+50	Sewage Pond	0.02

Source: Shannon and Wilson, 2004

Table III-9: Recommended Preferred Alternative Impacts to SIU 6 Ponds

Pond ID	Station	Side	Type	NWI	Soil Mapping	Impact Type	Water of the U.S.	Total Area (ac)	Impact* Area (ac)
Pond-2	1278+50	North	Pond	none	NH	Fill	No	1.79	0.04
Pond 6	1282+00	South	Pond	PUBGh	NH	Fill	Water of the U.S.	0.25	--
Pond-1	1513+00	South	Pond	none	NH	Fill	Water of the U.S.	1.57	0.53
Pond-3	2166+00	South	Pond	none	NH	Fill	Water of the U.S.	0.07	--
Pond-4	2203+50	South	Pond	none	NH	Fill	Water of the U.S.	0.02	--
Pond-5	2251+00	South	Pond	PUBGh	NH	Fill	No	3.20	1.14
TOTAL									**1.72**

Source: Shannon and Wilson, 2004
NH = Non-hydric soil
* Impacts were not calculated for ponds that were determined to be isolated

c. Lakes, Rivers and Streams

The SIU 6 study corridor lies within two watersheds, the Lower Missouri – Moreau (HUC 10300102) in western sections of the corridor and the Lower Missouri (HUC 10300200) in the Montgomery County area. All rivers and streams found in the corridor flow southwards into the Missouri River. There are no lakes located in the corridor.

The following streams and tributaries are located within the SIU 6 study corridor:

- Loutre River (perennial)
- Unnamed tributaries of the Loutre River (intermittent)
- Unnamed tributaries of the Fonso Branch of the Prairie Fork of the Loutre River (intermittent)
- Unnamed tributary of the Smith Branch of the Clear Fork of the Loutre River (intermittent)
- Unnamed tributaries of the Massee Branch of the Loutre River (intermittent)
- Unnamed tributary of the Davis Branch of the Loutre River (intermittent)
- Unnamed tributaries of the Sallee Branch of the Loutre River (intermittent)

- Unnamed tributaries of the Davis Branch of the Loutre River (intermittent)
- Unnamed tributary of the Prairie fork of the Loutre River (intermittent)
- Auxvasse Creek (Perennial)
- Unnamed tributaries of Auxvasse Creek (intermittent)
- McKinney Creek (intermittent)
- McCredie Branch of Auxvasse Creek (intermittent)
- Maddox Branch of Crows Fork Creek (intermittent)
- Unnamed tributary of the Maddox Branch of Crows Fork Creek (intermittent)
- Unnamed tributaries of McKinney Creek (intermittent)
- Unnamed tributary of the Maddox Branch of Crows Fork Creek (intermittent)
- Whetstone Creek (intermittent)
- Unnamed tributary (Intermittent) – Houfs Branch of the Maddox Branch of Crows Fork Creek (Intermittent)

None of the streams located within the SIU 6 study area met the following criteria:

- Used for a public water supply;
- A losing stream;
- Designated for cold-water sport fishery (10CSR 20.7, Table C);
- Designated "Outstanding National Resource Waters" (10CSR 20.7, Table D);
- Designated "Outstanding State Resource Waters" (10CSR 20.7, Table E);
- Designated "Metropolitan No-Discharge Streams" (10CSR 20.7, Table F); or
- A Wild and Scenic River (16 U.S.C. 1271 – 1287).

The Missouri Clean Water Commission has compiled a list of waters designated under section 303(d) of the Federal Clean Water Act. The list identifies lakes and stream segments that do not meet Missouri state water quality standards. No stream segments in the vicinity of the SIU 6 study corridor are included on the 303(d) list of impaired waters.

Environmental Consequences

Two perennial stream crossings are found in the SIU 6 Corridor, the Auxvasse Creek and the Loutre River. The crossings of the Auxvasse and Loutre would require expansion of the existing bridge structures, but would not require piers or other structures to be placed in the water course. Several intermittent stream crossings and alignments are also found within the corridor. Impacts to intermittent stream alignments in the SIU 6 Corridor fall into two categories: Realignments and culvert extensions. Stream realignment impacts would occur when it is necessary to move a stream bed to allow for fill required for roadway expansion. Culvert expansion impacts occur when a stream crosses the roadway and an extension of the existing culvert would be required to accommodate the expanded roadbed. **Table III-10** displays rivers and streams that would be impacted in the SIU 6 Corridor.

Several water quality problems could arise during construction of the Build Alternative, including excess sedimentation from soil erosion to hydrocarbon leaks from construction equipment. These temporary impacts to area streams can be minimized by utilizing MoDOT's Pollution Prevention Plan and the best management practices outlined by the Missouri Department of Conservation. The practices include conformance to the State Channel Modification Guidelines, grading and seeding disturbed areas, minimizing disturbance to the stream banks and riparian woodlands, avoiding working in stream channels between March 1 and June 15 to the extent possible and taking all necessary precautions to prevent petroleum products from entering the stream system. In addition, bridge and culvert designs would include practices designed to maintain existing flowage rates and patterns. Likewise, procedures would be followed in

accordance with the National Pollution Discharge Elimination System (NPDES) permit (for MoDOT this is the Missouri State Operating Permit, Route R100007, or subsequent operating permit) to prevent or minimize contamination of wetlands, streams and ponds adjacent to the project area.

Table III-10: Recommended Preferred Alternative Impacts to Lakes, Rivers and Streams

Stream #	Station	Side	USGS/ NWI	Soil Data	Water of the U.S.	Impact Type	OHWM Width (ft)	Artificial Channel		Natural Channel	
								Impact Length (ft)	Impact Area (acres)	Impact Length (ft)	Impact Area (acres)
304	1056+00	North	none	NH	Yes	Culvert	7	-	-	151	0.0242
75	1073+00	North	Bln-I	NH	Yes	Realign	5	-	-	182	0.0209
67	1079+50	North	Bln-I	NH	Yes	Realign	25	-	-	458	0.2630
215	1081+00	North	Bln-I	NH	Yes	Realign	5	-	-	10	0.0011
195	1095+00	South	Bln-I	NH	Yes	Realign	17	-	-	674	0.2628
194	1105+00	South	none	NH	Yes	Realign	3	-	-	175	0.0121
414	1130+00	South	none	NH	Yes	Culvert	3	-	-	247	0.0170
192	1159+50	South	none	NH	Yes	Culvert	5	-	-	124	0.0142
216	1203+00	North	Bln-I	NH	Yes	Culvert	10	-	-	249	0.0571
405	1206+00	South	Bln-I	NH	Yes	Culvert	10	-	-	137	0.0315
502	1208+00	South	none	NH	Yes	Realign	2	-	-	130	0.0060
404	1211+00	South	none	NH	Yes	Culvert	8	13	0.0024	324	0.0595
139	1216+25	North	none	NH	Yes	Culvert	3	-	-	90	0.0062
144	1222+50	North	none	NH	Yes	Realign	2	-	-	555	0.0255
147	1279+00	North	none	NH	Yes	Realign	5	-	-	172	0.0198
146	1290+50	North	none	NH	Yes	Culvert	2	-	-	237	0.0109
148	1292+50	North.	none	NH	Yes	Culvert	3	-	-	74	0.0051
503	1295+00	South	none	NH	Yes	Realign	2	-	-	374	0.0172
149	1302+00	North	none	NH	Yes	Realign	7	-	-	136	0.0219
505	1315+00	South	none	NH	Yes	Realign	5	-	-	275	0.0315
152	1322+00	North	none	NH	Yes	Realign	2	-	-	588	0.0270
151	1326+50	North	none	NH	Yes	Realign	5	16	0.0019	192	0.0220
153	1327+50	North	none	NH	Yes	Realign	2	-	-	66	0.0030
154	1328+00	North	none	NH	Yes	Realign	10	-	-	985	0.2259
307	1336+75	North/ South	Bln-P	NH	Yes	None	70	-	-	-	-
191	1337+00	North	Bln-I	NH	Yes	Realign	6	-	-	509	0.0701
189	1354+00	South	none	NH	Yes	Realign	1	-	-	189	0.0043
187	1365+00	South	none	NH	Yes	Realign	1.5	-	-	265	0.0091
186	1374+00	South	Bln-I	NH	Yes	Realign	7	-	-	1195	0.1920
131	1384+00	North	Bln-I	NH	Yes	Realign	6	-	-	408	0.0562
185	1424+00	South	none	NH	Yes	Culvert	2	-	-	251	0.0115
130	1427+50	North	none	NH	Yes	Culvert	3	-	-	145	0.0100
129	1440+00	North	none	NH	Yes	Culvert	3	-	-	157	0.0108
417	1440+00	South	none	NH	Yes	Culvert	2	-	-	580	0.0266
184	1446+00	South.	none	NH	Yes	Realign	4	-	-	235	0.0216
127	1447+00	North.	none	NH	Yes	Realign	3	-	-	199	0.0137
416	1448+00	South	none	NH	Yes	Culvert	4	-	-	292	0.0268
415	1449+00	South	none	NH	Yes	Culvert	7	-	-	171	0.0275
77	1456+00	South	none	NH	Yes	Fill	3.5	-	-	55	0.0044
136	1490+00	North	none	NH	Yes	Realign	4	-	-	591	0.0543
100	1513+50	North	none	NH	Yes	Realign	4	-	-	205	0.0188
125	1523+00	South	none	NH	Yes	Realign	2	49	0.0023	314	0.0144
211	1525+00	North	Bln-I	NH	Yes	Realign	8	-	-	156	0.0286
123	1525+50	South	none	NH	Yes	Culvert	10	-	-	100	0.0230
122	1526+50	South	Bln-I	NH	Yes	Realign	18	-	-	440	0.1819
210	1528+25	North.	none	NH	Yes	Realign	10	-	-	153	0.0352
121	1532+00	South	none	NH	Yes	Realign	2	-	-	153	0.0070
82	1546+75	North	Bln-I	NH	Yes	Culvert	2.5	-	-	172	0.0099
120	1547+00	South	Bln-I	NH	Yes	Culvert	5	-	-	86	0.0099
309	1569+50	North	none	NH	Yes	Culvert	1.5	-	-	48	0.0016
119	1569+75	South	none	NH	Yes	Culvert	10	-	-	128	0.0294
126	1582+00	South	none	NH	Yes	Culvert	3	-	-	260	0.0179
115	1641+00	North	none	NH	Yes	Culvert	1	-	-	67	0.0015
111	1719+00	North	none	NH	Yes	Culvert	3	-	-	63	0.0043
113	1719+00	South	none	NH	Yes	Culvert	4	-	-	150	0.0138
112	1743+00	South	none	NH	Yes	Realign	2	-	-	47	0.0021
182	1759+00	South	none	NH	Yes	Realign	2.5	-	-	677	0.0389
308	1761+00	South	none	NH	Yes	Culvert	3	-	-	77	0.0053
65	1776+00	South	none	NH	Yes	Culvert	6	-	-	62	0.0086

Table III-10: Continued

Stream #	Station	Side	USGS/ NWI	Soil Data	Water of the U.S.	Impact Type	OHWM Width (ft)	Artificial Channel		Natural Channel	
								Impact Length (ft)	Impact Area (acres)	Impact Length (ft)	Impact Area (acres)
205	1797+00	North	Bln-I	NH	Yes	Culvert	5	-	-	433	0.0497
406	1808+00	South	Bln-I	NH	Yes	Culvert	4	-	-	445	0.0408
204	1811+00	North	none	NH	Yes	Culvert	2	-	-	121	0.0055
408	1830+00	South	none	NH	Yes	Culvert	3	-	-	1236	0.0851
203	1845+50	North	Bln-I	NH	Yes	Culvert	2	-	-	133	0.0061
409	1851+00	South	none	NH	Yes	Realign	3	-	-	67	0.0046
206	1860+00	North	Bln-I	NH	Yes	Culvert	4	-	-	113	0.0104
410	1861+00	South	Bln-I	NH	Yes	Culvert	4	-	-	78	0.0071
208	1880+00	North	none	NH	Yes	Culvert	3	-	-	134	0.0093
314	1880+75	South	Bln-I	NH	Yes	Culvert	5	-	-	114	0.0131
207	1881+00	North	Bln-I	NH	Yes	Culvert	5	-	-	131	0.0150
312	1889+00	South	none	NH	Yes	Culvert	1.5	-	-	457	0.0157
93	1894+00	North	none	NH	Yes	Culvert	2	-	-	274	0.0126
506	1906+00	South	none	NH	Yes	Realign	3	-	-	123	0.0084
507	1912+00	South	none	NH	Yes	Realign	3	-	-	25	0.0017
91	1920+00	North	Bln-I	NH	Yes	Culvert	4	-	-	162	0.0148
411	1938+50	North	none	NH	Yes	Realign	7	-	-	171	0.0274
94	1949+50	North	none	NH	Yes	Realign	5	-	-	213	0.0244
95	1975+00	North	none	NH	Yes	Culvert	4	-	-	143	0.0131
101	1981+00	South	none	NH	Yes	Realign	3	-	-	22	0.0015
103	1981+50	South	none	NH	Yes	Realign	1	-	-	300	0.0069
102	1984+50	South	none	NH	Yes	Realign	4	-	-	38	0.0035
96	1987+50	North	none	NH	Yes	Realign	4	-	-	258	0.0236
107	2013+00	South	none	NH	Yes	Realign	6	-	-	158	0.0217
108	2015+00	South	none	NH	Yes	Realign	2	-	-	23	0.0011
106	2015+50	South	none	NH	Yes	Realign	2	-	-	97	0.0045
109	2016+00	South	none	NH	Yes	Realign	2	-	-	91	0.0042
110	2030+00	South	none	NH	Yes	Realign	4	-	-	58	0.0054
180	2092+00	South	Bln-I	NH	Yes	Extend Bridge	4	-	-	42	0.0038
303	2111+00	North	Bln-I	NH	Yes	Realign	10	-	-	96	0.0219
310	2118+50	North/ South	Bln-P	NH	Yes	None	84	-	-	-	-
301	2119+00	North	Bln-I	NH	Yes	Realign	7	-	-	256	0.0411
175	2153+00	South	none	NH	Yes	Realign	4	-	-	666	0.0611
171	2169+50	North	none	NH	Yes	Realign	3	-	-	7	0.0005
174	2173+00	South	none	NH	Yes	Realign	3	-	-	321	0.0221
173	2176+50	South	none	NH	Yes	Realign	3	-	-	402	0.0277
99	2195+50	South	none	NH	Yes	Realign	7	89	0.0142	196	0.0315
160	2226+50	North	none	NH	Yes	Culvert	1	-	-	149	0.0034
300	2226+50	North.	none	NH	Yes	Culvert	4	-	-	479	0.0440
162	2240+00	North.	none	NH	Yes	Realign	4	-	-	164	0.0151
163	2243+00	North.	none	NH	Yes	Fill	4	-	-	9	0.0008
157	2250+00	South	none	NH	Yes	Realign	3	-	-	81	0.0055
158	2262+00	South	none	NH	Yes	Realign	8	-	-	376	0.0691
165	2264+75	South	none	NH	Yes	Realign	9	-	-	349	0.0720
501	2265+00	North	none	NH	Yes	Realign	3	-	-	110	0.0076
166	2266+00	South	none	NH	Yes	Realign	4	-	-	490	0.0449
500	2364+00	North/ South	none	NH	Yes	Culvert	5	60	0.0068	-	-
156	2373+00	South	none	NH	Yes	Culvert	3	39	0.0027	81	0.0056
402	2373+50	North	none	NH	Yes	Culvert	5	43	0.0049	-	-
401	2391+00	North	none	NH	Yes	Culvert	2	-	-	32	0.0015
155	2393+50	South	none	NH	Yes	Culvert	3	33	0.0023	251	0.0173
400	2420+00	North	none	NH	Yes	Realign	3	-	-	7	0.0005
201	3032+00	Hwy 54	Bln-I	NH	Yes	Realign	7	-	-	758	0.1218
413	3039+00	Hwy 54	none	NH	Yes	Culvert	3	-	-	222	0.0153
196	3070+00	Hwy 54	Bln-I	NH	Yes	Culvert	4	-	-	489	0.0449
TOTAL								**342**	**0.0374**	**26,856**	**3.293**
Total stream length impact (in feet) = 27,187.7											
Total stream area impact (in acres) = 3.330											

Source: Shannon and Wilson, 2004

Bln-I = Blueline Intermittent; Bln-P = Blueline Perennial; NH = Non-hydric soil

Note: Stations in the 3000's are along Hwy 54. All other stations are along the centerline of the existing ROW.

d. Groundwater

The study area falls within the geohydrologic zone of northern Missouri, south of the Freshwater-Salinwater Transition Zone. Four major groundwater sources exist in northern Missouri: (1) dolomite and sandstone formations of Cambrian and Ordovician age, (2) limestone formations of Mississippian age, (3) alluvial valley deposits, and (4) surficial deposits of glacial drift.

The large, complex aquifer composed of formations of the Cambrian and Ordovician Systems (the Cambrian-Ordovician aquifer) is the only one of these four aquifers that underlies all of northern Missouri. The excessive salinity of water from this aquifer throughout much of the region limits its use to a few counties including Callaway and Montgomery. The Cambrian-Ordovician aquifer is the main source of potable water in the study area. The Cambrian-Ordovician aquifer within the study area has a local freshwater flow system, which is nearly independent of the regional saline-water flow system normally associated with this formation. Water enters this local flow system by leakage from the overlying Mississippian aquifer and by infiltration.

The Mississippian aquifer includes formations of the Osagean Series and Meramecian Series. Water enters the Mississippian aquifers by direct recharge from precipitation and by leakage from overlying Pennsylvanian and Mississippian strata where it is confined. The Burlington and Keokuk limestone are the principal water-yielding rocks in this aquifer. Both normally are composed of coarsely crystalline limestone containing varying quantities of chert nodules. Well-developed solution channels are common and provide a source for domestic and farm water supplies in the eastern part of the study area. In the area of study, the potentiometric surface is affected more by topography as the aquifer changes from confined to unconfined conditions. The aquifer discharges into the major rivers.

The study team conducted a search for groundwater wells in SIU 6 by contacting the Missouri Department of Natural Resources Well Head Protection Section and searching the Center for Agricultural Resource and Environmental Systems website database for well locations. The search identified 79 wellheads and 15 public water supply wells located within approximately one mile (1.6 km) of the study corridor. There were concentrations of wells in the Kingdom City area and the Mineola Hill area. Exact locations of wellheads in the corridor were not available due to security reasons. Wellheads in the Kingdom City area likely serve the existing business and small residential communities, while the wells in the Mineola Hill area serve existing residences and agricultural purposes. Smaller concentrations of wellheads in the SIU 6 Corridor were found at existing I-70 interchanges, primarily serving existing service business locations. Other wellheads were found sporadically throughout the corridor serving dispersed single family residences and agricultural interests.

Although precise locations of wellheads on properties could not be determined, 11 properties with wellheads appeared to fall within the general vicinity of construction limits for the recommended preferred alternative. If wellheads were found to be impacted, project design considerations would be incorporated to avoid or minimize any potential impacts. However, in the event any well would be impacted, the well would be appropriately closed and sealed to prevent any contamination of groundwater.

Construction activities would not have an adverse impact on the recharge zones for the Cambrian-Ordovician aquifer, the Mississippian aquifer and the alluvial aquifer since the aquifer materials would remain on-site after construction operations. Since sizeable dewatering or depressurizing activities are not anticipated during construction, temporary impacts on the groundwater system are not expected or would be minimal in isolated locations such as creeks/stream beds and other low lying areas. No noteworthy changes in chemical

characteristics of the surface material are anticipated and no degradation of water quality entering the aquifer is expected.

e. Floodplains

The Federal Emergency Management Agency (FEMA) and Federal Highway Administration (FHWA) guidelines 23 CFS 650 have identified the base (100-year) flood as the flood having a one-percent probability of being equalized or exceeded in any given year. The base floodplain is the area of 100-year flood hazard within a county or community. The regulatory floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 100-year flood discharge can be conveyed without increasing the base flood elevation more than a specified amount. FEMA has mandated that projects can cause no rise in a regulatory floodway and a one-foot cumulative rise for all projects in the base (100-year) floodplain. For projects that involve the State of Missouri, coordination with the State Emergency Management Agency (SEMA) is required. SEMA issues floodplain development permits. In the case of projects proposed within regulatory floodways, a "no-rise" certificate, if applicable should be obtained prior to issuance of a permit.

There are no regulatory floodways within the SIU 6 study corridor. The regulatory floodplains streams and rivers include:

- Houf's Branch – Houf's Branch is a minor tributary of the Crow's Fork Creek branch of Auxvasse Creek. At the U.S. 54 crossing, Houf's branch is an intermittent stream with a floodplain width of approximately 300 feet (90 meters).
- McKinney Creek – McKinney Creek is a tributary of the Maddox Branch of the Crow's Fork Creek branch of Auxvasse Creek. McKinney Creek crosses the preferred alternative twice. One crossing is under I-70 near Kingdom City, where its floodplain is approximately 680 feet (204 meters) wide. The second crossing occurs on the southeastern bypass of Kingdom City. The floodplain is marginally narrower at this point.
- McCredie Branch – Is a minor tributary of McKinney Creek near Kingdom City. At the I-70 crossing, the floodplain is approximately 280 feet (84 meters) wide.
- Maddox Branch – The Maddox Branch is a tributary of Crow's Fork Creek branch of Auxvasse Creek. At the I-70 crossing, the floodplain is approximately 423 feet (127 meters) wide.
- Auxvasse Creek – Auxvasse Creek drains a 220 square-mile (352 km^2) area of eastern Callaway County and the southwest corner of Audrain County. Many of the small streams in the SIU 6 Corridor are counted as its tributaries. At the existing I-70 crossing the floodplain is approximately 785 feet (236 meter) wide.
- Whetstone Creek – This intermittent watercourse is a minor part of the upper reaches of Whetstone Creek. Downstream portions of Whetstone Creek are designated very sensitive waters. At the I-70 crossing, the floodplain is approximately 250 feet (75 meter) wide.
- Loutre River – Loutre River is approximately 35 miles (56 km) in length and includes several small tributaries. The watershed drains parts of Audrain, Callaway, Montgomery and Warren Counties, a total of approximately 270 square miles (700 km^2). At existing I-70, the floodplain is near its widest point of 0.86 miles (1.34 km).

It is anticipated that impacts to floodplains in the SIU 6 Corridor would be limited to fill associated with expansion of the roadway and additional encroachment into the floodplains would be at locations where encroachment already occurs. A total of 38.9 acres (15.8 hectares) of floodplain are anticipated to be impacted with the proposed improvements, as illustrated in

Table III-11. None of the communities in the SIU 6 study area participate in the FEMA/SEMA floodplain buyout program and there are no floodplain buyout lands located in the study area.

Table III-11: Recommended Preferred Alternative Impacts to SIU 6 Floodplains

Floodplain	Floodplain Area (acres/hect.)	Floodplain Width (ft./m.)	Width of I-70 (ft./m.)
Houf's Branch	2.6/1.1	300/90	770/231
McKinney Creek (two crossings)	6.4/2.6	680/204	910/273
McCredie Branch	2.8/1.1	280/84	710/213
Maddox Branch	2.5/1.0	423/127	540/162
Auxvasse Creek	3.6/1.5	785/236	670/201
Unnamed Tributary of Whetstone Creek	2.2/0.9	250/75	520/156
Loutre River	18.8/7.6	4,566/1,370	410/123
Total	38.9/15.8		

Source: Wilbur Smith Associates, 2004

4. Public Lands, Recreational Facilities and Wildlife Refuges

Within the SIU 6 study corridor there are several state-owned parks and conservation areas. These public lands were identified early in the First Tier Study and were mapped as control points to guide planning during the First and Second Tier Studies.

These public lands are important control points because of their status under the provisions of Section 4(f) of the Federal Aid Highway Act of 1968. Section 4(f) states that land from a publicly owned park, recreation area, wildlife or waterfowl refuge, or land of a historic site can be used for a transportation project only if:

- There is no feasible and prudent alternatives to the use of these resources, and
- All possible planning has been taken to minimize harm to the resource.

Recreational resources that have been determined by FHWA to be eligible require analysis that demonstrates there is no feasible and prudent alternative to the use, impact or taking of these public recreation areas, parks and historic sites for a transportation project. Private recreation facilities are not eligible for inclusion in the analysis.

a. Land and Water Conservation Fund (6f Lands)

There is one park within the SIU 6 study corridor that has received grants from the Land and Water Conservation Fund. Recreational areas receive grants provided by this fund (known as LAWCON funds) for the purpose of recreational land acquisition and development. Impacted Section 6(f) properties must be replaced with land and/or facilities of at least equal recreational utility and monetary value and any impacts to or conversion of Section 6(f) land to highway use requires the prior approval of the U.S. Department of Interior. Graham Cave State Park is subject to the provisions of Section 6(f). The proposed improvement would not require additional land or impede recreational activities within the park and, therefore, no Section 6(f) impacts would result from the I-70 improvements.

b. Pittman Roberston Act Funds

The Federal Aid in Wildlife Restoration Act, popularly known as the Pittman-Robertson Act, was approved by Congress in 1937 with the purpose to provide funding for the selection, restoration, rehabilitation and improvement of wildlife habitat, wildlife management research and the

distribution of information produced by the projects. Since the proposed improvements for I-70 do not directly impact any public lands or wildlife refuges no impacts to land receiving Pittman Robertson funding, if any exist, would occur. The SIU 6 Study Team coordinated with the Missouri Department of Conservation (MDC) and other state and local agencies in identifying potentially impacted parks and recreation areas.

c. Graham Cave State Park

Graham Cave State Park, which borders the Loutre River, is approximately 357 acres (144 hectares) and is located in western Montgomery County on the north side of I-70. The main feature, Graham Cave, was inhabited by humans as much as 10,000 years ago and is designated as a National Historic Landmark. The park is a combination of moist bottomland forests, as well as rocky oak-hickory forest and glades. Graham Cave Glades Natural Area is an 82-acre tract made up of sandstone and dolomite glades that support a rich diversity of characteristic glade species. Several hiking trails wind through the park allowing visitors to enjoy an up-close look at the park's natural features. Displays in the shelter and in the visitor center interpret the natural and cultural features of the park. The park offers picnic areas, playgrounds, campgrounds and hiking trails.

Graham Cave was one of the first archaeological sites in the United States to be designated a National Historic Landmark in 1961. Frances Graham Darnell donated the cave and land to the state in 1964 to create a state park. After acquisition of the cave by the state park system, excavations were done in 1966 to clean up the area and provide additional research. Since then, excavations have not been conducted in order to preserve the remaining deposits. Today, an accessible trail leads to the entrance of the cave, where interpretive signs point out some of these interesting discoveries.

Detailed engineering analysis was completed through the Mineola Hill area to ensure an alternative could be constructed along the existing alignment that did not encroach into Graham Cave State Park. The recommended alternative through this section would utilize a series of retaining walls and would have 2:1 sideslopes with guard rail to ensure additional right of way would not be needed from the park. In addition, an analysis of potential constructive use impacts to the park was conducted, in coordination with FHWA, to ensure that the proposed improvements would not substantially impede the recreational usage of the park. The determination was made that the improvements would not substantially increase the existing noise problem and, therefore, would not hinder the use of the facility.

d. Whetstone Creek Conservation Area

The Whetstone Creek Conservation Area is located approximately five miles (8.0 km) north of Wiliamsburg and I-70 in Eastern Callaway County. This conservation area is owned by MDC and contains forests, old pastures and areas for fishing. Whetstone Creek is a small, highly productive stream with well-defined riffles and long, deep pools. The creek supports a diverse fish population of 34 species, including the blacknose shiner, which is classified by the state as a rare species. The stream is bordered on one side by steep, wooded bluffs. Within the conservation area, a 5.1 mile section of Whetstone Creek is considered an outstanding state resource water. The Whetstone Creek Natural Area is an aquatic natural area along 1.8 miles (2.9 km) of Whetstone Creek along with a 100-yard (91.4 m) buffer strip on each side of the creek. The Whetstone Creek Conservation Area is located north of the proposed improvements and would not be either directly or indirectly impacted by the proposed I-70 improvements.

e. McCredie Farm Lake

The McCredie Research Farm and McCredie Farm Lake property in Callaway County is located immediately north of I-70, approximately two miles (3.2 km) east of the I-70/U.S. 54 interchange. The property consists of the 291 acre (117 hectare) McCredie Research Farm that is owned by the University of Missouri and a 12-acre (5 hectare) pond, the McCredie Farm Lake, which is operated by the Missouri Department of Conservation through a partnership with the University. The McCredie Research Farm, which has also been called the Midwest Claypan Research Farm, serves University of Missouri, as well as USDA Agricultural Research Service scientists. Currently, much of the farming research and activity that takes place on the farm occurs in the northern and western parts of the property. The McCredie Farm Lake sits on the eastern half of the property. The pond, which has been in existence since the 1920s, is used for public fishing, conservation studies on fish and for bird watching. The Department of Conservation stocks the pond with such fish as sunfish, crappie, catfish and bass.

The proposed I-70 improvements, including the potential for a reconstructed frontage road would require a partial taking of the McCredie Farm parcel that currently fronts I-70. Consultation with FHWA, as well as the Study Management Group, indicated that despite it being a public use facility this acquisition would not constitute a Section 4(f) taking because the facility does not have the recreational, wildlife preservation, or historic component necessary for Section 4(f) eligibility. The farming operations, which are separate from the public use facility would be impacted, but are not public use facilities and, therefore, would not constitute a Section 4(f) issue.

f. Praire Fork Creek Conservation Area

The Prairie Fork Conservation Area is located in Callaway County approximately one mile (1.6 km) south of I-70 and the State Route D overpass west of Williamsburg. The Missouri Department of Conservation (MDC) owns and manages the Prairie Fork Conservation Area. In addition, a cooperative agreement among Mrs. Pat Jones, the University of Missouri's School of Natural Resources (SNR) and the Missouri Department of Conservation led to the establishment of the Pat and Ted Jones Fellowships in Natural Resources Conservation. This 700+ acre farm lies within the oak-hickory forest/prairie transition zone. About 70 percent of the land is open and had been row cropped until the early 1990s. The remainder of the land is in forest cover.

The Prairie Fork Creek Conservation Area is located south of the proposed improvements and would not be either directly or indirectly impacted by the proposed I-70 improvements.

g. Loutre Lick Access

The Loutre Lick Access Conservation Area is located three miles (5 km) south of the Danville Interchange West of Mineola on the banks of the Loutre River. Named for the salt lick located nearby, the 163 acre (66 hectare) area straddles the Loutre River. The conservation area is primarily forested and provides public access for boats. The Loutre Lick Access is located south of the proposed improvements and would not be either directly or indirectly impacted by the proposed I-70 improvements.

5. Prime Farmland

a. Affected Environment

Prime Farmland has been found to be of major importance in fulfilling the nation's needs for food and fiber. The Department of Agriculture defines prime farmland as land best suited for food, feed, forage, fiber and oilseed crops. It includes land used for cultivation, pasture and woodland, but does not include urban or built-up land. The soil must be of sufficient quality, with adequate growing season and sufficient moisture to produce a high-yield crop.

Since the supply of prime farmland is limited, actions resulting in the direct loss puts pressure on marginal land. Excessive farming of marginal lands, which are generally more erodible and subject to drought and flooding, reduces productivity and places greater strains on the natural environment.

Like the remainder of Callaway and Montgomery counties, the vast majority of the land in the SIU 6 Corridor is used for crop production and pasture and a great deal of the local economy is based upon agricultural enterprises. Notable sections of the SIU 6 Corridor that are not used for agricultural purposes include the urban and urbanizing areas around Kingdom City, steep and wooded slopes in the Auxvasse and Loutre Valleys and built-up areas around the cities of Danville and the I-70/Route 19 interchange. Crops grown in the corridor are similar to those found in other areas of the Midwest. Corn, soybeans and winter wheat are the principal cash crops, while beef and dairy cattle and hogs are the main types of livestock found in the corridor.

b. Environmental Consequences

No-Build Alternative

The No Build alternative would have no impact on the prime farmland base since no additional right of way would be acquired.

Build Alternative

To evaluate the overall impact to prime farmland by expanding the I-70 Corridor through the SIU 6 study area, a Farmland Conversion Impact Rating was established for the recommended preferred alternative based on correspondence with the U.S. Department of Agriculture's Natural Resource Conservation Service. Impact ratings were developed independently for the Callaway County and Montgomery County sections of the corridor. Conversion Impact Ratings for the corridor in each county were 138 (Callaway) and 142 (Montgomery), well below the 160 points needed to require additional avoidance and or/mitigation measures. Copies of the impact rating forms are provided in Appendix D.

The recommended preferred alternative converts approximately 410 total acres (166 hectares) of prime and unique farmland to highway right of way. Approximately 96 percent (394 acres, 159 hectares) of the total prime farmland expected to be converted is found in Callaway County, with the remaining four percent (16 acres, 7 hectares) in Montgomery County.

Conservation Reserve Program (CRP) Lands

The Conservation Reserve Program (CRP) provides technical and financial assistance to eligible farmers and ranchers to address soil, water and related natural resource concerns on their lands in an environmentally beneficial and cost-effective manner. The program provides assistance to farmers and ranchers in complying with Federal, State and tribal environmental

laws and encourages environmental enhancement. The program is funded through the Commodity Credit Corporation (CCC). CRP is administered by the Farm Service Agency, with NRCS providing technical land eligibility determinations, Environmental Benefit Index Scoring and conservation planning.

The Conservation Reserve Program reduces soil erosion, protects the nation's ability to produce food and fiber, reduces sedimentation in streams and lakes, improves water quality, establishes wildlife habitat and enhances forest and wetland resources. It encourages farmers to convert highly erodible cropland or other environmentally sensitive acreage to vegetative cover, such as tame or native grasses, wildlife plantings, trees, filterstrips, or riparian buffers. Farmers receive an annual rental payment for the term of the multi-year contract. Cost sharing is provided to establish the vegetative cover practices.

In the general vicinity of the SIU 6 Corridor, approximately 244 acres (99 hectares) of land are enrolled in the CRP. Much of this land is former cropland that has been converted to native grasses and plantings and now serves as prime habitat for native wildlife species. Approximately 8.5 acres of CRP land would be converted to right of way for an expanded I-70, representing approximately three percent of CRP lands in or in close proximity to the SIU 6 Corridor. Coordination with the NRCS would continue regarding impacts to CRP lands.

6. Visual Quality/Aesthetics

The Federal Highway Administration's (FHWA) Technical Advisory T6640.8A (TA) provides guidance on the preparation and processing of environmental documents. It identifies that whenever a potential for visual impacts exists, an environmental study should identify the impacts to the existing resource, the relationship of the impacts to potential viewers of and from the projects, as well as measures to avoid, minimize, or reduce the adverse impacts. This information is intended to serve as a guide for the preparation of the visual impacts discussion. The visual assessment information and findings would be integrated with the highway engineering design process and site planning efforts for affected lands within the corridor.

The visual assessment process provided a comprehensive assessment of the landscape character through which the existing and proposed highway traverses. It also is used to determine the type and degree of visual impact for various viewers, such as the interstate user, the recreational tourist and the local resident.

The Visual Assessment process consists of four critical study components. These include:

- Determining the Landscape Viewshed
- Analyzing the Landscape Character and Experience
- Predicting Baseline Impacts
- Identifying Mitigation Options and Highway Options

a. Affected Environment

Most of Missouri north of the Missouri River was covered twice during separate glaciations. These glaciers leveled the landscape and scraped rocks and debris over the bedrock, pushing south. The last Missouri glacier retreated approximately 400,000 years ago. The topographic features of the Glaciated Plains, which were covered during these times, are therefore much younger than those of the Ozarks and erosion has not had as much time to sculpt the landscape. The SIU 6 study corridor transverses these two physiographic regions of north-central Missouri. The western portion of the study corridor is located in the Eastern Glaciated Plains, consisting of gentle to moderate slopes with rolling hills. Much of this area has been cleared for use as agricultural cropland and pastureland.

Within the study corridor, there are several visual resources that are noteworthy and contribute to the visual identity of the environment, such as stream-related riparian environments, lakes and forested areas. One of the most notable scenic areas within the corridor is the Mineola Hill area. This scenic area contains the Loutre River and its wooded riparian environment, the forests and bluffs of Graham Cave State Park, an historic farmstead and a natural rock formation in the median of I-70. Other notable visual resources located throughout the study corridor include rivers, lakes, designated conservation areas and forested areas of the Ozark Border physiographic region.

Dividing the study corridor into areas which display consistent visual characteristics and a uniform visual experience resulted in six "Visual Assessment Units" (VAU) that can be thought of as outdoor rooms. These VAUs have direct relationships to physiography and types of land use. The boundaries of these visual environments occur where there is a change in visual character. The strongest determinations of the visual boundaries are topography and landscape components. The six VAUs within SIU 6 have the following characteristics and include:

- **VAU 1, Kingdom City** – The area in and around Kingdom City is rolling terrain that is dominated by man-made elements. Views of and from the highway are of billboards and signs promoting Kingdom City businesses.
- **VAU 2, Maddox Branch** – The area resting between Kingdom City and the Auxvasse Valley is generally characterized by occasional hills, plains and the crossing of the Maddox Branch stream. The majority of the land is used for agriculture. However, the VAU is completely dominated by billboards adjacent to the interstate.
- **VAU 3, Auxvasse Creek** – This VAU contains the Auxvasse Creek Valley and surrounding wooded area. Viewers in this VAU see a highway that rolls along naturally, following the terrain through the valley. Man-made structures are of a much more natural scale than are found in VAUs 1 or 2.
- **VAU 4, Williamsburg** – VAU 4 is the largest VAU in the SIU 6 Corridor and is composed of gently rolling terrain of hills and meadows. Viewers encounter a landscape dominated by agricultural uses.
- **VAU 5, Mineola Hill** – This VAU includes the sweeping panorama of hills and the Loutre River Valley. The VAU contains such natural features as the Loutre River, Mineola Hill, Graham Cave State Park, the Graham Farmstead and Graham Rock. Local landowners have resisted the installation of billboards in this VAU.
- **VAU 6, Danville** – VAU 6 returns viewers to the gently rolling terrain and agricultural land exhibited in VAU 4. The views are likewise similar to those found in VAU 4.

To determine a visual quality rating, the different visually distinct areas of the SIU 6 Corridor were defined and separated into visual assessment units. The visual assessment units were determined by analyzing the topography of the study corridor, studying the major landscape components and studying aerial photography. The quality of the visual environment can be collectively defined using the attributes of vividness, intactness and unity. Each VAU's visual quality is based on a rating of one to five for each attribute. A rating of 1 represents good visual quality, while a 5 represents poor visual quality. The overall visual quality rating for each VAU is as follows:

- VAU 1, Kingdom City – 4
- VAU 2, Maddox Branch – 4
- VAU 3, Auxvasse Creek – 3
- VAU 4, Williamsburg – 3

- VAU 5, Mineola Hill – 1
- VAU 6, Danville – 4

b. Environmental Consequences

No-Build Alternative

The No-Build Alternative would not entail any construction activities and as such would not have any impacts to the visual environment.

Build Alternative

An expanded I-70 would have minimal impact on most of the VAUs in SIU 6. The construction of the project would eliminate some woodlands and farmland along the existing highway. During construction, there would be several temporary visual impacts, such as exposed earth, jobsite equipment and vegetation loss. Removal of the Rest Area in the Mineola Hill VAU would reduce the light impacts at night in those areas. Overall, an expanded I-70 along the existing mainline path would not substantially change the viewshed either for viewers from or of I-70 in VAUs 2-4 and VAU 6. Since the highway would be expanded on its existing location in these areas, the views would remain relatively the same, with a larger roadway in the viewshed.

Kingdom City Final Alternatives

With the exception of directional ramps associated with the two interchange alternatives, viewers would see little difference in the VAU under either alternative. However, both Final Kingdom City Alternatives would include new directional ramps that run to the south and east of Kingdom City. The proposed ramps would cut through agricultural land and run near CRP land on the Houf family property. The viewshed in this area would be diminished as the directional ramps replace the existing open land. The intactness of the viewshed would suffer greatly and any potential billboards would add to the new visual clutter.

Mineola Hill Final Alternatives

In VAU 5, the Mineola On-Existing Alternative would improve the highway on its existing alignment and do little to alter the existing views of and from the highway. Adjacent visual receptors have become accustomed to the proximity of an interstate highway facility and would likely accept the larger elements. The views from the road would essentially remain the same, consisting of forested areas, the Loutre River riparian environment, an historic farmstead and a natural rock formation in the median.

The Mineola Far-North Alternative would travel through forested areas and the Loutre River riparian environment, both of which possess a very high degree of visual quality. This would result in a substantial visual impact to viewers as an area currently comprised of forested lands and meadows would be bisected by the highway. By traversing north of Graham Cave State Park the highway would become visible from certain areas of the park, detracting from these views, while the existing roadbed would likely remain as an impact. Viewers from I-70 would continue to have a picturesque and memorable view of the Loutre Valley/Mineola Hill forested areas and the Loutre River riparian environment.

c. Mitigation

Visual impacts resulting from the Kingdom City and Mineola final alternatives are site-specific, so mitigation would be varied. Close coordination and consultation with local communities would provide guidance on mitigation measures that are appropriate (e.g., context sensitive

solution). In general, visual impacts can be mitigated through a variety of actions ranging from location and alignment, through design, construction and maintenance. Some of the more common measures include:

- Adjusting horizontal and vertical alignments to follow terrain and avoid or better blend with terrain, especially for resources that are controversial or exceptional in quality;
- Develop and apply corridor standards for selective clearing and thinning, earthwork landscaping or other methods of screening;
- Incorporating architectural features into the design of retaining walls and other structures;

7. Air Quality

The federal Clean Air Act Amendments of 1970 required the adoption of air quality standards. These were established in order to protect public health, safety and welfare from known or anticipated effects of sulfur dioxide, particulate matter, carbon monoxide, nitrogen dioxide, ozone and lead. In addition to these pollutants, the State of Missouri has established additional criteria for hydrogen sulfide and sulfuric acid. The Missouri and National Ambient Air Quality Standards for these pollutants are listed in **Table III-12**.

Table III-12: Missouri and National Ambient Air Quality Standards

Pollutant	Averaging Time	Concentration
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean: Primary Twenty-four Hour [(1)]: Primary Three Hour [(1)]: Secondary	80 μg/m[(3)] (0.03 ppm) 365 μg/m[(3)] (0.14 ppm) 1,300 μg/m[(3)] (0.50 ppm)
Particulate (PM-10)	Annual Arithmetic Mean: Primary and Secondary Twenty-four Hour [(2)]: Primary and Secondary	50 μg/m 150 μg/m
Particulate (PM-2.5)	Annual Arithmetic Mean: Primary and Secondary Twenty-four Hour [(2)]: Primary and Secondary	15 μg/m 65 μg/m
Carbon Monoxide (CO)	One Hour [(1)]: Primary Eight Hour [(1)]:Primary	40 mg/m[(3)] (35 ppm) 10 mg/m[(3)] (9 ppm)
Ozone	Eight Hour [(1)]:Primary and Secondary	157 μg/m[(3)] (0.08 ppm)
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean: Primary and Secondary	100 μg/m[(3)] (0.053 ppm)
Lead (Pb)	Calendar Quarter Arithmetic Mean: Primary and Secondary	1.5 μg/m[(3)]
Hydrogen Sulfide (H_2S)	One-half Hour [(3)] One-half Hour [(4)]	70 μg/m[(3)] (0.05 ppm) 42 μg/m[(3)] (0.03 ppm)
Sulfuric Acid (H_2SO_4)	Twenty-four Hour [(5)] One hour [(6)]	10 μg/m[(3)] 30 μg/m[(3)]

Source: MoDNR Division 10 – Air Conservation Commission
Notes:
(1) Not to be exceeded more than once per year.
(2) Statistically estimated number in days with exceedances is not to be more than 1 per year.
(3) Not to be exceeded more than twice per year.
(4) Not to be exceeded more than twice in any consecutive days.
(5) Not to be exceeded more than once in any 90 consecutive days.
(6) Not to be exceeded more than once in any two consecutive days.
(7) Not more than one expected exceedance per year, on a 3-year average
(8) Missouri Air Quality Standards.
ppm = Parts of pollutant per million parts of air (by volume) at 25° C
μg/m(3) = Micrograms of pollutant per cubic meter of air.

The CAAA of 1977 required all states to submit to the USEPA a list identifying those air quality control regions, or portions thereof, which meet or exceed the NAAQS or cannot be classified because of insufficient data. Portions of air quality control regions which are shown by monitored data or air quality modeling to exceed the NAAQS for any criteria pollutant are designated “nonattainment” areas for that pollutant.

The 1990 CAAA established procedures for determining the conformity of state implementation plans with the requirements of the federal regulations. These procedures are published in 40 CFR Parts 51 and 53.

SIU 6 falls within the Northern Missouri intrastate Air Quality Control Region (AQCR #137). This AQCR has a designation of better than national standards for TSP and SO_2, unclassifiable/attainment for CO, cannot be classified or better than national standards for NO_2 and no designation for Pb. The Missouri state implementation plan does not contain any transportation control measures for this AQCR.

An Air Quality Analysis Agreement executed in March 1988 by FHWA, MoDNR and MoDOT states that a detailed air quality analysis for inclusion in an environmental document would only be prepared on federally funded highway projects when the present or predicted ADT volume on the project exceeds 54,000 vehicles in the year of project construction or 72,700 vehicles in the 20th year following the project construction. The most likely occurrence for exceeding the National Ambient Air Quality Standards are at a controlled intersection which has the potential to create excessive traffic queues. Since there are no controlled intersections along this section of the corridor, it is exceedingly unlikely that in the presence of free flow I-70 traffic that a detailed air quality analysis would project a violation. This project is not located in an air quality non-attainment area. This air quality analysis approach for the non-urban sections of the I-70 Corridor has been coordinated with the Environmental Protection Agency.

During construction of the project, construction methods and operations would be conducted in accordance with MDNR and MoDOT regulations, particularly concerning batch plant operations and clearing and grubbing functions. Standard construction specifications incorporate provisions for minimizing air quality impacts during construction.

Measures would be taken to reduce fugitive dust and other emissions generated during construction. Emissions from construction equipment would be controlled in accordance with emission standards prescribed under state and federal regulations. Materials resulting from clearing and grubbing, demolition or other operations (except materials to be retained) would be removed from the project, burned or otherwise disposed of by the contractor. Any burning, when permitted, would be conducted in accordance with applicable local laws and state regulations.

8. Noise

Noise is defined as excessive or unwanted sound. Sound intensity is measured in decibels (dBA), based on a logarithmic scale. The human ear does not respond identically to sound levels of different frequencies, being more sensitive to middle and high frequencies than low frequencies. When sound is described in terms of the frequencies humans are capable of hearing, the term dBA is used; this refers to an 'A-weighted' scale, which does not consider those frequencies outside of the human hearing range (20 to 20,000 Hertz).

Noise is a phenomenon that is continuously varying in intensity over time. For this reason, noise is typically represented in statistical measures that cover a period of time. The Leq descriptor represents the equivalent steady-state sound level which contains the same acoustic energy as a time-varying sound level during the same given period. In less technical terms, that means that Leq represents the low and high noise levels over a given time period (such as one hour) equated to a single continuous noise level. The term Leq(h) is used to describe the Leq in an hour’s time.

FHWA has established Noise Abatement Criteria (NAC) that are used for determining which properties may experience impacts that warrant further investigation into the feasibility of

abatement. These criteria are found in **Table III-13**. Different land uses are covered by the different NAC, but generally, most affected properties fall under Activity Category B or C.

Table III-13: FHWA Noise Abatement Criteria (NAC)
Hourly A-weighted Sound Level – decibels (dBA)

Activity Category	$L_{eq}(h)$	Description of Activity Category / Land Uses
A	57 dBA (exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the lands are to continue to serve their intended purpose.
B	67 dBA (exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries and hospitals.
C	72 dBA (exterior)	Developed lands, properties or activities not included in Categories A or B above.
D	--	Undeveloped lands.
E	52 dBA (interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals and auditoriums

Source: Code of Federal Regulations, 23 CFR 772, Revised August 1996.

According to FHWA and MoDOT policy, noise abatement procedures should be reviewed for any sensitive receptor that is exposed to noise levels that "approach" (come within 1 dBA) of the NAC. Therefore, for NAC "B", any sensitive receptors that meet or exceed 66 dBA are properties covered by this policy. For NAC "C", any sensitive receptors that meet or exceed 71 dBA are properties covered by this policy. MoDOT policy also requires consideration of noise abatement for any property that would experience a "substantial increase," defined as a 15 dBA increase in noise levels from existing conditions.

a. Affected Environment

A noise monitoring program was conducted to establish baseline noise level readings in order to calibrate existing and forecast noise level output from the noise modeling process. All noise measurements and analysis were conducted based on the FHWA's guidelines. Noise measurements were obtained at 22 receptor locations clustered in three areas: Kingdom City, a rural section of the corridor near Williamsburg and the Mineola Hill/Danville area. The receptor locations deemed to be most sensitive to noise under the recommended preferred alternative were selected because of their status and because they were representative of other receptors. Noise measurements were not limited to a particular daytime period because traffic volumes are at consistent levels throughout the day. **Table III-14** displays the noise levels measurements.

b. Environmental Consequences

Existing and future year noise levels (hourly Leq) at receptors were modeled using the FHWA's Traffic Noise Model (TNM®) Version 2.1. The MoDOT Statewide Traffic model was used for traffic volumes when modeling both existing (2000) and future year (2030) conditions. Truck percentages were based upon the statewide model as well. For mainline I-70, truck percentages were assumed to be 27 percent for year 2000 and 29 percent for 2030. Results of the analysis are shown in **Table III-15**.

Table III-14: Measured Noise Levels

	Receptor	Noise Abatement Criteria (NAC)	Monitored	
#	Description		L_{eq}	L_{max}*
1	Missouri Tourism Center – Kingdom City	C	62	72
2	Potential Historic Hotel on Old Hwy 40	B	63	88
3	Potential Historic Gas Station on Old Hwy 40	B	69	87
4	Potential Historic House	B	59	78
5	Mainline Segment	B	70	85
5a	Representative Location 78 meters from Existing Westbound Centerline**	N/A	--	--
6	Grouping of Homes North of I-70	B	46	53
7	Cemetery (North Side I-70)	B	66	83
8	Potential Historic Repeater Station	C	63	79
9	Homes on Far North Alignment near Mineola	B	48	65
10	Cemetery on Frontage Road	B	51	73
11	Graham Farmstead	B	66	80
12	Danville Female Academy	B	63	81
13	Baker Plantation	B	64	75
14	Kan-Do Campground	B	61	74
15	Homes on Far North Alignment near Danville	B	48	52
16	Graham Cave State Park (GCSP) office	B	55	62
17	GCSP Glades natural area	B	60	69
18	GCSP Shelter	B	60	70
19	GCSP Boat Ramp	B	53	59
20	Graham Cave	B	52	57
21	GCSP Campground	B	48	57

Source: Wilbur Smith Associates, 2004

* Peak level measured

** Location was not measured, but added during the modeling process

Table III-15: Design Hour Noise Levels, dBA L_{eq}(h), SIU 6

Receiver Number	Land Use	Number of Dwelling Units Represented	Noise Abatement Criteria (NAC) Category	NAC Level	Noise Level (Leq) (Design Hour)			Distance from Proposed Roadway to Noise Receptor, (ft)	Decibel Increase over Existing	Impact*
					Existing	Build 2030	No-Build 2030			
1	Tourism Center	--	C	72	70	77	74	271	7	Yes
2	Commercial	--	B	67	65	76	75	1,498	11	Yes
3	Residential	3	B	67	76	85	80	17	9	Taking
4	Residential	1	B	67	70	73	73	547	3	Yes
5a	Highway	--	B	67	76	--	80	0	--	--
5b	Undeveloped	--	N/A	--	71	77	75		6	--
6	Residential	10	B	67	56	60	60	2,027	14	--
7	Cemetery	--	B	67	68	73	72	210	7	Yes
8	Utility	--	C	72	75	77	79	102	2	Yes
9	Residential	5	B	67	46	50	50	7,911	4	--
10	Cemetery	--	B	67	69	71	72	532	2	Yes
11	Residential	1	B	67	73	77	77	112	4	Yes
12	Residential	1	B	67	73	77	76	167	4	Yes
13	Residential	1	B	67	72	75	76	161	3	Yes
14	Campground	--	B	67	63	71	66	759	8	Yes
15	Residential	8	B	67	47	51	51	6,292	4	--
16	State Park	--	B	67	57	61	61	2,209	4	--
17	State Park	--	B	67	66	70	70	664	4	Yes
18	State Park	--	B	67	67	71	71	351	4	Yes
19	State Park	--	B	67	64	69	68	672	5	Yes
20	State Park	--	B	67	59	63	63	1,320	4	--
21	State Park	--	B	67	52	57	57	3,402	5	--

Source: Wilbur Smith Associates, 2004

* Impact is defined as approaching, meeting or exceeding the FHWA Noise Abatement Critieria (NAC) or causing a substantial increase in noise levels. The noise level that approaches the FHWA NAC is 66 dBA and a "substantial increase" is defined as a 15 dBA increase over existing noise levels. A "Yes" in the Impact column indicate that there would be an impact to that receptor and "Taking" indicates that there would be an impact and the receptor property would be acquired.

No-Build Alternative

Based on FHWA Noise Abatement Criteria (NAC) and MoDOT policy, several receptors including the Graham Farmstead, Graham Cave State Park and Baker Plantation already experience impacts that are within 1 dBA of the criteria. Under the No-Build Alternative in Year 2030, 14 receptors are expected to exceed FHWA's NAC. The modeled high noise levels are primarily attributed to the high percentage of trucks using I-70.

Build Alternative

Under the recommended preferred alternative the same 14 receptors would exceed FHWA's NAC. Consideration of mitigation is required in cases where a receptor under the recommended preferred alternative experiences an increase of greater than 15 dBA than predicted for the No Build. An increase of 3 dBA is usually imperceptible to most humans. Only one receptor, an old gas station on U.S. 40 east of Kingdom City would experience an increase of more than 3 dBA. The increase would result from the location of directional ramps for the improved Kingdom City Interchange. However, the construction of the directional ramps and/or frontage roads would likely require the displacement of the gas station and adjacent homes on the property.

Methods of noise abatement were evaluated, for those areas where impacts are identified, to determine the feasibility and reasonableness of their implementation. The evaluation is based on many factors, including constructability, cost, height of wall, amount of noise reduction obtained, number of receptors benefited, views of impacted residents, type of land use and whether changes in existing land use are expected. Typical noise abatement measures include:

- **Highway Alignment** — Highway alignment selection involves the horizontal or vertical orientation of the proposed improvements in such a way as to minimize impacts and costs. The selection of alternative alignments for noise abatement purposes must consider the balance between noise impacts and other engineering and environmental parameters. For noise abatement, horizontal alignment selection is primarily a matter of locating the roadway at a sufficient distance from noise sensitive areas.
- **Traffic System Management Measures** — Traffic management measures which limit vehicle type, speed, volume and time of operations are often effective noise abatement measures. For this project, traffic management measures are not considered appropriate for noise abatement due to their effect on the capacity and level-of-service of the proposed roadway.
- **Noise Barriers** — Highway traffic noise level attenuation can often be obtained with a measurable degree of success by the application of solid mass, attenuable measures to effectively diffract, absorb and reflect highway traffic noise emissions. Solid mass, attenuable measures may include earth berms or artificial abatement walls. For a noise barrier to provide sufficient noise reduction, it must be high enough and long enough to shield the receptor from significant sections of the highway. Access openings in the barrier severely reduce the noise reduction provided by the barrier. It then becomes economically unreasonable to construct a barrier for a small noise reduction. Safety at access openings (driveways, crossing streets, etc.) due to restricted sight distance is also a concern. Furthermore, to provide a sufficient reduction, a barrier's length would normally be eight times the distance from the barrier to the receptor. For example, a receptor located 50 feet from the barrier would normally require a barrier 400 feet long. An access opening of 40 feet (10 percent of the area) would limit its noise reduction to approximately

4 dBA (Fundamentals and Abatement Of Highway Traffic Noise, Report No. FHWA-HHI-HEV-73-7976-1, USDOT, Chapter 5, Section 3.2, page 5-27).

In addition, businesses, industries and other related establishments located along a particular highway normally prefer accessibility and high visibility. Solid mass, attenuable measures for traffic noise abatement would tend to disallow these two qualities and thus, would normally not be acceptable abatement measures in those cases.

MoDOT has established, with FHWA approval, criteria for use in the evaluation of possible noise barriers. Feasibility is primarily concerned with the engineering aspects of a noise abatement measure. The topography of the area should be such that a barrier can be built. A minimum of 5 dBA attenuation should be achieved for first row receptors without compromising access, drainage or safety requirements. Other dominant noise sources in the area may make the application of noise walls infeasible.

Reasonableness is based on common sense and good judgment. A barrier should cost no more than $ 30,000 per benefited receptor. The exposed height of a noise wall should be no more than 18 feet above existing ground. It is generally not reasonable to provide abatement unless the change between existing noise levels and design year noise levels is more than 5 dBA (a barely perceptible change). Unless special conditions exist, it is generally not reasonable to provide abatement for isolated receptors (due to the cost of abatement versus the benefits derived), or for impacted businesses (which usually prefer visibility from the transportation facility). Unless special conditions exist which would allow effective abatement to be provided, it is generally not reasonable to attempt noise abatement on non-controlled or partial-controlled access facilities. A noise barrier should be located beyond the clear recovery zone or be incorporated into needed safety devices. A noise barrier is not considered reasonable if the majority of the affected residents do not want it.

Based on the study completed, mitigation of noise impacts for the proposed project does not meet all of FHWA and MoDOT's definitions for reasonableness. Therefore, no noise mitigation measures are being considered for the proposed improvement. If substantial changes in horizontal or vertical alignment occur during the remaining stages of design and construction, noise abatement measures would be reviewed.

Construction Noise

Normal construction activities, including clearing, earth moving, blasting, hauling, grading, paving and the construction of bridges, are expected to result in relatively short-term increases in noise. Considering the short-term nature of construction and the relative rural nature of SIU 6 the noise impacts are not expected to be substantial.

9. Biological Resources

a. Floral Communities / Faunal Communities

Much of the SIU 6 Corridor is rural in nature and is in agricultural production and as a result the flora and fauna of the region is heavily influenced by agriculture activities. Forested areas are often found on steep hillsides and wet bottomlands, areas that are not prime areas for row crops. White oak, elm, ash and cottonwoods would often be found in riparian woodland strips, drainage ways and floodplains, while hickory, post oak and chinkapin oak are prevalent on slopes and drier upland areas. Native natural grasses can be found on flat and rolling well-drained areas not in agricultural production. Grasslands, prior to being converted to agricultural uses, were the dominant vegetation in the SIU 6 Corridor.

The SIU 6 Corridor traverses the southern edges of the Grand Prairie Plain and the Cuivre River Prairie Plain and northern edges of the Central Missouri Savannah, the Loutre River Alluvial Plain and the Montgomery-Warren Oak Woodland/Forest Rugged Hills. This region is characterized by the diversity of cover types and a variety of wildlife habitat. That variety of habitat makes this region one of the richest game areas in the state. Turkey, bobwhite quail, rabbit, dove and pheasant all have sustainable populations to support hunting. Nearly all of the original prairie areas have been converted to other land uses and species dependent upon this type of habitat have nearly disappeared from the area. Badgers, prairie chickens and marsh hawks are some of the last remaining examples of animals associated with prairie habitat. The deer population in the corridor is thriving and interest in hunting is very high. The furbearing animal population in the area is good and trapping pressure is heavy. The most populous animals include raccoon, muskrat, opossum, coyote, beaver and fox.

A variety of fish are found in the rivers and streams of the SIU 6 Corridor. The Loutre River, Auxvasse Creek, numerous small tributaries and farm ponds all provide adequate habitat. Largemouth and smallmouth bass, catfish, rock bass, carp, sunfish and suckers can be found in area waterways. Farm ponds allow a thriving population of bass, bluegill and channel catfish.

b. Threatened and Endangered Species

The SIU 6 study area contains one federally listed endangered plant (Running Buffalo Clover), habitat for one listed endangered species (Indiana Bat) and several state-listed species. The Endangered Species Act of 1973 provides special protection to those species listed as either threatened or endangered by the U.S. Fish and Wildlife Service. The Missouri Department of Conservation (MDC) provided generalized locations and descriptions of sensitive species and habitats within the SIU 6 study area. The MDC report includes federally listed threatened and endangered species, federally listed candidate species and state listed rare species. The MDC list includes the following species that are known to exist within the project corridor.

Running Buffalo Clover (Trifolium stoloniferum)

Running Buffalo Clover (Trifolium stoloniferum) is a native clover of Missouri and was thought to have been extirpated from the state until 1989, when it was rediscovered growing on an unattended dirt pile in St. Louis. A natural site was discovered in Madison County in 1994 and a second followed in Maries County in 1998. It is a perennial that grows from 4 to 20 inches tall, blooming generally from mid-May through June. Its appearance is very similar to other clovers found in the state.

Running Buffalo Clover was recently discovered along the Loutre river, near the existing I-70 crossing. The sites where the plants were found appear to be in or adjacent to disturbed areas as well as in riverine settings, along the first wooded terrace or bench above the river. It has been thought that disturbance, such as that provided by the herds of buffalo in Missouri, were instrumental in the species propagation and distribution. Running Buffalo Clover does not appear to compete well with other species of clover. Currently, mowing and grazing can provide the disturbance that appears to be necessary for the plant's distribution.

Indiana Bat (Myotis sodalis)

Indiana Bats (Myotis sodalis) may be found throughout the state. The wintering range is generally south of the Missouri River and the summer range generally north. Caves are used for the hibernaculum during the winter, while trees are preferred for females and their young in the summer months. According to the MDC, there are fewer than 30 caves or mines which are known to have sizable Indiana Bat colonies. The bats have very specific habitat requirements for their winter hibernation sites.

The females and their young spend the summer months in maternity colonies in both riparian and upland woodlands where suitable roost trees are present. The preferred roost trees have exfoliating, loose or platy bark, or scars from fire or lighting strikes or other damage that allow the bats entry in a hollow or cavity in the tree. The tree could also be dead or declining vigor and the bark is in the process of sloughing off. Female maternity colonies prefer to roost under the sloughing bark.

There would be no anticipated impact on the Indiana Bat as a result of the recommended preferred alternative in SIU 6.

Blacknose Shiner (Notropis heterolepis)

The Blacknose Shiner, which is on the state list of imperiled species, is known to exist in Whetstone Creek and could also be extant within the Loutre River. According to the Missouri Department of Conservation, the portion of Whetstone Creek crossed by I-70 supports seasonal concentrations of spawning, incubating or rearing fishes or mussels of management interest, including Blacknose Shiner.

Other Species

Several other state listed imperiled species and natural communities are located in the study corridor but would not be affected by the proposed action.

- State Listed – Critically Imperiled in the State
  - Trout-Perch (Percopsis omiscomaycus)
  - A Liverwort (Marsupella sphacelata)
- State Listed – Imperiled in the State
  - Ghost Shiner (Notropis buchanani)
  - Prairie Dandelion (Microseris cuspidata)
- State Listed – Rare and Uncommon in the State
  - Adder's Tongue (Ophioglossum vulgatum)
  - Yellow False Mallow (Malvastrum Hispidum)
  - Heart-Leaved Plantain (Plantago cordata)
  - Oval Ladies' Tresses (Spiranthes ovalis var)
- State Listed – Other
  - False Mermaid (Floerkea proserpinacoides) – State listed
  - Mountain Spleenwort (Lythrum salicaria) – State listed
  - A Moss (Hypnum imponens) – State listed
- Natural Habitat Areas
  - Erostellata Mesic Bottomland Forest
  - Dry Sandstone Cliff
  - Sandstone Glade

c. Environmental Consequences

No-Build Alternative

The No-Build alternative would have no impact on threatened or endangered species since no additional right of way would be required.

Build Alternative

Potential habitat for both the Blacknose Shiner and the Indiana Bat could be impacted through the Loutre River Valley. Likewise potential habitat for the Blacknose Shiner could be impacted at the I-70 crossing of Whetstone Creek. According to the Missouri Department of Conservation, the portion of Whetstone Creek crossed by I-70 support seasonal concentrations of spawning, incubating or rearing fishes or mussels of management interest, including Blacknose Shiner.

Running Buffalo Clover – The I-70 Improvement Corridor crosses the Loutre River, near the site of the most recent discovery of Running Buffalo Clover. The I-70 Improvement Corridor's proposed right-of-way along the Loutre River crossing was surveyed by a local botantist consultant hired by MoDOT and no plants were located in the area of direct effect, i.e. anticipated ROW and construction easement area.

Since it would likely be a number of years before the I-70 Improvement is constructed, the distribution of this endangered plant could change over time. MoDOT would review the Natural Heritage Database periodically for new locations of the Running Buffalo Clover and would conduct a survey for the Running Buffalo Clover at least one year prior to construction and clearing activities at the locations noted below and any new areas identified from the Natural Heritage Data Base. MoDOT would commit to conducting Running Buffalo Clover surveys at the Loutre River crossing, the Auxvasse Creek crossing in SIU 6, the Cedar Creek crossing in SIU 5 and the Lamine River crossing in SIU 2 prior to construction. MoDOT would also continue consulting with the USFWS and MDC on this plant species and would develop or improve habitat for the plant when feasible to do so as part of the construction activities.

MoDOT recognizes the importance of riverine corridors for a variety of benefits , including habitats suitable for endangered species such as the Indiana Bat and Running Buffalo Clover. MoDOT has developed a stream mitigation and enhancement plan for the major river crossings, including those noted above.

Indiana Bat – There are likely additional areas within the I-70 corridor that provide seasonal habitat to the Indiana Bat. MoDOT recognizes the importance of minimizing the effects of habitat loss, especially with respect to habitats that could be used by threatened and endangered species. The Indiana Bat does prefer woodlands with a variety of species and age classes.

The USFWS previously used a guidance that focused on not cutting suitable roost trees during the breeding season (April 1 through September 30) to avoid negative impacts on the species. The USFWS now advocates reviewing projects on a case by case basis focusing on the following criteria: the projects proximity to known hibernacula; maternity, male roosts and/or important foraging areas; the composition of the woodland; the land use of the area after the project is complete; location in Knox, Macon and Shelby counties; and consideration of the magnitude, scope, frequency, and duration of the proposed action with regard to the importance of the area to the Indiana Bat.

To address USFWS and MDC concerns, MoDOT would review the Natural Heritage Data Base periodically during the project development process to identify any new locations of Indiana Bat activity. MoDOT would continue consultation with the USFWS to avoid or minimize potential impacts to this species.

Blacknose Shiner – The recommended preferred alternatives through the Loutre River valley would require improvements across the Loutre River, thereby potentially impacting Blacknose Shiner habitat. The recommended preferred alternative would be constructed adjacent to the existing facility; an area already disturbed by previous construction and an area downstream of Whetstone Creek. Also, potential habitat for the Blacknose Shiner could be impacted where I-70 crosses Whetstone Creek. Pools at the end of the culvert could support seasonal concentrations of Blacknose Shiner and other fish or mussels of management interest.

Avoidance of instream activities between March 15 and June 15 are recommended for reaches of Whetstone Creek that support seasonal concentrations of spawning, incubating or rearing fishes or mussels of management interest. Species of stream fishes spawn during specific times of the year. Fish eggs are extremely vulnerable to localized habitat destruction and activities that cause excessive sediment loads which can smother fish eggs. High levels of chemical and organic pollutants can also negatively affect the proper development of fertilized fish eggs. Human activities that change the physical structure of rivers and streams, such as building impoundments or channelization, could negatively affect fish movement and distribution. All activities that alter, destabilize or destroy stream bottoms or banks would be avoided to prevent disrupting the spawning activities of stream fishes. In addition, activities that introduce chemical or organic pollutants to streams would be avoided.

10. Hazardous Materials and Waste Management

a. Affected Environment

The study team utilized available data from the United States Environmental Protection Agency, Missouri Department of Transportation, Missouri Department of Natural Resources and the United States Geologic Survey. A database search of various federal, state and local records of environmental concern was contracted through Environmental Data Resources, Inc. (EDR).

The study team utilized Environmental Data Resources, Inc. (EDR) of Southport, CT to review available environmental record databases. The results of the environmental record database findings were provided in a report titled “EDR Environmental Atlas™– Area/Corridor Study, I-70 Second Tier, Callaway, MO, Inquiry No: 1037328.1s, prepared and dated September 4, 2003. The EDR report is not included as part of this document. The distances used for searching the environmental record databases were set at one half-mile distance north and south from the center point of the proposed corridor route. A number of federal and state agency databases were searched and reviewed for the evidence of any potential environmental contamination issues, such as incidents or facilities that may have affected the environmental integrity of the right of way corridor. Among the searched databases included the following:

- National Priority List (NPL)
- Brownfields Site List
- Superfund (CERCLA) Consent Decrees (CONSENT)
- Resource Conservation and Recovery Information System (RCRIS) Corrective Action Activity (CORRACTS)
- Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS)
- Resource Conservation and Recovery Information System Transportation, Storage

and Disposal (RCRIS-TSD)
- State Hazardous Waste Sites
- State Landfill/Solid Waste Disposal Sites
- Missouri Voluntary Cleanup Program (VCP)
- Leaking Underground Storage Tank (LUST)
- Underground Storage Tank (UST) and Above ground Storage Tank (AST) sites

Discrepancies between the information provided by government agencies and EDR may exist due to incomplete or non-updated databases of either resource. In addition, facilities may be listed in more than one category on the environmental screening report. The database would plot the location of a recorded site when sufficient address is given to geocode the site. Incomplete addresses or questionable addresses are listed in an "Orphan Listing" and may be actually located anywhere in the county. The database generated for this survey extended from Callaway County into Montgomery County and comprised over 1,000 pages in a printed document.

As displayed in **Table III-16**, the study team identified 27 properties within the SIU 6 study area that contained hazardous materials.

Table III-16: Known Hazardous Material Sites

Site Owner	Site Location	Federal/State Program List	Comments	Potential Impact *
Raymond F. Atkinson	West of Kingdom City int.; north of Old 40	pesticides herbicides	farm services facility; licensed pesticides & herbicides retailer; federal database	No Impact
Village of Kingdom City	Kingdom City int.; south of Old 40; east of U.S. 54	AST	behind City Hall building; not in database	No Impact
Vernon G. Van Engelenhoven	Kingdom City int.; north of Old 40; west of U.S. 54	AST	located in parking area; not in database	No Impact
Merten's Construction Co.	Kingdom City int.; SW quad of U.S. 54/ Old 40 Intersection	UST (removed) LUST (closed)	noted in MDNR databases	No Impact
Merten's Construction Co.	Kingdom City int.; SW quad of U.S. 54/ Old 40 Intersection	AST (process tank?)	same property as above; located adjacent to building; not in database	No Impact
Debra K. Davis	Kingdom City int.; NE quad	UST (active)	Phillips 66 station; Davis Oil Co.; in MDNR database	No Impact
Roger E. Redmon	Kingdom City int.; north of Old 40; east of U.S. 54	Former service station	Roger's Towing; appears to be former gas service station; not in database	No Impact
William H. Craigmiles	Kingdom City int.; NW quad	UST (active) LUST (closed)	Amoco Pick-a-Dilly station; closed LUST file in MDNR database	No Impact
Petro PSP Properties, LP	Kingdom City int.; SE quad	RCRIS-LQG	Federal database indicates site is a Large Quantity Generator of hazardous waste	No Impact
Petro PSP Properties, LP	Kingdom City int.; SE quad	UST (active) LUST (closed)	Petro Stop (Mobil); listed in MDNR database	No Impact
State of Missouri	Kingdom City int.; SE quad	AST	MoDOT Maintenance Yard; not in database	Impact – Low
Joseph R. Davis	Kingdom City int.; SW quad	UST (active) LUST (closed)	Fastlane McStop – Phillips 66, MDNR database	No Impact
Ronald W. Atkinson	Kingdom City int.; SW quad	UST (active)	Gasper-Atkinson Truck Plaza; Texaco, MDNR database	No Impact
Mid-Mo Properties, LTD	Kingdom City int.; SE quad	UST (active) LUST (closed)	Conoco Truck Stop; MDNR database; 2 adjacent properties	No Impact

Table III-16: Continued

Site Owner	Site Location	Federal/State Program List	Comments	Potential Impact *
Dennis W. Stone	east of CR 145; north of I-70	Former service station	appears to be 1930's or 1940's vintage gas station; no record in database search	Impact – Low
Merck Transitory, L.L.C.	east of CR 145; south of I-70	RCRIS-SQG	Federal database indicates site is a small quantity generator of hazardous waste	Impact – Low
Callaway Livestock Center, Inc.	SW quad of MO-JJ overpass	wastewater sewage	potential wastewater/sewage issue from livestock impoundments; no records exist in database search	No Impact
Eugene D. Wysong	Approx. 1.5 miles east of Calwood int.; north of I-70	Potential UST	old concrete platform with remnants of gas pump; no record in database search	Impact – Low
Larry D. Duffie	Approx. 2.0 miles east of Calwood int.; north of I-70	AST; excavated UST stored on property	Duffie Construction Co.; ASTs east end of property; excavated USTs staged on ground surface at west end	Impact – Low
Merten's Construction Co.	Triangle parcel between I-70, Route D and north outer road	Piles of asphalt/ road material	located between I-70 and North outer road; no record in database	Impact – Low
MoDOT	Williamsburg int.; NW quad	UST (removed); ASTs, tar, asphalt	MoDOT Williamsburg Maintenance Bldg.; MDNR database	Impact – Low
Mittenberger Oil Company	Williamsburg int.; SW quad	UST (active); LUST (active); AST	Travel Plaza; MDNR database	No Impact
Mary Masek	north of CR 1032; Callaway/ Montgomery County line	AST	residence; AST adjacent to driveway; not on database	No Impact
Union Electric	Danville int.; SW quad	Transformers Transformer oils	Ameren UE substation; not in database search	No Impact
Richard L. Arens	Danville int.; NE quad	UST (removed) AST	The Kwik Store, Phillips 66; ASTs contain fuel stock; MDNR database	No Impact
Pace Construction Company	Danville int.; SE quad	RCRIC-SQG asphalt, tar diesel fuel	Pace batch plant; facility stores tar, diesel fuel and manufactures asphalt	Impact – Low
Bob L. Scarlet	Danville int.; NE quad; west of Route 161	Former gas station	Danville Tire and Battery; appears to be former gas station; not in database	No Impact

Source: EDR
* Sites were evaluated for potential impact based on the likelihood that the level of effort and expense regarding the waste would be low, medium, or high in the event MoDOT would be required to deal with each site.

b. Environmental Consequences

The study team assessed each identified site for the potential surface and subsurface contamination. Each property with a hazardous material site was assessed for potential impact. Each site that had a potential for impact was rated low, medium or high based on the level of effort and expense in the event that MoDOT would be required to deal with the site. Within the SIU 6 study area, the study team identified eight sites with a potential for impact and each of the eight was rated low for level of effort and expense. The eight sites with a potential impact included the following types of hazards:

- 1 site with underground storage tanks,
- 1 site with resource conservation and recovery information systems,

- 3 sites with above-ground storage tanks,
- 3 sites with piles of asphalt/road materials.

Many of the properties containing these sites are commercial facilities, located within or near the limits of construction. There were no impacted landfills or CERCLA type (Superfund) sites in the study corridor. Additionally, the Village of Kingdom City is constructing a sewage treatment plant on the parcel housing the city hall. The parcel is located east of U.S. 54 and between old U.S. 40 and the interstate. The recommended preferred alternative would avoid direct impacts to the sewage treatment center.

If a site were to fall within the limits of construction, remediation or clean-up of the wastes sites within the limits would be required. The remediation of solid and hazardous waste sites and related contamination would be be conducted in the preconstruction phase of the project and would be considered a positive impact of the recommended preferred alternative.

In the immediate vicinity of the Kingdom City interchange, there is one property containing a site that lies within the limits of the recommended preferred alternative and two gas stations that are just outside the limits of construction. The improved interchange would likely impact MoDOT's Kingdom City Maintenance Yard. The yard is located along the existing frontage road in the southeast quadrant of the interchange and contains above-ground storage tanks. The proposed directional ramps associated with the interchange improvements cross two properties listed as potential sites. A former gas station located east of Kingdom City and north of U.S. 40 would be impacted by the directional ramps. The site was not listed on any of the databases searched and would require additonal research and testing to determine if any hazardous materials remained on the site that would require remediation or cleanup. Directly south of this property is the Missouri Farm, a research facility located immediately south of the interstate east of Kingdom City. The farm is listed in the Resource Conservation and Recovery Information System as a small quantity generator of hazardous waste. Frontage road improvements would encroach on the far northern boundary of the property, but would not likely impact the property in a way that would require mediation.

In the vicinity of the Williamsburg interchange, another MoDOT maintenance facility would be impacted by the recommended preferred alternative. The facility is located in the northwest quadrant of the interchange and would be impacted by the reconstructed interchange. The facility has ASTs, tar and asphalt on site and have had USTs which have been removed. Database records indicate that the gas station located in the southwest quadrant of the interchange has active underground storage tanks and leaking underground storage tanks. Although frontage road improvements would be made adjacent to the property, the recommended preferred alternative would not impact the property directly. If the preferred interchange concept changed, the need for mitigation and remediation at the site would need to be reassessed.

There is one site with the potential need for mitigation located near the Danville interchange. The Pace Construction Company is located south and east of the Danville interchange. Pace Construction stores tar and diesel fuel and manufactures hot mix asphalt pavement material. Improved frontage roads associated with the recommended preferred alternative would impact the property. In this case the frontage road would pass through the northwest corner of the property.

There are potential impacts to three properties located between the Calwood and Williamsburg interchanges. In two cases, the limits of construction would require taking a portion of the property. Each is a private property located north of I-70 and each has AST or potential UST sites on the property. A third property could be impacted by frontage road improvements.

11. Archaeological Resources

a. Affected Environment

It is believed that humans have occupied Missouri for at least 13,000 years, beginning with Pleistocene Clovis hunters and continuing through modern times. There are believed to be nine distinct periods of cultural advancement ranging from the Early Paleoindian Period that began some 13,000 years ago to the Protohistoric and Historic Periods that began about 300 years ago. Within the past 2,500 years the Woodland periods were marked by increasing population and rising diversity in resource procurement. This is marked by the use of ceramics, the widespread adaptation of domestic plant resources and increasing social complexity. The end of the Woodland period is marked by the appearance of the Mississippian cultures some 950 years ago. Population levels increased greatly during this period due to widespread, intensive cultivation of maize corn. Following the Mississippian Period, the Protohistoric and Historic periods began.

The First Tier Study conducted a preliminary assessment of cultural resources in a corridor stretching five miles to either side of the corridor. The assessment included properties on the National Register of Historic Places and recorded historic cemeteries. The study team identified three Mineola Hill sites as part of the first tier studies assessment: Graham Cave/Graham Cave State Park, Graham Farm, and Graham Rock.

The site files of the Archaeological Survey of Missouri (ASM) and the survey files of the Missouri State Historic Preservation Office (SHPO) were studied to determine where significant archaeological sites were located near the SIU 6 Corridor. Historic plat maps and Government Land Office survey maps from the early 1800's were also consulted to determine the areas of any potential significant sites. The locations of these potential sites were then mapped on a GIS database of the project area.

Methodology

Study team archaeologists conducted a Phase 1 survey in 2003 with some additional work conducted during spring 2004. The findings of the survey would be presented in the Phase 1 Archaeological Report and submitted to the SHPO in summer 2004 for concurrence. Although the report has not been formally submitted yet, the preliminary findings aided the study team's decision to ensure that the recommended preferred alternative avoided impacts to sites such as Graham Cave and Graham Cave State Park, Graham Rock and the Graham Farmstead.

The width of the investigated corridor varied, but was typically 270 feet (80 m) from the edge of the existing interstate. Existing frontage roads and ditches usually reduced the effective survey area to less than 175 feet (50 m). It was assumed that any archaeological deposits within this area were destroyed when I-70 was originally built and therefore these areas were not surveyed. In the field, where ground surface visibility was greater than 30 percent, a pedestrian survey was conducted at 30-foot (10 m) intervals. For areas where ground surface visibility was less than 30 percent, auger or shovel testing was conducted at 50-foot (15 m) intervals that ran parallel to the interstate. The areas previously identified as having the potential for subsurface preservation were subject to more intensive auger testing. Sites where auger or shovel tests occurred were given short field numbers.

The laboratory processing of the artifacts followed standard procedures. Articles were separated into material and functional categories, such as domestic, architectural and personal and were analyzed to develop a description and determine an age. The artifacts were processed and stored in plastic Ziploc bags. Currently, the artifacts are stored with MoDOT, who would determine the ultimate repository location for the materials.

b. Environmental Consequences

As will be presented in the Phase 1 Archaeological Report, study team archaeologists encountered a total of 69 archaeological sites: 61 prehistoric, one historic and seven mixed historic/prehistoric sites in the SIU 6 study area. Several parcels within the project area could not be surveyed because landowners could not be contacted or denied access to their properties. Of the 69 sites surveyed, 42 sites lacked the potential for substantial intact subsurface deposits and no further archaeological work would be recommended. Five sites were determined to be outside the proposed study corridor. Of the remaining sites, the Phase 1 Archaeological Report would note that:

- Eight sites near the proposed recommended preferred alternative were recommended for avoidance.
- Eleven sites were determined to have a potential for intact subsurface deposits.

Sites Recommended For Avoidance

Although the formal Phase I Archaeological Report has not yet been accepted and concurred with by the SHPO, the study team considered the survey's preliminary findings in deciding to avoid the following properties.

Graham Cave

The Graham Cave rock shelter is the centerpiece of Graham Cave State Park and one of the premiere archaeological sites in Missouri. Graham Cave is a National Historic Landmark and contains substantial deposits from the Archaic Period and smaller deposits from later periods. The significance of Graham Cave has been described in detail. Currently, the rock shelter is maintained by the Missouri Department of Natural Resources and the shelter interior is fenced off from the public. The cave may have intact deposits which are very likely to further illuminate prehistoric life ways. In addition to its scientific significance and potential for archaeological research, the cave is also highly significant as an established public symbol of the rich archaeological history of Missouri. The recommended preferred alternative would not impact the Graham Cave or Graham Cave State Park.

Graham Rock

Graham Rock is situated in the median of Interstate 70 on the east bluff of the Loutre River. Graham Rock consists of a large outcropping of rock that is quite prominent in the Loutre River valley. According to local lore, the Graham Rock was the location of slave auctions in the nineteenth century and thus is also referred to as Slave Rock. Archaeological investigators considered this assertion to be dubious since slave auctions typically took place in town squares or other public locations, not in remote areas such as rock outcroppings. However, the association with slavery is not unfounded, since the Graham family maintained slave quarters just south of the rock on the north side of the Graham Farmstead. It is probable that slaves would have been seen frequently on and around the rock. The association with slavery makes this rock culturally sensitive. In addition, the rock has a history of being an important landmark and meeting spot to area residents. This rock was occasionally used by picnickers in the late nineteenth and early twentieth century and was the site of the 1884 Montgomery County Old Settlers' Reunion. When Highway 40 was constructed in 1953, it ran next to the rock and Graham Rock was designated as a roadside picnic spot. Although the rock is still visible, most of it was buried during I-70 construction in the 1960s.

As noted in Chapter 2, Graham Rock functioned as a control point for on-existing highway improvements and eventually for the recommended preferred alternative. Because of the

culturally-sensitive nature of this rock formation the study team worked diligently to establish a recommended preferred alternative that avoided impacts to Graham Rock. The recommended preferred alternative would not impact Graham Rock.

Auxvasse Creek Site

A previously-recorded mound group is situated on a rise near Auxvasse Creek. Although it was determined that the site was outside the proposed project area, the exact location of the mounds needed to be ascertained to ensure they would not be impacted by the recommended preferred alternative. The owner of the property where the site is located reported that modern Native Americans had visited the site a few years ago and performed some sort of ceremony, leaving flowers. The study team noted that there were three mounds visible in 2003. A fourth mound may have been situated where a reservoir is now located. The archaeological investigators determined the mounds at this site could be significant and warranted preservation. The recommended preferred alternative would not impact the mounds.

Daniel Morgan Boone Cabin

A Loutre River Valley parcel is believed to be the location of one or two prehistoric mounds and the foundation of Daniel Morgan Boone's cabin. Unfortunately, this site could not be visited because the current landowner denied permission to enter his land. However, the owners of the Graham Farmstead who also previously owned the parcel were quite familiar with the site and described it to study team archaeologists in detail. The family reported the site consisted of a northwest-southeast trail with the cabin foundation of Daniel M. Boone located on the northeast side and two mounds on the southwest side of the trail. The cabin stood until ca. 1910 and was used intermittently by squatters. The 1838 GLO shows that this site area was part of a large parcel owned by Boone and indicates it is part of a Spanish land grant. Scattered references in Nathan Boone's (1999) memoirs indicate members of the Boone family lived for a time in this part of the Loutre River and the connections and proximity of Daniel M. Boone and the nearby Graham family are well established. There is a reasonable possibility this foundation is related to Boone's occupation. If the location information provided by the owners of the Graham Farmstead is correct, the recommended preferred alternative would not impact the sites. However, the precise location of the site needs to be accurately determined to ensure that the recommended preferred alternative would not impact the sites.

Rumbo Branch Creek Graves

This site is a possible location of Native American graves. It is situated north of Rumbo Branch Creek. A Right of Entry form returned by the property's owner included the statement, "May have Indian graves." The study team determined that the parcel would not be affected by any of the proposed alternatives.

Mineola Hill Rock Shelter

This site is an unrecorded rock shelter located in the Mineola Hill area. The rock shelter contains buried Late Woodland and probably earlier components. The site is not well known and is not recorded. However, the site has been looted on at least two separate occasions in recent years. Much of the center of the shelter has been looted to a depth of approximately 20 inches (50 cm). However, the margins of the shelter appear intact. On the ground surface around the shelter and in the looter back dirt, large amounts of flakes and some non-human bone were observed. As the nearby Graham Cave rock shelter and the Arnold Research Cave indicate, rock shelters often contain well-stratified and well-preserved archaeological resources. The Late Woodland component of this shelter would complement the archaic data from Graham Cave, since the Woodland component of Graham cave was largely destroyed. The

recommended preferred alternative would not impact the site. Investigators consider the site to have the potential for being one of the most important archaeological sites discovered in Missouri in recent years.

Loutre Valley Rock Shelter

This site, a prehistoric rock shelter, is situated in the Loutre River Valley. None of the material recovered was temporally diagnostic, but according to the property owners, the previous owner looted this site and reportedly found ceramics, indicating that the upper level of the shelter contains a Woodland or Mississippian component. The presence of prehistoric materials below a Woodland or Mississippian level strongly indicates this site has a high preservation potential. The recommended preferred alternative would not impact the rock shelter. However, due to the evidence of looting and other factors the deposits of this site are in danger.

Graham Farmstead

The Graham Farmstead contains the foundation of a slave cabin and may contain prehistoric and early historic deposits. The complex consists of the Graham Farmstead located south of I-70 on a prominent bluff ridge overlooking the Loutre River. It consists of all historic features associated with the Graham/Harris farm, including slave cabin foundations and a prehistoric scatter.

The foundation of a slave house and minor prehistoric scatter is located on the farm. According to the Harris family who own the farm, this was the location of slave cabin foundations in the early and mid nineteenth century. According to historic research compiled by study team architectural historians, four female slaves were kept in this structure in the 1830s, which was demolished during a 1917 tornado. The site is potentially important since so little is known about the daily life of slaves in Missouri and this site appears to have deposits associated with slaves. The prehistoric component of this site is less likely to be intact, considering the disturbed nature of the farmstead and its situation on a rocky ridge.

Near a concrete outhouse foundation is another prehistoric and historic scatter that is situated on the farm. The historic component of this site was not temporally diagnostic, but is clearly associated with the Graham Farmstead, which is an important early historic farmstead. Again, the prehistoric component of this locus is less likely to be intact, considering the disturbed nature of the farmstead and its situation on a rocky ridge. The recommended preferred alternative would not impact the Graham Farmstead.

Other Sites

The remaining 11 sites would not be impacted by the recommended preferred alternative. The Phase1 Archaeological Report discusses these prehistoric or mixed prehistoric/historic sites that display a potential for containing prehistoric intact subsurface deposits.

12. Historic Resources

MoDOT Cultural Resources staff conducted a historic and architectural investigation to identify architectural, bridge and historic resources associated with SIU 6. The purpose of the survey was to identify all historical, architectural and bridge resources within the project area. The investigation also sought to provide an evaluation and assessment of identified properties as it relates to their eligibility for listing on the National Register of Historic Places (NRHP). A protocol for the I-70 architectural resources survey was developed in conjunction with the State Historic Preservation Office (SHPO), MoDOT Cultural Resources staff and the GEC. A field review of the SIU 6 Corridor was conducted during Summer 2003. The survey utilized an area

of potential effects (APE) that included the project footprint and 50 to 100 feet on either or both sides of the footprint, depending on the proposed improvements and whether the area is urban or rural. The additional width beyond the footprint allowed for the consideration of secondary and indirect impacts. In those areas of the project where no new right of way or easements were proposed, the APE reflected the existing right of way limits. The resulting report, *I-70 SIU 6 Historical and Architectural Survey*, is available upon request.

a. Architectural Resources

The architectural investigation for SIU 6 included a survey of 342 parcels in the APE. The architectural survey yielded 139 properties with architetural resources in the APE. Of these 139 properties, 64 were contemporary in nature reflecting the recent development of this section of the I-70 Corridor. Buildings at these 64 properties did not appear on aerial photographs from 1968 or were new, usually replacement, buildings erected at the site of former buildings. This group of 64 parcels with only recent architectural resources was classified in the category of resources that post-date 1970.

Architectural resources built before 1970 account for 75 of the 342 surveyed properties. The majority of the surveyed properties are complexes with multiple architectural resources resulting in a total of 278 buildings and structures surveyed at these 75 properties. It was decided between the GEC, MoDOT and SHPO that all parcels having architecture dating prior to 1945 would be documented on historic/architectural inventory forms, as would any building dating after 1945 that had potentially eligible buildings or structures. There were 25 parcels in the study that involve at least one architectural or historical resource that is believed to pre-date 1945. Fifty of the surveyed properties presented architectural resources in the APE with construction dates estimated between 1945 and 1970. A slab rock building built, circa 1953 and formerly a commercial property, was the only building built in this time period that was inventoried.

As a result of architectural field surveys, literature searches, archival investigations and application of National Register Bulletin 15: “How to Apply the National Register Criteria for Evaluation”, MoDOT Cultural Resources staff considered four properties in the project area relate to significant historical themes, events or individuals; architecturally significant; or likely to yield important information. Because these properties possess the significance and integrity necessary to fulfill eligibility criteria for listing in the National Register Historic Places (NRHP), MoDOT Cultural Resources Staff recommended the following four properties eligible for listing on the NRHP and SHPO concurred with the recommendations. MoDOT corresspondence with SHPO is included in **Appendix D**.

Southwestern Bell Repeater Station

The SIU 6 Study Team recommends the Southwestern Bell repeater station, located in the northwest quadrant of the U.S. 54 and I-70 interchange, as eligible for listing on the NRHP under Criteria A and C, for local significance in communications and architecture. The building represents the efforts of Southwestern Bell to improve communications systems through technology and is part of regional improvements, thus it represents an important development in communications, with a period of significance of 1930, the year the new equipment was installed and put to use. The building is a Classical Revival Style repeater station that also contains elements of the Tudor Revival style present in the door surrounds with the massing and slightly pointed arches above the door.

The determination of eligibility for this building played a role in the final selection of a preferred interchange configuration in the Kingdom City area. The recommended preferred alternative would not impact this identified resource.

Slab Rock Commercial Building

The SIU 6 Study Team recommended the rock building, located in the northeast quadrant of the U.S. 54 and Old Highway 40 intersection in Kingdom City, as eligible for listing on the NRHP under Criterion C for local architectural significance. The building was an excellent example of the slab-rock construction method incorporating several interesting shaped rocks, but was unusual because of its use of rubble as well as slab. The period of significance for the building is circa 1953, when the building was constructed. The Slab Rock Commercial Building is located north of the Kingdom City interchange and would not be impacted by the recommended improvements for I-70.

Graham Family Farmstead

The Graham Farmstead, located just south of I-70 in the Loutre River Valley, is roughly 2.5 acres and comprised of a farmhouse and numerous support buildings and structures. A separate tract of nearly 278 acres surrounds three sides of the core parcel and contains additional outbuildings that are historically associated with the farm. The farm house was constructed on a sandstone foundation in 1826 and significantly remodeled in 1910, giving it its present gabled-L plan. The SHPO has previously determined that the Graham Farmstead is eligible for listing in the NRHP under Criteria A, B and D. It is an excellent example of a prosperous and very early Anglo-American farmstead. The period of significance for the property dates from 1819 to 1953 based on the house on this property which continues to be owned by Robert Graham's descendents and a number of later outbuildings that have also survived. The recommended NRHP boundaries encompass all 280 acres contained in the two combined parcels, which include land from the original Spanish Land Grant.

Numerous Improve I-70 alternatives were investigated through the Loutre River valley with the known constraints identified for the Graham Farmstead. Several of those alternatives were rejected from further consideration because they could not be reasonably constructed without directly impacting the Graham Farmstead property. The recommended preferred alternative recommended by the study team includes the extensive use of retaining walls on the south side of I-70 to stay within the existing I-70 right of way and out of the Graham Farmstead and therefore does not directly impact the farmstead.

Danville Female Academy

The SIU 6 Study Team recommended the Danville Female Academy Chapel as eligible for listing on the NRHP under Criteria A and C for local significance in education and architecture. The building is the only surviving element of the Danville Female Academy, which was important in the history of education in the region because it provided an education opportunity to women that they might not have had otherwise. The Historic American Buildings Survey (HABS) photographed the chapel and that the photos are in the Library of Congress HABS collection. The architectural significance of the building comes from its Greek Revival styling and its period of significance for education is 1859 to 1865 when the chapel was in use by the Academy. The recommended preferred alternative for this portion of SIU 6 would expand the highway to the south of existing I-70 and therefore would not impact either the Danville Female Academy Chapel or
the property.

b. NRHP Properties

A search of State Historic Preservation Office, MoDOT and other records were consulted for architectural surveys conducted in Callaway and Montgomery counties. The review found a total of 15 listings for Callaway County and six listing for Montgomery County on the National Register of Historic Places. Graham Cave, located in Graham Cave State Park and the Baker Plantation were the only properties located in the SIU 6 study area.

Graham Cave

Graham Cave, a site of early human occupation, is the centerpiece of the park and the SIU 6 Study Team took precautions to avoid impacting the property. The cave was recognized as a National Historic Landmark in 1961 and listed on the NRHP in 1966 for its archaeolgical significance. Remains found at the cave date to 8,000 BC and, at the time of the 1949 excavations, were among the earliest known for the Archaic Period. The recommended alternative would not impact Graham Cave.

Baker Plantation

Another property listed on the NRHP is the Baker Plantation, located just east of Danville and adjacent to the north of I-70. During the initial screening process, the study team determined that I-70 in that section would be improved by expanding it to the south. Once the decision was made to expand to the south, Baker Plantation did not lay within the APE. Baker Plantation would not be directly impacted by the recommended preferred alternative.

c. Graham Rock

As noted previously, Graham Rock is a large sandstone outcropping located immediately north of the Graham Farmstead in the median of I-70. During the 19th century, the rock became a popular site for picnics and other public gatherings following the 4th Old Setter's Reunion in 1884. People sometimes inscribed their initials and the dates of their visit on the rock. Historical photographs in the Graham's possession document the site's popularity as a picnic spot and local gathering point.

The belief that slave auctions took place on this rock during the 19th century has become widespread across Missouri in recent decades. This notion has become so popular that the rock is sometimes referred to as "Slave Rock." While Graham's farm was well known throughout the area, it would not have been a convenient location or prime public place for such events. Although it is possible that auctions took place at the site, there is no documentary evidence for this assertion.

While SHPO determined that Graham Rock was not culturally significant as it relates to Section 106 of the NHPA, the SIU 6 Study Team evaluated a series of alternatives that would improve I-70 without directly impacting the existing rock outcropping, including adding additional fill at the base of the rock. The recommended solution through this portion of the SIU 6 Corridor would not directly impact this rock.

d. Bridges

A records search and field survey were conducted to identify all bridge resources in the SIU 6 Corridor. Twenty-four bridges and culverts were located in the APE. This number includes three railroad bridges built in 1963. With construction dates ranging from 1924 to 1989, only three bridges and two culverts have original construction dates prior to 1961. None of the 24 bridges and culverts are considered to be eligible for listing in the NRHP, therefore it is not

necessary to evaluate the proposed action effects to the bridge resources or recommend measures to mitigate harm.

e. Missouri Interstate 70 and History

As early as 1938 consideration was given by the federal government to an interstate highway network. A report resulting from the Federal Highway Act of that year recommended construction of a 26,000-mile (41,843 km) inter-regional system consisting of two- or four-lane highways, some with controlled access. The plan remained dormant until the Federal Highway Act of 1944 authorized the designation of select existing highways as part of an interstate system. The act called for improvement of these designated roads, but made no provision for increased federal funding. Lack of money and lack of uniform design standards slowed progress on the project over the following years. Although funding increased with the Federal Highway Act of 1952, only 6,000 miles (9,656 km) of highway had been completed by 1953.

In an address prepared for a governors conference in 1954, President Dwight Eisenhower declared that the highway system then in place was totally inadequate, causing needless death and injury, creating delay in the transportation of goods and placing the nation at risk in the event of major disaster or war. He called for federal and state cooperation in the creation of a modern interstate network, paid for by a revamped system of financing that would avoid debt.

The Federal Highway Act of 1956 substantially enacted Eisenhower's proposal and initiated the current interstate highway system. The act instituted construction on a network 39,000 miles (63,730 km) in extent and authorized $25 billion for the project, to be spent over the period 1957 to 1969. Existing toll roads meeting system standards could be integrated into the interstate system. Inherent in the terms of the act was the idea that the interstate system should evolve and improve over time and that initial construction would be altered or replaced in the future as need arose. The original act permitted two-lane interstate segments with at-grade intersections in low-traffic rural areas, but called for the adoption of minimum standards aimed at the eventual elimination of these segments. Legislation passed in 1966 ultimately did require all interstates to be at least four lanes and have no at-grade intersections. According to the 1956 act, interstates were to be constructed according to standards accommodating traffic forecast for 1975. Subsequent legislation amended this requirement so that highway design would tolerate traffic estimates for a maximum of 20 years.

The 1956 act started a public works project that was the most expensive and wide-scale in United States history, surpassing any program undertaken during the New Deal era, with approximately 75 percent of the new interstate system constructed on new right of way. Initial construction of the interstate system was greeted with wide-ranging support. It was not until the 1960s that significant opposition to the program mounted, with criticisms centering on the displacement of residents and the destruction of urban neighborhoods caused by highway construction.

When finished, I-70 extended from Baltimore, Maryland, through the Alleghenies of Pennsylvania and across the Ohio River at Wheeling, West Virginia. From there it passed through Indianapolis, St. Louis and Kansas City, toward its original western terminus at Denver. In 1957 it was decided to extend I-70 west from Denver to a junction of I-15 in south central Utah.

As one of the interstates built in the immediate aftermath of the Federal Highway Act of 1956, I-70 was designated by federal legislation in 1990 as part of the Dwight D. Eisenhower System of Interstate and Defense Highways. In February, 1994, this system was named by the American Society of Civil Engineers as one of the "Seven Wonders of the United States", along with other

notable engineering accomplishments including the Golden Gate Bridge, the Panama Canal and Hoover Dam.

Missouri is sometimes credited as the first state to initiate interstate highway construction, breaking ground on a 2.6-mile (4.2 km) section of Interstate 70 in St. Charles County, after the state signed the first contracts under the new interstate program on August 2, 1956. Beginning in 1956, construction of I-70 across Missouri took nine years to complete. Work on the last sections, in Jackson and Lafayette counties, was completed in August of 1965. Extending 251 miles (403.9 km), the Missouri section of I-70 was designed to meet the 20-year design life standard established by federal legislation.

During the First Tier Study, discussions began with the Historic Preservation Program (HPP) office, which houses the Missouri State Historic Preservation Office (SHPO) within the Missouri Department of Natural Resources (MDNR), and the Federal Highway Administration (FHWA). These discussions examined the potential historic significance of I-70 in view of the National Historic Preservation Act of 1966 and its possible eligibility for the National Register of Historic Places. The interstate system is approaching the 50-year old threshold for consideration of eligibility and as a result, the national interstate system is currently being studied by a national task force including representatives of the National Conference of State Historic Preservation Officers, the FHWA, select state Departments of Transportation, the Advisory Council on Historic Preservation, the National Register and other interested parties. The discussions within Missouri led to the development of a memorandum of understanding (MOU) that outlines a course of action to be followed with regard to I-70. A copy of the MOU is found in **Appendix D**. The agreed action is the following:

- A formal assessment of the eligibility of the section of Interstate 70 addressed in the First Tier EIS and in the Second Tier environmental documents would be prepared by the Federal Highway Administration at such time that the interstate has reached 50 years of age, or the national task force has reached an opinion regarding the eligibility of the interstate system.
- In the interim, the FHWA and MoDOT would proceed in good faith to gather documentation on the history and development of this important interstate highway (Interstate 70) in Missouri.
- Should Interstate 70 or any part thereof be determined eligible at a later date, the FHWA and MoDOT shall enter into consultation with the MoSHPO and the ACHP pursuant to 36 CFR 800.

13. Energy Impacts

Energy considerations to be taken into account when evaluating the proposed improvements to I-70 include the energy consumed during construction and the energy consumed after construction is complete during operations and maintenance. Energy consumed during construction includes earthwork and construction activities, as well as energy consumed off-site for the production of materials and equipment. Energy consumed after construction includes fuel, as well as energy used for maintenance of the facility.

The proposed improvements within SIU 6 would be constructed along the existing facility, thereby minimizing the overall amount of energy consumed compared to the other alternatives off of the existing alignment examined during the course of this study.

14. Construction Impacts

a. General Impacts

The Missouri Department of Transportation (MoDOT) has developed a series of standard specifications for highway construction. These specifications include, but are not limited to, air, noise and water pollution control measures to minimize construction impacts. The standard specifications also include traffic control and safety measures. MoDOT would implement these standards for the I-70 improvements. Pollution control measures, both temporary and permanent, would be enacted under the project construction specifications.

Although construction can have adverse impacts on noise and air quality levels, construction impacts in the I-70 Corridor are not expected to be severe. Construction impacts would be of relatively limited duration and because all of the I-70 SIU 6 Corridor is located in rural areas, the number of receptors exposed to the increased noise level and decreased air quality would be limited. Furthermore, impacts would be mitigated by adherence to construction permit and contract conditions, which include prohibitions against burning of construction debris and control measures to limit pollution if tree trunks and limbs are permitted to be burned on site.

Specifications and procedures for disposal of wastes resulting from construction activity would be developed with consideration given to the MDNR Solid Waste Management Program. Furthermore, any potential hazards in the right of way would be identified and handled according to all applicable regulations.

Storm water runoff is addressed by MoDOT's Pollution Prevention Plan and its Missouri State Operating Permit, MO-R100007, and would be used to address this concern during construction. The MDC has stated that the following best management practices should reduce impacts to the aquatic environment to a minimal level. The best management practices include conformance to the State Channel Modification Guidelines when altering channels or relocating streams; grading and seeding disturbed areas as soon as possible and in compliance with the MDC seeding and planting recommendations; minimizing disturbances to the stream banks and riparian zones; avoiding work in stream channels from the beginning of March to mid-June as possible and practical; and the undertaking of all necessary precautions to prevent petroleum products from entering streams.

b. Vibration/Blasting – Mineola Hill

At the request of MoDOT, the study team investigated the feasibility of blasting in the Mineola Hill area. Some blasting would be necessary at Mineola Hill as part of the excavation required to lessen vertical grades from the current five to six percent to the Build three and four percent. MoDOT's concern was that during excavation, the vibrations associated with blasting could damage Graham Cave or the Graham Family Farmstead.

Graham Cave is unique geologically because the Jefferson City Dolomite and the St. Peters Sandstone are in contact. Currently the cave shows signs of spalling and cracking. Graham Cave is approximately 1,540 feet (462 m) from the centerline of I-70 and 1,800 feet (540 m) from the nearest rock that may require blasting for excavation. The Graham Farmstead's residence is a two-story structure located approximately 300 feet (90 m) from the I-70 centerline and 1,000 feet (300 m) from the nearest rock that may require blasting for excavation.

The study team utilized vibration monitoring experts to assess the feasibility of blasting in the area. The U.S. Bureau of Mines (USBM) seismologists have established criteria relating the occurrence of structural damage to certain frequencies and levels of ground motion. USBM Report of Investigations 8507 states that residential structures are most prone to damage as a

result of vibration energy within the frequency range of 4-12 hertz. These limits are designed to prevent the occurrence of even minor damage to the most brittle portions of a structure such as plaster and drywall. More massive materials can withstand greater magnitude vibrations.

Based on the information obtained for this study, the vibration experts concluded that blasting operations using generally accepted blasting practices anticipated with the recommended preferred alternative could be conducted without presenting a hazard to either the homestead or to Graham Cave. In the case of the cave, studies have shown that blasting either had no effect or that the influence from blasting was less than changes due to natural phenomena. The following mitigation measures were recommended to be included prior to and during construction.

- While damage from blasting is unlikely, it has been recommended that prior to the start of any operations involving the use of explosives, and contingent upon the permission and cooperation of the owner, the interior and exterior of the Graham Farmstead be thoroughly documented by photographs, videotape or both. A discussion with the property owner revealed that damage to the structure had occurred from previous blasting on I-70. The validity of the statement could not be verified. A water sample from the well should also be analyzed to establish a baseline.
- A long-term study is recommended for Graham Cave where strain gauges and/or crack monitors are installed to measure the expansion and contraction of openings through several seasons. This information would present a baseline of cave activity. If blasting operations are performed, these same sensors could provide real-time data measuring the influence, if any, as a result of blasting.
- If blasting is performed, all blasts should be monitored with seismographs at the homestead and at the cave. The USBM criteria established in RI 8507 should apply at the homestead.
- A test blast program should be implemented prior to full-scale mass rock excavation through the use of explosives. The testing would be site specific to insure that the USBM limits are adhered to.

A copy of the complete vibration/blasting report is available upon request.

15. Irreversible/Irretrievable Commitment of Resources

Implementation of the proposed alternative would involve a commitment of a range of natural, physical, human and fiscal resources. These resources cannot effectively be recovered once they have been expended for the construction. Land used in the construction of the proposed I-70 improvements would be an irreversible commitment during the time period that the land is used for a highway facility. However, if a greater need arises for use of the land or if the highway facility is no longer needed, the land can be converted to another use, although this is highly unlikely.

Considerable amounts of fossil fuels, labor and highway construction materials such as cement, aggregate and bituminous materials would be expended during the improvement of I-70. Additionally, large amounts of labor and natural resources would be used in the fabrication and preparation of construction materials that are generally not retrievable. These man-hours expended for the design and construction of an improved I-70 cannot be reclaimed, nor can the energy required for construction. However, the labor and natural resources are not in short supply. The construction would also require a one-time expenditure of both state and federal funds that are not retrievable.

The commitment of these resources is based on the concept that the improvement of I-70 would benefit residents in the Study Area, the region and the State of Missouri through the improved quality of the transportation system. These benefits would consist of improved accessibility and safety, savings in time and greater availability of quality services anticipated outweighing the commitment of these resources.

16. Joint Development

Among the potential benefits of a transportation investment are the opportunities to jointly enhance and/or preserve social, economic, environmental, cultural, or visual values of an area. The National Environmental Policy Act of 1969 (NEPA) declared that it is the "continuous responsibility" of the federal government to "use all practical means" to "assure for all Americans, a safe, healthful, productive and aesthetically and culturally pleasing surrounding." It is from this policy that the authority is granted to transportation agencies to utilize traditional improvement projects as means to provide for non-transportation benefits.

Through the use of this joint development concept in SIU 6, MoDOT would be willing to continue discussions with Graham Cave State Park officials to determine how right of way areas could best be used to enhance the park. In other areas of the corridor, the opportunity to develop such amenities as scenic overlooks or utility facilities can be explored. There were no other definitive projects that offer joint development opportunities identified by the study team.

17. Relationship Between Short-Term Uses Versus Long-Term Productivity

In order to evaluate the overall long-term benefit of the proposed alternatives, the short-term impacts and use of resources are compared to the projected long-term productivity associated with the highway improvements. If the overall long-term productivity, normally in terms of travel efficiency and reduced traffic accidents, outweigh the short-term impacts, then the project would be considered an efficient project and should be pursued.

The proposed improvements to the I-70 SIU 6 Corridor would have minimal change in short-term use but would have substantial benefits for long-term productivity. The short-term loss would be a direct result of displacing residential and commercial activity or removing access. However, over the long-term, productivity would be enhanced by reducing delay and increasing safety.

18. Permits

a. Section 10 of the Rivers and Harbors Act

This permit, controlled by the U.S. Army Corps of Engineers, regulates the alteration of navigable waters of the United States. None of the streams or river crossings is considered navigable and would not be regulated by this act.

b. Section 404 of the Clean Water Act

This permit, controlled by the U.S. Army Corps of Engineers, prohibits discharge of dredged materials or fill material into "Waters of the U.S." unless authorized by a Section 404 permit. Based on the presence of several small wetland areas and several stream and river crossings, it has been determined that "Waters of the U.S." are present and would require permitting. The Corps also has an agreement with the Missouri Department of Natural Resources to process requests for Section 401 water quality certifications jointly with the Section 404 permit

application. In addition, since the expected impact to area wetlands is expected to exceed one acre (0.4 hectare) a mitigation plan to compensate for wetland impacts would be developed.

c. Construction Related Permits

In coordination with the Missouri Department of Conservation, MoDOT would utilize the best management practices process to protect the natural environment from sedimentation and construction materials pollutants. In addition, MoDOT would abide by the National Pollution Discharge Elimination System permit that has already been obtained on a statewide basis (Missouri State Operating Permit, MO-R100007) from the Department of Natural Resources. Other permits relating to construction would be obtained as needed.

C. Secondary and Cumulative Impacts

1. Introduction

The assessment of secondary and cumulative impacts in NEPA documents is required by Council on Environmental Quality (CEQ) regulations. Secondary and cumulative impacts result when the effects of an action or project are added to or interact with other effects in a particular place and within a particular time. The cumulative impacts of an action or project can be viewed as the total effects on a resource, ecosystem, or human community of that action or project and all other activities affecting that resource no matter what entity is taking the actions. Secondary and cumulative impacts may occur outside the highway right of way and are generated as a result of changes in development patterns. Secondary or cumulative impacts may be the unintended consequences of roadway improvements. These impacts may include increases in traffic volumes outside the study corridor; or changes in population, housing, employment, tax base or other land use changes.

Determining the boundaries and time period depends on the characteristics of the resources affected, the magnitude and scale of the projects' impacts and the environmental setting. To avoid extending data and analytical requirements beyond those relevant to decision-making, a practical delineation of the spatial and temporal factors is needed. For this project, the existing spatial factor is the I-70 Corridor from Kansas City to St. Louis and the time period would cover from approximately the 1950's up to and through the year 2030. For the purpose of the overall secondary and cumulative impacts evaluation, the length of the I-70 Corridor is approximately 200 miles, the width for evaluation is resource dependent and the time period would cover approximately 75 years. The secondary and cumulative impacts evaluation for each section of independent utility (SIU) would cover the same time period. This secondary and cumulative impact analysis would consider impacts that are due to past, present and reasonably foreseeable actions.

2. Existing I-70 Overall Corridor

a. Land Use

Beginning in the 1910s and 1920s, Missouri improved and paved its first major cross-state highway. The route was designated Highway 40 and by the 1930s, the road was carrying cross-state and national traffic. A number of small communities arose along the highway to provide basic services for travelers such as fuel, food and lodging. When the original I-70 Corridor was located and constructed during the 1950s and 1960s, the direct and secondary impacts included noticeable changes to land use.

Most of the former Highway 40 was either incorporated into the new interstate or changed into a local access road along the new I-70 Corridor. Local access was lost to the controlled access I-70 facility and as a result many of the unincorporated villages and their transportation related businesses disappeared along the corridor. Although today the primary land use within the corridor is rural in character, the change from forest and agricultural lands to the location of development was highly related to the selection of the new corridor, as well as the locations of the current interchanges. Economic development generated new jobs, which in-turn increased the demand for housing, commercial and retail services and fundamental community infrastructure such as schools, libraries, police and fire protection and sewer and water service. The economic growth and the secondary growth that follows is a cumulative impact. The I-70 transportation corridor, past, now and in the future, would continue the economic development trend and hence, impacts to land use. Transportation contributes to and is one of several factors that helps facilitate economic development.

The existence or the creation of adequate utilities and other infrastructure was an attraction for development. Communities or areas with these types of facilities were and are able to attract development. Development is then a generator of tax rate revenues that contribute to the initial investment in the utilities and infrastructure. Over time, the expansion of the population, households and employment took place with the accompanying increase in the tax base. The cumulative impacts of the corridor have continued with these development trends until the present and it is expected that these trends would continue with the reconstruction and widening of the existing I-70 Corridor.

Agricultural uses, scattered residential and retail development, mining, forested and natural areas distinguish the rural areas. More dense and urbanized land uses occur within the cities located along the I-70 Corridor. These include Columbia, Warrenton, Wright City and Wentzville. Smaller urbanized areas are found at Oak Grove, Grain Valley, Higginsville, Odessa, Concordia, Boonville, Kingdom City and High Hill. Eastern Jackson County and western St. Charles County are generally characterized by low density, suburban development and represent the outermost reaches of the Kansas City and St. Louis metropolitan areas, respectively. The development trend is especially expected to continue on the fringe or edges of the urban areas of Kansas City, Columbia and St. Louis. The basic infrastructure is already in place, the typical level of traffic is high and the non-interstate roadways usually have unrestricted access. These three features are important factors to attract development. With the ultimate improvement of I-70, there would be some residential and business displacements along the existing roadway. It is likely that those displaced would relocate close to or within the I-70 Corridor area, especially the transportation-dependent businesses. This, in turn, would cause an additional change in land use, from non-developed to developed use.

b. Parklands

Section 4(f) of the U.S. Department of Transportation Act of 1966, as codified and amended, has afforded publicly owned parkland protection from being converted to uses other than park and recreation. Consequently and over time, Federal-aid highway projects have avoided or mitigated any impacts to the taking of parkland. Most often, parkland has been avoided and if impacted, the impact has been minor and appropriately mitigated.

c. Prime Farmland

The proposed reconstruction and widening of I-70 may result in secondary impacts to prime farmland due to farmland conversion along the new required right of way. It is estimated that approximately 1,300 acres (530 hectares) of farmland would be directly impacted along the entire length of the corridor. Farmers affected by the conversion of all or part of their land to the

development of the roadway may choose to no longer farm or cultivate their land. As a result, more farmland soils could be taken out of production if farmers choose to sell their land for non-farm uses. If the farmland is sold, it may be subdivided and converted to commercial and residential land use.

The improved roadway may, at some time in the future, act as a catalyst for increased growth, relocated development and expansion in the region. Historically, this has taken place in the I-70 Corridor. New development would depend on the location and such development would be expected to occur in areas already near the main population centers. However, with the proposed reconstruction and widening of existing I-70, overall secondary and cumulative impacts to the prime farmland resource are expected to be minimal.

d. Terrestrial and Aquatic Communities

Although the direct loss of forest acreage can eliminate or reduce the size of habitats, secondary and cumulative impacts can also occur as a result of habitat fragmentation, which can have an adverse effect on species diversity and connectivity. It is estimated that approximately 230 acres of forest land would be directly impacted along the length of the corridor. Habitat fragmentation in both terrestrial and aquatic areas can create variable-sized parcels or "islands" of viable habitats that become isolated. Secondary and cumulative impacts could also result by inducing more development within the corridor. Forested areas and watersheds across the I-70 Corridor are resources that have been impacted by the initial location and construction of I-70. With the reconstruction and widening of I-70 and, as more land is encroached upon by private development, the potential for additional disturbance of terrestrial and aquatic areas increases.

e. Threatened and Endangered Species

Much of the land near and adjacent to the I-70 Corridor already exhibits appreciable amounts of disturbance and/or development. Therefore, most of these areas are unlikely to harbor listed species that could be impacted by secondary development. Most of the recorded habitat locations are remote and are far enough removed from the I-70 Corridor to be secondarily impacted by reconstructing and widening existing I-70. Because of this, the potential for cumulative impacts to listed threatened and endangered species is considered to be low.

f. Wetlands and Waters of the U.S.

There is the potential for the proposed reconstruction and widening of the I-70 Corridor to contribute to secondary and cumulative impacts to wetlands and other waters of the U.S. During the construction phase, activities that impact these sites through sedimentation, changes in the nature of stream hydraulics, or clearing of vegetation in riparian habitat, are likely to have impacts on wetland functions and values of downstream or downslope waters of the U.S., including wetlands. It is estimated that approximately 80 acres of wetlands would be directly impacted along the I-70 Corridor. It should be noted however, that there would be wetland mitigation planned within the corridor to ensure, at a minimum, no net loss of wetlands as a resource. Major floodplain and floodplain complexes across the 200-mile corridor include the: Blackwater, Lamine, Missouri and Loutre Rivers. The Missouri River floodplain and Overton Bottoms wetlands complex is a special area within the I-70 Corridor.

g. Air Quality

The proposed reconstruction and widening of the 200-mile long I-70 Corridor falls within the Metropolitan Kansas City Interstate Air Quality Control Region, the Southwest Missouri Intrastate Air Quality Control Region, the Northern Missouri Intrastate Air Quality Control Region

and the Metropolitan St. Louis Interstate Air Quality Control Region. The Metropolitan Kansas City Interstate Control Region is classified as a maintenance area for ozone, while the Metropolitan St. Louis Interstate Air Quality Control Region is classified as non-attainment for Ozone. Corridor wide, emissions are projected to decrease in the next 20 to 30 years. These reductions in emission would offset the increase in free-flow traffic volumes along the study corridor. It is recognized that development trends are expected to continue throughout the foreseeable future. With the improved mobility and the access management policy implemented with the ultimately reconstructed I-70 Corridor, this project is not anticipated to cause a violation of the National Ambient Air Quality Standards. At the western and eastern termini, conformity statements may be required from the Metropolitan Planning Organizations.

h. The Land and Visual Quality

The I-70 Corridor travels through several physiographic regions of north-central Missouri. The western portion of the study corridor is located in the Western Glaciated Plains, consisting of gentle to moderate slopes with rolling hills. Much of this area has been cleared for use as agricultural cropland and pastureland.

The middle portion of the corridor includes the Lower Missouri River and the adjacent Ozark Border. The Lower Missouri River region consists of level river bottoms in a wide floodplain area, most of which has been cleared and is used for agricultural cropland. Some areas remain as wetlands and riparian forests. The Ozark Border is characteristically rugged with forested hilly terrain of steep to moderately steep slopes and narrow valleys. Some of this area has remained forested.

The eastern portion of the study corridor is located in both the Eastern Glaciated Plains and the Ozark Border adjacent to the Missouri River. The Eastern Glaciated Plains consist of gentle to moderate slopes with rolling hills, most of which has been cleared for agricultural use over time. The Ozark Border is characterized by hilly terrain similar to that of the middle portion of the corridor, however, there is much more remaining forested land in Callaway, Montgomery and Warren Counties, between Kingdom City and Wright City, especially in the area south of I-70.

In addition to the Missouri River valley, the study corridor includes several other perennial and intermittent stream valleys. Each of these provides a unique visual environment, which is composed of water, trees and rocks or bluffs.

The majority of the built environment is concentrated within the larger towns and cities such as the east side of the Kansas City metropolitan area, the west side of the St. Louis metropolitan area and the City of Columbia. In these areas, there is a sharp contrast between the built environment and the natural environment. In most cases, the edges of these urbanized or built-up areas tend to include highway corridors with adjacent commercial and industrial uses that lack harmonious or cohesive aesthetic relationships. In contrast, the smaller towns within the study corridor are less intrusive and can be more aesthetically pleasing, depending upon architectural styles and maintenance practices.

The proposed reconstruction and widening of existing I-70 would secondarily and cumulatively impact the visual quality of the environment as increases in growth, development and traffic volumes occur as a result of the proposed improvement. However, the visual quality of the corridor would be enhanced in accord with the appropriate elements of an I-70 Corridor Enhancement Plan.

3. Mitigation and Enhancement of I-70 Cumulative Impacts

The First Tier EIS documented the commitments of MoDOT and the FHWA to provide corridor-wide impact coordination, impact mitigation and considerations of corridor enhancements. The document provided agencies and community assurances, through the development of an enhancement master plan, that corridor-based considerations would be fulfilled and appropriate special considerations would be provided for each of the second tier studies.

A Corridor Enhancement Subcommittee, one of three subcommittees for the I-70 Corridor, is a consortium of the project team and local, state and federal agency technical staff. This committee developed a proposed mitigation and an enhancement plan for the overall I-70 Corridor. The goals of the corridor mitigation and enhancement plan include creating an approximately 200-mile I-70 transportation corridor that:

- Complements the existing natural environment.
- Maintains sensitivity to the existing context of the corridor.
- Provides a sense of consistency along the entire route.
- Showcases Missouri through enhancements which highlight Missouri history, cultural resources and economy.
- Establishes baseline enhancements for the entire corridor and identifies opportunities for additional enhancements by local communities and other partnering agencies.

Included in the plan are: a program for aesthetic enhancements for the existing natural features in the corridor; visual design treatments to built elements that reduce their sense of scale; an overall design theme for enhancements to complement the visual context of the corridor (context sensitive design); corridor landscape enhancements for both the mainline and interchanges; and, riparian habitat enhancement and wildlife corridors treatment. Applicable parts of the mitigation and enhancement plan would be incorporated and committed to in the second tier environmental decision documents.

On June 24, 2004 representatives from FHWA, MoDOT, MoDNR, RCS, MDC and USACE met to discuss possible wetland mitigation options for the I-70 Corridor. The GEC presented the I-70 Corridor Potential Wetland Mitigation Sites report, prepared in August of 2002. Also discussed was a memorandum that outlied a conceptual wetlands and stream mitigation program for the I-70 Corridor. This memorandum included several basic options for mitigation. They were: on site mitigation, off site mitigation, and off system mitigation. Within SIU 6, there was a consensus that the Loutre River Valley was an excellent location for wetland mitigation.

4. SIU 6 Secondary and Cumulative Impacts

The majority of the historic development in the SIU 6 study corridor since the original I-70 was constructed has occurred within close proximity of the Kingdom City interchange at U.S. 54 and I-70. The development was a direct result of business relocations away from the old U.S. 40. Since then additional development has occurred that primarily serves interstate traffic. Little additional development has occurred at the Calwood, Williamsburg or Danville interchanges primarily because of the lack of traffic on the crossroads.

The recommended improvements through SIU 6 call for replacing those existing interchanges in place without any relocation or additional access points. Land use growth patterns are expected to continue as anticipated whether or not the improvements are constructed. Development in the Kingdom City interchange would continue to expand on both the north and south sides of I-70 regardless of which interchange concept was constructed. Little to no additional development was expected at the other three study area interchanges. Therefore,

outside of the secondary and cumulative impacts associated with improving I-70 across the state which are listed above, the proposed improvements with the SIU 6 corridor would not have any substantial impact to existing land use patterns, parklands, prime farmland, natural habitat areas or water resources.