

Geologic Features

What are the typical geological features of the Osage, Maries and Phelps County region?

Topography along Route 63 through Osage, Maries and Phelps Counties is one of long tapering ridges, separated by moderately steep, well-entrenched valleys. The overall geologic conditions are characterized by layered, carbonate sedimentary bedrock. Under certain conditions, and infrequently, the rock can be disturbed or crushed and broken through faulting. Rock may be rotated at higher angles caused by tectonic activity and deep underground water solutioning activity. Since the rock is solutional, containing water-dissolving properties, shallow and deep features such as caves, voids and clay filling may be present. Caves or rock that have been voided and collapsed under pressure can be seen in the rock masses.



Existing rock cut along Route 63 at the Gasconade River Bridge shows solutioning activity, voids and clay filling.

All the soils, except for that which is alluvial (soil deposited by flowing water) and colluvial (soils transported downhill by gravity and water), are derived from the in-place chemical and mechanical weathering of the underlying original rock mass. The depth to bedrock can be highly variable, but can be predicted based on the particular location it is in. The soil layer, or mantle, is typically thin, 10 feet or less on the ridges underlain by the Jefferson City Formation. Rock is exposed in places along bluffs and some hillsides, and in road cuts. Depth to bedrock can be deeper, 10 to 50 feet, in the uplands and on ridge tops, with the underlying rock belonging to the Roubidoux Formation. Soil found above the layer of the Roubidoux Formation may contain a large amount of residual chert fragments. Pennsylvanian age shales, sandstones and claystones may be encountered in cuts from north of Vichy to just south of the Maries/Osage County line and just north of Rolla. These materials may require special handling. Only a few flat alluvial valleys exist throughout the study area. A mantle of 10 to 25 feet of mostly sand and gravel overlying bedrock may characterize these valleys. Colluvial soils can be found at the base of some slopes and may be up to 15 feet deep.

How does this geological data relate to the design of the roadway?

After horizontal and vertical alignments have been established, a geotechnical investigation is performed consisting of drilling, sampling and testing. During the design process, it is assumed there may be deep rock cuts and fills to achieve the desired grades. An economical design consists of balanced earthwork where the volumes of cut are sufficient to provide material for sections requiring fill and where hauling material from cut to fill sections is minimal. General locations of rock and soil layers are helpful for quantifying the different classes of excavation for construction bidding purposes. The type of material also affects the slopes used on the roadsides. Unstable soils require a more gradual slope to prevent slides, whereas some rock can be cut with a near vertical face. The types of cut and fill slopes also affects the amount of land required for the project.

What methods are used for drilling, sampling and testing along the proposed highway?

MoDOT geotechnical teams usually probe the cut area for rock at 100-foot intervals along the centerline of the roadway, to the left at the ditch line and to the right at the ditch line of the proposed alignment. The borings at the centerline locations are usually drilled to refusal and in the ditch lines to 10 feet below proposed grade or to the top of rock, whichever is less.

Wild and Scenic Rivers

The National Wild and Scenic Rivers Act of 1968 established a national system of rivers to be preserved in free-flowing condition, with their immediate environments protected. Congress selected certain rivers that possess outstandingly remarkable outdoor values. They established an initial system of eight rivers, and set up methods and procedures for adding new rivers to the system.

The Nationwide Rivers Inventory (NRI) is a register of rivers that may be eligible for inclusion in the National Wild and Scenic Rivers System. Rivers are placed on the NRI based upon the degree to which they are free flowing, the degree to which the rivers and their corridors are undeveloped, and the outstanding natural and cultural characteristics of the rivers and their immediate environments. There are three classifications of rivers in the system: wild, scenic, or recreational depending on the level of development near the stretch of river. There are no designated wild, scenic, or recreational rivers in the study area.

Air Quality

What impacts would the project have on air quality?

The Clean Air Act (CAA) requires the adoption of air quality standards, quality control regions, and state implementation plans. The federal government established the National Ambient Air Quality Standards (NAAQS), 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 established additional criteria for hydrogen sulfide and sulfuric acid.

Transportation can contribute to four of the six NAAQS pollutants: ozone, carbon monoxide, particulate matter, and nitrogen dioxide. Transportation conformity with the NAAQS, as required by the CAA, ensures that federally funded or approved transportation plans, programs, and projects conform to the air quality objectives established in State Implementation Plans. MoDOT is responsible for implementing the conformity regulation in nonattainment and maintenance areas. However, the Route 63 study area is located in a non-classified area as defined by the EPA through the CAA. Therefore, the transportation conformity requirements do not apply to this project. All of the alternatives, including the No-Build Alternative, would generate only minimal air quality impacts and are not subject to any other air quality analysis.

Floodplain Impacts

What is the 100-year (one-percent) floodplain and regulatory floodway?

Executive Order 11988, Floodplain Management, and subsequent federal floodplain management guidelines mandate an evaluation of floodplain impacts. When available, flood hazard boundary maps (National Flood Insurance Program) and flood insurance studies are used to determine the limits of the base (100-year) floodplain and the extent of encroachment.



Maries River Floodplain

The Federal Emergency Management Agency (FEMA) and FHWA regulation 23 CFR 650 have identified the base (100-year) flood as the flood having a one-percent probability of being equaled 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 the 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, the State Emergency Management Agency (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.

How are floodplains beneficial?

Floodplains provide a number of important functions in the natural environment, including creating wildlife habitat, providing temporary storage of flood water, preventing heavy erosion caused by fast moving water, recharging and protecting groundwater, providing a vegetative buffer to filter contaminants, and accommodating the natural movement of streams. Engineering analyses of floodplain impacts will be conducted to avoid and reduce impacts by bridging wherever possible. A determination will be made as to whether or not floodplain encroachment is significant. It is not possible to avoid floodplains completely; however, encroachments will be longitudinal whenever possible, so as to minimize floodplain impacts.

The use of bridges serves a dual function by reducing wetland disturbance while minimizing construction impact in the floodplain. Where feasible, the proposed crossings are located adjacent to existing road crossings where the additional impact would be minimized.

Flood Hazard Boundary Maps are available for Osage, Maries, and Phelps Counties. Special Flood Hazard Areas (SFHAs), classified as Zone A base (100-year) floodplain, occur intermittently throughout the area of the proposed project. Detailed hydraulic analyses are not performed by FEMA for Zone A areas, so no base flood elevations or depths have been determined.

The proposed project crosses base (100-year) floodplain at the Maries River, just south of Westphalia in Osage County, the Gasconade River and Spring Creek in Maries County, and Spring Creek in Phelps County (Appendix H, Plates 1-9). The Preferred Alternative and Alternative 2 would require a total of 45.1 acres of floodplain. Alternative 1 would need 76.1 acres, the connectors would require 4.8 acres, and improvements on existing right of way would need 97.6 acres. A floodplain development permit would be necessary.

Are there any FEMA buyout properties?

The Flood Disaster Protection Act of 1973, as amended by the Disaster Relief and Emergency Assistance Act of 1988, the Stafford Act, identified the use of disaster relief funds under Section 404 for the Hazard Mitigation Grant Program (HMGP), including the acquisition and relocation of flood damaged property. The Volkmer Bill further expanded the use of HMGP funds under Section 404 to “buyout” flood damaged property that had been affected by the Great Flood of 1993.

There are numerous restrictions on these FEMA buyout properties. No structures or improvements may be erected on these properties unless they are open on all sides. The site shall be used only for open space purposes and stay in public ownership.

These conditions and restrictions, along with the right to enforce same, are deemed to be covenants running with the land in perpetuity and are binding on subsequent successors, grantees, or assigns. Any decision involving these properties should take into consideration that two to three years is necessary to process an exemption from FEMA to utilize this parcel. This exemption would likely be a permanent easement rather than a transfer of property. According to available references, there are no FEMA buyout properties in the study area.

The crossings of all regulated floodplains will be designed and constructed in compliance with applicable floodplain regulations, including Executive Order 11988. There will be no increases in base flood elevations attributable to the implementation of the proposed roadway improvements. During the design process, a detailed hydraulic analysis of the flows and water surface elevations will be made in accordance with the requirements of the FEMA and the COE to ensure the absence of any encroachments upon regulatory floodways as well as to avoid any adverse impacts.

The proposed action conforms to applicable state of Missouri and local floodplain protection standards.

Based on the above considerations, and for the reasons stated in this EIS, the FHWA determines that the Preferred Alternative is the only practicable alternative.

Water Quality

What is water quality?

Water quality is the physical, chemical, and biological characteristics of water in relationship to a set of standards. Water quality standards are created for different types of water bodies and water body locations per their desired use. The primary uses considered for such characterization are parameters, which relate to drinking water, safety of human contact, and for the health of ecosystems.

There are several public water supply wells located within the study area. These wells are located in the vicinity of Westphalia, Freeburg, Vienna, and Vichy and serve the adjacent communities or are owned by the county water supply districts serving rural customers. All of these public wells draw from the Gasconade and Potosi Dolomite Geological Formations, both of which are formations of the Ozark aquifer having moderate yields of groundwater production ranging from 70 to over 125 gallons per minute.

The Preferred Alternative and Alternative 2 may impact two public water supply wells, owned by Osage County Public Water District #2, northeast of Westphalia. No wellhead protection areas are known to exist within the study area, although MDNR has established preliminary source water areas for public water supply wells in the region. If a public water supply well is compromised by construction, the well would be properly closed and the public water supply district would be provided a new supply source at a different location. No surface water sources of public water supply are found within the study area. Abandoned wells will be plugged in accordance with 10 CSR 23-3.110, as this is standard operating procedure.

Several streams within the study area have beneficial uses as designated in the water quality standards established by the Missouri Clean Water Commission. The Gasconade River has several designated uses: Livestock and Wildlife Watering, Protection of Warm Water Aquatic Life and Human Health – Fish Consumption, Cool Water Fishery, Whole Body Contact Recreation, and Boating and Canoeing. The Maries River also has beneficial uses designated by the Missouri Clean Water Commission. These are: Livestock and Wildlife Watering, Protection of Warm Water Aquatic Life and Human Health- Fish Consumption, and Whole Body Contact Recreation. While none of the alternatives directly impacts the Gasconade, all alternatives would impact the Lower Maries River near the community of Westphalia.

For all alternatives, water quality impacts to surface water systems would outweigh impacts to groundwater systems. In general, longer alternatives would lead to more land disturbance and erosion potential than shorter ones. As a result, potential water quality impacts for each alternative can be represented as a function of both the number of streams crossed and the length of each proposed alternative.

The project crosses the Gasconade River at existing crossing on Route 63, while the crossing of the Maries River at Westphalia includes all of the alternatives. The U.S. Coast Guard does not consider the Gasconade or the Maries Rivers to be navigable rivers. For all of the alternatives, there may be unmapped streams that could qualify as waters of the U.S. and thus fall under the jurisdiction of the Army Corps of Engineers. All of the alternatives are comparable in size and would involve approximately the same amount of land disturbance activities.

The project will utilize retention basins or other applicable Best Management Practices (BMPs) adjacent to the Maries River Bridge to ensure adequate protection to the waterway. It is possible that project components could prove to benefit the water quality of the Maries River. The current state of disrepair of both the existing roadway and bridge allow runoff directly into the Maries River. A new facility and structure could function to prevent the direct discharge of highway runoff into the river by creating detention basins to capture and temporarily store this runoff. The temporary storage should allow the water to slowly percolate through the ground, thus filtering contaminants and minimizing the probability of water pollution.

In addition, the new bridge would have solid walls that would prevent spray from tires from going directly into the river. To prevent contamination of streams, lakes, ponds, or other water impoundments adjacent to the project area, job specifications would require temporary or permanent pollution control measures as outlined in MoDOT's Sediment and Erosion Control Program first approved by the Missouri Department of Natural Resources on October 8, 1991, and subsequently approved June 15, 2007.

Water Resources

Why are water resources important?

Water resources are important because they provide essential biological functions in the environment. Wetlands provide water storage and energy dissipation during storm events, promote cycling of nutrients including removal and retention of some elements. Streams support animal and plant community types and are an integral part of the hydrologic cycle. In addition to these functions, public water resources provide aesthetic benefits, as well as recreational opportunities including fishing, canoeing, etc.

Water Resource:
ponds, wetlands,
streams and springs.

The Clean Water Act of 1972 (CWA) requires an evaluation of every project to determine whether the project could have a negative impact on any waters of the U.S. including wetlands, streams, ponds and special aquatic sites.

Section 404 of the CWA requires that all federal, state, and public entities obtain a permit from the U.S. Army Corps of Engineers (USACE) before placing dredged or fill materials into waters of the U.S. Section 401 (CWA) requires that water quality certifications be obtained for any activity that results in discharges into streams or jurisdictional wetlands. The MDNR manages this program.

MoDOT project concerns relating to waters of the U.S. include potential stream impacts at bridges and culverts, filling of jurisdictional wetlands, stream channelization, filling of ponds and filling of designated special aquatic sites. All regulated stream impacts are those that take place below the designated ordinary high water mark (OHWM), where the vegetation line is on the stream bank (Figure 27).



What are the key points affecting water resources?

The Route 63 study corridor would impact a variety of water resources including wetlands, streams, and ponds (Appendix H, Plates 1-9). Of the three alternatives, the Preferred Alternative has a greater mitigation cost, hence greater number of stream credits required, greater linear feet of streams impacted, but less actual streams crossed. After doing field studies and verifying impacts within the Preferred Alternative, overall impacts to ponds and wetlands were fairly equal for all alternatives. The northern portion of the corridor falls within a designated Conservation Opportunity Area (COA), which are MDC focus areas to target mitigation efforts where sensitive species and higher quality water resources exist.

How were the water resources evaluated and quantified for the study?

Streams, wetlands and ponds were initially identified using USFWS National Wetland Inventory (NWI) maps, FEMA Flood Insurance Rate Maps (FIRMs), U.S. Geological Survey (USGS) 7.5 minute topographic quadrangle maps and 2007 aerial photography. A minimal amount of field reconnaissance was conducted to confirm mapped resources and identify any additional unmapped resources for the DEIS. A preliminary jurisdictional determination (PJD) for all streams and wetlands within the Preferred Alternative (where accessible) was made prior to the Final EIS. The PJD involved field reconnaissance to enable the completion of the Routine Wetland Delineation Data Forms, Stream Data Forms, and GPS activities to define the boundaries of the resources. (Technical Report available upon request)

Wetland impacts were based on the entire wetland size of the mapped feature regardless of whether a portion fell outside of the corridor limits. Wetlands are classified in accordance with the USACE 1987 Wetland Delineation Manual. Potential wetland areas are considered jurisdictional wetlands if they meet all three wetland criteria (USACE, 1987):

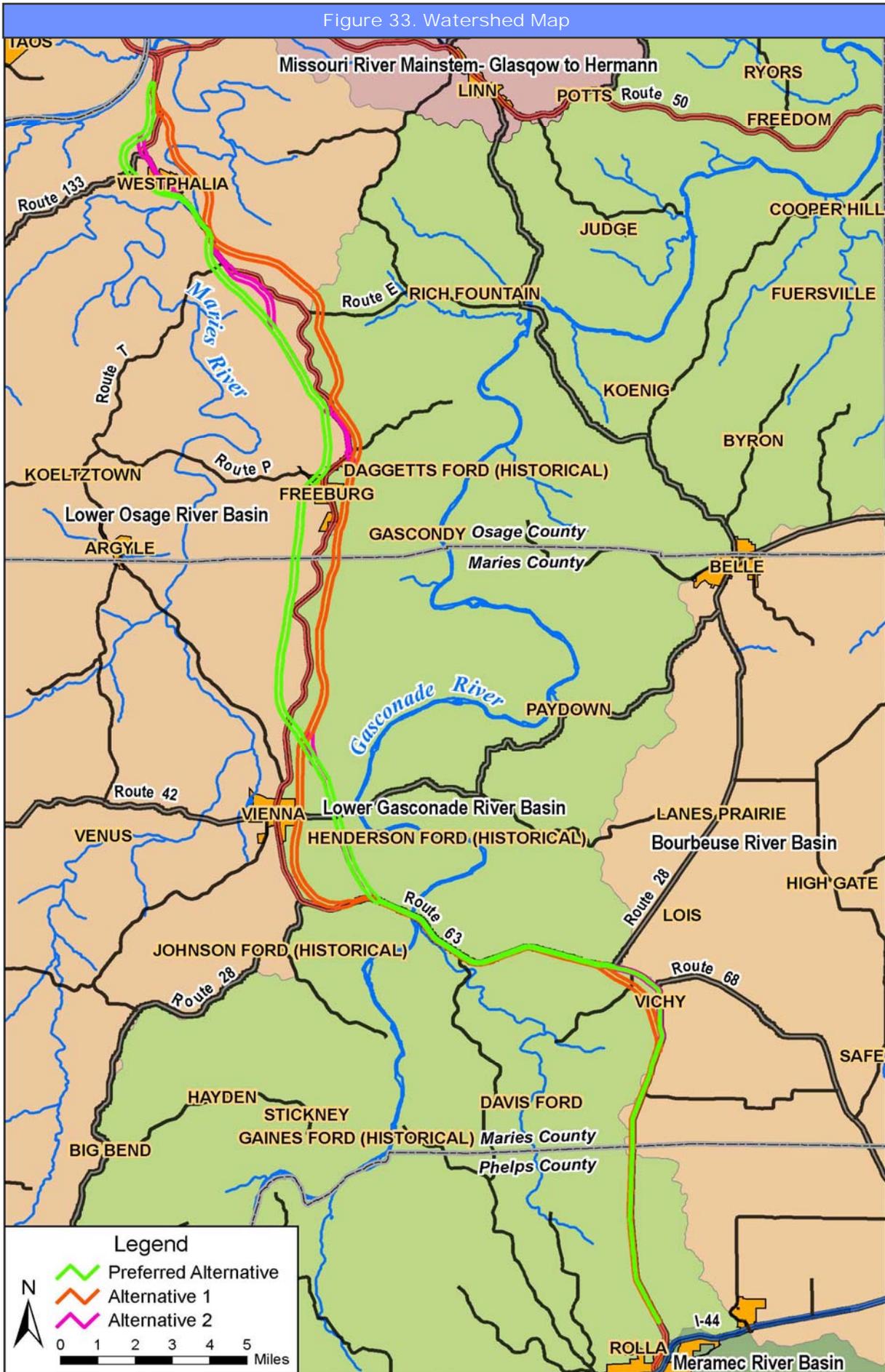
- **Vegetation** - The prevalent vegetation consists of species that are typically adapted to inundated or saturated soil conditions.
- **Soil** - Soils have been classified as hydric, or that they possess visual characteristics that are associated with reduced soil conditions.
- **Hydrology** - The area is either inundated or saturated to the surface continuously for at least five percent of the growing season in most years (50 percent probability of recurrence).

What water resources are found in the study area?

The existing Route 63 follows a ridge-top between three 8-digit hydrologic unit codes (HUC) watersheds, the Lower Osage River Watershed, the Lower Gasconade River Watershed, and the Bourbeuse River Watershed (Figure 28).

What is a Watershed?
A watershed is the entire geographical area drained by a river and its tributaries.

Figure 33. Watershed Map



North of Route E water resources drain into the Maries River, Lower Osage River Watershed. South of Route E resources are split. Water resources to the west of the existing Route 63 drain into the Maries, and to the east drain into the Gasconade River.

At Route 28, water resources drain into the Gasconade on both the west and east, until you arrive at Highway 68. At that point, water resources are split until you get to the county line, with water resources on the west draining into the Gasconade River and on the east into the Bourbeuse River (Figure 28).



Maries River



Gasconade River

After crossing the county line, water resources are entirely located within the Gasconade River drainage. The largest water resources in the study area are the Maries River and the Gasconade River.

Wetlands are not widespread throughout the study area. The majority of the wetlands were identified in the Westphalia area, in association with Alternative 1 as it crosses through the Maries River floodplain. The other area of higher density wetland occurrence is in the Gasconade River floodplain crossing in association with widening on the existing alignment. There are

numerous ponds in the project area. Most of the ponds are true farm ponds used for livestock watering. The average size of the ponds in the study area is 0.23 acres. There were no springs identified within the Preferred Alternative corridor.

How do wetland impacts compare between alternatives?

Overall, there was not a great difference in the amount of wetland impacts between the alternatives within the DEIS. There were slightly more wetland impacts in Alternative 1, 23.73 acres; than in Alternative 2, 20.06 acres; or the Preferred Alternative, 20.24 acres (Table 17). The largest wetland complex identified in the DEIS is located within the Gasconade River floodplain, 16.35 acres, and is potentially impacted by all alternatives. The NWI database shows the majority of this wetland complex is located outside the study corridor; however, it is contiguous with what lies within the corridor. After field verification, this wetland was preliminarily determined to be non-jurisdictional because although it is in the 100-year floodplain, the connection to the river has been lost.



Forested Wetland

Throughout each alternative, the majority of the impacts are classified as forested wetland. The second largest impacts are classified as ponds, and the third largest with emergent wetlands. There were no impacts associated with farmed wetlands or scrub-shrub wetlands across the alternatives. Compared to the other two alternatives, the Preferred Alternative has equal to or

less forested wetland impacts; greater pond impacts, and is second in emergent wetland impacts. The pond resources generally represent ponds constructed for livestock watering and are of significant value to the farming community. However, they are considered a less significant ecological resource since they are easily reproduced.



Emergent Wetland

After significant field reconnaissance, impacts to streams increased, but impacts to ponds and wetlands decreased significantly. Early estimates for streams only included mapped streams on the USGS topographic maps and wetland/ponds on the NWI maps. Additional streams were preliminarily identified as jurisdictional in the field. (Technical Report available upon request).

Table 17. Wetland Impacts by Type in Each Alternative

Type	Preferred-draft (acres)	Preferred-final (acres)	Alternative 1 (acres)	Alternative 2 (acres)
Farmed	0	0	0	0
Ponds	10.03	2.13	10.24	7.37
Emergent	0.63	0.2	0.72	0.45
Scrub Shrub	0	0	0	0
Forested	19.61	0	22.61	19.61
Riverine	0	0.46	0.4	0
Total	30.27	2.79	33.97	27.43

How do the stream impacts compare between alternatives?

Stream impacts (linear feet) are greater in the Preferred Alternative, 63,639 linear feet, as compared to 54,581 linear feet in Alternative 1 and 45,626 linear feet in Alternative 2. The actual number of streams impacted in the Preferred Alternative is 69, as compared to 79 for Alternative 1 and 55 for Alternative 2 (Table 18). After field reconnaissance, the number and linear feet of streams impacted by the preferred was greater than what was reported in the draft. It is assumed that this would be the case for any of the alternatives if field verified. (Technical Report available upon request)

Each alternative has a footprint encompassing more area than necessary, sometimes twice as much, to construct the new alignment and thereby allow room for adjustments. This additional width affords some flexibility for determining the final location of the selected alternative within the broader alternative boundaries and therefore enables efforts to minimize project effects to water resources.

Two large order streams would be crossed. The Maries River and Gasconade River would be crossed adjacent to the existing alignment for the Preferred Alternative. This minimizes aquatic impacts by spatially co-locating bridges rather than placing another bridge farther upstream or downstream from the existing structure, as would be the case in Alternative 1.

How do the pond impacts compare between alternatives?

The difference in the amount of pond impacts in the Preferred Alternative when compared to either Alternative 1 or Alternative 2 is minimal. Overall, across the corridor, ponds are small and generally occur in the headwaters of streams high on the landscape. After field verification, where access was available, only three ponds were preliminarily determined to be jurisdictional. (Technical Report available upon request)

Table 18. A Comparison of Water Resource Impacts for Each Alternative.

	Preferred-draft	Preferred- final	Alternative 1	Alternative 2
Estimated Impact (linear feet)	63,639	66,594	54,581	45,626
Number of streams	69	80	79	55
Wetlands (acres)	20.24	0.66	23.73	20.06
Ponds (acres)	10.03	2.13	10.24	7.37

How does the alternative analysis comply with Section 404(b)(1) guidelines?

There was no alternative that stood out as clearly having the fewest overall environmental impacts. In the case of the proposed alternatives for Route 63, the Preferred Alternative impacts were not always the least, as evidenced by the linear impact and number of streams and ponds respectively. It also did not have the greatest number of negative impacts, as evidenced by the number of streams and wetland acres impacted as compared to the other two build alternatives. To get a clearer picture of which alternative would be chosen as the preferred, the study team compared the alternatives by conducting an impact assessment, and combining those results with an evaluation of how well the alternatives addressed the purpose and need of the project.

Alternative 2 fails to address the need to improve safety compared to the Preferred Alternative or Alternative 1, because it uses the existing highway through Westphalia. The existing highway has an abundance of access points leading to increased probability of crashes, and was therefore deemed not practicable. Although Alternative 2 has the fewest negative impacts for the most environmental factors, including stream length, number of stream crossings, wetlands and ponds, it has a higher number of negative impacts for other factors, and thus does not meet the need for improved safety as effectively as the Preferred Alternative.

Alternative 1 also had a higher number of negative impacts than the Preferred Alternative, including the number of stream crossings and acres of forested wetlands impacted. Based on the negative impacts associated with Alternatives 1 and 2, and the ability to best meet the project's purpose and need (i.e. safety, traffic flow, continuity, and overall operational efficiency), the Preferred Alternative was carried forward as the recommended alternative. No appreciable difference was noted between Alternatives 1 and 2 with respect to negative impacts. However, both of these alternatives had considerably more negative impacts than the preferred.

What types of compensatory mitigation would be expected?

Mitigation is required after avoidance and minimization have been accomplished for impacts to streams, wetlands and some ponds in the project area. Mitigation for wetlands and ponds is calculated using a ratio system. For instance, wetlands classified as emergent are generally required to be mitigated in the range of 1 to 3 times the impacted area, depending on the quality of the wetland. Ratios are subject to the USACE and MDNR discretion. More mitigation is typically required for higher quality wetlands and unique wetland types.

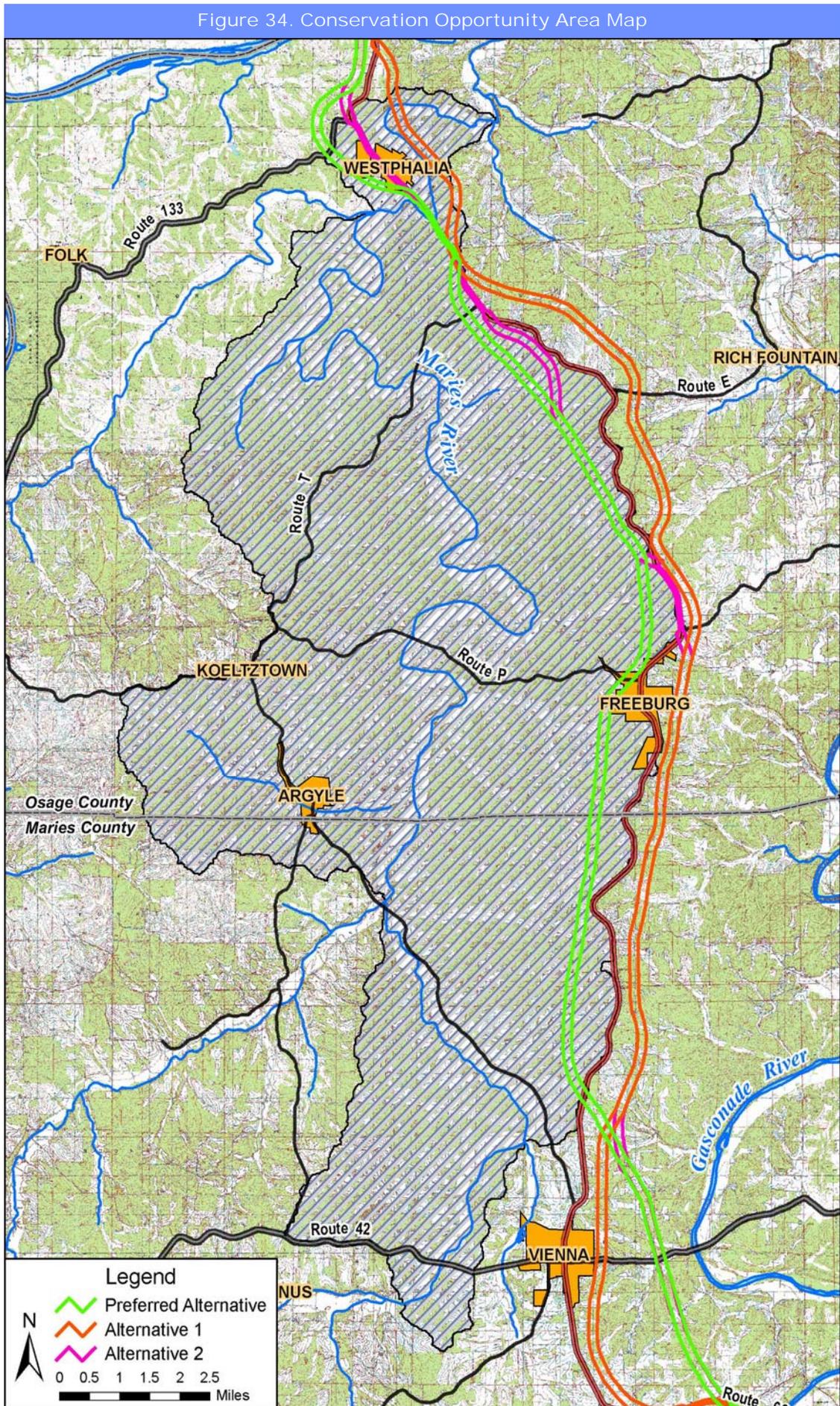
The amount of mitigation for stream impacts is determined using the State of Missouri Stream Mitigation Method (MSMM). The MSMM determines the amount of credits necessary to compensate for the stream impacts. More stream mitigation is required when impacts fall within certain priority areas or higher order, larger, streams. Examples of these are when impacts are on streams with spawning restrictions or involve those providing habitat for federally listed threatened and endangered species.

One such area is located within the study corridor. The Missouri Department of Conservation has designated part of the Maries River as a Conservation Opportunity Area (COA) (Figure 29). This particular COA is further designated by the USACE as "priority water". Impacts within this area would be required to have more mitigation than impacts outside of this area. The Preferred Alternative traverses through this area, and will require additional mitigation. Within the COA, first and second order stream impacts will be minimized by reducing velocities at the outlet of structures with additional Best Management Practices (BMP's) such as step-pools and other energy dissipaters.

Route 63

Environmental Impact Statement

Figure 34. Conservation Opportunity Area Map



How were compensatory stream mitigation costs calculated for the project?

Compensatory stream mitigation costs were calculated based on the cost to participate in the Missouri Conservation Heritage Foundation's Stream Stewardship Trust Fund (SSTF). This cost was estimated at \$35.00 per credit at the time of the DEIS. Since then, the cost per credit has decreased to \$25.00 per credit. Credits were calculated using the MSMM, Adverse Impact Worksheet. Certain assumptions were made in advance of knowing specific impacts to streams in order to complete the worksheet.

For example, all impacted streams are assumed to be fully functional streams (existing condition), involve *permanent* fill (duration), and a fill (activity). Based on these criteria, the number of credits needed for each alternative could be estimated. More credits are needed for the Preferred Alternative than either Alternative 1 or Alternative 2. Likewise, the cost of mitigation, if MoDOT were to participate in the SSTF, is more for the preferred (\$12.6 million) than for Alternative 1 (\$9.8 million) or Alternative 2 (\$8.5 million) (cost of mitigation numbers based on \$35.00 per credit). Worksheets can be referenced in the Appendix F and will reflect the \$25.00 per credit cost.

Overall, what are the water resource impacts and how would the project compensate for unavoidable impacts?

Overall, water resource impacts were not significantly different between the alternatives. The greatest difference is that there are more linear feet of stream impacts in the Preferred Alternative, which then reflects the higher number of credits required, and subsequently the higher cost to mitigate. Overall, impacts to wetlands and ponds showed little variation between any of the alternatives. During field verification, ponds and wetland impacts decreased significantly, whereas, stream impacts increased slightly.

Under the obligation of the Clean Water Act (CWA), Section 404 and 401, a permit is necessary for any dredge and fill activities within waters of the United States. A Section 404, USACE permit, and a Section 401, Missouri Department of Natural Resources (MDNR) certification would be needed prior to construction. Impacts to construct the entire Preferred Alternative would require Individual Permit authorization. Final impacts and a mitigation proposal would be required for permit submittal to the USACE and MDNR. Permit application submittal is typically completed during the design phase.

In accordance with Executive Order 11990, the FHWA ensures that, to the extent possible, this project avoids long- and short-term adverse impacts associated with the destruction or modification of wetlands.

The Preferred Alternative would affect 30.27 ac of wetlands. Such impacts would be mitigated in the manner prescribed by the associated Section 404 Clean Water Act Permit.

Public Lands

How does Section 4(f) apply to public lands?

Section 4(f) is part of the Department of Transportation (DOT) Act of 1966 that was designed to preserve the natural beauty of the countryside and Public Park and recreation lands, wildlife and waterfowl refuges, and historic sites. To be Section 4(f) eligible the property must be publicly owned, except for historic sites, which could be either public or privately owned. Section 4(f) eligible sites cannot be impacted by federally funded actions unless there is no feasible and prudent avoidance alternative.

What are Section 4(f) resources?

A Section 4(f) resource could be a public park, recreation area, wildlife or waterfowl area, or a historic property. When 4(f) resources are involved in federally funded MoDOT projects, alternative alignments must be considered to minimize or eliminate adverse effects to 4(f) resources. Section 4(f) prohibits federal transportation agencies from using 4(f) resources unless there is no "feasible and prudent alternative" to the use of land and the action includes all possible planning to minimize harm.

There are four privately owned properties with recreational facilities in the study area: The Knights of Columbus facility north of Westphalia on the west side of Route 63, the Lions Club property just south of Westphalia on the west side of Route 63, the Lions Club property just south of Freeburg on the west side of Route 63, and the recreational facilities belonging to Visitation Inter-Parish School and Visitation Catholic Church in Vienna. The Knights of Columbus property has a lease agreement for public use of its recreational facilities, thus making it potentially Section 4(f) eligible. None of these facilities would be affected by the proposed project.

Publicly owned properties in the study vicinity in Osage County include the Dr. Bernard Bruns Access on the Maries River east of Westphalia and the Msgr. Bernard S. Groner Memorial Park to the south of Holy Family Church in Freeburg.

Publicly owned properties in Maries County in the corridor area include the Freeburg Tower site, owned by the MDC, located on the west side of Route 63 at County Road 209. East of Route 63, on County Road 302, a lengthy drive leads to Paydown Access on the Gasconade River, also owned by MDC.

Further south, Vienna Park is located just west of Vienna and the Vienna Public School Complex is located on Route 42, just east of town. Both have recreational facilities. Continuing south, MDC's Spring Creek Gap Conservation Area is located north of Route 63. Scenic View Park, owned by MoDOT, is located opposite Spring Creek Gap on the south side of Route 63.

Further south, the final publicly owned property in the study area is Vichy Public Park, a 7.24 acre park administered by Maries County and located on the west side of Route 63 at the juncture of Route 68. There are no publicly owned properties in the corridor area in Phelps County.

One of these properties may be affected by the proposed project. The Preferred Alternative would impact the Freeburg Tower site; it is FHWA's opinion that since this property was developed for fire suppression, its primary purpose is not recreational and Section 4(f) does not apply. Correspondence from MDC indicates that the property has been utilized in recent years for fire suppression only, and that there are no long range plans for the tower or the site (see correspondence in Appendix A). Available references indicate that there are no planned potential Section 4(f) resources in the project area.

What is Section 6(f)?

Section 6(f) is part of the Land and Water Conservation Fund (LWCF) Act, which was designed to provide restrictions for public recreation facilities funded with LWCF money.

There are two properties with LWCF investment in the study area: Msgr. Bernard S. Groner Memorial Park in Freeburg in Osage County and Vienna Park, west of Route 63 in Vienna, in Maries County. Neither would be affected by any of the alternatives.

The study area has been examined for possible impacts to Section 4(f) and/or Section 6(f) resources. There are no parks/public lands Section 4(f) or Section 6(f) properties affected by this study. The study area has also been examined for resources funded with federal money from the Pittman-Robertson Act. Funds from this act are set aside for wildlife restoration projects. There are no properties using Pittman-Robertson Act funds in the project area.

Cultural Resources

What are cultural resources?

The consideration of cultural resources is a critical part of MoDOT project development. MoDOT must comply with federal and state environmental laws and regulations designed to protect significant cultural resources.

What are historic properties?

Historic properties are cultural resources (buildings, structures, sites, districts, or objects) that are listed or eligible for listing on the National Register of Historic Places. They may be prehistoric or historic in nature.

Cultural resources can be many things, such as old buildings; groups of tools or trash found where Native Americans or settlers lived, and sometimes even the locations where important events took place. Not all cultural resources are important, but those that are significant may be referred to as "historic properties."

Cultural resource specialists use this language to identify resources that are listed or eligible for listing on the National Register of Historic Places (NRHP). Just because something is old does not mean it is historic and automatically eligible for the National Register. MoDOT evaluates the historical and architectural significance of cultural resources to determine if they fulfill eligibility criteria for listing on the NRHP. The NRHP is the official federal list of historic properties in the country that are significant at the local, state, or national level. The NRHP eligibility criteria were established in 1966 through the National Historic Preservation Act to recognize and help protect historic properties.

Under Section 106 of the National Historic Preservation Act, agencies using federal funds, licenses, or permits must review the effects of their proposed actions on historic properties. This law and other related historic preservation regulations are briefly described below. More information about the role of cultural resources in MoDOT's projects can be found online in the MoDOT Engineering Policy Guide, Section 127.2, at <http://epg.modot.org>. This section discusses the potential effects that the various alternatives would have on historic properties in the study area.

How was the cultural resources study conducted?

MoDOT Historic Preservation staff typically use a phased approach for cultural resources investigations for corridor projects like the Route 63 EIS. The level of investigation depends on the project stage and the resource type. The two investigation phases correspond with the stages of the EIS document: the draft and the final stages.

MoDOT Historic Preservation staff consults with the State Historic Preservation Office (SHPO), Missouri Department of Natural Resources, throughout the study's Section 106 Process.

During the draft stage of the EIS investigation, and following the records investigation, an architectural historian looks at buildings and structures located within each reasonable alternative to identify those that are likely to be considered eligible for listing on the NRHP.

What makes a property eligible for the National Register of Historic Places (NRHP)?

To be eligible for the NRHP, properties generally are at least 50 years old and must fulfill at least one of the four Criteria for Evaluation, meaning they must be:

- a) associated with historic events or broad patterns of history,
- b) associated with significant persons,
- c) significant for their design or construction, or
- d) yield information important in prehistory or history.

Properties also must be fairly unaltered so they possess historic integrity, including aspects of location, design, setting, materials, workmanship, feeling, and association.

Archaeologists review the known professional archaeological reports and previously recorded archaeological sites so they can be plotted on the project maps to show which are located near any of the alternatives being considered.

Cemetery locations are also plotted on the project maps if the locations can be documented. While small family cemeteries may not be identified on existing maps, they must be treated the same as other known cemeteries. MoDOT would attempt to avoid impacts to known cemeteries; however, if impacting the cemetery were necessary, MoDOT would comply with all applicable laws.

After the draft stage of the EIS investigation, a detailed archaeological survey was conducted within the Preferred Alternative. Resources associated with alternatives other than the Preferred Alternative, or no longer located within corridor footprint of the Preferred Alternative, would not be affected by the study and therefore were no longer considered or included in the project. MoDOT requested permission from property owners to conduct an archaeological survey for each parcel that could be impacted by the future construction, and 64% responded with permission.

What are the cultural resource concerns in the study area?

Nine previous archaeological investigations have been conducted within the current study area. While several of these investigations were for relatively minor utility improvements such as water system expansions, sewer systems, and the construction of cell towers, the others have been more extensive, occurring in connection with proposed highway improvements.

What is an archaeological survey?

An archaeological survey is an intensive search of the proposed construction project to identify any archaeological sites. If there is good surface visibility (for example a recently plowed field), archaeologists simply walk the area and examine the surface.

In a pasture or wooded area the archaeologists use shovel or auger tests to look for artifacts. Shovel tests are small hand-dug holes about 12 inches wide and up to 24 inches deep, while auger tests are six-inch diameter holes up to six feet deep. In most survey areas, shovel tests or auger tests will be excavated at 50- or 100-foot intervals.

The archaeologists look through the soil to find artifacts and other evidence of prehistoric or early historic archaeological sites.

As early as 1977, the highway department was considering improvements to Route 63 and archaeological surveys were conducted as various routes were considered. Two different investigations were conducted, one in Maries County and one in Phelps County. Based on those surveys, additional investigations were conducted in 1979. Both of these looked at improvements that were later included in the current alignment of Route 63. The most recent investigation was conducted in 2004, for the improvements that were made in the vicinity of Vichy.

At the present time, 13 archaeological sites have been recorded along the reasonable alternatives being considered for this project. Only one of those sites is found in the northern half of the study area.

The remaining 12 sites were identified during cultural resources investigations for previous improvements to Route 63. Based on those investigations, eight sites have already been determined to be “not eligible” for listing on the NRHP. In general, the eight sites represent very light scatters of stone debris that suggest someone stopped at those locations and worked with some stone tools, some time in prehistory. There is no evidence of when the site was occupied or what sort of activities took place. Because those sites have already been determined to contain little or no useful information, no additional work is planned. However, if it is determined that the future improvements to Route 63 would impact one or more of the remaining five sites, some amount of additional investigations would be necessary.

During the literature review, six documented historic architectural resources were identified in the study or study vicinity. Three of these six historic properties are listed on the NRHP: Huber’s Ferry Farmstead Historic District, north of Westphalia; St. Joseph Church, Westphalia; and the Maries County Jail and Sheriff’s Residence, Vienna. As indicated on maps in Appendix G, these properties are not associated with any of the reasonable alternatives and would not be affected by the study.

While not listed on the NRHP, three additional historic properties have been determined eligible. The Westphalia Bridge, determined eligible in 2003, is at the edge of Alternative 1 and would not be impacted by the study.

The Vichy Normal & Business Institute and the Vichy Public School were determined eligible for listing on the NRHP in 2004. These two buildings are adjacent to existing Route 63, but outside the Preferred Alternative and Alternative 2 and therefore will not be affected by the project.

Historic architectural resources exist within each alternative. Westphalia has more historic buildings located in the alternatives than any other region, whereas no historic buildings were identified within any the alternatives in Vienna or the study limits south of Vichy. The Westphalia Bridge is the only historic bridge in the study limits. Although a dozen other bridges that are more than 50 years old are in the study vicinity, none are located in any of the alternatives.

Following reconnaissance surveys, MoDOT Historic Preservation staff identified 11 architectural resources in the study area that fulfill eligibility criteria for listing on the NRHP (Table 19 and Appendix G). These 11 resources are included among those historic properties counted in the table in the Executive Summary (page iii) and also Table 2 (page 32), “Total Impacts to Each Alternative.” These two previous tables were prepared with preliminary information and compiled early in the study to capture potentially eligible properties and potential project impacts by alternative, whereas this chapter provides information obtained later in the study following consultation with SHPO staff and efforts to avoid and minimize project impacts to historic properties. While the table in the Executive Summary appears as a summary itself, a further evaluation of cultural resources appears here, in Chapter 3. The cultural resources technical report contains more information about individual properties and the cultural resources investigation methods used than is presented in the abbreviated discussion that follows.

Table 19. Historic Architectural Resources by Reasonable Alternatives

Region/Property Name	NRHP Evaluation Status	Alternative
Westphalia Region		
Schmitz Barn	Considered Eligible	Preferred
Maries Valley Farm	Considered Eligible	Preferred
Castrop Barn	Considered Eligible	Alternative 2
Bure Farm	Considered Eligible	Alternative 2
Former Gas Station	Considered Eligible	Alternative 2
Luebbert Farm	Considered Eligible	Alternative 1
Westphalia Bridge	Determined Eligible, 2003	Alternative 1
Freeburg Region		
Bauer Log House	Considered Eligible	Alternatives 1 and 2
Johannesmeyer Farm	Considered Eligible	Alternatives 1 and 2
Vichy Region		
Vichy Normal & Business Institute	Determined Eligible, 2004	Preferred and Alt.2
Vichy Public School	Determined Eligible, 2004	Preferred and Alt. 2

What are the cultural resource concerns in the Preferred Alternative?

Archaeology:

Five previously recorded sites in the study area have already been determined eligible for listing on the NRHP or potentially eligible for that listing. It was found that the Preferred Alternative might impact all five of these sites. Each of these sites examined during the archaeological survey to gather information to help determine what, if any, additional investigations are necessary.

What do Archaeological Site numbers mean?

The first two numbers stand for Missouri; the next two letters for the County; and the final numbers are for the sites that have been recorded in that county. So, 23OS14 indicates that this site is the 14th site recorded in Osage County in Missouri (the 23rd state when the states are listed in alphabetical order). This system was set up by the Smithsonian Institution in Washington D.C. Additional information can be found at: <http://www.dnr.mo.gov/shpo/Archaeology.htm>.

Archaeological site 23MS12, located south of the Gasconade River, was tested in the late 1970s. Those investigations revealed that the site contained important information about how prehistoric people lived. Some of the information came from trash pits that were used between 1000-1500 years ago while other material provided information about life ways between 3000-5000 years ago.

This information was sufficient for site 23MS12 to be determined eligible for listing on the NRHP. At this location, the Preferred Alternative would require the existing highway to be widened and because of the significance of site 23MS12, additional large-scale excavations would likely be necessary to mitigate impacts caused by that widening.

Sites, 23MS57 and 23MS77, were revisited when the archaeological survey was conducted. Site 23MS77 extends beyond the right of way but is not considered eligible for the NRHP. Site 23MS57 is located on the south side of the right of way and most likely will not be impacted. At the northern end of the project, site 23OS14, is no longer in the Preferred Alternative. The final previously recorded archaeological site that was considered to be potentially eligible for listing on the NRHP is site 23PH234. When revisited in the archaeological survey, none of the site is within existing right of way.

Previously recorded sites 23MS 80, 85, 23PH232, 233, and 234 appear to have been destroyed by previous road construction. Previously recorded sites 23PH 77, 78, 79, and 81 along with 23PH231 were revisited and do not appear to be eligible for the NRHP. Previously recorded site 23PH235 is outside of the existing right of way.

The archaeological survey recorded an additional 57 archaeological sites (50 prehistoric and 7 historic). Two of these (23MS1126 and 23MS1141) are outside the Preferred Alternative. Seven sites (23OS1218, 1221, 1230 and 23MS1121, 1123, 1124, and 1130) are of unknown status and are potentially eligible for the NRHP. These sites need to be avoided or, if that is not possible, then Phase II testing will be initiated to determine if they are eligible for the NRHP.

Forty-eight sites (23MS1115-1120, 1122, 1125, 1127-29, 1131-1140, 23SO1219-1220, 1222-1229, 1231-1244, and 23PH1564-1566) are relatively low-density sites and are considered not eligible for listing on the NRHP and no further work is recommended.

Architecture: During the preparation of the DEIS, four properties associated with the Preferred Alternative were considered eligible for the NHRP, yet none of them were expected to be adversely affected by road construction (Table 20).

Table 20. Historic Architectural Resources within the Preferred Alternative During the Draft Stage of the EIS		
Region/Property Name	Applicable NRHP Criteria/Period/Boundary	Adverse Effect*
Westphalia Region		
Schmitz Barn	C, ca. 1890, bank barn footprint	No
Maries Valley Farm	C (and A), 1927, hatchery footprint	No
Vichy Region		
Vichy Normal & Bus. Inst.	C, ca. 1880, building footprint	No
Vichy Public School	A, 1901-1954, building footprint	No
*This column indicates whether or not this alternative is likely to have an adverse effect on the historic property.		

Now, at the final stage of the EIS, these buildings are no longer within the corridor footprint because the Preferred Alternative has been modified. By reducing the width of the Preferred Alternative at these four sensitive locations, all the buildings at these properties that were identified during the draft stage can be completely avoided; therefore they are considered outside the area of potential effects. A summary of these four historic or potentially historic properties that the Preferred Alternative now avoids is included in the following section.

Schmitz Bank Barn

This farm is comprised of several buildings including an abandoned house, a stone retaining wall, and outbuildings. Of the two barns are located on the property, one is considered architecturally significant--an unusual, bank barn with a stone foundation that exhibits Missouri-German characteristics.



Schmitz Barn, Westphalia

Its hanging gable, the entire width of the north gable end, distinguishes it from other barns; none like it were discovered during the literature review of previous architectural surveys for the county, nor were any others encountered during the present survey. Its construction date is undetermined, but it probably was built during the last quarter of the nineteenth century.



Maries Valley Farms Chicken Hatchery, Westphalia

Maries Valley Farms

This clay tile chicken hatchery is noteworthy for its architectural and possibly historical, commercial significance also. The business, Star Chick Hatchery, was established in 1923. After a fire in 1926 destroyed the original hatchery, the new, tile hatchery was constructed in 1927. In 1929, the business was renamed Maries Valley Farms. The company's name and advertising is featured inside

a brick tablet under the stepped parapet. The hatchery sold hatchlings locally and through mail orders, producing two million chicks per year at its peak.

Vichy Normal & Business Institute

In 2004, the Vichy Normal & Business Institute, a prominent two and one-half stories, commercial building built ca. 1880, was determined eligible for listing on the NRHP for its architectural significance.

The design, scale, massing, form, materials, and workmanship are architectural characteristics that set the building apart from others in the Vichy community.



Vichy Normal & Business Institute

While most other historical buildings in Vichy are frame construction, this one is brick. Although it does not represent a specific architectural style, features such as the steeply pitched roof and the arched window and door openings suggest the influence of the Gothic Revival and Italianate styles popular during the mid to late-nineteenth century.



Vichy Public School

Vichy Public School

In 2004, the Vichy School was determined a historic property as one of three Maries County schools in operation during the early twentieth century that advanced education in the area. The school is not considered architecturally significant because of the slight modifications to the windows, exterior siding, and shed porch addition to the building. These recent physical alterations are minor and could be reversed in the future; however, they affect the present evaluation.

In contrast to the draft stage of the study when the Preferred Alternative was wider and encompassed these buildings, no historic buildings are located within the Preferred Alternative at the final stage of the EIS. As a result of changes to the Preferred Alternative, the former Vichy Public School, Vichy Normal & Business Institute, Maries Valley Farms, and the bank barn at the Schmitz Farm are considered outside the area of potential effects. Of the fifty-three parcels with buildings that remain located within the Preferred Alternative, twenty-four of them are greater than forty-five years old (built before 1964) and none of them are considered eligible for the NHRP. The results of MoDOT's architectural investigation were submitted to the SHPO for review on April 29, 2009. On May 19, 2009, SHPO responded that a thorough and adequate cultural resources survey had been conducted for the project area and concurred with the recommendations that none of the architectural resources fulfilled NRHP eligibility criteria (see Appendix G).

What are the cultural resource concerns in Alternative 1?

Archaeology: Because Alternative 1 is located to the east of Westphalia, it does not impact site 23OS14, which would be impacted by Alternative 2. However, all the rest of the sites described above would be impacted by any of the three alternatives.

Architecture: There are approximately 69 parcels with buildings located in Alternative 1. Of these properties, four are considered eligible for the NRHP and three would be adversely affected by Alternative 1

Table 21. Historic Architectural Resources Associated with Alternative 1		
Region/Property Name	Applicable NRHP Criteria/Period/Boundary	Adverse Effect*
Westphalia Region		
Luebbert Farm	C (and A), ca. 1860, complex	Yes
Westphalia Bridge	C, 1893 and 1903	No
Freeburg Region		
Bauer Log House	C, undetermined date, house footprint	Yes
Johannesmeyer Log House	C, undetermined date, house footprint	Yes
*This column indicates whether or not this alternative would be likely to have an adverse effect on the historic property.		

Westphalia Bridge

Westphalia Bridge, carrying County Road 611 over the Maries River, is located at the base of the bluffs on the east side of Westphalia and on the western edge of Alternative 1. Constructed of steel and wrought iron, it is a seven panel, pin-connected Pratt through truss type with pin-connected Pratt half-hip pony truss approach spans. The Kansas City Bridge Company built the bridge in 1893 and the approach spans were added in 1903. The Westphalia Bridge is included in the Missouri Historic Bridge List and is considered a historic property.



Westphalia Bridge

Luebbert Farm

This Missouri-German farmstead is architecturally and historically significant. Stone is used extensively at this hillside site, not only for two houses, but also for retaining walls, building foundations, and even a watering trough.



Luebbert Farm, Westphalia

The complex also includes two barns (with log components), and a multipurpose outbuilding (combination privy and storage shed/smokehouse). The parcel was patented in 1837 and stone architecture at the site suggests at least two building periods, perhaps ca. 1860 and 1890. The later stonework at the site may be attributed to a stonemason who built Catholic churches in Frankenstein and Wardsville, Missouri.

Bauer Log House

The log house at the Bauer Property exhibits at least two historic building phases and is architecturally significant both for its log construction and building form. Its log core suggests the house expanded from its dogtrot origin, a name derived from its characteristic central, open breezeway or “dogtrot.” As common in other regions of the state, the breezeway between the two log units of the Bauer House was later enclosed with frame construction that resulted in a central-hall I house.



Bauer Log House, Freeburg



Johannesmeyer Log House, Freeburg

Johannesmeyer Log House

The stack house at the Johannesmeyer Farm represents a vernacular architectural type that is distinguished by its two-story, single-pen form. The single-pen, in essence, is “stacked” on itself to create a taller building than the basic, one-story single pen house.

In addition to its vernacular form, the Johannesmeyer stack house is noteworthy because of its log construction. Like the nearby Bauer log house, it is indicative of early building methods that used locally

available materials and both are worthy of further study in this traditionally German-American region.

What are the cultural resource concerns in Alternative 2?

Archaeology: Alternative 2 would impact all of the same sites previously described under the Preferred Alternative.

Architecture: There are approximately 108 parcels with buildings located in Alternative 2. Of these properties, seven are considered eligible for the NRHP and Alternative 2 would adversely affect five (Table 22). Because Alternative 2 has not been selected as the Preferred Alternative, none of the buildings are located in the final EIS study limits.

Table 22. Historic Architectural Resources Associated with Alternative 2		
Region/Property Name	Applicable NRHP Criteria/Period/Boundary	Adverse Effect*
Westphalia Region		
Castrop Barn	C (and possibly A), 1850-1940, barn footprint	Yes
Bure Farm	C (and A), ca. 1885, complex	Yes
Former Gas Station	C, ca. 1940, gas station footprint	Yes
Freeburg Region		
Bauer Log House	C, undetermined date, dogtrot log house footprint	Yes
Johannesmeyer Farm	C, undetermined date, stack house footprint	Yes
Vichy Region		
Vichy Normal & Bus. Inst.	C, ca. 1880, building footprint	No
Vichy Public School	A, 1901-1954, building footprint	No
*This column indicates whether or not this alternative would be likely to have an adverse effect on the historic property.		

Castrop Barn

This ca. 1850 barn with red siding is a highly visible, local landmark in Westphalia. It has been in continuous use since it was built, serving general farming purposes its first 70 years.

In the 1930s, owners August and Elizabeth Castrop used the second floor as a dance hall and restaurant to supplement their income and provide a gathering place and recreational facility for the community. Weekly dances were held for approximately a decade, while farm animals continued to occupy the first floor.



Castrop Barn, Westphalia

In the 1940s, the barn returned to its original purpose of sheltering stock and hay and serves the same function today. The barn would contribute to a historic district comprised of multiple properties in Westphalia, both for its architectural and historical significance.



Bure Farmhouse, Westphalia

Former Gas Station

This vintage gas station is considered eligible for the NRHP for its historical and architectural significance. Its omission from early highway project plans indicates it post-dates 1929 and an estimated construction date is ca. 1940, following the relocation of Route 63 in the early 1930s. Designated a “house and canopy” form, its design may be traced to early Texaco stations.



Former Gas Station, Westphalia

Bauer Log House. See the Alternative 1 Discussion.

Johannesmeyer Farm. See the Alternative 1 Discussion.

Vichy Normal & Business Institute. See the Preferred Alternative Discussion.

Vichy Normal School. See the Preferred Alternative Discussion.

Overall, how would the effects on historic properties compare between the alternatives?

During the draft stage of the study, the number of potential historic properties likely to be adversely affected was compared by alternative as shown in Table 23. Since that time, due to design alterations and field surveys, the number of adverse effects to historic properties in the Preferred Alternative has decreased (Table 24).

Table 23. Adverse Effects to Historic Properties by Alternative
(Draft EIS Stage)

Alternative	Associated Historic Architectural Resources	Associated Historic/Prehistoric Archaeological Sites	Historic Properties Adversely Affected
Preferred	4	1	1
Alternative 1	4	1	4
Alternative 2	7	1	6

Only one archaeological site in the project area, 23MS12, was considered to be a historic property (eligible for listing on the NRHP) at the time. The eligibility of the other four sites, as previously discussed, has not yet been determined. This prehistoric archaeological site is located in a portion of the study area where all three alternatives merge. As previous investigations at the site have shown that the site extends on both sides of the existing highway, any widening of Route 63 would impact the site and would require an intensive archaeological investigation. However, the impacts are the same for all three of the reasonable alternatives and one alternative is not recommended over the other two.

During the draft stage of the EIS, the number of historic architectural resources associated with each alternative varied from four to seven properties. The preliminary cultural resources study results indicated that the Preferred Alternative and Alternative 1 included the fewest historic buildings and structures at four, whereas Alternative 2 had the most, at seven.

Upon closer examination of the location of these properties in relation to the alternative footprints, topography, and engineering concerns, the Preferred Alternative would have the least impact to historic buildings and impact the same number of archaeological sites as the other alternatives. Furthermore, because of their location at the edge of the alternative, the alignment was adequately reduced in width, so no direct impacts to historic architectural resources would result. During the draft stage of the study, alternatives that represented new alignments were 750 feet wide, approximately three times the width necessary to construct a four-lane divided highway. In areas resulting in minimal amounts of cut and fill, this generous width provided a buffer for indirect effects and enabled flexibility within the alternatives. The narrower final alignment can be located by shifting it within the larger, wider preliminary alternative to avoid sensitive resources.

The final alignment of the Preferred Alternative has been centered between the Schmitz Barn to the west and the Maries Valley Farm Hatchery to the east. Due to minimal amounts of cut and fill needed in this particular area, the Preferred Alternative has been reduced to a corridor width of 500 feet between the two buildings, which is almost twice the width required to accommodate the proposed facility. The alignment width may shrink even more as it advances to the design stage and more engineering details are developed. In Vichy, the highway improvements were shifted to the west to avoid the Normal & Business Institute and the old county school. The entire parcels with these buildings lie outside the Preferred Alternative. Both MoDOT and SHPO believe this alignment could be built without affecting the historical qualities or character of these historic properties, and therefore consider these historic buildings beyond the area of potential effects. The number of identified historic properties located within each alternative following Phase 1 archaeological investigations and modifications made to the Preferred Alternative between the draft and final stage of the EIS are illustrated in Table 24.

Table 24. Adverse Effects to Historic Properties by Alternative (Final EIS Stage Assessment)			
Alternative	Associated Historic Architectural Resources	Associated Historic/Prehistoric Archaeological Sites	Historic Properties Adversely Affected
Preferred	0	1	1
Alternative 1	4	1	4
Alternative 2	7	1	6

In contrast to the Preferred Alternative, Alternative 1 and Alternative 2 would likely have adverse effects on historic architectural resources. Historic properties are located near the center of both alternatives; therefore, the final location of the highway within these alternatives cannot be as easily adjusted to avoid these buildings. The Westphalia Bridge, located at the extreme western edge of Alternative 1 could be successfully avoided; however, the remaining identified historic properties associated with that alternative—the cluster of buildings Luebbert Farm, the Bauer Log House, and the Johannesmeyer Log House—would be directly impacted and adversely affected.

Alternative 2 has the potential to adversely affect seven historic architectural resources; therefore, it would have the greatest impact on historic properties. Besides impacting four historic properties associated with the two other alternatives, Vichy Normal & Business Institute, Vichy Public School, Bauer Log House, and Johannesmeyer Log House, Alternative 2 impacts three additional properties in Westphalia: the Castrop Barn, Bure Farm, and the gas station.

Why would archaeological site 23MS12 not be considered a Section 4(f) resource?

While site 23MS12 is considered significant and eligible for the NRHP, Section 4(f) applies to an archaeological site only when the site must be preserved in place. Since the significant information from site 23MS12 can be preserved by excavation, it does not fall under the requirements of Section 4(f).

Through Westphalia, Alternative 2 is centered on the existing alignment and is already reduced in width compared to the other two alternatives in the region. Designing the improvements to the west could avoid the three historic properties east of the existing highway in Westphalia, but would create other environmental impacts.

Further assessments, such as costs and engineering requirements, would be addressed by a Section 4(f) Evaluation if adverse effects to historic properties could not be prevented. Section 4(f) of the Department of Transportation Act is introduced in Chapter 2 and included in the preceding Public Lands discussion and included in Appendix G.

How would the project affect Section 4(f) historic resources?

Because the Preferred Alternative involves no known historic properties that must be preserved in place, no Section 4(f) resources are associated with it. Historic buildings have been avoided by reducing the width of the Preferred Alternative, whereas the other alternatives do not present that option.

What are Section 4(f) resources?

A Section 4(f) resource could be a public park, recreation area, wildlife or waterfowl area, or a historic property. When 4(f) resources are involved in federally funded MoDOT projects, alternative alignments must be considered to minimize or eliminate adverse effects to 4(f) resources. Section 4(f) prohibits federal transportation agencies from using 4(f) resources unless there is no “feasible and prudent alternative” to the use of land and the action includes all possible planning to minimize harm. Section 4(f) Evaluations explore avoidance alternatives to determine if there are feasible and prudent alternatives that avoid historic properties.

Had an alternative other than the Preferred Alternative been selected and had adverse effects on historic properties to preserve in place, a Section 4(f) Evaluation addressing them would have been necessary

Energy Impacts

Energy impacts refer to the effect that each alternative has on energy use and consumption. There are two types of energy impacts measured. The first is energy spent on constructing the facility, and the second is the energy spent in long-term operation.

Initially, the No-Build Alternative would use less energy than the build alternatives because there would be no construction energy costs. However, the No-Build Alternative may use more energy than the build options in the long run due to slower speeds, stop-and-go-traffic, and other traffic delays that are typical of the existing facility. Since all of the ‘build’ alternatives are on new location, they would require roughly similar energy in construction and operation.

Construction and Utilities Impacts and Traffic Management

This section gives an overview of how MoDOT would manage traffic in construction zones and how the construction activities would affect the study area. Most likely the study area would be divided into smaller projects and construction would occur at different times. For the most part the traffic management and construction plan would be similar for each project. The No-Build Alternative will not be discussed because this alternative would not have any construction activity impacting the study area.



A bulldozer clears trees and brush for the Route 5 project in Camden County.

What would be the first order of work during construction?

Once the contractor gets the “Notice to Proceed” with construction of a project, the first task is to set up work zone signing. If the new alignment construction were parallel to the existing highway, there would be minimal traffic disruptions, with the exception of trucks entering and leaving the construction area, either to move equipment or to haul material in and out of the site.

The first major order of work is clearing the land, followed by earthwork. Most land clearing operations can be done without any disruptions to traffic. Trees that are potential roosting trees for the endangered Indiana Bat are marked and cut down between October 1 and March 31. Logging is possible and may be done by MoDOT contract, by the contractor, or by agreement with property owners. MoDOT attempts to make sure the usable timber is not wasted. The remaining trees would be removed by bulldozing.

What would the effects be from land clearing operations?

Clearing trees and stumps would require the use of heavy equipment such as bulldozers. A section of land between the limits of roadway construction would be cleared to bare earth to allow for excavating material and fill.

Smoke from burning trees, exhaust and noise from the dozers at work are some of the impacts that would be encountered during this phase of construction. These impacts are temporary and work can be completed usually in a few months. While the land clearing operations are taking place, the contractor may perform subsurface investigations to confirm rock layers.

How would waterways be protected during the land clearing operations?

Because the landscape is reduced to bare earth, erosion control measures must be put in place as the land clearing operations proceed. Erosion and sediment control may consist of a combination of ditch checks, silt fence, berms, sediment basins, temporary seeding, dams, slope drains, etc. The use of these erosion control measures is dependent upon the type of soil encountered. Sand and silt is easier to remove from suspension than clay. Clay is less erodible but once in suspension is more difficult to remove. The inspector/engineer needs to review the soil sheets and soil report for the project to apply the most effective Best Management Practices.

The following describes MoDOT's best management practices used in most land clearing operations.

Ditch Checks

Flow velocities increase as ditches become steeper and longer. Ditch erosion is controlled by widening ditches, flattening ditch grades, or by application of proper ditch protection such as mulch, sodding, ditch checks, erosion control blanket, rock ditch liner and paved ditches.

Silt Fence

Silt fences or rock dams should be placed around culvert ends to prevent sediment from entering the drainage ditch. However, silt fence should never be placed across the drainage area, as it cannot withstand concentrated flows. Seeding has to be done as soon as possible.



Silt fencing is most effective to control sheet erosion along the edge of the right of way where runoff from erodible fill could go onto adjacent property or into an adjacent stream.



Some examples of temporary erosion control in ditches – silt fence and rock ditch checks are often used depending on the grade of the ditch.

Sediment Basins, Slope Drains, Berms, Rock Dams

Various types of slope protection are used and many varieties of products are available. The design of flat slopes, 3:1 or greater, is the most desirable and requires the least erosion control measures. Often right of way costs drive the designer to settle for steeper slopes. If slopes become steeper than 3:1, rock fill may be used to minimize erosion and slides. Rock dams are used at downstream culvert outlets to prevent sediment from entering the stream. These erosion control measures are used mostly to fill areas to reduce the erosion of slopes. Temporary seeding and mulching is also required for effective erosion control.



Slope Protection



Installation of drainage structure

What happens after the clearing and grubbing is finished?

After the contractor has finished clearing and grubbing, drainage structures will be put in place and earth moving would begin.

The earthwork portion of the project takes longer than any other phase. Most of the earthwork can be done without disruption to traffic on the existing alignment unless the new alignment crosses the existing highway and trucks have to move material from one side of the roadway to the other. In this case, there would be some disruption to traffic and a flagging operation to stop traffic may periodically occur.

Large earthmovers, bulldozers, dump trucks, and concrete trucks may be some of the equipment moving in and out of the project area. In areas with deep rock cuts, explosives would be used to break up the rock to use in fill areas. While earthwork is moving along, fill for approach ends of bridges would also be constructed. Impacts during this phase of construction would consist of noise and exhaust from equipment and periodic rumblings from the explosives. Contractors usually take care to avoid impacts to nearby homes during blasting operations. Property owners, tenants, and utility companies are notified in advance of any explosives activity. Noise and air impacts are temporary, however, depending on the size of the project, the grading phase could take a full year or more to complete.

How long after the grading is done would the pavement be placed?

After the grading work is complete and base material placed, contractors can begin the paving process. MoDOT restricts placement of pavement, depending on the type of pavement selected, during the winter months. Conditions must be favorable for concrete and asphalt curing before material can be placed. Depending on the length of the project, weather conditions, and the type of material selected, the length of time required to complete construction of the paving portion of the project could be several months and can even extend over into a second construction season.

How would paving operations affect the project area?

Before paving operations begin, contractors would move in paving equipment. Traffic control would be set up at entry points for trucks hauling either asphalt or concrete. Some contractors set up portable plants in the project area to reduce the cost of hauling material miles from a supplier. Emissions and noise are the most common impacts of the equipment required to build a roadway. All impacts are temporary and would subside as the project is completed.

How would motorists be handled effectively during the construction stage?

During the design phase of the project, a Traffic Management Plan (TMP) would be developed. A TMP lays out a set of coordinated traffic management strategies to manage the work zone impacts of a road project. Strategies for managing traffic include temporary traffic control measures and devices, public information and outreach, working during low traffic volume hours i.e. staying off the road during peak morning and evening rush hours, if possible, and the use of law enforcement agencies to control traffic speeds.



Various traffic control devices used in construction work zones.

Generally, the temporary traffic control plan includes the signing for each construction stage required controlling traffic through a work zone, detour plans, if required, and detail of temporary connections. When contractors are ready to tie the new construction in to the existing highway, traffic disruptions would occur and would be handled by a temporary flagger-controlled lane drop. If the construction takes place along the existing highway, reduced speeds would be enforced because of the proximity of the work crews to the highway. Narrow lanes and shoulder drop-offs would be a concern along the roadway edge, requiring special signing along the construction zone.

If the disruption causes severe back-ups, the contractor may stop and perform the work at night. During construction message boards would be placed in each direction to inform travelers of upcoming work or work that is in progress that would require them to change their driving pattern – to be alert and slow down, for example.

Prior to each week's work, a news release is placed in the local newspapers giving locals information that could affect their daily travels. Local radio stations also air traffic related news releases. MoDOT publishes construction-related news releases and information on its Web site at www.modot.org for those who have access to a computer and the Internet. Work zone impacts and issues would vary along the project area during construction. Traffic management plans would be developed and implemented to best serve the mobility and safety needs of road users, highway workers, businesses and the communities.

What major utilities would be impacted within the Route 63 study area?

A number of major utilities exist within the Route 63 corridor. Impacts to the utilities would be similar in nature for each alternative in the reasonable range. Utility costs were not considered in this study as an impact criterion because of the uncertainty of actual impacts to each alternative.



Westphalia, Freeburg and Vienna have a variety of utilities. Telephone, cable, electric, gas and water utilities would be impacted by a through-town alternative. The alternative through the towns of Freeburg and Vienna was eliminated as a reasonable alternative.



Utilities through Westphalia include lighting in town along the highway. The alternative through Westphalia is among the reasonable range of alternatives.

There are two power transmission companies that would have impacts, Central Electric Power Cooperative and Ameren UE. Both companies have transmission facilities that would be impacted.

The impacts could involve moving one or two structures, or raising the existing lines, for each crossing. Central Electric also identified a substation that is close to the corridor, but the corridor is just north of the

substation.

There are two major pipelines that cross the corridor. The impacts to these pipelines may require changes in depth of the existing lines.

Other utilities that would be impacted are distribution lines of the electric, water, sewer and communication companies that serve the local area. These lines would require adjustments to be made to accommodate the new roadway.

Once the final location of the roadway is established within the corridor and the final grades are established, coordination with the utility companies would be made to ensure utility services to the local area is continued.



This recent improvement through Vichy required several major utility adjustments. For a 6.5-mile section of highway the utility costs were estimated to be \$1,960,000. That's about \$300,000 per mile.

Railroads

The railroad line, which runs in an east/west direction through the town of Freeburg, was originally owned by the Chicago, Rock Island, and Pacific Railroad. Most of the local citizens refer to the railroad as the Old Rock Island, even though Ameren UE currently owns the railroad line. The name of the railroad is the Missouri Central Railroad, which is a subsidiary of Ameren UE. Officially this part of the railroad line is out-of-service, but it has not been abandoned.

The alternatives that bypass Freeburg on both the east and west side of town would both cross the railroad line. Neither alternative would impact the railroad tunnel, which is inside the city limits of Freeburg. There are four scenarios when a road meets an existing railroad line that has not been abandoned: 1) Bridge the road over the railroad, 2) Bridge the railroad over the road, 3) Build an at-grade crossing, and 4) Pave over the existing tracks and sign a legally binding agreement that MoDOT would provide access from one side of the road to the other, if the railroad line is to become active again.

The costs associated with all of the above mentioned options are not able to be determined at this time. However, the costs and impacts associated with either the east alternative or the west alternative would be the same, unless there are some unknown extenuating topographical circumstances. As the project progresses a more detailed evaluation of the specific options would be needed.

Indirect and Cumulative Impacts

Indirect and cumulative impacts can be positive or negative depending on the environmental impact of the resource being evaluated. This section will analyze the indirect and cumulative impacts of the proposed project on the community, threatened and endangered species, water quality (encompassing streams and wetlands), and cultural resources. These issues are discussed because they have the greatest potential to be affected by the project. The study team has determined that this project when combined with other past, present, and reasonably foreseeable future projects will have minimal cumulative or indirect impacts on the other resources evaluated in this document.

Indirect impacts are caused by the project and are later in time or farther removed in distance than direct impacts, but are still “reasonably foreseeable.” Consider the construction of a new highway on what is now farmland. With increased access to this rural area, developers build new residential developments, and new houses increase demand on water supplies. The construction of the homes and increased water consumption are not directly caused by road construction, but rather are indirect impacts.

Indirect and Cumulative Impacts.

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Cumulative impacts are impacts on the environment resulting from the incremental impact of the project when added to other past, present, and reasonably foreseeable future projects.

Cumulative impacts are impacts on the environment resulting from the incremental impact of the project when added to other past, present, and reasonably foreseeable future projects regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. An example: homes were acquired for the original construction. This next improvement to the route would result in yet more homes being acquired.

Community Impacts

This section analyzes the potential indirect and cumulative impacts of the proposed project. The area of analysis includes the cities of Westphalia, Freeburg, Vienna and Vichy. This section will analyze the indirect and cumulative impacts of the proposed project on land use, traffic patterns, wildlife habitat, and wetlands. These issues are discussed because they have the greatest potential to be affected, indirectly or cumulatively, by the project.

Why do we look at existing conditions and development trends?

When considering a project's indirect and cumulative impacts, it is important to understand past and current conditions of the natural and built environment, and use these observations as a point of reference for assessing the project's potential effect on a particular natural or cultural resource. The following discussion sets the stage for understanding current conditions and development trends in areas that may be affected, indirectly or cumulatively, by the project.

Description of development in Osage, Maries and Phelps Counties:

The majority of each of the counties development has occurred within the cities identified along the corridor. Outside of these population centers, residential uses primarily located along major and minor roadways with a few commercial uses located mostly at the intersections with Route 63.

It is clear that Route 63 has influenced land development patterns in the immediate area for some time. In general, the primary land uses that surround the existing route include low-medium density commercial and low-medium density residential.

What are the indirect impacts?

The No-Build Alternative would not involve any expansion of the existing system. Under this alternative, traffic backups would likely increase over time along streets and intersections within the cities along the corridor. This may indirectly affect the travel patterns of people living in the vicinity of Route 63, as they try to avoid the areas of congestion. However, it does not appear that the effect on traffic patterns would be significant.

There is the potential for some increase in certain air pollutants over time such as particulate matter, because of increased traffic congestion. Overall, the No-Build Alternative would not have a significant indirect impact on land use, businesses, traffic patterns, farmland or wetlands.

Alternative 1 would require the relocation of only two businesses along its entire length. It is highly likely that all of these businesses would relocate in the general area since the area is primarily rural with plenty of undeveloped property. With this alternative induced business growth would most likely occur, if at all, at intersections with Route E, JJ and Route 42. These businesses would likely be travel-oriented businesses, but these locations could be ideal for new business growth that would benefit from access to a new four-lane highway.

Alternative 2 would require the relocation of 28 businesses along its entire length. The greatest numbers of these are located on existing Route 63 in Westphalia. These relocations would be reduced during the design phase of project development. Whatever the end result of relocations will be, it is likely that most of these businesses would relocate in the general area since there is ample undeveloped property. Because this alternative makes use of existing Route 63 in numerous locations, it has the greatest probability of indirect impacts caused by relocated businesses or new business development. As with all of the alternatives, business growth would most likely occur, if at all, at intersections with other state routes. These businesses would likely be travel-oriented businesses. But as with Alternative 1, these locations could be ideal for new business growth that would benefit from easy access to a new four-lane highway.

The Preferred Alternative would require the relocation of 15 businesses along its entire length. The greatest numbers of these are located on existing Route 63 in Vichy because of the larger width of the study corridor in comparison to the final roadway width. These relocations would be substantially reduced during the design phase of project development. Whatever the end result of relocations will be, it is likely that most of these businesses would relocate in the general area since there is ample undeveloped property. As with all of the alternatives, travel-oriented business growth would most likely occur, if at all, at intersections with state lettered Routes T and P, and Route 42. These locations could be ideal for new business growth that would benefit from easy access to a new four-lane highway.

The vitality of the cities as an indirect impact of being bypassed is assessed in terms of effects on their economies, which would be measured by revenues lost from diverted travelers. At first glance, the relocation may be a concern for all local businesses because it may allow potential customers to bypass their stores. However, the MERIC study shows that the majority of customers are local residents. In addition to this, a safer highway with faster average speeds will likely draw new businesses to these communities.

Additional studies on bypasses have suggested that, for the most part, bypasses seem to have favorable impact on rural communities and small urban areas but evidence in these studies is often weak. In these studies, interviews and surveys of residents and businesses indicate that bypasses increase development potential along the fringe areas served by the new route, and at the same time relieve congestion, safety hazards, and other undesirable conditions in the central areas from which traffic is diverted. In most cases, adverse effects on otherwise viable bypassed businesses appeared to be largely recouped by improved ambiance for patrons and residents in the community, although individual businesses may suffer when a new bypass is opened. A summary of the results reveals several contributing factors to the economic growth in a community following route relocation. Increased traffic flow, short distance from the interchange (typically within 10 miles), growing community population, nearness to major urban centers, prior economic development, and nearness to the next interchange are all important attributes correlating with economic growth.

Summary of indirect impacts for all three-build alternatives

If new or relocated businesses do develop around these intersections, that would cause conversion of farmland, pasture and other natural resources to another use. Residential relocations should not be an issue since there should be enough open, developable property at each intersection. On the other hand, it is probably more likely that new residential development would occur near these intersections or even county road intersections because of shortened travel times to work locations such as Jefferson City.

Access, in some manner, would be maintained to cities where the new route is relocated either east or west of its present location. Consequently, it is uncertain how much indirect growth would occur. Further, analysis revealed that every business studied in each community had over 60 percent of its customer base located within 30 miles. This finding is according to a study to determine business impacts caused by relocating Route 63, conducted by the Missouri Economic Research and Information Center of the Missouri Department of Economic Development in partnership with MoDOT (Appendix E). Thus, traffic pattern changes may cause only a small number of drivers to switch the location for their gas or meal purchases. But there may not be enough change to sustain a businesses relocation or development of at least additional travel-oriented businesses.

What are the cumulative effects?

During the Public Hearing comment period and the writing of this document, neither local officials nor the Meramec Regional Planning Commission reported planned development along the corridor, which would contribute to cumulative impacts.

Thus far it has been deduced that cumulative impacts to the communities, as a result of past development activity are limited to residential and business relocations. These relocations were minimal given the small cities and rural nature of this corridor.

The No-Build Alternative would not affect existing communities and, thus, would not result in a cumulative impact on the community and neighborhoods.

Alternative 1 would require the relocation of twenty-eight residences, and two businesses. The proposed relocations, in combination with past relocations, would not result in a significant cumulative impact. Nor, with the rural nature, would there be any significant impact to the cohesive nature of any community. There would also be a very small cumulative effect on the tax base of each county.

Alternative 2 would require the relocation of thirty-eight residences, and twenty-eight businesses. The proposed relocations, in combination with past relocations, would not result in a significant cumulative impact. However, since this alternative proposes improvements to existing Route 63 through Westphalia and other sections, the cumulative impacts to that community and the corridor in general would be greater. There would also be a very small cumulative effect on the tax base of each county.

The Preferred Alternative would require the relocation of twenty-seven residences, and fifteen businesses. As with the other Alternatives, the proposed relocations, in combination with past relocations, would not result in a significant cumulative impact. However, since this alternative proposes improvements to existing Route 63 through Vichy the cumulative impacts to that community would be greater. There would also be a very small cumulative effect on the tax base of each county.

Threatened and Endangered Species

Would the project impact the Indiana bat?

When considering cumulative effects to Indiana bats the entire state needs to be considered because the entire state of Missouri is considered potentially suitable breeding habitat for the species. Since this species roosts under the bark of trees during the breeding season, loss of forested habitat could have a negative affect on this species. It would be impossible to determine every past, present, and future activity across the entire state that involved tree clearing, so this discussion will be general. The Preferred Alternative for this project involves clearing 1,475 acres of forested land.

According to Frances Main in an article in the February 2007 issue of the *Missouri Conservationist* magazine, there were 14.5 million acres of forestland in the state of Missouri in 2005. So, this project would involve clearing less than one thousandth of a percent of the forested land in the state of Missouri. By itself that should not have an impact on this species. But when combined with all of the other tree clearing that has happened in the past, is currently happening, and is planned for the foreseeable future within the state, that percentage increases significantly.

Main states that there were 12.9 million acres of forestland in the state of Missouri in 1972 compared to 14.5 million acres in 2005. So the amount of forested acres in Missouri is actually increasing, which would indicate that the amount of potentially suitable breeding habitat available for this species should also be increasing. However, this species uses large, oftentimes dead or dying trees and there may not be as many of these types of trees now as there were in the past. Mains' concern is not that the amount of forested land is shrinking; rather it is that the average size of forested plots is shrinking. In other words there are more small patches of fragmented forestland and less large tracts of unfragmented forest. This does not necessarily impact Indiana bats since they do not rely on large tracts of forested land, but it could impact forest interior species such as many migratory songbirds.

Also, MoDOT and the MDC have started a program called "Trees for Tomorrow." Under this program, MoDOT purchases a half million trees every year and MDC distributes them to youth groups around the state to plant. These are small trees that would not provide suitable bat habitat for many years, but the program is helping to assure that there would be forested land in Missouri for years to come.

None of the three alternatives for this project should result in any noticeable indirect impacts to the Indiana bat. This project does not have a noticeable increase or decrease to the cumulative impacts to the Indiana bat.

Would the project impact the Niangua darter?

The project involves two river crossings. Both of these rivers have rare aquatic species in them. The Niangua darter is found in the Maries River and three rare mussel species and one rare amphibian, described in Threatened and Endangered Species and Unique Natural Communities Section, are all found in the Gasconade River. All of these species are sensitive to sedimentation in the waterways where they live. Any in-stream activities, such as bridge construction can destroy habitat and increase sedimentation in a waterway. MoDOT implements Best Management Practices when working in streams to minimize the amount of sedimentation created by its projects. The impacts from any of the three alternatives for this project alone should be minimal and short term. However, when combined with all other past, present, and future activities occurring in these watersheds, they could become more noticeable

How would the habitat fragmentation impact the different species?

Habitat fragmentation has negative impacts on many species. Much of the forested habitat in Missouri has previously been fragmented by the development of housing, industry, and other related infrastructure as well as intensive agriculture and forestry. All three alternatives for this project would result in more fragmented habitat. It is difficult to compare the impacts of the different alternatives since different species require different amounts of unbroken habitat for survival. In other words, fragmenting a 100-acre parcel of forest may have a negative impact on some species but not on others. The configuration of the remaining parcels may influence the extent of impact on some species. Since all three alternatives result in more habitat fragmentation, there is no detectable difference in the cumulative affects created by them. However, MoDOT did alter the preferred alignment slightly in some places to reduce fragmentation.

Water Resources

The three alternative alignments intersect three 8-digit hydrologic unit code (HUC) watersheds, the Lower Osage River Watershed, the Lower Gasconade River Watershed, and the Bourbeuse River Watershed. The Preferred Alternative lies within the Lower Osage River Basin from its starting point to just north of Route AA. South of Route AA, the Preferred Alternative lies in the Lower Gasconade River Basin to Highway 28. From this point, the Preferred Alternative traverses in and out of the Lower Gasconade and Bourbeuse River Basins and winds along the ridge top to the county line where it re-enters the Lower Gasconade River Basin all the way to Rolla, Missouri.

What would be the cumulative effects on wetlands?

The spatial presence of water resources varies significantly across the corridor, as the alignments traverse ridge tops where ponds are more prevalent and crosses lowland areas where streams, rivers, and wetlands are more common. According to the NWI database, the predominant water resources represented in the three watersheds are streams and rivers, forested wetlands and ponds (Table 25). As one might expect, corridor improvements have the greatest impact to these three most prevalent water resources types (Table 26).

Table 25. Wetland Resources by Type in Each Watershed Basin

Type	Lower Osage	Lower Gasconade	Bourbeuse River
Emergent (acres)	294.22	604.96	268.30
Forested (acres)	4305.24	3683.6	1105.28
Scrub Shrub (acres)	358.35	49.98	128.73
Ponds (acres)	2954.38	2519.2	4939.18
Riverine (acres)	2068.68	<i>n/a</i>	2205.35

Table 26. Percent of Wetland Impacts in Each Watershed Basin

Preferred Alternative			
Type	Lower Osage River Basin (%)	Lower Gasconade River Basin (%)	Bourbeuse River Basin (%)
Ponds	0.255%	0.041%	0.030%
Emergent	0.122%	0.028%	0.037%
Scrub Shrub	0.000%	0.000%	0.000%
Forested	0.000%	0.532%	0.000%
Riverine	0.000%	0.000%	0.000%
Alternative 1			
Ponds	0.066%	0.265%	0.033%
Emergent	0.054%	0.076%	0.037%
Scrub Shrub	0.000%	0.000%	0.000%
Forested	0.070%	0.532%	0.000%
Riverine	0.019%	0.000%	0.000%
Alternative 2			
Ponds	0.152%	0.114%	0.000%
Emergent	0.119%	0.017%	0.000%
Scrub Shrub	0.000%	0.000%	0.000%
Forested	0.000%	0.532%	0.000%
Riverine	0.000%	0.000%	0.000%

The national goal set by the FHWA for wetland compensation is to construct 1.5 acres of wetland for every 1.0 acre of wetland impacted. Compensating for wetlands at this ratio helps to offset the lost beneficial functions during the time it takes for a wetland to develop. Over the past two years, MoDOT has replaced wetlands at an average compensation ratio of 3:1. Overall, the impacts associated with any of the alternatives as compared to the amount of resources in the watershed, appear to be minimal.

After significant fieldwork, the actual amount of wetlands and ponds impacted greatly decreased in Preferred Alternative. Therefore, the percent of wetlands and ponds impacted in the watershed also decreased.

What types of land use have impacted water resources in the past and present?

Historical and recent land use impacts for all three watersheds include farming, grazing, mining, sand and gravel operations, and logging. According to MDC's watershed impact assessments, using the Army Corps of Engineer's Regulatory Analysis Management System database, the Lower Gasconade River basin had high densities of permitted sand and gravel sites. The Bourbeuse River basin in Gasconade and Phelps counties has one or two operations with a 30- to 40 year history of commercial sand and gravel mining (Michael Smith, personal communication). A few permitted gravel mine operations are present within the Lower Osage River basin; however, gravel mining from streams within this watershed is an ongoing, largely unregulated cumulative activity with serious natural resource consequences to biota and geomorphology. Other recent land use impacts to water resources within the Lower Osage River include a high density of Confined Animal Feeding Operations (CAFOS).

All three watersheds are predominantly rural areas with low population densities and high farmland/pastureland densities. In comparison across all three of these basins, the current rate of water resource loss/degradation is likely to be similar and directly related to typical land use activities such as logging, grazing, burning, row cropping, and development. It appears that the primary consequences of constructing any of the three alternatives are the stream channel impacts resulting from the project footprint.

Indirect impacts to stream resources could include increased sedimentation and in-stream habitat degradation. Based on the influences of historic and current land use within these basins, the construction of the new facility should not significantly alter the functional capacity of the water resources beyond their current condition. The proposed project would not have significant indirect impacts on the water resources within these basins based on the minimal systematic effects that are expected to occur. In addition, the project will not have a noticeable increase or decrease to the cumulative impacts.

Cultural Resources

The project is likely to indirectly affect both historic and prehistoric archaeological sites. Such impacts develop in the area because of the project that have greater impacts to sites over a larger area. Changes in communities and their structure are likely to further affect cultural resources negatively.

The project is not likely to have indirect or cumulative effects to historic buildings already bordering the existing highway. Because the alignment would remain virtually the same in relation to adjacent historic buildings, there is little change to the site or setting of these properties.

In contrast, new alignments near historic buildings have greater potential to create changes in the surrounding area and possibly the use of these properties. Because alternatives in this corridor study are fairly wide, they enable immediate indirect and cumulative impacts to be considered early in the planning stages.

Each alternative has a footprint encompassing more area than necessary, sometimes twice to three times as much, to construct the new alignment and thereby allow room for adjustments. This additional width affords some flexibility for determining the final location of the selected alternative within the broader alternative boundaries and therefore enables efforts to minimize project effects to adjacent historic resources. By shifting the alternative to one side or another of this broad band and away from the historic property at the early stages of the project, it is often possible to avoid impacting them, while simultaneously reducing indirect and cumulative impacts.

Future indirect and cumulative impacts are more difficult to accommodate given their unpredictable nature, especially when the project's construction lacks funding and the design year is unknown. With time being an unknown factor, it is difficult to assess how the project would influence or be influenced by the broader development patterns and changes in the area. It is possible that by the year the project is built, the historic resources may no longer be present, or different historic properties may be identified.

Indirect and cumulative impacts could have positive effects on historic buildings and promote historic preservation in the sense that the project could make them more visible and perhaps more accessible. Bringing motorists closer to them would improve their view, enabling them to be better seen and appreciated. Greater accessibility to the highway may yield higher commercial potential and market value for the historic buildings. These factors may encourage re-use of otherwise abandoned or vacant old buildings and reduce investment risks.

Historic properties in the vicinity of the project area appear to have benefited from recent highway improvements, especially considering the timing of their transformation in relation to the transportation project. Victorian brick houses at three farms bordering the new Route 50 and Route 63 interchange are less than one mile north of this study corridor. They began to show signs of improvement following MoDOT's plans to build the highway interchange. The first of these to reveal noticeable exterior restoration work in the late 1990s now welcomes guests traveling on Routes 50 and 63 while promoting historic preservation in its new role as a historic inn, Huber's Ferry Bed and Breakfast.

MoDOT began its cultural resources investigations for the Route 50/63 interchange project in 1995, Huber's Ferry Farmstead became a B&B and was listed on the National Register in 1998, and the interchange was completed in 2002. The proximity of the interchange project to the farmhouse had no adverse effects to it and the indirect or cumulative effects appear to be favorable.

The area's land use has changed somewhat over the past decade with more residential or suburban development near the new interchange, but the grounds surrounding the historic properties continue to provide some buffer to these encroachments, while these and neighboring parcels increase in value. During field consultation in the Route 63 corridor, MoDOT Historic Preservation staff and the SHPO concurred that historic and potentially historic buildings associated with the alternative ultimately selected as the Preferred Alternative could be avoided so none would be adversely affected by the project. As a result of reducing the width of the Preferred Alternative (see Chapter 3) the distance between the alignment and the buildings increased, thereby reducing potential indirect and cumulative impacts.

Would the project impact any historic properties or archaeological sites?

MoDOT's cultural resources investigation (April 2009) identified one historic property and 63 prehistoric sites that are associated with the Preferred Alternative. One site (23MS12) has been determined to be eligible for the NRHP and the Preferred Alternative would affect it. Seven additional sites are potentially eligible but are of unknown status. Fifty-two of the sites have been determined not eligible for the NRHP. During the draft EIS when the project area was larger, additional historic or potential historic properties were identified, including four buildings at the edge of the alternative that become the Preferred Alternative. As a result of project modifications to minimize impacts, including indirect and cumulative effects, the width of the Preferred Alternative was reduced and the buildings are no longer located within or as close to the alignment as they were during the draft EIS stage. Because all the buildings likely to fulfill NRHP eligibility criteria are associated with alternatives other than the Preferred, or located outside the Preferred, none will be impacted by the project and is considered outside the area of potential effects.

This includes two buildings that were previously determined eligible for the NRHP and are already located beside the existing Route 63 facility at Vichy, the former Vichy Normal & Business Institute and the Vichy Public School.

The other two buildings, a vacant barn and former chicken hatchery, are located outside a proposed realigned segment in the Westphalia area. During preliminary studies when the alternative was broader, MoDOT identified the barn at the former Schmitz Farm as the only potential historic building at the property. At that phase of the study, the proposed alternative did not impact the barn, but impacted an associated outbuilding at the farm. Since that time, the alignment has been reduced in width to avoid impacting any buildings at the farm and thereby reducing indirect effects to the complex. The fourth historic building, a former chicken hatchery, is currently used as a storage building. The barn and hatchery are located on nearby parcels at opposite sides of the Preferred Alternative. The proposed highway would be situated between the barn and hatchery, avoiding direct impacts to both.

Because these four buildings are no longer located within the Preferred Alternative or no longer associated with other buildings that are located within the Preferred Alternative, they are not considered within the area of potential effects. This assessment, additional information about these properties, and information regarding 53 properties with architectural resources in the area of potential effects was submitted to the SHPO on April 29, 2009. On May 19, 2009, the SHPO commented that MoDOT had conducted a thorough and adequate cultural resources survey of the project area and concurred with the results of the study.

A copy of the Cultural Resources Technical report is available upon request.

Visual Impacts

Federal legislation took its first notice of highway esthetics by protecting scenic road and parkway views. The significance of the view of the road began to emerge with the Historic Preservation Act of 1966. This act directs all federal agencies to account for the efforts of proposed projects on historic resources. NEPA applied environmental awareness policies to all types of federally supported projects and all types of project settings. It directs that we carefully consider existing visual resources which are high in quality and that we enhance the built environment by good project planning and design. This section will address the existing visual qualities of the project area and attempt to analyze the potential impact of a new highway through the adjacent land (*Publication No. FHWA-HI-88-054*).

What visual qualities characterize the existing landscape?

The existing Route 63 corridor can be characterized as having underlying landforms of gently rolling hills and valleys interrupted by developments such as towns, houses, farm buildings, and county roads. Route 63 is located along a ridge between two river valleys. The Gasconade River Valley runs along the east side and the Maries River Valley runs along the west side.

Key land use in the area is farming. Most of the farmland consists of wooded areas and open pasture for grazing cattle and hay production. Wooded areas consist mostly of deciduous trees such as oak, hawthorn, hickory, etc. This landscape is typical of many areas throughout Missouri. There are several areas along Route 63 that are more highly visual than others but only in comparison to the rest of the corridor.

Two scenic overlooks are located in the study area. The overlook near Westphalia is located at a roadside park also used as a commuter parking lot. The scene is a rolling hillside and valley with a mixture of wooded areas and open pasture. The other overlook is located at a roadside park between Vienna and Vichy. Its primary scenic characteristic is forested hills and valleys.

Route 63 runs through landscapes that transition from rolling pastureland to steep river valleys to thick-forested hillsides. These landscapes are interrupted by three towns; Westphalia, Freeburg, and Vienna. Vichy and the Rolla National Airport are located south of Vienna. Each town consists of residential areas and business districts. The towns serve those living in residences in the town and those living on farms in the surrounding area. The existing highway is lined with homes and businesses throughout the Route 63 corridor.

Visual quality is evaluated using measures called vividness, intactness, and unity.

- Vividness is the memorability of the visual impression received from contrasting landscape elements as they combine to form a striking and distinctive visual pattern.
- Intactness is the visual integrity of visual order in the natural and man-built landscape, and the extent to which the landscape is free from visual encroachment.
- Unity is the degree to which the visual resources of the landscape join together to form a coherent, harmonious visual pattern. (*Publication FHWA-HI-88-054*)

All three measures must be high to indicate high visual quality. Some examples of areas with high visual quality are national parks, scenic rivers, or areas designated by scenic overlooks, the New York skyline, the Grand Canyon, Rocky Mountains or Grand Tetons, Cape Cod etc.

Two locations within the study would be considered to have high visual quality simply because they have designated scenic overlooks and have been categorized as being visually appealing prior to previous highway improvement projects. Some areas near the Gasconade River or Maries River may be considered highly visual, however the scenery is not viewable from the existing highway except at bridge crossings.

What impact would the alternatives have on the visual qualities of the surrounding area?

The No-Build Alternative would not alter the existing visual quality of the environment through which Route 63 travels. Since there would be no changes in the horizontal or vertical alignment, the existing visual environment would be left intact and existing scenic views would remain unchanged.

All the remaining alternatives would affect the visual qualities of the existing landscape to some degree in that a new highway would be built through undeveloped land. The quality of the scenery for some landowners would be affected because what is now an uninterrupted view for them would be interrupted with an undesirable man-made feature. “No one wants a four-lane highway in their back yard”. Areas that currently have no view of a highway would no longer have an intact visual quality of their surrounding landscape.



This small section of Route 63 in Maries County has a more vivid and unified view of the surrounding landscape. This scene for a traveler would not be highly intact because of the buildings interrupting the view of the landscape. The landowners view, however, is intact until any future obstacle to the east side of their property interrupts it.

Since the landscape consists of rolling hills that can hide man-made features, the visual impact would be different for each landowner. The impact to the visual qualities of the landscape would be greater for the landowners than for the traveling public. The ultimate highway design, a four-lane divided highway, is primarily to move people and goods safely and efficiently through the state as a whole. Travelers along the new highway corridor would most likely be those wanting to get from point A to Point B in a hurry without interruptions to their travel. Four-lane divided highway speeds are typically between 60 and 70 mph. There are no specific scenic views that would inspire a traveler to interrupt their trip.

How would design features of the highway limit visual impacts?

The physical characteristics of the corridor put limitations on the design features of the new highway. There may be fewer large rock cuts and long straight stretches of highway because they are not cost effective. Design parameters would be stretched to the limit without affecting safety. There would be stretches of long sweeping curves and hills with grades improving the visual intactness and unity of the landscape. Cuts through rock would be benched and soil slopes can be revegetated with native plants and wildflowers to soften the view of the roadway and reinforce the natural beauty of the area.

The areas of highway that have existing right of way would have similar design features of the existing roadway and the additional visual impact would be slight. Additional bridges at each of the river crossings would have the same clean simple visual lines and general construction as the existing bridges.

Permits

There are various permits that would be required prior to construction of the proposed improvements. These include a Floodplain development permit, a Section 401 Water Quality Certifications (WQC), a Section 10 permit, and a Section 404 permit.

Water Quality Certification:
Required for any project that involves discharge into navigable waters of the U.S., and is linked to the issuance of a Section 404 permit. The State of Missouri has the authority to issue Water Quality Certifications under Section 401 of the Clean Water Act.

Because this project involves the discharge of fill into waters of the U.S., a Section 404 Clean Water Act permit application would be submitted to the Missouri Department of Natural Resources (MDNR), and the U.S. Army Corps of Engineers (USACE) for Section 401 WQC and Section 404 permit issuance, respectively. A complete Section 404 permit application, as determined by the USACE, provides MDNR and USACE the information they need to issue the Section 401 WQC and 404 permit. Water quality conditions included in the certification become conditions of the Section 404 permit. The Section 401 water quality certification is needed to ensure that the state water quality standards are not exceeded by the proposed activity.

The Gasconade River is considered a Section 10 navigable water of the United States from its confluence with the Missouri River, upstream to the vicinity of Arlington, in Phelps County, Missouri. Section 10 of the Rivers and Harbors Act of 1899 regulates excavation, as well as fills, for impacts to those water bodies. All Section 10 navigable waters are also regulated by Section 404 of the CWA. A Section 10 authorization will be obtained concurrently with the Section 404 permit.

Mitigation

Compensatory stream mitigation costs were calculated based on the cost to participate in the Missouri Conservation Heritage Foundation's Stream Stewardship Trust Fund (SSTF). This cost was estimated at \$35.00 per credit during the draft stage. At this time, the cost is \$25.00 per credit. Credits were calculated using the MSMM, Adverse Impact Worksheet.

Under the authority of the Clean Water Act (CWA), Section 404 and 401, a permit is necessary for any dredge and fill activities within waters of the United States. A Section 404, USACE permit, and a Section 401, Missouri Department of Natural Resources (MDNR) certification would be needed prior to construction. Impacts to construct the entire Preferred Alternative would require Individual Permit authorization. Final impacts and a mitigation proposal would be required for permit submittal to the USACE and MDNR. Permit application submittal is typically completed during the design phase.

Commitments

The Route 63 improvement is planned as a four-lane divided highway with a 65 mph design speed.

Mass transit facilities, such as commuter bus, subway, and light rail service currently do not exist within the corridor and are not considered to be viable alternatives for consideration.

There are three upgraded sections of Route 63 that have right of way available for a future four-lane divided highway and one section that has been recently widened with improved intersections. The study team agreed these sections of improved highway should be considered as alternatives throughout the study.

The Preferred Alternative will route traffic around the community of Vienna and allow for the use of existing Route 63 as a business route for lake traffic and a connector to Route 28.

The Preferred Alternative will use the recently upgraded segment through Vichy. The existing alignment through Vichy is relatively flat and can be widened to the west for a 5-lane section. To avoid a county owned park in Vichy, the new alignment can be adjusted to fit within existing right of way.

From the Maries/Phelps County line, the existing alignment and roadway can be used and expanded to the west within existing right of way with no additional impacts.

All of the alternatives will require new bridge crossings over the Maries and Gasconade Rivers.

Maintenance of traffic and sequence of construction will be programmed to minimize traffic delays throughout the corridor. A traffic management plan will be developed and implemented during future engineering phases to ensure reasonable and convenient access to agricultural fields, residences, businesses, community services, and local roads during construction. Signs will be used to provide notice of road closures and other pertinent information to the traveling public. Where appropriate, the local news media will be notified in advance of road closings and other construction related activities that could excessively inconvenience the community.

MoDOT will coordinate construction activities, sequencing, and traffic management plans with the county Sheriff's Departments, local fire and emergency services, school districts, and other appropriate organizations to minimize delays during construction.

Erosion control measures will be implemented during construction to prevent sedimentation in the floodplain and streams. Following construction, the areas will be reseeded with a mix of fast-growing grasses. In addition, construction debris will be kept out of the floodplain and river.

If a public water supply well is compromised by highway construction, the well will be properly closed and the public water supply district will be provided a new supply source located at a different place.

Once the final location of the roadway is established within the corridor and the final grades are established, coordination with the utility companies would be made to ensure utility services to the local area is continued.

MoDOT and Osage, Maries, and Phelps counties would need to reach an agreement regarding maintenance responsibilities for any portions of existing Route 63 that would remain in service after construction.

Energy dissipaters will be used at culvert and pipe outlets, where necessary, to minimize downstream velocities, especially in first and second order streams.

MoDOT will conduct periodic reviews of the NHD and coordinate with the USFWS and MDC throughout the design phase of the project to track new locations and further analyze the projects impacts to these species. If it is deemed necessary, MoDOT will have qualified biologists conduct surveys for individual species. If it is determined that the project may impact one of these species, MoDOT and FHWA will conduct the necessary consultation with the USFWS to comply with the Endangered Species Act and to determine what measures can be implemented to eliminate or reduce the projects impacts to these species.

Further field investigation will be necessary to verify these preliminary findings. It is possible that unique natural communities do exist in the study area but to date they have not been identified.

To minimize disruption to turkey farm operations, the new roadway will be designed and constructed as far as possible from turkey barns located within the Preferred Alternative corridor.

What will happen after the Final Environmental Impact Statement is signed?

After the Final Environmental Impact Statement (FEIS) is completed and signed, a Record of Decision (ROD) will be drafted as the final step in the EIS process. The ROD will identify the selected alternative, presents the basis for the decision, identify all the alternatives considered, specify the environmentally preferable alternative, and provide information on the processes selected to avoid, minimize, and compensate for environmental impacts.

This project is consistent with the overall goals and objectives of the Statewide Long Range Plan to enhance Route 63 capacity from Iowa to Arkansas. The project is currently in MoDOT's 2010 -2014 Statewide Transportation Improvement Program (STIP) for completion of environmental work and preliminary engineering.

A Transportation Community and System Preservation Program grant has been appropriated by FHWA for preliminary design on this project. Pending receipt of the Record of Decision, MoDOT will apply the grant funds toward the project and continue the next phase of work.