4.0 AFFECTED ENVIRONMENT & ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

This FEIS is a comprehensive document that contains and/or references all the original information in the DEIS and/or the revised or updated information contained in the subsequent SDEIS.

The SDEIS provided a description of the proposed action, affected environment descriptions, and the NEPA analysis for the full range of reasonable alternatives. The SDEIS can be found online at the following location: http://www.rivervalleyintermodal.org/deis.htm.

The SDEIS evaluated the direct, indirect, and cumulative effects of implementing each of the reasonable study alternatives. Those impacts were presented in detail by resource category in Sections 4, 5, and 6 of the SDEIS. Impacts associated with implementing any of the four reasonable alternatives (no action and three build alternatives) were associated with the following changes to the baseline conditions: socio-economic changes as a result of the action; commercial, industrial, and infrastructure development; land-based construction activities; water-based construction activities; and increased truck, rail, and river commerce in the region.

At the end of this Section of the FEIS, a table summarizing the direct impacts of the No Action, Green (Preferred), Red, and Purple Alternatives has been provided (see Table 4.2).

The following development elements are required to support a general purpose intermodal facilities complex: transportation facilities including the slackwater harbor, rail, and highway access; material handling equipment; support facilities; industrial/distribution facilities; and utility infrastructure. The build-out of these elements would contribute to the impacts discussed below under each resource category for each alternative.

4.1.1 Affected Environment

The affected environment was described for the following natural, cultural, manmade, and socioeconomic resources in the March 2006 DEIS and in the August 2010 SDEIS:

- Land Use and Infrastructure;
- Farmland, Soils, and Physical Environment;
- Social Environment;
- Relocation;
- Economics;
- Pedestrians and Bicyclists Considerations;

- Air Quality;
- Noise;
- Water Quality;
- Wetlands;
- Water Body Modifications and Wildlife;
- Floodplains;
- Commercial Navigation;
- Threatened and Endangered (T&E) Species;
- Cultural Resources;
- Hazardous Waste Sites; and,
- Visual Impacts.

As necessary, updates were made to the affected environment section of this FEIS for each of the resources listed above. New and updated information was used in the FEIS, where appropriate.

4.1.2 Environmental Consequences

The terms “effect”, “consequence”, and “impact” are synonymous as used in this FEIS. Impacts may be beneficial or adverse and may apply to the full range of natural, aesthetic, historic, cultural, and economic resources within the project area and also within the surrounding area. The discussion concentrates on aspects of the environment that could potentially be affected by implementation of new activities and facilities associated with the intermodal facilities.

The analysis of impacts associated with each course of action was divided into direct, indirect, and cumulative impacts in the original DEIS and SDEIS. Definitions of the various types of impacts and how the term “significance” implies to such impacts are defined below.

Although it is assumed that the proposed project will result in changes to current land uses within the project study area to mixed industrial use, several unknowns are created due to the change in land use. It is not presently known exactly which types of industries would use the transportation services provided at the facilities, which modes of transportation they would rely on most heavily, or which of those industries may choose to locate warehouses, factories, or other structures within the proposed intermodal facilities. Likewise, it is not known which types of materials may be transported, stored, or produced at the proposed intermodal facilities.

The type of industries that choose to locate or utilize the intermodal facilities could alter the potential long-term impacts of the project. To compensate for the unknowns of the project and to attempt to fully disclose the potential impacts of the project, the impacts analyses were conducted using a “worst-case-scenario” for most of the resources

categories reviewed. For instance, it was assumed that all wetlands within the proposed boundaries of any of the Build Alternatives would be completely lost (drained and/or filled) as part of the proposed project. Therefore, regardless of what industry or development occurred within the site, the worst possible impacts would have been identified and disclosed. However, for some resource categories there are too many potential scenarios to consider in the scope of a NEPA study to make a worst-case scenario methodology feasible. For instance, impacts to air quality attributed to the intermodal facilities could be dramatically different depending on the types of industry choosing to use the area or the types of materials transported, stored, used, or produced within the site. In those situations, impacts analyses conducted for this study relied on the best available information to offer insight as to what types of industries may want to use the area. This information was based on the types of transportation services that would be available at the facilities, existing industries in the region, industries that use other ports within Arkansas, and information from local economic planners that may have the best insight as to the types of industries that have indicated an interest in services provided by intermodal facilities, such as the RVIF.

This document utilizes CEQ guidelines and is based on the best information available at the time of the study. If in the future an industry potentially has impacts that would be more substantial than those described in this document and decides to locate at the intermodal facilities, it is likely other environmental laws and regulations would apply in keeping the impacts to the human and natural environments to the minimum possible. Private industries would also be required to disclose information regarding the types of activities they propose to conduct at the site in an appropriate, legal manner, as part of the environmental and/or other regulatory permit application processes typically required of them.

Most industries that would have substantial environmental impacts are regulated by environmental laws outside the realm of NEPA studies, such as this FEIS. Therefore, any private industry wanting to locate at the intermodal facilities that is anticipated to have substantial impacts would have to conform to environmental laws set forth by Federal, state, and local regulatory agencies such as the U.S. Environmental Protection Agency (USEPA), USACE, Occupational Safety and Health Administration (OSHA), USFWS, Arkansas Department of Environmental Quality (ADEQ), and others. The ADEQ website contains information regarding the primary environmental laws that apply to the various types of industries that may utilize the proposed intermodal facilities (http://www.adeq.state.ar.us/regs/fed_regs.htm and http://www.adeq.state.ar.us/regs/ar_env_laws.htm).

Such private industries are typically aware of their responsibilities under such laws and regulations, and they would have their own resources (staff or consultants) available to ensure they comply with all legal requirements. It would not be beneficial for such businesses to violate environmental regulations due to the serious penalties and financial implications that could occur if they fail to comply. Therefore, even though it is not possible to fully assess all potential environmental impacts that could occur under the various scenarios of potential development at the intermodal facilities, it is expected any substantial impacts would be identified and regulated by appropriate regulatory

agencies, which would help protect the local and regional environment. Reasonable options to avoid, minimize, and/or mitigate for any adverse impacts would be identified and enforced by the responsible regulatory agency or agencies during the permit application phase of those developments. Permits required for development of the initial intermodal facilities infrastructure, such as levees, roads, rail access, the slackwater harbor, and any utilities would be the responsibility of the Authority and would be obtained prior to construction of the project.

Although the initial site development of the intermodal facilities would result in differing impacts depending on which Build Alternative location were chosen, the overall impacts associated with the long-term use of the intermodal facilities would not be expected to differ greatly. It is assumed that the same types of industries would utilize the intermodal facilities no matter which Build Alternative site where chosen. Therefore, the long-term impacts caused by the various industries or activities that occur on the site under full operation would not be expected to differ between alternatives, with few exceptions. For instance, if the Green (Preferred) Alternative were chosen there could be more noise impacts for residences located near Highway 247. However, in terms of air quality, economics, traffic generation, and other potential impacts, there would be no major differences between the Build Alternatives

Through coordination and consultation with federal, state, and local agencies, it was determined that the No Action and the selected Build Alternatives would have no impact on any Department of Transportation Act of 1966 Section 4(f) protected properties (such as a significant, publicly owned park, recreation area, or wildlife and waterfowl refuge, or any significant historic site). As discussed in the cultural resources section below (Section 4.16.2), the cultural resources sites eligible for the National Register of Historic Places (NHPA) will be addressed through a PA and recovery plans that describe in detail how each site will be addressed. If any Section 4(f) properties and/or any additional cultural resources protected under Section 106 of the NHPA are discovered on proposed project sites, appropriate agencies would be contacted immediately for further consultation and appropriate actions would be taken to avoid, minimize, and/or mitigate the impacts.

4.1.2.1 Direct vs. Indirect Impacts

Direct Impacts. A direct impact is caused by the proposed action and occurs at the same time and place.

Indirect Impacts. An indirect impact is caused by the proposed action and occurs later in time, or is farther removed in distance but is still reasonably foreseeable.

Application of Direct versus Indirect Impacts. For direct impacts to occur, a resource must be present in a particular area. For example, if highly erodible soils were disturbed due to construction, there would be a direct impact to soils from erosion at the development site. Sediment laden runoff might indirectly affect water quality in adjacent areas downstream from the development site.

4.1.2.2 Significance

The term "significant", as defined in Paragraph 1508.27 of the Regulations for Implementing NEPA (40 CEQ 1500), requires consideration of both the context and intensity of the impact evaluated. Significance can vary in relation to the context of the proposed action; thus, the significance of an action must be evaluated in several contexts and varies with the setting of the proposed action. For example, context may include consideration of effects on a national, regional, or local basis. Both short-term and long-term effects may be relevant.

In accordance with the President's CEQ implementing guidance, impacts are also evaluated in terms of their intensity or severity. Factors contributing to the evaluation of the intensity of an impact include, but are not limited to:

- A significant impact may exist even if, on balance, the impact is considered beneficial because an impact may be both beneficial and adverse;
- The degree to which the action affects public health or safety;
- Unique characteristics of the geographic area where the action is proposed such as proximity to parklands, historic or cultural resources, wetlands, prime farmlands, wild and scenic rivers or ecologically critical areas;
- The degree to which the effects on the quality of the human environment are likely to be controversial;
- The degree to which the effects of the action on the quality of the human environment are likely to be highly uncertain or involve unique or unknown risks;
- The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration;
- Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts;
- The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the NRHP or may cause loss or destruction of significant scientific, cultural, or historical resources;
- The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973 (ESA); and
- Whether the action threatens a violation of federal, state, or local law or requirements imposed for the protection of the environment.

4.1.3 Cumulative Impacts

Cumulative impact analyses evaluate the incremental impacts of implementing any of the study alternatives in association with past, present, and reasonably foreseeable future actions of other parties in the surrounding area (where applicable).

The cumulative impact analyses in the DEIS and SDEIS were prepared at a level of detail that was reasonable and appropriate to support an informed decision in selecting the Green (Preferred) Alternative as the Preferred Alternative. Summaries of the cumulative impact analyses are presented under each of the individual resource categories in Sections 4.2 through 4.18 of this FEIS.

The following information provides introductory or background information used to determine cumulative impacts.

4.1.3.1 Definitions Used in Cumulative Analysis

This Section defines several key terms used in the cumulative impact analysis:

Cumulative Impact Geographic Area of Analysis. The cumulative impact geographic area of analysis includes the geographic area that has the potential to be affected by implementation of any of the alternatives in the reasonably foreseeable future.

Past Actions. Past actions are defined as actions within the cumulative impact geographic areas of analysis that occurred before the EIS was initiated. These include past actions in the project areas, and past demographic, land use, and development trends in the areas that surround the project areas.

Present Actions. Present actions include: 1) current activities within the cumulative impact geographic areas of analysis; and 2) current resource management programs, land use activities, and development projects that are being implemented by other governmental agencies and the private sector (where they can be identified) within the cumulative impact geographic areas of analysis.

Reasonably Foreseeable Future Actions. Reasonably foreseeable future actions may include those actions in the planning, budgeting, or execution phases. Actions may be those of the Federal government, state or local government, or private organizations or individuals.

4.1.3.2 Cumulative Impact Geographic Area of Analysis

The boundary of the cumulative impact geographic area of analysis varies according to the resource evaluation category considered. For many of the resource categories considered, the impacts of the Alternatives are not expected to extend beyond the project area boundaries, or the impact to the resource is expected to be minimal beyond this area during the reasonably foreseeable future. For those categories, the cumulative impact geographic area of analysis is appropriately limited to lands within the project area boundaries. The boundaries of the cumulative impact geographic area of analysis for each resource category are identified in Table 4.1 of the SDEIS. The

SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.1.3.3 Past and Present, and Reasonably Foreseeable Future Actions

The primary past, present, and reasonably foreseeable future actions that have occurred both within and adjacent to the project areas that have been considered in the analysis of cumulative impacts were identified in Section 4.1.3.3 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm). The SDEIS considered the Highway 247 improvement project as a reasonably foreseeable future project that could have cumulative impacts when combined with the intermodal project. Since the SDEIS was written, the Highway 247 project was completed and is now considered as part of the present condition. It has been removed from the reasonably foreseeable future projects in the cumulative impact analysis but is still considered in the overall analysis of the cumulative project impacts.

4.2 LAND USE AND INFRASTRUCTURE

4.2.1 Affected Environment

Land use planning and zoning information, descriptions of highway and roadway networks, railroads, and utilities for the No Action, Green (Preferred), Red, and Purple Alternative project areas can be found in Section 4.2.1 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.2.2 Consequences

4.2.2.1 Potential Land Use and Infrastructure Consequences of the No Action Alternative

The predominance of floodplain and lack of infrastructure within the Green (Preferred) and Red Alternative project areas poses limitations to future development under the No Action Alternative. The Purple Alternative project area would continue its current land use conditions, with the potential for additional poultry operations likely. Direct, indirect, and cumulative impacts to land use and infrastructure and mitigation measures under the No Action Alternative are presented in detail in Section 4.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.2.2.2 Potential Land Use and Infrastructure Consequences of the Green (Preferred) Alternative

4.2.2.2.1 Direct Impacts

Direct land use impacts under the Green (Preferred) Alternative would consist of the conversion of primarily low-density residential and agricultural land to industrial and commercial uses. Approximately 615 acres of land would be removed from agricultural production, primarily soybeans and hay. In addition, six residences would be displaced.

Direct beneficial impacts to infrastructure would result as utilities, roadways, and railroads would be extended into the Green (Preferred) Alternative project area to support the intermodal facilities. This infrastructure expansion would improve the area's ability to support development within the intermodal facilities area and in adjacent areas. In addition, a levee would be constructed to protect the land within the intermodal facilities project area and would further promote development by providing a flood-protected area.

Improvements to roadways and railroads would occur due to extension and improvements of facilities within the Green (Preferred) Alternative proposed intermodal facilities project area.

Roadway improvements would occur as existing gravel and dirt roads are converted to hardened roads of either concrete or pavement. An additional road network would be developed within the intermodal facilities boundaries providing improved access to land within the project area and supporting future development. Extension of the Dardanelle Russellville Railroad (DRRR) into the project area would provide additional transportation options for new industries or other facilities within the Green (Preferred) Alternative proposed intermodal facilities area. It would be possible for infrastructure to be further extended in the future if the intermodal facilities reaches a point of full capacity and additional adjacent land is required to meet demand.

4.2.2.2.2 Indirect Impacts

Indirect impacts could occur in the form of secondary land use changes resulting from expansion of surrounding development due to the proposed intermodal facilities under the Green (Preferred) Alternative. The new proposed facilities could foster and promote additional supportive industrial and commercial development within the immediate area. This expansion of the area for industrial or commercial uses would also require expansion of infrastructure.

The potential development of the intermodal facilities as a major employment center could promote new residential development in the vicinity of the proposed development. These impacts would result in potential land use changes in the vicinity of the project area including the City of Russellville, the City of Dardanelle, and surrounding unincorporated areas within reasonable commuting distance.

The above land use changes may be viewed as beneficial or adverse depending on whose perspective is being considered. In general the impacts would be beneficial for most socioeconomic resources, but adverse for most natural resources. The specific impacts of these land use changes cannot be quantified until individual developments are planned and designed. However, proactive steps could be taken by local planners to identify and protect areas in the region that contain high quality wetlands, stream corridors, or any other important resources deserving protection. Such steps may require cooperation between landowners, local citizen groups, private organizations, and city, county, and state governments.

Increased truck traffic associated with the intermodal facilities could result in minor long-term, adverse impacts to safety. Table 4.3 of the SDEIS describes the increase in amount of truck traffic. This increase has the long-term potential to increase the number of accidents that occur on the roads in the general area surrounding the project site.

4.2.2.2.3 Cumulative Impacts

Cumulative impacts associated with the Green (Preferred) Alternative would include potential land use changes, infrastructure improvements, and increased truck, rail, and barge traffic. All of these changes would result from a combination of the intermodal facilities project and the other past, present, or reasonably foreseeable improvements such as the Arkansas River Navigation Project, which would increase navigation capabilities on the McClellan-Kerr Arkansas River Navigation System (MKARNS). In addition, it is possible that once the intermodal facilities are developed the City of Russellville would purchase additional land in the project vicinity to provide additional industrial growth capacity. However, it is unlikely that this would occur in the reasonably foreseeable future.

An overall improvement in infrastructure would result from development of the Green (Preferred) Alternative intermodal facilities in combination with other improvements, such as the recently completed Highway 247 improvements, MKARNS improvements, extension of railroads, and expansion of utilities. All of these improvements, when combined, would enhance the area's transportation and other infrastructure capabilities to support growth of the regional economy and improve the overall transportation network. The increased tax base and revenue brought into the region by the expansion of industrial, commercial, and residential development would help offset the costs of expanding infrastructure into the area and other public services required to support the development.

Arkansas River Navigation Project

Potential increases in barge traffic associated with the Green (Preferred) Alternative intermodal facilities would combine with potential increases following completion of improvements to the navigability of the MKARNS being proposed by the USACE. It is not anticipated that the level of increased barge traffic associated with the intermodal facilities and the MKARNS improvements would have substantial adverse impacts to the local or regional environment.

Industrial Development in the Arkansas River Bottoms near Russellville

It is expected that at least some industrial development may occur in the Green (Preferred) Alternative project area regardless of the intermodal facilities being constructed. However, more substantial land use changes in terms of increased commercial and industrial development would occur in the area if intermodal facilities were constructed to provide multiple modes of freight transportation options. This increase in industrial land uses would combine with potential increases in industrial and commercial development due to the Highway 247 improvement project and the

Arkansas River Navigation Project, which would create a more efficient truck route and enhance barge transportation making the general project area more suitable or attractive for development. All of these projects would combine to result in a shift from rural residential and agricultural land uses in the immediate project vicinity to industrial or commercial uses. However, the creation of jobs due to the intermodal facilities and expanded industrial and commercial developments may promote increased residential development in the surrounding areas. The increased residential development would maintain and enhance residential land uses in or surrounding the City of Russellville and or adjacent communities including Dardanelle and Pottsville. All of the land use changes or enhancements could result in increased property values especially for strategically located parcels within reasonable commuting distances to the project vicinity, which would include most areas within 20 miles of the site, or possibly more.

Expansion of Soil and Gravel Excavation and Removal

The proposed intermodal facilities project under the Green (Preferred) Alternative would result in shifts in the sand, soil, and gravel excavation operations from within the proposed project boundaries to adjacent areas. Therefore, some minor shifts in land uses may result in those areas where the excavation operations relocate. These land use changes would be in combination with land use changes resulting from the intermodal facilities project and the other reasonably foreseeable projects anticipated in the project vicinity. However, the expansion of soil and gravel excavation operations is not expected to result in major land use changes at any given location as these operations would likely continue to be small, scattered operations most likely impacting lands not currently being used for other more productive uses. There could be some cumulative loss of agricultural land uses where good farmland soils are excavated and transported to areas outside the project vicinity for use as topsoil for lawns, landscaping, or other purposes.

Removal of the soil, sand, and gravel excavation land uses away from the lands within the proposed Green (Preferred) Alternative intermodal facilities boundaries, and potentially in adjacent areas that could eventually become used for industrial or commercial uses, could result in beneficial cumulative impacts. Changing the land uses, including agricultural land uses, to industrial or commercial land uses has less potential for long-term adverse impacts than allowing the current soil, sand, and gravel excavations to continue to somewhat randomly expand on those lands. This is because most of the underlying soils, sand, and gravel would remain in place or onsite if it were used for industrial purposes and could potentially be converted back to productive agricultural land uses in the future. If the soil, sand, and gravel operations continue to expand in the somewhat random fashion that currently exists in the project area, those resources would be lost indefinitely and would not allow for existing agricultural land uses to reoccur on those areas.

Continuation of Agricultural Land Use

No noticeable cumulative impacts associated with continuation of agricultural land use practices in combination with land use changes associated with the intermodal facilities

or other reasonably foreseeable projects would occur. The agricultural land uses in the Green (Preferred) Alternative project area would be complemented by the anticipated product storage capacity and shipping options provided at the intermodal facilities. The revenues generated by new industries within the intermodal facilities and continued agriculture production on remaining farmland adjacent to the site would result in cumulative benefits to local and regional economies. The magnitude of those benefits cannot be determined at this time.

Increase Existing Arkansas River Commerce

There would be beneficial cumulative impacts to land use and infrastructure in combination with an increase in existing Arkansas River commerce. The change in land use from agricultural land use to industrial land use would promote additional transportation of goods along the Arkansas River and increase commerce in the region. The extension of infrastructure in the proposed project area would allow for industries and businesses to fully utilize the project area.

4.2.2.2.4 Mitigation

Since the planning for the intermodal facilities is being developed through the NEPA process, including interagency involvement along with consideration of comments from private citizens and local, state, and federal stakeholders, it is anticipated that impacts to the social, cultural, and natural environment would be minimized. This NEPA study is being conducted to help identify potential adverse impacts early in the process, and these impacts can be avoided, minimized, or mitigated to the extent practicable. Since the NEPA process is being utilized, mitigation for impacts is more likely to occur than if the site were developed with local or private funding that would not require the intensive planning and NEPA study. If the site were to be developed without proper environmental consideration, it is likely that anticipated impacts would be more severe and would not be mitigated to the same level. For instance, it is possible that without the intensive searches for natural, social, and cultural resources in the project vicinity, those resources may be destroyed before they are ever identified. By conducting the NEPA study within the intermodal facilities project area, all known resources are identified and dealt with in a legal and appropriate manner to ensure that long-term adverse impacts are avoided, minimized, and/or mitigated. Those resources are being identified through intensive survey efforts along with input from regulatory agencies, landowners, and the general public.

Unavoidable impacts to the environment associated with construction of the intermodal facilities would be mitigated to the extent practicable. General construction and other appropriate BMPs could be implemented to reduce any unnecessary impacts to adjacent land uses and infrastructure. Adjacent land uses could be protected from construction and development activities of the intermodal facilities through good housekeeping practices and erosion and sedimentation BMPs. Signs and temporary fencing would delineate construction boundaries to minimize impacts to adjacent land uses. Construction and operations of the proposed intermodal facilities would comply with the respective regulations and avoid adverse impacts wherever possible.

Appropriate marking of any existing utilities could reduce any interruptions in existing services and prevent any injuries and damages. Proper coordination with the appropriate highway and railroad entities could reduce interruption in current service.

Without NEPA, it is unlikely that this mitigation would occur and some resources would be completely lost with little or no chance of recovery or replacement. For example, continuation of the current soil and gravel excavation and removal operations would likely continue to expand in the project area. These excavation operations typically are unplanned and have a strong likelihood of adversely impacting cultural resources, wetlands, soils, drainage, and aquatic resources without considering the nature or severity of impacts generated by their operations. These extractive activities could result in the loss of resources on the site forever without any requirement of mitigation or documentation. With the NEPA study being conducted for this project, every effort is being made to document resources and impacts, protect the environment, and mitigate as required for all resources in the project area.

To help reduce overall cumulative impacts associated with shifts in the excavation operations caused by the intermodal facilities and other foreseeable future projects, local planners, resource agencies, and local landowners should help identify areas where such operations would be less detrimental or would have less long-term impacts to existing or adjacent resources and land uses. This would ensure that such mining operations do not relocate or shift to areas where other more productive land uses, such as agriculture, could occur well into the future if the productive soils remained on the area. Proactive planning would allow the soil, sand, and gravel mining operations to occur in a more controlled manner with less apparent random site selection and may help confine the impacts of those operations to fewer sites. Such choices would ultimately be left to local landowners who, as long as they comply with existing environmental laws and regulations, would be free to allow mining operations to occur on their lands. Regulatory agencies should try to monitor impacts caused by new mining operations as they develop to help protect any known sensitive areas.

To help minimize or avoid potential impacts to important resources, such as high quality wetlands and stream corridors, appropriate mitigation measures would be developed. These measures are discussed in Section 4.11. Through coordination and consultation with federal, state, and local agencies, it was determined that the Green (Preferred) Alternative project area does not contain any Section 4(f) protected properties. If, during the preparation of the FEIS, any Section 4(f) properties and/or historic properties or cultural resources protected under Section 106 of the NHPA are discovered on the proposed project area, appropriate agencies would be contacted immediately for further consultation and appropriate actions would be taken to avoid, minimize, and/or mitigate the impacts.

In addition, local planners and regulatory agencies should consider conducting studies and increasing communication to identify such areas and then propose ways to protect those areas from future developments and land use changes. This would reduce the potential for secondary and/or cumulative impacts of future industrial, commercial, and/or residential developments in the area. This form of land use planning has

become more popular for many communities throughout the country as more natural resources or other important aspects of the human and natural environments are impacted by development and more citizens are aware of such impacts. Proper land use planning combined with avoidance, minimization, and mitigation for known impacts to important resources helps benefit humans and their environment.

The NEPA process used in development of the intermodal facilities project has already resulted in reducing the potential impacts of the project through the public involvement process, interagency coordination, and detailed environmental technical studies that have been conducted. Several potential locations studied for this project were initially avoided for development of the intermodal facilities due to various limitations including substantial impacts to the natural, social, cultural, or human environments. Where impacts are unavoidable, continued efforts will be made to avoid, minimize, or mitigate for impacts to important resources in the project area.

Although such detailed studies and mitigation efforts are not required for most local and/or private developments, those NEPA-like studies and land use planning efforts would help enhance protection of the most sensitive natural resources or important cultural resources.

4.2.2.3 Potential Land Use and Infrastructure Consequences of the Red Alternative

Under the Red Alternative, impacts to land use and infrastructure would be similar to those under the Green (Preferred) Alternative. However, approximately 155 fewer acres would be removed from agricultural production than under the Green (Preferred) Alternative. There would be two more residential relocations and one business relocation under the Red Alternative.

Direct, indirect, and cumulative impacts to land use and infrastructure and mitigation measures under the Red Alternative are presented in detail in Section 4.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.2.2.4 Potential Land Use and Infrastructure Consequences of the Purple Alternative

Impacts to land use and infrastructure would be similar to those under the Green (Preferred) Alternative. Approximately 533 acres of land would be removed from agricultural production. Approximately 69 acres of forested land would be removed. In addition, 15 residences would be displaced.

Direct, indirect, and cumulative impacts to land use and infrastructure and mitigation measures under the Purple Alternative are presented in detail in Section 4.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.3 FARMLAND, SOILS, AND PHYSICAL ENVIRONMENT

4.3.1 Affected Environment

Descriptions of the farmland, soils, and physical environment of the No Action, Green (Preferred), Red, and Purple Alternative project areas can be found in Section 4.3.1 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.3.2 Consequences

4.3.2.1 Potential Farmland, Soils, and Physical Environment Consequences of the No Action Alternative

Because no activities related to the proposed intermodal facilities would occur under the No Action Alternative, there would be no impacts to farmland, soils, and physical environment. However, if the intermodal facilities are not built in the project area the current soil and gravel excavation and removal operations would continue and would likely expand, resulting in the long-term loss of productive topsoil from the area and altered drainage patterns. This would negatively affect farmland as these borrow sites would not be able to support the current agricultural land uses once the topsoil has been removed.

Direct, indirect, and cumulative impacts to farmland, soils, and physical environment and mitigation measures under the No Action Alternative are presented in detail in Section 4.3.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.3.2.2 Potential Farmland, Soils, and Physical Environment Consequences of the Green (Preferred) Alternative

4.3.2.2.1 Direct Impacts

The NRCS identified areas of prime and unique farmland and assigned a land evaluation point rating for the proposed alternative. A site assessment evaluation was completed and point values were assigned for the project area. The build alternative alignment was rated at 168 points. Approximately 615 acres of land would be removed from agricultural production, primarily soybeans and hay. That land would be converted from agricultural land to industrial and commercial uses. However, the area could be converted back to farmland at some point in the future as the farmland soils would not be removed from the site permanently. The farmland in the project area represents only a small percentage of the total acres of farmland in Pope County. A copy of the NRCS letter and associated farmland impact rating form is included in Appendix A of the SDEIS.

Minor, long-term adverse impacts to topography and soils of the proposed project area would occur because some earth moving activities would be required. Soil movement would be required for the construction of various buildings, roads, levees, and other infrastructure. Although topsoil in the project area may be moved during construction,

most of the topsoil would remain within the intermodal facilities project area and would not be permanently removed from the site. Dredging of the slackwater harbor would produce dredged materials that would likely be deposited on-site. Some of these dredged materials may be placed in areas containing prime farmland soils.

The main earthmoving operations would occur during construction of the levee that would be built around the proposed intermodal facilities to protect the area from flooding from the Arkansas River and Whig Creek. This levee would be built to a height suitable to protect the site during a 500-year flood event. It is anticipated that most of the materials used to create this levee would be taken from on-site by scraping and depositing soil materials on the levee. This would result in long-term adverse impacts to soils and farmland on the site. Because much of the on-site soils contain a high content of sand and other permeable materials, additional material may need to be brought from off-site to provide a non-permeable core for the levee. All material brought from off-site would be taken from a pre-approved location and would consist of clean fill material. The pre-approved site would be surveyed for natural and cultural resources to ensure the borrow area used results in only minimal impacts. It is anticipated that soils containing high clay content would be used to support the levee. This type of soil is typically found in upland areas and therefore would likely not be taken from the region's more fertile floodplains.

Impacts to groundwater are expected to be minor because use of BMPs as well as regulations set forth in environmental permits would help protect groundwater resources in the area. Any accidental releases of contaminants on the site would be remediated immediately.

Due to the separation of groundwater on the east and west sides of the river it is assumed that any contaminants that are potentially accidentally released into the groundwater under the proposed intermodal facilities would not enter into the Dardanelle aquifers on the west side of the river. Because the proposed intermodal facilities project area is located directly across to somewhat downstream of Dardanelle, it is not expected that potential pollutants accidentally released from the intermodal facilities into surface waters, including the Arkansas River, would impact the Dardanelle aquifers or well fields either. In order for contaminants to reach the groundwater supply of Dardanelle, they would have to travel almost directly horizontal across the surface waters of the river, filter through the alluvial sediments, and then flow into the groundwater aquifers. Spill Prevention, Control, and Countermeasures (SPCC) Plans would likely be required for tenants using the intermodal facilities that would potentially handle, store, or transport contaminants such as oil. All requirements and guidelines set forth in those plans and other environmental permits would be complied with to further reduce any risks associated with accidental releases of contaminants.

BMPs would be employed as part of proposed development projects to reduce the amount of surface runoff and erosion. These BMPs would also help eliminate sediment erosion and migration from potential construction sites. All exposed soils would be planted with grasses and other vegetation immediately following construction to further protect the soils.

4.3.2.2.2 Indirect Impacts

There is potential for long-term beneficial impacts to soils because construction of the intermodal facilities on the proposed site would cease the current soil excavation and removal activities that are taking place. Although soils on the site would be moved and disturbed during construction of the intermodal facilities, it is anticipated that the majority of the soils would remain on the site near their current location and could potentially be returned to their approximate locations in the future, if necessary. If the soil excavation and removal operations were allowed to continue, with expansion of the operations likely, the soils would be permanently transported off-site.

Construction of the intermodal facilities could foster and promote additional supportive industrial and commercial development within the immediate area resulting in additional loss of farmland and disturbance of soils. In addition, because the current soil and gravel removal operations would cease within the project area, there is a chance that these operations would shift to adjacent areas with similar natural resource characteristics, resulting in a long-term loss of soils and farmland and alteration of existing drainage patterns in those areas. These impacts cannot be fully predicted at this time, however, the impact is expected to be relatively minor given the minor nature of the impacts to soils and farmland anticipated to occur with implementation of the Green (Preferred) Alternative.

Some of the initial loss of farmland within the proposed intermodal facilities project boundaries could be partially offset by the potential increase in value of the remaining farmland adjacent to the site, which would indirectly protect those adjacent farmlands from being taken out of production and perhaps used for more destructive uses such as sand, soil, and/or gravel mining. The value of the adjacent land could potentially increase, because farming the remaining lands may become more cost effective due to the new options for storing and transporting grain or other agricultural products that would be made available at the neighboring intermodal facilities. Any cost savings provided to local farmers may be enough to make continuation of farming of the adjacent properties a better option than selling their land or allowing it to be used for other purposes. If the lands could continue to be effectively farmed in the long-term, it would not be logical to mine the soils to gain the relatively short-lived income received from such operations. Once soils are completely removed from a property, the landowner no longer has the option of going back and farming the land to make additional revenues.

Secondary developments associated with the intermodal facilities are not expected to substantially impact groundwater aquifers in the area, especially those used by the City of Dardanelle. Major toxic releases from barges into the harbor or the Arkansas River are unlikely to impact Dardanelle's municipal water system. A release of this type within the harbor would be quickly identified and remediation steps would be implemented rapidly. An SPCC Plan would be required if certain pollutants, such as containers of oil are to be transported or stored at the facilities. Such plans would identify steps that would be taken to minimize potential dangers resulting from spills. If a spill were to occur within the harbor area, the portion of the Arkansas River impacted would likely be

relatively limited. Furthermore, recharge from the river represents only a small portion of the yield of the public water supply. The impacts to the public water supply would significantly lag the time of the release, allowing for a testing program to be established to quantify any possible impact to the wells. In the unlikely event of a catastrophic release, the Arkansas River currents would likely disperse and dilute the release, making it even more unlikely that the released contaminants would cross the river, enter and migrate through the alluvium, and into ground water wells.

4.3.2.2.3 Cumulative Impacts

Arkansas River Navigation Project

Dredging impacts associated with this project would not cause substantial increases in impacts to farmland or soils when combined with the proposed MKARNS improvements the USACE intends to implement. Only a minor amount of initial and maintenance dredging in the channel of the Arkansas River is expected to occur to support the intermodal facilities. The main dredging would occur in the slackwater harbor area, most of which can be completed prior to opening the connection of the harbor to the actual river channel. Dredged material removed for the project would likely be placed within the intermodal facilities boundaries and not on the USACE dredge disposal site located near the site's southern boundary. The proposed slackwater harbor area is in a mostly disturbed area currently being used as a soil, sand, and gravel excavation area by a private company.

Industrial Development in the Arkansas River Bottoms near Russellville

It is possible that some of the lands adjacent to the intermodal facilities proposed for the Green (Preferred) and Red Alternative project areas would be converted to industrial or commercial land uses by the City of Russellville or private individuals at some point in the future. However, because an adequate amount of property is being considered for development of ancillary facilities and industrial uses as part of the intermodal facilities project, it is assumed that most of the reasonably foreseeable industrial and commercial development would occur exclusively in the proposed project boundaries. Therefore, cumulative impacts to farmland and soils due to additional industrial and commercial development anticipated in the reasonably foreseeable future are not expected to be substantial.

Expansion of Soil and Gravel Excavation and Removal

The proposed intermodal facilities project would result in shifts in the sand, soil, and gravel excavation operations from within the proposed project boundaries to adjacent areas. This could result in increased impacts to farmland and soils in those adjacent areas. These impacts would be in combination with impacts to soils and farmland resulting from the intermodal facilities project and the other reasonably foreseeable projects anticipated in the project vicinity. It is anticipated that most new sand, soil, and gravel operations would continue to be small, scattered operations most likely impacting lands not currently being used for crops or other more productive agricultural uses. There may however be some cumulative loss of agricultural land uses where farmland

soils are excavated and transported to areas outside the project vicinity for use as topsoil for lawns, landscaping, or other purposes.

Removing the soil, sand, and gravel excavation operations from the lands within the proposed intermodal facilities boundaries, and potentially in adjacent areas that could eventually become used for industrial or commercial uses, may result in beneficial cumulative impacts to farmland and soils. The reasoning is that changing the land uses, including agricultural land uses, to industrial or commercial land uses has less potential for long-term adverse impacts to farmland and soils than allowing the current soil, sand, and gravel excavations to continue in the project area. This is because most of the underlying soils, sand, and gravel would remain in place or onsite if it were used for industrial purposes and could potentially be converted back to productive agricultural land uses in the future. If the soil, sand, and gravel operations continue to expand in the somewhat random fashion that currently exists in the project area, those resources would be lost indefinitely and would not allow for most agricultural land uses to reoccur on those areas.

Continuation of Agricultural Land Use

Continuation of agricultural land uses in areas adjacent to the intermodal facilities would not result in adverse impacts to farmland or soils, other than minor loss of soils due to wind erosion. Continuation of agricultural land uses may be more likely to occur on the properties adjacent to the intermodal facilities because local farmers would have new grain storage capacity and transportation options available in the vicinity potentially providing them overall savings in grain handling and transportation activities. Therefore, the combination of the intermodal facilities project and increased likelihood that agricultural land uses would continue in adjacent areas would result in minor beneficial cumulative impacts to farmland and soils resources. Without the intermodal facilities, there is a potential that farmland in the area would gradually be taken out of production and the lands used for other purposes. If those lands would not continue to be used for agricultural purposes, there is a possibility that adverse impacts to farmland and soils would occur on those adjacent lands. This would be especially true if those lands were to be used for sand, soil, and/or gravel mining operations that would adversely impact farmland and soils resources in the long-term and not allow those resources to be replaced in the future.

Increase Existing Arkansas River Commerce

Construction of the proposed intermodal facilities would enhance commerce along the Arkansas River. Enhanced commerce on the river is not expected to impact farmland, soils, and the physical environment. Therefore, there are no cumulative impacts to farmland, soils, and the physical environment associated with implementation of this alternative combined with the increase commerce on the Arkansas River.

4.3.2.2.4 Mitigation

Because the planning for the intermodal facilities is being developed through the NEPA process including interagency involvement along with consideration of comments from

private citizens and local, state, and federal stakeholders, it is anticipated that impacts to the social, cultural, and natural environment would be minimized. This NEPA study is being conducted to help identify all potential adverse impacts early in the process, and these impacts can be identified and avoided, minimized, or mitigated to the extent practical. Mitigation for impacts is more likely to occur than if the site were developed with local or private funding that would not require the intensive planning and NEPA study as does this project that involves federal funding. If the site were to be developed without proper environmental consideration, it is likely that the anticipated impacts would be more severe and would not be mitigated for where appropriate.

Unavoidable impacts to the environment associated with construction of the intermodal facilities would be mitigated to the extent practicable. Required mitigation would be determined through continued coordination with regulatory agencies. Without NEPA, it is unlikely that this mitigation would occur and some resources would be lost with little or no chance of recovery or replacement. For example, continuation of the current soil and gravel excavation and removal operations would likely continue to expand within the project area. These excavation operations have a basic lack of planning associated with them and have a good likelihood of adversely impacting cultural resources, wetlands, soils, farmland, and aquatic resources without any consideration of the severity of the impact. These operations could result in the permanent loss of on-site resources without the appropriate identification, documentation, or mitigation ever being required or occurring. With the NEPA study being conducted for this project, every effort is being made to identify, document, protect, and mitigate as required for all resources in the area. Proper advanced planning of a development, such as the proposed intermodal facilities, is essential in order to ensure that the required environmental considerations are taken and every effort is made to avoid impacts.

To reduce impacts of soil disturbance a Sediment and Erosion Control Plan (SECP) would be implemented, and the appropriate BMPs concerning sediment control would be applied. BMPs would be used to protect surface and groundwater resources in the project area. Any accidental contamination of such resources would be remediated immediately.

4.3.2.3 Potential Farmland, Soils, and Physical Environment Consequences of the Red Alternative

Under the Green (Preferred) Alternative, impacts to farmland, soils, and the physical environment would be similar to those under the Red Alternative. However, approximately 155 fewer acres would be removed from agricultural production than under the Green (Preferred) Alternative. The NRCS identified areas of prime and unique farmland and assigned a land evaluation point rating for the proposed alternative. A site assessment evaluation was completed and point values were assigned for the project area. The build alternative alignment was rated at 166 points.

Direct, indirect, and cumulative impacts to farmland, soils, and physical environment and mitigation measures under the Red Alternative are presented in detail in Section 4.3.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.3.2.4 Potential Farmland, Soils, and Physical Environment Consequences of the Purple Alternative

The NRCS identified areas of prime and unique farmland and assigned a land evaluation point rating of 49.4 for the proposed Purple Alternative. A site assessment evaluation was completed and a point value of 116 was assigned for the project area resulting in a sum of points on the form of 165 points. Due to the steep slopes in the area, moderate short-term and long-term adverse impacts to soils in the proposed project area are expected under the Purple Alternative because soil movement would be required for the construction of various buildings, roads, and other infrastructure.

Direct, indirect, and cumulative impacts to farmland, soils, and physical environment and mitigation measures under the Purple Alternative are presented in detail in Section 4.3.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.4 SOCIAL ENVIRONMENT

4.4.1 Affected Environment

A description of the social environment for the No Action, Green (Preferred), Red, and Purple Alternative project areas can be found in Section 4.4.1 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.4.2 Consequences

4.4.2.1 Potential Social Consequences of the No Action Alternative

Under the No Action Alternative, there could be potential long-term adverse social impacts because lack of development of the area as a potential employment center could contribute to stagnant population growth in the region. Under the No-Action alternative the existing land use pattern of the project area would most likely continue.

Direct, indirect, and cumulative impacts to the social environment under the No Action Alternative are presented in detail in Section 4.4.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.4.2.2 Potential Social Consequences of the Green (Preferred) Alternative

4.4.2.2.1 Direct Impacts

There would be both direct short-term adverse social impacts due to relocations and long-term beneficial social impacts due to development and potential population growth under the Green (Preferred) Alternative. Short-term adverse impacts would include the potential displacement and relocation of six residences, one business, and one partial business relocation.

All relocations are within Census Block 5015, which has 87 housing units, 205 people, and approximately 10 minorities. Because minorities make up approximately 5% of the

population, it is not anticipated that the proposed alternatives would have a disproportionate impacts on minorities. However, some of the households may contain low-income families. As reflected in Table 4.4 of the SDEIS, the percent of persons below the poverty level within the project area (22.4%) slightly exceeds that of Pope County (15.7%) and the City of Russellville (15.6%). This equates to one of every five or six persons being below the poverty level in Pope County, the City of Russellville, and the project area. Although a house to house survey of household income was not conducted, considering what was stated above and field observations, there may be the potential for an impact on the low-income population. However, potential impacts to the low-income population would not be disproportionate.

Neighborhood and community cohesion would not be adversely impacted by implementation of the proposed project because no splitting or truncation of existing neighborhoods, communities, or business districts would occur with implementation of the Green (Preferred) Alternative. The proposed development would be aligned and associated with the adjacent Arkansas River, a significant water transportation resource currently under-utilized by the City of Russellville, Pope County, and the ARV. Proposed development under the Green (Preferred) Alternative would enhance functionality and viability of the project area, and foster interaction between the project area and the local and regional communities in the form of new transportation and employment opportunities.

Long-term beneficial social impacts could include additional population growth potentially attributable to direct and indirect employment and other opportunities afforded by the proposed intermodal facilities.

Development of the project area under the Green (Preferred) Alternative would result in long-term beneficial impacts in the provision of public services. Water line for fire protection and other services can be expanded and extended into the proposed project area as required during development phasing. The project site for the Green (Preferred) Alternative has ready access for future public services from the City of Russellville. No major adjustments in school bus routes would result from project implementation.

4.4.2.2.2 Indirect Impacts

Potential additional population growth fostered by increased employment and other opportunities afforded by the proposed facilities would require the provision of additional public services. However, the increased tax base resulting from the new development would contribute to financing the costs of these additional services.

The currently undeveloped or under-developed areas in the vicinity of the proposed project could potentially be developed residentially, especially in the areas east and north of the project area. Increased residential development would result in increased demands on local school districts as increased school enrollment would most likely occur. Additional tax revenues generated by the primary and secondary industrial, commercial, and residential developments in and around the intermodal facilities project area would provide additional funding to help offset the increased demands on schools.

Although it is anticipated that some additional railroad and truck traffic would be generated locally as trains and trucks enter and leave the intermodal facilities, it is not anticipated that the amount of increased traffic would be substantial. Therefore, it is not anticipated that any noticeable changes would occur in terms of local highway or railroad safety conditions as a result of this project. The USDOT FHWA and FRA continually strive to monitor and improve safety conditions on highways and railroads. The FRA Office of Safety promotes and regulates safety throughout the nation's railroad industry (FRA 2007). Railroads used by the intermodal facilities would be operated following all FRA guidelines to ensure any increased rail traffic generated by the intermodal facilities in the ARV region would move though the area in a safe and efficient manner. It is possible that overall safety could improve for the ARV region as a whole if more barges are used to ship products to and from the area once the efficient and modern intermodal facilities were available. Using barges to ship more products would likely reduce the number of trucks and/or trains moving in and out of the region.

The removal of agricultural land from production would have minor adverse impacts on local businesses that serve the agricultural producing sector because a small portion of their clientele would be removed. However, there would continue to be agricultural uses in the general vicinity that would continue to support those agriculture-related businesses. There is some potential that the intermodal facilities could indirectly increase agricultural production in the adjacent areas as the facilities would provide cost saving potential to local farmers by providing additional grain storage capacity and increased transportation options. These savings could entice farmers to continue to produce, or restart production, on marginal agricultural lands that may not always yield enough return to make it worthwhile to farm those lands. If new transportation savings are available, the cost/benefit ratio for farming on those lands may favor production over leaving the lands idle. This secondary increase in agricultural production could in turn help to offset some of the initial loss of business for the agriculture-related businesses from conversion of agricultural lands in the boundaries of the intermodal facilities.

4.4.2.2.3 Cumulative Impacts

Arkansas River Navigation Project

Construction of the intermodal facilities under the Green (Preferred) Alternative would allow the ARV region to take full advantage of the MKARNS resource available to the area. In addition, the potential benefits of the proposed channel deepening of the Arkansas River for commercial navigation purposes would be more fully realized by providing additional interconnection between the barges and land-based shipping options via trucks and trains. The benefits provided by interconnecting the individual transportation methods would combine to provide long-term beneficial impacts in terms of opportunities for potential social and economic growth of the region.

Industrial Development in the Arkansas River Bottoms near Russellville

Additional benefits to the social and economic environments would occur if industrial development occurs in the Arkansas River bottoms near Russellville separate from the industrial development expected as part of the intermodal facilities project. Most of the

industrial development in the Russellville bottoms in the reasonably foreseeable future is anticipated to occur within the actual intermodal facilities property as infrastructure and utilities would be provided there. Therefore, cumulative benefits from other industrial developments in the Russellville bottoms would likely be further in the future once the intermodal facilities property has reached capacity to support new developments.

Expansion of Soil and Gravel Excavation and Removal

The expansion of sand, soil, and gravel operations in the Russellville bottoms area would not provide substantial adverse or beneficial impacts to social or economic resources in the region. If anything, the impacts would tend to be adverse as the removal of sand, soil, and gravel from the properties in the area could result in those lands becoming less usable for other more productive uses in the future. Unless a large operation is developed, these impacts are expected to be minimal in the reasonably foreseeable future. If mining operations are kept from occurring on highly productive agricultural areas or prime developable lands, these operations could provide slight benefits to local social and economic resources in terms of revenues they produce and by providing the necessary components needed for construction materials, such as concrete or road materials.

Continuation of Agricultural Land Use

Continuing agricultural land uses in areas surrounding the intermodal facilities would have primarily beneficial impacts to social and economic resources in the region. Such benefits would be due to continuation of agricultural revenues from farm operations as well as continued support for local agricultural-related businesses. Also, agricultural land uses are perceived to be more aesthetically pleasing to some individuals than other more intense land uses such as industrial or commercial developments. These agricultural areas would continue to provide open space and some wildlife habitat compared to areas that become converted to industrial, commercial, or residential uses. These aspects can provide some social benefits such as outdoor recreation opportunities. Continuation of agricultural land uses in the non-levee protected portions of the Arkansas River bottoms would provide additional floodwater storage capacity during flooding events.

Minor cumulative adverse impacts in terms of air quality may occur due to dust from crop fields and from use of gravel and dirt roads used to access most of the agricultural areas in the project vicinity. Dust from those areas would be in addition to the short-term construction dust that may occur while the intermodal facilities are being developed. Reduced air quality could impact the social environment especially for residents living downwind of the agricultural areas.

In the long-term, overall dust emissions from the area would be slightly reduced as the exposed soils and gravel and dirt roads currently in the intermodal facilities area would be replaced by hardened surfaces, paved roads, and would likely contain permanent vegetation in non-developed areas. Most of the residents currently impacted by

agricultural-related dust live adjacent to the north and east of the Russellville bottoms project area. The intermodal facilities would likely be placed closer to that area thereby replacing the dusty agricultural area with the less dusty environment. Other air quality impacts associated with the intermodal facilities are unknown at this time as it is not known what types of industries may choose to locate their operations at the new facilities. Although the exact industries that would use the intermodal facilities are unknown, it is anticipated that a mixture of industrial, commercial, and warehousing activities will occur at the intermodal facilities. Potential adverse impacts to air quality for adjacent residents would be regulated by state and Federal regulatory agencies, such as the USEPA, that regulate and monitor those industries. Consequently adverse impacts, if any, would be expected to be minor.

Increase Existing Arkansas River Commerce

Under this alternative the Russellville community and the ARV would be afforded the opportunity to take full advantage of the resource available to the area. The potential benefits of the proposed channel deepening of the Arkansas River for navigation purposes and the construction of the recently completed Highway 247 bypass would be fully realized under this alternative because opportunities for potential social and economic growth of the region would be available. Additionally, there would be great potential for business expansion as well as employment and income opportunities in the region.

4.4.2.2.4 Mitigation

The displacement and relocation of the affected residences, businesses, and non-profit organizations would be addressed and minimized by the appropriate authorities. Relocation assistance would be in accordance with the *Uniform Relocation Assistance and Real Property Acquisition Act of 1970* (Public Law 91-646). It is policy of AHTD that no person shall be displaced unless and until comparable replacement housing has been provided. AHTD provides written assurance of compliance with the Public Law 91-646, and that all replacement housing is fair housing, or open and available to all persons regardless of race, color, religion, sex or national origin. AHTD relocation policy also includes construction of “Housing of Last Resort” (HLR) if comparable, decent, safe, and sanitary replacement housing is not available in the local housing market.

4.4.2.3 Potential Social Consequences of the Red Alternative

The short-term and long-term social impacts under the Red Alternative would be similar to those under the Green (Preferred) Alternative. Impacts on minority and low-income populations would also be similar to those under the Green (Preferred) Alternative. The Red Alternative would have eight potential residential relocations, one business and one partial business relocation, and one not-for-profit organization (Community Church).

Direct, indirect, and cumulative impacts to the social environment and mitigation measures under the Red Alternative are presented in detail in Section 4.4.2 of the

SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.4.2.4 Potential Social Consequences of the Purple Alternative

There would be both direct short-term adverse social impacts due to relocations and long-term beneficial social impacts due to development and potential population growth under the Purple Alternative. Short-term adverse impacts would include the potential displacement and relocation of 15 residences. Six of the residences are considered businesses, since they are family farms. Impacts would be similar to those under the Green (Preferred) Alternative.

Direct, indirect, and cumulative impacts to the social environment and mitigation measures under the Purple Alternative are presented in detail in Section 4.4.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.5 RELOCATION

4.5.1 Affected Environment

Relocation procedures for the No Action, Green (Preferred), Red, and Purple Alternative project areas can be found in Section 4.5.1 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

A detailed displacement/relocation analysis is contained in the *Relocation Technical Memorandum* located in Appendix D of the SDEIS.

4.5.2 Consequences

4.5.2.1 Potential Relocation Consequences of the No Action Alternative

Because no activities related to the proposed intermodal facilities would occur under the No Action Alternative, there would be no direct or indirect relocation impacts. However, cumulative relocation impacts may occur due to a combination of unrelated past, present, and reasonably foreseeable future projects regardless of whether the proposed intermodal facilities are built.

Direct, indirect, and cumulative relocation impacts and mitigation measures under the No Action Alternative are presented in detail in Section 4.5.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.5.2.2 Potential Relocation Consequences of the Green (Preferred) Alternative

4.5.2.2.1 Direct Impacts

Under the Green (Preferred) Alternative, there would be six residential relocations. These relocations consist of four residences on Jennings Road, one residence on Levi

Lane, and one residence on Robinson Lane. All of these potential relocations are also potential relocations under the Red Alternative.

One business and a partial business displacement would be required under the Green (Preferred) Alternative; the same businesses would also be displaced under the Red Alternative. This business consists of a private commercial horse stable on Robinson Lane south of Robinson Sand & Gravel Excavating. In addition, there would be a partial business displacement associated with the Robinson Sand & Gravel Excavating business on Robinson Lane. This latter displacement consists of a house recently converted to office space associated with the above business.

There would be no institutional or public relocations under the Green (Preferred) Alternative.

4.5.2.2.2 Indirect Impacts

Existing housing resources within the City of Russellville or the region would be necessary for relocation of the displaced households from the project area. Current vacant housing in the area would be utilized for this purpose. Several of the displaced households may be relocated into housing of higher quality and value than their existing residence under the policies and guidelines of the *Uniform Relocation Assistance and Real Property Acquisition Act.*

No additional relocations of residences or businesses are anticipated due to secondary developments induced by the intermodal facilities. Those developments would occur on properties purchased from willing sellers and would not require individuals to relocate or sell their properties if they did not desire to do so.

4.5.2.2.3 Cumulative Impacts

Relocations required due to the intermodal facilities project would be cumulative to relocations required for other known past, present, and reasonably foreseeable projects in the area. It is anticipated that there is currently enough replacement housing available in the general project vicinity to provide comparable, suitable options for the relatively few displacees. In the long-term, additional residential developments may be required in the ARV region due to the operation of the intermodal facilities, especially in areas within reasonable commuting distances. This additional housing would be required if a substantial number of new jobs become available as new industries locate their operations in the intermodal facilities industrial area or in adjacent areas. New employees for those new developments would increase demands for housing in the area. The increased populations could also result in the need for additional infrastructure improvement projects that could result in scattered relocations.

Arkansas River Navigation Project

The proposed improvements to the MKARNS would not result in any relocation impacts in the project area; therefore, no cumulative relocation impacts would occur.

Industrial Development in the Arkansas River Bottoms near Russellville

No involuntary relocations would be expected due to additional industrial development in the Arkansas River bottoms outside of the intermodal facilities boundaries. If future industrial developments occur in the area, they would likely occur on currently vacant lands or on lands bought from willing sellers that would relocate voluntarily. Therefore, no measurable cumulative relocation impacts would be anticipated due to industrial developments in the area.

Expansion of Soil and Gravel Excavation and Removal

No involuntary relocations would be expected due to expansion of sand, soil, and/or gravel mining operations in the area. If future expansions of such operations occur in the area, they would likely occur on currently vacant lands or on lands bought from willing sellers that would relocate voluntarily. Therefore, no measurable cumulative relocation impacts would be anticipated due mining operations in the area.

Continuation of Agricultural Land Use

No involuntary relocations would be expected due to continuation of agricultural land uses in the area. Therefore no cumulative relocation impacts would be anticipated due agricultural land uses in the area.

Increase Existing Arkansas River Commerce

The increase in river commerce would not result in any relocation impacts in the project area; therefore, no cumulative relocation impacts would occur.

4.5.2.2.4 Mitigation

Relocation assistance would be in accordance with the *Uniform Relocation Assistance and Real Property Acquisition Act* as amended by *the Surface Transportation and Uniform Relocation Act of 1987*. Comparable replacement housing would be provided for all displaced households under the provisions of the above laws. AHTD relocation policy also includes construction of HLR if comparable, decent, safe, and sanitary replacement housing is not available in the local housing market. HLR is presented as a relocation option by AHTD relocation agents as circumstances require. If necessary, a relocation office would be established in the vicinity of the project area at the initiation of negotiations for property acquisition.

4.5.2.3 Potential Relocation Consequences of the Red Alternative

Impacts from relocation under the Red Alternative would be similar to those under the Green (Preferred) Alternative. There would be eight residential relocations under the Red Alternative. These relocations consist of four residences on Jennings Road, three residences on or near Levi Lane, and one residence on Robinson Lane. All of the residences are single-family homes with one of the residences a farmstead associated with a farming operation. Four of the residences are mobile homes.

One business and a partial business displacement would be required under the Red Alternative; the same businesses would also be displaced under the Green (Preferred) Alternative. There would be one institutional relocation, a community church on Levi Lane, under the Red Alternative.

Direct, indirect, and cumulative impacts from relocation under the Red Alternative and mitigation measures under the Red Alternative are presented in detail in Section 4.5.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.5.2.4 Potential Relocation Consequences of the Purple Alternative

There would be fifteen residential relocations under the Purple Alternative. These relocations consist of three residences on Highway 64/Old Highway 64, four residences on county road (CR) 1650, one on CR 1670, two on CR 1631, three on CR 1638, and two on CR 1660. Approximately thirteen of the residences are single-family homes and two are mobile homes.

Six of the residences are family farm operations. Relocation payments for business reestablishment, moving costs, and other related expenses would be afforded the business owners in accordance with the *Uniform Relocation Assistance and Real Property Acquisition Act of 1970.* There would be no institutional or public relocations under the Purple Alternative.

Direct, indirect, and cumulative impacts from relocation under the Purple Alternative and mitigation measures under the Purple Alternative are presented in detail in Section 4.5.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.6 ECONOMIC

4.6.1 Affected Environment

A description of the economic environment for the No Action, Green (Preferred), Red, and Purple Alternative project areas can be found in Section 4.6.1 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

A more detailed description and analysis of the regional economy is contained in the *Community Impact Assessment Technical Memorandum* located in Appendix C of the SDEIS.

4.6.2 Consequences

4.6.2.1 Potential Economic Consequences of the No Action Alternative

The currently under-utilized and undeveloped nature of the project area would most likely remain under the No Action Alternative. The physical features of the project area

and lack of infrastructure would continue as major constraints to future development without major private or public investment.

Direct, indirect, and cumulative economic impacts and mitigation measures under the No Action Alternative are presented in detail in Section 4.6.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.6.2.2 Potential Economic Consequences of the Green (Preferred) Alternative

4.6.2.2.1 Direct Impacts

Short-term and long-term beneficial impacts due to operation of the proposed RVIF, increased employment, and increased tax revenues would occur under the Green (Preferred) Alternative. Adverse economic impacts due to loss of property tax revenues would occur under the Green (Preferred) Alternative. Short-term beneficial impacts would be realized by employment associated with the construction of the intermodal facilities. This new construction related employment would create additional personal income for the local and regional purchase of consumer goods and services during the construction period, which would most likely occur intermittently over a period of 15-20 years.

Long-term beneficial impacts would be realized by the operation of the intermodal facilities. According to an analysis of the economic feasibility of the intermodal facilities (Hamilton et al., 2002), there are over 500 potential waterway users in the ARV six-county area. These users include twelve industry classifications that have a high or medium potential for using the MKARNS. Industries included in these classifications that would benefit the most from the intermodal facilities include the following: paper and allied products; primary and fabricated metals; glass products; industrial machinery; lumber and wood products; food products; and stone, clay, and mining products. The same study identified two distinct major types of benefits of the intermodal facilities. These include cost savings to current waterway users, and the shift-of-mode benefits for cargos that would reallocate to waterborne transport from their current non-waterborne transportation (for example, shifting from long-haul trucks to barges).

Additional long-term economic benefits would be realized with increased real property and other tax revenues resulting from development of the intermodal facilities.

Property tax rates are determined by local millage (mil) rates. A mil equals one-thousandth of a dollar (.001). In Arkansas, Counties can levy up to 21 mils of property tax while cities can levy up to 20 mils. School districts must levy 25 mils at a minimum with no maximum, and their mil amounts are determined by vote. For example, a 50-mil property tax would mean you pay approximately $50 for every $1,000 in assessed value.

According to the Little Rock Port Authority, they estimate it would take approximately 20-25 years for the proposed intermodal facilities to reach complete build-out. The Little

Rock Port has approximately 55 plants on 1,500 acres, so using the same ratio, there would be approximately 33 plants on the proposed 882 acre site. Factories and warehouses range in size from 25,000-50,000 SF and build cost for the Russellville Area is approximately $50/square foot (RSMeans, 2010). Based on the following:

- an Arkansas assessment ratio of 20 percent (State of Arkansas, 2009);
- an estimated property tax rate of 21 mil for the county and 25 mil for the school district; and
- an estimated construction cost value that would be similar to the property value.

An intermodal facilities complex with a mixture of 33 factories and warehouses all 25,000 SF in size could generate a total of $2.0 million in property tax. The majority of this new tax revenue would be collected by the local school district. Since the land would be owned and leased by the Authority, tax revenues would only be generated by private improvements within the project area.

The presence of a national transportation system and central market location in the U.S. are major factors that contribute to the ARV's potential for a major freight consolidation and distribution center. A study by the USACE projected waterborne cargo flows within the six-county region "without project" and "with project" (USACE, 2001). The projections indicated that by the year 2022 over 35 percent of the total regional cargo or commodity movement would consist of waterborne transport under the "with project" versus only 14 percent under the "without project." The majority of this increase in waterborne traffic would be the result of a shift-of-mode for commodity movement. The intermodal facilities would provide for economic development of the region by offering a competitive advantage in transportation efficiencies.

Specific long-term beneficial economic impacts would be incurred with new employment associated with the intermodal facilities and the industrial, commercial, and other facilities within the project area associated directly or indirectly with the port. Development of the intermodal facilities would enhance the capacity of the region for the retention and expansion of existing industries and the attraction of new industries. It is anticipated that employment levels associated with the RVIF and four associated industries at full build-out would bring approximately 1,100 employees (Garver Engineers, 2002). The Little Rock Port encompasses approximately 1,700 acres with approximately 55 plants that employ nearly 5,000 (Latture, personal communication 2010). Utilizing the Garver Engineers research and since the proposed sites are half the size of the Little Rock Industrial Site, it is anticipated that the RVIF may employ between 1,500 and 2,500. On average, employees in the production sector in Arkansas make approximately $27,000 (USBLS, 2008). This additional direct annual employment income could range from $41 million to $68 million, with additional indirect personal income created by indirect or secondary employment generated by the intermodal facilities. The new permanent employment generated would create additional personal income for consumption of goods and services in the local and regional economy.

Short-term adverse economic impacts would be realized with the loss of tax revenue producing real property and subsequent removal from the tax rolls because of acquisition by a public entity. Under the Green (Preferred) Alternative improved and unimproved parcels with a total assessed valuation ranging between $150,000 and $160,000 would be removed from the local real property tax roll. This loss of tax revenue producing property translates into an approximate annual loss of $7,500 to $8,000 in real property tax revenue, of which approximately 90 percent would be lost from the Pottsville School District.

4.6.2.2.2 Indirect Impacts

Indirect short-term beneficial impacts would be realized in the additional jobs created both on- and off-site during construction and site development. Indirect employment would result in the form of jobs associated with the provision of supportive goods, supplies, and services necessary for the construction phase of the project. This creation of indirect employment would result in additional indirect personal income for the purchase of goods and services within the region.

Indirect long-term beneficial economic impacts would be incurred from the operations of the intermodal facilities and associated development. These impacts would be the indirect employment and personal income created because of additional business generated from the operations of the intermodal facilities. Local and regional retail and service outlets would realize increased business volume and personal income. In addition, local and regional vendors of goods and supplies for the businesses within the project area would benefit from the proposed action. A study on the impact of waterways in Arkansas estimated that indirect impacts on job creation and personal income are approximately equal to direct impacts on employment and income (Nachtmann, 2002).

Other indirect beneficial impacts could result from the potential expansion of existing businesses and development of new businesses that would have an interest in the transportation and other services offered by the intermodal facilities. In addition, development of a less expensive mode of transportation and a shift-of-mode in commodity movement could create more savings for business investment. It is also expected that land values within the vicinity of the project area would increase because of new development opportunities afforded by the intermodal facilities. This includes the potential need for residential developments needed to supply housing for increased numbers of people working in the region as increased numbers of jobs become available with the development of the intermodal facilities and any secondary growth.

The development of the project area as proposed would demand new infrastructure and public services in the project area, including water, sewer, electricity, natural gas, communication, fire, police, and EMS. Costs associated with such services include the initial construction and subsequent provision of these services. It is expected that increased property and sales tax revenues associated with new developments would help offset costs for providing such services. Development of utilities would result in the generation of additional utility franchise tax revenue.

Potential long-term indirect adverse economic impacts could be realized by the private Port of Dardanelle and the Dardanelle School District. The Port of Dardanelle is located upstream and adjacent to the proposed intermodal facilities. There is a potential for competition between the proposed public intermodal facilities and the Port of Dardanelle. Adverse impacts on the existing private port may result in loss of employment and personal income associated with the intermodal facilities and its activities. In addition, the Dardanelle School District could be adversely impacted because of the loss of real property tax revenues if the private port ceased to operate, and if no reuse of the site and facilities subsequently occurred. Currently, the Dardanelle School District receives approximately $4,500 in annual real property tax revenues from these facilities. It is anticipated that some of this loss may be offset by future residential and/or commercial developments that could occur in Dardanelle due to the proximity to the proposed intermodal facilities. Increased property values and increased property tax revenue would be expected as economic growth generated by the intermodal facilities occurs. New residents locating to the region to work at the intermodal facilities or any secondary businesses associated with the facilities may choose to live in the Dardanelle area, because commuting distance and times to the intermodal facilities would be minimal. Other local school systems would likely benefit from tax revenues generated by the intermodal facilities and associated secondary developments.

Other long-term indirect adverse economic impacts include the loss of productive farmland within the project area. Approximately 615 acres of farmland, consisting primarily of soybeans and hay, would be removed from agricultural production under the Green (Preferred) Alternative. Based on the most recent five-year average per acre yield and price/bushel data, approximately $127,000 of gross revenue from soybean production would be lost annually (USDA, 2005). In addition, there would be an annual loss of revenue from the cessation of the production and sale of hay on over 80 acres used for this purpose. The revenues generated by the intermodal facilities and associated secondary growth in the area would help offset the loss of farmland revenue.

There are reduced freight rates associated with barge transportation, especially for bulk commodities moved long distances (AHTD, 2005). Where barge transportation is available, rates of either truck or rail, particularly rail, tend to be lower. The corollary is that where barge transportation is not available, rail rates tend to be higher. Shippers are aware of this economic reality as they constantly compare transportation costs in an attempt to reduce operating expenses. Lower costs to the shipper translate into lower costs for the consumer (CARIA, 2007). By promoting use of barge transportation through provision of intermodal facilities that interconnect water transportation with other modes of transportation in the region, this project is expected to result in reduced costs for producers. Increasing the competitive value of water transportation in the area would likely help reduce costs for other modes of transportation in the region. These savings would likely be passed on to consumers eventually buying the products being shipped at the cheaper rates.

4.6.2.2.3 Cumulative Impacts

The proposed intermodal facilities would create improved and expanded transportation services in the ARV by providing for more economically efficient movement of goods by a combination of truck, rail, and water. Currently, the region is lacking shipping choices and transportation support facilities that facilitate the use of different transportation modes. The proposed facilities would result in benefits in the form of additional jobs, personal income, transportation costs savings, and other monetary returns associated with manufacturing and distribution activities. In addition, establishing the new intermodal facilities proximate to a high level of existing industries (see Table 3.4 and Figure 3.13 in the SDEIS) would be a considerable attraction for these industries to stay and/or expand their business in the region.

Potential cumulative impacts include the expansion or establishment of existing and new market areas along with greater product profits accruing from lower transportation costs.

Potential long-term, cumulative economic effects could be realized by the private Port of Dardanelle from loss of employment and personal income associated with the intermodal facilities and their activities. This assumes that the Port of Dardanelle is adversely impacted by the intermodal facilities. However, the recent improvement of Highway 247 could offset some of the potential adverse impacts associated with the intermodal facilities as the improvements to Highway 247 would provide the same types of benefits for the existing port as they would for the proposed intermodal facilities. Access to and from the existing Port of Dardanelle has been improved with the Highway 247 improvements. In addition, due to the proximity of the existing Port of Dardanelle, its facilities could potentially complement the new intermodal facilities rather than be replaced by them.

If the Port of Dardanelle is adversely impacted, the Dardanelle School District could potentially be adversely affected. The loss of real property tax revenues, approximately $4,500 annually, would occur if the private port ceased to operate and if no reuse of the site and facilities subsequently occurred. However, it is anticipated that some of this loss may be offset by future residential and/or commercial developments that could occur in Dardanelle due to the proximity to the proposed intermodal facilities. Increased property values and increased property tax revenue would be expected as economic growth generated by the intermodal facilities occurs. New residents locating to the region to work at the intermodal facilities, or any secondary businesses associated with the facilities, may choose to live in the Dardanelle area because commuting distance and times to the intermodal facilities would be minimal. Other schools, such as those located in Pottsville and Russellville, would likely benefit from increased tax revenues generated by economic growth in those areas prompted by the intermodal facilities and/or associated secondary developments.

Other long-term cumulative adverse economic effects include the loss of approximately 615 acres of productive farmland within the project area, consisting primarily of soybeans and hay that would be removed from agricultural production. Based on the most recent five-year average per acre yield and price/bushel data, approximately

$127,000 of gross revenue from soybean production would be lost annually. In addition, there would be an annual loss of revenue from the cessation of the production and sale of hay on over 80 acres used for that purpose. The revenues generated by the intermodal facilities and associated secondary growth in the area would help offset the loss of farmland revenue.

Arkansas River Navigation Project

The proposed improvements to the MKARNS and its commercial navigational uses proposed with the Arkansas River Navigation Project have a good potential to result in beneficial impacts to the ARV economy. However, unless additional intermodal connections are provided in the area, the full benefits of the project would not be realized. The intermodal facilities would ultimately combine all of the positive beneficial impacts to the ARV regional economy provided by the proposed MKARNS improvements and the recently completed Highway 247 improvements by interconnecting these available transportation modes and providing a unique facilities complex to attract additional industries to the area. Providing more freight transportation options with reduced costs and handling capacity would provide increased economic growth in the ARV region by attracting industries that would otherwise go elsewhere where such options or capacities were available.

Industrial Development in the Arkansas River Bottoms near Russellville

Additional benefits to the economic environment would occur if industrial development occurs in the Arkansas River bottoms near Russellville separate from the industrial development expected as part of the intermodal facilities project. Most of the industrial development in the Russellville bottoms in the reasonably foreseeable future is anticipated to occur within the actual intermodal facilities property because infrastructure and utilities would be provided there. Therefore, cumulative benefits from other industrial developments in the Russellville bottoms would likely be further in the future once the intermodal facilities property has reached capacity to support new developments.

Expansion of Soil and Gravel Excavation and Removal

The expansion of sand, soil, and gravel operations in the Russellville bottoms area would not provide substantial adverse or beneficial impacts to economic resources in the region. If anything, the impacts would tend to be adverse as the removal of sand, soil, and gravel from the properties in the area could result in those lands becoming less usable for other more productive uses in the future. Unless a large operation is developed, those impacts are expected to be minimal in the reasonably foreseeable future. If mining operations are kept from occurring on highly productive agricultural areas or prime developable lands, those operations could provide slight benefits to local social and economic resources in terms of revenues they produce and by providing the necessary components needed for construction materials such as concrete or road materials.

Continuation of Agricultural Land Use

Continuing agricultural land uses in areas surrounding the intermodal facilities would have primarily beneficial impacts to economic resources in the region. Such benefits would be due to continuation of agricultural revenues from farm operations as well as continued support for local agricultural-related businesses.

Increase Existing Arkansas River Commerce

Under this alternative the Russellville community and the ARV would be afforded the opportunity to take full advantage of the resource available to the area. The potential benefits of the proposed channel deepening of the Arkansas River for navigation purposes and the recent construction of the Highway 247 bypass would be fully realized under this alternative. Thus, opportunities for potential social and economic growth of the region would be available under this alternative and there would be great potential for business expansion as well as employment and income opportunities in the region.

4.6.2.2.4 Mitigation

The overall economic benefits the intermodal facilities would provide to the local and regional economies would mitigate potential adverse impacts due to losses of current revenues generated in the proposed project area. Potential long-term adverse impacts to the Port of Dardanelle can be minimized by developing mutually beneficial relationships and possibly developing cooperative agreements between the Port and the Authority.

4.6.2.3 Potential Economic Consequences of the Red Alternative

The economic impacts under the Red Alternative would be similar to those under the Green (Preferred) Alternative. However, some indirect impacts would be reduced under the Red Alternative. For example, using the same estimates and assumptions from section 2.2.2.4 of the SDEIS, there would be approximately 31 plants on the 832 acre site under the Red Alternative. An intermodal facilities complex with a mixture of 31 factories and warehouses all 25,000 SF in size could generate a total of $1.7 million in property tax (versus $2.0 million under the Green (Preferred) Alternative). In addition, approximately 155 fewer acres of soybeans would be removed from production. Based on recent five-year average yield and price data from the United States Department of Agriculture, Arkansas Statistical Office, approximately $90,000 of gross revenue from soybean production would be lost annually, or $37,000 less than under the Green (Preferred) Alternative.

Direct, indirect, and cumulative economic impacts under the Red Alternative and mitigation measures under the Red Alternative are presented in detail in Section 4.6.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.6.2.4 Potential Economic Consequences of the Purple Alternative

The economic impacts under the Purple Alternative would be similar to those under the Green (Preferred) Alternative. However, some negative impacts would be greater under the Purple Alternative because of tax revenue losses. Improved and unimproved parcels with a total assessed valuation around $1,000,000 would be removed from the local real property tax roll.

Under the Purple Alternative, approximately 450 acres of farmland, consisting primarily of cattle pasture and hay production, would be removed from agricultural production. The beneficial impacts from property tax would be smaller than the benefits under the Red and Green (Preferred) Alternative because a smaller site would be utilized. Using the same estimates and assumptions from section 2.2.2.4 of the SDEIS, there would be approximately 27 plants on the 742 acre site. An intermodal facilities complex with a mixture of 27 factories and warehouses all 25,000 SF in size could generate a total of $1.5 million in property tax.

Direct, indirect, and cumulative economic impacts under the Purple Alternative and mitigation measures under the Purple Alternative are presented in detail in Section 4.6.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.7 PEDESTRIAN AND BICYCLIST CONSIDERATIONS

4.7.1 Affected Environment

The project area is used primarily for agricultural activities and has no pedestrian or bicycle paths. The roads in the project area are used primarily to transport farm equipment. The proposed intermodal facilities would support industrial, railroad, and shipping type activities, which are not conducive to pedestrian and bicycle activities. The large machinery that would be used would be dangerous to those types of recreational activities. Therefore, no consideration is being given to the provision of pedestrian and bicycle facilities.

Due to the industrial nature of this project, no new pedestrian or bicycle routes are proposed as part of this project. No impacts would occur to existing pedestrian or bicycle routes.

4.8 AIR QUALITY

4.8.1 Affected Environment

A description of air quality for the No Action, Green (Preferred), Red, and Purple Alternative project areas can be found in Section 4.8.1 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.8.2 Consequences

4.8.2.1 Potential Air Quality Consequences of the No Action Alternative

Because no activities related to the proposed intermodal facilities would occur under the No Action Alternative, there would be no impacts to air quality.

Direct, indirect, and cumulative air quality impacts and mitigation measures under the No Action Alternative are presented in detail in Section 4.8.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.8.2.2 Potential Air Quality Consequences of the Green (Preferred) Alternative

4.8.2.2.1 Direct Impacts

No portion of this project is within a designated nonattainment area for any of the air pollutants for which the USEPA has established standards. Accordingly, a conformity determination under 40 CFR Part 93 (Criteria and Procedures for Determining Conformity to State or Federal Implementation Plans of Transportation Plans, Programs, and Projects Funded or Approved Under Title 23 U.S.C. or the Federal Transit Act) is not required.

The results of the microscale CO analysis indicate that this project would not result in any violations of either the one-hour (35.0 ppm) or eight-hour (9.0 ppm) NAAQS for CO. All of the predicted 1-hour CO concentrations are well below the NAAQS of 35.0 ppm. The highest predicted 8-hour concentration is 2.1 ppm at the intersection and below the NAAQS of 9.0 ppm. It is unlikely that this concentration level would ever be experienced by anyone, because extremely conservative assumptions were built into the modeling for this project. The most conservative assumption is the locating of receptors along the edge of the right of way, which means a person would have to be located on the right of way for 8 hours to experience the calculated maximum concentration.

As shown on Table 4.3 of the SDEIS, a localized estimated average increase of 11,196 truck loads/year is expected with use of the intermodal facilities. This increase is expected to have a very minor long-term adverse impact on air quality due to emissions. Increased barge and rail traffic would also have minor long-term adverse impacts on air quality due to emissions.

No microscale air quality models are available to calculate site specific pollutant emissions from rail vehicles. However, given the projected train volume on the site (i.e., up to one train per hour), impacts to air quality from increased rail traffic would be negligible.

Short-term direct impacts to air quality will occur during construction due to operation of construction vehicles and dust created.

4.8.2.2.2 Indirect Impacts

Although localized increases in truck traffic would occur, there would be long-term beneficial impacts to regional air quality from the intermodal facilities project because of the potential shift from truck to barge transportation. Promoting the use of barges to transport products to and from the region versus having those products shipped primarily by truck would result in beneficial impacts to air quality. This is because barges could be used to reduce the total number of trucks operating in the region. As discussed in Section 2 of the SDEIS, trucks produce much worse air quality impacts than do barges and/or trains. Therefore providing facilities that promote the use of these other alternative modes of transportation would help reduce overall air quality impacts in the region.

Short-term, indirect impacts to air quality will occur in the surrounding areas during construction due to construction equipment exhaust and dust. In the long term, it is anticipated that dust emissions within the project area would be reduced because the current agricultural practices that result in excess dust during dry periods would be removed (NRCS, 2007). Much of the dust currently generated in the project area occurs when vehicles drive on the areas gravel roads and when farm equipment is used to prepare crop fields or produce hay. If the intermodal facilities were constructed, dust emissions would be reduced because the access roads and on-site roads would all be paved. Much of the remaining land would consist of other hardened surfaces such as concrete parking lots or holding areas or would contain large warehouses or other structures. Remaining portions of the intermodal facilities would likely consist of lawns or other permanent vegetation or landscaping resulting in less exposed soils than occurs under the current conditions.

It is likely that fewer chemicals would be spayed in the project area compared to the amounts used for current agricultural purposes. Emissions from vehicles and equipment would likely be the primary air quality concerns if the intermodal facilities were constructed. Direct air quality impacts associated with the intermodal facilities were described in the DEIS. Many of the air quality impacts cannot be determined until it is known what types of industries or activities would occur on the site. Although the exact industries that would use the intermodal facilities are unknown, it is anticipated that a mixture of industrial, commercial, and warehousing activities will occur at the intermodal facilities. Local permits as well as monitoring and permitting required by state and Federal regulatory agencies would help ensure that air quality impacts are kept to the minimum possible and that no substantial long term impacts to air quality occur.

4.8.2.2.3 Cumulative Impacts

Cumulative impacts to local air quality may be somewhat beneficial in the long-term because of reduced emissions from trucks and lower dust emissions. Reduced emissions would result from promoting the use of barge and/or train transportation versus primarily truck transportation. Replacing numerous trucks with more air quality-friendly modes such as barges and/or trains would result in long term beneficial impacts to air quality.

Lower dust emissions would result from fewer gravel or dirt roads being utilized in the project area along with fewer agricultural activities, all of which can combine to result in adverse air quality impacts especially during dry periods. In addition, fewer chemicals would likely be sprayed in the area.

Arkansas River Navigation Project

The Arkansas River Navigation Project and the Intermodal Facilities projects would combine to promote increased use of barge transportation in the region. When viewed cumulatively, increased use of river transportation via barges would result in air quality improvements for the entire region.

The improved commercial navigation capabilities that would be occur on the MKARNS from the Arkansas River Navigation project would result in some increased barge traffic and possibly result in minor adverse impacts to local air quality. This would combine with increased truck traffic in the localized area adjacent to the intermodal facilities. Because the general local air quality is relatively good at this time, the cumulative impact of the increased barge and truck traffic on air quality is not expected to be substantial. The increased number of barges and trucks in the local area would not be anticipated to be substantial. The overall benefits to the regional air quality described above would negate any minor localized adverse air quality impacts. The recently improved Highway 247 would provide trucks entering and leaving the intermodal facilities with a non-congested route. This new, more efficient roadway would reduce the potential for adverse air quality impacts in the local environment.

Industrial Development in the Arkansas River Bottoms near Russellville

Additional industrial development in the Arkansas River bottoms outside of the proposed intermodal facilities development is expected to be relatively minor in the reasonably foreseeable future. Most new industrial development in the area is expected to occur in the intermodal facilities project boundaries. Therefore, potential air quality impacts from industrial development outside the intermodal facilities would be minor. Although the exact industries that would use the intermodal facilities are unknown, it is anticipated that a mixture of industrial, commercial, and warehousing activities will occur at the intermodal facilities. It is not anticipated that substantial impacts to air quality would occur as state and Federal regulatory agencies would identify and monitor potential air quality impacts as part of their permit requirements and regulatory activities.

Expansion of Soil and Gravel Excavation and Removal

It is not anticipated that expansion of soil and gravel operation in the area would have substantial cumulative impacts to air quality due to the relatively small size of the operations anticipated to occur in the area.

Continuation of Agricultural Land Use

Minor cumulative adverse impacts in terms of air quality may occur due to dust from crop fields and from use of gravel and dirt roads used to access most of the agricultural

areas in the project vicinity. Dust from those areas would be in addition to the short-term construction dust that may occur while the intermodal facilities are being developed or while other reasonably foreseeable projects are being implemented.

In the long-term, overall dust emissions from the area would be slightly reduced as the exposed soils in cultivated areas and gravel and dirt roads currently in the intermodal facilities area would be replaced by hardened surfaces, paved roads, and permanent vegetation in non-developed areas. Most of the residents currently impacted by agricultural-related dust live adjacent to the north and east of the Russellville bottoms project area. The intermodal facilities would likely be placed closer to that area thereby replacing the dusty agricultural area with the less dusty environment. Although the exact industries that would use the intermodal facilities are unknown, it is anticipated that a mixture of industrial, commercial, and warehousing activities will occur at the intermodal facilities. Potential adverse impacts to air quality for adjacent residents would be regulated by state and Federal regulatory agencies, such as the USEPA, that regulate and monitor those industries. Consequently adverse impacts, if any, would be expected to be minor.

Increase Existing Arkansas River Commerce

The increase in existing Arkansas River commerce and the Intermodal Facilities projects would combine to promote increased use of barge transportation in the region. When viewed cumulatively, increased use of river transportation via barges would result in air quality improvements for the entire region. This is due to reducing the reliance on truck transportation, which results in much higher adverse impacts to air quality than barge transportation.

Increased barge traffic would possibly result in minor adverse impacts to local air quality. This would combine with increased truck traffic in the localized area adjacent to the intermodal facilities. Because the general local air quality is relatively good at this time, the cumulative impact of the increased barge and truck traffic on air quality is not expected to be substantial. The overall benefits to the regional air quality described above would negate any minor localized adverse air quality impacts.

4.8.2.2.4 Mitigation

No violations of the NAAQS are projected for this project. Therefore, no air quality mitigation measures are required for the project improvements.

During construction the contractor must comply with all federal, state, and local laws and regulations governing the control of air pollution. Adequate dust-control measures would be maintained so as not to cause detriment to the safety, health, welfare, or comfort of any person or cause any damage to any property or business.

All bituminous and Portland cement concrete proportioning plants and crushers would meet the requirements of AHTD. For any portable bituminous or concrete plant or crusher, the contractor must apply for a permit-to-install from AHTD.

Demolition and construction activities can result in short-term increases in fugitive dust and equipment-related particulate emissions in and around the project area. (Equipment-related particulate emissions can be minimized if the equipment is well maintained.) The potential air quality impacts would be short-term, occurring only while demolition and construction work is in progress and local conditions are appropriate.

The potential for fugitive dust emissions typically is associated with building demolition, ground clearing, site preparation, grading, stockpiling of materials, on-site movement of equipment, and transportation of materials. The potential is greatest during dry periods, periods of intense construction activity, and during high wind conditions.

Dust and airborne dirt generated by construction activities would be controlled through dust control procedures or a specific dust control plan, when warranted. The contractor and the Authority would meet to review the nature and extent of dust-generating activities and would cooperatively develop specific types of control techniques appropriate to the specific situation. Techniques that may warrant consideration include measures such as minimizing track-out of soil onto nearby publicly-traveled roads, reducing speed on unpaved roads, covering haul vehicles, and applying chemical dust suppressants or water to exposed surfaces, particularly those on which construction vehicles travel. With the application of appropriate measures to limit dust emissions during construction, this project would not cause any short-term particulate matter air quality impacts.

Paving access roads and other roads within the intermodal facilities would reduce overall dust emissions from within the project area in the long-term. In addition, replacing crop fields with hardened surfaces, buildings, or permanent vegetation would potentially reduce dust emissions in the project area as well. Currently during dry periods, high winds can blow dust particles from the open, flat fields and carry them substantial distances downwind. Dust emissions can also be high when fields are being prepared for planting or being harvested or when hay is being mowed and bailed. These activities often occur when the surface of the agricultural fields is dry allowing equipment to be driven on the land. The dry surfaces allow additional dust to be transported in the air and carried downwind.

4.8.2.3 Potential Air Quality Consequences of the Red Alternative

Impacts due to implementation of the Red Alternative would be similar to those listed for the Green (Preferred) Alternative except that the long term reduction in dust emissions in the project area may be slightly better under the Green (Preferred) Alternative as more gravel roads and agricultural lands would be replaced with hardened surfaces, structures, or permanent vegetation compared to the Red Alternative.

4.8.2.4 Potential Air Quality Consequences of the Purple Alternative

Impacts due to implementation of the Purple Alternative would be similar to those listed for the Green (Preferred) Alternative.

4.9 NOISE

4.9.1 Affected Environment

A description of noise for the No Action, Green (Preferred), Red, and Purple Alternative project areas can be found in Section 4.9.1 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.9.2 Consequences

4.9.2.1 Potential Noise Consequences of the No Action Alternative

Because no activities related to the proposed intermodal facilities would occur under the No Action Alternative, there would be no impacts as the result of noise. Direct, indirect, and cumulative noise impacts and mitigation measures under the No Action Alternative are presented in detail in Section 4.9.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.9.2.2 Potential Noise Consequences of the Green (Preferred) Alternative

4.9.2.2.1 Direct Impacts

Noise impacts for this project were evaluated in accordance with the FHWA Noise Assessment Guidelines. Direct noise impacts will occur due to the increase of barge, truck, and train traffic because of the new facilities. Machinery at the facilities and dredging activities will also increase noise around the site.

Short-term increases in noise levels will occur during construction due to construction vehicles and general noise created during construction.

4.9.2.2.2 Indirect Impacts

Indirect noise impacts would occur due to an increase of traffic associated with growth in the adjacent communities attributed to the intermodal facilities and any secondary developments that may be prompted by the facilities. Construction activities associated with secondary growth and development in the area would result in short-term noise impacts around those specific developments.

4.9.2.2.3 Cumulative Impacts

Direct long-term cumulative impacts would be anticipated when the noise associated with the intermodal facilities is combined with the additional noise expected due to other reasonably foreseeable projects in the area. The increased noise levels would mainly impact the residences interspersed along Highway 247.

Arkansas River Navigation Project

Additional noise generated by the intermodal facilities, including increased barge, truck train, and equipment noise would result in some cumulative impacts with increased barge traffic noise associated with the proposed improvements to the MKARNS. These increases in barge noise would combine with existing noise in the project area from

farming and mining operations and increased noise from additional trucks using the improved Highway 247. Noise impacts from barges would not be considered substantial as total number of barges passing through the area per day would not be high, primarily because fewer barges are required to carry large quantities.

Industrial Development in the Arkansas River Bottoms near Russellville

Additional industrial development in the Arkansas River bottoms outside of the proposed intermodal facilities development is expected to be relatively minor in the reasonably foreseeable future. Most new industrial development in the area is expected to occur in the intermodal facilities project boundaries. Therefore, potential cumulative noise impacts from industrial development outside the intermodal facilities would be minor.

Expansion of Soil and Gravel Excavation and Removal

It is not anticipated that expansion of soil, sand, and gravel mining operations in the area would have substantial cumulative impacts to noise due to the relatively small size of the operations anticipated to occur in the area. Some increased truck traffic would occur with expansion of the soil and gravel excavation areas. This would combine with additional truck traffic from the intermodal facilities and the recently improved Highway 247. The additional noise impacts from mining traffic would be minimal.

Continuation of Agricultural Land Use

There would not be any additional agricultural noise in the foreseeable future above the baseline conditions. Noise from farm equipment is not expected to result in substantial noise impacts when combined with noise from other activities or foreseeable projects in the area. If anything, there could be a slight reduction in agricultural noises because some agricultural land uses would be removed from the area if the intermodal facilities are constructed in the proposed area. However, the decreases in agricultural noise would be replaced by noises associated with the intermodal facilities, which would likely be more intense than noises from farm equipment or other agricultural noise.

Increase Existing Arkansas River Commerce

The increase in noise levels from the increase existing Arkansas River commerce is expected to be relatively minor in the reasonably foreseeable future. Therefore, potential cumulative noise impacts from the increase in existing Arkansas River commerce would be minimal and would not be measurable.

4.9.2.2.4 Mitigation

Although projected noise levels at certain receptors exceed the FHWA criteria for the Build alternatives in the year 2025, no noise mitigation is proposed for this project.

The typical method of mitigating traffic noise impacts is to construct a noise barrier in the form of an earthen berm and/or vertical wall. Typically, noise abatement is only

provided for zoned residential land uses and publicly used, or non-profit, institutional structures, such as hospitals, libraries, schools, and churches.

Noise abatement could be provided for sensitive receptors projected to experience noise levels greater than 67 dBA or projected to experience a 10 dBA increase from existing noise levels. The primary source of noise at the noise receptors evaluated is from traffic along Highway 247. A noise barrier along the intermodal facilities property would not be effective at attenuating noise at the sensitive receptors, because it would not block noise from Highway 247. A noise barrier along Highway 247 would not be effective, because maintaining access to the adjacent properties would require "breaks" in the barrier, which would limit its effectiveness. Noise mitigation would also not be economically feasible for this project, because the impacted receptors are dispersed throughout the corridor, requiring an individual barrier for most of the impacted receptors.

In addition to noise barriers, other abatement measures, such as eliminating truck traffic, reducing the speed limit, or providing air conditioning and insulation were considered and found to be either unwarranted or infeasible for this project.

Construction noise impacts were also considered. As with any major construction project, areas around the construction site would likely experience varied periods and degrees of noise impact if a build alternative were constructed. Construction noise would be minimized by the use of mufflers on construction equipment. Air compressors would meet federal noise level standards and would, if possible, be located away from or shielded from residences and other sensitive noise receptors.

Where pavement must be fractured or structures must be removed, care will be taken to prevent vibration damage to adjacent structures. In areas where construction-related vibration is anticipated, basement surveys could be conducted before construction begins to document any damage caused by facilities construction.

Trucks and machinery used for construction produce noise and vibration, which may affect some land uses and activities during the construction period. Individuals inhabiting homes adjacent to the project area will at times notice construction noise and vibration from the implementation of this project. Occupants of buildings within a radius of approximately 200 feet from very specific construction equipment may perceive ground vibration effects during the operation of that equipment. These noise impacts would be temporary and would vary from day to day based on specific construction operations. Cosmetic damages are unlikely to occur to buildings situated beyond approximately 100 feet from the heaviest vibration generators. To minimize or eliminate the effects of construction noise on adjacent sensitive receptors, mitigation measures meeting state requirements should be incorporated into the standard specifications for this project.

Under normal circumstances, construction activity is typically confined to the hours between 7:00 a.m. and 6:00 p.m. on weekdays. Therefore, critical time periods in which

sleep or outdoor recreation would occur would not be subject to noise intrusion from construction activities.

There will also be noise generated from operations occurring at the proposed intermodal facilities. Predicting these noise levels accurately is not reasonable at this stage of project development. Post-construction noise levels will be measured near the intermodal facilities to determine if any noise impacts are caused by operations at the facilities.

4.9.2.3 Potential Noise Consequences of the Red Alternative

Impacts due to the implementation of the Red Alternative would be similar to those listed for the Green (Preferred) Alternative. Direct, indirect, and cumulative noise impacts under the Red Alternative and mitigation measures under the Red Alternative are presented in detail in Section 4.9.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.9.2.4 Potential Noise Consequences of the Purple Alternative

Impacts due to the implementation of the Purple Alternative would be similar to those listed for Green (Preferred) Alternative. Direct, indirect, and cumulative noise impacts under the Purple Alternative and mitigation measures under the Purple Alternative are presented in detail in Section 4.9.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.10 WATER QUALITY

4.10.1 Affected Environment

A description of water quality for the No Action, Green (Preferred), Red, and Purple Alternative project areas can be found in Section 4.10.1 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.10.2 Consequences

4.10.2.1 Potential Water Quality Consequences of the No Action Alternative

Because no activities related to the proposed intermodal facilities would occur under the No Action Alternative, there would be no direct impacts to water quality. Direct, indirect, and cumulative water quality impacts and mitigation measures under the No Action Alternative are presented in detail in Section 4.10.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.10.2.2 Potential Water Quality Consequences of the Green (Preferred) Alternative

The Green (Preferred) Alternative directly borders the Arkansas River along approximately 4,500 linear feet of riverbank. It directly borders Whig Creek along approximately 2,800 linear feet of streambank. Implementation of the Green (Preferred) Alternative would result in construction activities and facilities along the south bank of

Whig Creek. Other than the cut for the slackwater harbor, the riparian buffer along the east side of the Arkansas River would not be altered if the Green (Preferred) Alternative were implemented. The Green (Preferred) Alternative would not destroy wetlands that drain directly into Whig Creek. Those wetlands would continue to serve as filters of surface water that drain into the creek from upstream area.

4.10.2.2.1 Direct Impacts

Direct impacts due to the implementation of the Green (Preferred) Alternative would be similar to those listed for the Red Alternative. A slackwater harbor would be constructed that is hydrologically connected to the Arkansas River. Excavation of the harbor would cause some sediment to be released into the River. Proper BMPs and construction techniques would be employed so that impacts are minimal. In addition, turbidity associated with maintenance dredging could cause potential for short duration impacts to water quality in the slackwater harbor over the long term.

The potential for water quality impacts to the tributary to Whig Creek, the tributary to Flagg Lake, and Whig Creek would be slightly reduced in comparison to the Red Alternative due to the project area being shifted south away from those streams under the Green (Preferred) Alternative. In addition, construction of the levee at the Green (Preferred) Alternative site would be set back from the bank of the Arkansas River. Therefore, potential water quality impacts to the river would be less than those under the Red Alternative.

A long-term potential impact to water quality exists due to the potential for small incremental releases or large accidental spills of contaminants into the Arkansas River or Whig Creek. Because the types of materials that would be transferred or used at the proposed intermodal facilities are not known at this time, it is difficult to quantify these impacts.

Accidental spills of dissolved contaminants that enter the Arkansas River would have little or no chance of impacting the quality of water produced from the City of Dardanelle's well field, because the proposed intermodal facilities project area is located almost directly across the Arkansas River from Dardanelle. In order for contaminants to reach the groundwater supply of Dardanelle, they would have to travel almost directly horizontal across the surface waters of the river, filter through the alluvial sediments, and then flow into the groundwater aquifers. Due to the separation of groundwater on the east and west sides of the river it is assumed that any pollutants that are potentially accidentally released into the groundwater under the proposed intermodal facilities on the east side of the river would not enter into the Dardanelle aquifers on the west side of the river (AGC, 2003).

SPCC Plans would likely be required for tenants using the intermodal facilities that would potentially handle, store, or transport contaminants, such as oil. All requirements and guidelines set forth in those plans and other environmental permits would be complied with to further reduce any risks associated with accidental releases of contaminants.

Most transfers of materials to and from barges would occur within the proposed slackwater harbor area. If spills occurred in the slackwater harbor it is likely the release would be quickly identified and contained mainly within the harbor itself. Containment and remediation steps would be implemented rapidly to avoid the spread of contaminants into the main channel of the Arkansas River. If contaminants are accidentally released into the main channel of the Arkansas River, it is likely that the swift currents would quickly dilute and disperse the materials. It is unlikely that dangerous concentrations of contaminants would accumulate near public water supply areas as containment and remediation efforts would be implemented immediately following an accidental release. Any potential impacts to the public water supply would lag behind the time of an accidental release providing ample time for testing programs to become established to quantify any potential dangers to the public.

Contrary to the beliefs of many people, environmental safety may be better when materials are shipped via waterways because truck and rail spills occur more often than barge spills (USDOT, 1994). Design features of barges, such as double-hulls and navigational aids, help reduce the frequency of accidents. All new inland tank barges carrying liquid cargo now have an inner and outer hull. The United States Coast Guard (USCG) regulates the design and construction of these vessels and equipment as well as qualifications of the personnel manning them. The USCG inspects the vessels annually to ensure compliance (USDOT, 1994). Therefore, promoting the use of barge transportation would not be considered a major threat to water quality due to spills from barges.

Although the exact industries that would use the intermodal facilities are unknown, it is anticipated that a mixture of industrial, commercial, and warehousing activities will occur at the intermodal facilities. Water quality impacts associated with these industries would be associated with non-point source runoff from the businesses and potentially point source discharges for industries requiring large volumes of water. Non-point source impacts would be expected to be minor as stormwater detention ponds will be incorporated into the overall intermodal facilities design. Point source impacts would be managed via the water quality permitting process on an individual industry basis and could include NPDES permits and SPCC plans.

Use of BMPs and adherence to environmental permits would help protect groundwater resources in the area. Any accidental releases of contaminants on the site would be remediated immediately.

4.10.2.2.2 Indirect Impacts

Short-term adverse indirect impacts to aquatic habitats would occur during clearing, site preparation, and construction of the proposed RVIF. There could be short-term adverse indirect impacts to aquatic species due to reduced water quality from physical disturbances. During construction, sedimentation and soil erosion would likely increase due to soil disturbances, especially during storm events. This situation could lead to increased silt loads (suspended solids and total solids), increased turbidity, and potential for the introduction of contaminants, such as oil and grease from construction equipment. Siltation can eliminate or impair the growth of benthic fauna and fish, while

increased turbidity can impact primary production by aquatic plants and phytoplankton. Petroleum products in contaminated runoff could have direct toxic effects on the stream flora and fauna. Larval and juvenile fish would likely be the most adversely affected since they are less mobile and have a narrow range of tolerance to disturbance and pollution. In general, changes in surface water quality in tributaries to the Arkansas River from construction of the project would not be expected to cause measurable changes in the water in the Arkansas River or in the water produced from the City of Dardanelle's well field.

The riparian buffer that is present along the Arkansas River would remain under the Green (Preferred) Alternative, and the levee would be constructed east of the riparian buffer. The mature trees and shrubby vegetation would continue to intercept sediment and runoff, and would provide water quality protection during construction and every day operation of the intermodal facilities. Also, the wetlands along the tributary to Whig Creek in the northern portion of the Red Alternative would not be impacted by the Green (Preferred) Alternative. Therefore the potential for water quality impacts to the lower portion of Whig Creek would be reduced under this alternative, because the wetlands could continue to function as filters for water from the tributary to Whig Creek.

Long-term adverse indirect impacts to aquatic resources would occur from increased impervious surface area and conversion from rural to industrial use. Activities related to industrial traffic in the project area would increase the potential for chemical contaminants from equipment, such as oil and grease, to indirectly impact aquatic habitats.

Small incremental releases of contaminants, such as oils, greases, and other materials are possible during the long-term operation of the intermodal facilities. Such contaminants could indirectly impact water quality for the adjacent streams and rivers due to stormwater runoff transporting them off of the site. However, it is unlikely that major impacts to local water quality would result, because most small incremental releases would likely occur in portions of the intermodal facilities with impermeable surfaces such as pavement or concrete. These areas could be cleaned periodically to keep the contaminants from being transported through stormwater runoff from the site. Any visible concentrations or puddles of contaminants such as oils would be cleaned to keep those materials from being transported from the site with stormwater runoff. Periodic cleaning of the impervious surfaces such as pavement or concrete would further reduce the chance of such contaminants entering groundwater and potentially being transported through the alluvium adjacent to the Arkansas River.

Although Whig Creek is listed as "water quality limited," it is unlikely that the project would compound existing problems along the creek. Major impacts to Whig Creek are from municipal sewage and minor impacts are from industrial heavy metals. It is not anticipated that municipal sewage would be discharged from intermodal facilities; however, it is possible that some industrial heavy metals would occur on the site. If industries transporting such materials do choose the intermodal facilities, they would be required to obtain the necessary permits and develop the appropriate management plans. Some examples include NPDES permits and SPCC plans.

Long-term beneficial indirect impacts would also occur by eliminating the use of the project area for agriculture. Extensive agricultural usage exposes bare soil to runoff and wind erosion and increases sedimentation into aquatic resources. Chemical contamination of aquatic resources from fertilizer and pesticide would be eliminated in the project area.

4.10.2.2.3 Cumulative Impacts

Most of the potential cumulative water quality impacts associated with the reasonably foreseeable projects or activities in the area would be short-term impacts that occur during the construction phase of the project. It is not likely that construction phases for the various foreseeable projects, including the intermodal facilities, would occur at the same time. Therefore, potential impacts to water quality would likely not be substantial at any given period. Use of BMPs and mitigation efforts would likely be required for all projects requiring NPDES permits or other permits from regulatory agencies. This would help to ensure that overall water quality impacts to surface and groundwater resources in the area remain minimal.

Arkansas River Navigation Project

Activities associated with the proposed Arkansas River Navigation project could increase barge traffic on the MKARNS. An increase in barge traffic elevates the chance of spilling contaminated material, resulting in potential adverse impacts to water quality. However, contrary to the beliefs of many people, environmental safety may be better when materials are shipped via waterways, because truck and rail spills occur more often than barge spills (USDOT,1994). Design features of barges, such as double-hulls and navigational aids, help reduce the frequency of accidents. All new inland tank barges carrying liquid cargo now have an inner and outer hull. The USCG regulates the design and construction of these vessels and equipment as well as qualifications of the personnel manning them. The USCG inspects the vessels annually to ensure compliance (USDOT, 1994). Therefore, promoting the use of barge transportation would not be considered a major threat to water quality due to spills from barges.

Implementation of the MKARNS project would increase maintenance dredging on the Arkansas River, resulting in occasional increased turbidity and decreased water quality. These impacts would combine with any increased turbidity or decreased water quality associated with the intermodal facilities and any other projects or activities in the area. Anticipated use of BMPs during construction and operation of the intermodal facilities would help reduce the cumulative effect to water quality.

Industrial Development in the Arkansas River Bottoms near Russellville

It is not likely that substantial industrial development would occur outside of the intermodal facilities project area in the reasonably foreseeable future that could contribute to substantial cumulative water quality impacts in the area. It is anticipated that much of the industrial development in the reasonably foreseeable future would occur within the boundaries of the intermodal facilities due to the levee protected areas provided and the other transportation services and infrastructure that would be

provided. Impacts associated with industrial development within the intermodal facilities were discussed under the direct and indirect impacts discussions.

If additional industrial development does occur in the Arkansas River bottoms near Russellville, the potential for water quality impacts would be similar and cumulative to those of the intermodal facilities. However, as with the intermodal facilities, the exact industries that would become established are unknown, it is anticipated that a mixture of industrial, commercial, and warehousing activities would become established. Therefore, it would not be possible to accurately determine if heavy metals or other hazardous materials would be transported at the site. If a business that handled, shipped, or produced such materials built, leased, or operated a facility in the area, that business would likely be required to obtain permits such as NPDES permits and develop the appropriate management plans such as the SPCC plans mentioned earlier. Regulatory agencies would be responsible for identifying and/or monitoring water quality impacts of private industries in the area and would require compensation and remediation if any violations were observed.

Use of BMPs as well as regulations set forth in environmental permits would help protect groundwater resources in the area. Any accidental releases of contaminants on the site would be remediated immediately.

Expansion of Soil and Gravel Excavation and Removal

Expansion of sand, soil, and gravel mining operations in the project vicinity would result in increases in water quality impacts. The mining operations would primarily result in increased erosion due to exposed soils and/or increased runoff and sedimentation into adjacent streams in the area. Most of the mining operations would likely occur in areas separated from streams or rivers by vegetation buffers or other areas that would help to filter sediments or slow surface drainage leaving those areas. Adverse impacts to water quality associated with the mining operations would be cumulative to any water quality impacts associated with the intermodal facilities project and any other reasonably foreseeable activities or projects in the area that could also impact water quality.

Continuation of Agricultural Land Use

Continuation of agricultural land uses in the project vicinity would result in continued potential for cumulative adverse impacts to water quality. Agricultural land uses would continue to contribute to water quality impacts due to contaminated runoff from agricultural fields that may include fertilizers, pesticides, herbicides, or other pollutants. These water quality impacts would be cumulative with other water quality impacts associated with reasonably foreseeable projects in the project vicinity. Due to the past and present agricultural land uses and past water quality reductions in the area, it is not likely that substantial additional water quality increased would occur, even with the cumulative effect of the foreseeable projects.

In some streams in the project area, construction of the intermodal facilities could potentially increase water quality in the long-term as the agricultural land uses would be

replaced by other uses. It is possible that the uses of the land in the intermodal facilities may not result in as severe of water quality issues as the present agricultural uses. However, this cannot be determined at this time because it is not known what industries may utilize the property or how the streams would be directly impacted during construction of the project. It is possible that further protection may be provided for the streams in the area, because regulatory agencies may have additional jurisdiction over the proposed industrial uses than they currently have over certain agricultural and small mining practices presently occurring on the lands.

Increase Existing Arkansas River Commerce

Construction of the proposed intermodal facilities would enhance commerce along the Arkansas River. Enhanced commerce on the river is not expected to measurably impact water quality. Therefore, there are no cumulative impacts to water quality associated with implementation of this alternative combined with the increase in commerce expected on the Arkansas River.

4.10.2.2.4 Mitigation

It is expected that the combined use of water quality protection measures during construction and appropriate mitigation measures would result in no overall reduction in the long-term water quality.

Although short-term and long-term adverse impacts would be anticipated, BMPs would be followed to reduce or mitigate for the overall impact to water quality. Water quality protection measures that would be followed are described in the following documents:

- Reducing Nonpoint Source Water Pollution by Preventing Soil Erosion and Controlling Sediment on Construction Sites (Smoot et al., 1992);
- FHWA BMPs for Erosion and Sediment Control (FHWA, 2007).

Examples of stream protection measures that may be used include the following:

- When possible, streamside and in-stream construction activities would be performed during dry periods, when stream flow is at a minimum.
- The unnecessary removal of existing vegetation would be avoided as much as possible. Canopy removal along all working or staging areas would be limited to the extent practicable.
- Where removal of vegetation is necessary, bank stabilization and sediment control measures would be employed immediately at the start of construction. Bank stabilization measures would include seeding with native species and placing of silt fences or rip-rap.
- Control structures would be inspected and properly maintained throughout the life of the project.

Specific mitigation measures for this project would be developed during the permit acquisition process once final design plans have been developed, but prior to any construction activities. All construction activities and associated mitigation requirements would need to be approved by the appropriate agencies responsible for protecting water resources in the project area. Continued coordination with appropriate regulatory agencies would occur during final planning and construction of the project and extend through required monitoring periods that may be established during the initial permit acquisition process.

An NPDES permit would be required for all construction activities and would also be required for the future facilities whose operations include discharges. In addition, an SPCC plan would be developed for both the construction process and for operations of the facilities after construction.

Design features of barges, such as double-hulls and navigational aids, help reduce the frequency of accidents. All new inland tank barges carrying liquid cargo now have an inner and outer hull. The USCG regulates the design and construction of these vessels and equipment as well as qualifications of the personnel manning them. The USCG inspects the vessels annually to ensure compliance (USDOT, 1994). Therefore, promoting the use of barge transportation would not be considered a major threat to water quality due to spills from barges.

4.10.2.3 Potential Water Quality Consequences of the Red Alternative

The Red Alternative directly borders the Arkansas River along approximately 6,250 linear feet of riverbank. It directly borders Whig Creek along approximately 3,309 linear feet of streambank. It is within 135-600 feet of Whig Creek along an additional 3,115 feet of streambank. The Red Alternative would have construction activities and facilities along the south and east banks of Whig Creek. Currently, the area on the east bank of Whig Creek is not in agricultural production and is serving as a riparian buffer. This riparian buffer would be impacted if the Red Alternative is implemented. The Red Alternative would also remove several wetlands that drain directly into Whig Creek. These wetlands are serving as filters of surface water that drain into the creek from upstream areas and as wildlife habitat.

Impacts from implementation of the Red Alternative would be similar to those listed for the Green (Preferred) Alternative. However, the potential for water quality impacts to the tributary to Whig Creek, the tributary to Flagg Lake, and Whig Creek would be slightly greater under the Red Alternative. A railroad bridge would be constructed across Whig Creek under the Red Alternative that could cause short-term construction activity-related adverse impacts to the creek. Adverse impacts related to the railroad bridge would be minimized using BMPs and would not be substantial. Direct impacts to Whig Creek would be minimal, because the project area occurs near the creek's confluence with the Arkansas River. The majority of Whig Creek lies upstream of the project area.

Potential channel modification would be required for the tributary to Whig Creek and the tributary to Flagg Lake in the northern portion of the Red Alternative. These

modifications could reduce water quality in those streams, and the streams and water bodies they flow into such as Whig Creek and Flagg Lake. In addition, implementation of this alternative would include building a levee along the Arkansas River bank with no riparian buffer, which could result in long-term impacts to the river.

Direct, indirect, and cumulative water quality impacts and mitigation measures under the Red Alternative are presented in detail in Section 4.10.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.10.2.4 Potential Water Quality Consequences of the Purple Alternative

The Purple Alternative directly borders the Arkansas River (Lake Dardanelle) along approximately 4,200 linear feet of riverbank. Implementation of the Purple Alternative would result in construction of an access road and railroad bridge across two unnamed tributaries. One of these tributaries drains into the Lake Dardanelle State Fish Hatchery, and the other tributary drains into a larger embayment on Lake Dardanelle that lies east of the Fish Hatchery. Although 34.5 acres of riparian forested buffer would be protected along the north side of the Lake Dardanelle shoreline, approximately 53 acres of riparian forest would be removed just north of the buffer if the Purple Alternative was implemented. Less than 4 acres of wetlands would be removed under the Purple Alternative.

Direct, indirect, and cumulative water quality impacts and mitigation measures under the Purple Alternative are presented in detail in Section 4.10.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.11 WETLANDS

4.11.1 Affected Environment

A description of wetlands for the No Action, Green (Preferred), Red, and Purple Alternative project areas can be found in Section 4.11.1 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.11.2 Consequences

4.11.2.1 Potential Wetlands Consequences of the No Action Alternative

Because no activities related to the proposed intermodal facilities would occur under the No Action Alternative, there would be no impacts to wetlands. Direct, indirect, and cumulative wetland impacts and mitigation measures under the No Action Alternative are presented in detail in Section 4.11.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.11.2.2 Potential Wetland Consequences of the Green (Preferred) Alternative

4.11.2.2.1 Direct Impacts

Wetlands 1, 2, 7, 8, and 9 (see Section 4.11.1 of the SDEIS for a description of these wetlands) are located in the Green (Preferred) Alternative proposed project area. In total, these wetlands comprise 17.76 acres. With the exception of Wetland 1, it is likely that these wetlands would be regulated by the USACE. The hydrology for Wetland 1 is derived from unnatural sources and it would be considered atypical.

It is likely that unavoidable direct long-term adverse impacts would occur to wetlands during the construction phase of the proposed action. Removing wetlands from a watershed removes the wetland's ability to store floodwaters, provide wildlife habitat for aquatic flora and fauna, and filter storm water runoff. The total number of wetland acres adversely impacted by implementing the Green (Preferred) Alternative would be determined using the final site development plans. Table 4.1 shows the wetland impacts of the Green (Preferred) Alternative.

The Authority would complete all Section 404 and 401 permitting requirements in consultation with the ADEQ, USACE, and the USEPA in accordance with the CWA prior to construction of the intermodal facilities under the Green (Preferred) Alternative. As part of the Section 404 permitting process, attempts would be made to avoid, minimize, or mitigate impacts to wetlands. Proper mitigation would be developed in accordance with USACE permit requirements as described in Section 4.11.2.2.4.

Table 4.1. Wetland Impacts from the Green (Preferred) and Red Alternatives for the River Valley Intermodal Facilities EIS*

	Green (Preferred) Alternative		Red Alternative	
Wetland#	**Acres Directly Impacted**	**Acres Indirectly Impacted**	**Acres Directly Impacted**	**Acres Indirectly Impacted**
1	0.83	0	0.83	0
2	0.06	0	0.06	0
3	0	0	1.92	0
4	0	0	0.91	0
5	0	0	4.84	0
6	0	0	6.13	0
7	1.46	0	1.46	0
8	0.60	0	0	0.60
9	14.81	0	4.47	10.34
Total Acres	**17.76**	**0**	**20.62**	**10.94**

Source: Parsons, 2005 and Parsons, 2010.

*Complete wetland data for the Purple Alternative is not available due to property entry restrictions; however the total impact would be less than four acres.

4.11.2.2.2 Indirect Impacts

Indirect short- and long-term adverse impacts from soil disturbance and surface runoff during construction of the Green (Preferred) Alternative intermodal facilities could occur to nearby wetlands. Increases to impervious surfaces associated with the proposed action would increase the opportunity for storm water runoff and soil erosion to have long-term impacts to the wetlands. To minimize short- and long-term impacts to surface water from storm water runoff and soil erosion, appropriate BMPs concerning sediment control would be applied.

4.11.2.2.3 Cumulative Impacts

Arkansas River Navigation Project

The MKARNS channel deepening or maintenance associated with the Arkansas River Navigation project would not measurably impact wetlands in the project area. Therefore, no cumulative impacts to wetlands are anticipated due to that project.

Industrial Development in the Arkansas River Bottoms near Russellville

It is unlikely that substantial industrial developments would occur outside of the proposed intermodal facilities boundaries within the reasonably foreseeable future. This is because the intermodal facilities project would attract new industries to lands within the boundaries first due to the infrastructure, utilities, levee protection, and transportation options provided in that area. Therefore, the potential for cumulative impacts to wetlands is low. If industrial growth does occur adjacent to the intermodal facilities in the future, there would be potential for adverse impacts to wetlands, especially the small scattered wetlands located in the existing floodplains surrounding the proposed project boundaries. It would be important for regulatory agencies to monitor the industrial growth in the area to make sure that all wetland impacts are identified and that all new developments comply with wetland regulations. USACE would likely have jurisdiction over those wetlands and would require Section 404 permits for impacts to them. If Section 404 permits are provided, it is likely that impacts would be mitigated properly and overall cumulative impacts to wetlands would be relatively minor.

Expansion of Soil and Gravel Excavation and Removal

Expansion of soil, sand, and gravel mining operations would have potential adverse cumulative impacts to wetlands. Mining operations can adversely impact hydrology for adjacent wetlands due to changes in groundwater and/or surface drainage as soils and other substrates are removed from an area. Excavated areas may be deeper than the water table and may therefore drain an area as water flows into the excavated area from surrounding land. If wetlands are present in those adjacent areas, the moisture needed to maintain hydric soil conditions and to support hydrophytic vegetation would be lost. Impacts to wetlands from mining operations would be cumulative to other wetland impacts that have resulted from impacts to wetlands associated with the intermodal facilities and other past, present, or reasonably foreseeable future projects or

activities. However, due to the small size of most of the mining operations anticipated to occur in the area, and the number of wetlands remaining in the floodplains surrounding the Green (Preferred) Alternative, it is not likely that substantial cumulative impacts to wetlands would occur.

Continuation of Agricultural Land Use

Continuation of agricultural land uses in the project area is not likely to result in a substantial amount of additional wetland impacts beyond those past impacts that initially occurred when the lands were converted to such uses. It is likely that much more wetland habitat was present in the Arkansas River floodplain within the project area prior to the area being converted to farmland. Small pockets of wetlands remain scattered in swales running parallel to the Arkansas River within the floodplain areas. It is likely that those areas will remain as they provide drainage for the adjacent crop fields. Therefore, it is not anticipated that any new substantial wetland impacts would occur due to agricultural practices in the area.

Increase Existing Arkansas River Commerce

Increases in the amount of commerce along the Arkansas River could lead to additional infrastructure along the river to support increased barge traffic that would be transporting goods and materials. It is unlikely that developments would occur outside of the proposed intermodal facilities boundaries within the reasonably foreseeable future because the intermodal facilities project would attract new industries within the boundaries first due to the infrastructure, utilities, levee protection, and transportation options provided in that area. Therefore, the potential for cumulative impacts to wetlands is low. If infrastructure along the river does occur adjacent to the intermodal facilities in the future, there would be potential for adverse impacts to wetlands, especially the small scattered wetlands located in the existing floodplains surrounding the proposed project boundaries. It would be important for regulatory agencies to monitor the infrastructure growth in the area to make sure that all wetland impacts are identified and that all new developments comply with wetland regulations. USACE would likely have jurisdiction over those wetlands and would require Section 404 permits for impacts to them. If Section 404 permits are provided, it is likely that impacts would be mitigated properly and overall cumulative impacts to wetlands would be relatively minor.

4.11.2.2.4 Mitigation

Mitigation measures would be required to reduce impacts to wetlands in the event jurisdictional wetland avoidance is not possible. The Authority would complete all Section 404 and 401 permitting requirements in consultation with the ADEQ, USACE, and the USEPA in accordance with the CWA prior to construction of the intermodal facilities. As part of the Section 404 permitting process, attempts would be made to avoid, minimize, or mitigate impacts to wetlands. Proper mitigation would be developed in accordance with USACE permit requirements.

Avoiding Impacts

Avoidance of wetlands impacts would be applied to the greatest extent practicable. The potential for impacts to wetlands was one of the factors considered in the selection of the preferred alternative. Context sensitive design would be employed, where possible, to avoid jurisdictional wetlands. Proposed measures for avoiding impacts to wetlands include the following elements:

- Avoidance of riparian and wetland zones would be used to the fullest possible extent to prevent impacts to these resources by reconfiguring the facilities or selective routing around jurisdictional wetland areas.

- Scheduling of construction activities and grading, to the extent practicable, would coincide with dry periods or low-flow conditions.

- In order to avoid disturbance of wetland/riparian soils and vegetation outside of the alternative project area, wetland boundaries would not be crossed by vehicles or other equipment. A construction corridor through any wetland or riparian area would be temporarily fenced to prevent disturbances (including operation of equipment and trucks, storage of material, and other construction activities) outside of the corridor.

- Sediment traps (e.g., straw bales, filter fabric fences, and siltation berms) located down-gradient from construction areas can be used to intercept eroded soils and sediments transported toward adjacent streams, wetlands, and floodplains during storm events.

- Material stockpiles (sand, gravel, and other construction materials) would not be in unprotected floodplains and wetlands and, if necessary, would be contained or enclosed by berms to prevent transport of materials into streams and wetlands.

Minimizing Impacts

Where wetland impacts are unavoidable, impact minimization measures would be enacted to reduce the potential effects as much as possible. For high-value or unique wetlands, impact minimization would be particularly important. Some potential measures to minimize wetland impacts include:

- Employing construction practices that reduce soil erosion (such as sediment traps and scheduling constraints) and minimize vegetation losses.

- Existing drainage patterns within the project area would be maintained uninterrupted, to the extent practicable.

- The width of roads through wetland areas would be minimized as much as possible to reduce the overall extent of wetland damages.

- The amount of vegetation removal would be minimized in wetlands and riparian areas.

- Disturbed areas in wetlands and riparian areas would be revegetated with native species or species similar to those that were present on the wetland before site alterations occurred.

Impact Compensations

A wetland mitigation and monitoring plan would be prepared to compensate for unavoidable wetland losses or damages. This plan would focus on wetland restoration and or creation off site or at the perimeter of the project. Minor impacts to wetlands may be mitigated on site.

The size, habitat type, and the functional value of each wetland was used to determine the mitigation feasibility for each wetland. The mitigation feasibility of each wetland present in the Green (Preferred), Red, and Purple Alternatives is shown in Table 4.10 of the SDEIS. For example, small wetlands with herbaceous vegetation and low functional values would be easier to mitigate than a large tract of mature bottomland hardwoods with high functional values. Small wetlands with low functional values tend to receive "High" Mitigation Feasibility scores while wetlands that are large and have high functional values receive "Low" scores. The following potential actions may be employed as compensation measures for wetland losses or impacts.

- The functions and values to be replicated would be coordinated with resource and permitting agencies. Specific functions to be enhanced or restored would be included in the Section 404 Permit.
- Restoration efforts would include revegetating areas denuded during construction with either seeding, sprigging, transplanting, or covering barren areas with wetland soils (natural seed bank) salvaged from wetlands filled elsewhere in the project area. The specific methods of site regeneration would vary according to site size and desired vegetation type.
- A wetland monitoring plan would be developed and implemented to insure the success of the wetland mitigation process and to confirm the accomplishment of intended goals.
- Permit conditions and mitigation plans would be coordinated with state and federal resource and permitting agencies.

4.11.2.3 Potential Wetland Consequences of the Red Alternative

The entirety of Wetlands 1, 2, 3, 4, 5, 6, and 7 and a portion of Wetland 9 are located in the Red Alternative proposed project area. In total, these wetlands comprise 20.62 acres. With the exception of Wetland 1, it is likely that these wetlands would be regulated by the USACE. The hydrology for Wetland 1 is derived from unnatural sources, and it would be considered atypical. Table 4.1above shows the wetland impacts of the Red Alternative.

Direct, indirect, and cumulative wetland impacts and mitigation measures under the Red Alternative are similar to those under the Green (Preferred) Alternative and are presented in detail in Section 4.11.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.11.2.4 Potential Wetland Consequences of the Purple Alternative

The only wetland identified in the Purple Alternative was the wetland fringe along the Lake Dardanelle embayment. It is likely that this area would be considered jurisdictional and would be impacted/removed during construction of the slackwater harbor under the Purple Alternative. The total impact would be less than four acres. If other wetlands were found in the project area during a delineation, these wetlands could be directly impacted by the proposed action. Based upon field observations, it is likely that there are no seeps, springs, or other meaningful wetlands in the upland areas of the Purple Alternative.

Direct, indirect, and cumulative wetland impacts and mitigation measures under the Purple Alternative are similar to those under the Green (Preferred) Alternative and are presented in detail in Section 4.11.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.12 WATER BODY MODIFICATION, WILDLIFE, AND VEGETATION

4.12.1 Affected Environment

A description of water body modification, wildlife, and vegetation for the No Action, Green (Preferred), Red, and Purple Alternative project areas can be found in Section 4.12.1 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.12.2 Consequences

4.12.2.1 Potential Water Body, Wildlife, and Vegetation Consequences of the No Action Alternative

Because no activities related to the proposed intermodal facilities would occur under the No Action Alternative, there would be no direct impacts to water bodies, wildlife, or vegetation under this alternative. Direct, indirect, and cumulative water body, wildlife, and vegetation impacts and mitigation measures under the No Action Alternative are presented in detail in Section 4.12.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.12.2.2 Potential Consequences of the Green (Preferred) Alternative on Water Bodies, Wildlife, and Vegetation

4.12.2.2.1 Direct Impacts

Impacts to riparian forests and wetlands would be reduced under the Green (Preferred) Alternative in comparison to the Red Alternative because the levee along the Arkansas River side of the intermodal facilities would be set back under the Green (Preferred)

Alternative in order to preserve the forested riparian buffer. In addition, the Green (Preferred) Alternative would not impact wetlands and riparian forests located near the confluence of the tributary to Whig Creek and Whig Creek. This overall reduction in loss of riparian forest and higher quality wetlands would substantially reduce the overall impacts to water bodies, wildlife, and vegetation. This protection of wetlands adjacent to streams and riparian corridors would continue to help provide natural water quality protection and wildlife habitat along Whig Creek, the tributary to Whig Creek, and the Arkansas River.

Direct long-term adverse impacts to wildlife would occur because of the permanent loss of old field, grassland, forest, wetlands, and cropland habitats. This habitat would be replaced primarily with non-vegetated surfaces that would provide little or no wildlife habitat.

Construction of the proposed intermodal facilities harbor and channel, along with subsequent maintenance dredging, would result in short-term increases in sedimentation in the Arkansas River. Impacts due to dredging activities are not expected to be substantial as only a minor amount of dredging would be required at this location due to the proximity of the harbor location to the main navigable channel of the river. Dredge disposal sites would be located in approved locations.

Barge fleeting operations may occur along the left descending bank of the Arkansas River upstream of the proposed harbor location. This would result in increased disturbance to wildlife along the shore of the river and potential increases in streambank erosion due to shifts in river currents around barges and increased usage of the river banks to get to and from barges.

Direct mortality may occur to wildlife during the construction phase of the project, especially in less mobile species, such as turtles, newly hatched birds, invertebrates, and various other species. Because much of the project area is actively farmed, direct mortality is expected to be minor because the majority of the land is in row-crops that are not used extensively by many species. Species that do tend to use crop fields are often more mobile species that would be capable of fleeing the area during construction. Removal of habitat during the winter months would be most beneficial to species protected under the MBTA.

There would be a long-term potential for minor releases of environmentally harmful substances, such as chemicals and fuels, because these substances would be transported through the intermodal facilities and could cause direct impacts to water bodies and wildlife if spilled near water. Such releases could result in short-term adverse impacts to fish and wildlife in the area and their habitats. All efforts would be made to ensure that safe handling of materials occurs within the intermodal facilities and that a quick clean-up response was achieved, if a release were to occur.

4.12.2.2.2 Indirect Impacts

Removal of riparian forests and wetlands during construction of the intermodal facilities could result in impaired water quality and decreased habitat quality for aquatic species.

Lower water quality could result from erosion, streambank instability, and loss of canopy cover over the streams. Removing canopy cover could result in localized increased water temperatures, thereby making the stream uninhabitable by some species. The loss of wetlands, which currently filter excess nutrients, sediments, and contaminants from the water, could also impair aquatic habitats adjacent to the area.

During construction of the proposed intermodal facilities harbor and channel, short-term adverse impacts from increased in sedimentation in the Arkansas River may occur. Maintenance dredging could result in repeated short-term increases in sedimentation in the Arkansas River. These impacts are not expected to be substantial as only a minor amount of dredging would be required at this location due to the proximity of the harbor location to the main navigable channel of the river. Dredge disposal sites would be located in approved locations where runoff and sedimentation are less likely to occur.

There would be a long-term potential for releases of environmentally harmful substances, such as chemicals and fuels, because they would potentially be transported through the intermodal facilities and could cause indirect impacts to water bodies and wildlife if spilled near water. Such releases could result in short-term adverse impacts to fish and wildlife in the area and their habitats. All efforts would be made to ensure that safe handling of materials occurs within the intermodal facilities and that a quick clean-up response was achieved, if a release were to occur.

4.12.2.2.3 Cumulative Impacts

Construction of the intermodal facilities would result in minor cumulative adverse impacts to water bodies, wildlife, and vegetation due to modifications to water bodies and removal of wildlife habitats. Proposed water body modifications, such as construction of a new railroad bridge over Whig Creek, construction of the levee system, and dredging in the Arkansas River, would combine with modifications associated with past, present, and reasonably foreseeable projects in the area. The main cumulative impacts would be due to the removal of riparian forests and wetlands associated with the existing water bodies causing decreased water quality and reduced stream bank integrity in those areas. The loss of riparian forest and wetlands would reduce wildlife habitat in the area. The loss of riparian forests and wetlands from project implementation would accumulate with past loss of riparian forest associated with agricultural practices and other activities that have occurred in the area.

The cumulative impacts to water bodies, wildlife, and vegetation under the Green (Preferred) Alternative would be substantially reduced compared to those under the Red Alternative because the Green (Preferred) Alternative would protect riparian forests and wetlands adjacent to the streams that would be impacted in the northern portion of the Red Alternative. Protection of these areas would allow them to continue to provide wildlife habitat and other natural values.

Arkansas River Navigation Project

Dredging and excavation operations are expected during construction of the intermodal facilities harbor and adjacent channel. Future maintenance dredging would frequently

occur for short durations. Impacts from these short-term operations could result in minor short-term cumulative impacts to water bodies and aquatic wildlife. The maintenance dredging operations for the intermodal facilities would combine with the long-term maintenance dredging in the Arkansas River as part of the Arkansas River Navigation project to result in slight increases in overall turbidity and sedimentation downstream of the site. These impacts would likely be temporary and occur primarily during and immediately following active dredging operations. Impacts would be more pronounced if dredging for the intermodal facilities is conducted at the same time as other dredging activities being conducted as part of the MKARNS maintenance dredging. Coordination of efforts between proponents of the dredging projects would help to minimize cumulative impacts associated with the separate projects. If possible dredging could be completed at different times to reduce the amount of sediments released into the water column at any one time.

Industrial Development in the Arkansas River Bottoms near Russellville

If the intermodal facilities are constructed, it is less likely that substantial industrial development would occur in the Arkansas River bottoms near Russellville outside of the intermodal facilities boundaries in the foreseeable future. Therefore, potential for cumulative impacts to water bodies, wildlife, and vegetation resources is considered low. However, if the lands in the project area are developed into an industrial site in the future it would likely be with local and/or private funding. NEPA documentation would not be required for that type of development to occur. Therefore, the land could be developed without a substantial study of the environmental consequences of the activities. This situation could elevate the probability that more substantial water body, wildlife, and/or vegetation impacts would occur due to less avoidance, minimization, or mitigation efforts. Regulatory agencies, such as the USACE, would require disclosure of impacts and permits for any construction that impacts waters of the U.S. including streams and jurisdictional wetlands. Therefore, it is not anticipated that substantial cumulative impacts to water bodies, wildlife, or vegetation would occur with development in the area, unless development was somehow completed without compliance with environmental regulations and no mitigation occurred. If stream corridors and higher quality wetlands are avoided by industrial developments, fish and wildlife species using those habitats would also be protected.

Expansion of Soil and Gravel Excavation and Removal

The expansion of soil, sand, and gravel operations in the project area would result in some additional cumulative impacts to water bodies, wildlife, and vegetation resources, primarily due to erosion and sedimentation in nearby streams and/or wetlands. Erosion from the non-vegetated mining areas may result in sediments being carried into nearby streams and adversely impacting aquatic species. Sedimentation can reduce the quality of aquatic habitats making them less productive for aquatic organisms. Sediments can also cause reproduction failure for some aquatic species. Mining operations may also result in the loss of terrestrial habitats, such as old fields, grasslands, or forests that provide beneficial habitat for various wildlife species.

Continuation of Agricultural Land Use

The continuation of agricultural land uses in the project area would not result in major changes to water bodies, wildlife, or vegetation resources from baseline conditions. Therefore no substantial cumulative impacts would be anticipated. The agricultural land uses would continue to adversely impact aquatic habitats due to agricultural contaminants entering streams. The replacement of some of the agricultural lands by the intermodal facilities may reduce agricultural related contaminants in the project area. However, new contaminants could potentially be introduced to the area due to industrial uses. These impacts cannot be predicted at this time. It is likely that long-term cumulative impacts to water quality in the area would remain relatively neutral, as benefits achieved by reducing the agricultural contaminants would likely be offset by adverse impacts associated with industrial contaminants. Use of BMPs and compliance with environmental regulations would help reduce the chances of long-term adverse impacts to water quality and the resultant affects on fish and wildlife resources.

Continuation of row-crop farming practices would continue to provide only limited wildlife habitat in the areas adjacent to the intermodal facilities. Crop fields would benefit a small suite of species, primarily game species such as deer, turkey, doves, and geese. Maintaining scattered old fields, fence rows, and the small forested or shrub-scrub wetlands scattered in between the crop fields would help maintain habitat for several other species in the project vicinity. It is likely that at least some wildlife habitats would be maintained within the boundaries of the intermodal facilities that would provide at additional, but likely lower quality habitat for some species.

Increase Existing Arkansas River Commerce

Increases in existing Arkansas River commerce would lead to increases in barge traffic on the river, which would have minor long-term adverse impacts to water bodies, wildlife, and vegetation, but these impacts would not be substantial. Infrastructure to support this increase in barge traffic would be necessary. If the intermodal facilities are constructed, it is less likely that substantial infrastructure development to support barge traffic would occur in the Arkansas River bottoms near Russellville outside of the intermodal facilities boundaries in the foreseeable future. Therefore, potential for cumulative impacts to water bodies, wildlife, and vegetation resources is considered low. Regulatory agencies, such as the USACE, would require disclosure of impacts and permits for any construction that impacts waters of the U.S. including streams and jurisdictional wetlands. Therefore, it is not anticipated that substantial cumulative impacts to water bodies, wildlife, or vegetation would occur with development along the Arkansas River, unless development was somehow completed without compliance with environmental regulations and no mitigation occurred. If stream corridors and higher quality wetlands are avoided by developments, fish and wildlife species using those habitats would also be protected.

4.12.2.2.4 Mitigation

The impacts discussed in this FEIS presume that all resources within the intermodal facilities boundaries would be lost or impacted (worst-case scenario). Where possible,

efforts would be made to preserve the most sensitive habitats, such as the higher quality wetlands and stream corridors during final design of the intermodal facilities. Whenever possible, impacts to water bodies, wildlife, and vegetation would be avoided and minimized.

It is expected that the combined use of water quality protection measures during construction and appropriate mitigation measures would result in a reduction in potential impacts to water bodies, wildlife, and vegetation. Although short-term and long-term adverse impacts would be anticipated, BMPs would be followed to mitigate for the overall impact to water bodies, wildlife, and vegetation. When possible, streamside and in-stream construction activities would be performed during dry periods, when stream flow is at a minimum. The removal of existing vegetation would be avoided as much as possible and would occur in winter months to avoid impacts to migratory bird species. Canopy removal along all working or staging areas would be limited to the extent practicable. Where removal of vegetation is necessary, bank stabilization and sediment control measures would be employed immediately at the start of construction. Bank stabilization measures would include seeding with native species and placing of silt fences or rip-rap. Control structures would be inspected and properly maintained throughout the life of the project. An SPCC plan would be developed for both the construction process and for operations of the facilities after construction.

The RVIF at the Green (Preferred) Alternative location would be constructed away from the riparian zone along the Arkansas River. The levee for the Green (Preferred) Alternative would be located away from the river and would not disturb trees and other vegetation along the river. The Green (Preferred) Alternative would also avoid disturbing the higher quality riparian wetlands along a tributary to Whig Creek and a tributary to Flagg Lake.

4.12.2.3 Potential Consequences of the Red Alternative on Water Bodies, Wildlife, and Vegetation

The impacts to water bodies, wildlife, and vegetation due to construction of the intermodal facilities under the Red Alternative would be similar to those under the Green (Preferred) Alternative. However, impacts to riparian forests and wetlands would be increased under the Red Alternative. Riparian forests would also be removed along the Arkansas River due to levee construction adjacent to the river bank. This would result in exposure of portions of the river bank, which would adversely impact the bank's integrity, especially near the Whig Creek and Arkansas River confluence. The riparian forests and wetlands along the Arkansas River, Whig Creek, and the tributary to Whig Creek would be almost entirely removed resulting in a loss of habitats considered highly beneficial to several species of wildlife.

Direct, indirect, and cumulative water body, wildlife, and vegetation impacts and mitigation measures under the Red Alternative are presented in detail in Section 4.12.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.12.2.4 Potential Consequences of the Purple Alternative on Water Bodies, Wildlife, and Vegetation

Adverse impacts to Lake Dardanelle, an embayment, intermittent streams, and several ponds are anticipated due to construction activities associated with the Purple Alternative. Construction of the harbor and intermodal facilities would cross two intermittent streams and remove a portion of the intermittent stream channel and several ponds. Portions of the forested areas in the southern part of the project would be removed along the shoreline of Lake Dardanelle resulting in long-term habitat loss and expose of shoreline. Long-term adverse impacts to wildlife would occur due to the permanent loss of pasture and forested habitats. Construction of the proposed intermodal facilities harbor and channel, along with subsequent maintenance dredging, would result in short-term increases in sedimentation in Lake Dardanelle.

Direct, indirect, and cumulative water body, wildlife, and vegetation impacts and mitigation measures under the Purple Alternative are presented in detail in Section 4.12.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.13 FLOODPLAINS

4.13.1 Affected Environment

The USACE Little Rock District conducted a floodplain analysis for the Red and Green (Preferred) Alternatives to determine if flood impacts would occur (USACE, 2005a). The study took the proposed levee system into account for the Red and Green (Preferred) Alternatives. Existing hydrology for the Arkansas River was used in this study. The Arkansas River discharges were determined in a discharge-frequency study for the "Arkansas River Land Impact Study," by Little Rock District, USACE. The entire USACE floodplain study report is contained in Appendix B of this FEIS.

Please note that the floodplain study information contained in Appendix B is based on the best available data at the time of the study and that data differs from previous studies completed. For instance, there are differences in the base flood elevations for adjacent areas along the Arkansas River where the Yell County and Pope County Flood Insurance Rate Maps (FIRM) meet. The FIRM update for Yell County, effective in March 2002, based its mapping information along the Arkansas River through the project area based on the original study of the City of Dardanelle. It included analyses for the Arkansas River and Smiley Bayou, which were performed by the USACE Little Rock District, in 1969. The Pope County FIRM update, effective March 2010, used this information as well; however, Pope County also incorporated the more current “U.S. Department of the Army, Corps of Engineers, Restudy of Arkansas River: Navigation Pool 9 and Dardanelle Reservoir, 1986 (unpublished).” These models and hydrology for the 1% annual chance flood event have been approved by the USACE Southwestern Division. In addition, FEMA approved all of the models when requested by the National Flood Insurance Program participating communities. The base flood elevations differ due to changes in the channel geometry, more detailed topographic

information, and the development of more accurate computer modeling software and data.

The United States Geological Survey (USGS) actively maintains a gauge at the Highway 7 Bridge. The USGS fact sheet states that the flow (Q100) for the 1% annual chance flood event is 696,000 cubic feet per second (cfs). The USGS Q100 data was most likely developed prior to any major upstream flood control projects in Oklahoma being constructed as it compares favorably to USACE's 1960 unregulated Q100 of 760,000 cfs and USACE's 1972 unregulated Q100 of 700,000 cfs. The USACE Flood Plain Analysis Report in Appendix B of this FEIS indicates that the Q100 is 485,000 cfs. This is consistent with the Pope County FIRM update of 2010. The elevations from the Yell County FIRM should not be compared, because it is not based on the best and most recent information.

The "Notes to Users" portion of the March 4, 2002 FIRM map states, "Users should be aware the Base Flood Elevations shown on the FIRM represent rounded whole-foot elevations. These Base Flood Elevations are intended for flood insurance rating purposes only and should not be used as sole source of flood elevation information." The USACE elevation measurements in the Floodplain Analysis Report are more accurate than those provided on FIRM maps and use the latest floodplain data and modeling. FHWA hydraulic engineers have reviewed the USACE Report and HEC-RAS modeling. The Flood Plain Analysis Report mapping is based on Light Detection and Ranging (LiDAR) information generated in 2000-2001, using a contour interval of 2 feet (precision ±1 foot).

A more detailed description of floodplains for the No Action, Green (Preferred), Red, and Purple Alternative project areas can be found in Section 4.13.1 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.13.2 Consequences

4.13.2.1 Potential Consequences of the No Action Alternative to Floodplains

Because no activities related to the proposed intermodal facilities would occur under the No Action Alternative, there would be no impacts to floodplains. Direct, indirect, and cumulative floodplain impacts and mitigation measures under the No Action Alternative are presented in detail in Section 4.13.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.13.2.2 Potential Consequences of the Green (Preferred) Alternative to Floodplains

4.13.2.2.1 Direct Impacts

The computer program HEC-RAS, version 3.1.3 (May 2005), was used to compute existing condition water surface elevations for the 10-year, 50-year, 100-year, and 500-year flow events. The HEC-RAS analysis shows the proposed River Valley Intermodal Facilities will increase 100-year floodplain water surface elevations by a maximum of

0.09 feet for the Green (Preferred) Alternative. Therefore, the Green (Preferred) Alternative is consistent with EO 11988 and 44 CFR Section 60.3(c) and satisfies the requirements of Federal Emergency Management Agency (FEMA) for good floodplain management. Refer to Table 4.14 of the SDEIS for the results of the 10-, 50-, 100-, and 500-year floodplain analysis of the Green (Preferred) Alternative. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm). The Green (Preferred) Alternative would have less impact than the Red Alternative for the 10-, 50-, 100-, and 500-year flood events due primarily to the offset levee.

A direct loss of 886 acres of the 100-year floodplain would result from the construction of the intermodal facilities under this alternative. The construction of the slackwater harbor would add a minor amount of flood storage capacity, however these benefits are minimal.

The proposed project will have negligible impacts to the river training dikes in the area.

4.13.2.2.2 Indirect Impacts

There would be no indirect impacts to floodplains associated with the Green (Preferred) Alternative because there are no known plans to extend any of the levees associated with the Green (Preferred) Alternative to protect additional floodplain areas. Any private secondary developments outside the levee-protected areas of the proposed intermodal facilities would likely be constructed on adjacent upland areas due to the costs associated with building and maintaining levees.

4.13.2.2.3 Cumulative Impacts

Due to the negligible increase of flood impacts as determined by the floodplain analysis conducted for the intermodal facilities project, measurable cumulative impacts are not anticipated under the Green (Preferred) Alternative.

4.13.2.2.4 Mitigation

Mitigation is not necessary as minimal floodplain impacts are anticipated. The levee for the Green (Preferred) Alternative will be set back further from the river channel than under the Red Alternative. Also, the construction of the slackwater harbor would add a minor amount of flood storage capacity, however these benefits are minimal.

4.13.2.3 Potential Consequences of the Red Alternative to Floodplains

Floodplain impacts of the Red Alternative would be similar to those of the Green (Preferred) Alternative. However, HEC-RAS analysis shows the proposed River Valley Intermodal Facilities will increase 100-year floodplain water surface elevations by a maximum of 0.12 feet for the Red Alternative. Refer to Table 4.13 of the SDEIS for the results of the 10-, 50-, 100-, and 500-year floodplain analysis of the Red Alternative.

A direct loss of approximately 797 acres of the 100-year floodplain will result from the construction of the intermodal facilities under this alternative. The construction of the slackwater harbor would add a minor amount of flood storage capacity, however these benefits are minimal.

Direct, indirect, and cumulative floodplain impacts and mitigation measures under the Red Alternative are presented in detail in Section 4.13.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.13.2.4 Potential Consequences of the Purple Alternative on Floodplains

The Purple Alternative is consistent with EO 11988 and 44 CFR Section 60.3(c) and satisfies the requirements of FEMA for good floodplain management. A floodplain analysis and HEC-RAS model were not performed for the Purple Alternative based on direction from the USACE, Little Rock District. This is primarily due to its location on higher elevations around Lake Dardanelle and a minimal amount of floodplain that would be potentially impacted. Lake Dardanelle and its flowage easement in are classified as Zone A (100-year floodplain) by FEMA. Although portions of the Purple Alternative are within the flowage easement of the lake, and therefore the Arkansas River floodplain, negligible floodplain would be removed as a result of this alternative. Riparian buffer areas would preserve the majority of the flowage easement along Lake Dardanelle. Creation of the slackwater harbor under the Purple Alternative will enlarge an existing cove located on Lake Dardanelle, and would minimally increase the water storage capacity of the lake.

Direct, indirect, and cumulative floodplain impacts and mitigation measures under the Purple Alternative are presented in detail in Section 4.13.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.14 COMMERCIAL NAVIGATION

4.14.1 Affected Environment

A detailed description of commercial navigation on the MKARNS for the No Action, Green (Preferred), Red, and Purple Alternative project areas can be found in Section 4.14.1 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.14.2 Consequences

4.14.2.1 Potential Consequences of the No Action Alternative on Navigation

There would be no realization of the region's potential for greatly expanded intermodal transportation opportunities under the No Action Alternative. Direct, indirect, and cumulative commercial navigation impacts under the No Action Alternative are presented in detail in Section 4.14.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.14.2.2 Potential Consequences of the Green (Preferred) Alternative on Navigation

4.14.2.2.1 Direct Impacts

Substantial long-term beneficial impacts to commercial navigation would be incurred under the Green (Preferred) Alternative due to economic benefits in the form of savings in transportation costs from the construction of the proposed intermodal facilities. Other beneficial impacts include the employment, personal income, and additional business revenue directly related to the intermodal facilities activities.

Implementation of the public intermodal facilities would provide access to transportation for waterborne commerce. A study by AHTD (AHTD, 1998) revealed that the ARV has the potential to become a major center for freight consolidation and distribution because of its favorable central geographic location to the nation's markets. In addition, the presence of the other major elements (interstate highways, railroads) of the nation's transportation system further contributes to the region's market potential.

A study by the USACE (USACE, 2002) projected waterborne cargo flows within the six-county region "with" project and "without" project. A survey of existing businesses and industries indicated that potential waterborne commerce movements through the proposed intermodal facilities would be 166,000 tons during the first year of operation, and over 350,000 tons by the end of the study period under "with" project conditions. These tonnage volumes, respectively, represent a 38 percent and a 150 percent increase over "without" project tonnage. Projections indicated that by the year 2022 over 35 percent of the total regional cargo could consist of waterborne transport under the "with" project versus only 14 percent under the "without" project. The majority of this increase in waterborne traffic would be the result of a shift in transportation modes for commodity movement. Annual potential savings or benefits over a 50-year period for the "with" project condition is projected to exceed $400,000. These project benefits are based on the reduction in transportation costs between the "with" and "without" project (USACE, 2001).

4.14.2.2.2 Indirect Impacts

Additional secondary employment, personal income, and business volume would occur as a result of the direct employment related to the commercial navigation industry. A study on the impact of waterways in Arkansas (Nachtmann, 2002) estimated that the indirect impacts on job creation and personal income are equal to, or greater than, the direct impacts on employment and income. In addition, the intermodal facilities would provide a catalyst for the expansion of existing industry and attraction of new industry into the region.

4.14.2.2.3 Cumulative Impacts

The combination of transportation services provided at the intermodal facilities and the existing transportation services and storage capabilities provided by the adjacent private Port of Dardanelle could complement each other to attract additional users of the

commercial navigation system. Any increased use of the MKARNS system would provide cumulative benefits to the regional economic and social environments.

Arkansas River Navigation Project

The presence of intermodal facilities and improvements to the MKARNS through the Arkansas River Navigation Project would provide long-term beneficial impacts to commercial navigation throughout the ARV. By deepening the commercial navigation channel of the Arkansas River, barges would be able to carry heavier loads and increase the productivity and utility of the intermodal facilities and the MKARNS transportation options. The new transportation capabilities would promote economic growth and provide social benefits for the ARV region.

Industrial Development in the Arkansas River Bottoms near Russellville

If the intermodal facilities project is constructed, it is unlikely that a substantial amount of industrial development would occur outside of the proposed project boundaries in the reasonably foreseeable future. This is because the intermodal facilities would be constructed on a large enough tract of land to support industrial developments and the infrastructure and equipment needed to provide the intermodal connections between road, rail, and river transportation options. Therefore, the potential for industrial development in the Russellville bottoms adjacent to the intermodal facilities is not expected to provide noticeable impacts for commercial navigation. If substantial industrial growth were to occur in adjacent areas that would also want to utilize the commercial navigation system, long-term beneficial impacts would occur. These commercial navigation benefits would be due to increase jobs and revenue provided for the region to support the increased commercial navigation industry.

Expansion of Soil and Gravel Excavation and Removal

The expansion of soil, sand, and gravel mining operations in areas adjacent to the intermodal facilities could potentially provide additional use of the available commercial navigation system provided on the MKARNS. The intermodal facilities could potentially promote expansion of those mining operations especially in adjacent areas that would have convenient access to the intermodal connections provided at the facilities. Transportation of sand, soil, and/or gravel by barge from the intermodal facilities would provide cumulative benefits to the commercial navigation industry and therefore provide potential additional economic and social benefits for the region. At this time it is not known if any expansion of mining operations would occur or if the intermodal facilities would be used to transport the materials to other areas. Therefore, it is difficult to determine what if any impacts from such operations would occur.

Continuation of Agricultural Land Use

The continuation of agricultural land uses in areas adjacent to the intermodal facilities could potentially provide additional use of the available commercial navigation system provided on the MKARNS. The intermodal facilities could potentially promote continuation or additional agriculture in the adjacent areas that would have convenient

access to the intermodal connections provided at the facilities. Transportation of agricultural products such as grain, fertilizer, or hay by barge from the intermodal facilities would provide cumulative benefits to the commercial navigation industry and therefore provide potential additional economic and social benefits for the region. At this time it is not known what if any agricultural products would be shipped to and from the intermodal facilities; therefore it is difficult to determine what if any impacts from such uses would occur. The existing Port of Dardanelle would continue to provide shipping and storage capabilities to support local agricultural land uses as well.

Increase Existing Arkansas River Commerce

Beneficial cumulative impacts would be expected if the proposed intermodal facilities could potentially provide additional use of the available commercial navigation system provided on the MKARNS. Increase in commercial navigation would compliment any other increase in the existing Arkansas River commerce. This would provide potential additional economic and social benefits for the region.

4.14.2.2.4 Mitigation

Since no adverse impacts to commercial navigation are expected under the Green (Preferred) Alternative, mitigation measures would not be necessary. Beneficial impacts to commercial navigation would be expected.

4.14.2.3 Potential Consequences of the Red Alternative on Navigation

The impacts to commercial navigation under the Red Alternative would be similar to those of the Green (Preferred) Alternative. Direct, indirect, and cumulative commercial navigation impacts and mitigation measures under the Red Alternative are presented in detail in Section 4.14.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.14.2.4 Potential Consequences of the Purple Alternative on Navigation

The impacts to commercial navigation under the Purple Alternative would be similar to those of the Green (Preferred) Alternative. Direct, indirect, and cumulative commercial navigation impacts and mitigation measures under the Purple Alternative are presented in detail in Section 4.14.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.15 THREATENED AND ENDANGERED SPECIES

4.15.1 Affected Environment

A detailed description of threatened and endangered (T & E) species potentially occurring in the No Action, Green (Preferred), Red, and Purple Alternative project areas can be found in Section 4.15.1 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.15.2 Consequences

4.15.2.1 Potential Consequences of the No Action Alternative on Threatened and Endangered Species

There would be no impact to T&E species under the No Action Alternative. Direct, indirect, and cumulative commercial navigation impacts under the No Action Alternative are presented in detail in Section 4.15.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.15.2.2 Potential Consequences of the Green (Preferred) Alternative on Threatened and Endangered Species

4.15.2.2.1 Direct Impacts

There would be no measurable direct impacts to federally listed T&E species because sensitive habitat required for federally listed species known to occur in Pope County does not exist within the project area. However, if any federally listed T&E species are detected within the proposed project during any phase of the project, the USFWS would be contacted immediately for further consultation.

The Arkansas Natural Heritage Commission (ANHC) reviewed their files for records indicating the occurrence of rare plants and animals, outstanding natural resource communities, natural or scenic rivers, or other elements of special concern within or near the area of potential effect for the proposed RVIF. They found no records present. Because of this finding, the project is not expected to have an impact on any Arkansas state-listed resources.

A full discussion of the direct, indirect, and cumulative impacts to T & E species under the Green (Preferred) Alternative are presented in Section 4.15.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.15.2.2.2 Indirect Impacts

Proper BMPs and mitigation measures would be employed to minimize disturbance within the project area during construction. There would be no indirect adverse impacts to gray bats. Minimal adverse indirect impacts may affect, but are not likely to adversely affect interior least tern assuming an increase in barge traffic on the Arkansas River occurs from the proposed action. Increased barge traffic could potentially disturb interior least terns and sand bars where least tern may feed or nest.

Secondary developments in the immediate project area are not anticipated to impact T&E species because no critical habitats were identified in the immediate vicinity.

4.15.2.2.3 Cumulative Impacts

Arkansas River Navigation Project

As part of the Arkansas River Navigation Project, the USACE is proposing to construct a sandbar for use by the least tern in every pool along the length of the MKARNS. It is unknown if one of those sandbars would be constructed in proximity to the Green (Preferred) Alternative. Increased barge traffic using the Arkansas River due to the proposed action and the Arkansas River Navigation Project could have negligible cumulative adverse impacts on the interior least tern. Increased barge traffic could potentially disturb interior least terns and sand bars where least tern may feed or nest. The impacts would not be substantial or measurable.

Industrial Development in the Arkansas River Bottoms near Russellville

No cumulative impacts to T&E species are expected from potential industrial development in the Arkansas River bottoms near Russellville because no critical habitats were identified in this area.

Expansion of Soil and Gravel Excavation and Removal

No cumulative impacts to T&E species are expected due to the expansion of sand, soil, and gravel mining operations in the adjacent areas because no critical habitats were identified in the soil and gravel excavation areas.

Continuation of Agricultural Land Use

No cumulative impacts to T&E species are expected from the continuation of agricultural land uses on the lands adjacent to the intermodal facilities project area because no critical habitats were identified in these areas.

Increase Existing Arkansas River Commerce

Construction of the proposed intermodal facilities will enhance commerce along the Arkansas River. Enhanced commerce on the river would mean an increased amount of barge traffic. Increased barge traffic using the Arkansas River due to the proposed action and the Arkansas River Navigation Project could have minimal cumulative adverse impacts on the interior least tern. Increased barge traffic could potentially disturb interior least terns and sand bars where least tern may feed or nest, but the impacts would not be substantial or measurable.

4.15.2.2.4 Mitigation

Mitigation is not required for minimal impacts to T&E species. Therefore, no mitigation is needed to reduce impacts to T&E species under the Green (Preferred) Alternative.

The preservation of the forested riparian corridor along the Arkansas River would provide marginal roosting/perching habitat for bald eagles.

4.15.2.3 Potential Consequences of the Red Alternative on Threatened and Endangered Species

The impacts to T & E species under the Red Alternative would be similar to those of the Green (Preferred) Alternative. However, impacts to bald eagle habitat would be higher under the Red Alternative, because more of the forested riparian corridor along the Arkansas River would be removed. Approximately 6,265 linear feet of riverbank would be converted to industrial use under the Red Alternative. Much of this length of riverbank supports large trees suitable as perch locations for foraging eagles. All of these trees would be lost if the Red Alternative were implemented.

Direct, indirect, and cumulative T & E species impacts and mitigation measures under the Red Alternative are presented in detail in Section 4.15.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.15.2.4 Potential Consequences of the Purple Alternative on Threatened and Endangered Species

The impacts to T & E species under the Purple Alternative would be similar to those of the Green (Preferred) Alternative. Direct, indirect, and cumulative T & E species impacts and mitigation measures under the Purple Alternative are presented in detail in Section 4.15.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.16 CULTURAL RESOURCES

Cultural resources are prehistoric and historic sites, structures, districts, artifacts, or any other physical evidence of human activity considered important to a culture, subculture, or community for traditional, religious, scientific, or any other reason. Cultural resources are discussed in terms of archaeological sites, which include both prehistoric and historical occupations either submerged or on land, architectural resources, and locations of concern to Native American groups including Traditional Cultural Properties (TCPs). Archaeological sites can become submerged when they are inundated following impoundment of rivers. TCPs may consist of archaeological sites, buildings, neighborhoods, prominent topographic features, habitats, plants, animals, and minerals that Native Americans or other groups consider essential for the continuance of cultures.

A detailed description of cultural resources potentially occurring in the No Action, Green (Preferred), Red, and Purple Alternative project areas can be found in Section 4.16 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.16.1 Affected Environment

This section presents information on archaeological, architectural, and Native American resources located in the project area. The discussion includes a description of regulatory requirements and the number and types of archaeological, architectural, and Native American resources known or expected to occur within the project area.

Procedures for the identification, evaluation, and treatment of cultural resources are contained in a series of federal and state laws and regulations and agency guidelines. Archaeological, architectural, and Native American resources are protected by a variety of laws and their implementing regulations including: the National Historic Preservation Act (NHPA) of 1966, as amended in 2006; the Archeological and Historic Preservation Act of 1974; the Archaeological Resources Protection Act of 1979; the American Indian Religious Freedom Act of 1978; and the Native American Graves Protection and Repatriation Act of 1990.

Section 106 of the NHPA, as amended (16 USC 470), governs Federal actions that could affect NRHP eligible properties. Section 106 requires Federal agencies to take into account the effects of their undertakings, including licensing and approvals, on NRHP eligible properties and to afford the Advisory Council on Historic Preservation (ACHP) and other interested parties a reasonable opportunity to comment. The ACHP further guides treatment of cultural resources through the implementing regulations for Section 106, Protection of Historic Properties (36 CFR 800). Section 101(b)(4) of NEPA requires Federal agencies to coordinate and plan their actions so as to preserve important historic, cultural, and natural aspects of the country's national heritage.

Historic properties, as defined by the NHPA, represent the subset of cultural resources listed on, or are eligible for, inclusion on the NRHP. Properties that qualify for inclusion in the NRHP must meet at least one of the following four criteria:

- Criterion A: be associated with events that have made a significant contribution to the broad patterns of our history;
- Criterion B: be associated with the lives of persons of significance in our past;
- Criterion C: embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components could lack individual distinction; or
- Criterion D: have yielded, or could be likely to yield, information important in prehistory or history (36 CFR 60.4).

Properties that qualify for the NRHP also must possess integrity, defined by the following seven aspects: location, design, setting, materials, workmanship, feeling, and association. The term “eligible for inclusion in the NRHP” includes properties formally designated as eligible and all other properties determined to meet NRHP criteria. Normally, NRHP eligibility requires a property to be at least 50 years of age. Resources less than 50 years of age that are highly significant and meet the “special criteria

considerations" as outlined in the regulations (36 CFR 60.4) also may be eligible for the NRHP.

The Area of Potential Effect (APE) for cultural resources was defined as the proposed alternative areas. The proposed project boundaries for the Green and Red Alternatives were submitted to the Arkansas Historic Preservation Program [State Historic Preservation Office (SHPO)] for review and concurrence. The SHPO concurred with the proposed APE to consist of the combined area of the proposed Red and Green (Preferred) alternatives in a letter dated April 2005. The proposed Purple alternative project area was added in 2009; the APE also consists of the entire alternative area.

Cultural resources investigations were conducted to identify archaeological and architectural resources in the proposed Red, Green (Preferred), and Purple alternative project areas (Buchner et al., 2012; Lafferty et al., 2005; Lafferty and Hess, 2005; Leonard, 2010). Native American consultation was also conducted to identify locations and resources of religious or cultural significance in the project areas.

4.16.1.1 Archaeological Resources

Mid-Continental Research Associates, Inc. conducted archaeological investigations of the proposed Red and Green (Preferred) Alternative areas from November 2004 to August 2005 (Lafferty et al., 2005). The investigations included a comprehensive records review and a pedestrian archaeological survey. The records review indicated the presence of seven previously recorded archaeological sites within the project area. No archaeological properties were previously listed on the NRHP; however, site, 3PP449/611, was previously tested and recommended as eligible for listing on the NRHP (Lafferty et al., 2005).

Approximately 728 acres were intensively surveyed for archaeological resources. An additional 240 acres had been destroyed by borrow pits and sand quarries. These destroyed areas were mapped and exposed profiles were inspected for buried deposits. Another 140 acres were not surveyed; 50 acres, because no permission could be secured from the landowner; 35 acres were wetlands; and 55 acres were inaccessible at the time of the survey. Approximately 56 percent of the APE had excellent to good surface visibility with freshly disked and rain-washed surfaces. Just under 6 percent of the area with pine trees and pasture covering the surface, was shovel tested.

Seventy-six archaeological sites and four isolated finds were documented during this survey including seven previously recorded sites which were revisited. Surface artifacts were flagged, mapped, and collected. One or more screened shovel tests were excavated on each site. The sites range from Early Archaic lithic scatters to mid-20th century farmsteads. The most substantial components represented were Late Archaic, Woodland, and Caddoan occupations. Stratified deposits were found at four sites and buried A horizon soils were found at many locations, indicating the potential presence of substantial buried deposits within the APE, which is typical for archaeological sites in alluvial floodplains. Forty-nine sites were recommended for additional testing to determine eligibility for listing on the NRHP. No further work was recommended for twenty-seven sites including two designated as destroyed. The archaeological survey

report was submitted to the SHPO on December 15, 2005 for review and concurrence. The SHPO concurred with the findings of this report in March 2006.

Panamerican Consultants, Inc. conducted a Phase I/Phase II cultural resources survey of the proposed Purple Alternative area in November 2009 and February 2010 (Leonard, 2010). The investigation included archival and records searches, pedestrian survey and systematic shovel testing of accessible onshore portions of the project area and development of a predictive model for the presence of cultural resources in portions of the project area that were not accessible for survey. The records review indicated no previously recorded archaeological sites within the project area.

The Purple Alternative project area covers approximately 741.5 acres, including onshore and offshore areas, but difficulties in obtaining landowner permission prevented survey in approximately 60 percent (444.9 acres) of the onshore project area. The accessible portions of the project area were surveyed by placing shovel tests at 30 m intervals along parallel transects spaced 30 m apart. In the southwestern, northwestern, and north-central parts of the project area, transects were oriented north-south. In the northeastern part, transects were oriented east-west. In the access corridor, the survey was conducted parallel to the centerline of the corridor alignment.

A total of 435 shovel test locations were laid out in the project area; however, due to varying conditions including steep slopes, standing water, and pavement, only 267 shovel tests were excavated. Of these, only 28 were positive for cultural material.

The survey resulted in the identification of two archaeological sites – 3JO715, a prehistoric campsite and 3JO716, the remains of an historic cabin - and an isolated find, consisting of a single lithic tool fragment. The NRHP eligibility of Site 3JO715 could not be determined during the Phase I investigation. Site 3JO716 is not considered eligible for inclusion on the NRHP. The isolated find is not eligible for the NRHP.

The predictive model for inaccessible portions of the project area suggests that the highest probability for the presence of prehistoric archaeological resources is in the southernmost portion of the project area along the river, both onshore and offshore. In addition, a somewhat higher likelihood for historic archaeological resources exists for the northeastern segment of the access corridor nearest the town of Knoxville. However, a low likelihood for archaeological resources, especially small prehistoric artifact scatters, exists for the entire project area (Leonard, 2010).

The Phase I report for the Purple Alternative was reviewed by the Arkansas SHPO and concurrence with the report findings is pending completion of an additional survey once landowner access is obtained (see Appendix A).

Panamerican Consultants, Inc. conducted Phase II testing of 29 sites located in the overlap area of the proposed Red/Green Alternative and one site located in the the proposed Purple Alternative area between October 3, 2011 and January 27, 2012 (Buchner et al., 2012). The investigation included the development of an explicit Work Plan and research themes, the excavation of 2,247 shovel tests and 62 1-x-2-m test

units, geophysical survey of one site (3PP449/3PP611), and the analysis of the recovered assemblage of 18,553 artifacts. Two additional sites could not be tested because access was denied (3PP722 and 3PP743).

The testing results revealed that eight sites are eligible for the National Register of Historic Places under Criterion d, or information potential. They include seven sites in the overlap area of the proposed Red/Green Alternative (3PP449/3PP611, 3PP610, 3PP681, 3PP682, 3PP729, 3PP733, and 3PP740), and one site located in the Purple Alternative (3JO715). Testing results at the remaining sites reveal that the 21 sites are not eligible for NRHP nomination (3PP612, 3PP692, 3PP693, 3PP694, 3PP695, 3PP697, 3PP699, 3PP700, 3PP701, 3PP703, 3PP709, 3PP710, 3PP712, 3PP727, 3PP730, 3PP731, 3PP732, 3PP734, 3PP736, 3PP737, and 3PP741). One site (3PP725) was found to be destroyed by a sand pit (i.e., borrow pit), and its National Register of Historic Places status is not eligible. The SHPO concurred with the NRHP eligibility recommendations of this report on July 25, 2012.

Green (Preferred) Alternative

Based on the archaeological survey results, seventy-two archaeological sites are located within the proposed boundaries for the Green (Preferred) Alternative (Lafferty et al. 2005). Based on the Phase II testing results, seven sites, including site 3PP449/611, are considered eligible for the NRHP, and twenty additional sites are considered potentially eligible for the NRHP pending further Phase II testing (Buchner et al., 2012). Forty-four sites are not considered eligible and one site has been destroyed; no further work at these locations is required (Buchner et al., 2012).

Red Alternative

Based on the archaeological survey results, forty-nine archaeological sites are located within the proposed boundaries for the Red Alternative (Lafferty et al., 2005). Based on the Phase II testing results, seven sites, including site 3PP449/611, are considered eligible for the NRHP and two sites are considered potentially eligible, pending further Phase II testing (Buchner et al., 2012). Thirty-nine sites are not considered eligible and one site has been destroyed; no further work at these locations is required (Buchner et al., 2012).

Purple Alternative

Based on the archaeological survey results, two archaeological sites and one isolated find are located within the proposed boundaries for the Purple Alternative (Leonard, 2010). Based on the Phase II testing results, one site, 31JO715, is considered eligible for the NRHP (Buchner et al., 2012). One site, 31JO716, and the isolated find are not considered eligible and no further work at these locations is required.

The predictive model indicated a high potential for additional archaeological resources to occur in the southern and northeastern areas of the unsurveyed portions of the Purple Alternative project area. However, a low likelihood for cultural resources exists

for the entire project area (Leonard, 2010). Some of these archaeological sites are likely to be considered eligible for the NRHP.

4.16.1.2 Architectural Resources

Mid-Continental Research Associates, Inc. conducted an architectural survey and viewshed analysis of the proposed Red and Green (Preferred) Alternatives on April 18 and 19, 2005 (Lafferty and Hess, 2005). The survey of the combined proposed Red and Green (Preferred) Alternatives was conducted systematically around. Observations were recorded from public rights-of-way associated with lanes and side roads; private property was not accessed for this survey. Most of the standing architecture is located in the upland area on the northern fringe of the project area. Very few structures occur in the lowlands, most of which are within the 100 year floodplain of the Arkansas River. The 1936 highway map shows many more structures than are currently present in the project area. The architecture in this area primarily consists of manufactured homes and house trailers. Most of these structures have been altered from their original condition and such modifications include vinyl siding, aluminum windows, and fiberglass porches (Lafferty and Hess, 2005). None of the structures within the proposed Red and Green (Preferred) Alternatives are considered potentially eligible for the NRHP.

In addition, a viewshed analysis was conducted within a one mile radius of the proposed project area including both the east and west banks of the Arkansas River. On the east bank, photographs toward the APE were taken from selected modern or modified structures. No NRHP-eligible architectural resources occur or were identified on the east bank of the Arkansas River (Lafferty and Hess, 2005). From the west bank, photographs were taken from all structures listed on the NRHP, as well as systematically down each street in the City of Dardanelle toward the APE. Eight NRHP listed architectural resources: the Thomas James Cotton House, Dardanelle Agricultural and Post Office, Dardanelle Confederate Monument, First Presbyterian Church, the Berry House associated with the First Presbyterian Church, the Methodist Episcopal Church, the Steamboat House, and the Yell County Courthouse, served a viewshed points of reference.

The architectural survey report and viewshed analysis was submitted to the SHPO for review and concurrence, and the SHPO concurred with the findings of the report that none of the standing structures within the APE were eligible for nomination to the NHRP.

Panamerican Consultants, Inc. conducted a Phase I cultural resources survey of the proposed Purple alternative area in November 2009 and February 2010 (Leonard, 2010). The investigation included archival and records searches as well as survey of accessible portions of the project area. The records review indicated no previously recorded architectural resources within the project area. Although structures, such as houses, poultry sheds, and farm outbuildings were identified in the project area, none of these resources are likely more than 50 years of age and were not documented or evaluated for NRHP eligibility.

The Phase I report for the Purple Alternative, including information on standing structures ,was reviewed by the Arkansas SHPO and concurrence with the report findings is pending completion of an additional archaeological survey once landowner access is obtained (see Appendix A).

Green (Preferred) Alternative

No architectural resources eligible for listing on the NRHP were identified in this proposed alternative area.

Red Alternative

No architectural resources eligible for listing on the NRHP were identified in this proposed alternative area.

Purple Alternative

No architectural resources eligible for listing on the NRHP were identified in this proposed alternative area.

4.16.1.3 Native American Resources

Native American resources are sites, areas, and materials important to Native Americans for religious or heritage reasons. Resources may include prehistoric sites and artifacts, historic sites, and artifacts (such as Native American farmsteads), cemeteries and burial locations, contemporary sacred areas, traditional use areas (*e.g.*, native plant or animal habitat), sources used in the production of sacred objects and traditional implements, or TCPs. Sacred places important to religion may also be present and include mountain peaks, springs, and burial sites. Traditional rituals may prescribe the use of particular native plants, animals, or minerals from specific places. Therefore, activities that may affect sacred areas, their accessibility, or the availability of materials used in traditional practices may be of concern.

Fourteen Native American groups that may have historical ties to the project area were identified in consultation with the SHPO and include the Alabama-Quassarte Tribal Town of the Creek Nation of Indians, Oklahoma; Caddo Nation of Oklahoma; Cherokee Nation of Oklahoma; Chickasaw Nation of Oklahoma; Choctaw Nation of Oklahoma; Eastern Band of the Cherokee Indian Nation, North Carolina; Kialegee Tribal Town, Oklahoma; Jena Band of the Choctaw Indians, Louisiana; Mississippi Band of the Choctaw Indians, Mississippi; Osage Tribal Council, Oklahoma; Poarch Band of Creek Indians, Alabama; Quapaw Tribal Business Committee, Oklahoma; Thlopthlocco Tribal Town of the Creek Indian Nation of Oklahoma; and United Keetoowah Band of Cherokee Indians. The FHWA initiated consultation with these Native American groups on January 11, 2005 and asked for assistance in identifying whether locations of religious or cultural significance could occur in the proposed project area.

Responses were received from the Cherokee Nation and the Quapaw Tribal Business Committee, who both expressed an interest in the project.

The FHWA conducted a tribal scoping meeting in Russellville, Arkansas on June 2, 2005. Project information provided included a summary of the site records search and a tour of the project area. Mr. Robert Cast and Mr. Bobby Gonzales of the Caddo Nation of Oklahoma attended the meeting. No other tribal representatives were in attendance. A written summary of previous archaeological work in the area was later provided to the Cherokee Nation and the Quapaw Tribal Business Committee. Consultation with Native American groups will continue throughout the decision-making process for this project.

Copies of the Phase II testing report, prepared by Panamerican Consultants, Inc., were provided to the fourteen Native American groups for review and comment in August 2012. Responses were received from the Osage Nation and the United Keetoowah Band of Cherokee Indians, and they requested to be participants in the development of the PA to resolve adverse effects (Appendix C). Consultation with all Native American groups will continue in the development of the PA.

Green (Preferred) Alternative

Based on the archaeological survey results, thirteen Native American farmsteads, including site 3PP449/611, are located within the proposed boundaries for the Green (Preferred) Alternative (Lafferty et al. 2005). Based on the Phase II testing results, three Native American farmsteads are considered eligible and five sites are considered potentially eligible for the NRHP, pending further Phase II testing (Buchner et al., 2012). Five Native American farmsteads are not considered eligible and no further work at these locations is required.

Red Alternative

Based on the archaeological survey results, nine Native American farmsteads, including site 3PP449/611, are located within the proposed boundaries for the Red Alternative (Lafferty et al., 2005). Based on the Phase II testing results, three Native American farmsteads are considered eligible and one site is considered potentially eligible for the NRHP, pending further Phase II testing (Buchner et al., 2012). Five Native American farmsteads are not considered eligible and no further work at these locations is required.

Purple Alternative

Based on the archaeological survey results, no Native American farmsteads were identified (Leonard, 2010).

4.16.2 Consequences

Impacts to cultural resources were determined using the criteria established for the NHPA. An undertaking is considered to have an effect on a historic property when the undertaking may alter characteristics of the property that may qualify it for inclusion in the NRHP. An effect is considered adverse when it diminishes the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

Adverse effects as defined by Section 106 of the NHPA under 36 CFR 800.5(a)(2)(i) through (vii) include, but are not limited to:

- Physical destruction, damage, or alteration of all or part of the property;
- Isolation of the property from or alteration of the character of the property's setting when that character contributes to the property's qualification for the NRHP;
- Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting;
- Neglect of a property resulting in its deterioration or destruction; and
- Transfer, lease, or sale of the property.

For the purposes of this SDEIS, a significant impact under NEPA is defined as an un-resolvable "adverse effect" under Section 106 of the NHPA. Because cultural resources are nonrenewable, all adverse effects on NRHP-eligible cultural resources in the RVIF, as addressed in this SDEIS would be long term.

Indirect Impacts are the result of future projects such as residential, school, and infrastructure development created by the proposed action. Some types of development (such as new roads, trails, etc.) could facilitate access to sensitive cultural resources. This could result in increased vandalism and damage to resources.

4.16.2.1 Potential Consequences of the No Action Alternative on Cultural Resources

4.16.2.1.1 Direct Impacts

Because no activities related to the construction of the proposed intermodal facilities would occur under the No Action Alternative, there would be no direct impacts to cultural resources. Existing ground disturbing activities, such as agricultural use and gravel mining, and natural degradation of archaeological resources from increased flooding and erosion potential along the Arkansas River floodplain would continue. The No Build Alternative would avoid additional impacts to NRHP-eligible cultural resources.

4.16.2.1.2 Indirect Impacts

Because no activities related to the construction of the proposed intermodal facilities would occur under the No Action Alternative, there would be no additional indirect impacts to any NRHP-eligible cultural resources.

4.16.2.1.3 Cumulative Impacts

Because no activities related to the construction of the proposed intermodal facilities would occur under the No Action Alternative, no direct impacts are expected that could contribute to the cumulative disturbance or destruction of NRHP-eligible cultural resources resulting from other reasonably foreseeable projects in the area as identified below.

Arkansas River Navigation Project

Potential impacts to cultural resources associated with the Arkansas River Navigation project may include physical disturbance through channel deepening and dredging operations, and construction and/or modification of dikes and revetments within the river channel and on adjacent shorelines. River bottom dredging is unlikely to encounter intact cultural resources. Construction and/or modification of dikes may adversely affect submerged archaeological sites. Construction and/or modification of revetments and increased access to shoreline areas may adversely affect both submerged and terrestrial archaeological sites. As this project is a Federal undertaking, compliance with Section 106 of the NHPA is required. All known NRHP-eligible cultural resources have been and would continue to be assessed by the Arkansas SHPO and appropriate actions taken to resolve adverse effects to any NRHP-eligible or listed resources.

Industrial Development in the Arkansas River Bottoms near Russellville

The City of Russellville has purchased some of the land within the Red/Green (Preferred) Alternative project area to provide a future industrial development area. It is possible that at least some of the land would still be developed in the reasonably foreseeable future regardless of whether the intermodal facilities are built. If the City of Russellville properties are developed using only local and/or private funding, it is possible that NRHP-eligible cultural resources identified through technical studies and coordination efforts associated with this NEPA study, could be impacted without efforts to preserve, document, or recover those important resources as mandated under Section 106 of the NHPA.

Expansion of Soil and Gravel Excavation and Removal

If the intermodal facilities are not constructed on the proposed project area, it is likely that the current soil and gravel excavation operations would continue to expand in the area. This would likely result in a greater impacts to cultural resources within the APE, because any unknown NRHP-eligible cultural resources that may be buried in the soils would be permanently destroyed and transported off of the site to unknown areas. Whereas with construction of the intermodal facilities, no soils or gravel that could contain potential cultural resources are expected to be transported off-site. The potential for impacts to cultural resources is likely higher from sand, soil, and gravel mining operations than any other activity or project anticipated to occur on the proposed project area. With the expansion of privately owned soil and gravel excavations, it is likely that NRHP-eligible cultural resources identified through technical studies and coordination efforts associated with this NEPA study would be impacted without efforts to preserve, document, or recover those important resources as mandated under Section 106 of the NHPA. Impacts to cultural resources from such operations would be cumulative to other past, present, and reasonably foreseeable projects and/or activities in the area.

Expansion of Agricultural Land Use

The expansion of agricultural land uses in the project area would result in potential adverse impacts to previously undisturbed NRHP-eligible cultural resources. Most of those impacts would be due to plowing and disking of the soils which could damage cultural resources contained in the upper layers of the soils. Cultural resources impacts would occur on newly converted areas that had previously not been plowed or not plowed as deep as modern equipment permits. With the expansion of privately owned agricultural fields, it is likely that NRHP-eligible cultural resources identified through technical studies and coordination efforts associated with this NEPA study, would be impacted without efforts to preserve, document, or recover those important resources as mandated under Section 106 of the NHPA. Any impacts to cultural resources would be cumulative to other past, present, and reasonably foreseeable projects and/or activities in the area.

Increase Existing Arkansas River Commerce

There would be no measurable cumulative impacts for the No Action Alternative when combined with the anticipated increase in existing Arkansas River Commerce.

4.16.2.1.4 Mitigation

Because no activities related to the construction of the proposed intermodal facilities would occur under the No Action Alternative, no NRHP-eligible cultural resources would be adversely affected. No mitigation measures are required.

4.16.2.2 Potential Consequences of the Green (Preferred) Alternative on Cultural Resources

4.16.2.2.1 Direct Impacts

Direct impacts to archaeological sites include physical disturbance through surface grading, building excavation and construction, road construction, utility line trenching, use of staging areas for heavy equipment and supplies, borrow pit excavations, and vandalism of archaeological materials. Any ground-disturbing action in the area of an NRHP-eligible or potentially eligible archaeological site, or modification to such a site, can affect the physical integrity of that cultural resource, resulting in alteration or destruction of those characteristics or qualities, which make it potentially eligible for inclusion in the NRHP and thus, would be an adverse effect under Section 106 of the NHPA.

Implementation of the Green (Preferred) Alternative would disturb or destroy twenty-seven archaeological sites that are considered eligible or potentially eligible for the NRHP (pending further Phase II testing) resulting in an adverse effect to archaeological resources.

Direct impacts to architectural resources include demolition, alteration of architectural traits, structural instability through vibration, short-term audio intrusions during construction, and visual intrusions to historic settings and cultural landscapes. Any

visual or audio intrusions to the setting or demolition or alteration of architectural traits, can affect the integrity of an NRHP-eligible or potentially eligible architectural resource, resulting in alteration or destruction of those characteristics or qualities that make it potentially eligible for inclusion in the NRHP and thus, would be an adverse effect under Section 106 of the NHPA.

No NRHP-eligible architectural resources are located within the APE for the Green (Preferred) Alternative. The proposed Green (Preferred) Alternative area is located on the opposite bank of the Arkansas River from NRHP-listed architectural resources in the City of Dardanelle. The construction activities associated with the Green (Preferred) Alternative would result in leaving a tree-lined riparian zone along the bank of the Arkansas River, except, of course, at the entrance to the slackwater harbor. The character of the buildings and other facilities expected to be built on the intermodal facilities project area would be of similar scale and types as are currently at the Port of Dardanelle. The distance from the proposed area and the presence of vegetation and other intrusions will shield any visual impacts of the RVIF to these NRHP-eligible resources. No visual impact to NRHP-listed architectural resources will occur as a result of implementation of the Green (Preferred) Alternative.

Direct impacts to Native American resources include destruction of traditional resources, burials, and sacred sites, and plant or animal habitat through ground-disturbing activities and construction of buildings and roads. Audio and visual intrusion may adversely affect the visual and audio landscape or the viewshed of these resources. These types of physical disturbance may disturb or destroy unidentified Native American resources and thus, would be an adverse effect under Section 106 of the NHPA.

Implementation of the Green (Preferred) Alternative would disturb or destroy eight Native American farmsteads that are considered eligible or potentially eligible for the NRHP (pending further Phase II testing) resulting in an adverse effect to Native American resources.

Based on the Phase II testing, seven NRHP-eligible archaeological sites and twenty unevaluated sites are located within the Green (Preferred) Alternative. Additional cultural resources Phase II investigations would be required for the 20 archaeological sites to determine NRHP eligibility in accordance with the approved PA that was developed for the FEIS. A copy of the approved PA and associated Work Plan are contained in Appendix C. The NRHP-eligible sites would be protected or mitigated in accordance with the procedures outlined in the approved PA. Such steps would include, but not be limited to, avoiding NRHP-eligible resources through project redesign, minimizing impacts if avoidance is not possible, and mitigating impacts to all NRHP-eligible sites that would be partially or entirely affected by the project, through the implementation of Phase III data recovery efforts, as described in Section 4.16.2.2.4.

4.16.2.2.2 Indirect Impacts

Secondary development in the area surrounding the proposed intermodal facilities could result in additional impacts to unknown or undiscovered NRHP-eligible cultural

resources in the area. Secondary development may be privately funded and compliance with federal and state laws on historic preservation would not be required. NRHP-eligible cultural resources would be impacted without efforts to preserve, document, or recover those important resources as mandated under Section 106 of the NHPA. Disturbance or destruction through secondary development would create an adverse effect.

4.16.2.2.3 Cumulative Impacts

Under the Green (Preferred) Alternative, direct impacts are expected that would contribute to the cumulative disturbance or destruction of cultural resources resulting from all past, present, and future construction projects in the area. Such cumulative effects would further diminish the regional archaeological record decreasing the potential of its overall research contribution; would disrupt the regional architectural character and historic setting; and would diminish the Native American landscape.

Arkansas River Navigation Project

Potential impacts to cultural resources associated with the Arkansas River Navigation project may include physical disturbance through channel deepening and dredging operations, and construction and/or modification of dikes and revetments within the river channel and on adjacent shorelines. River bottom dredging is unlikely to encounter intact cultural resources. Construction and/or modification of dikes may adversely affect submerged archaeological sites. Construction and/or modification of revetments and increased access to shoreline areas may adversely affect both submerged and terrestrial archaeological sites. The intermodal facilities, which would also involve dredging operations and grading work mainly associated with construction of the levee, could result in cumulative impacts to cultural resources when combined with impacts from the Arkansas River Navigation Project. As this project is a Federal undertaking, compliance with Section 106 of the NHPA would be required. All known cultural resources within both project areas have been and will continue to be assessed by the Arkansas SHPO and appropriate actions would be taken to resolve adverse effects to any NRHP-eligible or listed resources.

Industrial Development in the Arkansas River Bottoms near Russellville

The City of Russellville has purchased some of the land within the Red/Green (Preferred) Alternative project area to provide a future industrial development area. It is possible that at least some of the land would still be developed in the reasonably foreseeable future regardless of whether the intermodal facilities are built. If the City of Russellville properties are developed using only local and/or private funding, it is possible that NRHP-eligible cultural resources identified through technical studies and coordination efforts associated with this NEPA study, could be impacted without efforts to preserve, document, or recover those important resources as mandated under Section 106 of the NHPA.

Expansion of Soil and Gravel Excavation and Removal

It is likely that soil, sand, and gravel mining operations would continue to expand in the area. This would likely result in additional impacts to NRHP-eligible cultural resources, because any unknown cultural resources that may be buried in the soils would be permanently destroyed and transported off of the site to unknown areas. With construction of the intermodal facilities, no soils or gravel that could contain potential cultural resources are expected to be transported off-site. The potential for impacts to cultural resources is likely higher from sand, soil, and gravel mining operations than any other activity or project anticipated occurring in the project vicinity. With the expansion of privately owned soil and gravel excavations, it is likely that NRHP-eligible cultural resources identified through technical studies and coordination efforts associated with this NEPA study, would be impacted without efforts to preserve, document, or recover those important resources as mandated under Section 106 of the NHPA. Impacts to cultural resources from such operations would be cumulative to other past, present, and reasonably foreseeable projects and/or activities in the area.

Expansion of Agricultural Land Use

The expansion of agricultural land uses in the project area would continue to result in potential adverse impacts to NRHP-eligible cultural resources. Most of those impacts would be due to plowing and disking of the soils which could damage cultural resources contained in the upper layers of the soils. Cultural resources impacts would occur on newly converted areas that had previously not been plowed or not plowed as deep as modern equipment permits. With the expansion of privately owned agricultural fields, it is likely that NRHP-eligible cultural resources identified through technical studies and coordination efforts associated with this NEPA study, would be impacted without efforts to preserve, document, or recover those important resources as mandated under Section 106 of the NHPA. Any impacts to cultural resources would be cumulative to other past, present, and reasonably foreseeable projects and/or activities in the area.

Increase Existing Arkansas River Commerce

There would be no measurable cumulative impacts for the Green (Preferred) Alternative when combined with the anticipated increase in existing Arkansas River Commerce.

4.16.2.2.4 Mitigation

Mitigation measures resolve adverse effects on cultural resources. The preferred mitigation is avoidance. Avoidance preserves the integrity of cultural resources and protects their research potential (i.e., their NRHP eligibility). Avoidance also eliminates the costs and potential construction delays associated with data recovery.

Should avoidance not be possible, resolution of potential adverse effects to NRHP-eligible or listed resources will be achieved through execution of a PA as required under 36 CFR 800.6. The PA is signed by the FHWA, AHTD, USACE, the Authority, and the tribes to address the future testing requirements and resolution of adverse effects to

NRHP-eligible resources and sensitive Native American resources for the preferred alternative. A copy of the PA and associated Work Plan are contained in Appendix C.

If project excavation (e.g. building construction and utility lines) or staging areas should occur in areas with intact NRHP-eligible archaeological resources as determined by the Phase II investigations and these resources cannot be avoided, mitigation measures would be developed in consultation with the Arkansas SHPO and all consulting parties. Traditionally, data recovery of archaeological sites through professional techniques such as surface collection, mapping, photography, subsurface excavation, technical report preparation and dissemination, has been the standard mitigation measure. Data recovery is labor intensive (*i.e.,* costly) but may be necessary if NRHP-eligible sites cannot be avoided. Data recovery of archaeological information is now considered, in and of itself, an adverse effect under the revised Section 106 regulations (36 CFR800.5(a)(2)(i)).

If additional cultural resources are discovered during construction activities, work would cease until those cultural resources could be assessed and evaluated by the Arkansas SHPO. Through coordination and consultation with federal, state, and local agencies, it was determined that the Green (Preferred) Alternative project area contains Section 4(f) protected properties. If, during the preparation of the FEIS, any additional Section 4(f) properties are discovered on the proposed project area, appropriate agencies would be contacted immediately for further consultation and appropriate actions would be taken to avoid, minimize, and/or mitigate the impacts.

With a signed and executed PA, there would be no significant impacts to cultural resources as define under NEPA. In addition, the execution of the PA concludes the Section 106 process under the NHPA.

4.16.2.3 Potential Consequences of the Red Alternative on Cultural Resources

4.16.2.3.1 Direct Impacts

Implementation of the Red Alternative would disturb or destroy nine archaeological sites that are considered eligible or potentially eligible for the NRHP (pending further Phase II testing) resulting in an adverse effect to archaeological resources.

No NRHP-eligible architectural resources are located within the APE for the Red Alternative. However, the proposed Red Alternative is located on the opposite bank of the Arkansas River from NRHP-listed architectural resources in the City of Dardanelle. The construction activities associated with the Red Alternative would result in the removal of trees and construction of a levee along the bank of the Arkansas River, making the port facilities visible from Front Street in Dardanelle. The character of the buildings and other facilities expected to be built on the intermodal facilities project area would be of similar scale and types as are currently at the Port of Dardanelle. The distance from the proposed area and the presence of other intrusions would minimize any visual impacts of the RVIF to these NRHP-eligible resources. No visual impacts to

NRHP-listed architectural resources will occur as a result of implementation of the Red Alternative.

Implementation of the Red Alternative would disturb or destroy four Native American farmsteads that are considered eligible or potentially eligible for the NRHP (pending further Phase II testing) resulting in an adverse effect to Native American resources.

Based on the Phase II testing, seven NRHP-eligible archaeological sites and two unevaluated sites are located within the Red Alternative. Additional cultural resources Phase II investigations would be required for the two archaeological sites to determine NRHP eligibility in accordance with the approved PA that was developed for the FEIS. The NRHP-eligible sites would be protected or mitigated in accordance with the procedures outlined in the approved PA. Such steps would include, but not be limited to, avoiding NRHP-eligible resources through project redesign, minimizing impacts if avoidance is not possible, and mitigating impacts to all NRHP-eligible sites that would be partially or entirely affected by the project, through the implementation of Phase III data recovery efforts, as described in Section 4.16.2.2.4.

4.16.2.3.2 Indirect Impacts

Indirect impacts associated with the Red Alternative would be similar to those discussed under the Green (Preferred) Alternative above.

4.16.2.3.3 Cumulative Impacts

Cumulative impacts associated with the Red Alternative would be similar to those discussed under the Green (Preferred) Alternative above.

Arkansas River Navigation Project

Cultural resources cumulative impacts in combination with the Arkansas River Navigation Project in the area for the Red Alternative would be similar to those described under the Green (Preferred) Alternative.

Industrial Development in the Arkansas River Bottoms near Russellville

Cultural resources cumulative impacts in combination with industrial development in the Arkansas River bottoms near Russellville for the Red Alternative would be similar to those described under the Green (Preferred) Alternative.

Expansion of Soil and Gravel Excavation and Removal

Cultural resources cumulative impacts in combination with the expansion of soil and gravel excavation and removal in the area for the Red Alternative would be similar to those described under the Green (Preferred) Alternative.

Expansion of Agricultural Land Use

Cultural resources cumulative impacts in combination with the continuation of agricultural land use for the Red Alternative would be similar to those described under the Green (Preferred) Alternative.

Increase Existing Arkansas River Commerce

There would be no measurable cumulative impacts for the Red Alternative when combined with the anticipated increase in existing Arkansas River Commerce.

4.16.2.3.4 Mitigation

Mitigation measures associated with the Red Alternative would be similar to those discussed under the Green (Preferred) Alternative above.

4.16.2.4 Potential Consequences of the Purple Alternative on Cultural Resources

4.16.2.4.1 Direct Impacts

Implementation of the Purple Alternative would disturb or destroy one archaeological site that is eligible for the NRHP resulting in an adverse effect to archaeological resources. Additional archaeological sites are likely to occur in the unsurveyed portions of the Purple Alternative project area and some may be considered NRHP-eligible. These sites would also be disturbed or destroyed with the implementation of this alternative.

No NRHP-eligible architectural resources are located within the APE for the Purple Alternative. The proposed Purple Alternative area is located on the bank of the Arkansas River. No NRHP-eligible or listed architectural resources are located within the viewshed for the Purple Alternative. No visual impact to NRHP-listed architectural resources will occur as a result of implementation of the Purple Alternative.

Pending further consultation, no Native American resources have been identified in the APE for the Purple Alternative. At this time, it is assumed that no Native American resources will be adversely affected.

4.16.2.4.2 Indirect Impacts

Indirect impacts associated with the Purple Alternative would be similar to those discussed under the Green (Preferred) Alternative above.

4.16.2.4.3 Cumulative Impacts

Arkansas River Navigation Project

Cultural resources cumulative impacts in combination with the Arkansas River Navigation Project in the area for the Purple Alternative would be similar to those described under the Green (Preferred) Alternative.

Continuation of Agricultural Land Use

Cultural resources cumulative impacts in combination with the continuation of agricultural land use for the Purple Alternative would be similar to those described under the Green (Preferred) Alternative.

Increase Arkansas River Commerce

The increase of current Arkansas River commerce would not affect NRHP-eligible cultural resources. No river bottom dredging or shoreline modification which could adversely affect NRHP-eligible cultural resources would occur with an increase in commerce.

4.16.2.4.4 Mitigation

Mitigation measures associated with the Purple Alternative would be similar to those discussed under the Green (Preferred) Alternative above**.**

4.17 HAZARDOUS WASTE SITES

4.17.1 Affected Environment

Detailed information regarding hazardous waste sites for the No Action, Green (Preferred), Red, and Purple Alternative project areas can be found in Section 4.17.1 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.17.2 Consequences

4.17.2.1 Potential Consequences of the No Action Alternative on Hazardous Waste Sites

There would be no impacts to hazardous waste sites under the No Action Alternative. Direct, indirect, and cumulative hazardous waste impacts under the No Action Alternative are presented in detail in Section 4.17.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.17.2.2 Potential Consequences of the Green (Preferred) Alternative on Hazardous Waste Sites

4.17.2.2.1 Direct Impacts

Because no hazardous waste sites exist in the project area according to the EDR Report, direct impacts associated with existing hazardous waste sites would not occur at this site.

If this alternative is selected, hazardous materials could be used, stored, and transported throughout the intermodal facilities. With this possible introduction of hazardous materials, hazardous waste sites may need to be designated in the future.

Examples of probable hazardous materials include gasoline, oil, degreasers, and other materials used for general equipment maintenance. Although the exact industries that would use the intermodal facilities are unknown, it is anticipated that a mixture of industrial, commercial, and warehousing activities will occur at the intermodal facilities. Potential adverse impacts associated with hazardous materials or hazardous wastes would be regulated by state and Federal regulatory agencies, such as the USEPA, that regulate and monitor those industries. Consequently adverse impacts, if any, would be expected to be minor.

A long-term potential for short duration impacts exists due to direct releases of hazardous materials from trains, trucks, and other operating equipment throughout the intermodal facilities. Generation and management of hazardous waste would be addressed via the RCRA permitting process.

4.17.2.2.2 Indirect Impacts

Because no hazardous waste sites exist, indirect impacts associated with existing hazardous waste sites would not occur at this site. Construction of the intermodal facilities may result in increased transportation of hazardous materials to and from the general project area or region. This could increase the potential for accidental spills or releases, not only in the immediate project vicinity, but in areas beyond the immediate project vicinity as those materials are transported to and from the area. It is not known what, if any, hazardous materials would be transported to and from the intermodal facilities at this time so it is not possible to determine what the potential indirect impacts would be. All materials would be transported to and from the site in approved containers.

4.17.2.2.3 Cumulative Impacts

Arkansas River Navigation Project

Improvements to the commercial navigation channel of the MKARNS would combine with the recent improvements to Highway 247 and the intermodal facilities project to increase the potential for hazardous materials and wastes to be transported throughout the project vicinity and ARV region. An increase in the usage of these areas for hazardous materials and wastes would increase the possibility that these would

materials could be accidentally released. Therefore, there is a long-term potential for short-term impacts to occur. It is not known what, if any, hazardous materials would be transported through the area at this time. Therefore, it is not possible to determine the potential impacts at this time. Potential impacts to water quality due to accidental spills or small incremental releases of contaminants or potentially hazardous materials were discussed in more detail above.

Although there is a risk that hazardous materials could be released into the MKARNS posing threats to human and natural environments, the Arkansas River Navigation project in combination with the intermodal facilities project, could provide some benefits in terms of reducing potential risks in other areas. Providing more river navigation capabilities and intermodal connection options would allow more of those hazardous materials to be transported by river rather than have those same materials be transported by multiple trucks or rail cars through more densely populated areas. Contrary to the beliefs of many people, environmental safety may be better when materials are shipped via waterways because truck and rail spills occur more often than barge spills (USDOT, 1994). Design features of barges, such as double-hulls and navigational aids, help reduce the frequency of accidents. All new inland tank barges carrying liquid cargo now have an inner and outer hull. The USCG regulates the design and construction of these vessels and equipment as well as qualifications of the personnel manning them. The USCG inspects the vessels annually to ensure compliance (USDOT, 1994). Therefore, promoting the use of barge transportation would not be considered a major threat to water quality due to spills from barges. Risks associated with highway and rail transportation may be higher as those systems tend to require transportation of hazardous materials closer to populated areas, especially residential areas. Potential for accidents on highways and rails may also be higher due to the number of trucks and rail cars that would be required to transport large quantities of materials compared to the same amount in a barge. If barges were used to transport those same materials, it would remove those materials from highways or rails and reduce risks in more heavily populated areas.

Industrial Development in the Arkansas River Bottoms near Russellville

Industrial development in the Arkansas River bottoms near Russellville is not expected to be substantial outside of the boundaries of the intermodal facilities. However, any development that occurs in the adjacent areas would increase potential risks associated with hazardous materials that could be used as part of the industrial uses. Those increased uses would increase risks to the local environment in cases of accidental spills or releases of those materials. Those risks would be cumulative to risks associated with increased truck transportation along the improved Highway 247, increased barge traffic due to the Arkansas River Navigation project, and potential increased transportation, storage, production, or use of hazardous materials at the intermodal facilities. It is not known what materials would be transported through the area by truck or barge, or what if any hazardous materials would be used, produced, or stored at the industrial developments within the intermodal facilities. Therefore, it is not possible to determine the severity of the potential impacts at this time. Regulatory agencies would likely monitor all transport of hazardous materials as well as potential

risks to humans that may occur with industrial developments. Generation and management of hazardous waste would be addressed via the RCRA permitting process.

Expansion of Soil and Gravel Excavation and Removal

Expansion of the soil, sand, and gravel mining operations in the areas adjacent to the intermodal facilities would not pose substantial risks due to hazardous materials. Fuels and other chemicals used for mining equipment would be the primary materials of concern. It is not expected that substantial amounts of any of those chemicals would be used for the mining operations. Therefore, potential for cumulative impacts would be low.

Continuation of Agricultural Land Use

Continuation of agricultural land uses in the areas adjacent to the intermodal facilities would pose some potential for risks due to hazardous materials. Fuels and other chemicals used for farm equipment operation would be some of the materials of concern. The primary hazardous materials of concern would be pesticides and herbicides used for agricultural production in the area. It is not expected that use of hazardous materials would increase substantially from baseline conditions. In fact, the removal of some agricultural land uses due to the intermodal facilities development would likely reduce overall agricultural land uses and associated hazardous materials use or storage. There are not expected to be substantial cumulative impacts associated with continuation of agricultural land uses in the area.

Increase Existing Arkansas River Commerce

There would be no cumulative impacts associated with hazardous waste sites in combination with the increase in existing Arkansas River commerce. Any increase in commerce that accompanies the proposed intermodal facilities would not be impeded by hazardous waste sites, since none occur in the cumulative impact geographic area of analysis.

4.17.2.2.4 Mitigation

Since there are currently no hazardous waste sites in the project area, mitigation would not be necessary to remediate or avoid such sites. However, appropriate BMPs would be used to ensure safe handling of any hazardous materials and wastes associated with the operation of the proposed intermodal facilities. Appropriate BMPs would include the use of SPCC plans for operations that utilize hazardous materials and wastes and utilizing NPDES permits for discharges to surrounding waters where appropriate.

Federal and state regulatory agencies (e.g., USEPA and ADEQ) would likely monitor all transport, storage, production, and use of hazardous materials as well as potential risks to humans and the environment that may occur with development of the intermodal facilities and associated industrial developments. All ASTs and USTs would be properly

documented and regulated by ADEQ. Generation and management of hazardous waste would be addressed via the RCRA permitting process.

The continued use of new inland tank barges that have an inner and outer hull would reduce the likelihood of spills from barges containing hazardous materials. The use of BMPs as well as regulations set forth in environmental permits would help protect water resources in the area. Any accidental releases of contaminants on the site would be contained and remediated immediately.

4.17.2.3 Potential Consequences of the Red Alternative on Hazardous Waste Sites

The impacts to hazardous waste sites under the Red Alternative would be similar to those of the Green (Preferred) Alternative. Direct, indirect, and cumulative hazardous waste impacts and mitigation measures under the Red Alternative are presented in detail in Section 4.17.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.17.2.4 Potential Consequences of the Purple Alternative on Hazardous Waste Sites

The impacts to hazardous waste sites under the Purple Alternative would be similar to those of the Green (Preferred) Alternative. Direct, indirect, and cumulative hazardous waste impacts and mitigation measures under the Purple Alternative are presented in detail in Section 4.17.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.18 VISUAL IMPACTS

4.18.1 Affected Environment

Detailed information regarding visual quality for the No Action, Green (Preferred), Red, and Purple Alternative project areas can be found in Section 4.18.1 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.18.2 Consequences

4.18.2.1 Potential Visual Impact Consequences of the No Action Alternative

There would be no impacts to visual quality under the No Action Alternative. Direct, indirect, and cumulative visual quality impacts under the No Action Alternative are presented in detail in Section 4.18.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.18.2.2 Potential Visual Impact Consequences of the Green (Preferred) Alternative

4.18.2.2.1 Direct Impacts

Regardless of the alternative chosen, the intermodal facilities would reduce the visual quality of the project area in terms of loss of undeveloped habitats (e.g., cropland, old fields, forests, etc.), and the modification of wetlands. Under the Green (Preferred) Alternative, the view from Dardanelle will be preserved as the riparian forest along the river will remain, resulting in substantially less visual impacts in terms of loss of forested areas when compared to the Red Alternative. During construction, there will be several temporary visual impacts, such as exposed earth, jobsite equipment, and vegetation loss.

4.18.2.2.2 Indirect Impacts

Construction of the intermodal facilities may induce adjacent land use changes (e.g., commercial development and new housing), which could generate visual impacts away from the project area. Again, depending on the perception of the residents in the area, these impacts may or may not be viewed as negative. In some instances residents may prefer the view of newly developed and well-maintained areas rather than rundown areas, mined areas, or exposed soils in crop fields.

4.18.2.2.3 Cumulative Impacts

Arkansas River Navigation Project

No substantial cumulative visual impacts are anticipated in the project vicinity due to the Arkansas River Navigation project. The dredging disposal sites and construction of, or modification of, river training structures would provide a minor, short-term decrease in aesthetics along the MKARNS. However, those areas would likely transition into vegetated areas in the future. Therefore, no substantial long-term visual impacts are anticipated.

Industrial Development in the Arkansas River Bottoms near Russellville

It is not likely that substantial industrial development would occur in the Arkansas River bottom near Russellville in the reasonably foreseeable future if the intermodal facilities are developed, because most of the development would occur within the boundaries of the project area. However, if industrial development does occur outside the boundaries of the intermodal facilities it would have slightly adverse visual impacts in the immediate area, due to construction of industrial land uses in place of more rural views of vegetation and agricultural areas. However, some people may perceive the industrial developments positively, especially if high quality developments are constructed and landscaping or other beneficial characteristics are included with those developments. Therefore, cumulative visual impacts are not expected to be either strongly adverse or positive.

Expansion of Soil and Gravel Excavation and Removal

The expansion of soil, sand, and gravel mining operations would result in adverse visual impacts due to removal of vegetation and due to the condition the mined lands are often left in based on past and current mining operations in the area. Due to the small, private nature of many of the mining operations in the area, there does not appear to be substantial efforts made to reclaim the mined areas by regrading and/or revegetating the areas. It appeared that several mined areas were left as large holes in the floodplain floor that had eroded walls and were being used as unapproved dumps for trash, old appliances, and other waste materials from nearby residences or businesses. As a result of the scattered nature of these areas and the low human use of these areas for recreational purposes, the overall adverse visual impacts would not be considered substantial. If such areas occurred in proximity to more highly populated or viewed areas, the impacts would be worse.

There is some potential that construction of the intermodal facilities could replace and repair past and present mining areas. This could result in slight visual improvements in the area.

Continuation of Agricultural Land Use

The continuation of agricultural land uses in the area would not result in substantial changes from baseline conditions. Therefore, no cumulative visual impacts are anticipated.

Increase Existing Arkansas River Commerce

The increase in existing Arkansas River commerce and the Intermodal Facilities projects would combine to promote increased use of barge transportation in the region. When viewed cumulatively, increased use of river transportation via barges would result in minor visual impacts for the entire region.

4.18.2.2.4 Mitigation

Mitigation measures, as defined by the CEQ (40 CFR 1508.20), include avoiding impacts, minimizing impacts, rectifying impacts, reducing or eliminating the impact over time, and compensating for the impact. Potential mitigation measures for visual impacts would include, but should not be limited to:

- Consideration of post-project aesthetic appeal during the project's functional design, surveying, and clearing;
- Preparation of areas within the project area to permit successful revegetation programs that accommodate, preserve, and capitalize on mature and semi-mature stands of vegetation;
- Care in establishment of native vegetation through natural revegetation or planned seeding; and

- Establishment of visual easements along the project area to preserve prominent vistas and views of desirable open space, agricultural land, and forests.

4.18.2.3 Potential Visual Impact Consequences of the Red Alternative

Direct impacts due to the implementation of the Red Alternative would be similar to those listed for the Green (Preferred) Alternative. However, the view of the project area under the Red Alternative from Dardanelle will be considered more of a negative impact by some due to the removal of the riparian forest and the creation of a grass levee to protect the facilities. However, as discussed in Section 4.16.3 of the SDEIS, because the intermodal facilities would be a continuation of the river transportation tradition of Dardanelle, the visual impacts would not be perceived as a severe impact by others in the area.

The need for impact mitigation for the Red Alternative would be higher due to the fact that the forested riparian buffer would be substantially removed between the intermodal facilities and the City of Dardanelle.

Direct, indirect, and cumulative visual impacts and mitigation measures under the Red Alternative are presented in detail in Section 4.18.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

4.18.2.4 Potential Visual Impact Consequences of the Purple Alternative

The impacts to visual quality under the Purple Alternative would be similar to those of the Green (Preferred) Alternative. Direct, indirect, and cumulative visual impacts and mitigation measures under the Purple Alternative are presented in detail in Section 4.18.2 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

Since the Purple Alternative consists of the conversion of the embayment into a slackwater harbor on Lake Dardanelle, the visual quality of the recreational opportunities on the lake may be adversely impacted.

A forested riparian buffer between Lake Dardanelle and the intermodal facilities would reduce the need for visual mitigation measures for the Purple Alternative.

4.19 SUMMARY OF ENVIRONMENTAL IMPACTS

Detailed information regarding direct, indirect, and cumulative impacts associated with the Green (Preferred) Alternative are discussed in Sections 4.2 through 4.18 of this FEIS. Detailed discussions of impacts for all alternatives, including the No Action, Green (Preferred), Red, and Purple Alternative, are discussed in detail in Sections 4.2 through 4.18 of the SDEIS. The SDEIS can be found online at the following location: (http://www.rivervalleyintermodal.org/deis.htm).

Table 4.2 contains a summary of the direct impacts associated with each of the alternatives studied in the EIS.

Table 4.2. Summary of Direct Impacts of the No Action, Green (Preferred), Red, and Purple Alternatives				
	No Action Alternative	**Green (Preferred) Alternative**	**Red Alternative**	**Purple Alternative**
Land Use & Infrastructure	Land uses within the proposed project areas would continue without major changes. Without major public or private investment, lack of infrastructure within the project area would continue to pose limitations to future development.	Land use impacts would consist of the conversion of primarily low-density residential and agricultural land to industrial and commercial uses. Beneficial impacts to infrastructure would result as utilities, roadways, and railroads would be extended into the project area to support the intermodal facilities.	Impacts would be similar to those of the Green (Preferred) Alternative.	Impacts would be similar to those of the Green (Preferred) Alternative.
Farmland, Soils, & Physical Environment	No direct impacts to farmland, soils, and physical environment.	Minor, long-term adverse impacts to topography and soils of the proposed project area resulting from earth moving activities. Approximately 615 acres of land would be removed from agricultural production.	Impacts would be similar to those of the Green (Preferred) Alternative. Approximately 155 fewer acres would be removed from agricultural production than under the Green (Preferred) Alternative.	Moderate short-term and long-term adverse impacts to soils resulting from earth moving activities in the proposed project area are expected. Minor short-term adverse impacts would occur as a result of soil disturbance.
Social Environment	There could be long-term adverse social impacts as a result of lack of development.	There would be both short-term adverse (displacements and relocations) and long-term beneficial (population growth and employment) social impacts.	Short-term and long-term social impacts would be similar to those under the Green (Preferred) Alternative.	Short-term and long-term social impacts would be similar to those under the Green (Preferred) Alternative.
Relocation	There would be no relocation impacts.	There would be six residential relocations, one business displacement, and a partial business displacement.	There would be eight residential relocations, one business displacement, one partial business displacement, and one institutional displacement.	There would be fifteen residential relocations.

Table 4.2. Summary of Direct Impacts of the No Action, Green (Preferred), Red, and Purple Alternatives				
	No Action Alternative	**Green (Preferred) Alternative**	**Red Alternative**	**Purple Alternative**
Economic	The project area would most likely remain under utilized and undeveloped.	Short-term and long-term beneficial (employment, increased tax revenues) and adverse (loss of property tax revenue) economic impacts would occur.	Economic impacts would be similar to those of the Green (Preferred) Alternative.	Economic impacts would be similar to those of the Green (Preferred) Alternative.
Pedestrian & Bicyclist Considerations	No impacts would occur to existing pedestrian or bicycle routes.	No new pedestrian or bicycle routes are proposed as part of this project. No impacts would occur to existing pedestrian or bicycle routes.	No new pedestrian or bicycle routes are proposed as part of this project. No impacts would occur to existing pedestrian or bicycle routes.	No new pedestrian or bicycle routes are proposed as part of this project. No impacts would occur to existing pedestrian or bicycle routes.
Air Quality	There would be no impacts to air quality.	Short-term impacts to air quality will occur during construction due to operation of construction vehicles and dust created.	Impacts would be similar to those of the Green (Preferred) Alternative.	Impacts would be similar to those of the Green (Preferred) Alternative.
Noise	There would be no impacts as a result of noise.	Noise impacts will occur due to the increase of barge, truck, and train traffic related to the new facilities. Machinery at the facilities and dredging activities will also increase noise around the site. Short-term increases in noise levels will occur during construction due to construction vehicles and general noise created during construction.	Impacts would be similar to those of the Green (Preferred) Alternative.	Impacts would be similar to those of the Green (Preferred) Alternative.

Table 4.2. Summary of Direct Impacts of the No Action, Green (Preferred), Red, and Purple Alternatives				
	No Action Alternative	**Green (Preferred) Alternative**	**Red Alternative**	**Purple Alternative**
Water Quality	There would be no impacts to water quality.	The potential for water quality impacts to the tributary to Whig Creek, the tributary to Flagg Lake, and Whig Creek would be slightly less than under the Red Alternative. Because the levee at the Green (Preferred) Alternative site would be set back from the bank of the Arkansas River, potential water quality impacts to the river would be less than those under the Red Alternative. A long-term potential impact exists due to the possibility for small incremental releases or large accidental spills of contaminants into the Arkansas River or Whig Creek.	Impacts would be similar to those for the Green (Preferred) Alternative. However, because the Red Alternative area is closer to Whig Creek and contains more of its tributaries, impacts would be slightly greater under the Red Alternative. Short-term adverse impacts to Whig Creek could occur from a railroad bridge required to cross the creek. Water quality could be reduced by potential channel modifications for the tributary to Whig Creek and the tributary to Flagg Lake. Construction of a levee on the bank of the Arkansas River would adversely impact the river due to sedimentation during construction.	Short-term adverse impacts could be caused by construction of a roadway and railroad bridge across the unnamed tributary to the Lake Dardanelle State Fish Hatchery and the unnamed tributary to the embayment east of the Fish Hatchery. Water quality could be reduced by potential channel modifications to the tributary to the embayment that would be converted into a slackwater harbor. Excavation and maintenance dredging of the harbor would cause some sediment to be released into the reservoir. A long-term potential impact exists due to the possibility for small incremental releases or large accidental spills of contaminants into the tributaries of Lake Dardanelle.

Table 4.2. Summary of Direct Impacts of the No Action, Green (Preferred), Red, and Purple Alternatives				
	No Action Alternative	**Green (Preferred) Alternative**	**Red Alternative**	**Purple Alternative**
Wetlands	There would be no impacts to wetlands.	It is likely that unavoidable long-term adverse impacts would occur to approximately 18 acres of wetlands during the construction phase of the proposed action. The total number of wetland acres adversely affected would be determined using the final site development plans.	It is likely that unavoidable long-term adverse impacts would occur to approximately 21 acres of wetlands during the construction phase of the proposed action. The total number of wetland acres adversely affected would be determined using the final site development plans.	The total number of wetland acres adversely affected would be determined using the final site development plans. The total impact would be less than 4 acres.
Water Body Modification, Wildlife, & Vegetation	There would be no impacts to water bodies, wildlife, or vegetation	Long-term and short-term adverse impacts to the Arkansas River, Whig Creek, the tributary to Whig Creek, and the tributary to Flagg Lake are anticipated with construction of the intermodal facilities. Long-term adverse impacts to wildlife would occur due to the permanent loss of old field, grassland, forest, wetlands, and cropland habitats. There would be a long-term potential for minor releases of chemicals and fuels that could result in short-term adverse impacts to fish and wildlife and their habitats.	Impacts to water bodies, wildlife, and vegetation would be similar to those of the Green (Preferred) Alternative. However, impacts to riparian forests and wetlands would be more under the Red Alternative.	Long-term and short-term adverse impacts to Lake Dardanelle, the embayment, the intermittent streams, and several ponds are anticipated with construction of the intermodal facilities. Long-term adverse impacts to wildlife would occur due to the permanent loss of pasture and forested habitats. Other impacts to water bodies, wildlife, and vegetation would be similar to those of the Green (Preferred) Alternative.

Table 4.2. Summary of Direct Impacts of the No Action, Green (Preferred), Red, and Purple Alternatives				
	No Action Alternative	**Green (Preferred) Alternative**	**Red Alternative**	**Purple Alternative**
Floodplains	There would be no impacts to the floodplain Without major public or private investment, floodplain within the Green (Preferred) Alternative project areas would continue to pose limitations to future development.	The computer program HEC-RAS was used to compute existing condition water surface elevations for the 10-year, 50-year, 100-year, and 500-year flow events. The HEC-RAS analysis shows the proposed Intermodal Facilities will increase 100-year floodplain water surface elevations by a maximum of 0.09 feet for the Green (Preferred) Alternative. Therefore, the Green (Preferred) Alternative is consistent with EO 11988 and satisfies the requirements of FEMA for good floodplain management.	HEC-RAS analysis shows the proposed Intermodal Facilities will increase 100-year floodplain water surface elevations by a maximum of 0.12 feet for the Red Alternative. Therefore, the Red Alternative is consistent with EO 11988 and satisfies the requirements of FEMA for good floodplain management.	A floodplain analysis and HEC-RAS model were not performed for the Purple Alternative based on direction from the USACE, Little Rock District. Although portions of the Purple Alternative are within the flowage easement of Lake Dardanelle, and therefore the Arkansas River floodplain, negligible floodplain would be removed as a result of this alternative. Therefore, the Purple Alternative is consistent with EO 11988 and satisfies the requirements of FEMA for good floodplain management.
Commercial Navigation	There would be no realization of the region's potential for greatly expanded intermodal transportation opportunities.	Substantial long-term beneficial impacts (savings in transportation costs, employment, personal income, and additional business revenue) to commercial navigation would be incurred.	Impacts on commercial navigation would be similar to those of the Green (Preferred) Alternative.	Impacts on commercial navigation would be similar to those of the Green (Preferred) Alternative. There would be minor adverse impacts to commercial navigation due to congestion from recreational boating in Lake Dardanelle.

Table 4.2. Summary of Direct Impacts of the No Action, Green (Preferred), Red, and Purple Alternatives				
	No Action Alternative	**Green (Preferred) Alternative**	**Red Alternative**	**Purple Alternative**
Threatened & Endangered Species	There would be no impacts to any federally listed threatened or endangered species.	There would be no measurable impacts to federally listed threatened or endangered species.	There would be no measurable impacts to federally listed threatened or endangered species.	There would be no measurable impacts to federally listed threatened or endangered species.
Cultural Resources	There would be no impacts to cultural resources.	Implementation of the Green (Preferred) Alternative would disturb or destroy 27 archaeological sites that are considered eligible or potentially eligible for the NRHP (pending further Phase II testing) resulting in an adverse effect to archaeological resources.	Implementation of the Red Alternative would disturb or destroy nine archaeological sites that are considered eligible or potentially eligible for the NRHP (pending further Phase II testing) resulting in an adverse effect to archaeological resources.	Implementation of the Purple Alternative would disturb or destroy one archaeological site that is eligible for the NRHP resulting in an adverse effect to archaeological resources. Additional archaeological sites are likely to occur in the unsurveyed portions of the Purple Alternative project area and some may be considered NRHP-eligible. These sites would also be disturbed or destroyed with the implementation of this alternative.
Hazardous Waste Sites	There would be no impacts associated with Hazardous Waste Sites.	Because no hazardous waste sites exist in the project area, impacts associated with existing hazardous waste sites would not occur at this site.	Because no hazardous waste sites exist in the project area, impacts associated with existing hazardous waste sites would not occur at this site.	Because no hazardous waste sites exist in the project area, impacts associated with existing hazardous waste sites would not occur at this site.

Table 4.2. Summary of Direct Impacts of the No Action, Green (Preferred), Red, and Purple Alternatives				
	No Action Alternative	**Green (Preferred) Alternative**	**Red Alternative**	**Purple Alternative**
Visual Impacts	No impacts to the view shed are anticipated, because no activities related to the proposed intermodal facilities would occur.	The intermodal facilities would reduce the visual quality of the project area in terms of loss of undeveloped habitats (e.g., cropland, old fields, forests, etc.), and the modification of wetlands. Under the Green (Preferred) Alternative, the view from Dardanelle would be preserved because the riparian forest along the river would remain, resulting in substantially less visual impact in terms of loss of forested areas. During construction, there would be several temporary visual impacts, such as exposed earth, jobsite equipment, and vegetation loss.	Impacts due to the implementation of the Red Alternative would be similar to those of the Green (Preferred) Alternative. However, under the Red Alternative, the view from Dardanelle would be considered a negative impact by some due to the removal of the riparian forest and the creation of a grass levee to protect the facilities. During construction, there would be several temporary visual impacts, such as exposed earth, jobsite equipment, and vegetation loss.	Impacts to the view shed would include a reduction in the visual quality of the project area in terms of loss of undeveloped habitats (e.g., cropland, old fields, forests, etc.), and minimal modifications of wetlands and floodplains. Additionally, where the intermodal facilities will be in the view shed of existing residences, or residences now shielded by trees, shrubs, and/or distance, there will be an adverse visual impact due to the nearness of the facilities, the effects of traffic, and the loss of trees and shrubs.