4.0 ENVIRONMENTAL ANALYSIS

The environmental consequences of constructing and operating the Project would vary in duration and significance. Four levels of impact duration were considered: temporary, short-term, long-term, and permanent. Temporary impacts generally occur during construction with the resource returning to pre-construction conditions almost immediately afterward. Short-term impacts would continue for up to 3 years following construction. Impacts were considered long-term if resources would require more than 3 years to recover. Permanent impacts would occur as a result of activities that modify resources to the extent that they would not return to pre-construction conditions during the life of the Project, such as impact to vegetation as a result of the construction and operations of an aboveground facility. We considered an impact to be significant if it would result in a substantial adverse change in the physical environment.

In this section, we discuss the affected environment, general construction and operational impacts, and proposed mitigation for each resource. Rockies Express, as part of its proposal, agreed to implement certain measures to reduce impacts, and we evaluated the proposed mitigation measures and in some cases identified additional mitigation measures, which we believe would further reduce impacts. The additional mitigation measures that we have identified appear as bulleted, boldface paragraphs in the text. We recommend these measures be included as specific conditions to any Certificate that the Commission may issue to Rockies Express for the Project.

Conclusions in this EIS are based on our analysis of the environmental impact and the following assumptions:

- Rockies Express would comply with all applicable laws and regulations;
- The facilities would be constructed as described in section 2.1 of this EIS; and
- Rockies Express would implement the mitigation measures identified in its application and supplemental filings to the FERC.

This section of the EIS is organized by environmental resource. The scope of our analysis includes the construction and operation of the Project facilities. This EIS also includes a discussion of natural gas pipeline reliability and safety (see section 4.12) and the cumulative impacts of the Project with other projects in the area (see section 4.13).

4.1 GEOLOGY

4.1.1 Geologic Setting

The REX East Project would be located within five main physiographic regions:

- Central Lowlands (Dissected Till Plains): Missouri
- Central Lowlands (Till Plains): Illinois, Indiana, and western Ohio
- Appalachian Plateau (Glaciated and Unglaciated Allegheny Plateau): eastern Ohio
- Wyoming Basin: Wyoming
- Great Plains (High Plains): Nebraska

Much of the Project would be located in areas where the land has been shaped by multiple glacial events. Elevations along the proposed pipeline route would range from 424 feet above mean sea level in Illinois to 1,332 feet above mean sea level in Ohio. Most of the pipeline route would be relatively flat in

Missouri, Illinois, and Indiana. Generally, steeper slopes would occur in Ohio, especially in the eastern portion of the state. Geologic conditions along the REX East pipeline route are summarized in table 4.1.1-1.

Table 4.1.1-1

Summary of Geologic Conditions Along Proposed Route a/

Milepost Range	Description of Bedrock Formations Crossed
0 to 339	Pennsylvanian and Mississippian limestone, shale, siltstone, and sandstone
339 to 377	Silurian and Devonian limestone and dolomite
377 to 462	Ordovician limestone and dolomite
462 to 547	Mississippian and Silurian limestone, shale, and dolomite
547 to 639	Pennsylvanian and Permian limestone, shale, sandstone, including coal-bearing formations

a/ National Atlas of the United States, 2007.

In most areas bedrock is buried so deeply by glacial deposits and/or soils that it would not be encountered during construction. Approximately 14 percent of the proposed pipeline route would cross areas where bedrock may be encountered during trenching. Table 4.1.1-2 identifies general locations

Table 4.1.1-2

Shallow Bedrock Areas that Require Blasting Along Proposed Pipeline Route a/

State/County	Areas requiring blasting (miles)	Areas which may require blasting (miles)	Total (miles)
MISSOURI			
Pike	0.1	0.1	0.2
ILLINOIS			
Pike	0.1	0.0	0.1
INDIANA			
Vermillion	0.0	0.1	0.1
Morgan	0.0	<0.1	<0.1
Decatur	0.4	0.0	0.4
Franklin	0.0	4.2	4.2
OHIO			
Butler	0.0	9.8	9.8
Warren	0.1	2.3	2.4
Clinton	0.1	0.0	0.1
Fairfield	1.0	0.1	1.1
Perry	5.8	2.9	8.7
Muskingum	9.8	12.1	21.9
Guernsey	3.8	10.3	14.1
Noble	1.1	2.9	4.0
Belmont	14.9	1.2	16.1
Monroe	4.1	1.4	5.5
Project Total	**41.3**	**47.4**	**88.7**

a/ U.S. Department of Agriculture, 2003.

where shallow bedrock may be encountered. Depending upon the type of rock, Rockies Express would use either rippers or blasting to break up bedrock encountered during construction. If blasting is required, Rockies Express would implement its Blasting Plan (CD Document C). The Blasting Plan outlines the procedures and safety measures that Rockies Express would adhere to while implementing blasting activities along the pipeline right-of-way during construction. Blasting would be used only where other methods of trenching are not feasible. Site-specific blasting plans would be prepared for each area where blasting would occur. These site-specific plans would outline the procedures to be used for notification of nearby property owners; safety precautions; methods for storing, handling, transporting, loading and detonating explosives; and monitoring the effects of explosions. No blasting would be necessary in constructing the aboveground facilities.

Based on the overall geologic conditions present in the Project area, we conclude that construction of the REX East Project would not significantly alter the geologic and physiographic conditions.

4.1.2 Mineral Resources

The construction and operation of REX East facilities near or over mineral resources could impact the present and future extraction of those resources. The types of potentially exploitable mineral resources identified in the REX East Project area are oil and gas, coal, crushed stone, cement, lead, lime, salt, soda ash, clay, and Grade–A helium.

Table 4.1.2-1 identifies the known mineral resource production areas within 1,500 feet of the proposed pipeline route. No mining or mineral resource production areas were identified within 1,500 feet of any of the proposed aboveground facilities. No production of cement, lead, lime, salt, soda ash, clay, or Grade–A helium is known to occur within 1,500 feet of the Project.

Table 4.1.2-1
Summary of Known Mineral Resource Production Areas Within 1,500 Feet of Proposed Project

State/County	Milepost	Area Where Resource is Found	Distance (in feet) and Direction from Centerline
ILLINOIS			
Pike	59.9	Quarry	1,300 – Southeast
	70.6	Gravel Pit	1,250 – South
Douglas	199.9	Quarry	500 – North
INDIANA			
Morgan	310.0	Sand/Gravel Pit	575 – West
	315.2	Sand/Gravel Pit	900 – Northeast
	315.4	Sand/Gravel Pit	500 – West
OHIO			
Butler	424.9	Gravel Pit	450 – Southwest
	430.6	Sand/Gravel Pit	1,000 – North
	RR 2031-MP434.1+1.6	Sand/Gravel Pit	1,500 – North
	473.0	Sand/Gravel Pit	1,500 – North

Sand, gravel, and crushed stone

No active sand and gravel pits or quarries would be crossed by the Project. The construction of the Project would not prevent the operation of the existing pits/quarries in the area. Construction of the Project may limit future exploitation of these resources, but only in the immediate vicinity of the Project. We note that in areas where the REX East pipeline would parallel existing rights-of-way, those rights-of-way already prohibit or limit the exploitation of these mineral resources.

A landowner in Waldron, Indiana expressed concern that blasting at a nearby quarry could damage the pipeline. The nearest quarry to the proposed pipeline in this area appears to be about 3,500 feet away. As discussed in section 4.1.3, the pipeline is designed to withstand some amount of earth movement. We do not believe that blasting at a quarry more than 0.5 mile from the pipeline would affect the integrity of the pipeline.

Oil and gas

The pipeline route is within 500 feet of 101 active oil and gas wells. These wells were identified in Christian County, Illinois (5); Parke (2), Shelby (2), and Decatur (9) Counties, Indiana; and Fairfield (3), Perry (20), Muskingum (40), Guernsey (13), Noble (2), Belmont (3), and Monroe (2) Counties, Ohio.

Seven of these wells appear to be within the pipeline construction right-of-way (at MPs 555.0, 573.8, 599.0, 606.6, 627.1, and 2 at 635.4). Grading and trenching activities could damage wellheads or gathering lines, creating a potential safety hazard to workers and interrupting oil and gas production until appropriate repairs are made. Blasting operations could also damage nearby oil and gas wells. Rockies Express has indicated that it would contact the owners of the wells within the construction work area prior to construction, would modify its workspace to attempt to avoid these wells, and would require equipment to remain 10 feet from aboveground well equipment. Although these actions would partially mitigate impacts to the wells, Rockies Express has not provided a plan for monitoring these wells during construction or protecting the integrity of the well and casing. Therefore, **we recommend that:**

- **Prior to the start of construction, Rockies Express file with the Secretary for review and written approval by the Director of OEP, a site-specific plan for oil or gas wells within the construction work area, both active and abandoned. The plan should include details on how the wells would be protected and monitored during construction and discuss how it would determine if any damage attributable to construction activities occurred to the aboveground equipment, casing, or plug (for abandoned wells). The plan should also discuss how any damage would be mitigated.**

By avoiding and/or protecting existing oil and gas production facilities, we believe the Project would not interfere with current oil and gas production in the Project area. Additionally, because oil and gas are generally produced from depths of more than 1,000 feet, construction of the pipeline is not expected to affect future oil or gas production in the area because the proposed pipeline would only be at maximum depths of 10 feet from the ground surface except for HDD crossings, where it would be deeper for short distances.

Coal

Coal deposits are located in the vicinity of the REX East Project. The pipeline and facilities would be located in three coal-producing regions—the Interior, Appalachian, and Western regions. Coal is produced in the Project area through surface strip mining and underground operations; however, no active coal mines or coalbed methane production areas were identified in the locations crossed by the

REX East Project facilities. The pipeline route would cross abandoned underground coal mines in Illinois, Indiana, and Ohio (see table 4.1.2-2). The main concern with crossing abandoned underground coal mines is the potential for subsidence, which could affect the integrity of the pipeline. Subsidence associated with coal mining is discussed in section 4.1.3.

Table 4.1.2-2

Abandoned Underground Mines Crossed by the Proposed Pipeline Route a/

State/County	Begin Milepost	End Milepost	Length (miles)	Type of Mining
ILLINOIS				
Sangamon	117.5	119.0	1.4	Room and Pillar
	119.0	119.0	<0.1	Room and Pillar
Douglas	208.2	208.3	0.1	Room and Pillar
	208.7	211.9	3.2	Room and Pillar
INDIANA				
Warren	246.4	246.7	0.3	Room and Pillar
OHIO				
Perry	561.2	561.2	<0.1	Room and Pillar
	561.4	561.4	<0.1	Room and Pillar
	561.5	561.6	0.1	Room and Pillar
	561.6	561.7	0.1	Room and Pillar
	562.5	562.6	0.1	Room and Pillar
	563.7	563.8	0.1	Room and Pillar
	563.9	564.0	0.1	Room and Pillar
	564.1	564.3	0.2	Room and Pillar
	564.3	564.6	0.3	Room and Pillar
	564.7	565.1	0.4	Room and Pillar
Muskingum	567.0	567.1	0.1	Room and Pillar
	567.1	567.1	<0.1	Room and Pillar
	567.2	567.4	0.2	Room and Pillar
	567.4	567.5	0.1	Room and Pillar
	567.6	568.2	0.6	Room and Pillar
	570.8	571.1	0.3	Room and Pillar
	571.5	571.6	0.1	Room and Pillar
	571.6	571.7	0.1	Room and Pillar
Guernsey	595.3	596.0	0.7	Room and Pillar
	596.0	596.2	0.2	Room and Pillar
	596.2	596.3	0.1	Room and Pillar
	596.3	596.5	0.2	Room and Pillar
	596.5	596.5	<0.1	Room and Pillar
	597.6	597.7	0.1	Room and Pillar
	597.9	598.0	0.1	Room and Pillar
	598.8	599.2	0.4	Room and Pillar
	600.4	600.8	0.4	Room and Pillar
	600.8	600.8	<0.1	Room and Pillar
	601.0	601.1	0.1	Room and Pillar
	601.1	601.1	<0.1	Room and Pillar
	601.1	601.9	0.8	Room and Pillar
	601.9	602.4	0.5	Room and Pillar
	602.4	602.7	0.3	Room and Pillar

Table 4.1.2-2 (continued) Abandoned Underground Mines Crossed by the Proposed Pipeline Route a/				
State/County	Begin Milepost	End Milepost	Length (miles)	Type of Mining
	602.7	603.6	0.9	Room and Pillar
	603.9	604.4	0.5	Room and Pillar
	605.9	606.1	0.2	Room and Pillar
	606.2	606.2	<0.1	Room and Pillar
Belmont	RR 2010-MP619.8+4.3	RR 2010-MP619.8+4.3	<0.1	Room and Pillar
	629.6	629.8	0.2	Room and Pillar, Longwall
	629.8	631.1	1.3	Room and Pillar, Longwall
Monroe	633.8	633.9	0.1	Room and Pillar
	634.3	639.1	4.8	Room and Pillar

a/ Stiff, 1997; Crowell, et al., 2006.

We have received comments from coal companies indicating that the REX East Project would cross areas for which they have future mining rights. REX East would need to reach an agreement with these companies as to whether it would compensate the companies for the lost revenue, if pipeline placement were to preclude mining activities. Alternatively, Rockies Express may need to move the pipeline in the future to avoid damage to the pipeline from the mining activities.

All surface mining sites within 1,500 feet of the proposed pipeline and aboveground facilities are rock quarries or sand and gravel pits. These are important non-fuel mineral resources in the Project states, but are also fairly common, and the REX East Project facilities are not located near any critical deposits. Construction of the Project could prohibit or limit the mineral resource deposits located under or near the proposed pipeline or aboveground facilities from being recovered by surface mining. However, in many areas the proposed pipeline follows existing rights-of-way, which would already limit the extraction of these resources.

4.1.3 Geologic Hazards

Potential geologic hazards identified in the REX East Project area are seismicity (earthquakes and faults), landslides, subsidence, and flooding/scour. Each of these hazards is discussed below.

Seismicity

Seismic hazards include earthquakes, ground faulting, and secondary effects such as liquefaction and related slope failures. Liquefaction is a phenomenon where saturated, non-cohesive soils typically having uniform grain size temporarily lose their strength when subjected to intense ground shaking, often resulting in sloughing or landslides.

The REX East Project route crosses an area of relatively low seismic risk. No active faults were identified in the vicinity of the REX East Project, although features indicative of Quaternary faulting are present in southeastern Illinois and southwestern Indiana where the Project is proposed.

Most seismic activity in the region is generally linked to the New Madrid fault zone located to the south of the pipeline route. Between December 1811 and February 1812, three of the most powerful

earthquakes in U.S. history originated in this area, reaching a Modified Mercalli intensity of up to XII. Since that time numerous intensity V or greater earthquakes have been reported in Missouri, Illinois, Indiana, and Ohio. The Project would not cross the seismically active portion of the New Madrid fault zone. The area in which the probability of a seismic event is highest is located well to the south of the Project area, along the adjoining boundaries of Missouri, Arkansas, and Tennessee. Based on the Seismic Source Zones Map provided in Algermissen et al. (1982), the majority of the Project area (including Nebraska) could experience about three to six Modified Mercalli intensity V earthquakes every 100 years (maximum Richter magnitude of 6.1). Portions of the Project area in Indiana and western Ohio could experience between 11 and 15 Modified Mercalli intensity V earthquakes every 100 years.

The Wabash Valley Seismic Zone is located in southeastern Illinois and southwestern Indiana. This zone is capable of producing seismic activity. On June 18, 2002, a 5.0 magnitude earthquake occurred near Evansville, Indiana in an area that is part of the Wabash Valley Seismic Zone. The Project is located to the north of this seismic zone, but the pipeline route would cross an area in the Wabash Valley region identified as containing liquefaction features. However, no historical earthquakes in this area have been strong enough to cause liquefaction. These features are likely the result of prehistoric events in the Holocene and late Pleistocene epochs (Obermeir and Crone, 1994).

Although the intensity, frequency, and duration of impacts resulting from the potential hazard of minor earthquakes are difficult to quantify, all REX East Project facilities would be designed and constructed in accordance with 49 CFR Parts 192 and 193. These specifications ensure that pipeline facilities are designed and constructed in a manner that provides adequate protection from washouts, floods, unstable soils, landslides, or other hazards that may cause the pipeline facilities to move or sustain abnormal loads. Pipeline installation techniques, especially padding and use of rock-free backfill, effectively protect the pipeline from minor earth movements. Furthermore, the ductility of modern pipelines gives further assurance that minor earth movements would have little impact on the REX East Project pipeline.

The REX East Project would be constructed using arc-welding techniques. O'Rourke and Palmer (1996) evaluated the seismic performance of gas transmission pipelines in southern California using arc-welding as a construction method. Based on their findings, electric arc-welded pipelines constructed after World War II, and properly maintained, have never experienced a break or leak as a result of a southern California earthquake. O'Rourke and Palmer also concluded that electric arc-welded pipelines in good repair are the most resistant type of piping and are generally highly resistant to traveling ground-wave effects and moderate amounts of permanent deformation. Therefore, we do not expect seismic hazards to pose a significant risk to the proposed pipeline facilities.

Landslides

A landslide is defined as the movement of a mass of rock, debris, or earth down a slope. Several factors contribute to slope failures and subsequent landslides, including the degree of slope or tilt of geologic materials, the composition of the materials, the amount of manmade disturbance of the materials, proximity to seismic activity, and the amount of rainfall exposure. Generally, flat areas were selected for the location of the proposed compressor and meter sites; therefore, slope failure is not expected at aboveground facility locations. However, slope failures and subsequent landslides represent a potential hazard along portions of the Project route that would traverse areas of side slopes and rolling terrain. Factors that would increase the potential for slope failures along slopes and rolling terrain include cutting along slopes, the weight of construction equipment, and unusually high precipitation.

The portions of the Project area located in Audrain, Ralls, and Pike Counties, Missouri and Hendricks and Morgan Counties, Indiana have recorded areas of moderate susceptibility/low incidence of

previous landslides. Portions of the pipeline route would encounter recorded areas of high susceptibility/ low incidence in Pike County, Missouri; Pike County, Illinois; Franklin County, Indiana; and Perry, Muskingum, and Guernsey Counties, Ohio. Portions of the route would encounter recorded areas of high susceptibility/moderate incidence in Guernsey, Noble, and Belmont Counties, Ohio. Lastly, isolated areas of the pipeline route would encounter recorded areas of high susceptibility/high incidence in Belmont and Monroe Counties, Ohio. Approximately 29 percent of the total proposed REX East pipeline route (based on length) would be located in areas of moderate to high landslide susceptibility. Table 4.1.3-1 identifies areas along the right-of-way that are susceptible to landslides.

Table 4.1.3-1

Areas Crossed by the Proposed Pipeline Route with Moderate or High Susceptibility to Landslides a/

State/County	Begin Milepost	End Milepost	Length (miles)	Susceptibility	Incidence
Missouri					
Audrain	7.8	15.8	8.0	Moderate	Low
Ralls	15.8	19.8	4.0	Moderate	Low
Pike	19.8	36.4	16.6	Moderate	Low
	36.4	43.0	6.6	High	Low
Illinois					
Pike	43.0	69.7	26.7	High	Low
Indiana					
Hendricks	291.0	301.1	10.1	Moderate	Low
	301.1	304.3	3.2	Moderate	Low
Morgan	304.3	306.6	2.3	Moderate	Low
Franklin	379.6	396.8	17.2	High	Low
Ohio					
Perry	557.9	566.3	8.4	High	Low
Muskingum	566.3	577.4	11.1	High	Low
	577.4	591.7	14.3	High	Low
Guernsey	591.7	591.8	0.1	High	Low
	591.8	594.7	2.9	High	Moderate
	594.7	602.8	8.1	High	Low
	602.8	611.3	8.5	High	Moderate
Noble	611.3	618.0	6.7	High	Moderate
Belmont	618.0	618.1	0.1	High	Moderate
	618.1	RR 2010-MP619.8+6.0	15.7	High	High
	625.5	633.8	8.3	High	High
Monroe	633.8	639.1	5.3	High	High

a/ Godt, 1997.

Construction of the pipeline would be accomplished in accordance with Rockies Express' Plan and Procedures (CD Documents A, B), which include measures to control runoff and erosion that would minimize the potential for slope failures. If feasible, Rockies Express would bury the pipeline below potential landslide depth to reduce landslide susceptibility. Additionally, Rockies Express would implement drainage controls including slope and ditch breakers to reduce the potential for slope failures.

Pipeline construction on steep slopes could initiate localized slope movement. However, we believe that modern construction techniques along with the implementation of Rockies Express' Plan and

Procedures would reduce the potential for construction-related activities to trigger landslides or other slope instability.

Along with the design measures to mitigate for minor earth movements (as set forth by 49 CFR Part 192), the orientation of the pipeline along the long axis of a slope face would minimize the overall energy to which a segment of pipe would be exposed during a landslide event. Should a landslide occur, sections of the pipe could become exposed and thus would require subsequent reburial. None of the aboveground facilities would be located in an area with recorded landslides or on steep slopes.

Subsidence

Subsidence can range from small localized areas of collapse to broad, regional lowering of the ground surface. It can be associated with areas of karst terrain, past underground mining, earthquake-induced liquefaction, and withdrawal of fluids such as groundwater and petroleum. Subsidence related to withdrawal of groundwater or petroleum is generally not a concern in the REX East Project area.

Karst terrain refers to areas characterized by dissolution of rocks such as limestone, dolomite, gypsum, and salt, resulting in sinkholes (closed depressions), pinnacled bedrock, caves/caverns, and underground drainage systems. The tendency for and rate of solubility of rock formations is variable and is believed to be affected by rock mineralogy as well as local structural features, such as jointing, bedding characteristics, and differences in groundwater chemistry.

Approximately 24 percent of the pipeline route crossed by the Project has the potential for karst features from 10 to 200 feet below the ground surface. Table 4.1.3-2 identifies areas of the proposed

Table 4.1.3-2
Location and Length of Potential Karst Terrain Crossed by the Proposed Pipeline Route a/

State/County	Begin Milepost	End Milepost	Length (miles)
Missouri			
Pike	25.4	42.7	17.3
Missouri Subtotal			**17.3**
Illinois			
Pike	54.5	71.2	16.7
Scott	71.2	83.5	12.3
Illinois Subtotal			**29.0**
Indiana			
Putnam	268.1	281.6	13.5
Shelby	343.3	358.7	15.4
Decatur	358.7	376.9	18.2
Franklin	376.9	397.9	21.0
Indiana Subtotal			**68.1**
Ohio			
Clinton	464.3	473.7	9.4
Greene	473.7	476.5	2.8
Fayette	476.5	499.8	23.3
Pickaway	499.8	500.7	0.9
Ohio Subtotal			**36.4**
Project Total			**150.8**

a/ National Atlas of the United States, 2007.

pipeline route that would cross potential karst terrain. These sections may be susceptible to subsidence caused by dissolution and sinkhole activity that can occur in karst terrain. But, as most pipeline construction would not occur at depths greater than 10 feet from the surface, and Rockies Express identified no karst-related features during its survey of the proposed right-of-way, no impacts attributable to surficial karst features are expected. However, not all areas of the right-of-way have been surveyed for karst features, and one landowner has expressed concern that karst features may be present on the pipeline route. Therefore, **we recommend that:**

- **Prior to the start of construction, Rockies Express file with the Secretary for review and written approval by the Director of OEP, a plan developed in consultation with the appropriate state agencies for the identification of karst features and mitigation for crossing any such features identified during construction. This plan should also indicate how areas with these features would be monitored during the life of the Project and what steps would be taken if the area were to destabilize in the future.**

It is possible, but unlikely, that an HDD operation may intercept a solution void in a karst area; depending on the size of the void, this could result in the loss of drilling mud and/or the failure of the drill. Rockies Express has not indicated what it would do if a solution void were intercepted during an HDD; therefore, **we recommend that:**

- **Prior to the start of construction, Rockies Express file with the Secretary for review and written approval by the Director of OEP, a contingency plan developed in consultation with state and federal natural resource agencies for HDDs in the karst areas identified in table 4.1.3-2. This plan should include pre-construction identification of the potential for subsurface karst features and identify what Rockies Express would do if a solution void is intercepted to limit the amount of mud lost and successfully complete the drill.**

Subsidence can also occur due to the collapse of underground mines. The two forms of subsidence associated with underground mining are pit and sag. Subsidence due to pits can range from 6- to 8-feet deep with a diameter from 2 to 40 feet. Subsidence due to sags may be several feet deep and cover several acres. The locations of abandoned underground mines along the Project route are listed in table 4.1.2-2. Analysis of the effects of coal mine subsidence on the REX East Project pipeline indicates that for areas in relatively gentle terrain, the pipeline should be capable of accommodating vertical and horizontal ground displacements associated with coal mine subsidence. In areas susceptible to coal mine subsidence with steeper terrain, bends in the pipeline, or elevated pipeline operating temperature, the chances of damage to the pipeline are greater.

Subsidence associated with longwall mining is usually immediate. Unless there is active longwall mining in the area, the subsidence resulting from longwall mining should have occurred prior to construction. With regard to future mining activities, mining applicants must provide notice to surface owners prior to the beginning of new mining operations. Additionally, Ohio DNR – Division of Mineral Resources Management (DMRM) requires that underground mine applicants prepare a subsidence prevention or control plan. For those mine applicants proposing longwall or pillar mining, the mining company must provide an inventory of land features and structures above the coal to be mined, including utility transmission lines. DMRM will determine if sufficient mine stability is designed to prevent subsidence (room and pillar mining) or that planned subsidence mining (longwall or pillar removal mining) is designed to occur in a predictable and controlled manner. To ensure that subsidence from past and potential future mining activities does not affect the pipeline, **we recommend that:**

- **Prior to the start of construction, Rockies Express file with the Secretary for review and written approval by the Director of OEP, a Mining Subsidence Plan that at a minimum addresses the following:**

  a. **The plan should indicate how areas where the pipeline would cross underground mines would be monitored during the life of the Project and what steps would be taken if the area were to destabilize in the future; and**

  b. **Communications with mining companies planning to use longwall or room and pillar mining techniques in areas of the pipeline. The plan should outline the monitoring protocol and mitigation measures that may be implemented to prevent subsidence impacts from these specific types of mining to the pipeline.**

None of the aboveground facilities are located in areas considered to be affected by subsidence due to either karst features or past underground mining, with the exception of the Dominion Transmission, Dominion East, and TETCO meter stations, which are located on an abandoned underground mine area at MP 639.1. However, there is no indication of ongoing subsidence in this area.

Flooding/Scour

Seasonal and flash flooding hazards are a potential concern where the proposed pipeline route crosses major streams and small watersheds. Although flooding itself does not present a risk to buried pipelines, bank erosion and/or scour could expose or cause sections of pipe to become unsupported.

In flood or scour-prone areas, the REX East Project pipeline would be buried at greater depths (greater than 5 feet) to minimize scour potential. Rockies Express identified three areas with the potential for severe scour, all within Indiana (see table 4.1.3-3). Aboveground facilities are located in upland areas and would not be susceptible to severe scouring. Rockies Express identified scour-prone waterbodies based on aerial interpretation. We have received comments from individuals, which suggest there may be other waterbodies of concern in Indiana and Ohio. Therefore, **we recommend that:**

- **Prior to the start of construction, Rockies Express consult with INDNR and ODNR to discuss the scour susceptibility of waterbodies crossed by the Project. Rockies Express should file the results of its consultations and a revised list of scour-prone areas with the Secretary.**

Table 4.1.3-3
Waterbodies Crossed with Potential for Severe Scour

County/State	Milepost	Waterbody
Parke, IN	250.7	Leatherwood Creek
Putnam, IN	269.9	Big Raccoon Creek
Johnson, IN	337.9	Sugar Creek

Flooding may be an issue during the construction of the Mississippi River crossing. The pipeline would be installed under the Mississippi River by the HDD method. The drilling operation would involve two separate HDDs, one for the Salt River and one for the Mississippi River. These two drills would take several months to complete. The drilling equipment would be set up on Blackburn Island, which is prone to flooding. The only access to the drilling site would be by boat. Flooding during the drill operation could result in hazardous material (such as diesel and hydraulic fluid) spilling into the river and

equipment used for the drilling operation (such as barges, tanks, and drilling equipment) could float away in the flood waters. Rockies Express has indicated that it does not plan to construct this crossing during the time of year that flooding is most likely (April 1 to July 15). Rockies Express has also indicated that it would monitor river levels during construction. If a flood is predicted, the drilling operations would be halted and to the extent possible equipment would be removed from the island with priority given to diesel fuel storage tanks and diesel powered equipment. We believe that Rockies Express has not provided sufficient information on how it would deal with flooding during construction of the Mississippi River crossing. Other issues that have not been addressed include: how equipment/materials left on the island would be secured, whether the temporary dock (barge) would be left in place, how equipment/materials left behind would be protected from floating debris, and whether timber cut on the island (potential floating debris) would be left there. Because Rockies Express has not provided sufficient detail, **we recommend that:**

- **Prior to the start of construction, Rockies Express file with the Secretary for review and written approval by the Director of OEP a High Water Contingency Plan for the construction of the Mississippi River crossing. This plan should be developed in consultation with COE.**

4.1.4 Paleontological Resources

Many geologic formations have the potential to contain paleontological resources; however, those containing vertebrate fossils are generally considered to be most scientifically significant because vertebrate fossils are rarer than invertebrate or plant fossils. Potential impacts in fossil localities during construction could include direct impacts (such as damage to or destruction of fossils resulting from excavation activities) and indirect impacts (such as erosion of fossil beds resulting from slope regrading, clearing of vegetation, and unauthorized collection of significant fossils by construction personnel or the public).

Rockies Express consulted with MODNR, Division of Geology and Land Survey; the Illinois State Geological Survey; the Illinois State Museum; the Indiana Geological Survey; and the ODNR, Division of Geological Survey staff to identify areas along the pipeline route with potentially sensitive paleontological resources. Only the Illinois State Museum identified potential paleontological resources of concern along the Project route. In a letter dated February 13, 2007 to Rockies Express, the Illinois State Museum identified areas in Illinois where the Project route crosses potential fossil assemblages (see table 4.1.4-1) (Illinois State Museum, 2007). The Illinois State Museum identified members of the Glasford formation that have previously been found to contain isolated fossiliferous material and the Wedron and Equality Formations that have previously been found to contain significant fossiliferous material, including large mammals. However, the Illinois State Museum did not provide recommendations for any specific actions to be taken regarding potential fossils in these units. Additionally, the ODNR in a letter dated March 6, 2007, identified the Waynesville and Liberty Formations in the interval between MPs 446.6 and 462.5 as having the potential to contain Ohio's official fossil, the *Isotelus* trilobite (ODNR, 2007g). However, the ODNR stated no precautions are necessary with regard to excavating a specimen.

Rockies Express has filed with the FERC Unanticipated Discovery Plans for paleontological resources for each state that would be crossed by the pipeline. Contractors and staff would be instructed to be aware of the possibility of encountering paleontological material during pipeline or aboveground facility construction in the abovementioned areas. If any significant paleontological material is encountered, the EI would contact the appropriate agency and request further investigation. Construction would halt until a site determination is made.

Table 4.1.4-1

Potential Fossiliferous Formations Crossed by the Project Route in Illinois

County	Begin Milepost	End Milepost	Length (miles)	Formation – Member
Pike	65.3	70.4	5.1	Glasford – Kellerville
Scott	75.0	86.3	11.3	Glasford – Vandalia
Morgan	86.3	94.7	8.4	Glasford – Vandalia
	95.1	105.1	10.0	Glasford – Vandalia
	105.1	106.0	0.9	Glasford – Hagarstown
	106.0	106.4	0.4	Glasford – Vandalia
Sangamon	106.4	120.4	14.0	Glasford – Vandalia
	121.3	125.6	4.3	Glasford – Vandalia
	126.3	131.7	5.4	Glasford – Vandalia
Christian	132.2	132.6	0.4	Glasford – Vandalia
	133.2	134.8	1.6	Glasford – Vandalia
Sangamon	134.8	135.4	0.6	Glasford – Vandalia
Christian	135.4	141.9	6.5	Glasford – Vandalia
	141.9	151.1	9.2	Glasford – Radnor
Macon	151.1	154.0	2.9	Glasford – Radnor
	154.6	160.3	5.7	Wedron – Piatt
	160.3	164.6	4.3	Wedron – Piatt
	164.6	165.0	0.4	Wedron – Fairgrange
	165.0	169.4	4.4	Wedron – Piatt
	169.4	172.1	2.7	Wedron – Piatt
Moultrie	172.1	172.9	0.8	Wedron – Piatt
	172.9	187.5	14.6	Wedron – Piatt
Douglas	187.5	188.0	0.5	Wedron – Piatt
	188.4	192.6	4.2	Wedron – Piatt
	193.2	195.2	2.0	Wedron – Batestown
	195.2	201.1	5.9	Wedron – Batestown
	201.1	202.4	1.3	Equality – Dolton
	202.4	202.5	0.1	Wedron – Batestown
	203.1	204.7	1.6	Equality – Dolton
	204.7	205.3	0.6	Wedron – Batestown
	205.3	212.4	7.1	Equality – Carmi
	212.4	213.4	1.0	Equality – Carmi
	213.4	214.7	1.3	Wedron – Batestown
Edgar	214.7	228.0	13.3	Wedron – Batestown
	229.1	232.6	3.5	Wedron – Batestown
	233.8	234.9	1.1	Wedron – Batestown
	235.4	236.3	0.9	Wedron – Batestown
	237.1	238.1	1.0	Wedron – Batestown

Because of this stop-work contingency, and because pipeline construction would disturb a relatively small area of relatively low-fossil-density formations, construction impacts to paleontological resources are considered minimal.

Normal operation of the pipeline and aboveground facilities would not disturb paleontological resources. Although maintenance activities would result in surface disturbance, such disturbance would typically occur in areas previously disturbed by construction. Therefore, operational impacts to paleontological resources are considered negligible.

4.2 SOILS

Information regarding the soil types present in the Project area and their characteristics was obtained using NRCS in the State Soil Geographic (STATSGO) database. STATSGO is an electronic database maintained by the U.S. Department of Agriculture (USDA), NRCS. The soil characteristics/limitations that are evaluated are the potential for erosion by wind and water, shallow bedrock, prime farmland designation, compaction, and the percentage of stones/rocks, droughty soil, and hydric soil present.

Pipeline construction activities such as clearing, grading, trench excavation, backfilling, heavy equipment traffic, and restoration along the construction right-of-way may result in adverse impacts on soil resources. Clearing removes protective vegetative cover and exposes soil to the effects of wind, sun, and precipitation, which could potentially increase soil erosion and the transport of sediment to sensitive areas. Grading and equipment traffic can compact soil, reducing porosity and percolation rates, which could result in increased runoff potential. In addition, grading can result in the mixing of topsoil with subsoil, which could result in long-term reduction of agricultural productivity and introduce subsurface rocks to the soil surface. Trench excavation and backfilling could also lead to the mixing of topsoil and subsoil, introduction of excavated rocks from the fracturing of bedrock, and introduction of rock and/or gravel into the soil surface. This could result in future increases in operation labor, decreases in agricultural productivity, and potential damage to agricultural field equipment. Soil contamination from equipment spills and/or leakage of fuels, lubricants, and coolants could also impact soils. Rockies Express has developed three plans, the Upland Construction Plan (CD Document A), the Wetland and Waterbody Construction and Mitigation Procedures (CD Document B), and the AIMP (appendix I contains the AIMP for Illinois as an example) to identify baseline mitigation procedures for minimizing impacts on soils and enhancing revegetation. Further discussion of the AIMPs and their proposed mitigation measures for agricultural areas can be found in section 4.8.2 of this EIS.

4.2.1 Soil Limitations

Table 4.2.1-1 summarizes the soil limitations that could be encountered by the proposed pipeline route and table 4.2.1-2 summarizes the soil limitations associated with the proposed aboveground facilities[1]. Impacts associated with construction and operation of aboveground facilities would be similar to those described above for pipeline limitations; however, impacts at aboveground facilities would be permanent. Because land used for construction of the aboveground facilities would be permanently converted to industrial use, mitigation measures implemented at the aboveground facilities are limited to erosion and sediment control measures.

Erosion Potential

Erosion is a natural process by which surface soils are worn away, typically by wind or water. Factors that influence the erosion potential of soil include gradation (distribution of soil particles), vegetative cover, length and percentage of slope, rainfall, and wind intensity. Soils on steep, long slopes are much more susceptible to water erosion than soils on shallow, short slopes because the steeper slopes accelerate the flow of surface runoff.

[1] Specific soil characteristics and limitations along the Project length by milepost can be found on the accompanying CD (CD Document K).

Table 4.2.1-1

Summary of Soil Limitations at Pipeline Facilities (by miles crossed) a/

County	Highly Water Erodible b/	Highly Wind Erodible c/	Prime Farmland d/	Hydric e/	Compaction Prone f/	Stony Rocky g/	Shallow Bedrock h/	Droughty i/
MISSOURI								
Audrain	0.7	0.0	13.5	6.9	6.2	0.0	0.0	0.0
Ralls	0.0	0.0	3.9	1.9	1.7	0.0	0.0	0.0
Pike	9.3	0.0	8.3	3.8	3.4	5.1	4.5	0.0
ILLINOIS								
Pike	5.2	0.0	16.7	6.1	1.7	0.0	0.0	0.0
Scott	3.5	0.0	9.0	2.1	0.7	0.0	0.0	0.0
Morgan	3.5	0.0	14.5	3.6	2.6	0.0	0.0	0.0
Sangamon	1.9	0.0	22.8	7.8	8.9	0.0	0.0	0.0
Christian	1.0	0.0	15.7	5.1	0.7	0.0	0.0	0.0
Macon	1.0	0.0	18.2	4.5	4.3	0.0	0.0	0.0
Moultrie	0.0	0.0	14.9	5.2	5.2	0.0	0.0	0.0
Douglas	0.1	0.0	26.2	10.6	7.1	0.0	0.0	0.0
Edgar	0.6	0.0	22.7	8.0	7.4	0.0	0.0	0.0
INDIANA								
Vermillion	2.2	0.0	5.6	1.1	0.3	0.0	0.2	0.0
Parke	5.4	0.1	14.2	2.7	0.7	0.0	0.0	0.2
Putnam	5.6	0.0	11.8	1.3	1.0	0.0	0.7	0.1
Hendricks	2.8	0.1	14.3	2.5	0.4	0.0	0.2	0.1
Morgan	1.1	0.2	11.4	3.8	1.8	0.0	0.0	0.3
Johnson	2.1	0.1	16.9	4.6	1.1	0.0	0.0	0.1
Shelby	2.0	0.3	16.7	5.8	0.4	0.0	0.2	0.2
Decatur	3.8	0.0	13.7	2.9	1.0	0.0	0.6	0.0
Franklin	15.8	0.1	10.6	1.2	0.7	5.3	7.5	0.1
OHIO								
Butler	8.4	0.0	22.0	4.0	2.9	0.0	1.2	0.1
Warren	5.9	0.0	16.3	2.3	1.6	0.0	0.9	0.0
Clinton	2.7	0.0	11.4	1.8	0.2	0.0	0.4	0.0
Greene	0.1	0.0	2.7	1.5	1.5	0.0	0.0	0.0
Fayette	2.2	0.0	20.9	8.2	6.8	0.0	0.0	0.0
Pickaway	4.8	0.2	18.9	5.6	4.7	0.1	0.0	0.0
Fairfield	7.8	0.0	16.4	2.4	0.9	1.4	1.4	0.0
Perry	14.7	0.0	2.3	0.8	0.0	3.8	7.1	0.0
Muskingum	20.7	0.0	1.8	1.5	0.5	5.5	14.2	0.0
Guernsey	16.0	0.0	1.4	1.3	0.4	2.4	14.3	0.0
Noble	6.4	0.0	0.0	0.0	0.0	4.2	5.5	0.0
Belmont	14.6	0.0	1.4	0.0	0.0	0.8	15.7	0.0
Monroe	5.2	0.0	0.0	0.0	0.0	0.0	5.0	0.0
Total	**177.1**	**1.1**	**417.1**	**120.9**	**76.8**	**28.6**	**79.6**	**1.2**
Percent of Total j/	**27.7**	**0.2**	**65.3**	**18.9**	**12.0**	**4.5**	**12.5**	**0.2**

a/ Values may be overestimated due to rounding as all values <0.1 were counted as 0.1.
b/ Includes map unit having average slope class of 9 percent or more and designated as land capability subclasses 4E through 8E by NRCS.
c/ Includes map unit designated as wind erodibility group 1 or 2 by NRCS.
d/ Includes map unit designated as prime farmland by NRCS.
e/ Includes map unit designated as hydric by NRCS.
f/ Includes map unit having sandy clay loam texture or finer in drainage classes categorized as somewhat poor, poor, or very poor.
g/ Includes map unit meeting criteria for stony-rocky soils.
h/ Includes map unit having bedrock within 60 inches of soil surface.
i/ Includes map unit meeting criteria for droughty soils.
j/ Percentages sum to greater than 100 because some areas are characterized by more than one soil limitation.

Table 4.2.1-2

Summary of Soil Limitations at Aboveground Facilities

Facility (County)	Total Acres	Highly Erodible a/	Prime Farmland b/	Hydric c/
MISSOURI				
Mexico Compressor Station (Audrain)	12.8	No	Yes	No
ILLINOIS				
Blue Mound Compressor Station (Christian)	12.9	Yes	Yes	No
NGPL Meter Station (Moultrie)	5.6	No	Yes	Yes
Ameren Power Company (Moultrie)	1.2	No	Yes	No
Trunkline Meter Station (Douglas)	2.6	No	Yes	Yes
MGT Meter Station (Edgar)	1.2	Yes	Yes	No
INDIANA				
PEPL Meter Station (Putnam)	1.2	Yes	Yes	No
Bainbridge Compressor Station (Putnam)	21.3	No	Yes	Yes
Citizen Gas Meter Station (Morgan)	1.2	No	Yes	Yes
IGC Meter Station (Morgan)	2.0	No	Yes	No
ANR Meter Station (Shelby)	2.2	Yes	Yes	No
OHIO				
Hamilton Compressor Station (Warren)	15.2	No	Yes	Yes
Dominion/TETCO/TG/Vectren/CGE Meter Station (Warren)	6.8	Yes	Yes	No
CGTC Meter Station (Fairfield)	2.2	No	Yes	No
Chandlersville Compressor Station (Muskingum)	19.9	Yes	Yes	No
TG Meter Station (Guernsey)	2.2	Yes	No	No
DT/DEG/TETCO Meter Station (Monroe)	6.1	Yes	No	No
WYOMING				
Arlington Compressor Station (Carbon)	15.0	Yes	No	No
NEBRASKA				
Bertrand Compressor Station (Phelps)	17.7	No	Yes	Yes

a/ Includes map unit designated by NRCS as highly erodible land.
b/ Includes map unit designated by NRCS as prime farmland.
c/ Includes map unit designated by NRCS as hydric.

As presented in table 4.2.1-1, approximately 28 percent of the soils that would be crossed by the REX East pipeline route are highly susceptible to water erosion and 0.2 percent of the soils are most susceptible to wind erosion. Clearing, grading, and equipment movement could accelerate the erosion process. Without adequate protection, this could result in topsoil loss, reduced soil fertility, and discharge of sediment into sensitive areas. The sloping banks of ravines, waterbodies, and soil storage piles would be most susceptible to water erosion.

The Plan would be used during construction in upland areas. The Procedures would be followed in wetland areas and waterbody crossings and includes measures to protect soils in those areas. The Plan and Procedures are designed to control erosion and sedimentation during construction. These include use of temporary and permanent breakers on slopes. Temporary sediment barriers or slope breakers, such as

straw bales or silt fences would be installed at the base of slopes adjacent to waterbodies, in wetlands, on roadways, and along the edge of the right-of-way. This would prevent sediment from flowing off the right-of-way. Permanent trench breakers, such as sacks of soil or sand, polyurethane foam, or bentonite clay, would be installed around the pipe in the trench prior to filling to mitigate subsurface channeling of water where applicable. The measures implemented would be monitored by Rockies Express' EIs to ensure control of erosion. Temporary sediment barriers would be evaluated daily and maintained (reinstalled as necessary) until areas disturbed by construction are stabilized and successful revegetation is accomplished. Active revegetation using seed mixtures recommended by NRCS and landowners would be used as necessary to further stabilize soils to prevent erosion. Rockies Express would also temporarily employ the use of water trucks, as needed, to reduce wind erosion and road dust associated with construction activities.

Rockies Express would also implement waterbody crossing methods as outlined in its Plan and Procedures to minimize potential impacts of soil erosion from water and sedimentation near waterbodies. For example, spoil from waterbody crossings would be maintained in the construction right-of-way at least 10 feet from the water's edge or in an additional workspace. Sediment barriers would be installed and properly maintained to prevent flow of sediment into the waterbody and to contain spoil and sediment within the construction right-of-way. In addition, trench plugs would be used as necessary to prevent diversion of water into upland portions of the pipeline trench, and all waterbody banks would be returned to a stable condition. Where trench dewatering is required, Rockies Express would pump water from the trench into vegetated upland areas to prevent soil erosion in areas disturbed by construction. Filtering and discharge dissipation devices would be used as appropriate to ensure that trench dewatering activities do not cause erosion or result in heavily silt-laden discharge water.

During the restoration in nonagricultural areas, Rockies Express would condition the right-of-way by preparing a seedbed and applying soil amendments at rates previously agreed upon by the landowner, land management agency, or soil conservation authority.

Rockies Express has detailed several ways it would construct and monitor its pipeline to ensure proper depth of cover and right-of-way stability. In addition to the procedures discussed above, landowners would have the option of negotiating with Rockies Express for the use of additional mitigation measures as long as those measures would not impact other landowners (without their permission) or impact other sensitive resources (e.g., waterbodies, wetlands, protected species, cultural sites, or residential areas). Upon commissioning the pipeline, Rockies Express would implement a surveillance plan that includes monthly aerial pipeline patrolling to inspect for excavation activities, ground movement, wash-outs, leakage, or other changes along the right-of-way. Within one year of cathodic protection system installation, Rockies Express would conduct a close internal survey along the pipeline route on foot. In addition, Rockies Express would use an outreach program for landowner and tenant communication to discuss pipeline location, operation, maintenance, and emergency reporting. We believe these measures would ensure right-of-way stability and minimize the potential for operational disturbances, including increased erosion.

We have received comments concerning the potential for erosion in Franklin County, Indiana due to the sandy soils. The erosion control measures described above can control erosion even in areas with sandy soils. Properly installing and maintaining the erosion control devices (such as haybales, berms, and silt fences) until the area is restored and revegetated is critical to successfully controlling erosion. Inspection by Rockies Express' EI and the FERC's monitors would ensure that these devices are properly installed and maintained.

Prime Farmland

Prime farmland soils consist of soils classified as those best suited for the production of food, feed, forage, fiber, and oilseed crops. These soils generate the highest yields with the least amount of expenditure. Soils currently occupying pastures and fields or otherwise undeveloped forest and open land also can be classified as prime farmland soils; lands occupied by surface water or residential, commercial, or industrial uses cannot receive this designation. Prime farmland soils generally meet the following criteria: they have an adequate water supply from either precipitation or irrigation; contain little or no rock; are permeable to water and air; are not excessively erodible or saturated for long periods; and do not flood frequently or are protected from flooding. Approximately 65 percent (417.1 miles) of the REX East Project route would cross prime farmland soils as designated under these criteria.

Potential impacts on agricultural uses and prime farmland soils from pipeline construction include eroding soil; interference with and damage to surface drainage, drain tiles, and irrigation systems; mixing of topsoil and subsoil; potential loss of fertile topsoil; and compaction of topsoil. The AIMP was developed to minimize the impacts of the pipeline to agricultural soils. Discussion of the AIMP and additional analysis of agriculture-related issues is presented in section 4.8.2 of this EIS. We recommend in this section the pipeline be buried at a minimum depth of 5 feet where it would cross agricultural fields.

Construction of the aboveground facilities, compressor stations, and meter stations would permanently affect approximately 126.0 acres of prime farmland soils. Additional acres of prime farmland soils would be temporarily affected during the construction of the mainline and laterals; however, this land would revert to its original use after construction and the acreage affected would not significantly reduce agricultural production in the REX East Project area.

Compaction Potential

Soil compaction occurs when soil particles are compressed. Compaction modifies soil structure and can reduce the porosity and moisture-holding capacity of the soil, thus restricting rooting depth. Compaction also decreases infiltration and thereby increases runoff and the potential for water erosion. The risk for compaction is greatest when soils are wet. Fine-grained soils having poor drainage characteristics have the greatest propensity for compaction. Construction equipment traveling over wet or saturated soils could disrupt soil structure, reduce pore space, increase runoff potential, and cause topsoil/subsoil rutting and mixing. Approximately 12 percent of the soils crossed by the REX East route are susceptible to compaction.

Operating heavy equipment can cause soil compaction in residential and agricultural areas. Construction vehicles and heavy equipment could leave ruts and cause excessive soil compaction. Rockies Express would mitigate rutting and compaction in agricultural and non-agricultural soils by implementing the procedures in its Plan, such as conducting compaction tests across the right-of-way using a cone penetrometer or another similar instrument and using a paraplow or other deep-tilling equipment in severely compacted agricultural areas. In areas where topsoil has been segregated, the subsoil would be plowed before replacing the segregated topsoil. In addition, Rockies Express would consult with landowners, NRCS, and additional agencies and perform decompaction as required by the affected party. To further minimize the potential for soil impacts in residential and agricultural areas, Rockies Express indicated that it would modify its construction practices by stopping construction activities that would cause irreparable rutting and mixing of the topsoil and subsoil. However, Rockies Express has also indicated that it believes the use of full right-of-way topsoil segregation would allow the continuation of construction during wet weather. We disagree; the concerns with compaction are not limited to topsoil and removing the topsoil would not negate the compaction concern. We believe that

additional mitigation measures should be implemented to minimize these potential impacts. To further mitigate for compaction in agricultural areas during wet weather, **we recommend that:**

- **Rockies Express prepare an Agricultural Wet Weather Contingency Plan to address construction practices in agricultural areas during wet weather (i.e., active precipitation and/or saturated ground or as otherwise determined by the EI). This plan should include, at a minimum:**

  a. A determination of the allowable depth of rutting, and allowable working conditions, prior to suspension of construction activities based on the type of soil, topsoil, and subsoil thickness and/or using the Atterberg Field Test Procedure;

  b. Designation of authority for the onsite AI to have "stop-work" authority in the event that wet weather conditions place topsoil and subsoil at risk; and

  c. Identification of alternate construction procedures to enable activities to continue without risking the loss and/or mixing of topsoil and subsoil and severe compaction in the event of an unseasonably wet construction season.

  This plan should be filed with the Secretary for review and written approval by the Director of OEP prior to the start of construction.

IDOA also strongly supports the development and implementation of an Agricultural Wet Weather Contingency Plan.

Stony-Rocky or Droughty Soils

Stony soils are identified as soils having more than 5 percent by weight of particles larger than 3 inches. Stony-rocky soils could interfere with agricultural practices and inhibit revegetation efforts.

Droughty soils have a surface texture of sandy loam or coarser material and are moderately well or excessively drained. As a result, droughty soils may not be able to sustain adequate moisture levels in the root zone, making revegetation difficult.

Approximately 4.5 percent of the soils crossed by the REX East facilities are stony-rocky and less than 1 percent of the soils crossed by the REX East facilities are droughty. Construction through stony-rocky soil could bring rock to the surface, which could interfere with agricultural practices and also hinder revegetation of the right-of-way.

In the event that blasting is required, Rockies Express' Plan and Procedures allow blast rock to be used to backfill the trench up to the level of the preexisting bedrock profile, but require the removal of excess blast/excavated rock, which would be considered construction debris. The Plan and Procedures also require the removal of excess stones and rock in areas where soils off the right-of-way do not contain similar materials. In nonagricultural areas, mulch application could be used to conserve soil moisture in droughty soils, in addition to providing stability of the soil surface and reducing erosion. Based on these procedures, we conclude that Rockies Express' use of its Plan and Procedures would effectively minimize impacts from construction through these types of soils.

Hydric Soils

Hydric soils are defined as soils that are formed under conditions of saturation, flooding, or ponding that has taken place long enough during the growing season to develop anaerobic conditions in the upper horizon. Hydric soils include those developed under sufficiently wet conditions to support the growth and regeneration of hydrophytic vegetation, and soils that are sufficiently wet because of artificial measures. Locations where hydric soils are encountered may also contain artificial drainage systems.

Approximately 19 percent of the soils crossed by the REX East route are designated as hydric soils. Construction through hydric soils and wetlands is discussed in sections 2.3.2 and 4.3.7 of this EIS. Implementation of the measures contained in Rockies Express' Plan and Procedures would also minimize impacts on hydric soils.

Shallow Bedrock

Soils indicated as consisting of shallow bedrock have the potential for bedrock to occur within 60 inches of the soil surface. In these areas, specialized mechanical equipment or blasting may be required for trench excavation.

Approximately 14 percent of the soils that would be crossed by REX East facilities have the potential for shallow bedrock, mainly on the eastern end of the Project. Approximately 47 percent of the shallow bedrock crossed would require blasting. The remaining areas of shallow bedrock may require blasting, but may also be soft enough to be ripped with backhoes or bulldozers equipped with rippers. Implementation of Rockies Express' Blasting Plan would minimize the effects of blasting (CD Document C). Shallow bedrock impacts are discussed in section 4.1.1 of this EIS.

4.2.2 Spill/Contamination Prevention

Soil contamination along the pipeline route could result from at least two sources: material spills during construction and trench excavation of existing contaminated areas. Contamination from spills or leaks of fuels, lubricants, coolants, and solvents from construction equipment could impact soils. Through its review of national and state regulatory databases, Rockies Express has not identified the presence of any existing contaminated sites in the immediate Project vicinity.

Rockies Express' Spill Prevention, Control, and Countermeasure (SPCC) Plan includes clean-up procedures designed to minimize contamination from accidental spills or leaks of fluids from construction-related equipment or materials (CD Document E). If an unanticipated area of suspected contamination is encountered during construction, Rockies Express would implement the procedures set forth in the SPCC Plan to minimize the spread of contamination and to ensure the health and safety of construction workers and the general public.

4.2.3 Topsoil Segregation

In addition to erosion and compaction, construction activities such as grading, trenching, and backfilling can cause mixing of soil horizons. Mixing of topsoil with subsoil, particularly in agricultural lands, leaves less productive soil in the root zone, which lowers soil fertility and the ability of disturbed areas to revegetate successfully.

According to section IV.B.1 of its Plan, Rockies Express would use the full work area or ditch-plus-spoil-side method in (1) actively cultivated or rotated croplands and pastures, (2) residential areas, (3) hayfields, and (4) other areas at the request of landowners or land-managing agencies.

Rockies Express' Plan includes measures to prevent or minimize the mixing of topsoil with subsoil. In addition, for agricultural areas, the AIMP includes directives for topsoil segregation.

Regarding the depth of topsoil, Rockies Express proposes to strip a maximum of 16 inches in actively cultivated or rotated croplands and other areas as requested by landowners or land-managing agencies. In areas where the topsoil is less than 16 inches, Rockies Express would attempt to segregate the entire topsoil depth. Rockies Express would protect the topsoil piles from loss or mixing with subsoil, being used as trench backfill or pipe padding, and from wind and water erosion. Procedures for soil segregation and depth of cover in agricultural areas are discussed in the AIMP.

During scoping we received several comments regarding topsoil segregation in areas of no-till farming. Erosion and sedimentation controls described in the AIMP would be implemented to minimize impacts in no-till farming areas, in addition to conventional farming areas. By implementing the topsoil segregation procedures described in the Plan and Procedures, as well as the AIMP, impacts to soils in no-till farming areas would be minimized and would not significantly impact soil quality in the Project area.

4.3 WATER RESOURCES

4.3.1 Groundwater Resources

Along the REX East Project route, groundwater is a significant source of drinking water in selected areas and is used for agricultural irrigation and industry. Groundwater flow generally reflects surface topography. Although depth to groundwater is variable along the proposed pipeline route, groundwater is often found near the ground surface, and the Project is likely to encounter groundwater during construction activities.

Major aquifers along the Project route include the Glacial Till, Dissected Till and Residuum, Pre-Wisconsin Drift, New Castle Till, New Castle Till Subsystem, Lower Tertiary, and Upper Cretaceous. These aquifers underlying the proposed pipeline and aboveground facilities are generally found in geological units composed of glacially derived till, alluvium, sand, and gravel. Additional information on the aquifers that occur along the Project route, including sole-source aquifers, WPAs, wells, springs, and contaminated groundwater is presented below.

Aquifer Systems

The Glacial Till Aquifer underlies the pipeline route in Audrain, Ralls, and Pike Counties, Missouri. This aquifer is a glacial drift aquifer consisting of sand and gravel. Depths to this aquifer range from 0 to below 200 feet and yields range widely, from less than 1 gallon per minute (gpm) to more than 2,000 gpm (MODNR, 2007a; Miller and Vandike, 1997). Some individual households use the Glacial Till aquifer for drinking water, but it is inadequate for municipal drinking supplies.

Aquifers underlying the pipeline route in Pike, Scott, and Morgan Counties, Illinois are typically composed of glacial alluvium. These aquifers are found in unconsolidated deposits of glacial sand and gravel varying in thickness and depth. These aquifers range in thickness from about 50 feet to as much as 150 feet and are capable of yielding 200 to 1,000 gpm for municipal, industrial, and irrigation uses.

In Sangamon, Christian, Macon, Moultrie, Douglas, and Edgar Counties, Illinois, glacial alluvium aquifers are minor. However, in this area of east-central Illinois, small areas of sand and gravel incised in Pennsylvanian shales are significant sources of groundwater for small communities and domestic wells. These wells have varying yields ranging from less than 1 gpm to 100 gpm at depths of less than 25 feet (Wehrmann and Sinclair, 2003).

Aquifers underlying the pipeline route from Vermillion County through Franklin County, Indiana include a combination of glacial alluvium aquifers, Pennsylvanian-age rock unit aquifers, and unconsolidated aquifers. In the glacial alluvium aquifer zones, the depth to water and the quantity and quality of groundwater are extremely variable. Depth to groundwater ranges from 50 to more than 550 feet in the Pennsylvanian-age rock unit aquifers. In Decatur and Franklin Counties, Indiana the pipeline route would cross four unconsolidated aquifer systems: Dissected Till and Residuum, Pre-Wisconsin Drift, New Castle Till, and New Castle Till Subsystem. Water depths range from 10 to 100 feet. The thicknesses of the unconsolidated deposits throughout these counties is variable, and often depends on the underlying bedrock topography (INDNR, 2005).

Aquifer systems underlying the pipeline route from Butler County, Ohio to the pipeline terminus in Monroe County, Ohio include a combination of glacial alluvium, limestone bedrock, Silurian carbonate, Niagaran limestone, sedimentary bedrock, abandoned coal mine, and shaley sandstone or limestone aquifers. Glacial alluvium aquifers vary in depth to groundwater and tend to be shallower

(approximately 200 feet) than bedrock aquifers. In general, glacial alluvium aquifers can be high-yielding, with ranges greater than 1,000 gpm.

The pipeline's route in Noble, Belmont, and Monroe Counties, Ohio features unglaciated upland areas. The two types of aquifers in these areas are from either shaley sandstone or thin limestone, both of varying depths with low yields of less than 1 gpm (Ohio State University Extension, 2007a,b).

The Lower Tertiary and the Upper Cretaceous aquifers are located beneath the Arlington Compressor Station site, in Carbon County, Wyoming. The Lower Tertiary aquifer includes a combination of shale, mudstone, siltstone, lignite, and coal. The depth to groundwater ranges from 300 to 900 feet below the surface (USGS, 1996). Wyoming wells have yields ranging from less than 1 gpm to 50 gpm, with maximum yields exceeding 1,000 gpm.

The proposed Bertrand Compressor Station site in Phelps County, Nebraska is underlain by Quaternary sand and gravel deposited by glacial and river-related processes, and the Tertiary Ogallala Group consisting of lime-cemented sand and gravel, loess-like silt, and unconsolidated sand and gravel. Depth to groundwater (with the Quaternary overlying the Tertiary) ranges from less than 50 feet to greater than 200 feet below the surface. Well yields can range from 1 to 1,000 gpm or more. Generally, the water quality is good, and dissolved concentrations of mineral constituents typically range from 200 to 500 milligrams per liter (Conservation and Survey Division, 1996).

Sole-Source Aquifers

EPA defines a sole- or principal-source aquifer as one that supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer. EPA guidelines stipulate that such areas can have no alternative drinking water source(s) that could physically, legally, and economically supply all those who depend upon the aquifer for drinking water (EPA, 2006). No sole-source aquifers have been designated by EPA in Illinois, Missouri, or Nebraska. In Wyoming, EPA has designated two sole-source aquifers: the Eastern Snake River Plain Aquifer Stream Flow Source Area and the Elk Mountain Aquifer. These aquifers would not be impacted by the compressor station in Carbon County. One sole-source aquifer has been designated by EPA in Indiana; however, it is located in the northern part of the state and would not be near the REX East Project facilities. In Ohio, EPA has designated five sole-source aquifers. The Pleasant City Sole-Source Aquifer is located 1.3 miles south of the pipeline route and would not be crossed by the Project. The Miami Valley Buried Sole-Source Aquifer would be crossed by the pipeline. It is located in the southwestern part of Ohio and underlies the pipeline route in Butler and Warren Counties. Depth to groundwater in most parts of the Miami Valley Buried Aquifer is less than 20 feet (GMBA, 2007). If properly constructed, wells may yield more than 1,000 gpm. The pipeline route would cross approximately 7.0 miles of land underlain by this sole-source aquifer. The three remaining sole-source aquifers in Ohio are located more than 10 miles from the Project and would not be impacted.

Water Supply Wells and Springs

Based on agency consultations, surveys, and an analysis of public and private water supply wells and springs, 67 wells and 6 springs have been identified within the vicinity of the pipeline. No public water supply wells were identified within 150 feet of Project facilities. The pipeline would be located within 150 feet of 7 private water wells in Illinois, 20 private water wells in Indiana, and 40 private water wells in Ohio (see appendix G). While no springs were identified in the vicinity of the route in Missouri, the pipeline would be located within 150 feet of two springs in Illinois, one spring in Indiana, and one spring in Ohio (see table 4.3.1-1). Rockies Express is currently in the process of field verifying the occurrence and locations of active wells and springs within 150 feet of the pipeline right-of-

Table 4.3.1-1 Springs Located Within 150 Feet of the REX East Proposed Pipeline Route a/		
State/County	**Approximate Milepost**	**Approximate Distance from Centerline (feet)**
MISSOURI	None Identified	N/A
ILLINOIS		
Edgar	228.5	55
Edgar	233.9	125
INDIANA		
Morgan	317.2	100
OHIO		
Monroe	638.2	32

a/ Spring information is based on civil survey information.

way. Rockies Express has not been granted survey access for the entire route to document all active wells and springs within 150 feet of the Project; thus, the data that have been filed with the Commission are incomplete. Therefore, **we recommend that:**

- **Prior to the start of construction, Rockies Express file with the Secretary the locations by milepost of all springs, seeps, and wells identified within 150 feet of construction work areas.**

Wellhead Protection Areas

WPAs are generally defined as surface and subsurface areas surrounding a water well or wellfield supplying a public water system through which contaminants are reasonably likely to move toward and reach such water well or wellfield. As such, WPAs are regulated to protect the water supply that is drawn by that particular well. Twelve WPAs have been identified along the pipeline route and are listed in table 4.3.1-2.

Impacts and Mitigation

Standard pipeline construction procedures, such as clearing and grading, trench excavation and dewatering, fuel handling, and blasting could affect groundwater resources including aquifers, water supply wells, springs, and WPAs. Clearing and grading removes vegetation, which could affect overland water flow and infiltration rates. Trenching and soil stockpiling activities temporarily alter overland flow and groundwater recharge and could result in minor fluctuations in groundwater levels and/or increased turbidity. In addition, heavy equipment used for construction could compact soil resources along the right-of-way, reducing its ability to absorb water and thus slowing the rate of groundwater recharge and increasing surface runoff and the potential for ponding.

Rockies Express would minimize or avoid groundwater impacts during construction by implementing measures outlined in its Plan and Procedures. Construction of the pipeline would require trenching and backfilling to a depth of approximately 7 to 8 feet below the ground surface. In areas where the water table is near the ground surface, trench excavation could intersect the water table, requiring trench dewatering. Trench dewatering may result in localized, minor changes in the water table, as well as changes in springs and wetland areas. Because pipeline construction at a given location would

Table 4.3.1-2 Wellhead Protection Areas Crossed by the Construction Work Area			
State/County	**Milepost**	**Wellhead Protection Area**	**Crossing Length (miles)**
MISSOURI a/			
Audrain	0 – 15.8	Area 1	15.8
Ralls	15.8 – 19.8	Area 4	4.0
Pike	19.8 – 43.1	Area 4	23.3
ILLINOIS			
Douglas	188.0	Arthur Community Water Supply Well	0.3
INDIANA			
Vermillion	247.0	Hillsdale Water Corporation	1.2
Morgan	308.3	Indiana American Water-Mooresville	0.3
Morgan	310.3	Hill Water Corporation-Wells	1.0
Franklin	393.7	North Dearborn Water Corporation	0.4
Franklin	393.7	Hoosier Hills Regional Water District	0.2
OHIO			
Butler	425.3	Southwest Regional District South Plant	0.9
Warren	453.5	Village of Waynesville	0.1
Fairfield	531.9	Airport Gun Club Public Water Supply	0.1

a/ Entire state is a Wellhead Protection Area.

be completed within a short period of time, potential impacts from dewatering would be temporary and water table elevations would be expected to quickly re-establish. Further, dewatering of the trench would occur in an adjacent upland through a sediment filter and energy displacement device. This discharge method would likely recharge the impacted aquifer, spring, or wetland area.

Rockies Express' Procedures details measures to mitigate potential impacts on shallow groundwater from dewatering, excavation, excessive soil compaction, and removal of vegetation from Project construction and restoration. Although surface drainage patterns could be changed during construction, Rockies Express' commitment to return the construction area to its previous contours (as practicable) would minimize or eliminate these impacts.

Potential impacts on wells and springs located within 150 feet of construction work areas could include localized decreases in groundwater recharge rates, changes in overland water flow, contamination due to hazardous material spills, decreased well yields, decreased water quality, interference with well mechanics, or complete disruption of a well's or spring's function. These impacts could result from trenching, equipment traffic, or blasting activities.

If springs or seeps are identified that construction activity could impact, Rockies Express would treat the spring or seep as a waterbody and avoid or minimize impacts by following its Procedures, which includes such measures as installation of erosion control devices (e.g., silt fences, hay bales), seep collars (e.g., trench plugs), and equipment bridges and culverts, as appropriate.

Construction of the pipeline necessitates the use of heavy equipment and associated fuels, lubricants, and other potentially hazardous substances that, if spilled, could affect shallow groundwater

and/or unconsolidated aquifers. Potential contamination due to accidental spills or leaks of hazardous materials associated with vehicle and equipment fueling and maintenance, and storage of construction materials presents the greatest potential threat to groundwater resources. If not properly responded to, soils contaminated by such spills or leaks would continue to leach and add pollutants to groundwater long after a spill has occurred.

Rockies Express developed an SPCC Plan to address preventative and mitigative measures that would be used to avoid or minimize the potential impacts of hazardous material spills during construction. The SPCC Plan specifies preventative measures such as spill training for construction personnel, regular inspection of construction equipment for leaks, replacement of deteriorating containers, and construction of containment systems around equipment storing hazardous liquids. Rockies Express' SPCC Plan also restricts refueling or other liquid transfer areas to be more than 100 feet from wetlands and waterbodies, prohibits refueling within 200 feet of any private water supply well and within 400 feet of any municipal water supply wells, and provides additional precautions when specified setbacks cannot be maintained. However, the specific distances for setbacks in these areas are not consistent in sections 3.2 and 3.3 of the Rockies Express SPCC Plan. Therefore, **we recommend that:**

- **Prior to the start of construction Rockies Express file with the Secretary a revised SPCC Plan that states it would restrict refueling or other liquid transfer within 100 feet of wetlands and waterbodies, 200 feet of any private water supply wells, and 400 feet of any municipal water supply wells.**

The SPCC Plan identifies emergency response procedures, equipment, and clean-up measures in the event of a spill, and requires the contractor to complete an inventory of all construction fuels, lubricants, and other hazardous materials that may be used, stored, or transferred in designated Project areas, and the amount and type of containers that would be used to store these materials. In the event soil or groundwater is contaminated during construction, Rockies Express would notify the affected landowner and coordinate restoration procedures with the appropriate federal and state agencies as required by its SPCC notification requirements. We have reviewed Rockies Express' SPCC Plan and find that it adequately addresses the storage and transfer of hazardous materials and the response to be taken in the event of a spill. We believe that the potential for the REX East Project to contaminate local aquifers would be minimal.

Construction through WPAs must protect against the potential for impaired water quality, decreased yield, or other disruptions of service. Potential impacts on WPAs would be avoided or minimized by the measures described above to prevent impacts on groundwater resources. Rockies Express would comply with state and local regulations and its SPCC Plan when working in WPAs to protect against the potential for impaired quality, decreased yield, or other disruptions of service.

Hoosier Hills Water Management District (Hoosier Hills) provides water for over 35,000 people in Indiana and raised many concerns during the comment period on the draft EIS. The proposed pipeline would cross about 0.2 miles of this shallow WPA (10 to 30 feet below the ground's surface to the top of the aquifer) starting at MP 393.7. One concern was the possibility of agricultural contaminants from the surface (e.g., pesticides and herbicides) entering the groundwater as a result of construction. Most contaminants would be confined to the topsoil, which would be segregated from the subsoil. Rockies Express' commitment to return soils to their original horizons would minimize the likelihood of such contaminants entering the groundwater at a rate greater than is currently experienced along the proposed pipeline route. Concern was also raised regarding fecal coliforms entering the groundwater from potential septic system damages caused during construction of the Project. No septic systems have been identified, to date, within or adjacent to Hoosier Hills WPA; however, we recommend in section 4.8.3 that Rockies Express identify all septic systems and provide a Septic System Contingency Plan to each

property owner prior to construction. We believe implementation of our recommendations would minimize the likelihood of septic system damages from construction of the Project, and thus fecal coliforms entering the groundwater in the Project area.

Construction of the Project would be more than 350 feet from Hoosier Hills' current wells; therefore, no impacts on their mechanics or function would be anticipated as a result of construction of the Project. Concern was raised regarding an increase in turbidity as a result of Project construction. Construction of the trench typically would be less than 10 feet below the ground's surface. This could contact the uppermost reaches of the WPA (typically 10 to 30 feet below the ground's surface). We would expect any turbidity-related impacts to quickly dissipate and not impact the water at the withdrawal locations.

An HDD crossing of the Whitewater River, located between approximately MPs 392.9 and 393.4, could reach depths of 50 feet below the ground's surface. The HDD exit point would be at least 1,200 feet west of the 5-year time of travel area for Hoosier Hills wells; therefore, we believe any impacts associated with HDD activities on the Hoosier Hills WPA would be minimized. A frac-out could result in increased turbidity of the Whitewater River; however, we believe any impacts on Hoosier Hills as a result of a frac-out would be negligible. Furthermore, because construction of the HDD would be outside of the 5-year time-of-travel area for the WPA, we believe any clay in the groundwater would have settled out (or have been naturally filtered) by the time the water would be withdrawn at the Hoosier Hills' well locations.

However, due to the shallow depth of the Hoosier Hills WPA (10 to 30 feet below the ground's surface) we believe an inadvertent spill of hazardous materials could cause contamination within the WPA. Therefore, **we recommend that:**

- **Rockies Express develop a site-specific specialized spill plan that would further reduce the likelihood of spills/leaks from construction-related equipment impacting the Hoosier Hills WPA. This plan should be in addition to Rockies Express' SPCC Plan and should contain a list of all fluids that would be used during construction in the area. Rockies Express should file this plan with the Secretary for review and written approval of the Director of OEP prior to the start of construction between MPs 393 and 394.**

We believe these mitigation measures would reduce the likelihood of any contamination entering the Hoosier Hills or North Dearborn Water Corporation WPA. However, to ensure that no impacts have occurred as a result of construction, **we recommend that:**

- **Rockies Express develop a water quality testing plan for Hoosier Hills Regional Water District's existing wells in consultation with Hoosier Hills Regional Water District. This plan should include water quality testing prior to, during, and for 2 years post construction to document any construction-related impacts on the Hoosier Hills WPA. Rockies Express should file a finalized plan with the Secretary prior to the start of construction. Copies of the water quality test results should be provided to Hoosier Hills.**

For Hoosier Hills to better understand Rockies Express' proposed construction techniques and have an opportunity to observe pipeline construction, **we recommend that:**

- **Rockies Express notify Hoosier Hills at least 48 hours prior to the start of construction between MPs 393 and 394.**

Construction of aboveground facilities would not require subsurface work. The development of the impervious surfaces and structures associated with the aboveground facilities would result in very minor alteration of infiltration/recharge rates, thus resulting in very minor effects on groundwater resources. No aboveground facilities would be located within 0.25 mile of a WPA in Illinois or Indiana. Rockies Express confirmed that MDNR has not expressed any concerns regarding the construction of the Project within Missouri WPAs. However, consultation with state and local authorities regarding WPAs has not been completed, nor have mitigation measures been agreed to for each WPA; therefore, **we recommend that:**

- **Prior to the start of construction, Rockies Express file with the Secretary documentation of consultations with applicable local and state agencies regarding construction in areas with WPAs or other groundwater management areas crossed by the pipeline.**

Rockies Express also has committed to documenting the condition (i.e., water quality and flow evaluations) of potable water wells within 150 feet of the construction right-of-way prior to the start of construction and after construction is completed. In the event that a potable water well is damaged by construction activities, Rockies Express has agreed to provide a temporary source of water and would restore the well to its original capacity or would provide other mutually agreeable remedies. Adequate protection of water supply wells/systems needs to be ensured. Therefore, **we recommend that:**

- **Within 30 days of placing the pipeline facilities in service, Rockies Express file a report with the Secretary identifying all water supply wells/systems damaged by construction and how they were repaired. The report should include a discussion of any complaints concerning the well yield or quality and how each problem was resolved.**

Blasting may be necessary along segments of the pipeline route where bedrock is located at or near the ground surface. If consolidated rock is encountered during construction that requires blasting to attain required trench depths, Rockies Express would use controlled blasting techniques in compliance with all federal and state regulations governing the use of explosives. To ensure that blasting would not have a significant impact on other environmental resources in the Project area (including water wells), Rockies Express has developed a Blasting Plan (CD Document C). Potential impacts from blasting to groundwater and bedrock-based water well systems include temporary changes in water level and turbidity. These impacts would be limited to those systems located in close proximity to the pipeline construction right-of-way. In accordance with its Blasting Plan, Rockies Express would notify nearby landowners at least 48 hours prior to the initiation of blasting activities. Mitigation of impacts would include the use of controlled blasting techniques limiting rock fracture to the immediate vicinity of detonation, and pre- and post-construction well testing along with any necessary repairs and restoration to any well located within 200 feet of a particular blasting location.

Upon completion of construction, Rockies Express would restore the ground surface as closely as practicable to pre-construction contours and revegetate the right-of-way. These measures would ensure restoration of overland flow of water and aquifer recharge patterns. Effects, if any, from construction of the pipeline on groundwater would likely be localized and temporary.

No long-term groundwater impacts would be anticipated as a result of constructing and operating the Project because disturbances would be temporary, erosion controls would be implemented, and ground contours would be restored. The measures that Rockies Express would implement to avoid or minimize the potential impacts of construction on groundwater are contained in its Plan and Procedures. For the few areas with shallow groundwater that would be crossed by the pipeline route with a depth less

than 10 feet below the ground surface, temporary, minor impacts could result from construction. The greatest threat posed to groundwater resources is that of a hazardous material spill or leak into groundwater supplies. However, Rockies Express' SPCC Plan adequately addresses strategies and methods to prevent such contamination and would provide effective responses should a spill occur.

Comments received on the draft EIS expressed concern regarding the possibility of the pipeline coating impacting water supplies, especially given the heat from the pipeline. Rockies Express would use a non-toxic epoxy material manufactured by 3M for the coating of the proposed pipeline. Because this material is considered non-toxic, no contaminant-associated impacts on drinking water supply areas or other waterbodies would be expected. Further, the Rate Schedule for the proposed Project, as regulated by the Commission, would limit gas temperatures to 120 degrees Fahrenheit, which is identical to other interstate natural gas pipelines. These temperatures would not exceed the melting point of the pipeline coating.

Commenters also expressed concern regarding contaminants from inside the pipeline leaching into the groundwater. The pipeline would be routinely cleaned internally by pigs to eliminate any liquids from gathering in the pipeline. During pigging operations, the pig receivers, typically collocated with other aboveground facilities (i.e., compressor stations and meter stations), would be equipped to contain any liquids gathered by the cleaning process.

4.3.2 Surface Water Resources

The REX East Project would cross two major watersheds: the Upper Mississippi Regional Watershed and the Ohio Regional Watershed. Table 4.3.2-1 provides the approximate location by milepost and descriptions of each river basin and watershed crossed by the pipeline and aboveground facilities.

The REX East Project would cross 1,485 surface waters. Specifically, the Project would cross: 326 perennial, 447 intermittent, 689 ephemeral, and 1 ephemeral/intermittent waterbodies; and 22 open water areas (e.g., ponds), as follows:

- Missouri: 13 perennial, 34 intermittent, 0 ephemeral, 0 open water;
- Missouri/Illinois: 1 perennial, 0 intermittent, 0 ephemeral, 0 open water;
- Illinois: 58 perennial, 82 intermittent, 23 ephemeral, 5 open water;
- Indiana: 101 perennial, 124 intermittent, 272 ephemeral, 5 open water; 1 ephemeral/ intermittent; and
- Ohio: 153 perennial, 207 intermittent, 394 ephemeral, and 12 open water.

A complete list of the waterbodies that would be crossed by the Project is provided in appendix G and includes the location, width, state water classification, and crossing method. No surface waters are within or immediately adjacent to the boundaries of the aboveground facility sites.

By reviewing USGS topographic maps and various databases and consulting with relevant agencies, Rockies Express identified the major (i.e., waterbodies greater than 100 feet wide) and/or sensitive waterbodies that would be crossed by the pipeline route (as described in table G-5 in appendix G).

Table 4.3.2-1

Major River Basins and Watersheds Crossed by the REX East Project a/

River Basin or Watershed	Approx. MP Range	Description
Upper Mississippi Regional Watershed	0.0 – 172.2	The Upper Mississippi Regional Watershed encompasses 189,000 square miles within 8 states: Illinois, Iowa, Minnesota, Missouri, Wisconsin, and small portions of Indiana, Michigan, and South Dakota. b/
Ohio Regional Watershed	171.9 – 639.1	The Ohio Regional Watershed covers approximately 203,940 square miles of land within 10 states: Illinois, Indiana, Kentucky, Maryland, New York, North Carolina, Ohio, Tennessee, Virginia, and West Virginia. c/
North Platte River Basin	Arlington Compressor Station	Beginning at snowmelt, the North Platte River flows northward from north-central Colorado into central Wyoming where it gradually curls southeast before joining the South Platte River. From its source at about 11,000 feet above sea level to its confluence with the South Platte, the North Platte River traverses approximately 665 miles and drains an area of 34,900 square miles. d/
Middle Republican Regional Watershed	Bertrand Compressor Station	The Middle Republican Regional Watershed is located in south-central Nebraska and north-central Kansas. It covers Franklin, Harlan, Kearney, Nuckolls, Phelps, and Webster Counties in Nebraska and Jewell, Phillips, Smith, and Republic Counties in Kansas. The surface of the entire watershed totals 1,399,835 acres with 961,514 acres in Nebraska and 435,321 acres in Kansas. e/

a/ U.S. Geological Survey (USGS), 1994.
b/ UMRSHNC, 2006.
c/ StormCenter, 2002.
d/ USGS, 2006.
e/ U.S. Department of Agriculture, 2007.

Surface waters are generally classified according to a beneficial use classification system as developed by each state crossed by the Project. Surface waters are also classified based on size: major waterbodies being greater than 100 feet wide, intermediate waterbodies being between 10 and 100 feet wide, and minor waterbodies being less than 10 feet wide.

No waterbodies crossed by the Project are known to have or are suspected of having sediments or waters with contaminants in concentrations that pose an unacceptable risk to human health or the environment. Furthermore, no waterbodies crossed by the Project are known to be or suspected of being contaminated with persistent chemicals.

Missouri

The state of Missouri categorizes surface waters according to 15 beneficial use classifications: irrigation; livestock and wildlife watering; cold-water fishery; cool-water fishery; protection of aquatic life–general warm-water fishery; protection of aquatic life–limited warm-water fishery; human health protection; whole-body contact recreation; secondary contact recreation; drinking water supply; industrial process and cooling water; storm- and flood-water storage and attenuation; habitat for resident and

migratory wildlife species; recreational, cultural, educational, scientific, and natural aesthetic values and uses; and hydrologic cycle maintenance.

Of the waterbodies that would be crossed in Missouri, two are classified as major crossings: the Salt River (MP 42.5) and the Mississippi River (MP 43.2). The Mississippi River is categorized as sensitive due to the presence of special status species, as discussed in section 4.7. Water quality impairments (fecal coliform and polychlorinated biphenyls [PCBs]) have also been identified at the Mississippi River crossing, while impairments from mercury and manganese have been identified at the Salt River Crossing.

A potable water intake source has been identified 1.6 miles downstream of the tributary to the proposed Lake Vandalia (MP 22.4) crossing. Because of the beneficial uses of this tributary, this intake source would be crossed by the dam-and-pump construction method to reduce sedimentation and turbidity downstream of the Project area. Any potential impacts on this intake source would be minimized by Rockies Express adhering to its Plans and Procedures.

Illinois

The state of Illinois categorizes surface waters into four classifications: general use–protection of indigenous aquatic life, primary and secondary contact recreation, agricultural and industrial uses; public and food processing water supply; Lake Michigan; and secondary contact and indigenous aquatic life use.

Of the waterbodies that would be crossed in Illinois, three are classified as major crossings: the Mississippi River (MP 43.2), Illinois River (MP 71.2), and South Fork Sangamon River (MP 132.1).

Potable water intake sources have been identified 1.4 and 1.5 miles downstream of the proposed Mississippi River (MP 43.2) crossing. The Mississippi River would be crossed by the HDD method, thereby minimizing any potential impacts on the downstream water intakes.

Indiana

The state of Indiana categorizes surface waters according to four beneficial use classifications: aquatic life use, primary contact recreation, fish consumption, and drinking water.

Of the waterbodies that would be crossed in Indiana, four are classified as major crossings: Wabash River (RR 2032 – MP 242.9 + 4.0), White River (MP 315.8), Big Blue River (MP 340.8), and Whitewater Canal (MP 394.0).

The pipeline would cross 74 waterbodies in Indiana that require a floodway crossing license from the INDNR Division of Water. Of those 74 waterbodies, 31 qualify for the Utility Line Crossing General License, and thus individual licenses would not be required. The remaining 43 of 74 waterbodies would require individual licenses because they are classified as "outstanding waters" or because they do not qualify for the general license. Those waterbodies that require a crossing license are identified in table G-5 in appendix G.

Potable water intake sources have been identified 1.6 miles downstream of the pipeline crossing at Flatrock River (MP 362.7) and 0.2 mile downstream of the Righthand Fork Salt Creek (MP 375.6) crossing. Both waterbodies would be crossed by open-cut construction methods.

Ohio

The state of Ohio categorizes surface waters according to beneficial use classifications within a three-pronged, broad classification scheme: aquatic life habitat (warm-water, limited warm-water, exceptional warm-water, modified warm-water, seasonal salmonid, coldwater, and limited resource water); water supply (public, agricultural, and industrial); and recreational (bathing waters, primary contact, and secondary contact).

Of the waterbodies that would be crossed in Ohio, seven are classified as major crossings: Four Mile Creek (MP 421.6), Great Miami (MP 430.7), Caesar Creek (MP 459.6), Deer Creek (MP 499.6), Big Darby Creek (MP 509.2), Scioto River (MP 514.6), and Muskingum River (MP 577.2).

Potable water intake sources have been identified 2.5 miles downstream of the pipeline crossing at Caesar Creek (MP 459.6) and 0.2 mile downstream at the tributary to Somerset Creek (MP 553.2). Caesar Creek would be crossed by HDD construction methods and Somerset Creek would be crossed by open-cut construction methods.

Consultations with the organizations or individuals who withdraw potable water within 3 miles of the proposed open-cut crossings of Flatrock River in Indiana and Somerset Creek in Ohio have not been completed. The City of Louisiana in Missouri also expressed concern regarding water withdrawal along the proposed pipeline route. Therefore, **we recommend that:**

- **Prior to the start of construction, Rockies Express file with the Secretary documentation of finalized consultation with the organizations or individuals who withdraw potable water within 3 miles of the open-cut crossings of Flatrock River (MP 362.7) in Indiana and Somerset Creek (MP 553.2) in Ohio, along with documentation of finalized consultations with the City of Louisiana in Missouri.**

4.3.3 Impacts on Surface Water Resources

Pipeline construction could affect surface waters in several ways. Clearing and grading of stream banks, instream trenching, trench dewatering, and backfilling could result in modification of aquatic habitat, increased sedimentation, turbidity, decreased dissolved oxygen concentrations, releases of chemical and nutrient pollutants from sediments, and introduction of chemical contaminants such as fuel and lubricants. The crossing of irrigation canals could interrupt the flow of irrigation water, which could damage crops and reduce crop yields. Further agricultural discussion is provided in section 4.8.2 of this EIS.

The greatest potential impact on surface waters would result from the temporary suspension of sediments during instream construction. The extent of the impact would depend on sediment loads, stream velocity, turbidity, bank composition, and sediment particle size. These factors would determine the density and downstream extent of sediment migration. Instream construction could cause the dislodging and transport of channel bed sediments and the alteration of stream contours. Changes in the bottom contours could alter stream dynamics and increase downstream erosion or deposition. Turbidity resulting from resuspension of sediments from instream construction or erosion of cleared right-of-way areas could reduce light penetration and photosynthetic oxygen production. Instream work could also introduce chemical and nutrient pollutants from sediments. Resuspension of deposited organic material and inorganic sediments could cause an increase in biological and chemical use of oxygen, resulting in a decrease of dissolved oxygen concentrations in the affected area. Lower dissolved oxygen concentrations could cause temporary displacement of motile organisms and may suffocate less- or non-motile organisms within the affected area.

Rockies Express may require blasting activities at 54 locations in or adjacent to perennial waterbodies along the Project right-of-way. Instream blasting could injure or kill aquatic organisms, displace organisms during blast-hole drilling operations, and temporarily increase stream turbidity. Rockies Express has agreed to prepare and implement a site-specific Blasting Plan before beginning any construction where blasting would be required within each waterbody greater than 10 feet wide.

The clearing and grading of streambanks would make soil vulnerable to erosion and reduce riparian vegetation along the cleared section of the waterbody. Riparian vegetation is discussed in more detail in section 4.4 of this EIS. The use of heavy equipment for construction could compact near-surface soils, resulting in increased runoff into surface waters. The increased runoff could transport additional sediment into the waterbodies, resulting in increased turbidity levels and sedimentation rates in the receiving waterbody.

The HDD method could impact surface waters if drilling fluids were released (frac-out) during drilling. Response to and mitigation for such a release is described in Rockies Express' HDD Contingency and Inadvertent Release Plan (CD Document D), which includes containment measures should an inadvertent release of drilling mud occur.

The drilling fluid would be primarily freshwater, with high-yield bentonite clay added to facilitate drill-hole stability. A temporary, localized increase in turbidity could occur from a release and the cleanup of a release. EPA does not list bentonite as a hazardous substance; therefore, an inadvertent release of drilling fluids would have no long-term adverse environmental impacts on water quality.

Rockies Express proposes to conduct 21 HDDs that would install the pipeline under 32 waterbodies (appendix G). Rockies Express was denied survey permission to complete site-specific geotechnical surveys for the proposed HDD crossings at the Embarras River (MP 202.9) and the Muskingum River (MP 577.2). Therefore, **we recommend that:**

- **Rockies Express file with the Secretary for review and written approval by the Director of OEP, the results of its HDD geotechnical feasibility investigations, revised site-specific construction diagrams, and contingency plans for the Embarras and Muskingum Rivers' HDD locations. If a planned HDD crossing is not feasible, then Rockies Express should develop a site-specific alternative crossing plan for each waterbody in consultation with all relevant agencies. Rockies Express' plans and documentation of consultations regarding the site-specific HDD plans should be filed with the Secretary prior to the start of construction.**

Refueling of vehicles and storage of fuel, oil, or other hazardous materials near surface waters could create contamination. If a spill were to occur, users immediately downstream could experience degradation in water quality. Acute and chronic toxic effects on aquatic organisms also could result from such a spill.

The measures Rockies Express would implement to avoid or minimize the potential impacts of construction on surface waters are contained in its Procedures and its SPCC Plan and are discussed below. No long-term impacts are anticipated as a result of the Project because the beneficial use classifications would not be permanently affected, the pipeline would be installed beneath the bed and banks of waterbodies, erosion controls would be implemented, and the streambanks and streambed contours would be restored.

For each state crossed by the Project, Rockies Express has developed conceptual mitigation and restoration plans identifying procedures that would be implemented to minimize impacts on riparian areas affected by the Project. These procedures describe site-specific conditions found at wetland and stream-bank crossings in the respective states along the proposed route, and describe methods for re-seeding, planting, and monitoring reclamation success. In response to the plan Rockies Express submitted for Missouri, the MDC has requested that crossings with alluvial substrate in the state be identified that would possibly require toe protection (i.e., rip rap), which would protect those crossings vulnerable to head-cutting of the banks. Rockies Express has committed to consult with appropriate agencies prior to installation of the pipeline to ensure adequate toe protection.

4.3.4 Waterbody Construction and Mitigation Procedures

Rockies Express proposes to use several methods to cross perennial waterbodies, including the HDD, dry-ditch (dam-and-pump or flume), open-cut, and/or microtunneling methods. Construction methods are described in sections 2.3.1 and 2.3.2. Rockies Express would minimize impacts on surface waters by implementing the construction and mitigation procedures contained in its Procedures, which include:

- limiting clearing of vegetation between extra work areas and the edge of the waterbody to preserve riparian vegetation;
- constructing crossings as close to perpendicular to the waterbody as site conditions allow;
- maintaining adequate flow rates throughout construction to protect aquatic life and prevent the interruption of existing downstream uses;
- locating areas for equipment staging, soil stockpiles, and refueling at appropriate setbacks from surface waters;
- requiring construction across waterbodies to be completed as quickly as possible and during the windows specified in its Procedures or required by applicable permits;
- developing and adhering to any required site-specific construction plan for each waterbody greater than 100 feet wide at the crossing location (major waterbody);
- requiring temporary erosion and sediment control measures to be installed across the entire width of the construction right-of-way after clearing and before ground disturbance;
- requiring maintenance of temporary erosion and sediment control measures throughout construction until streambanks and adjacent upland areas are stabilized;
- requiring bank stabilization and re-establishment of bed and bank contours and riparian vegetation after construction;
- limiting post-construction maintenance of vegetated riparian strips adjacent to streams;
- restoring, monitoring, and correcting any drainage or irrigation system problems that have resulted from pipeline construction in active agricultural areas;

- developing a Stormwater Pollution Prevention Plan to minimize impacts on surface waters associated with silt-laden runoff during construction; and

- implementing its SPCC Plan if contamination occurs during construction.

A major use of water during Project construction would be for mitigating air quality impacts from construction-related dust. Rockies Express would obtain water from municipal sources to use for dust control.

Rockies Express proposes to cross non-sensitive, dry intermittent waterbodies using conventional upland construction methods as outlined in the Rockies Express Plan. For some minor or smaller intermediate waterbody crossings with specific environmental sensitivities, Rockies Express proposes to use the dam-and-pump or flume method, which would isolate the construction work area from the water flow, thereby providing continuous flow and minimizing downstream sedimentation and turbidity. The use of conventional upland construction methods in dry intermittent waterbodies could require a wider construction right-of-way and have greater impacts on riparian areas, waterbody beds, and banks. Therefore, **we recommend that**:

- **Rockies Express shall cross all dry intermittent waterbodies using the open-cut method with application of the mitigation measures described in v(B)(2) through v(B)(4) of its Procedures.**

Vegetated riparian strips along streams are important for erosion prevention; therefore, no HDD entry and exit points would be located within riparian areas. Rockies Express also would not conduct normal maintenance (mowing) along the permanent right-of-way between the HDD entry and exit points. We further recommend in section 4.4.1 that onsite markers be used to identify "no-clearing" zones within vegetated riparian strips adjacent to waterbodies that are to be avoided during maintenance activities.

In addition to the measures described above, Rockies Express would need to obtain and comply with all conditions of its COE Section 404 permit, Section 10 of the Harbors Act, Section 401 state water quality certifications, and Section 7 (a) of the WSR.

4.3.5 Sensitive or Unique Waterbodies

Numerous waterbodies that are considered sensitive for several reasons, including, but not limited to size, the presence of coldwater fish species, special status species, high-quality recreational or visual resources, historic value, or the presence of impaired water or contaminated sediments would be crossed by the pipeline. In accordance with its Procedures, Rockies Express has committed to filing site-specific crossing plans for these waterbodies. However, because surveys and agency consultations are ongoing, these crossing plans have not been provided to the Commission. Therefore, **we recommend that:**

- **Prior to the start of construction, Rockies Express file with the Secretary revised site-specific crossing plans that identify specific restoration and mitigation measures applicable to each sensitive waterbody crossing listed in tables 4.3.5-1 and 4.6.2-1 in the EIS and any applicable state and federal agency consultations for review and written approval by the Director of OEP.**

Potential impacts associated with construction in wooded riparian areas, on fisheries, and on special status species are discussed in sections 4.4, 4.6, and 4.7, respectively.

The pipeline would cross 59 waterbodies that are considered sensitive because of significant fisheries resources: 1 on the border of Missouri and Illinois, 1 in Illinois, 7 in Indiana, and 49 in Ohio. Table 4.6.2-1 lists these crossings. All of these waterbodies are designated as significant fisheries resources based on outstandingly remarkable values, exceptional habitat, or the presence of special status species.

As shown in table 4.3.5-1 below, 51 of the waterbodies that would be crossed by the Project have been designated as impaired waters by EPA. Examples of impairments commonly found in these waterbodies include metals, pathogens, dissolved oxygen, pH, PCBs, total suspended solids (TSS), and sedimentation/siltation. None of the waterbodies that would be affected by the Project are known or suspected of having sediments or waters contaminated in concentrations that pose an unacceptable risk to human health or the environment.

Table 4.3.5-1

Impaired Waterbodies Crossed by the REX East Project

State/County	Milepost	Waterbody Name	Proposed Crossing Method	Impairment Cause
MISSOURI				
Pike	42.5	Salt River	HDD	Mercury, Manganese
ILLINOIS				
Pike	43.2	Mississippi River	HDD	Fecal coliform, PCBs
Pike	61.0	Honey Creek	Open-cut	Dissolved oxygen, Sedimentation/Siltation
Pike	63.9	Bay Creek	Open-cut	303(d) Impairment – Dissolved oxygen, Phosphorus, Sedimentation, Siltation, TSS, Fecal coliform
Scott	71.2	Illinois River	HDD	PCBs, Mercury
Sangamon	117.1	Panther Creek	Open-cut	Sedimentation/siltation
Sangamon	121.2	Sugar Creek	Open-cut	Fecal coliform
Sangamon	125.2	Brush creek	Open-cut	Dissolved oxygen, Manganese
Sangamon	126	Horse Creek	Open-cut	Dissolved oxygen, Manganese
Sangamon	130.7	Tributary to South Fork Sangamon River	Open-cut	Iron, Nitrogen, pH, Dissolved oxygen, Manganese, Phosphorus, Sedimentation/Siltation, TSS, Chlordane
Sangamon	132.1	South Fork Sangamon River	Open-cut	Iron, Nitrogen, pH, Dissolved oxygen, Manganese, Phosphorus, Sedimentation/Siltation, TSS, Chlordane
Christian	140.7	Buckhart Creek	Open-cut	Dissolved oxygen
Macon	175.5	Tributary to West Okaw River	Open-cut	Nitrogen, Fecal coliform, Dissolved oxygen, pH, Phosphorus, TSS
Douglas	193.4	Kaskaskia River	Open-cut	Manganese, Fecal coliform, Dissolved oxygen, pH, Phosphorus, Sedimentation/Siltation, TSS
Edgar	198.7	Scattering Fork	Open-cut	Nitrogen, Phosphorus
Douglas	201.2	Hackett Branch	Open-cut	Dissolved oxygen, Phosphorus
Edgar	202.9	Embarras River	HDD	Nitrogen, Dissolved oxygen, pH, Phosphorus, Sedimentation/Siltation, TSS, Fecal coliform
Edgar	227.4	Brouiletts Creek	Open-cut	Fecal coliform

Table 4.3.5-1 (continued)

Impaired Waterbodies Crossed by the REX East Project

State/ County	Milepost	Waterbody Name	Proposed Crossing Method	Impairment Cause
INDIANA				
Vermillion	RR 2302–MP 242.9 + 4.0	Wabash River	HDD	*E. coli*, PCBs, Mercury
Putnam	282.2	Plum Creek	Open-cut	Biotic community status
Hendricks	286.6	Clear Creek	Open-cut	Pathogens
Hendricks	288.7	Tributary to Miller Creek	Open-cut	Pathogens
Hendricks	289.7	Tributary to Crittenden Creek	Open-cut	Pathogens
Hendricks	291.8	Mill Creek	Open-cut	Pathogens
Hendricks	294.3	East Fork Mill Creek	Open-cut	Pathogens
Hendricks	299.4	Mud Creek	Open-cut	Pathogens
Morgan	311.0	White Lick Creek	Open-cut	*E. coli*, PCBs, Mercury
Morgan	311.1	Tributary to White Lick Creek	Open-cut	*E. coli*, PCBs, Mercury
Morgan	312.4	White Lick Creek	HDD	*E. coli*, PCBs, Mercury
Morgan	315.8	White River	Dam and Pump/Flume	PCBs, Pathogens, Mercury
Morgan	317.5	Crooked Creek	Open-cut	Pathogens
Morgan	318.1	Banta Creek	Open-cut	Pathogens
Johnson	323.4	Tributary to North Prong Stotts Creek	Open-cut	Pathogens
Johnson	331.3	Buckhart Creek	Open-cut	PCBs
Johnson	336.1	Youngs Creek	Open-cut	PCBs
Shelby	337.9	Sugar Creek	Open-cut	*E. coli*, PCBs, Mercury
Shelby	340.8	Big Blue River	HDD	*E. coli*, PCBs
Decatur	362.7	Flatrock River	Open-cut	Mercury, PCBs, Pathogens
Franklin	392.5	Blue Creek	Open-cut	*E. coli*
Franklin	392.8	Tributary to Blue Creek	Open-cut	*E. coli*
Franklin	397.5	Big Cedar Creek	Open-cut	*E. coli*
OHIO				
Butler	421.6	Four Mile Creek	HDD	PCBs
Butler	422.7	Seven Mile Creek	HDD	PCBs
Butler	430.7	Great Miami River	HDD	PCBs
Warren	447.3	Clear Creek	Open-cut	Nutrients, Organic enrichment
Fayette	480.4	Rattlesnake Creek	Open-cut	Nutrients, Organic enrichment
Fayette	486.4	Paint Creek	Dam and Pump/Flume	Nutrients, PCBs, Siltation, Organic enrichment
Pickaway	515.9	Walnut Creek	HDD	PCBs, Mercury, Organic enrichment, Cause unknown

Table 4.3.5-1 (continued) Impaired Waterbodies Crossed by the REX East Project				
State/ County	**Milepost**	**Waterbody Name**	**Proposed Crossing Method**	**Impairment Cause**
Fairfield	529.6 and 529.9	Hocking River	Open-cut	PCBs, Metals, Chlorides, pH
Muskingum	566.1	Moxahala Creek	Open-cut	pH, Siltation
Muskingum	577.2	Muskingum River	HDD	Pathogens, PCBs, Organic enrichment

Nationwide Rivers Inventory

The Project would cross eight sensitive perennial waterbodies that are listed on the Nationwide Rivers Inventory (NRI). In order to be listed on the NRI, a river must have at least one outstandingly remarkable value (ORV). An ORV is a natural, recreational, or cultural value that is judged to have more than local or regional significance. Four of the eight rivers listed on the NRI that would be crossed by the Project (Big Walnut Creek, Big Blue River, Wabash River, and White River) are located in Indiana. The remaining four rivers (Four Mile Creek, Great Miami River, Scioto River, and Paint Creek) are located in Ohio. The Big Blue River, Four Mile Creek, Great Miami River, Big Walnut Creek, Wabash River, and Scioto River are all proposed to be crossed by the HDD method. Rockies Express would cross Paint Creek and the White River by dry-ditch construction methods. In consultation with the NPS, Rockies Express has prepared and would implement a site-specific crossing plan for each of the NRI waterbodies crossed by the Project.

IDEM and FWS are concerned with the amount of tree clearing proposed in the wooded riparian habitat associated with Big Walnut Creek (Indiana wooded riparian corridors are further discussed in section 4.4). Tree clearing could impact the viewshed, wildlife, aquatic species, and recreational enjoyment. We recognize that the workspace for the HDD crossing of Big Walnut Creek would be within an upland forested area; however, utilizing this construction method would limit the overall impact on the waterbody and the siting of the proposed HDD entry location away from the waterbody would minimize impacts on riparian habitat.

IDEM and FWS have also expressed concerns about construction through a meander of the White River, as well as the removal of riparian trees along the river, which could speed the process of a natural adjustment by the river to straighten in this area. Additionally, with the changing hydrology, the potential exists for the pipeline to become exposed at this crossing. Rockies Express conducted geotechnical investigations and determined that an HDD crossing of the White River is not feasible because the subsurface is mostly sand and gravel, which would not support a successful HDD.

Rockies Express has agreed to cross the White River using a dry-ditch construction method if water flows permit. In addition to the dry-ditch crossing method, Rockies Express has agreed to several IDEM measures to limit impacts at this crossing. Rockies Express would install the pipeline with additional depth of cover within the river channel, and would extend this additional depth beyond the banks before the pipe is allowed to gradually ascend to normal depths of cover. The pipe would be weighted at the crossing, creating negative buoyancy in the event that the river should change direction and cause the pipe to become exposed. In accordance with Rockies Express' Procedures, the riverbanks would be restored to pre-construction contours and permanently stabilized immediately following construction. Dry-ditch crossings are proposed for Paint Creek and White River. If dry-ditch crossing methods at these locations are not feasible due to no water flow or extreme water flow conditions, **we recommend that:**

- **Rockies Express file with the Secretary consultations with all applicable state and federal agencies for review and written approval by the Director of OEP prior to initiating an alternative crossing method at Paint Creek or the White River.**

Wild and Scenic Rivers

Federal designation for wild and scenic rivers stems from the WSR of 1968, which protects the free-flowing natural condition; water quality; and outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, and cultural values of the designated rivers. Two Ohio waterbodies, the Little Miami River and Big Darby Creek, are designated as National Wild and Scenic Rivers. NPS is responsible for reviewing federally assisted water resources projects pursuant to Section 7(a) of the WSR, and the state of Ohio is responsible for fulfilling the remaining requirements of the Act. At the proposed points of crossing by the pipeline, the specific classifications for these rivers under this general designation are scenic river areas, which are regarded as being rivers free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped but accessible in places by roads.

ODNR administers a state Scenic Rivers Act, which (based on the waterbody's length, adjacent forest cover, biological characteristics, water quality, present use, and natural conditions) provides three categories for river classification: wild, scenic, and recreational. Scenic river designation is a cooperative venture among state and local government, citizen groups, and local communities within a watershed. The Ohio state-designated wild and scenic rivers crossed by the proposed pipeline route are also the Little Miami River and Big Darby Creek (ODNR, 2008b).

The Little Miami River is a perennial river that would be crossed at MP 451.3 in Warren County, Ohio. The approximately 3,100-foot-long crossing would be accomplished using the HDD method to minimize disturbance to vegetation, stream banks, and the streambed.

Big Darby Creek is a perennial river that would be crossed at MP 509.2 in Pickaway County, Ohio. Rockies Express would accomplish the approximately 1,850-foot-long crossing using the HDD method to minimize disturbance to vegetation, stream banks, and the streambed.

At both the Little Miami River and Big Darby Creek, Rockies Express has conducted geotechnical investigations and determined that conditions are suitable for the HDD method. However, there is always a risk that an HDD could be unsuccessful. The geotechnical investigation of the Big Darby Creek describes that cobbles and boulder-size materials may be encountered and may be problematic during drilling operations. However, an open-cut crossing could cause temporary and permanent impacts on the beds and banks of these waterbodies and would not be an acceptable crossing method to NPS; therefore, Rockies Express has identified microtunneling as the alternative construction method that would be used if the HDD installation were to fail. Rockies Express has committed to crossing both of these rivers using trenchless construction methods.

The draft EIS contained a condition that Rockies Express identify alternative routes to avoid the Little Miami River and Big Darby Creek, in the event that the HDD crossing would not be successful. The condition also prevented Rockies Express from constructing within the areas that would be avoided by a potential alternative, in the event the HDD crossing was not successful. Rockies Express believes that the two waterbodies could be crossed by one of the proposed construction methods (HDD or microtunneling). We believe that successful HDD or microtunnel crossings of the Little Miami River and

Big Darby Creek would eliminate impacts on these waterbodies. However, to minimize environmental impacts in the event a non-trenching method could not be successfully completed, **we recommend that:**

- **Rockies Express successfully complete the HDD or microtunneling crossing of the Little Miami River prior to the start of construction between MP 432.9 and MP 467.2.**

Further, we recommend that:

- **Rockies Express successfully complete the HDD or microtunneling crossing of Big Darby Creek prior to the start of construction between MP 494.1 and MP 533.9.**

To further limit impacts on the Little Miami River and Big Darby Creek, Rockies Express has agreed to cross all tributaries of the Little Miami River and Big Darby Creek using dry-ditch construction methods.

Rockies Express has agreed to not use the Little Miami River, Big Darby Creek, or any tributaries to these two waterbodies as sources or discharge locations of hydrostatic test water. However, Rockies Express did not identify the water source or discharge location for the hydrostatic testing of these HDDs. Therefore, **we recommend that:**

- **Prior to the start of construction, Rockies Express develop and file site-specific plans with the Secretary for review and written approval by the Director of OEP that identify the source and discharge locations of hydrostatic test water used for the HDD of Little Miami River and Big Darby Creek.**

Mississippi River

The Mississippi River is the principal feature in the Upper Mississippi Regional watershed that would be crossed by the Project (see table 4.3.2-1). The river has been designated as supporting irrigation, livestock and wildlife watering, protection of warmwater aquatic life and human health fish consumption, Class B whole-body contact recreation, secondary contact recreation, drinking water supply, and industrial process and cooling water. Impairments by fecal coliform and PCBs have been identified at the Mississippi River crossing.

The Mississippi River crossing would be part of a larger scale crossing, starting in Pike County, Missouri and ending in Pike County, Illinois where the Salt River and the Mississippi River would be crossed at their confluence (totaling about 4,700 feet). At MP 43.2, the Mississippi River's width is about 1,800 feet. Rockies Express proposes to cross these waterbodies using the HDD method in two stages. The Mississippi River portion of this crossing would begin from Blackburn Island on the west side of the Mississippi River and exit west of the Sny Levee, which is located on the east side of the Mississippi River. Further analysis of the Sny Levee crossing is located in section 4.8.5 of this EIS.

By utilizing the HDD method, Rockies Express would minimize the potential impacts on the Mississippi River by the Project. Hard limestone formations underlay the substrate of the proposed crossing. The design radius that has been chosen for the Project would avoid these formations while minimizing the stresses placed on the pipeline itself.

Crucial to the planned HDD crossing of the Mississippi River is the dredging operation required to achieve sufficient water depth on the east side of Blackburn Island to accommodate barges. These barges would be used to transport necessary equipment for the HDD operations that would take place on the island.

Because the HDD crossing of the Mississippi River would require dredging, there are potential impacts not only from the dredging itself, but also from the resultant dredge spoils. Potential impacts include, but are not limited to, increased turbidity, habitat destruction, noise and air (localized) pollution, thermal stratification disruption within the water column, entrainment of organisms, and release and spread of previously sequestered contaminants from the dredged spoils. The spreading of previously sequestered contaminants from the dredged spoils has been addressed through consultations with MDNR, IEPA, and USGS and is not considered a threat because no contaminated sediments were identified in the proposed dredging location. Furthermore, COE has indicated that chemical analysis of the sediments to be dredged is unnecessary. Rockies Express has prepared a Dredge Plan (CD Document H) that describes the dredging activities that would be carried out along with the dredging and disposal schedule. We believe this plan adequately addresses proper dredging disposal.

Hunter Lake Reservoir

The area near the proposed Hunter Lake Reservoir, south of Springfield, Illinois, is considered a unique area of the Project because it is licensed to be a reservoir. Rockies Express is maintaining ongoing consultations with representatives from the City of Springfield's Office of Public Utilities to ensure that the correct measures are taken regarding construction techniques. Through consultations with the City of Springfield's Office of Public Utilities, Rockies Express has agreed to construct through the area near the proposed reservoir similar to that of crossing a waterbody. To assure the right-of-way would not adversely impact the proposed reservoir, Rockies Express would provide 4 to 5 feet of cover over the pipeline, and would weight the pipeline similarly to a waterbody crossing to create negative buoyancy. Rockies Express would provide the City of Springfield an engineering plan to review and, if appropriate, would develop additional mitigation measures in coordination with the city.

4.3.6 Hydrostatic Testing

Rockies Express would verify the integrity of its pipeline before placing it into service by conducting a series of hydrostatic tests. These tests involve filling the pipeline with water, pressurizing it, and then checking for pressure losses due to pipeline leakage. Sources of hydrostatic test water are expected to be surface waterbodies in close proximity to the pipeline. Rockies Express would require approximately 246.3 million gallons (755.9 acre-feet) of water to hydrostatically test the entire proposed pipeline.

Rockies Express identified preliminary hydrostatic test water sources and approximate amounts of water required for construction Spreads 1 through 7 (see table 4.3.6-1). In accordance with its Procedures, Rockies Express has agreed to file with the Secretary a final list of hydrostatic test water sources and discharge locations for the review and approval of the Director of OEP prior to construction.

The withdrawal of large volumes of hydrostatic test water from surface water sources could temporarily affect the recreational and biological uses of the waterbody if the diversions comprise a large percentage of the source's total flow or volume. The diversion of large volumes of water from waterbodies could also result in temporary changes in habitat, changes in water temperature and dissolved oxygen levels, and entrainment or impingement of fish or other aquatic organisms.

Rockies Express would minimize the potential effects of hydrostatic testing on surface water resources by adhering to the measures in its Procedures. These measures include screening intake hoses to prevent the entrainment of fish and other aquatic organisms and regulating the rate of withdrawal of test water to avoid adverse impact on aquatic resources or downstream users. Rockies Express would not

Table 4.3.6-1

Project Water Requirements for Hydrostatic Testing

State/Spread	From MP	To MP	Spread Length (miles)	Approx. Volume (gallons) a/	Approx. Volume (acre-feet)	Potential Supply and Discharge Sources
Missouri/Illinois/1	0.0	107.2	107.2	41,100,000	126.1	Grassy Creek Salt River Mississippi River – east side Illinois River – west side Little Apple Creek (Seasonal) Left Fork of Little Apple Creek (Seasonal)
Illinois/2	107.2	230.3	123.1	47,500,000	145.7	Brush Creek South Fork of Sangamon River Mosquito Creek (Seasonal) Ditch #3 Ditch #4 Lake Fork Kaskaskia River Embarras River Brushy Fork
Illinois/Indiana/3	230.3	334.0	103.7	40,000,000	122.8	Crabapple Creek Wabash River Little Raccoon Creek Big Raccoon Creek Big Walnut Creek White Lick Creek White River-east side
Indiana/Ohio/4	334.0	424.0	90.0	34,700,000	82.6	Youngs Creek – west side Big Blue River – west side Flatrock River – west side Little Flatrock River – west side Salt Creek Whitewater River (IN) Big Cedar Creek Dry Fork Whitewater River (OH) Indian Creek Four Mile Creek Seven Mile Creek
Ohio/5	424.0	533.3	109.3	42,200,000	106.5	Great Miami River Caesar Creek feeding Caesar Creek Lake Scioto River
Ohio/6	533.0	587.0	53.7	20,700,000	63.5	Moxahala Creek Muskingum River
Ohio/7	587.0	639.1	52.1	20,100,000	61.7	Wills Creek Barnesville Reservoir
Total			639.1	246,300,000	755.9	

a/ Rockies Express continues to review waterbodies for supply and discharge capacity.

add chemicals to the water during testing. Rockies Express would acquire the necessary permits from state agencies before withdrawing or discharging hydrostatic test water, including specific approvals from applicable resource agencies.

Nine of Rockies Express' proposed hydrostatic test water sources (Mississippi River, Whitewater River, Seven Mile Creek, Scioto River, Muskingum River, Little Miami River, Big Cedar Creek, Young's Creek, and Flatrock River) are known to contain federally listed and state-listed endangered and threatened species. The impacts on federally listed and state-listed species, including potential depletion impacts, are discussed in section 4.7.

Rockies Express would discharge the test water in upland areas unless direct discharge into surface waters is determined to be acceptable and permitted by the appropriate state and federal agencies. Hydrostatic test water discharged into waterbodies has the potential to cause erosion of stream beds and banks, resulting in a temporary increase of sediment load and disturbance of habitat. These discharges could affect state-designated uses. If discharge into waterbodies is permitted, Rockies Express would minimize the potential for these effects through the use of energy dissipating devices that would disperse and slow the velocity of the discharge. Final test water discharge locations would be in accordance with Rockies Express' NPDES permit and any state-issued hydrostatic test water discharge permits. Water discharges over land would be conducted through containment structures, such as hay bale structures or filter bags. Rockies Express has estimated that the discharge rate of the hydrostatic test water would be regulated to be between 2,000 and 5,000 gpm using valves and energy dissipation devices.

Hoosier Hills Regional Water District expressed concern about the possible discharge of hydrostatic test water to the Whitewater River and the impacts it could have on the Hoosier Hills WPA; therefore, **we recommend that:**

- **Rockies Express provide Hoosier Hills Regional Water District a copy of hydrostatic test water analysis prior to discharge to the Whitewater River.**

4.3.7 Wetlands

Wetlands are areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of wetland vegetation typically adapted for life in saturated soil conditions (Environmental Laboratory, 1987). Wetlands are found primarily in temporarily flooded sinks, along drainage ways, in shallow basins, and in association with riparian areas.

Section 404 of the CWA of 1972 established standards to minimize impacts to wetlands under the regulatory jurisdiction of COE. These standards require avoidance of wetlands where possible and minimization of disturbance where impacts are unavoidable to the degree practical. Rockies Express conducted field delineations during winter, spring, and summer 2007 in accordance with the methodology outlined in COE's 1987 Wetland Delineation Manual (Environmental Laboratory, 1987), which comprises at least 61 percent of the Project right-of-way. In addition, in areas where access was denied, Rockies Express used National Wetland Inventory (NWI) data to identify wetlands crossed by the proposed REX East pipeline right-of-way and aboveground facilities. This information would be included in Rockies Express' Section 404 permit application filed with COE.

Affected Wetlands

The REX East pipeline route would cross approximately 4.3 miles of wetlands. Construction of the Project would affect a total of about 37.8 acres including 7.1 acres of wetlands in Missouri, 6.8 acres in Illinois, 6.8 acres in Indiana, and 17.1 acres in Ohio. No wetlands would be affected by the proposed facilities in Nebraska and Wyoming. A description of wetland types crossed by the proposed pipeline route is presented in table 4.3.7-1. Wetlands vegetation is also discussed in section 4.4.

Table 4.3.7-1

Descriptions of Wetland Types Crossed by the Project a/

Wetland Type	NWI Code	Description
Palustrine Emergent	PEM	These are wetlands that are characterized by erect, rooted herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years and is usually dominated by perennial plants. All water regimes are included except subtidal and irregularly flooded. Emergent wetlands are known by many names, including marsh, meadow, fen, prairie pothole, and slough. In areas with relatively stable climatic conditions, emergent wetlands maintain the same appearance year after year. However, in other areas, such as the prairies of the central United States, severe climatic fluctuations cause them to revert to an open-water phase in some years. Dominant hydrophytic species may include *Phalaris arundinacea, Polygoum pensylvanicum, Polygonum hydropiper*, or *Polygonum lapathifolium*.
Palustrine Scrub-Shrub	PSS	These are wetlands that include areas dominated by woody vegetation less than 20 feet tall. Vegetation forms found in this wetland include true shrubs, young trees, and trees or shrubs that are small or stunted because of environmental conditions. All water regimes are included except subtidal. Scrub-shrub wetlands may represent a successional stage leading to a forested wetland or they may be relatively stable communities. Dominant species may include *Cornus spp*. *Salix*, *Lindera*, and immature tree species, such as *Acer spp*., *Fraxinum spp*., and *Ulmus spp*.
Palustrine Forested	PFO	These are wetlands that are characterized by woody vegetation that is 20 feet tall. All water regimes are included except subtidal. Forested wetlands are most common in the eastern United States and in those sections of the West where moisture is relatively abundant, particularly along rivers and in the mountains. Forested wetlands normally have an overstory of trees, an understory of young trees or shrubs, and an herbaceous layer. Dominant species may include *Acer spp., Faxinus spp., Platanus spp., Ulmus spp*., or *Populus spp*.

a/ Cowardin, et al., 1979.
NWI = National Wetlands Inventory
Wetland Types:
PEM = Palustrine Emergent
PSS = Palustrine Scrub-shrub
PFO = Palustrine Forested

The Project would affect about 16.5 acres of forested wetlands, 19.1 acres of emergent wetlands, and 2.2 acres of scrub-shrub wetlands during construction. The primary impact of pipeline construction and right-of-way maintenance activities on wetlands would be the temporary and permanent alteration of wetland vegetation. These effects would be greatest during and immediately following construction.

Generally, palustrine emergent and palustrine scrub-shrub wetland vegetation would be temporarily impacted by the construction of the Project and would transition back into a community functionally similar to pre-construction wetlands. Emergent and scrub-shrub wetlands vegetation would regenerate within 1 to 3 years (2 to 3 growing seasons). Forested wetlands could take more than 50 years to regenerate into a forest community, which would be a long-term impact; however, woody species would regenerate over time outside of the maintained permanent right-of-way. The majority of forested wetland impacts would be from the conversion of woody vegetation to scrub-shrub and herbaceous vegetation. Therefore, impacts on forested wetlands would be long-term with limited permanent conversion of vegetation types (see table 4.3.7-2).

Table 4.3.7-2

Wetlands Affected by the REX East Project

State	Wetland Classification a/	Length of Wetland Crossed (miles)	Wetland Area Affected During Construction (acres) b/	Wetland Area Affected by Operations (permanent acres) c/
Missouri	PEM	0.1	1.5	0.0
	PFO	0.7	5.5	0.7
	PSS	0.0	0.1	0.0
	MO subtotal:	**0.8**	**7.1**	**0.7**
Illinois	PEM	0.2	1.8	0.0
	PFO	0.9	4.6	1.9
	PSS	<0.1	0.4	0.2
	IL subtotal:	**1.1**	**6.8**	**2.1**
Indiana	PEM	0.4	4.3	0.0
	PFO	0.2	2.2	0.9
	PSS	<0.1	0.3	0.0
	IN subtotal:	**0.6**	**6.8**	**0.9**
Ohio	PEM	1.1	11.5	0.0
	PFO	0.6	4.2	1.8
	PSS	0.1	1.4	0.1
	OH subtotal:	**1.8**	**17.1**	**1.9**
Totals	PEM	**1.8**	**19.1**	**0.0**
	PFO	**2.4**	**16.5**	**5.3**
	PSS	**0.1**	**2.2**	**0.3**
	Total	**4.3**	**37.8**	**5.6**

a/ Wetland Types:
PEM = Palustrine Emergent
PFO = Palustrine Forested
PSS = Palustrine Scrub-shrub

b/ Area affected during construction (temporary impact) is based upon a 100-foot-wide construction right-of-way to reflect the maximum potential impact to the wetlands.

c/ Acreage reflects a maintained permanent right-of-way width of 30 feet within the 50-foot-wide permanent easement in forested wetlands and a maintained permanent right-of-way width of 10 feet within the 50-foot-wide permanent easement in scrub-shrub wetlands. The remaining area would be restored. Emergent wetlands would not be permanently affected during operation of the pipeline, as they would be allowed to revegetate to pre-construction condition.

Given the tree species that typically dominate forested wetlands in the Project area (red maple, American elm, ash, black gum, tupelo gum, and swamp white oak), regeneration may take 50 years or more. As previously stated, a corridor centered on the pipeline and up to 10 feet may be maintained in an herbaceous state and trees taller than 15 feet and within 15 feet on either side of the pipeline may be selectively cut and removed. By limiting revegetation of a portion of forested wetlands, some of the wetland functions would be altered. During operations, 5.3 of the 16.5 acres of palustrine forested wetlands would be permanently altered. Additionally, 0.3 acre of scrub-shrub wetlands would be converted to emergent wetlands during operations from maintenance activities. Clearing activities and disturbance of wetland vegetation would temporarily affect the wetland's capacity to buffer flood flows

and/or control erosion. Removal of wetland vegetation could also deprive wildlife of valuable habitat and encourage the recruitment of less desirable invasive species.

Other types of impacts associated with construction of the pipeline could include temporary changes in wetland hydrology and water quality. During construction, failure to segregate topsoil over the trenchline in non-saturated wetlands could result in the mixing of topsoil with subsoil. This disturbance could result in altered biological activities and chemical conditions in wetland soils and could affect the reestablishment and natural recruitment of native wetland vegetation after restoration. In addition, inadvertent compaction and rutting of soils during construction could result from the movement of heavy machinery and the transport of pipe sections. The resulting alteration of the natural hydrologic patterns of the wetlands could inhibit seed germination or increase the potential for siltation.

No wetlands would be permanently filled or drained as a result of the Project. The proposed aboveground facilities and access roads for the REX East Project would not be located within wetlands.

Wetlands within Shallow Bedrock

Shallow bedrock exists in 48 of the 309 unique wetland areas identified along the proposed pipeline route. Rockies Express may perform blasting in some of these wetland areas. If blasting is performed during construction in wetlands areas, Rockies Express would implement the measures in its Blasting Plan to avoid or minimize impacts to wetlands, as they could be habitat for wildlife species. Areas with shallow bedrock with the potential for blasting are discussed in section 4.1.1. Wildlife species potentially occurring in these areas are discussed in section 4.5.2. The presence of shallow bedrock could be a primary hydrological factor for a wetland's existence; therefore, **we recommend that:**

- **Rockies Express prepare site-specific blasting plans for each wetland with shallow bedrock prior to blasting. Rockies Express should also evaluate and incorporate appropriate methods to seal fractures in the bedrock following blasting to help prevent possible drainage of the wetlands. Rockies Express should file this plan with the Secretary for review and written approval by the Director of OEP.**

Additional Temporary Workspace

There are 42 proposed additional temporary workspaces located less than 50 feet from a wetland. We have recommended in section 2.3.1 that Rockies Express file site-specific justifications for each extra workspace within 50 feet of a wetland prior to construction.

Wetlands of Special Concern or Value

The Wetland Reserve Program (WRP) is a voluntary program offering landowners the opportunity to sell conservation easements and/or enter into cost-share agreements with NRCS on eligible wetlands. NRCS provides technical and financial assistance to eligible landowners to protect, restore, and enhance the original hydrology, native vegetation, and natural topography. The goal of the program is to restore and protect the functions and values of wetlands in the agricultural landscape. The emphasis of the program is to attain habitat for migratory birds and wetland-dependent wildlife, including threatened and endangered species, protect and improve water quality, attenuate water flows, recharge groundwater, and protect native flora and fauna. NRCS-held easements identified along the Project route have been avoided, and, therefore, no WRP lands would be crossed by the Project.

Wetlands can be categorized as sensitive and significant because of their ecological quality and high level of functionality. This quality and functionality is based on wildlife habitat and hydrologic and

recreational functions. Two wetlands in Missouri are categorized as sensitive and significant because they are both located in the Upper Mississippi COA. Five wetlands in Indiana and eleven wetlands in Ohio are categorized as sensitive and significant because of their high-functional value. Additional information on the high-functioning wetlands (wooded riparian corridors) in Indiana, which are also significant habitat features, is discussed in section 4.4.2. No sensitive and significant wetlands have been identified along the Project route in Illinois. Table 4.3.7-3 lists each sensitive and significant wetland that would be affected by the proposed pipeline route.

Two sensitive wetlands (WL-MO-43A and WL-MO-43B) in Missouri are located between the Salt River and Mississippi River and are part of Blackburn Island, which is included within the Upper Mississippi COA. Blackburn Island is located between the Salt and Mississippi Rivers, which includes these two sensitive wetlands that are part of a larger significant, forested wetland system. Rockies Express would locate one HDD entry workspace on Blackburn Island for both the westward HDD crossing of the Salt River and the eastward HDD crossing of the Mississippi River. Impacts to Blackburn Island would be minimized by use of the HDD method, including wetland WL-MO-43A; however, 5.5 acres of wetland WL-MO-43B would be impacted by the drill entry and additional temporary workspaces. The resulting impact would be a 0.7-acre permanent conversion of forested wetland to herbaceous emergent wetland. Rockies Express would also use the HDD method to minimize impacts to the sensitive wetland WL-OH-505-AA in Pickaway County, Ohio (see table 4.3.7-3).

Five of the eighteen significant wetlands identified in table 4.3.7-3 are palustrine emergent and thirteen are palustrine forested. The impact to palustrine emergent wetlands would be short-term, whereas the palustrine forested wetland impacts would be long-term and limited to permanent conversion of wetland vegetation. Four of the thirteen palustrine forested wetlands (WL-MO-43-A, WL-OH-497-AAA, WL-OH-497-CCC, and WL-OH-505-AA) would be crossed using the HDD method. Therefore, impacts would be avoided. The remaining nine palustrine forested wetlands would be allowed to revegetate naturally according to Rockies Express' Procedures.

Table 4.3.7-3
Sensitive and Significant Wetlands Affected by the REX East Project

State/County	Wetland Identification	Wetland Type a/	Description	Temporary Impact (acres) b/	Permanent Impact (acres) c/
Missouri					
Pike d/	WL-MO-43-A	PFO	Upper Mississippi Conservation Opportunity Area	0.0	0.0
Pike	WL-MO-43-B	PFO	Upper Mississippi Conservation Opportunity Area	5.5	0.7
Indiana					
Putnam	WL-IN-265-A	PFO	High-Functioning Wetland	<0.1	<0.1
Putnam	WL-IN-272-AAA	PFO	High-Functioning Wetland	0.1	0.1
Hendricks	WL-IN-290-AAAA	PEM	High-Functioning Wetland	0.1	0.0
Morgan	WL-IN-315-AAAA	PFO	High-Functioning Wetland	0.4	0.2
Morgan	WL-IN-315-BBBB	PFO	High-Functioning Wetland	0.2	0.1

Table 4.3.7-3 (continued)

Sensitive and Significant Wetlands Affected by the REX East Project

State/County	Wetland Identification	Wetland Type a/	Description	Temporary Impact (acres) b/	Permanent Impact (acres) c/
Ohio					
Fayette	WL-OH-481-A	PEM	High-Functioning Wetland	<0.1	0.0
Fayette d/	WL-OH-497-AAA	PFO	High-Functioning Wetland	0.0	0.0
Fayette d/	WL-OH-497-CCC	PFO	High-Functioning Wetland	0.0	0.0
Fayette d/	WL-OH-497-BBBB	PEM	High-Functioning Wetland	0.0	0.0
Pickaway d/	WL-OH-505-AA	PFO	High-Functioning Wetland	0.0	0.0
Perry	WL-OH-560-BBB	PFO	High-Functioning Wetland	<0.1	0.0
Muskingum	WL-OH-568-AAA	PFO	High-Functioning Wetland	<0.1	<0.1
Muskingum	WL-OH-575-B	PEM	High- Functioning Wetland	0.1	0.0
Guernsey	WL-OH-596-AAA	PEM	High-Functioning Wetland	0.1	0.0
Guernsey	WL-OH-608-DDD	PFO	High-Functioning Wetland	0.1	<0.1
Noble	WL-OH-610-AAA	PFO	High-Functioning Wetland	<0.1	0.0
Total	**—**	**—**	**—**	**<7.1**	**<1.4**

a/ Wetland Types:
PEM = Palustrine Emergent
PFO = Palustrine Forested
PSS = Palustrine Scrub-shrub

b/ Area affected during construction (temporary impact) is based upon a 100-foot-wide construction right-of-way to reflect the maximum potential impact to the wetlands.

c/ Acreage reflects a maintained permanent right-of-way width of 30 feet within the 50-foot-wide permanent easement in forested wetlands and a maintained permanent right-of-way width of 10 feet within the 50-foot-wide permanent easement in scrub-shrub wetlands. The remaining area would be restored. Emergent wetlands would not be permanently affected during operation of the pipeline, as they would be allowed to revegetate to pre-construction condition.

d/ Would be crossed using the HDD method; therefore there is no impact.

In its comments on the draft EIS, FWS expressed concern about forested wetland impacts. Specifically, FWS stated that the wetland impacts on Blackburn Island would occur on property owned by COE and managed by MDC for fish and wildlife. FWS recommended that these wetlands be replaced near or adjacent to the Ted Shanks State Conservation Area in order to support ongoing conservation and restoration efforts. COE also suggested that MDC be contacted for information on sites that may be suitable for this purpose. Therefore, **we recommend that:**

- **Prior to the start of construction, Rockies Express develop a site-specific wetland restoration plan for Blackburn Island in consultation with COE, FWS, and MODNR. Rockies Express should file this plan with the Secretary for review and written approval by the Director of OEP.**

Wetland Construction Procedures

Rockies Express' Procedures contain wetland mitigation measures that are designed to minimize the overall area of wetland disturbance, minimize the duration of wetland disturbance, reduce the amount of wetland soil disturbance, and enhance wetland restoration following construction. Examples of some of the wetland impact minimization measures specified in its Procedures are:

- using existing rights-of-way to overlap previously disturbed corridors;
- limiting the operation of construction equipment within wetlands to operating only that equipment essential for clearing, excavation, pipe installation, backfilling, and restoration;
- limiting grading in wetlands to areas directly over the trenchline, except where necessary to ensure safety;
- minimizing the length of time that topsoil is segregated and the trench is open;
- installing trench breakers at the boundaries of wetlands as needed to prevent draining of a wetland and to maintain original wetland hydrology;
- prohibiting storage of hazardous materials, chemicals, fuels, and lubricating oils within a wetland or within 200 feet of a wetland boundary;
- limiting post-construction maintenance of vegetation within herbaceous wetlands to a 10-foot-wide strip of vegetation centered over the pipeline; and
- limiting post-construction maintenance in forested and scrub-shrub areas to vegetation/tree removal in those areas that have plant growth taller than 15 feet and within 15 feet of either side of the pipeline centerline.

Rockies Express has attempted to avoid and minimize impacts on wetlands to the extent practicable by collocating the proposed pipeline route within existing corridors. As discussed previously, Rockies Express would also avoid permanent impacts on several wetlands by using the HDD construction method. Rockies Express would further minimize wetland impacts by adhering to the measures specified in its Procedures, which are in accord with our Procedures.

Rockies Express would restore wetlands to pre-construction contours and elevations. Within the construction right-of-way, Rockies Express would leave existing root systems intact where possible. This would encourage regrowth and revegetation of those areas. In areas to be excavated, Rockies Express would salvage topsoil removed and replace that material as a source of native seeds and propagules after construction. These methods would constitute a passive approach to wetland revegetation in the trench and traffic areas. In comments provided to us, federal and state agencies recommended that measures be implemented to control the growth of noxious weeds and other invasive species in wetlands during construction (see section 4.4.4 for a discussion of noxious weeds and invasive species).

In addition, Rockies Express' Procedures (CD Document B) include the commitment to ensure that all disturbed areas successfully revegetate with wetland herbaceous and/or woody plant species. If revegetation is not successful at the end of 3 years, Rockies Express would develop and implement (in consultation with a professional wetland scientist) a remedial plan to actively revegetate the wetlands. The remedial program would be implemented and would continue until wetland revegetation is

considered successful by the federal and state regulatory agencies. In the following paragraphs we are requiring Rockies Express to include reforestation of forested temporary work areas (additional temporary work spaces, contractor yards, pipe yards, etc.) as part of its wetland mitigation plan.

The REX East Project would affect a total of about 3,095.8 acres of forested lands during construction, and of this, about 16.5 acres would be forested wetlands and 3,079.3 acres would be upland forest land. About 10.2 acres of the forested wetland would be collocated with other facilities. In its comments on the draft EIS, FWS expressed concern about mitigation for impacts to upland/bottomland forest areas and non-jurisdictional wetlands. FWS stated that "in order to minimize overall impacts on fish and wildlife it is appropriate to mitigate for impacts to all forested habitats and nonjurisdictional wetlands." Impacts to upland forests are discussed in section 4.4 of this EIS. Impacts to forested wetlands (jurisdictional and non-jurisdictional) are discussed below.

Our Procedures require that gas pipeline be built such that wetlands are not permanently lost. However, forested vegetation would be converted to herbaceous and scrub-shrub type wetlands. With proper planting and restoration practices, this impact can be minimized. Due to safety concerns, the entire disturbed right-of-way cannot be replanted with trees. As a result, we do not require vegetation maintenance over the full width of the permanent right-of-way (50 feet centered over the pipeline). However, to facilitate periodic pipeline and corrosion/leak surveys, a corridor centered on the pipeline and up to 10 feet wide may be maintained in an herbaceous state. In addition, trees within 15 feet of the pipeline that are greater than 15 feet in height may be selectively cut and removed from the permanent right-of-way.

Alternative Measure to Our Procedures

Rockies Express has agreed to use a 75-foot-wide construction right-of-way in forested and saturated wetlands. However, Rockies Express has requested to use a 100-foot-wide construction right-of-way in non-saturated herbaceous and scrub-shrub wetlands. This alternative measure is requested because of the size of the pipeline (42 inches in diameter), the depth of the trench, and the size of equipment required to install a 42-inch pipeline. We have recommended in section 2.3.2 that Rockies Express revise its Procedures to use a 75-foot-wide right-of-way for all wetlands. A 75-foot-wide right-of-way is recommended to reduce impacts on wetlands. It is our experience that a 42-inch-diameter pipeline can be constructed in a 75-foot-wide construction right-of-way.

Wetland Mitigation

Impacts to Blackburn Island would be minimized by use of the HDD method, including for wetland WL-MO-43A; however, 5.5 acres of wetland WL-MO-43B would be impacted by the drill entry and additional temporary workspaces. The resulting impact would be a 0.7-acre permanent conversion of forested wetland to herbaceous emergent wetland.

We concur with FWS and believe it is reasonable to require off-site compensatory mitigation for the permanent loss of forested vegetation in wetlands that would occur along the permanent right-of-way due to maintenance activities. We believe that the off-site mitigation option represents the preferable compensation system because it: allows for improvement of existing degraded wetlands; can be implemented on a large scale; can be designed to utilize public land; and has the potential to avoid or lessen land ownership, long-term protection, and long-term maintenance problems. Therefore we believe off-site compensatory wetland mitigation be incorporated into the Project-specific wetland mitigation plan for unavoidable forested vegetation in wetlands lost due to permanent maintenance activities.

Natural gas pipeline projects convert forested wetland vegetation to herbaceous and scrub-shrub vegetation, both temporarily and permanently. We believe that onsite restoration should be pursued along the temporarily cleared portions of the right-of-way to mitigate long-term impacts to forested wetlands. Also, COE (St. Louis District) stated that "all forested areas should be replanted, monitored, and managed for reforestation. The monitoring and management of these areas should continue for five years." COE added that onsite areas conducive to tree planting could be replanted with native tree species to compensate for temporal loss of replanting and for the spatial loss of non-forested areas over the pipeline. Hence we are requiring Rockies Express to actively plant native trees to revegetate the right-of-way, excluding the 30-foot-wide permanently maintained strip centered over the pipeline, to restore preconstruction forested wetlands affected by the REX East Project. Therefore, **we recommend that:**

- **Prior to the start of construction, Rockies Express consult with COE, FWS, and other appropriate state and federal agencies regarding replanting, monitoring, and managing reforestation, including compensatory mitigation for wetland impacts for all temporary and permanent rights-of-way, additional temporary workspaces, and contractor yards/pipe yards located within forested wetlands. Rockies Express should include this information in its Wetland Mitigation Plan.**

Based on the results of the consultations completed to date, Rockies Express has proposed to compensate other permanent wetland impacts through purchase of wetland mitigation bank credits. A wetland mitigation bank is a wetland area set aside for restoration, establishment, or enhancement for the purpose of providing compensation for an unavoidable impact to a wetland impacted by a project. Mitigation banks are a form of "third-party" compensatory mitigation, in which the responsibility for compensatory mitigation implementation and success is assumed by a party other than the permittee (EPA, 1995). Mitigation banking is an approved alternative to onsite mitigation and often provides for greater likelihood of success in replacement of wetland function and long-term management of restored wetland areas. Rockies Express is already considering the option of wetland mitigation banking as compensatory mitigation for wetland impacts. However, FWS has indicated that it does not support the use of wetland mitigation banks to mitigate for wetland impacts until more details have been determined. FWS further stated that any mitigation through wetland mitigation banks would need to be overseen by the appropriate state and federal resource agencies, and added that wetlands should be replaced within the same state and watershed in which the impacts would occur, typically in like kind. Therefore, **we recommend that:**

- **Prior to the start of construction, Rockies Express finalize consultations with COE, FWS, and appropriate state and federal agencies to develop its Wetland Mitigation Plan; and file with the Secretary a final Wetland Mitigation Plan and the results of its consultations with these agencies.**

4.4 VEGETATION

The REX East Project would extend across several ecoregions of the United States (EPA, 2007c). All ecoregions that would be crossed by the pipeline and aboveground facilities are described below in table 4.4-1 with their respective subecoregions and locations. In addition to the pipeline, two compressor stations—one constructed in Phelps County, Nebraska and the other in Carbon County, Wyoming—would be located in separate ecoregions.

4.4.1 General Vegetation Resources

Construction of the Project pipeline would affect the following three main vegetative communities: agricultural, herbaceous, and forested vegetation as presented in table 4.4.1-1. During construction, the pipeline route would cross 490.6 miles of agricultural and herbaceous open areas and 143.5 miles of forested areas. The major vegetation categories are further subdivided into vegetative types (table 4.4.1-1). In this section, forested wetlands are included with forested vegetation and emergent wetlands are included with herbaceous vegetation. Wetlands (emergent, scrub-shrub, and forested) are further discussed in section 4.3.7. Agriculture and direct impacts associated with croplands are further discussed in section 4.8.2. Project-related acreage impacts for vegetative communities are presented in table 4.4.1-2.

Project Facilities

The Project would affect 14,227.1 acres of vegetated land during construction and 4,020.1 acres of vegetated land during operation. Of the acres that would be affected by construction, 3,095.8 acres are forested areas, 438.7 acres are herbaceous (nonforested) areas, and 10,692.6 are agricultural land. Of the total acres that would be affected during operation, about 885.7 acres are forested land, 180.7 are herbaceous land, and 2,953.9 are agricultural land. See more details in table 4.4.1-2 for breakdown of these acres by facility. Acres reported in table 4.4.1-2 reflect numbers for both upland and wetland areas.

The primary impacts on vegetation from construction of the REX East Project would be the cutting, clearing, or removal of existing vegetation within the construction work area. The severity of impact would depend on the specific type and amount of vegetation affected, and the rate at which vegetation would regenerate after the completion of construction activities. The majority of construction-related impacts would be temporary, and cleared vegetation would be allowed to return to natural conditions after construction. Operation of the pipeline would include a permanent loss of vegetation along forested areas within the 50-foot-wide permanent pipeline right-of-way and where aboveground facilities would be located. Construction impacts outside of the 50-foot-permanent right-of-way to forested areas would be long-term, as it could take 50 years or more for forested vegetation to return to pre-construction conditions.

The 50-foot-wide permanent right-of-way in upland areas would be kept free of large trees and shrubs through selective cutting, and would be maintained not more than once every 3 years, except where otherwise specified. In wetland areas and FWS-identified forested areas of fragmentation concern, trees greater than 15 feet tall would be selectively removed every 3 years along a 30-foot-wide permanent right-of-way (15 feet on either side of the pipeline). A 10-foot-wide corridor directly above the pipeline would be annually maintained in an herbaceous state throughout the life of the project. The loss of forested vegetation along the pipeline route would result in forest fragmentation and subsequent loss of wildlife habitat. Other impacts resulting from the widening of the existing corridor or the removal of vegetation include increased erosion, sediment runoff, altered soil chemistry, modified infiltration and groundwater recharge rates, and an increased susceptibility to invasive or exotic species.

Table 4.4-1 EPA Ecoregions Crossed by the Project		
Ecoregion	**Location of Occurrence in Project Area (State, Count[ies])**	**Description**
Central Irregular Plains Subecoregion Claypan Prairie	**Missouri** Ralls, Audrain	This ecoregion is less irregular and less forest-covered than the ecoregions to the south and east. The potential natural vegetation of this region is a grassland/forest mosaic with wider forested strips along the streams compared to the north. Tallgrass prairies (big bluestem and Indian grass) dominate the scattered white oak dry woodland. Currently, the region is mostly used for agriculture and pastureland for cattle grazing.
Interior River Valley and Hills Subecoregion River Hills Upper Mississippi Alluvial Plain Western Dissected Illinoisan Till Plain	**Missouri** Pike **Illinois** Pike, Scott, Morgan	This ecoregion comprises old till plains, hills, forested river bluffs, major rivers, and valleys containing levees, oxbow lakes, islands, and scattered sand sheets and dunes. The region is a transitional area between the more forested Ozark Highlands, and the flatter, much less forested Central Corn Belt Plains. The potential natural vegetation of well-drained upland areas is a mosaic of oak-hickory forests and bluestem prairies, while other regions in the area often have bottomland hardwood forests, floodplain forests, and marshes. Agriculture dominates most of the prairie habitat.
Central Corn Belt Plains Subecoregion Illinois/Indiana Prairies	**Illinois** Morgan, Sangamon, Christian, Macon, Moultrie, Douglas, Edgar **Indiana** Vermillion	This ecoregion comprises vast glaciated plains that were once dominated by bluestem prairies and oak-hickory forests. At present, this region has mostly been converted for crops such as corn, wheat, and soybeans. Sycamores, cottonwood, and maple are native to floodplain regions. Bulrush sedges and reeds are common to prairie potholes and marshes.
Interior River Lowland Subecoregion Glaciated Wabash Lowlands	**Indiana** Putnam, Parke, Vermillion	This broad, undulating lowland was formed in non-resistant, non-calcareous sedimentary rock. Many wide, flat-bottomed, terraced valleys are present and are filled with alluvium, outwash, aeolian, and lacustrine deposits. Much of this ecoregion is covered by till or windblown silt and sand that is pre-Wisconsinan in age. The vegetation in the region has scattered woodlands (predominantly beech forest and oak-hickory forest) mixed with prairies. This region also supports agriculture, livestock, and surface coal-mining activities.
Eastern Corn Belt Plains Subecoregion Loamy High Lime Till Plains Darby Plains	**Indiana** Putnam, Hendricks, Morgan, Johnson, Shelby, Decatur, Franklin **Ohio** Butler, Warren, Clinton, Pickaway, Fairfield, Fayette, Clinton, Pickaway	This ecoregion is primarily a rolling plain with local end moraines; it has more natural tree cover and lighter colored soils than the Central Corn Belt Plains. Glacial deposits of Wisconsinan age are extensive. Indiana and Ohio counties have beech forests, oak-sugar maple forests, and elm-ash swamp forests. Ohio counties additionally have a mixture of oak forests, wet-prairie, and tall-grass prairie habitats. Currently, the region is dominated by extensive farming, some urban-industrial activity, and livestock areas.

Table 4.4-1 (continued) EPA Ecoregions Crossed by the Project		
Ecoregion	**Location of Occurrence in Project Area (State, Count[ies])**	**Description**
Interior Plateau Subecoregion Northern Bluegrass	**Indiana** Franklin	This ecoregion has rolling to deeply dissected, rugged terrain. Land use/land cover is a transition between agriculture, livestock, and woodlands of mesophytic and oak-hickory origin.
Erie/Ontario Drift and Lake Plain Subecoregion Low-Lime Drift Plain	**Ohio** Perry	Low-lime drift and lacustrine deposits blanket the rolling to level terrain of this ecoregion. Lakes, wetlands, and swampy streams occur where stream networks are deranged or where the land is flat and clayey. This region has a mixture of forests (mesophytic forest, mixed oak forest, beech forest, oak-sugar maple forest, and elm-ash swamp forests), dairy farming, agriculture, gas wells, and coal mining.
Western Allegheny Plateau Subecoregion Permian Hills Monongahela Transition Zone Unglaciated Upper Muskingum Basin Ohio/Kentucky Carboniferous Plateau	**Ohio** Perry, Muskingum, Morgan, Guernsey, Noble, Belmont, Monroe	This extensive, rugged, wooded terrain has mixed mesophytic forests, mixed oak forests, oak-sugar maple forests, beech wood forests, hemlock hardwoods in ravines, and red maple seepage swamps. At present, most of the hilly rugged areas remain as forest, while agriculture, dairy, livestock, and residential areas lie in lower regions. Gas wells, coal mining, and reclaimed land are extensive in this region and are associated with the degradation of several streams.
Wyoming Basin Subecoregion Rolling Sagebrush Steppe	**Wyoming** Carbon	This ecoregion is broad, arid, intermontane basin, interrupted by hills, low mountains, and dominated by grasslands and shrublands. The region also has rolling plains with hills, cuestas, mesas, terraces, while near the mountains are footslopes, ridges, alluvial fans, and outwash fans. Potential natural vegetation is mostly sagebrush steppe, with the eastern edge of the region having more mixed-grass prairie. Wyoming big sagebrush is the most common shrub with silver and black sagebrush occurring in the lowlands and mountain big sagebrush in the higher elevations. Frequent fires have affected the sagebrush steppe and some areas are dominated by European annual grasses. Most of the land is in rangeland, cattle and sheep ranches, or wildlife habitat; however, there are also major gas and oil production areas.
Central Great Plains Subecoregion Rainwater Basin Plains	**Nebraska** Phelps	The Central Great Plains is slightly lower, receives more precipitation, and is more irregular than the Western High Plains. This region has tall-grass and mixed-grass prairies dominated by bluestems with scattered low trees and shrubs. Currently, much of this ecoregion is now in cropland and is the major winter wheat growing area of the United States. Although this region has natural wetlands in the North American Central Flyway for waterfowl migration, most of the wetlands have been drained for cultivation and relatively few areas remain.

Table 4.4.1-1
Vegetative Communities Occurring along the Project Route a/

Classification	Representative Species	Location by State (County)
Agriculture Land		
Cropland/Pasture	Corn, alfalfa, soybean, wheat, hay, grasses, clover	Ohio, Indiana, Illinois, Missouri, Nebraska (Phelps County)
Herbaceous		
Tall-grass prairie	Big bluestem, little bluestem, Indian grass, blue grama, prairie dock sideoats grama, golden rod	Ohio, Indiana, Illinois, Missouri
Mixed-grass prairie	Blue grama, western wheatgrass, June grass, Sandberg blue grass, buffalo grass, needle-and-thread, bluestem, fringed sage, rabbitbrush	Wyoming (Carbon County)
Sagebrush steppe	Wyoming big sagebrush, sagebrush steppe, silver and black sage brush, mixed grass prairie species	Wyoming (Carbon County)
Emergent wetlands	Bulrush sedge, reed, cord grass, cattail	Ohio, Indiana, Illinois, Missouri
Forest		
Riparian forests	Sycamore, cottonwood, maple, ash, elm, willow, green ash, American elm	Ohio, Indiana, Illinois, Missouri
Deciduous/Mixed forests	White oak, black oak, sugar oak, hickory, beech, maples, silver oak, eastern hemlock, chestnut, black cherry, poplar, pine, basswood, bur oak, hackberry, mesophytic species	Ohio, Indiana, Illinois, Missouri
Forested wetlands	Ash, red maple, black gum, tupelo gum, American elm, white oak	Ohio, Indiana, Illinois, Missouri
Previously Developed Land	Areas with ornamental and manicured vegetation from developed or previously developed property; mixture of native and non-native species	Ohio, Indiana, Illinois, Missouri

a/ Cowardin et al., 1979
EPA, 2007c
OSU, 2007
Wyoming Game and Fish Department, 2007

Table 4.4.1-2

Summary of Vegetation Affected by Construction and Operation of the Project by State (in acres)

	Agricultural		Forested a/		Herbaceous b/		Total	
	Const.	Oper.	Const. c/	Oper.	Const.	Oper.	Const.	Oper.
MISSOURI								
Pipeline d/	516.8	206.7	112.9	45.2	16.5	6.6	646.2	258.5
Interconnects and Laterals e/	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Additional Temporary Workspace	211.9	0.0	54.0	0.0	9.6	0.0	275.5	0.0
Aboveground Facilities f/	12.9	12.9	0.1	0.1	0.0	0.0	13.0	13.0
Contractor/Pipe yards	22.6	0.0	11.6	0.0	0.7	0.0	34.9	0.0
Subtotal	764.2	219.6	178.6	45.3	26.8	6.6	969.6	271.5
ILLINOIS								
Pipeline d/	2,623.4	1,049.4	217.7	87.1	98.0	39.2	2,939.1	1,175.7
Interconnects and Laterals e/	5.1	3.1	0.3	0.2	0.2	0.1	5.6	3.4
Additional Temporary Workspace	1,077.5	0.0	86.1	0.0	3.9	0.0	1,167.5	0.0
Aboveground Facilities f/	24.1	24.1	0.1	0.1	0.0	0.0	24.2	24.2
Contractor/Pipe yards	65.3	0.0	0.2	0.0	2.2	0.0	67.7	0.0
Subtotal	3,795.4	1,076.6	304.4	87.4	104.3	39.3	4,204.1	1,203.3
INDIANA								
Pipeline d/	1,826.2	730.5	579.9	231.9	97.9	39.1	2,504.0	1,001.5
Interconnects and Laterals e/	4.0	2.5	0.0	0.0	0.0	0.0	4.0	2.5
Additional Temporary Workspace	815.0	0.0	188.6	0.0	1.8	0.0	1,005.4	0.0
Aboveground Facilities f/	28.2	28.2	0.1	0.1	0.0	0.0	28.3	28.3
Contractor/Pipe yards	62.2	0.0	0.8	0.0	0.0	0.0	63.0	0.0
Subtotal	2,735.6	761.2	769.4	232.0	99.7	39.1	3,604.7	1,032.3

Table 4.4.1-2 (continued)

Summary of Vegetation Affected by Construction and Operation of the Project by State (in acres)

	Agricultural		Forested a/		Herbaceous b/		Total	
	Const.	Oper.	Const. c/	Oper.	Const.	Oper.	Const.	Oper.
OHIO								
Pipeline d/	2,081.1	832.7	1,264.1	505.6	172.7	69.2	3,517.9	1,407.4
Interconnects and Laterals e/	7.9	5.0	2.8	1.7	15.9	11.4	26.6	18.1
Additional Temporary Workspace	1,175.1	0.0	532.0	0.0	3.2	0.0	1,710.3	0.0
Aboveground Facilities f/	41.0	41.0	13.7	13.7	0.1	0.1	54.8	54.8
Contractor/Pipe yards	74.6	0.0	30.8	0.0	1.0	0.0	106.4	0.0
Subtotal	3,379.7	878.7	1,843.4	521.0	192.9	80.7	5,416.0	1,480.3
NEBRASKA								
Aboveground Facilities	17.7	17.7	0.0	0.0	0.0	0.0	17.7	17.7
Subtotal	17.7	17.7	0.0	0.0	0.0	0.0	17.7	17.7
WYOMING								
Aboveground Facilities	0.0	0.0	0.0	0.0	15.0	15.0	15.0	15.0
Subtotal	0.0	0.0	0.0	0.0	15.0	15.0	15.0	15.0
REX EAST PROJECT								
Pipeline d/	2.047.5	2,819.3	2,174.6	869.8	385.1	154.1	9,607.2	3,843.1
Interconnects and Laterals e/	17.0	10.6	3.1	1.9	16.1	11.5	36.2	24.0
Additional Temporary Workspace	3,279.5	0.0	860.7	0.0	18.5	0.0	4,158.7	0.0
Aboveground Facilities f/	123.9	123.9	14.0	14.0	15.1	15.1	153.0	153.0
Contractor/Pipe yards	224.7	0.0	43.4	0.0	3.9	0.0	272.0	0.0
Total	**10,692.6**	**2,953.9**	**3,095.8**	**885.7**	**438.7**	**180.7**	**14,227.1**	**4,020.1**

NOTE: The numbers in this table have been rounded for presentation purposes. As a result, the totals may not reflect the exact sum of the addends in all cases. Totals may be off by 0.1 place.

a/ Forested wetlands are included in these estimates.
b/ Emergent wetlands are included in these estimates.
c/ Forested areas could take 50 years or more to return to pre-construction vegetated conditions.
d/ Assumes 125-foot-wide construction right-of-way and a 50-foot-wide permanent right-of-way in all locations.
e/ Assumes a 50- to 100-foot-wide construction right-of-way and a 50-foot-wide permanent right-of-way.
f/ Includes construction and operational impact associated with the compressor stations and meter stations and access roads to compressor stations and meter stations. Because mainline valves would be constructed within the construction right-of-way, land use impacts are accounted for with the pipeline. However, because mainline valves would result in a land use conversion, aboveground totals include permanent impacts associated with mainline valves. Temporary pig launchers and receivers would be used within the area to be disturbed by the compressor stations. Therefore, land use impacts resulting from these facilities are already accounted for in the construction impacts for aboveground facilities.

Const: Impacts during construction of project.

Oper: Impacts associated with operation of project.

Impacts to agricultural lands and herbaceous communities, such as prairie habitats, would be short-term as these vegetation types would return to their herbaceous status within one to three growing seasons after the completion of construction activities, cleanup, and restoration. Areas planted with field crops are typically disturbed by periodic agricultural practices and would be replanted in the next growing season. Rockies Express would implement its AIMP to minimize impacts to these lands. Agricultural impacts are further discussed in section 4.8.2.

In general, the clearing of upland forest would result in long-term impacts as upland forest could take 50 years or more to return to pre-construction conditions. Impacts to upland areas constitute the most significant change in vegetation strata, appearance, and habitat, as mature trees would be replaced for a period of years by herbaceous plants, shrubs, saplings, and other successional species. The Project would cross areas of unsegmented portions of forest in Missouri, Illinois, Indiana, and Ohio. About 59 percent of the proposed pipeline route is collocated parallel to existing utility corridors. Collocation avoids additional fragmentation of large forested areas. We estimate that when the proposed pipeline crosses forested areas, approximately 48 percent of the route would be collocated, for a total of 1,054.4 acres. A total of 1,137.5 acres of forested areas crossed by the pipeline would be unfragmented forest. The remaining 910.0 acres are forest areas that are not contiguous. The removal of trees from unfragmented forested areas would cause loss of wildlife habitat from the conversion of forested vegetation to scrub-shrub and herbaceous types. Other impacts could include increased erosion from the conversion of deeply rooted vegetation to shallow-rooted vegetation on the right-of-way and increased exposure to solar radiation, which could dry the soil and stimulate growth of early successional species within and immediately adjacent to cleared areas. The removal of trees on the right-of-way could also expose trees growing adjacent to the newly cleared areas to higher wind gusts, which may increase the risk of blowdowns.

We received several comments expressing concern that large areas of forests would be destroyed or fragmented from the construction and operation of the Project. FWS, in its comments on the draft EIS, expressed concern about mitigation for impacts to upland forest, bottomland forest, and nonjurisdictional wetlands. FWS stated that in order to minimize overall impacts on fish and wildlife, it is appropriate to mitigate for impacts to all forested habitats and nonjurisdictional wetlands. Rockies Express, in consultation with FWS, has developed and signed *Guidelines for Achieving Compliance With the Migratory Bird Treaty Act and Executive Order No. 13186 Through Voluntary Conservation Measures* (Conservation Guidelines) to minimize forest impacts and forest fragmentation impacts to migratory birds (CD Document L). The areas of affected forested land (both fragmented and unfragmented) identified in the Conservation Guidelines differ from those cited throughout the EIS. The acreages calculated for the Conservation Guidelines are specific to forested parcels that provide important habitat to migratory birds. Our analysis of forested impacts in this EIS includes all forested impacts, including small forested parcels not included in the Conservation Guidelines assessment. Our calculations are also based on a standard construction right-of-way width of 125 feet. The Conservation Guidelines are discussed further in section 4.5.3. Wetland impacts and mitigation are discussed in section 4.3.7.

Much of the REX East Project would be collocated with existing rights-of-way or in areas fragmented by agricultural or other development that would not fragment areas of contiguous forest. However, construction and maintenance of the pipeline right-of-way through contiguous forests would cause forest fragmentation. Many species of migratory birds require large blocks of contiguous forest to successfully reproduce and survive. The measures that would be implemented to reduce and mitigate impacts to contiguous forests include:

- Locating HDD equipment outside of forested riparian areas where they occur adjacent to waterbodies crossed by HDD methods;

- Restoring forested areas by maintaining only a 30-foot-wide maintenance area within the 50-foot-wide permanent right-of-way. A 10-foot-wide corridor centered over the pipeline would be kept in an herbaceous state with the remaining 20 feet of the corridor to return to a scrub/shrub community. Trees taller than 15 feet would be removed from the 30-foot right-of-way every 3 years; and

- Planting bare root seedlings within the temporary construction right-of-way of large forested areas and forested areas of concern to expedite the return of forest vegetation, unless otherwise restricted by landowner easement conditions.

Additionally, Rockies Express has agreed to compensatory mitigation for impacts to forest habitat. Rockies Express would contribute funds prior to the start of construction to be used by an appropriate conservation organization for mitigation purposes. As stated previously, the calculations for acreages of forested impacts for mitigation differ from the calculations used in this EIS, which represents all impacts to forested land.

Rockies Express would further minimize and mitigate impacts to forested wetlands and Indiana forests within floodways in accordance with permit requirements from COE and IDNR, respectively. Conservation Guidelines as they relate to migratory birds are discussed in section 4.5.3.

Rockies Express would use 21 HDD crossings to avoid impacts to 32 waterbodies. These proposed HDD crossings could impact upland forests and riparian areas. No drill entry or exit points would be located within riparian areas. However, HDD construction equipment would travel through the riparian area located on Blackburn Island from the temporary dock to the HDD entry/exit location. Rockies Express would not perform maintenance activities between the entry and exit points of the drill; therefore, we believe impacts to riparian areas would be minimal. To further minimize impacts to upland forests and wooded riparian areas during construction, **we recommend that:**

- **For all HDDs, Rockies Express not clear any trees between the workspace for the drill entry site and the workspace for the exit site during construction. Minor brush clearing, less than 3 feet wide, using hand tools is allowed to facilitate the use of the HDD tracking system.**

Vegetated riparian strips along streams are important for erosion prevention and serve as wildlife habitat. To ensure the protection of vegetated riparian strips during maintenance, **we recommend that:**

- **Rockies Express use onsite markers along the permanent right-of-way for identifying "no-clearing" zones within vegetated riparian strips adjacent to waterbodies that are to be avoided during maintenance activities.**

As previously stated, during operation, Rockies Express' Plan would allow for maintenance mowing along the permanent 50-foot-wide right-of-way once every 3 years. Maintenance impacts to forest communities during operation would be permanent for the life of the Project. However, impacts to herbaceous communities during operational maintenance would be minimal because the vegetation would return to pre-construction conditions.

In addition, to minimize impacts during construction and operation Rockies Express would implement the measures included in its Plan, Procedures, and AIMP to ensure successful revegetation of disturbed areas. According to its Plan and Procedures, Rockies Express would:

- provide temporary and permanent erosion control measures;
- test topsoil and subsoil for compaction at regular intervals in agricultural and residential areas disturbed by construction activities;
- segregate topsoil;
- begin cleanup immediately after backfilling and completion of restoration within 20 days;
- restore pre-construction contours and natural drainage patterns within the construction right-of-way;
- fertilize and add soil pH modifiers in accordance with written recommendations obtained from the local soil conservation authority, land management agencies, or landowner; incorporate recommended soil pH modifier and fertilizer into the top 2 inches of soil as soon as possible after application;
- implement the NRCS and state agency recommendations and standards for revegetation in areas disturbed by the Project;
- provide barriers to control off-road vehicle activities; and
- monitor the revegetation progress of the right-of-way for 2 growing seasons following construction.

Aboveground Facilities

The REX East Project would involve the construction of compressor stations, meter stations, MLVs, delivery point interconnects, and access roads at various locations along the proposed pipeline route that would affect grasslands, sagebrush prairie rangeland (Wyoming), agricultural lands, and forests. Aboveground facilities would impact a total of 153.0 acres of vegetated land during construction and operation including herbaceous lands (about 15.1 acres), forested lands (about 14.0 acres), and agricultural lands (123.9 acres) (see table 4.4.1-2). Aboveground facilities would be permanent and would remain in operation throughout the life of the Project. We do not consider these impacts to be significant because the impacted area represents a very small percentage of the total available land of similar type in the area surrounding the Project.

The Project would require the use of temporary contractor pipe yards that would affect a total of 272.0 vegetated acres, including 43.4 acres of forested areas. As described earlier, removal of trees within forested areas would result in long-term impacts due to the length of time needed for the forest to mature to pre-construction conditions. Herbaceous and agricultural areas affected by contractor pipe yards would be able to revegetate in shorter timeframes. To minimize impacts to forested areas Rockies Express has agreed to avoid cutting trees, where feasible, in wooded areas at the Bowling Green, Springfield, Green Castle, Middletown, Hamilton, Jeffersonville, Pickaway, Lancaster, and Guernsey contractor and pipe storage yards.

4.4.2 Vegetation Communities of Special Concern

The REX East pipeline would cross vegetation communities of special concern in Indiana and CRP lands in Missouri, Illinois, Indiana, and Ohio. The communities in Indiana include classified forests and wooded riparian corridors. No vegetation communities of special concern have yet been identified in Illinois or Ohio. State-managed and conservation areas are discussed in section 4.8.5.

Classified Forests

Classified forests are privately owned lands in Indiana that have been enrolled voluntarily for a conservation stewardship program by the landowner in partnership with INDNR. The Classified Forest Program is specially designed to help keep Indiana's private forest regions intact. Classified forests that would be crossed by the pipeline route in Indiana are listed in table 4.4.2-1.

Construction of the REX East Project would temporarily disturb approximately 51.8 acres of classified forests in Indiana. Operation of the pipeline would require the conversion of approximately 20.5 acres of classified forests to scrub-shrub and herbaceous areas from maintenance of the 50-foot right-of-way. The Project has the potential to impact 4.2 acres of classified forest owned by a single landowner. Impacts to classified forested areas would be long-term.

A classified forest starting at approximately MP 331.9 would be crossed by the proposed pipeline in Johnson County, Indiana. A route variation was considered in the draft EIS, but it was determined that a minor route variation would not avoid or minimize impacts to the classified forest. Therefore, to reduce impacts to this classified forest, **we recommend that:**

- **Prior to the start of construction, Rockies Express file with the Secretary for review and written approval by the Director of OEP a site-specific construction plan that uses a 75-foot right-of-way within the classified forest located between approximate MP 331.9 and MP 332.2 and provides justification for any temporary workspace which requires the removal of trees.**

Rockies Express would compensate any classified-forest landowner who incurs costs or penalties resulting from the construction and operation of the Project. Rockies Express proposes to mitigate these areas by replanting trees outside the 50-foot permanent right-of-way, in the temporary construction right-of-way, at a one-to-one ratio and by replanting other native vegetation. Rockies Express is continuing its consultations with the classified forest landowners; INDNR, Division of Forestry; and the local District Forester about mitigation and state and local requirements; therefore, **we recommend that:**

- **Prior to the start of construction, Rockies Express develop its Compensatory Mitigation Plan for classified forest areas in Indiana, in consultation with classified forest landowners; INDNR, Division of Forestry; and the local District Forester. This plan should be filed with the Secretary along with documentation of related consultation for review and written approval by the Director of OEP.**

Indiana Wooded Riparian Corridors

Indiana has wooded riparian corridors with valuable tree species that are associated with bottomlands and waterways. These riparian areas are important waterway buffers and significant habitat features. If not revegetated and stabilized properly, removal of riparian vegetation could cause soil erosion associated with surface runoff, and streambank depressions could lead to instream sediment deposition after construction.

The following waterbody crossings have wooded riparian corridors and would require an INDNR permit based on their outstanding waterbody classifications: Wabash River (RR 2032 - MP 242.9+4), Big Walnut Creek (MP 281.5), Sugar Creek (MP 337.9), Big Blue River (MP 340.8), and Whitewater River (MP 393.1) (INDNR, 2007). The White Lick Crossing (MP 311.0) including its wooded riparian area would also require a permit because this portion of the pipeline runs parallel to White Lick Creek for

Table 4.4.2-1

Classified Forest Areas Crossed by REX East Project Pipeline in Indiana

County	Begin Milepost a/	Length of Crossing (feet) b/	Temporary Easement Impact (acres) c/	Permanent Easement Impact (acres) d/
Vermillion	RR 2032 MP 242.9 + 3.4	1,338.5	3.5	1.5
Parke	253.4	369.4	1.1	0.4
Parke	258.5	94.4	0.3	0.1
Parke	260.6	483.1	1.4	0.6
Putnam	268.6	927.3	2.7	1.1
Putnam	269.6	341.7	1.0	0.4
Putnam	269.7	743.8	2.1	0.9
Putnam	269.8	5.9	<0.1	<0.1
Putnam	269.8	289.8	0.8	0.3
Putnam	270.0	693.6	2.0	0.8
Putnam	270.1	32.7	<0.1	<0.1
Putnam	270.1	2,727.5	7.8	3.1
Putnam	271.4	0.0	0.7	0.0
Putnam	272.8	3,337.0	9.6	3.8
Putnam	273.6	349.2	1.0	0.4
Putnam	278.7	865.6	2.5	1.0
Putnam	280.0	134.2	0.4	0.2
Putnam	282.9	405.8	1.2	0.5
Hendricks	295.1	0.0	<0.1	0.0
Morgan	310.7	0.0	<0.1	0.0
Johnson	331.9	950.0	2.7	1.1
Shelby	344.6	552.8	1.6	0.6
Decatur	376.0	667.5	1.9	0.8
Decatur	376.6	541.8	1.6	0.6
Franklin	379.7	0.0	0.1	0.0
Franklin	381.7	23.8	<0.1	<0.1
Franklin	381.8	982.2	2.8	1.1
Franklin	382.1	212.3	0.6	0.2
Franklin	382.2	847.9	2.4	1.0
Total		**17,917.8**	**51.8**	**20.5**

a/ Mileposts are used for reference and may not reflect actual surveyed distances.

b/ A crossing length of zero represents classified forests that are not crossed by the centerline, but that are within the Project workspace.

c/ Temporary impact based on a 125-foot-wide construction right-of-way in upland areas. Forested areas could take 50 years or more to return to pre-construction vegetated conditions.

d/ Permanent impact based on a 50-foot-wide maintained right-of-way.

more than 50 feet in the floodplain (INDNR, 2007). Four of these waterbodies (Wabash River, Big Walnut Creek, Big Blue River, and Whitewater River) would be crossed by using the HDD method; therefore, impacts to these waterbodies and riparian areas would be avoided. Rockies Express would comply with INDNR's permitting requirements regarding floodway licensing and mitigation measures within the temporary right-of-way in wooded riparian corridors. These mitigation measures include: replanting trees greater than 10 inches in diameter in wooded riparian corridors at a ratio of five-to-one,

revegetating intermixed groundcover within the forested floodway with appropriate herbaceous seed mixes, and mitigating disturbed riparian corridor areas greater than 1 acre at a higher ratio. Furthermore, during right-of-way maintenance within a floodway, if trees are cut in the floodway, they would be removed from the floodway or secured in place to prevent their displacement during a flood event.

Rockies Express, as part of the flood control act permitting requirements, is continuing its consultations with INDNR to develop mitigation measures to minimize impacts to floodways and riparian areas. Waterbodies in Indiana that require floodway crossing licenses are further discussed in section 4.3.2. **We recommend that:**

- **Prior to the start of construction, Rockies Express file with the Secretary a copy of its Flood Control Permit from INDNR.**

4.4.3 Conservation Reserve Program

The CRP is managed and administered by USDA's Farm Service Agency (FSA) with technical assistance provided by USDA's NRCS. The program provides eligible farmers and ranchers both technical and financial assistance to conserve and protect soil, water, and related natural resources on their land. The CRP encourages farmers to convert highly erodible cropland or other environmentally sensitive lands to vegetative cover such as native grasses, wildlife plantings, trees, filter strips, or riparian buffers. To date, a total of 24 tracts of CRP lands have been identified along the REX East Project, which includes 518.5 feet (at four crossings) in Missouri. FSA has identified landowners with land enrolled in the CRP program in all counties crossed by the Project except Belmont and Monroe Counties in Ohio.

Temporary and permanent impacts on CRP lands would generally be similar to those described previously for vegetation. Rockies Express would negotiate easement terms and conditions with individual landowners of CRP lands to minimize and restore temporarily impacted areas to preconstruction conditions. Rockies Express also would implement its Plan and Procedures to further minimize impacts by reseeding disturbed areas with a seed mix recommended by NRCS, state agencies, or landowners specifically for CRP lands. Rockies Express is currently consulting with representatives of FSA to confirm the location of these properties and identify any other CRP lands; therefore, **we recommend that:**

- **Prior to the start of construction, Rockies Express identify affected CRP lands in consultation with landowners and develop mitigation measures to protect CRP lands. Rockies Express should file this information with the Secretary along with copies of all related correspondence.**

4.4.4 Noxious Weeds and Invasive Species

Noxious Weeds

Noxious weeds and other invasive plants are non-native, undesirable native, or introduced species that are able to exclude and outcompete desirable native species, thereby decreasing overall species diversity. The term "noxious weed" is legally defined under both federal and state laws. Under the Federal Plant Protection Act of 2000 (formerly the Noxious Weed Act of 1974 [7 U.S.C. Sections 2801-2814]), a noxious weed is defined as "any plant or plant product that can directly or indirectly injure or cause damage to crops, livestock, poultry, or other interests of agriculture, irrigation, navigation, the natural resources of the United States, the public health, or the environment." The Federal Plant Protection Act contains a list of 137 federally restricted and regulated federal noxious weeds (per 7 CFR Part 360), including 19 aquatic and wetland weeds, 62 parasitic weeds, and 56 terrestrial weeds. Each

state is federally mandated to uphold the rules and regulations set forth by the Federal Plant Protection Act and manage its lands accordingly.

Noxious weeds are also addressed by Executive Order (EO) 13112, which directs federal agencies to prevent the introduction of invasive species; provide for their control; and minimize the economic, ecological, and human health impacts that invasive species can cause. The Order further specifies that federal agencies shall not authorize, fund, or carry out actions likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless it has been determined that the benefits of such actions outweigh the potential harm caused by invasive species and that all feasible and prudent measures to minimize the risk of harm would be taken in conjunction with the actions.

Federal, state, and county agencies are responsible for identifying noxious plant species and preventing them from becoming invasive. In addition to federal noxious weed lists, each state crossed by the REX East Project maintains a list of regulated and prohibited noxious and invasive weed species. County weed control boards or districts are present in most counties crossed by the pipeline route. These county weed control boards monitor local weed infestations and provide guidance on weed control.

Following disturbances to the soil caused by the Project, vegetation communities can be susceptible to infestations of invasive or noxious weed species. Vegetation removal and soil disturbance during construction could create optimal conditions for the establishment of undesirable species. Mobile construction equipment can carry weeds into disturbed areas and disperse invasive or noxious weed seeds that would propagate and spread through the affected area. Noxious species are most prevalent in areas with prior surface disturbance, such as agricultural areas, roadsides, and existing utility rights-of-way.

Federal and state agencies filed comments recommending that disturbed areas be revegetated with native plant species that are currently found in the Project area. Agencies also identified known locations of noxious weed infestations in the states the pipeline would cross and provided recommendations for seed mixes and erosion control. A list of these noxious weeds is provided in the REX East Weed Management Plan (CD Document F). In response to COE's request, Rockies Express has included the Japanese hop (*Humulus japonicus*) in the list of noxious weeds in its Weed Management Plan. The NRCS offices in Missouri, Illinois, and Indiana provided state-specific NRCS Critical Area Planting Conservation Standards. Rockies Express has developed the Weed Management Plan based on the agencies' recommendations to minimize the spread of noxious weeds with preventative measures and treatment methods such as ensuring that:

- all contractor vehicles and equipment would arrive at the work site clean and weed-free;
- soils imported for agricultural or residential use would be certified as free of noxious weeds, unless otherwise approved by the landowner; and
- noxious weeds along the construction right-of-way would be removed by mechanical, biological, or chemical methods under the direction of NRCS state offices.

To further limit the introduction of noxious weeds, **we recommend that:**

- **Rockies Express use only certified weed-free straw or hay bales for sediment barriers or mulch during construction and revegetation of disturbed areas.**

Invasive Species

Invasive species are non-native, undesirable species, whose introduction causes is likely to cause economic, environmental, or ecological harm. The emerald ash borer (EAB) is a beetle and known invasive species that infests and kills ash trees. The USDA has quarantined the entire states of Illinois, Indiana, and Ohio for the EAB. This federal quarantine prohibits the movement of ash tree materials out of these states without federal certification. Furthermore, the state of Ohio has implemented a state quarantine for specific counties, in which ash tree materials cannot be removed from the quarantined counties, but can move freely within each quarantined county. The REX East Project would cross three quarantined counties in Ohio: Butler, Warren, and Fairfield (ODA, 2008). As stated in section 2.3.1, Rockies Express would dispose of cleared vegetation in accordance with applicable federal and local regulations and landowner requirements. Additionally, in section 2.3.1, we have recommended that Rockies Express prepare a bulk material disposal plan to ensure that proper disposal methods are followed and to ensure that invasive species, such as EAB, are not inadvertently transported from a quarantined county or state.

We believe that Rockies Express' proposed measures, including the use of its Weed Management Plan, our recommendations, and the implementation of mitigation practices recommended by state and federal agencies, would minimize the Project-related impacts on vegetation communities and would minimize the spread of noxious weeds and invasive species.

4.5 WILDLIFE

The REX East Project area encompasses a diversity of animal taxa, including large and small mammals, raptors, waterfowl, turtles, and various amphibians. General impacts to these wildlife resources are discussed in the following sections. Specific information is also provided for significant resources that occur in the Project area, including raptors and migratory birds, as well as managed and sensitive wildlife areas that would be affected by the Project.

4.5.1 General Wildlife Resources

The predominant wildlife habitats in the REX East Project area are open water, agricultural lands, forested lands, herbaceous upland, herbaceous wetland, and developed areas. These habitats provide local wildlife with areas for foraging, cover, and breeding. Vegetative species within these habitat types are described in section 4.3.7 (wetland habitats) and 4.4 (upland habitats). Table 4.5.1-1 lists common game and non-game species that occur within wildlife habitats crossed by the Project.

Table 4.5.1-1

Representative Wildlife Species with Significant Recreational and Commercial Value that Potentially Occur in the REX East Project Area

Habitat Type	Representative Species	Scientific Name
Open Water	River Otter	*Lontra canadensis*
	Beaver a/	*Castor canadensis*
	Muskrat a/	*Ondatra zibethica*
	Mallard a/	*Anas platyrhynchos*
	Wood Duck a/	*Aix sponsa*
	Tundra Swan	*Cygnus columbianus*
	Great Blue Heron	*Ardea herodias*
	American Toad	*Bufo americanus*
	Snapping Turtle	*Chelydra serpentina*
Agricultural Land	Virginia Opossum	*Didelphis marsupialis*
	Coyote	*Canis latrans*
	Red Fox a/	*Vulpes vulpes*
	Long-Tailed Weasel	*Mustela frenata*
	Striped Skunk	*Mephitis mephitis*
	White-Tailed Deer a/	*Odocoileus virginianus*
	Mallard a/	*Anas platyrhynchos*
	Ring-Necked Pheasant a/	*Phasianus colchicus*
	Wild Turkey a/	*Meleagris gallopavo*
	Turkey Vulture	*Cathartes aura*
	Red-Tailed Hawk	*Buteo jamaicensis*
	Horned Lark	*Eremophila alpestris*
Forested Upland	Virginia Opossum	*Didelphis marsupialis*
	Silver-Haired Bat	*Lasionycteris noctivagans*
	Coyote	*Canis latrans*
	Red Fox a/	*Vulpes vulpes*
	Bobcat	*Lynx rufus*
	Striped Skunk	*Mephitis mephitis*
	White-Tailed Deer a/	*Odocoileus virginianus*
	Wood Duck a/	*Aix sponsa*
	Cerulean Warbler	*Dendroica cerulean*
	Hooded Warbler	*Wilsonia citrine*
	Worm-Eating Warbler	*Helmitheros vermivorus*
	Kentucky Warbler	*Oporornis formosus*
	Wild Turkey a/	*Meleagris gallopavo*
	Great-Horned Owl	*Bubo virginianus*
	American Toad	*Bufo americanus*

Table 4.5.1-1 (continued)

Representative Wildlife Species with Significant Recreational and Commercial Value that Potentially Occur in the REX East Project Area

Habitat Type	Representative Species	Scientific Name
Forested Wetlands	Raccoon a/	*Procyon lotor*
	Silver-Haired Bat	*Lasionycteris noctivagans*
	Coyote	*Canis latrans*
	Bobcat	*Lynx rufus*
	White-Tailed Deer a/	*Odocoileus virginianus*
	Mallard a/	*Anas platyrhynchos*
	Wood Duck a/	*Aix sponsa*
	Wild Turkey a/	*Meleagris gallopavo*
	Great-Horned Owl	*Bubo virginianus*
	American Toad	*Bufo americanus*
	Prothonotary Warbler	*Protonotaria citrea*
	Cerulean Warbler	*Dendroica cerulean*
	Hooded Warbler	*Wilsonia citrine*
	Kentucky Warbler	*Oporornis formosus*
Herbaceous Upland	Virginia Opossum	*Didelphis marsupialis*
	Coyote	*Canis latrans*
	Red Fox a/	*Vulpes vulpes*
	Long-Tailed Weasel	*Mustela frenata*
	Striped Skunk	*Mephitis mephitis*
	Ring-Necked Pheasant a/	*Phasianus colchicus*
	Turkey Vulture	*Cathartes aura*
	Red-Tailed Hawk	*Buteo jamaicensis*
	Horned Lark	*Eremophila alpestris*
	American Toad	*Bufo americanus*
Herbaceous Wetland	Muskrat a/	*Ondatra zibethica*
	River Otter	*Lontra canadensis*
	Long-Tailed Weasel	*Mustela frenata*
	Mink a/	*Neovison vison*
	Snowy Egret	*Egretta thula*
	Northern Harrier	*Circus cyaneus*
	Swamp Sparrow	*Melospiza georgiana*
	Prothonotary Warbler	*Protonotaria citrea*
	Western Chorus Frog	*Pseudacris triseriata*
	Spring Peeper	*Pseudacris crucifer*
	Spotted Salamander	*Ambystoma maculatum*
	Northern Painted Turtle	*Chrysemys picta*

a/ NatureServe, 2006.

Open-water habitats within the Project area include large rivers, streams, lakes, and ponds. These habitats provide food and water sources, in addition to habitat for species such as wading birds, waterfowl, beavers, otters, snakes, and other wildlife species dependent upon an aquatic environment. Waterbodies are specifically discussed in section 4.3, and fisheries resources within these waterbodies are discussed in section 4.6.

Agricultural lands within the Project area generally consist of pasture/hay, row crops, and small grains. These lands provide cover and foraging opportunities for wildlife species within the crops or pastures, or within the small areas of natural vegetation, such as vegetation along streams or small forested patches, that sometimes occur within agricultural lands. Although generally not as diverse as other habitat types, agricultural lands provide habitat for a variety of wildlife species.

Forested lands consist of deciduous, evergreen, and mixed upland forests, as well as forested wetlands. Upland forests provide both interior and edge habitats that often attract different species based on their habitat preferences. Interior forested habitats are secluded, wetter, and more stable, whereas edge habitats are more volatile, experiencing more dramatic environmental change. Exterior forests are sunnier, drier, windier, and more prone to disturbance. Forested wetlands comprise diverse vegetation assemblages that provide an abundance of cover, foraging, and nesting habitat for a variety of wildlife species, such as migrating birds, reptiles, amphibians, and mammals.

Herbaceous uplands include upland grasslands, maintained rights-of-way, fallow fields, and areas used for production of hay and small grains. Herbaceous habitats can be important to a variety of species, particularly birds and small mammals, by providing edge areas and feeding and rearing habitats.

Herbaceous wetlands include emergent wetlands, ditches, road and railroad rights-of-way, pipeline and power line utility corridors, fallow fields, and areas used for production of hay and small grains where hydric soils are present. Herbaceous wetlands provide an abundance of cover, foraging, and nesting habitat for a variety of wildlife species including mammals, birds, and reptiles. Emergent wetlands also provide resting sites for migratory birds; food sources for waterfowl; and nursery habitat for amphibians, crustaceans, and fish.

Developed land consists of residential, industrial, and other areas developed for active human use. Residential land occurs throughout the Project area in varying densities. These areas generally do not have diverse vegetative communities or provide substantial forage or cover for wildlife. Although they may be used by some wildlife species that are well adapted to human activity, these areas are not considered to provide significant value as wildlife habitat.

4.5.2 General Wildlife Impacts

Construction of the REX East Project, including additional temporary workspaces, aboveground facilities, pipe storage/contractor yards, and laterals, would temporarily disturb 14,227.1 acres of upland and wetland vegetation habitats and 24.3 acres of open water. Of this, 3,095.8 acres of forested habitat would be disturbed by construction. Of that total, about 885.7 acres would either be converted to developed land for aboveground facilities or maintained as permanent right-of-way in accordance with Rockies Express' Plans and Procedures. About 247.1 acres of managed and sensitive wildlife areas would be temporarily disturbed by construction (see section 4.5.4).

The impact of the Project on wildlife species, including game species and their habitats, would vary depending on the requirements of each species and the existing habitat present along the pipeline route. During construction, the more mobile species would be temporarily displaced from the construction right-of-way and surrounding areas to similar habitat nearby. Some wildlife displaced from the right-of-way would return to the newly disturbed area and adjacent, undisturbed habitats soon after completion of construction. Less mobile species, such as small mammals, reptiles, and amphibians, as well as birds nesting in the right-of-way, may be permanently affected by construction activities due to direct mortality or permanent displacement. However, the overall impact on wildlife due to active pipeline construction would not be significant because of the relatively small percentage of the available forest habitat affected and the short duration of construction.

The clearing of right-of-way vegetation would reduce cover, nesting, and foraging habitat for some wildlife. The degree of impact would depend on the type of habitat affected and the rate at which vegetation regenerates after construction. The impact on species that commonly inhabit agricultural lands would be relatively minor and temporary because these areas are regularly disturbed and would be replanted during the next growing season following pipeline installation. The effect on forest-dwelling

wildlife species would be greater, as forested lands may take longer (more than 50 years) to return to pre-construction conditions and 885.7 acres would be prevented from reestablishing during operation of the pipeline. All other forested areas impacted during construction would be allowed to reestablish. The impacts on species using nonforested areas would be short-term because herbaceous lands, riparian vegetation, and vegetated portions of developed lands would recover within 1 to 3 years. See section 4.3.7 for our recommendations to offset forested wetland impacts.

Blasting may be required along approximately 14 percent of the pipeline route. Blasting could result in the removal of adjacent habitat and the direct mortality or injury of wildlife species in the vicinity. These impacts would be minimized by adherence to the Rockies Express Blasting Plan (CD Document C). Rockies Express states that it would develop site-specific blasting plans that contain procedures for preventing flying rock and excessive noise.

Construction and operation of the Project would cause habitat fragmentation, especially in forested areas. Fragmentation can alter the species composition in a given community because biophysical conditions near the forest's edge can significantly differ from those found in the center or core of the forest. As a result, edge species could recruit to the fragmented area and species that occupy interior habitats could be displaced. The disturbance of these areas could create a long-term impact on some forest interior species. Species most likely to be adversely affected by the long-term or permanent conversion of forested habitat to nonforested habitat include forest interior species such as certain migratory birds, as discussed in section 4.5.3, as well as various other birds, mammals, amphibians, and reptiles. Conversion of intact forested habitats to early successional stages and the increase in forest edge that results could adversely affect forest interior species by increasing rates of nest predation, parasitism, or interspecific competition; reducing pairing success and nesting areas; increasing destruction of habitat of understory species by browsers; inhibiting migration, dispersal, foraging, and other movements of forest interior species that are hesitant to cross openings; and encouraging the expansion of non-native species. The breeding success of some forest interior bird species has been shown to be limited by the size of available unbroken forest tracts (Robbins, 1979; Robbins et al., 1989). Additional loss of forest habitat in tracts of already marginal size, in particular where the pipeline would traverse smaller isolated woodlots (Galli et al., 1976), could further reduce breeding success. The conversion of forested land may also affect woodland amphibians, through lack of cover, changes in ground moisture, and increased exposure to the sun.

The Conservation Guidelines adopted by Rockies Express and FWS identifies 2,372.3 acres of specific forested areas that are, or are likely to be, important migratory bird habitat, and would be affected by the construction or operation of the project. Because many migratory bird species require large blocks of contiguous forest to successfully reproduce and survive, impacts of the Project on fragmented and unfragmented forest land were evaluated for forest parcels that meet criteria for migratory bird habitat. The construction of the Project would have long term and temporary impacts to 1,920.2 acres of migratory bird habitat, including impact to 371.1 acres within unfragmented forest parcels and 1,549.1 acres within fragmented forest parcels. Operations of the Project would result in permanent impacts to 452.1 acres of migratory bird habitat, including 87.0 acres within unfragmented forest parcels and 365.1 acres within fragmented forest parcels. See section 4.5.3 for a detailed discussion of the Conservation Guidelines.

In a letter received September 12, 2007, FWS identified numerous forested areas that provide breeding habitat for forest Birds of Conservation Concern (BCC) (FWS, 2007d). Specifically FWS expressed concern for migratory bird species and forest fragmentation. To minimize fragmentation impacts to the identified areas, we have included a recommendation that Rockies Express consult with FWS to develop site-specific plans to mitigate fragmentation impacts in these areas (see section 4.5.3). In addition, Congress charged each state and territory with developing a statewide wildlife conservation

strategy, called a Comprehensive Wildlife Conservation Strategy, which identifies species and habitats of greatest conservation need and outlines the necessary actions to protect them. Each state's Comprehensive Wildlife Conservation Strategy and the appropriate state coordinator should be consulted in order to minimize impacts to wildlife resources. Rockies Express has initiated consultation with each applicable agency. ILDNR has indicated that the Project is in compliance with their Wildlife Action Plan. However, consultation has not yet been finalized with Missouri, Indiana, or Ohio. Therefore, **we recommend that:**

- **Prior to the start of construction, Rockies Express consult with the Comprehensive Wildlife Conservation Strategy Coordinators for Missouri, Indiana, and Ohio to verify that it is in compliance with the state's Comprehensive Wildlife Conservation Strategy to the maximum extent practicable and file with the Secretary documentation of this correspondence.**

Species utilizing edge habitat and nonforested lands would often return to the disturbed area after construction activities have ceased (Jalkotzy et al., 1997); therefore, impacts on wildlife in these habitats would be minimal. Species utilizing forest interior habitat would sustain a moderate impact through lasting habitat loss and fragmentation. However, through implementation of our recommendation for site-specific mitigation to minimize forest fragmentation, collocating the pipeline with existing rights-of-way to the extent practicable, and implementing the Rockies Express Plan and Procedures for the revegetation of wildlife habitats, we believe that the Project would not substantially alter local wildlife populations.

4.5.3 Raptors and Other Migratory Birds

Migratory birds are species that nest in the United States and Canada during the summer and migrate south to the tropical regions of Mexico, Central and South America, and the Caribbean for the nonbreeding season. Migratory birds are protected under the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703–711) and EO 13186 (66 FR 3853), which serve to protect migratory birds from adverse impacts. The EO was enacted, in part, to ensure that the environmental analysis of a federal action evaluates the impacts of that action on migratory birds. It states that emphasis should be placed on species of concern, priority habitat, and key risk factors. It also prohibits the taking of migratory birds without authorization from FWS. Destruction or disturbance of a migratory bird nest, or any eggs or young contained within it, is also a violation of the MBTA.

Portions of the Mississippi Flyway and its principal routes pass through each state that would be crossed by the pipeline; thus, migratory birds occur in the Project area. In addition, principal routes of the Central Flyway cross through Nebraska and Wyoming, the sites of two proposed compressor stations. FWS maintains a list of migratory BCC that was developed as a result of a 1988 amendment to the Fish and Wildlife Conservation Act. The Fish and Wildlife Conservation Act mandates that FWS "identify species, subspecies, and populations of all migratory non-game birds that, without additional conservation actions, are likely to become candidates for listing" under the ESA. The goal of the BCC is to prevent or remove the need for additional ESA bird listings by implementing proactive management and conservation actions, and to ensure that these species would be considered in accordance with EO 13186. Partners in Flight is an organization with the goal of documenting and reversing population declines of neotropical migratory birds and their habitats. Migratory BCC and Partners in Flight priority bird species that potentially occur in the Project area are listed in table 4.5.3-1, along with their associated habitats. However, as the MBTA provides protection for all migratory birds, additional species not listed in table 4.5.3-1 would also be affected by the Project.

Table 4.5.3-1

Important Migratory Bird Species That Potentially Occur in the Project Area a/

Species Name	PIF Status c/	Migratory Classification by State b/						Preferred Habitat
		WY d/	NE e/	MO f/	IL f/	IN f/	OH f/	
Peregrine Falcon	CS	PM	PM	WR	PM	PM	PM	Along mountain ranges, river valleys, coastlines, cities
Short-Eared Owl	CC	NR, WR	NR, WR	WR	WR	WR	WR	Open fields, meadows, marsh, prairie, tundra
King Rail	--	PM	PM	NR	PM	PM	PM	Emergent wetlands
American Golden Plover	--	PM	PM	PM	PM-ST	PM	PM	Natural tributaries
Hooded Warbler	CS	PM	PM	PM	PM	NR	NR	Woodlands
Bewick's Wren	RC	NR	PM	NR	PM	PM	NR, PM	Woodlands
Chuck-Will's-Widow	RC, CS	PM	PM	NR	PM	PM	PM	Woodlands
Red-Headed Woodpecker	CC, RC, RS	NR	NR	NR, WR	NR, WR	NR, WR	NR, WR	Woodlands that support cavity nesting
Yellow-Bellied Sapsucker	CS	PM	PM	PM	PM	PM	PM	Woodlands that support cavity nesting
Acadian Flycatcher g/	RC, CS	PM	PM	NR	NR	NR	NR	Woodlands near water, along rivers or swamps
Wood Thrush g/	CC, RC, CS	PM	PM	NR	NR	NR	NR	Woodlands
Bell's Vireo	CC. RC	PM	NR	NR	NR	NR	PM	Successional scrub that supports ground nesting
Blue-Winged Warbler	CC, CS	PM	PM	NR	NR	NR	NR	Successional scrub that supports ground nesting
Golden-Winged Warbler	--	PM	PM	PM	PM	PM	PM	Successional scrub that supports ground nesting
Prairie Warbler	CS	PM	PM	NR	NR	NR	NR	Successional scrub that supports ground nesting
Cerulean Warbler g/	CC, RC, CS	PM	PM	NR	NR	NR	NR	Woodland midstory or canopy
Prothonotary Warbler g/	CC, RC, CS	PM	PM	NR	NR	NR	PM	Woodland midstory trees that support cavity nesting
Worm-Eating Warbler g/	CS	PM	PM	NR	NR	NR	NR	Woodland cover to support ground nesting
Swainson's Warbler	CC, RC, CS	PM	PM	PM	PM	PM	PM	Woodland cover to support ground nesting
Louisiana Waterthrush g/	RC, CS	PM	PM	NR	NR	NR	NR	Woodlands along waterbodies
Kentucky Warbler g/	CC, RC, CS	PM	PM	NR	NR	NR	NR	Woodland cover to support ground nesting
Dickcissel	CC, RC, CS, RS	PM	NR	NR	NR	NR	NR	Grasslands that support ground nesting
Bachman's Sparrow	CC, RC, CS	PM	PM	PM	PM	PM	PM	Woodland cover to support ground nesting
Grasshopper Sparrow	RC. CS	PM	NR	NR	NR, WR	NR, WR	NR	Open fields and grasslands
Henslow's Sparrow	CC, RC, CS, RS	PM	PM	NR	NR	NR	NR	Open fields with tall herbaceous vegetation

Table 4.5.3-1 (continued)

Important Migratory Bird Species That Potentially Occur in the Project Area a/

Species Name	PIF Status c/	Migratory Classification by State b/						Preferred Habitat
		WY d/	NE e/	MO f/	IL f/	IN f/	OH f/	
Smith's Longspur	CS	PM	PM	PM	PM	PM	PM	Open areas, beaches, tundra, short grass, bare fields
Rusty Blackbird	--	WR	WR	WR	WR	WR	WR	Wet, wooded areas
Bald Eagle h/	CS	NR	NR	NR	NR	NR	NR	Woodland near wetland or open water areas
Scarlet Tanager g/	--	PM	PM	NR	NR	NR	NR	Woodlands

a/ Species in this list are protected under the Migratory Bird Treaty Act (MBTA) (FWS, 1989b); FWS Birds of Conservation Concern (BCC) (FWS, 2002a); and Partners in Flight (PIF) (Rich et al., 2004). Exceptions: the king rail is protected under the MBTA only, and the hooded warbler and scarlet tanager are protected under the MBTA and PIF only. Gough, et al., 1998; FWS, 2007d; PIF, 2007.
b/ Migratory classifications are represented as PM = Passing Migrant, PM-ST = Passing Migrant, Important Staging Area, NR = Nesting Resident, WR = Winter Resident.
c/ PIF Species Assessment Listings for Bird Conservation Region (BCR) 22 (CC = Continental Concern Species, RC = Regional Concern Species, CS = Continental Stewardship Species, RS = Regional Stewardship Species. -- = Not Listed in BCR 22.
d/ Arlington Compressor Station.
e/ Bertrand Compressor Station.
f/ Proposed pipeline.
g/ Midwestern forest breeding bird species that are known to be adversely impacted by forest fragmentation.
h/ The bald eagle is protected under the MBTA and PIF, as well as the Bald and Golden Eagle Protection Act.

A great blue heron rookery occurs approximately 0.9 mile south of the proposed Scioto River pipeline crossing location (MP 514.6) in Pickaway County, Ohio. Rockies Express would cross the Scioto River using the HDD method. Although the herons may be present during construction, they are not expected to be impacted by the increase in noise because the rookery is almost 1 mile from the HDD site. In addition to the known rookery, landowner comments received March 13, 2007 indicated that the landowners observed a single heron pair south of the Dry Fork Whitewater River near MP 407.2 and a single breeding pair east of Caesar Creek near MP 459.6. However, ODNR has no record of blue heron rookeries within 0.25 mile of these crossing locations. Although the exact location of the two heron pairs is unknown, they may potentially suffer from decreased breeding success should they occur in close proximity during construction activities.

Bald Eagles

The bald eagle was removed from the federal list of threatened and endangered species in June 2007 due to recovery and is no longer protected under the ESA. The species is currently protected under both the MBTA and the Bald and Golden Eagle Protection Act (BGEPA) and is known to nest in the Project area. Federal and state agency consultations have indicated that bald eagles are known to overwinter between November 15 and March 15 in Pike and Ralls Counties, Missouri, and that they may be summer casuals along this section of the proposed route. A known nest is located on Blackburn Island approximately at MP 42.9. In Indiana, bald eagle habitat or nests have been specifically identified at the Wabash River (RR 2032 - MP 242.9+4.0), Sugar Creek (MP 337.9), Big Raccoon Creek (MP 269.9), Big Walnut Creek (MP 281.5), and the White River (MP 315.8). One nest was also recorded within 0.1 mile of the proposed route at MP 315.5. The lowland areas of the Wabash River in the Project area also serve as important wintering habitat for bald eagles. Ohio hosts casual residents through the summer in Pickaway, Muskingum, Guernsey, and Noble Counties. Nesting populations have been identified in Morgan County, Indiana, including a breeding pair that maintains a nest from February 1 through June

30. In addition, bald eagles could establish new nesting sites along the route; however, these sites would predominantly be located in riparian areas.

FWS expressed concern about HDD noise impacts on nesting bald eagles located on Blackburn Island. FWS also recommended that Rockies Express identify the location of bald eagle nests in the vicinity of the Project. FWS further stated that the use of available current and reliable nesting surveys is acceptable. However, if surveys are not available, Rockies Express should conduct surveys of bald eagles in the Project area. FWS recommended that where nests are located in the vicinity of the pipeline, Draft National Bald Eagle Management (NBEM) Guidelines be followed. According to these Guidelines, Category A activities, including construction of roads and other linear utilities, should be conducted outside the nesting season, which occurs from February 1 through July 31. FWS has recommended that surveys be conducted to determine bald eagle nests in the vicinity of the Project for areas where current and reliable information is not available. Although the Marion, Illinois office has determined that further surveys are not warranted, Rockies Express has not yet finalized consultation with FWS to determine where these surveys would be required. Therefore, **we recommend that:**

- **Prior to the start of construction, Rockies Express file with the Secretary documentation of consultations with FWS to determine the need for bald eagle surveys. If surveys are required, Rockies Express should file with the Secretary survey reports along with FWS comments on those surveys and documentation of its consultation with FWS.**

The Project could temporarily affect aerial foraging and predatory activities if construction occurs along waterbodies when roosting eagles are present. Project disturbance could change foraging patterns or remove preferred roosting trees. Individual eagles could find other suitable roosts in similar habitat surrounding the Project area, and eagles would be expected to return to the Project area when construction activity has ceased (Jalkotzy et al., 1997). Given the linear nature of the clearing associated with the Project and the short timeframe in which waterbody construction would occur, we believe these impacts would be a minor, temporary disruption to foraging individuals.

Crossing waterbodies using the HDD method may cause noise impacts to nesting bald eagles prior to the time that the eagles have fledged. Foraging bald eagles are anticipated to return to the area once construction and HDD crossings have been completed; however, an increase in noise near nesting bald eagles may cause nest abandonment and subsequent mortality of eggs and young. FWS has developed the NBEM Guidelines that would minimize impacts to bald eagle nests by implementing site-specific buffers and limiting loud, disruptive construction activities (including open-cut and HDD construction methods) to periods outside of the nesting season, which is between February 1 and July 31 in the Project area. Rockies Express has agreed to adhere to the NBEM Guidelines in the presence of known or newly encountered active nests and would limit construction activities in the vicinity of active bald eagle nests, as recommended by FWS, to periods outside of the nesting season.

With the implementation of our recommendation, and Rockies Express's stated compliance with the MBTA, the NBEM Guidelines, and the Bald and Golden Eagle Act to avoid disturbance to the bald eagle, we believe that the impact on the bald eagle would be minimal.

Other Migratory Birds of Conservation Concern

Additional migratory BCC include the king rail and the prothonotary warbler, which occur in the COA in Missouri (as discussed in section 4.5.4). The American golden-plover and Smith's longspur have nationally important staging areas in Edgar and Douglas Counties, Illinois. Impacts to the king rail, American golden plover, and Smith's longspur would be avoided by the timing and/or location of the pipeline. In addition, collocation of the pipeline within these counties and adherence to the Rockies

Express Procedures would minimize impacts to the prothonotary warbler. Impacts to this species through tree-clearing on Blackburn Island would be mitigated through the installation of bird houses during restoration to supply nesting sites for this species.

The potential impacts from forest fragmentation are important for migratory bird species that have limited habitat in the Project area or are otherwise more sensitive to disturbance. Rockies Express, in consultation with FWS, has developed and signed Conservation Guidelines which identifies specific forested areas of fragmentation concern that are, or are likely to be, used by migratory birds within the Project area. In a letter received September 12, 2007, FWS identified numerous migratory BCC that would be impacted by forest fragmentation, such as the cerulean, prothonotary, hooded, worm-eating, and Kentucky warblers, and Bewick's wren (see table 4.5.3-1). Many of these birds inhabit a breeding habitat within large forested tracts in Indiana and Ohio. Identified forests in Indiana are known breeding sites, or close to known breeding sites, for the cerulean warbler, a species of high conservation concern by FWS and Partners in Flight. These forests also likely harbor breeding species of conservation concern, such as the hooded, worm-eating, and Kentucky warblers. In Ohio, forest fragmentation is a concern because of impacts to breeding cerulean warbler and several other forest BCC including worm-eating and hooded warblers, and potential Bewick's wren occurrence. As forested areas of concern identified by FWS are breeding sites of species of conservation concern, fragmentation to them would cause a moderate impact through the loss of habitat to the species that use these areas. In section 3.5.13, we have recommended a route variation from MP 405.1 to MP 405.9 that would avoid fragmentation of two large forested parcels in Butler County, Ohio. Rockies Express has signed the Conservation Guidelines developed in consultation with FWS that would minimize and mitigate impacts related to fragmentation of forested areas through measures including, but not limited to, site-specific construction time windows, limited right-of-way maintenance, replanting of seedlings within the construction right-of-way, and on- and off-site mitigation.

The two compressor stations proposed for Nebraska and Wyoming would affect either agricultural or herbaceous land, decreasing the amount of habitat available for ground-nesting species, while avoiding impacts to forested lands that are considered suitable nesting habitat for many migratory bird species. Therefore, there would be no impacts to wildlife species in forested areas in Nebraska and Wyoming.

Construction of the Project would start during June 2008, which would overlap with the nesting seasons for many migratory birds. Construction during this time would cause direct and indirect impacts on the species that occur in the area. Direct effects would be from the loss or disturbance of nesting trees, nests, and young; unfledged birds would likely be lost as habitat is removed. Indirect effects would be associated with the noise created by construction, as well as by human presence. Indirect effects would not likely cause significant impacts to non-nesting birds, as they likely would be temporarily displaced and would return once construction in that area is completed. Construction activities occurring adjacent to nesting individuals could result in nest abandonment, which would subsequently result in the chilling or mortality of eggs and young, or premature fledging and ejection from the nest. Within 10 specific forested areas of fragmentation concern, identified by FWS in the Conservation Guidelines, Rockies Express would be required to delay construction until after July 15 to avoid impacts to the majority of nesting birds.

We note that EO 13186 requires federal agencies to avoid or minimize negative impacts on migratory bird populations and to restore and enhance the habitat of migratory birds, as practicable. The EO also requires a federal agency to identify where an unintentional "take" is likely to have a measurable negative effect on migratory bird populations. Effects on nonsensitive bird species (those that do not have significantly reduced populations) would not result in long-term or significant population-level impacts, given the stability of local populations, the abundance of available habitat outside the Project

right-of-way, and the linear nature of the Project over a large geographic range. Potential impacts on tree-nesting species would be minor, given the limited amount of forested land crossed by the REX East Project, collocation of the pipeline to the extent practicable, and our recommendation to comply with the Conservation Guidelines.

In addition to implementation of its Plan and Procedures, Rockies Express has developed and signed the Conservation Guidelines in consultation with FWS, which outlines the steps that it would follow to comply with the MBTA and the mitigation measures it would use to minimize impacts to migratory birds. Because we believe adherence to all mitigation measures described in the Conservation Guidelines is important, **we recommend that:**

- **Rockies Express comply with the Conservation Guidelines developed in consultation with FWS to minimize impacts to forested lands and migratory birds during construction and operation of the Project.**

With the implementation of Rockies Express' Plan and Procedures, which include measures to limit routine maintenance clearing to not more than once every 3 years (with the exception of a 10-foot wide corridor centered over the pipeline which may be maintained annually) and never between April 15 and August 1 to limit impact to nesting birds, as well as implementation of our recommendations regarding compliance with the implementation of the Conservation Guidelines, we believe that the REX East Project would minimize impact to migratory bird species.

4.5.4 Managed and Sensitive Wildlife Areas

Construction of the Project would cross 11 areas considered to be significant or sensitive wildlife habitats (see table 4.5.4-1). Impacts to the habitats and wildlife species would be based on the habitat type and crossing methods, as previously discussed. Areas with recreational or special land uses are also discussed in section 4.8.5. Waterbodies judged to contain significant or sensitive habitat or listed species are considered to be fisheries of special concern and are discussed in sections 4.3.5 and 4.6.2. Those waterbodies would be affected during construction by increased turbidity, sedimentation, and removal of cover (structure and riparian vegetation). USDA-managed lands that would be impacted are discussed in section 4.4.3. Intact forests and classified forests in Indiana are discussed in section 4.4.

Missouri

Pipeline construction through Missouri would impact two COAs: Grassy Creek COA and Upper Mississippi COA, both of which are part of the Ted Shanks Alluvial Complex, an Important Bird Area (as designated by the National Audubon Society). COAs are designated based on the natural community; rare or threatened species, their habitat, or opportunity for recovery; and/or stream systems of high integrity, minimal alterations, or species diversity. Important bird areas provide habitat for bird species of conservation concern, those with restricted ranges, or those that congregate in large numbers.

Grassy Creek Conservation Opportunity Area

The Grassy Creek COA, also known as the Ted Shanks Conservation Area, is managed by MDC and private parties. The Grassy Creek COA is managed for aquatic criteria (stream integrity and fish spawning and nursing potential), but has a rich diversity of both aquatic and terrestrial species. The area provides abundant migratory stopover and breeding habitat for water and forest birds, such as the pied-billed grebe, king rail, bald eagle, American and least bitterns, common moorhen, and bobolink. This area is known to have one of the largest king rail populations in the Midwest; however, the specific areas

Table 4.5.4-1

Significant or Sensitive Wildlife Habitats Crossed by the Proposed Project a/

Wildlife Habitat	County	Milepost	Habitat Significance	Proposed Crossing Schedule	Peak Hunting/ Migratory Season
Missouri					
Grassy Creek Conservation Opportunity Area	Pike	33.4-42.2	Aquatic criteria, biological richness, resource for migratory birds	June to November 2008 b/	Hunting: Deer: Sept. 15-Nov. 15 Waterfowl: Sept. 1-Apr. 30 Turkey: Apr. 15-May 15 and Oct. Bird Migrations: Oct. 15-Mar. 31
Upper Mississippi Conservation Opportunity Area	Pike	42.6-42.9	Terrestrial criteria, species of conservation concern, resource for migratory birds	June to November 2008 b/	Hunting: Deer: Sept. 15-Nov. 15 Waterfowl: Sept. 1-Apr. 30 Turkey: Apr. 15-May 15 and Oct. Bird Migrations: Oct. 15-Mar. 31
Ohio					
Little Miami Scenic State Park	Warren	451.6-451.7	Undeveloped shorelines, special status species	June to November 2008 b/	Hunting: N/A Bird Migrations: Apr. 1-May 31, Aug. 1-Oct. 30
Caesar Creek State Park	Clinton	459.5-459.6	Nature preserve	June to November 2008 b/	Hunting: N/A Bird Migrations: Apr. 1-May 31, Aug. 1-Oct. 30
Caesar Creek Wildlife Area	Clinton	459.6-459.8	Nature preserve	June to November 2008 b/	Hunting: Deer: Sept. 29-Dec. 30 Migratory game: Sept. 1-Nov. 25 Bird Migrations: Apr. 1-May 31, Aug. 1-Oct. 30
Deer Creek State Park	Pickaway	499.9-500.9	Nature preserve	June to November 2008 b/	Hunting: N/A Bird Migrations: Apr. 1-May 31, Aug. 1-Oct. 30
Deer Creek Wildlife Area	Pickaway	498.8-499.9, 500.8	Nature preserve	June to November 2008 b/	Hunting: Deer: Sept. 29-Dec. 30 Migratory game: Sept. 1-Nov. 25 Bird Migrations: Apr. 1-May 31, Aug. 1-Oct. 30
Perry State Forest	Perry	558.5-558.7, 558.9-559.9	Nature preserve	June to November 2008 b/	Hunting: Deer: Sept. 29-Dec. 30 Migratory game: Sept. 1-Nov. 25 Bird Migrations: Apr. 1-May 31, Aug. 1-Oct. 30
Blue Rock State Forest	Muskingum	581.6-582.7	Nature preserve	June to November 2008 b/	Hunting: Deer: Sept. 29-Dec. 30 Migratory game: Sept. 1-Nov. 25 Bird Migrations: Apr. 1-May 31, Aug. 1-Oct. 30

Table 4.5.4-1 (continued)
Significant or Sensitive Wildlife Habitats Crossed by the Proposed Project a/

Wildlife Habitat	County	Milepost	Habitat Significance	Proposed Crossing Schedule	Peak Hunting/ Migratory Season
Captina Creek Preserve	Belmont	RR 2010-MP619.8+5.0 to RR 2010-MP619.8+5.5	Nature preserve	July 15 to November 2008 b/	Hunting: NA Bird Migrations: Apr. 1-May 31, Aug. 1-Oct. 30
Raven Rocks	Belmont	628.5-630.3	Nature preserve	June to November 2008 b/	Hunting: NA Bird Migrations: Apr. 1-May 31, Aug. 1-Oct. 30

a/ Crossing schedules for waterbodies within these habitats are discussed in section 4.6.
b/ Birdnature, 2008; ODNR, 2008; MDC, 2008.

impacted by construction of the proposed pipeline are not considered to be suitable habitat for the king rail (FWS, 2007d; MDC, 2007a). The area is approximately 6,705 acres and contains numerous wildlife habitats, including bottomland hardwoods and wetlands (MDC, 2007b). Rockies Express would cross the Grassy Creek COA between MPs 33.4 and 42.2 using conventional construction methods, which would have a long-term, temporary effect on 96.9 acres of forested land, and temporarily affect 9.2 acres of herbaceous land and 27.3 acres of agricultural land. Permanent impacts would include 38.8 acres of forested land, 3.6 acres of herbaceous land, and 10.9 acres of agricultural land. The pipeline route would parallel an existing right-of-way for approximately 7.8 miles of the 8.8 miles within the Grassy Creek COA, minimizing impacts from fragmentation.

Upper Mississippi Conservation Opportunity Area

The Upper Mississippi COA, located on Blackburn Island, is managed by MDC. This COA contains a vast wetland complex and numerous species of conservation concern, including the prothonotary warbler, a migratory bird that likely breeds in the bottomland forests. The area between MPs 42.6 and 42.9 would be crossed by the HDD method, limiting impacts to the clearing of the HDD pit, which would have a long-term, temporary impact on 5.4 acres of bottomland forests. Operational impacts would result in permanent impacts to 0.5 acre of forested land that would be maintained in an herbaceous state.

Migratory birds (mainly ducks and geese) use the two COAs between October 15 and March 31, with peak numbers around December 1 and again around March 1. Hunting seasons within the COAs extend from September 1 through April 30 (for waterfowl); from September 15 and November 15 (for deer); from April 15 to May 15 (for spring turkey); and all of October (for fall turkey) (MDC, 2008).

Rockies Express would minimize impacts to the COAs during construction and operation through implementation of its Plan and Procedures, including limiting maintenance of the right-of-way to once every 3 years, and never between April 15 and August 1 to limit impact to nesting birds. In addition, Rockies Express, in consultation with MDC, has developed best management practices that would limit impacts within the COAs, including utilizing timing restrictions, reducing construction right-of-way, reducing riparian clearing, revegetation practices, and invasive species control. However, construction of the Project would occur between June and November 2008, which would overlap with migration times for birds (October 15 through March 31) and peak hunting seasons for waterfowl, deer, and turkey (variable between September 1 and May 15). MDC has requested that Rockies Express not construct through these

areas between September 15 and May 15 to avoid peak migration and hunting periods (MDC 2008). Therefore, **we recommend that**:

- **Rockies Express develop construction schedules in consultation with the MDC and appropriate agencies responsible for managing the Grassy Creek and the Upper Mississippi COA to minimize construction-related impacts on migratory birds, waterfowl, deer, and turkey, prior to the start of construction.**

With the implementation of our recommendation, the Rockies Express Plan and Procedures, and measures developed in consultation with MDC to minimize impacts to these areas, we do not believe that the REX East Project would significantly reduce the amount of quality wildlife habitat available within the Grassy Creek and Upper Mississippi COAs, or the associated Important Bird Area. For further discussion on the Grassy Creek and Upper Mississippi COA, see section 4.8.5.

Illinois

No significant or sensitive wildlife habitats would be crossed by the Project in Illinois.

Indiana

No significant or sensitive wildlife habitats would be crossed by the Project in Indiana.

Ohio

Little Miami Scenic State Park

The Little Miami Scenic State Park, managed by ODNR, would be crossed between MPs 451.6 and 451.7. The park is linear, running along the Little Miami River for approximately 50 miles across Ohio and providing various recreational activities, such as fishing and bird watching. The area also contains forested lands that are used by great blue heron (ODNR, 2006f). The park would be crossed by the HDD and horizontal bore methods, limiting long-term, temporary impacts to approximately 0.1 acre of forested lands and temporary impacts to 0.1 acre of agricultural lands. In addition, in section 4.8.5 we have recommended that Rockies Express develop a plan for the construction and restoration of the Little Miami Scenic State Park in consultation with the ODNR.

Caesar Creek State Park and Wildlife Area

The Project would cross both Caesar Creek State Park (between MPs 459.5 and 459.6) and the adjacent Caesar Creek Wildlife Area (between MPs 459.5 and 459.8), both of which are managed by the ODNR. The park is a 4,700-acre area containing scattered woodlands, meadows, and steep ravines. The various vegetative communities support 65 plant species, as well as animal species such as the red-tailed hawk, white-tailed deer, red fox, and box turtles (ODNR, 2006a). The park would be crossed by the HDD method, eliminating impacts. About 2,500 acres of the wildlife area is used by deer, turkey, waterfowl, and rabbits. The wildlife area would be crossed by conventional open-cut, impacting 1.4 acres of forested lands and 1.1 acres of agricultural lands, and open water (0.1 acre). The operational right-of-way would include 0.4 acre of agricultural land, 0.5 acre of forested land, and less than 0.1 acre of open water and would have no significant impact on the quality of wildlife habitat in these two areas. In addition, in section 4.8.5 we have recommended that Rockies Express develop a site-specific crossing, mitigation, and restoration plan for construction through the Caesar Creek State Park and Wildlife Areas in consultation with ODNR.

Deer Creek State Park and Wildlife Area

Deer Creek State Park and its adjacent wildlife area are both managed by ODNR. Deer Creek State Park would be crossed between MPs 499.9 and 500.9 in Pickaway County, Ohio. Approximately 2,337 acres of the park provide fishing and hunting opportunities, and the habitat contains various species of amphibians, reptiles, mammals, and birds (ODNR, 2006c). The wildlife portion of the park is approximately 4,085 acres and would be crossed by the Project for 1.1 miles between MPs 498.8 and 499.9. This area also supports hunting, fishing, and bird-watching activities (ODNR, 2006d). HDD, open-cut, and horizontal bore crossing methods would be used to cross the State Park and Wildlife Area, resulting in a temporary impact to forested (9.3 acres) and agricultural (22.5 acres) lands during construction. Permanent impacts within these two areas would include 6.3 acres of forested lands and 6.5 acres of agricultural lands.

Perry and Blue Rock State Forests

The Perry and Blue Rock State Forests are both managed by ODNR for reforestation efforts (ODNR, 2007a,c), habitat preservation, and recreational opportunities (such as hunting and wildlife viewing). The Perry State Forest in Perry County would be crossed by conventional methods at two locations: between MPs 558.5 and 558.7, and between MPs 558.9 and 559.9. The total impact to these areas would include 18.1 acres of forested land; however, the pipeline route would be collocated with existing rights-of-way for the entire crossing length, minimizing habitat fragmentation. The Blue Rock State Forest in Muskingum County would be crossed by conventional methods between MPs 581.6 and 582.7, impacting 16.7 acres of forested lands. The forested lands may recover, but the impacts would be long-term. Permanent impacts to the Perry and Blue Rock State Forests would be 7.3 and 6.7 acres, respectively. In a September 12, 2007 letter, FWS expressed concerns about impacts to migratory birds through forest fragmentation in Perry and Muskingum Counties. As the pipeline is collocated through Perry State Forest, the existing corridor would be widened during construction, but no further fragmentation would occur. We have recommended in section 4.8.5 that Rockies Express develop a site-specific crossing, mitigation, and restoration plan for construction activities through the Perry and Blue Rock State Forests.

We believe, with the implementation of Rockies Express' Plan and Procedures, AIMP, and Weed Management Plan (CD Document F), and our recommendation for site-specific mitigation and restoration, the REX East Project would have minimal impacts on the quality of wildlife habitat in Perry and Blue Rock State Forests.

Captina Creek Preserve

Captina Creek Preserve is a privately owned woodland preserve in Belmont County, Ohio. The Preserve would be crossed between RR 2010-MP619.8+5.0 and RR 2010-MP619.8+5.5 by open-cut construction. Temporary impacts would occur on 3.8 acres of herbaceous lands. Long-term, temporary impacts would occur on 3.7 acres of forested land. Permanent impacts would be limited to 2.8 acres of forested area that would be within the permanently maintained right-of-way. We believe, with the implementation of Rockies Express' Plan and Procedures, AIMP, and Weed Management Plan (CD Document F), the REX East Project would have minimal impact on the quality of wildlife habitat in the Captina Creek Preserve. FWS expressed concerns about impacts to migratory birds through forest fragmentation in Belmont County. In accordance with our recommendation in section 4.5.3 that Rockies Express comply with the Conservation Guidelines, construction through this area would not begin prior to July 15 to avoid impacts to the majority of nesting birds. For further discussion on the Captina Creek Preserve, see section 4.8.5.

Raven Rocks

Raven Rocks, a privately owned preserve, would be crossed by the pipeline between MPs 628.5 and 630.3 in Belmont County, Ohio. The area currently preserves approximately 1,260 acres of scenic ravines, hills, and woodlands (including high-quality hemlock-hardwood forest). The proposed conventional crossing of this area would require the clearing of 25.5 acres of forested land and 1.9 acres of agricultural land. The permanent right-of-way would require maintenance of 10.9 acres of land, of which 10.1 are forested. Although FWS expressed concerns about impacts to migratory birds through forest fragmentation in Belmont County, the pipeline route through Raven Rocks parallels an existing power line right-of-way, and construction would not cross special use areas of the preserve; therefore, construction of the REX East Project would have minimal impact on Raven Rocks Preserve. For further discussion on Raven Rocks, see section 4.8.5.

Sensitive and significant wildlife areas may support greater numbers and diversity of species during certain times of the year. Migratory birds pass through the Project area during spring and fall, utilizing many of the sensitive wildlife areas crossed by the Project. As construction of the Project is scheduled to commence in the spring of 2008, it would overlap with spring migration, causing impacts to more birds through loss or disturbance of nesting habitat and nest abandonment, than would be incurred during non-migratory times when fewer birds would be present. To minimize impacts to migratory birds within sensitive wildlife areas we have recommended in section 4.5.3 that Rockies Express comply with the Conservation Guidelines developed in consultation with FWS.

We believe, with the implementation of our recommendations, use of HDD and bore crossings where practicable, and implementation of Rockies Express' Plan and Procedures, AIMP, Weed Management Plan (CD Document F), and Blasting Plan (CD Document C), the REX East Project would minimize impacts on the quality of wildlife habitat in these managed and sensitive wildlife areas in Missouri and Ohio.

4.6 FISHERIES

4.6.1 Fisheries Resources

All waterbodies affected by the Project have been classified as warmwater fisheries. Of the 1,485 waterbody crossings, 59 would involve fisheries of special concern. No essential fish habitat, as defined by the Magnuson-Stevens Fishery Conservation and Management Act, would be affected by the Project.

Some of the more common warmwater fish species that occur within the Project area are bass, bluegill, black bullhead, bigmouth buffalo, common carp, catfish, crappie, freshwater drum, saugeye (walleye/sauger), gizzard shad, river carpsucker, sunfish, and walleye. Commercially harvested fish species are found in Missouri, Illinois, and Indiana watersheds. These species include the bigmouth buffalo, common carp, channel catfish, freshwater drum, gizzard shad, and river carpsucker.

Construction of the Project, including hydrostatic testing, could result in several impacts on fisheries resources. Potential impacts on fisheries include increased stress due to changes in water quality, and the alteration and removal of instream and streambank cover. Removal of cover within and adjacent to a waterbody during construction would decrease the habitat value of that waterbody. Removal of rocks and branches from the streambed would reduce the structure available for fish to aggregate. Loss of riparian vegetation would reduce shading of the waterbody, increasing the temperature of the water at that location. Removal of riparian vegetation would also increase the likelihood of streambank erosion and the subsequent sedimentation of the waterbody. Overall, these impacts would be minor due to the relatively small area in which a waterbody would be affected.

The extent of impacts on fisheries would depend on the construction method used to cross the waterbody, the existing conditions at each crossing location, the duration of instream activity, the seasonal timing of instream construction, and the mitigation measures used.

Rockies Express proposes to use the open-cut method for most of the waterbodies that would be crossed by the Project. Open-cut construction could result in increased turbidity and sedimentation in the crossing vicinity, potentially decreasing the dissolved oxygen, thereby potentially suffocating the eggs and larvae of fish and invertebrates. Sedimentation could displace the more mobile species and potentially smother benthic invertebrates, decreasing prey availability for fish. These effects could degrade the quality of the habitat, making it unsuitable for spawning and rearing activities. Impacts from open-cut construction would be temporary and limited to the crossing location and areas immediately downstream. Impacts would normally be limited to a few days, and generally no longer than one month after construction ends, depending on conditions at the crossing, the type and amount of suspended sediment, and other factors.

Dry-ditch methods, such as flume and dam-and-pump, would also be used to cross project waterbodies. Both crossing methods would maintain water flow and decrease impacts from turbidity and sedimentation. Temporary impacts from sedimentation and turbidity would generally be limited to periods of active construction within a waterbody. Benthic invertebrates located in an area where water is diverted would experience direct adverse impacts. Larger, more mobile species would experience little to no impact through use of the flume or dam-and-pump method.

Rockies Express proposes to use 21 HDDs to cross 32 waterbodies (see appendix G). Successful use of an HDD crossing would avoid direct impacts on the waterbody. In the event of a frac-out, or a release of drilling fluid during an HDD crossing of a waterbody, benthic invertebrates and fish eggs and larvae could be smothered and the more mobile species could be displaced. These impacts would be minimized by Rockies Express' continuing geotechnical evaluations of the waterbodies to determine the

suitability of an HDD crossing and implementation of its HDD Contingency Plan (CD Document D). Bore crossings, as discussed in section 2.3, could also be used for small waterbody crossings and would avoid impacts on waterbodies by allowing the pipeline to be installed underneath the waterbody without disturbing the bank or bed.

Rockies Express may require blasting activities at 54 locations in or adjacent to perennial waterbodies along the Project right-of-way. Rockies Express would adhere to its site-specific Blasting Plan (CD Document C) and would file a blasting schedule with the FERC before beginning any construction where blasting would be required within each waterbody greater than 10 feet wide. If instream blasting is required, aquatic organisms close to blasting activities could be injured or killed. Temporary and minor impacts on aquatic resources from blasting activities would be expected. However, the preparation for blasting may displace many aquatic organisms from the immediate vicinity of blasting activities. Rockies Express would immediately remove all blasted rock from the area to prevent any obstruction or slowing of stream flows.

Rockies Express' Plan and Procedures contain measures that would minimize construction impacts on fish and aquatic/streambank habitat. Temporary erosion controls, such as silt fences and strawbales, would be installed immediately after vegetation removal, and rootstock would be left in the ground where possible to promote revegetation. Rockies Express would also take measures to improve the probability of successful revegetation within disturbed areas, as described in its Plan and Procedures.

Erosion and sediment control measures would prevent sediment from leaving the construction site and entering waterbodies. Impacts on the fisheries from erosion would also be minimized by limiting the amount of time that construction activities would take within a waterbody. Minor waterbodies (less than 10 feet wide) and intermediate waterbodies (10 to 100 feet wide) would be crossed in 24 and 48 hours, respectively. Major waterbody crossings (greater than 100 feet across) would require a site-specific crossing plan. Additionally, streambanks would be stabilized within 24 hours after construction has been completed.

The season in which construction takes place can influence the degree of impacts associated with instream activities. Construction during periods of sensitive fish activity (i.e., spawning and migration) could have a greater impact on fish than construction during other periods. Several agencies have recommended construction timing restrictions at fish-bearing waterbodies crossed by the proposed pipeline. These timing restrictions are designed to prevent disturbance on fish spawning activities and limit destruction of instream habitat. As stated in Rockies Express' Procedures, instream construction activities at warmwater fisheries must occur from June 1 to November 30, unless otherwise permitted or restricted by the applicable agency. ILDNR has recommended that construction not be conducted in waterbodies within Illinois between March 1 and June 30 to avoid the spawning periods of local fish. INDNR has recommended that construction, including installation of bridges, not be conducted in waterbodies within Indiana between April 1 and June 30 without the prior written consent of the Indiana Division of Fish and Wildlife. We believe a bridge that could span the waterbody, and not require instream construction, would minimize impacts on any spawning fishes. The Ohio Power Siting Board, of which the ODNR is a part, recommends that no instream work be conducted between April 15 and June 30. We agree with these agencies and **we recommend that:**

- **Rockies Express comply with the waterbody crossing time windows established by the ILDNR (no construction activities from March 1 to June 30), the INDNR (no construction activities, including installation of bridges requiring instream support, between April 1 and June 30), and the OPSB (no construction activities between April 15 and June 30), unless provided with written approval from the appropriate state agency.**

The withdrawal of hydrostatic test water has the potential to affect fisheries from entrainment and loss of prey organisms, as well as through the loss of fish and invertebrates during early life stages. Rockies Express would withdraw water from local waterbodies for hydrostatic testing (see section 4.3.6 for details about potential withdrawal locations). The intakes for these withdrawals would be screened and located off the stream bottom to minimize the intake of large or benthic organisms and sediment.

Impacts on fisheries from hydrostatic test water withdrawals would be limited by Rockies Express adhering to its Procedures. Specifically, Rockies Express would maintain adequate flow rates in order to protect fisheries and generally try to locate hydrostatic test manifolds outside wetlands and riparian areas to the maximum extent practicable. In addition, our recommendations in sections 2.3, 4.7.1, and 4.7.2 would further limit impacts on fisheries from hydrostatic test water withdrawals.

After the integrity of the pipeline is established, the untreated hydrostatic test water would be discharged back into the source waterbody, if allowed by permit. Otherwise, hydrostatic test water would be discharged to upland areas. Water used from municipal or industrial sources would also be discharged into well vegetated upland areas. If discharge rates are not carefully controlled, the discharge of large volumes of hydrostatic test water into surface waters could temporarily affect the biological uses of the resources. Hydrostatic discharges could result in a change in water temperature and dissolved oxygen levels, cause an increase in downstream flows and turbidity levels, and contribute to streambank and substrate scour. To minimize impacts, Rockies Express would discharge the water at a rate between 2,000 and 5,000 gpm through an energy-dissipating device to prevent erosion, streambed scour, suspension of sediments, and increased downstream flow. Rockies Express would discharge the hydrostatic test water in accordance with any applicable local, state, or federal permits (e.g., NPDES Permits).

Fuels and other hazardous materials could spill or leak from storage containers, equipment working in or near streams, or fuel transfers. Any spill that reaches a waterbody would be detrimental to the fisheries. The chemicals released during spills could have acute, direct effects on fish, or could have indirect, chronic effects such as altered behavior, changes in physiological processes, or changes in food sources. Large spills also could cause the direct mortality of species within the waterbody and indirect effects on the local food chain through ingestion of contaminated prey. To minimize the potential for spills, Rockies Express would implement its SPCC Plan (CD Document E), which specifies preventive measures such as training the personnel that handle fuel and hazardous materials, as well as regular equipment inspection and maintenance. Rockies Express would designate restricted refueling areas in locations where the typical 100-foot buffer between fueling activities and waterbodies cannot be maintained. Any activities required in the restricted areas would be verified and approved by the EI. If a spill were to occur, adherence to measures in Rockies Express' SPCC Plan (CD Document E) would reduce the time Rockies Express would need to control and clean up a spill, thus avoiding or minimizing the effects of a spill on fisheries resources.

Impacts on fisheries through the resuspension of contaminated sediments would be similar to those discussed above. No waterbodies that would be crossed by the Project are listed on the EPA's Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database of Superfund Information Systems, which lists Superfund sites, or the EPA's National Priority List, which lists known or threatened releases of hazardous substances, pollutants, or contaminants (EPA, 2007b).

We believe through the use of HDD and dry crossing methods where practicable, implementation of the Rockies Express Procedures, and our recommendations (including construction timing windows),

impacts on fisheries resources during construction of the Project would be minimized. No impacts on fisheries resources would be expected as a result of pipeline operations.

4.6.2 Fisheries of Special Concern

Fisheries of special concern would include those areas containing exceptional recreational or commercial fisheries, specially designated streams or rivers, and waterbodies supporting threatened or endangered aquatic species. In addition, we have considered primary tributaries to designated Wild and Scenic Rivers to be fisheries of special concern due to concerns raised by NPS. The REX East Project would cross 59 fisheries of special concern, including 1 waterbody on the border of Missouri and Illinois, 1 in Illinois, 8 in Indiana, and 49 in Ohio. Information on fisheries of special concern that would be crossed by the Project is provided in table 4.6.2-1. Threatened or endangered species that occur in these waterbodies are discussed in section 4.7.

Table 4.6.2-1
Fisheries of Special Concern Crossed by the Project

Waterbody	Crossing Location (MP) a/	Width (feet)	Waterbody Type	Proposed Crossing Method b/	Reason for Designation c/
Missouri/Illinois					
Mississippi River	43.2	1,500	Perennial	HDD	SSS–FC spectaclecase
Illinois					
Embarras River	202.9	50	Perennial	HDD	Biologically significant stream
Indiana					
Big Walnut Creek	281.5	56	Perennial	HDD	OR–recreation, SSS–FE clubshell
White River	315.8	225	Perennial	Dam and Pump/Flume	ORV–fish and wildlife
Sugar Creek	337.9	40	Perennial	Open-cut	OR–ecology, INE rabbitsfoot
Big Blue River	340.8	160	Perennial	HDD	ORV–fish and wildlife, OR–ecology
Flatrock River	362.7	60	Perennial	Open-cut	OR–ecology, SSS–FE clubshell
Whitewater River	393.1	60	Perennial	HDD	OR–ecology and recreation, SSS–INE variegate darter
Little Cedar Creek	394.7	30	Perennial	Open-cut	SSS–INE variegate darter
Big Cedar Creek	397.5	45	Perennial	Open-cut	SSS–INE variegate darter
Ohio					
Dry Fork Whitewater River	407.2	50	Perennial	Open-cut	EWH
Lick Run	411.8	7	Perennial	Open-cut	EWH
Lick Run	412.0	15	Perennial	Open-cut	EWH
Four Mile Creek	421.6	278	Perennial	HDD	ORV–fish, EWH

Table 4.6.2-1 (continued)

Fisheries of Special Concern Crossed by the Project

Waterbody	Crossing Location (MP) a/	Width (feet)	Waterbody Type	Proposed Crossing Method b/	Reason for Designation c/
Seven Mile Creek	422.7	45	Perennial	HDD	SSS–OHT tongue-tied minnow
Great Miami River	430.7	293	Perennial	HDD	EWH
Tributary to Clear Creek	448.4	15	Intermittent	Open-cut	EWH
Tributary to Newman Run	451.2	3	Intermittent	HDD	EWH
Little Miami River	451.3	60	Perennial	HDD	EWH, WSR, SSS–OHE snuffbox, and OHT fawnsfoot
Tributary to Little Miami River	451.9	3	Perennial	Dam and Pump/Flume	EWH, WSR tributary
Tributary to Little Miami River	451.9	6	Intermittent	Dam and Pump/Flume	EWH, WSR tributary
Tributary to Little Miami River	452.0	4	Ephemeral	Dam and Pump/Flume	EWH, WSR tributary
Tributary to Little Miami River	452.0	3	Ephemeral	Dam and Pump/Flume	EWH, WSR tributary
Tributary to Little Miami River	452.3	2	Ephemeral	Dam and Pump/Flume	EWH, WSR tributary
Tributary to Little Miami River	452.5	13	Intermittent	Dam and Pump/Flume	EWH, WSR tributary
Tributary to Little Miami River	452.6	8	Intermittent	Dam and Pump/Flume	EWH, WSR tributary
Tributary to Little Miami River	453.3	2	Intermittent	Dam and Pump/Flume	EWH, WSR tributary
Tributary to Little Miami River	453.4	1	Intermittent	Dam and Pump/Flume	EWH, WSR tributary
Tributary to Little Miami River	453.4	3	Ephemeral	Dam and Pump/Flume	EWH, WSR tributary
Tributary to Little Miami River	454.1	4	Intermittent	Dam and Pump/Flume	EWH, WSR tributary
Tributary to Little Miami River	454.2	8	Perennial	Dam and Pump/Flume	EWH, WSR tributary
Tributary to Caesar Creek	454.4	7	Intermittent	Dam and Pump/Flume	EWH
Tributary to Caesar Creek	454.4	3	Ephemeral	Dam and Pump/Flume	EWH
Tributary to Little Miami River	454.5	7	Intermittent	Dam and Pump/Flume	EWH, WSR tributary
Tributary to Little Miami River	454.5	10	Perennial	Dam and Pump/Flume	EWH, WSR tributary
Tributary to Little Miami River	454.7	7	Perennial	Dam and Pump/Flume	EWH, WSR tributary
Tributary to Little Miami River	455.0	2	Ephemeral	Dam and Pump/Flume	EWH, WSR tributary

Table 4.6.2-1 (continued)

Fisheries of Special Concern Crossed by the Project

Waterbody	Crossing Location (MP) a/	Width (feet)	Waterbody Type	Proposed Crossing Method b/	Reason for Designation c/
Tributary to Little Miami River	455.0	14	Perennial	Dam and Pump/Flume	EWH, WSR tributary
Tributary to Little Miami River	455.2	10	Perennial	Dam and Pump/Flume	EWH, WSR tributary
Tributary to Little Miami River	455.2	2	Ephemeral	Dam and Pump/Flume	EWH, WSR tributary
Tributary to Shaffers Run	455.4	3	Perennial	Dam and Pump/Flume	EWH
Shaffers Run	455.4	23	Perennial	Dam and Pump/Flume	WSR tributary
Tributary to Little Miami River	458.6	2	Ephemeral	Dam and Pump/Flume	WSR tributary
Caesar Creek	459.6	134	Perennial	HDD	Foraging and spawning habitat, EWH
Sugar Creek	484.3	30	Perennial	Open-cut	SSS–FE clubshell,
Deer Creek	499.6	100	Perennial	HDD	Foraging and spawning habitat
Tributary to Big Darby Creek	509.1	3	Ephemeral	HDD	WSR tributary
Big Darby Creek	509.2	170	Perennial	HDD	WSR, ORV–fish and wildlife, EWH, SSS–FE northern riffleshell, OHE snuffbox, OHT fawnsfoot
Tributary to Big Darby Creek	509.9	2	Ephemeral	Dam and Pump/Flume	WSR tributary
Tributary to Big Darby Creek	509.9	3	Ephemeral	Dam and Pump/Flume	WSR tributary
Tributary to Big Darby Creek	510.1	20	Intermittent	Dam and Pump/Flume	WSR tributary
Tributary to Big Darby Creek	510.2	1	Ephemeral	Dam and Pump/Flume	WSR tributary
Tributary to Big Darby Creek	510.8	5	Ephemeral	Dam and Pump/Flume	WSR tributary
Scioto River	514.6	200	Perennial	HDD	SSS–FE northern riffleshell, FE clubshell, OHE rabbitsfoot/ OHE longsolid
Walnut Creek	515.9	90	Perennial	HDD	EWH
Turkey Run	520.2	20	Perennial	Open-cut	EWH
Tributary to Little Walnut Creek	520.5	15	Perennial	Open-cut	EWH

Table 4.6.2-1 (continued) Fisheries of Special Concern Crossed by the Project					
Waterbody	**Crossing Location (MP) a/**	**Width (feet)**	**Waterbody Type**	**Proposed Crossing Method b/**	**Reason for Designation c/**
Little Walnut Creek	526.6	30	Perennial	Open-cut	EWH
Muskingum River	577.2	420	Perennial	HDD	SSS–OHT fawnsfoot, OHT eastern hellbender

a/ Mileposts (MP) based on a desktop analysis of the proposed pipeline route (may not match those found in Wetland and Waterbody reports).
b/ HDD = horizontal directional drilling.
c/ ORV=outstandingly remarkable value, OR=outstanding river, WSR=wild and scenic river, EWH=exceptional warmwater habitat, SSS=special status species, FE=federally listed endangered, INE=Indiana-listed endangered, OHE=Ohio-listed endangered, OHT=Ohio-listed threatened, FC=federal candidate.

Waterbodies discussed as having ORVs are either designated as Wild and Scenic Rivers, and protected under the WSR Act of 1968, or are listed in the NRI as potentially eligible for designation as a Wild and Scenic River. All federal agencies must seek to avoid or mitigate actions that would adversely affect one or more NRI segments or Wild and Scenic Rivers. A complete list of Wild and Scenic Rivers and NRI-listed rivers that would be crossed by the Project (including those not having ORVs for fish and/or wildlife) is discussed in section 4.3.5.

The REX East Project would cross two Ohio waterbodies with significant spawning aggregations—Caesar Creek (MP 459.6) and Deer Creek (MP 499.6). Caesar Creek is one of the larger tributaries to Caesar Creek Lake, providing spawning runs for white bass. Likewise, Deer Creek is the headwater of Deer Creek Lake and an important tributary for white bass spawning runs. White bass migrate upstream to spawn in late April through May. As proposed, impacts on Caesar Creek and Deer Creek would be avoided by Rockies Express' implementation of the HDD crossing method. Rockies Express would conduct HDD crossings to avoid impacts on an additional 15 fisheries of special concern.

Big Walnut Creek, Sugar Creek (MP 337.9), Big Blue River, Flatrock River, and Whitewater River are state-designated in Indiana as Outstanding Rivers for outstanding ecological or recreational importance. The White River, Big Blue River, Four Mile Creek, and Big Darby Creek are designated for fish and/or wildlife ORVs, as defined in section 4.3.5. Big Walnut Creek, Big Blue River, Whitewater River, Four Mile Creek, and Big Darby Creek would be crossed using the HDD method, which would eliminate direct impacts on the waterbody if the HDD is successful. A geotechnical study has determined that an HDD crossing of the White River would not be feasible; however, as discussed in section 4.3.5, if water is present in the crossing location at the time of crossing and water flow permits, a dry crossing would be conducted and specific mitigation measures would be applied to minimize future impacts to the waterbody. In section 4.3.5, we have recommended that Rockies Express file consultations with applicable state and federal agencies for approval by the Director of OEP prior to crossing the White River with an alternative crossing method. Rockies Express proposes to cross Sugar Creek (MP 337.9) and Flatrock River using the open-cut method. Mitigation procedures for the open-cut method are described in section 4.3.4.

Rockies Express has agreed to conduct dry-ditch crossings for 30 fisheries of special concern. These include tributaries to Wild and Scenic Rivers and an NRI-listed river for which an HDD would not be feasible (the White River). As discussed in section 4.6.1, dry-ditch crossings minimize impacts on the waterbody by limiting the amount of turbidity and sedimentation. As shown in appendix G, Rockies Express has also agreed to cross secondary tributaries to Wild and Scenic Rivers by dry-ditch crossing

methods. In addition, 17 fisheries of special concern would be crossed by the HDD method, including Wild and Scenic Rivers, significant spawning rivers, biologically significant streams, and various streams containing special status species, avoiding impacts on the waterbodies and the fishery resources contained within them. In section 4.7.1, we have also recommended that a dry-ditch crossing method be used to cross Sugar Creek (MP 484.3).

We believe that a properly implemented waterbody crossing using an open-cut method, including adherence to specific construction time-of-year restrictions and other measures in the Procedures, would adequately minimize impacts on most aquatic resources and their instream impacts. Rockies Express currently proposes to open-cut 12 of the waterbodies considered to be fisheries of special concern, 5 of which are less than 30 feet wide. Rockies Express, as described in its Procedures, proposes to cross fisheries designated by a state as "significant" using a dry-ditch technique if the water-to-water width is less than 30 feet at the time of construction (unless otherwise permitted by the appropriate state agency). Dry-ditch techniques typically refer to the flume or dam-and-pump methods, but a bore or HDD may also be used. Because Rockies Express has not provided correspondence with state agencies approving an open-cut technique for any of the sensitive waterbodies, **we recommend that:**

- **Rockies Express use a dry-ditch technique, such as flume, dam-and-pump, bore, or HDD, to cross any waterbodies that are considered fisheries of special concern with a wetted width less than 30 feet, as described in table 4.6.2-1. If a wet crossing method would be used for waterbodies less than 30 feet, Rockies Express should file with the Secretary the proposed crossing method and documentation of approval by the appropriate state and federal agencies prior to the start of construction.**

We believe, with the implementation of our recommendations, use of HDD and dry crossings where practicable, and implementation of Rockies Express' Procedures, impacts on fisheries of special concern as a result of the REX East Project would be minimized.

4.7 THREATENED AND ENDANGERED SPECIES

Section 7 of the ESA requires the lead federal agency (the FERC) to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of a federally listed threatened or endangered species or result in the destruction or adverse modification of the designated critical habitat of a federally listed species. The agency is required to consult with FWS to determine whether any federally listed or proposed species or any critical or proposed critical habitat may occur in the Project area, and to determine the potential effects of the proposed actions on these species or critical habitats. To determine if the Project would adversely affect a listed species, we prepared a BA in accordance with Section 7 of the ESA and submitted it to FWS for review and concurrence.

To comply with Section 7 of the ESA, Rockies Express, as the FERC's non-federal representative, has been assisting the FERC by conducting informal consultation with FWS. The FERC also contacted and consulted with FWS about which species under their respective jurisdictions would be potentially affected by the Project. In addition to FWS, Rockies Express consulted with the Natural Heritage Program and other appropriate state and local agencies to develop a list of state-listed special status species in the Project area. Based on these consultations, we developed a list of federally and state-listed species that could occur in the Project vicinity.

In accordance with Section 7 of the ESA, through informal consultation with the FWS, Rockies Express initially identified 23 federally listed threatened, endangered, or candidate species as potentially occurring in the Project area. However, since the initial review, 10 of the 23 species are no longer being evaluated for the following reasons:

- The bald eagle has been delisted, and a discussion of the potential impacts on bald eagles is presented in section 4.5.3.

- There is no habitat for the black-footed ferret, Canada lynx, blowout penstemon, and Ute ladies'-tresses orchid at the Arlington Compressor Station in Carbon County, Wyoming, where these species could occur.

- The water needs at the Arlington Compressor Station, up to 1 acre-foot, qualify as an "existing water-related activity" under Wyoming's Depletion Plan and the Program[1] because it would be purchased from an entity that holds existing water rights covered under an existing water-related activity (the City of Laramie or the Town of Rock River). FWS issued a Programmatic Biologic Opinion in 2006 which determined that Program implementation, along with existing depletions and a specified amount of new depletions, may adversely affect but would not likely jeopardize the continued existence of several species. These include the federally endangered whooping crane, interior least tern, and pallid sturgeon, and the federally threatened northern Great Plains populations of the piping plover, western prairie fringed orchid, and bald eagle in the central and lower Platte River. The withdrawals from the Platte River associated with the Arlington Compressor Station would fall within the assessed water depletions contained in the Programmatic Biologic Opinion, and FWS has been notified of this determination. Further, FWS determined that the Program

[1] The State of Wyoming has entered into the Platte River Recovery Implementation Program (Program) with the U.S. Department of the Interior and the states of Colorado and Nebraska. The purpose of the Program is to ensure compliance with the ESA for certain historic and future uses in each state. Without such a Program, most water users proposing new projects or rehabilitating or improving existing projects would have to undergo an individual ESA consultation with FWS.

implementation was not likely to destroy or adversely modify designated critical habitat for the whooping crane (Wyoming State Engineer's Office, 2008).

- There is no habitat for the interior least tern, piping plover, or pallid sturgeon at the Bertrand Compressor Station in Phelps County, Nebraska, where these species could occur.

- The pink mucket pearly mussel and the sheepnose are no longer being evaluated, because the Project would no longer cross Morgan County, Ohio, where these species could potentially occur.

Therefore, these species are not evaluated in the EIS.

Table 4.7-1 lists the 10 federally listed threatened or endangered species and 3 candidate species that may occur in the Project area.

Rockies Express initially identified 31 state-listed threatened or endangered species as potentially occurring in the Project area. Sixteen of the state-listed species were eliminated from detailed review because they are transient in the Project area, are unlikely to adversely respond to temporary and permanent impacts associated with the proposed facilities, or were determined after the initial review, in consultation with the agencies, to probably not occur in the Project area. These species include: the big eye chub, little spectaclecase, black sandshell, butterfly mussel, bobcat, scarlet hawthorn, northern madtom, mountain madtom, Sloan's crayfish, Carolina willow, upland sandpiper, rock ramalina, American badger, cobblestone tiger beetle, diffuse rush, and white wood-sorrel.

A total of 15 state-listed species were identified as being potentially affected by the Project, and are discussed in section 4.7.2. No state-listed threatened or endangered species would be affected by the Project in Carbon County, Wyoming, the location of the proposed Arlington Compressor Station.

4.7.1 Federally Listed Species

Indiana Bat

Background

The federally endangered Indiana bat is listed as occurring in all of the counties crossed by the proposed pipeline route. Since this species was first listed as endangered in 1967, populations have declined by nearly 60 percent (FWS, 2002b). The Indiana bat is a temperate, insectivorous, migratory bat that utilizes mines, caves, and wooded habitats. Indiana bats use a spectrum of forest habitats that are utilized by maternity colonies, as well as male and non-reproductive (juvenile) female Indiana bats. Indiana bats can travel up to 300 miles in search of caves that provide the necessary habitat for hibernation. The bat hibernates in mines and caves from mid-October to April and later disperses to reproduce and forage in spring and summer in various forested areas associated with streams. The mines and caves provide stable cold temperatures. In late March to early June, females leave the caves and migrate to roosting areas (ODNR, 2007b). Individuals may roost under the bark of trees in riparian and upland forests, generally near perennial waterbodies. During the summer, maternity colonies typically occur behind sloughing bark or in cavities, often in, but not limited to, dead trees. Indiana bats forage on insects in and around the tree canopy of floodplain, riparian, and upland forests. Waterbodies associated with floodplain forests and impounded bodies of water such as ponds, reservoirs, and wetlands are sometimes considered preferred foraging habitats for bats (FWS, 2006e). Population declines are caused primarily by human disturbance during hibernation and the loss of suitable hibernacula (FWS, 2002b).

Table 4.7-1

Federally Listed Endangered, Threatened, and Candidate Species Potentially Occurring in the Project area

Species	Federal Status	State Status	Counties/State	Preferred Habitat	Preliminary Determination
Mammals					
Indiana bat (*Myotis sodalis*)	E	OH/E	All counties crossed by the pipeline route	Riparian and upland forests along proposed pipeline route	Not likely to adversely affect
Birds					
Whooping crane a/ (*Grus Americana*)	E	NE/E	Phelps/NE; and IN and OH a/	Winter migrant that nests in wetlands with protective vegetation	Not likely to adversely affect
Reptiles					
Eastern massasauga (*Sistrurus catenatus catenatus*)	C	MO, IL, IN, OH/E	Clinton, Fayette, Greene, and Warren/OH	Crayfish burrows in wetland areas	NA
Mussels					
Clubshell (*Pleurobema clava*)	E	OH/E	Greene, Pickaway, Fairfield/OH	Prefers medium to small waterbodies with sand or gravel substrate and low turbidity	Not likely to adversely affect
Fanshell (*Cyprogenia stegaria*)	E	OH/E	Muskingum/OH	Prefers medium to large waterbodies with sand or gravel substrate and low turbidity	Not likely to adversely affect
Fat pocketbook (*Potomalus capax*)	E	NL	Pike, Ralls/MO	Found in deep pools of large waterbodies with silt, mud, and sand substrates	No effect
Northern riffleshell (*Epioblasma torulosa rangiana*)	E	OH/E	Pickaway/OH	Firm sand or gravel substrate in various-sized waterbodies and low turbidity	Not likely to adversely affect
Rayed bean (*Villosa fabalis*)	C	OH/E	Pickaway, Warren/OH	Headwater species that requires low turbidity	NA
Spectaclecase (*Cumberlandia monodonta*)	C	IL/T	Pike /MO and ILL	Large rivers and low turbidity	NA
Plants					
Decurrent false aster (*Boltonia decurens*)	T	NL	Pike (MO and ILL), Scott/ILL	Prefers moist soil in open areas with regular disturbance	No effect
Eastern prairie fringed orchid (*Platanthera leucophaea*)	T	IL, OH/E	All counties crossed by the pipeline in ILL.	Requires full sunlight, inhabits tall grass calcareous silt/loam or sub-irrigated sand prairies, including calcareous wetlands	No effect
Prairie bush clover (*Lespedeza laptostachya*)	T	NL	All counties crossed by the pipeline in ILL.	Found in tall-grass prairies or steep slopes that have not been converted to prairies	No effect
Running buffalo clover (*Trifolium stoloniferum*)	E	NL	Warren/OH	Habitat generalist; requires moderate disturbance and cannot tolerate full sun or full shade	Not likely to adversely affect

a/ This includes an experimental migratory population.

T = Threatened
E = Endangered
C = Candidate for listing as Threatened or Endangered

NA = Not applicable – determination does not apply to candidate species, NL = Not listed

FWS has identified important habitat for this species near the Wabash River, Sugar Creek, Big Raccoon Creek, Big Walnut Creek, West Fork White River, and Big Darby Creek along the pipeline route. FWS additionally noted that the Indiana bat can be found among the Mississippi River islands and floodplain and within the floodplain areas of the Illinois side of the Mississippi River. FWS maintains that summer foraging and roosting habitat is likely to be present throughout the Project area (FWS, 2006b; FWS, 2006c; FWS, 2006d; FWS, 2006e).

Eleven caves/mines are designated as critical habitat for the Indiana bat, including caves in LaSalle County and Pike County, Illinois; Crawford County and Greene County, Indiana; Crawford County, Franklin County, Iron County, Shannon County, Pike County, and Washington County, Missouri. In the counties crossed by the REX East Project, there is one record of a Priority IV hibernaculum in Pike County, Missouri (located 8.5 miles from the REX East centerline) and one historic winter record of Indiana bats in Pike County, Illinois (located 17.4 miles from the proposed centerline), both of which are designated as critical habitat.

Human activities are a major cause of declining bat populations. Clusters of hibernating bats are highly susceptible to disturbance and vandalism. The clearing of forests decreases the amount of summer foraging and roosting habitat available to the Indiana bat. Rockies Express would minimize the amount of tree cutting and removal in areas documented as Indiana bat habitat.

Rockies Express has completed Indiana bat surveys to include mist net collection sites and roost site identification along the majority of the Project right-of-way. Because the Indiana bats are in their hibernacula from roughly mid-October to April, additional surveys cannot be initiated until March 2008. The mist surveys were conducted from May 14 through August 16, 2007, and 161 mist net surveys were completed across 40 unique habitat units (habitat unit IDs). Rockies Express has identified approximately 56 additional mist net sites that would be evaluated in consultation with FWS. Based on the evaluation results and the FWS consultation, the area would be surveyed prior to construction. Access was denied by the landowners for two habitat unit IDs along the route: one habitat unit is located in Pike County, Illinois and a second habitat unit is located in Belmont County, Ohio. Surveys have yet to be completed in these areas. Rockies Express would assume the presence of good Indiana bat habitat within these areas until all surveys are complete, as requested by FWS. One-hundred and sixty-one mist net sites were surveyed and 26 Indiana bats were counted during the survey (table 4.7.1-1).

In addition to the surveys completed by Rockies Express, a property owner who denied access to Rockies Express commissioned a mist net survey on his property between MP 291 and MP 291.3. A total of six lactating Indiana bats were captured during two nights of mist netting (Clark, 2007). The survey was completed by investigators who are permitted by FWS to capture and handle Indiana bats. The survey was completed adjacent to a site surveyed by Rockies Express (IN-19.5), which identified three roost trees in the area. This area is within Habitat Unit ID IN-19.5, which has been designated as containing nursery roost trees and will be re-surveyed in 2008 to verify the location of the nursery roost trees.

Impact Assessment

Construction of the pipeline through forested areas known to support or capable of supporting Indiana bats could result in direct and indirect impacts on the species. Potential direct impacts, or those that have immediate impacts on the species or occupied habitat, from the Project on Indiana bats could occur through changes to occupied foraging habitat, removal of or changes in potential roost trees in occupied habitat, injury or harm to individual bats, and/or disturbances near roosting bats.

Table 4.7.1-1
Indiana Bat Survey Results

County, State	Habitat Unit ID	Sex and Maturity of Bats Found	Number of Roosts Found	Roosts Located Within Project Right-of-way
Audrain, MO	MO-1.0	2 adult females	1	Not located within ROW
Pike, MO	MO-3.0	2 adult females; 4 adult males	0	No roosts found
Pike, IL	IL-1.0	1 juvenile female a/	0	No roosts found
Vermillion, IN	IN-0.5	3 adult females	3	None located within ROW
Parke, IN	IN-11.0	5 adult females; 2 adult males	5	None located within ROW
Putnam, IN	IN-18.0	1 adult female 1 adult male	0	No roosts found
Hendricks, IN b/	IN-19.5	1 adult female; 1 adult male	3	None located within ROW
Franklin, IN	IN-32.0	1 adult female	0	No roosts found
Warren, OH	OH-10.7	1 adult female	0	No roosts found
Belmont, OH	OH-33.0	1 adult female	1	Not located within ROW
Totals		**17 adult females 1 juvenile female 8 adult males**	**13 roosts**	

a/ Due to the small size of the juvenile female, a transmitter could not be attached, but the capture of a juvenile female could be an indicator of a maternity colony in the Project area.

b/ In addition, within Habitat Unit IN-19.5, six adult female Indiana bats were captured in an independent survey (Clark 2007).

Potential indirect impacts, or those that are caused by or would result from the Project but occur later in time, could result from a reduction in potential roost trees, alterations to potential foraging areas or migration corridors, and forest fragmentation in potential roosting areas. Potential direct and indirect impacts are discussed in the following paragraphs. The discussions below focus on potential Project impacts on maternal roosts or reproductive female Indiana bats. Impacts on non-reproductive female or male Indiana bats would generally be similar in nature, but typically on a lesser scale as those groups do not normally assemble in large colonies and they use a wider range of habitat since they can occupy trees with very limited suitable roost areas.

FWS has recommended that potential roost trees be removed between October 1 and March 31 to avoid the summer roosting season for Indiana bats along the Project route. Given the market demands and the customer agreements required of Rockies Express, construction of the REX East Project has been scheduled for the summer and fall of 2008. Removal by cutting of occupied roost trees between April 1 and September 30, when bats may occur along the proposed route, could injure or kill bats if bats do not leave the tree or cause harm through harassment due to noise disturbance. Based on the surveys completed by Rockies Express in 2007, no known maternal colony roost trees are present within the proposed impact area or would otherwise be directly affected by the Project. Rockies Express would avoid the two confirmed roost trees in Hendricks, Indiana (IN-291A and IN-291C) that are located within

the Project action area (250-foot-wide corridor). The microhabitat surrounding these two roost trees also would be preserved. Microhabitat would be assessed on a site-specific basis by a biologist experienced with bat ecology in coordination with FWS, and would typically encompass a 100-foot radius around a nursery roost tree. To avoid such areas the proposed route would be altered; however, the deviation would likely not be more than 100 feet from the originally proposed route. No known maternal colony roost trees identified in 2007 would be directly affected by the Project.

Loss of maternity roost trees due to clearing incurs a loss of potential summer habitat to individuals. Rockies Express proposes to burn the cleared materials such as limbs, brush, and debris on site. The smoke from these activities could affect the Indiana bat. Roost trees are by nature, ephemeral, changing from season to season in condition. As historically used roost trees are lost due to human disturbance or natural events (e.g., wind damage), bats relocate to alternate roost trees. Given that locating alternate roost trees is a typical process for Indiana bats and that the bats typically utilize more than one roost tree per season, and up to 20 alternate sites, roost tree availability for maternal colonies is not likely to be a limiting factor for occupation within an area, even if a primary roost tree is lost. Nonetheless, bats seeking roost trees may be under additional physical stress, potentially during a critical time when females are pregnant. However, this stress is not expected to rise to the level of failed reproduction or death (FWS, 2007a).

Project-related construction activities could directly expose roosting bats to noise and vibrations caused by tree clearing activities and pipeline construction equipment. The response of Indiana bats exposed to these disturbances while roosting could range from no perceivable response to avoidance of the area. In the biological opinion developed for the Ohio Department of Transportation's (ODOT) Statewide Transportation Program (FWS, 2007a), FWS notes that linear ODOT projects that occur in previously disturbed areas within existing roadways would likely have existing vehicle noise, and additional noise from construction would not likely elicit a measurable response from roosting Indiana bats in the surrounding landscape. Although the REX East Project would not be built within road rights-of-way, the route does traverse areas with fairly intensive agricultural use that requires regular seasonal use of heavy equipment in open areas surrounding forested stands. Equipment activity in agricultural areas, although not particularly heavy in mid-summer, can be regular during the late spring, when bats are expected to be returning to roost sites and young are born.

During May to August 2007, Rockies Express conducted surveys and delineated areas where Indiana bat occurs, in accordance with FWS recommendations. The survey included a review of forested stands in field surveys, identifying the surrounding landscape, tree diameter, and snag or live-tree presence. Trees were also observed for exfoliating bark and/or cavities for potential roosts. Secondly, the survey identified areas as low-, medium-, and high-quality habitat based on field reviews, which were verified by FWS personnel. Thirdly, Rockies Express conducted mist net surveys as recommended by FWS. The mist net surveys were conducted from May 14 through August 16, 2007, and 161 mist net surveys were completed across 40 unique habitat units.

Thirteen roost locations were identified during the 2007 survey efforts. Nine are located near a road, active agricultural field, or occupied residence, all of which receive at least some level of equipment use or activity during the entire summer or at least during the spring roost lactating stage. See table 4.7.1-1. Of the 40 habitat units completely surveyed, 26 Indiana bats were counted during the mist net surveys from 5 habitat unit IDs. These survey results are identified in table 4.7.1-1. In these areas, it is unlikely that disturbance associated with construction activity would cause abandonment or even an alteration in bat use of the area. One of the remaining four roosts is within a pasture while the three other roosts were identified toward the interior of a forested stand. Only roost trees IN-291A and IN-291C occur in close enough proximity to potentially be disturbed by construction noise associated with the

Project and only roost tree IN-291A would be considered a primary roost tree (at least 30 bats on more than one occasion according to Callahan, et al. [1997]).

With the exception of activities associated with HDD crossings of major waterbodies, no lights or noise would occur in any areas after dusk or before dawn. Directional drills require continuous operation to facilitate successful completion of the bore, reaming, and pull back portions of the process. Lights and noise associated with these activities are not expected to affect foraging or roosting by Indiana bats. Directional drills would reduce the amount of forested area that would be impacted at the waterbody crossings as drill entry and exit pads generally would be located outside of riparian forests. Construction of the pipeline and use of HDD methods would temporarily increase noise levels. This could temporarily deter the Indiana bat from foraging in the Project area during construction activities, which would be a short-term adverse affect. The bat would be anticipated to return to the area for foraging once construction had been completed. However, numerous studies have been completed that document Indiana bats foraging in areas with noise disturbance (Rockies Express, 2008).

Fragmentation of forest habitat used for foraging or migration may contribute to population declines, as it reduces the area individuals can safely traverse without the heightened threat of predation (FWS, 2006c, 2002b). Also, a reduction in the amount of forest habitat available in the general vicinity of roost trees or foraging areas, if substantial, could alter use patterns in an area or preclude use of an area altogether.

To better understand potential landscape-level changes in areas where reproductively active female Indiana bats were captured in 2007 and as recommended by FWS, Rockies Express evaluated the amount of forested area surrounding each mist net site (based on NLCD, 2001) where a reproductively active female Indiana bat was captured. Specifically, Rockies Express placed a 2.2-mile-diameter circle around the mist net site and calculated the amount of forested area within the circle. Rockies Express then calculated the amount of forested area within the circle that would be affected by construction and operation of the REX East Project.

As shown in table 4.7.1-2, a maximum of approximately 37 acres (TEH-MN-IN-32.0) of forest could be removed by construction within 1.1 miles of any single location where a reproductively active female Indiana bat was captured during the 2007 field effort. The loss of the forested area resulting from construction in the areas surrounding successful mist net sites represents a 0.8- to 2.8-percent (averaging 1.7 percent) reduction in the total forest area within 1.1 miles of each successful mist net site. During a field visit with FWS to one of the sites where a female Indiana bat was captured in Ohio (TEH-MN-OH-458A), FWS acknowledged that a pipeline corridor through an already fragmented area would not likely alter bat foraging or travel in the area. Similarly, given the fragmented nature of the landscape surrounding most of the other areas where female Indiana bats were captured, this minimal reduction in forest would not be expected to have a measurable effect on bat foraging, travel, or roosting.

Impacts were calculated separately such that impact values presented in table 4.7.1-2 for mist nets and roost trees are overlapping and should not be considered cumulatively.

Of the surveys completed in 2007 and listed in table 4.7.1-2, there were five habitat units where Indiana bats were captured and nursery roost trees were identified and five habitat units where Indiana bats were captured and nursery roost trees were not identified (see tables 4.7.1-3 and 4.7.1-4). Table 4.7.1-3 summarizes the area of the nursery roost trees, provides the extent of the Habitat Unit ID (by milepost), and lists the number of nursery roost trees located for that habitat. Table 4.7.1-4 summarizes the area of the habitat unit IDs where no nursery roost trees were identified and provides the extent of the Habitat Unit ID (by milepost). These habitat units will be resurveyed prior to construction in 2008 at the

Table 4.7.1-2

Forested Area and Expected Impacts Around Mist Net Sites Where Reproductively Active Female Indiana Bats Were Captured and Associated Roost Trees Along the REX East Project a/

		Mist Net Sites					Roost Trees				
County/ State	Approx. Milepost	Habitat Unit ID/Unit ID(s) (TEH-MN-)	Forested Area Within 2.2-mile-diameter of Mist Net (acres) b/	Percent of Forested Area within 2.2-mile-diameter b/	Forested Area Within 2.2-mile-diameter Area Affected During Construction (acres) c/, b/	Percent of Forested Area Affected by Construction b/, d/	Unit ID (TEH-RT-)	Forested Area Within 2.2-mile diameter of Roost Tree (acres) b/	Percent of Forested Area Within 2.2-mile-diameter b/	Forested Area Within 2.2-mile-diameter Area Affected During Construction (acres) b/, d/	Percent of Forested Area Affected by Construction b/, d/
Audrain, MO	0.9	MO-1.0 / MO-00A	331.6	13.6%	3.1	0.9%	MO-00A	224.9	9.2%	0.9	0.4%
Pike, MO	22.3	MO-3.0 / MO-22A	455.1	18.7%	8.9	2.0%		No roost tree identified			
Pike, IL	52.6	IL-1.0 / IL-52A	899.0	37.0%	18.4	2.0%		No roost tree identified			
Vermillion, IL	242.6-242.7	IN-0.5 / IN-243A	666.4	27.4%	5.3	0.8%	IN-243A, IN-243B, IN-243C	984.0	24.7%	11.1	1.1%
Putnam, IN	271.9-274.0.	IN-11.0 / IN-272A and IN-273A	979.7	25.1%	27.7	2.8%	IN-272A, IN-272B, IN-272C, IN-273A, IN-273B	1,235.3	22.4%	27.7	2.2%
Putnam, IN	282.3	IN-18.0 / IN-282B	855.3	35.2%	17.7	2.1%		No roost tree identified			
Hendricks, IN	290.9-291.0	IN-19.5 / IN-291A	355.3	14.6%	3.4	1.0%	IN-291A, IN-291B, IN-291C	377.5	14.2%	3.4	0.9%

Table 4.7.1-2 (continued)

Forested Area and Expected Impacts Around Mist Net Sites Where Reproductively Active Female Indiana Bats Were Captured and Associated Roost Trees Along the REX East Project a/

		Mist Net Sites					Roost Trees				
County/ State	Approx. Milepost	Habitat Unit ID/Unit ID(s) (TEH-MN-)	Forested Area Within 2.2-mile-diameter of Mist Net (acres) b/	Percent of Forested Area within 2.2-mile-diameter b/	Forested Area Within 2.2-mile-diameter Area Affected During Construction (acres) c/, b/	Percent of Forested Area Affected by Construction b/, d/	UNIT ID (TEH-RT-)	Forested Area Within 2.2-mile diameter of Roost Tree (acres) b/	Percent of Forested Area Within 2.2-mile-diameter b/	Forested Area Within 2.2-mile-diameter Area Affected During Construction (acres) b/, d/	Percent of Forested Area Affected by Construction b/, d/
Franklin, IN	388.2	IN-32.0 / IN-388B	1,569.1	64.5%	36.5	2.3%	No roost tree identified				
Warren, OH	457.6	OH-10.7 / OH-458A	922.5	37.9%	13.2	1.4%	No roost tree identified				
Belmont, OH	623.1	OH-32.8 / OH-621A	1,324.0	54.4%	28.0	2.1%	OH-621A e/	1,032.0	42.4%	17.4	1.7%

a/ Rockies Express 2008.

b/ Forested area is based on National Land Classification Data (NLCD), 2001.

c/ Analyses for mist net sites and roost trees were conducted in largely overlapping areas. Impacts were calculated separately such that impact values presented here for mist nets and roost trees are overlapping and should not be considered cumulatively.

d/ Amount of forest impacts is based on the proposed construction right-of-way combined with the NLCD, 2001 data.

e/ TEH-RT-OH-621A is a residence, not a roost tree.

Table 4.7.1-3

Indiana Bat Habitat Units Where Nursery Roost Trees Were Identified in 2007 a/

County, State	Habitat Unit ID	Milepost In and Out (including 1.1-mile buffer)	Number of Nursery Roost Trees Identified in Habitat Unit
Audrain, MO	TEH-MO-1.0	0.0 – 2.1	1
Vermillion, IN	TEH-IN-0.5 b/	N/A	3
Putnam, IN	TEH-IN-11.0	265.4 – 275.0	5
Hendricks, IN	TEH-IN-19.5	289.3 – 292.1	3
Belmont, OH	TEH-OH-33.0 c/	N/A	1

a/ Rockies Express 2008.

b/ Habitat unit is associated with the Wabash River, and is now offline due to a reroute in the area. The new route associated with this location will be mist net surveyed in 2008.

c/ Habitat unit is associated with the Barnesville Reservoir, and is now offline due to a reroute in the area. The new route associated with this location will be mist net surveyed in 2008.

Table 4.7.1-4

Indiana Bat Habitat Units Where Indiana Bats Were Captured and No Nursery Roost Trees Were Identified in 2007 a/

County, State	Habitat Unit ID	Milepost In and Out (including 1.1-mile buffer)
Pike, MO	TEH-MO-3.0	21.0 – 23.5
Pike, IL	TEH-IL-1.0	51 – 53.7
Putnam, IN	TEH-IN-18.0	277.6 – 284.1
Franklin, IN	TEH-IN-32.0	372.9 – 392.9
Warren, OH	TEH-OH-10.7 b/	456.5 – 460.9

a/ Rockies Express 2008.

b/ This site will not be resurveyed in 2008 as a result of consultation with the U.S. Fish and Wildlife Service.

same intensity (i.e., with the same number of mist net sites) as was conducted in 2007. Habitat unit TEH-OH-10.7 in Warren County, Ohio will not be resurveyed in 2008 based on consultation with FWS (Rockies Express, 2008).

For the five areas where roost trees were identified (tables 4.7.1-2 and 4.7.1-3), the forest area that would be affected by construction ranges from 0.9 acres (TEH-RT-MO-00A) to approximately 28 acres (TEH-RT-IN-272/273 series). The loss of the forested area resulting from construction in the areas surrounding identified nursery roost trees represents a 0.4- to 2.2-percent (averaging 1.3 percent) reduction in the total forest area within 1.1 miles of each nursery roost tree. Similar to successful mist net sites, the minimal reduction in forest around identified roosts would not be expected to have a measurable effect on bat foraging, travel, or roosting.

With the exception of activities associated with HDD crossings of major waterbodies, no lights or noise would occur in any areas after dusk or before dawn. The HDD crossings would reduce the amount of forested area that would be impacted at the waterbody crossings as drill entry and exit pads would be located generally outside of riparian forests. HDD installations could occur 24 hours-a-day for the duration of the drilling, which typically would last three months. Noise and lights are typically associated

with the HDD process, which could affect Indiana bats, particularly in areas of limited habitat where bat colonies are already stressed. Due to this disruption, negative fitness consequences could result for both adult female bats and their young. However, effects due to HDD crossings would be temporary in the scope of construction and in the life cycle of the Indiana bat. No negative long-term population effects would be expected due to the light and noise disturbance resulting from HDD activities.

As indicated above, in 2007 the Indiana bat surveys were not completed for the entire proposed route due to timing constraints, access denial by the property owner, or changes in the proposed route. Additionally, some areas have not yet been evaluated to determine if potential roost trees are present or if mist net surveys are necessary. Areas where mist net surveys are required but surveys were not completed in 2007, as well as areas that require a preliminary survey to determine if mist net surveys would be required, are listed in table 4.7.1-5.

To better understand potential landscape-level changes in the unsurveyed areas, Rockies Express centered a 2.2-mile-diameter circle on an assigned point on the pipeline centerline rather than a maternity roost, and then calculated the amount of forested area within the circle that would be affected by construction and operation. Impacts were calculated separately such that impact values presented in table 4.7.1-5 for mist nets and roost trees are overlapping and should not be considered cumulatively.

As shown in table 4.7.1-5, up to 131.1 acres (UNS 38, 39, 40, 41, 42, and 43) of forest could be removed due to construction impacts within 1.1 miles of a location where mist net surveys need to be completed during the 2008 field effort. The loss of the forested area resulting from construction in the areas that remain to be surveyed in 2008 represents a 0.8- to 2.6-percent (averaging 1.9 percent) reduction in the total forest area within 1.1 miles of each proposed mist net location. Given the fragmented nature of the landscape surrounding most of the areas where mist netting would occur in 2008, even if Indiana bats are captured at each location, this minimal reduction in forest would not be expected to have a measurable effect on bat use.

Furthermore, the documented maternal colony near Big Darby Creek is approximately 0.5 mile away from the proposed crossing location of the waterbody, as stated in an email from FWS – Reynoldsburg, Ohio Ecological Services Field Office on November 30, 2006. As such, lights and noise should have no effect on the roost location. Given that the waterbody is proposed to be crossed using the HDD method, the suspected primary foraging corridor of the creek would not be disturbed and foraging individuals would not be expected to be adversely affected during the HDD operation.

Some blasting would occur in areas where bedrock is located near the surface. Approximately 14 percent (88.7 miles) of the pipeline route would cross areas with bedrock at depths of less than 60 inches. (Note: the minimum excavation, even in areas of consolidated rock, would exceed 60 inches to allow for required minimum depth of cover requirements and a minimum of 6 inches of bedding or padding material.) Most of these soils are located along the eastern Ohio portion of the proposed route. Approximately one-half of this bedrock is considered paralithic (soft) and may not require blasting during construction. The remaining areas would cross soils with a lithic contact (hard bedrock) within 60 inches of the surface that may require blasting or other special construction techniques during installation of the proposed pipeline. For each area determined to require blasting, a site-specific blasting plan would be created.

Blasting in the vicinity of the REX East Project could temporarily affect nearby roosting, foraging, or traveling Indiana bats. However, blasting would be temporary in the scope of construction and in the life cycle of the Indiana bat. No negative long-term population effects would be incurred due to blasting.

Table 4.7.1-5

Forested Area and Expected Impacts Where Mist Net Surveys and Indiana Bat Habitat Evaluation Are Pending a/

County/ State	Approx. Milepost	Habitat Unit ID and/or Unsurveyed Mist Net Site ID	Extent of Area by Milepost	Distance of Site from Nearest Mist Net Survey (miles)	Nearest Mist Net Site (TEH-MN-)	Forested Area Within 2.2-mile-diameter of Roost Tree (acres) b/	Percent of Forested Area Within 2.2-mile-diameter b/	Forested Area Within 2.2-mile-diameter Area Affected During Construction (acres) b/, c/	Percent of Forested Area Affected by Construction b/, c/
Pike, MO	28.9	UNS 1 d/	27.7 – 29.9	1.0	MO-29A	907.6	37.3%	23.7	2.6%
Pike, IL	43.3	UNS 2 d/	Removed	0.7	MO-42A	731.6	30.1%	5.5	0.8%
Pike, IL	54.2	UNS 3	Not defined	1.6	IL-52A	1,491.4	38.1%	18.0	1.2%
Pike, IL	54.8	UNS 4	Not defined	2.1	IL-52A				
Pike, IL	55.3	UNS 5	Not defined	2.6	IL-52A				
Pike, IL	57.6	UNS 6	Not defined	4.8	IL-52A	1,583.7	42.9%	17.7	1.1%
Pike, IL	58.6	UNS 7	Not defined	5.7	IL-52A				
Christian, IL	133.2	UNS 8	Not defined	37.3	IL-94A	548.0	22.5%	3.0	0.5%
Douglas, IL	188.1	UNS 9	Not defined	24.0	IL-212A	151.9	6.2%	2.5	1.6%
Douglas, IL	202.9	UNS 10	Not defined	9.6	IL-212A	228.4	9.4%	1.1	0.5%
Edgar, IL	228.9	TEH-IL-6.5 d/	227.8 - 230	13.0	IN-243C	273.8	11.3%	6.8	2.5%
Vermillion, IN	RR 2032 - 242.9 + 2.0	UNS - WA 1 d/ and UNS-WA2	RR 2032 243.7 - 247.9	0.7 1.5	IN-244A IN-246A	2,089.8	46.8%	26.3	1.3%
Parke, IN	250.3	UNS 11 (FWS Site 2)	249.2 - 251.8	1.6	IN-251A	604.5	24.8%	21.7	3.6%
Morgan, IN	314.9	UNS 12	Not defined	3.2	IN-311B	2,165.2	28.3%	24.1	1.1%
Morgan, IN	315.3	UNS 13	Not defined	3.6	IN-311B				
Morgan, IN	316.2	UNS 14	Not defined	4.4	IN-311B				
Morgan, IN	317.4	UNS 15	Not defined	5.5	IN-311B				
Morgan, IN	319.0	UNS 16	Not defined	6.8	IN-311B				
Johnson, IN	336.1	THE-IN-27.8 (UNS 17)	334.8 - 337.3	6.6	IN-329A	557.3	22.9%	6.0	1.1%
Shelby, IN	356.2	UNS 18 (FWS Site 11) e/	361.1 - 363.9	10.8	IN-367A	416.3	17.1%	6.4	1.5%
Decatur, IN	362.7	UNS 19	Not defined	4.5	IN-367A	259.5	10.7%	11.6	4.5%
Decatur, IN	369.4	UNS 20	Not defined	2.0	IN-367A	284.2	8.7%	3.7	1.3%
Decatur, IN	370.0	UNS 21	Not defined	2.6	IN-367A				

Table 4.7.1-5 (continued)

Forested Area and Expected Impacts Where Mist Net Surveys and Indiana Bat Habitat Evaluation Are Pending a/

County/ State	Approx. Milepost	Habitat Unit ID and/or Unsurveyed Mist Net Site ID	Extent of Area by Milepost	Distance of Site from Nearest Mist Net Survey (miles)	Nearest Mist Net Site (TEH-MN-)	Forested Area Within 2.2-mile-diameter of Roost Tree (acres) b/	Percent of Forested Area Within 2.2-mile-diameter b/	Forested Area Within 2.2-mile-diameter Area Affected During Construction (acres) b/, c/	Percent of Forested Area Affected by Construction b/, c/
Franklin, IN	395.0	UNS-FR-IN-1 f/	393.9 - 396.1						
Franklin, IN	392.5	UNS 22	Not defined	4.0	IN-388B	1,740.2	71.5%	16.6	1.0%
Franklin, IN	397.5	UNS 23	Not defined	2.3	IN-400A	2,093.0	54.9%	31.3	1.5%
Franklin, IN	398.0	UNS 24	Not defined	2.0	IN-400A				
Franklin, IN	398.6	UNS 25	Not defined	1.5	IN-400A				
Butler, OH	408.2	UNS 26	Not defined	7.6	IN-400A	572.1	23.5%	7.4	1.3%
Butler, OH	413.5	UNS 27	Not defined	5.0	OH-420A	390.6	16.1%	6.3	1.6%
Butler, OH	421.3	UNS 28	Not defined	0.9	OH-420B	902.1	37.1%	13.1	1.5%
Butler, OH	434.6	UNS 29	Not defined	2.9	OH-431B	764.1	11.1%	20.5	2.7%
Butler, OH	435.5	UNS 30	Not defined	3.6	OH-431B				
Butler, OH	436.0	UNS 31	Not defined	4.0	OH-431B				
Butler, OH	436.6	UNS 32	Not defined	4.5	OH-431B				
Warren, OH	438.9	UNS 33	Not defined	6.0	OH-431B				
Warren, OH	441.1	UNS-WA-OH-1 f/ UNS 34	439.6 - 441.8	8.2	OH-431B	294.1	12.1%	5.0	1.7%
Warren, OH		UNS-WA-OH-2 f/	442.9 - 445.1						
Warren, OH	447.0	UNS 35	Not defined	4.5	OH-452A	476.5	15.4%	11.3	2.4%
Warren, OH	447.4	UNS 36	Not defined	4.0	OH-452A				
Clinton, OH	466.9	UNS-CT-OH-1 f/ UNS 37	465.5 - 486.2	8.6	OH-458B	426.6	17.5%	8.4	2.0%
Fayette, OH	499.3 499.7	TEH-OH-14.5 (UNS - DCSP 1 d/ UNS - DCSP 2 d/)	498.1 - 501.0	15.2	OH-484A	743.6	26.2%	13.2	1.8%

Table 4.7.1-5 (continued)

Forested Area and Expected Impacts Where Mist Net Surveys and Indiana Bat Habitat Evaluation Are Pending a/

County/ State	Approx. Milepost	Habitat Unit ID and/or Unsurveyed Mist Net Site ID	Extent of Area by Milepost	Distance of Site from Nearest Mist Net Survey (miles)	Nearest Mist Net Site (TEH-MN-)	Forested Area Within 2.2-mile-diameter of Roost Tree (acres) b/	Percent of Forested Area Within 2.2-mile-diameter b/	Forested Area Within 2.2-mile-diameter Area Affected During Construction (acres) b/, c/	Percent of Forested Area Affected by Construction b/, c/
Muskingum, OH	578.5 578.9 580.3 581.0 581.3 583.4	TEH-OH-22.0 f/ (UNS 38 UNS 39 UNS 40 UNS 41 UNS 42 UNS 43)	577.5 - 584.6	1.0	OH-577B	4,982.5	59.0%	131.1	2.6%
Muskingum, OH		TEH-OH-29.0 f/	586.9 - 588.1						
Guernsey, OH	601.1	UNS-GN-OH-1 (UNS 44)	599.9 - 602.1	2.1	OH-604A	1,158.7	47.6%	26.4	2.3%
Belmont, OH	RR 2010 - 619.4 + 1.8	UNS-BAR/THE-OH-33 UNS - BAR 1 d/ UNS - BAR 2 d/ UNS - BAR 3 d/	RR 2010 MP - 6.20.1 - 624.4	1.0 0.9 0.4	OH-621A OH-623A OH-621A	2,484.2	52.2%	55.7	2.2%
Belmont, OH	618.1	UNS 45	Not defined	0.4	OH-618A	2,486.2	68.6%	45.5	1.8%
Belmont, OH	619.0	UNS 46	Not defined	0.4	OH-620A				
Monroe, OH	638.4	UNS 47	Not defined	0.4	OH-638A	1,816.7	59.8%	16.0	0.9%
Monroe, OH	639.0	UNS 48	Not defined	0.8	OH-638A				

a/ Rockies Express, 2008.

b/ Forested area is based on National Land Classification Data (NLCD), 2001. Areas are combined for multiple UNS sites where circles overlap.

c/ Amount of forest impacts is based on the proposed construction right-of-way combined with the NLCD, 2001 data.

d/ These unsurveyed sites have already been assessed for Indiana bat habitat, but they were not surveyed in 2007 due to a change in route location, property access denial by landowners, or time restrictions. These sites will be surveyed in 2008, but the sites shown on the associated maps may not accurately reflect the exact location of the future mist net survey, which will be determined by certified biologists based on field conditions at the time of survey.

e/ Due to access denial, site has not been assessed for potential roost trees.

f/ These areas contain potential roost trees but have not yet been assessed for habitat quality or reviewed with FWS.

In addition, because of the distance from the REX East Project and the designated critical habitat of the Indiana bat (i.e., the wintering hibernacula), 8.5 miles and 17.4 miles from the REX East centerline, respectively, the Project would not affect or alter designated critical habitat.

Compensation, Mitigation, and Monitoring

During a visit with FWS to a site where two female bats were captured in 2007 (TEH-MN-MO-00A/TEH-RT-MO-00A), FWS expressed concern about an additional workspace planned for the area that would facilitate the crossing of Littleby Creek at MP 1. The proposed workspace is located within the forested stand where the bats were captured and the roost tree is located. Although the workspace would not directly impact the roost tree, FWS indicated that a reduced right-of-way through the forest stand would help minimize potential impacts on the character of the area. After reviewing the crossing location, the construction footprint in the area has been revised from 1.1 acres to 0.5 acre, a reduction of 0.6 acre of forest impact.

Rockies Express has proposed to limit specific construction activities (clearing, trenching, welding, backfilling, and grading) within 300 feet of roost trees identified during the 2007 field surveys from one-half hour after dawn to one-half hour before dusk. This would be in effect for the period of tree clearing restriction as identified by FWS (April 1 to September 30) in order to minimize potential impacts on foraging Indiana bats during construction. Rockies Express believes that this timing restriction would allow ample time for bats to return to roost trees at dawn and time for bats to emerge from roosts at dusk. Other compensation, mitigation, and monitoring measures that Rockies Express has agreed to implement include:

- To facilitate the reestablishment of a diverse forest within the disturbed construction right-of-way, Rockies Express would plant bare root seedlings (both hard-and soft-mast species) in areas of upland forest where Indiana bats were captured and in areas of forest fragmentation concern for migratory birds as identified by FWS. Rockies Express would adhere to the FWS-recommended species mix and planting rate that would ensure a 50:50 mix between hard-mast and soft-mast species, unless otherwise approved by FWS.

- Rockies Express would replant Classified Forests in Indiana and other special-use areas where necessary.

- Rockies Express would also encourage landowners through easement negotiations to allow forest regeneration to mitigate for impacts on migratory birds and Indiana bats.

- In consultation with FWS, Rockies Express has developed a signed Conservation Agreement to address concerns relating to migratory birds, forest fragmentation, and other upland forest clearing concerns.

To further minimize the potential impacts on the Indiana bat, the FERC staff and FWS have developed recommendations and conservation measures for specific areas (Habitat Unit IDs) based on the results of the 2007 surveys and the status of the surveys to be completed in 2008. As described in the BA, the following recommendations would apply to an entire tract of suitable habitat in an area (the Habitat Unit ID). The Habitat Unit ID is the entire block of suitable habitat – not just the immediate location of the survey site. For the habitat unit IDs surveyed in 2007 for which no Indiana bats were found and for areas that were not recommended for survey and approved by FWS, no additional recommendations or conservation measures would be required. Therefore, **we recommend the following:**

- **For the habitat unit IDs surveyed in 2007 and for which Indiana bats were identified but no nursery roost trees were identified, Rockies Express should implement the following recommendations and conditions to avoid direct effects on Indiana bat roosting in alternative roost trees:**

  a. Remove trees during the inactive season (between October 1 and March 31); <u>OR</u>

  b. Remove trees while bats are foraging under the following conditions:

    i. Tree removal would occur between 1 hour after sunset and 1 hour before sunrise,

    ii. Temperature would be greater than 50°F, and

    iii. No precipitation or strong winds (as before an approaching thunderstorm).

- **For the habitat unit IDs surveyed in 2007 and for which Indiana bats were identified and nursery roost trees were identified, Rockies Express would implement the following recommendations and conditions:**

  a. Rockies Express should reconfirm the location of the nursery roost tree(s) prior to the start of construction to determine if it remains suitable. This requirement would apply to all sites in table 4.7.1-3 of this EIS where at least one roost tree was identified, as well as to Habitat Unit IDs MO-3.0, IN-32.0, and OH-10.7.

    i. If the nursery roost tree remains a suitable nursery roost tree, Rockies Express would avoid the nursery tree and immediate microclimate (as identified by a certified biologist and approved by FWS) by altering the construction area and placement of the pipeline route. A minimum distance of 100 feet would be maintained between the construction area and the nursery roost tree and Rockies Express would (a) erect fencing to delineate the boundary and prevent inadvertent encroachment into the area, and (b) erect signs stating "no trespassing" or "do not disturb – sensitive area."

    ii. If the nursery roost tree is no longer suitable, Rockies Express would implement one of the following conservation measures:

      (1) Conduct a radiotelemetry study in accordance with FWS-approved 2007 procedures to locate new nursery roost tree(s) and if within the action area, avoid the tree(s) and its microclimate in accordance with Conservation Measure 3(a)(i) in the BA; <u>OR</u>

      (2) Protect all potential nursery trees (live or standing dead trees or snags over 9 inches dbh with exfoliating, peeling or loose bark, split trunks or branches, or cavities). These characteristics must be plentiful enough to allow the colony to change locations along the tree to aid in thermoregulation. If the habitat characteristics are found only on the branches of the tree, the branches must be at least 8 inches in diameter at the site of the habitat characteristics. These trees must have some solar exposure, and trees must be part of, or connected to, a travel corridor,

forested area within the action area, that is, treat all potential nursery roost trees as actual nursery roost trees; <u>OR</u>

(3) Identify potential nursery roost trees and conduct exit counts to determine whether it is an occupied nursery roost (if more than 20 bats are observed, the tree would be classified as an occupied nursery tree; if fewer than 20 bats are observed, the tree would be classified as an alternate roost tree). If a nursery roost tree is documented, avoid the tree and its microclimate per Conservation Measure 3(a)(i) in the BA. If it is not documented as a nursery roost tree, employ applicable alternate roost tree avoidance measures per recommendation and Conservation Measure 2 in the BA.

- **In all areas that were not surveyed in 2007 including any areas where the alignment has shifted such that unsurveyed habitat may be affected (see table 4.7.1-5), Rockies Express should survey the areas in accordance with FWS-approved 2007 procedures to locate new nursery roost tree(s). Prior to the start of construction in an unsurveyed habitat unit ID area, Rockies Express should complete all surveys and submit the findings to the FERC and FWS for review and comment. Rockies Express should not begin construction in the habitat unit ID until it has received written notification from the Director of OEP that construction or use of mitigation may begin. Based on the findings of the surveys to be conducted in 2008, Rockies Express would implement one of the following measures:**

  a. If a nursery roost tree is identified, Rockies Express would avoid the nursery tree and immediate microclimate (as identified by a certified biologist and approved by FWS) by altering the construction area and placement of the pipeline route. A minimum distance of 100 feet would be maintained between the construction area and the nursery roost tree and Rockies Express would erect fencing to delineate the boundary and prevent inadvertent encroachment into the area.

  b. If Indiana bats are captured and a nursery roost tree is not identified, Rockies Express would identify potential nursery roost trees and conduct exit counts to determine whether it is an occupied nursery roost (if more than 20 bats are observed, the tree would be classified as an occupied nursery tree; if fewer than 20 bats are observed, the tree would be classified as an alternate roost tree). If a nursery roost tree is documented, avoid the tree and its microclimate per Conservation Measure 3(a)(i) in the BA. If it is not documented as a nursery roost tree, employ applicable alternate roost tree avoidance measures per recommendation and Conservation Measure 2 in the BA.

- **Prior to the start of construction, Rockies Express file with the Secretary and FWS an updated list of areas that remain to be surveyed for Indiana bats, identifying the habitat unit IDs by milepost.**

- **Prior to the start of construction within an identified habitat unit ID, Rockies Express file with the Secretary for review and written approval by the Director of OEP the specific mitigation measures in accordance with the BA that would apply based on the survey results.**

- **During construction, Rockies Express not burn trees, limbs, brush, and debris in the right-of-way within 500 feet of the entire area of suitable habitat associated with each habitat unit ID.**

- **Rockies Express not use herbicides or pesticides for maintenance of the permanent right-of-way or adjacent forested areas, regardless of whether Indiana bats are present, for the life of the Project except as allowed by the appropriate land management agency or state agency.**

- **In the event that a trenchless crossing fails at the Mississippi River, Wabash River, Big Walnut Creek, or Big Darby Creek, Rockies Express halt construction activities at the crossing(s) until Rockies Express files with the Secretary and receives written approval by the Director of OEP a site-specific alternate waterbody crossing plan developed in consultation with the FERC, COE, and FWS. The plan should include:**

  a. **Scaled drawings identifying all areas that would be disturbed by an alternative crossing method; and**

  b. **A description of the mitigation measures that would be implemented to minimize the extent and duration of disturbance on the river and the Indiana bat.**

- **In addition, Rockies Express not begin an alternative crossing of the Mississippi River, Wabash River, Big Walnut Creek, or Big Darby Creek until:**

  a. **The FERC evaluates the potential impact on the Indiana bat and the Commission staff completes consultation with FWS;**

  b. **The FERC, FWS, and COE determine that the alternative crossing method and mitigation plan are acceptable; and**

  c. **The Director of OEP notifies Rockies Express in writing that it may proceed with the alternative river crossing plan.**

- **Rockies Express use a dry-ditch crossing method at Sugar Creek (MP 484.3).**

- **To minimize potential impacts on foraging Indiana bats during construction, Rockies Express limit specific construction activities (clearing, trenching, welding, backfilling, and grading) within 300 feet of documented nursery roost trees and alternative roost trees identified during the field surveys from one-half hour after dawn to one-half hour before dusk for the period of tree clearing restriction as identified by FWS (April 1 - September 30). This timing restriction would allow ample time for bats to return to roost trees at dawn and time for bats to emerge from roosts at dusk.**

- **Rockies Express have a FWS qualified biologist supervise tree clearing operations in Indiana bat habitat along the construction areas to ensure that individual bats that may be in the vicinity are not harmed, and all tree clearing activities are in compliance with FWS requirements as identified above under Compensation, Mitigation, and Monitoring.**

Adherence to the recommendations presented in section 4.3, relating to site-specific crossing plans that identify specific restoration and mitigation measures, alternative routes and crossing methods, and HDD contingency plans would minimize some of the impacts on the Indiana bat.

Determination of Effect

Due to Rockies Express' commitment to (1) avoid occupied roost trees and their immediate microclimate; (2) consult with FWS on the protection of the microclimate of a nursery roost tree; and (3) implement the measures outlined above based on the results of the 2008 mist net surveys, as well as the recommendations and conservation measures developed by the FERC staff and FWS, we have determined that the REX East Project would *not be likely to adversely affect* the Indiana bat.

Whooping Crane

Background

The whooping crane is a federally endangered species. Populations of whooping cranes utilize the Texas Gulf coast, including Arkansas NWR, Texas, and Bosque del Apache NWR, New Mexico, and migration and staging areas through northwestern Montana, the western half of North Dakota, central South Dakota, Nebraska, Oklahoma, and east-central Texas. A non-migratory population occurs in Florida. In addition, a nonessential experimental population of whooping cranes was established by FWS. FWS stated that this population migrates between Wisconsin where it summers and Florida where it winters (50 CFR 17). Therefore, the whooping crane may have a migratory or staging area presence in the Project area at the Bertrand Compressor Station site in Phelps County, Nebraska, as well as in portions of Ohio and Indiana. There are five areas of Critical Habitat designated for the whooping crane, located in Idaho, Kansas, Nebraska, Oklahoma, and Iowa, primarily on federal and state wildlife management lands. These areas provide roosting, nesting, and foraging habitat for whooping cranes as they migrate between their breeding and wintering grounds.

Whooping cranes generally arrive at their Canadian breeding grounds during late April and conduct their southward migration from the breeding grounds from mid September to mid October. They are normally on their wintering grounds in the southern United States by mid November. They use a variety of habitats during migration including croplands for feeding and large palustrine wetlands for nesting (NatureServe, 2006). They are also known to roost in riverine habitat, most notably the Platte River, Middle Loup River, and Niobrara River in Nebraska; Cimarron River in Oklahoma; and the Red River in Texas. Cranes also roost on submerged sandbars in wide unobstructed channels that are isolated from human disturbance (NatureServe, 2006). The whooping crane nests in areas around wetlands and shallow ponds that have dense vegetation. Females lay eggs in late April to mid May. During migration whooping cranes eat grains and small plants from agricultural fields, acorns, berries, insects, and crustaceans. Threats to this species include loss of habitat to agriculture, shortened breeding season, collision with obstructions during migration, predation, and mortality caused accidentally or intentionally by humans (FWS, 2005a).

Impact Assessment

Several potentially impacted populations of whooping cranes have been identified. The first population may have a migratory presence at the proposed Bertrand Compressor Station site in Phelps County, Nebraska. A second population may have a migratory presence in the Project areas in Missouri, Illinois, Indiana, and Ohio (FWS, 2001). The proposed Bertrand Compressor Station site is situated on agricultural rangeland, which would be considered marginal foraging habitat, but could be used by individual whooping cranes during migration. However, additional suitable and higher quality foraging

habitat is located adjacent to and in the general area surrounding the proposed site. Also, no wetlands or waterbodies would be affected by construction of the compressor station. Therefore, whooping cranes are not anticipated to typically use the proposed compressor station site during migration nor would individuals be encountered during construction. Therefore, Rockies Express does not anticipate that whooping cranes typically use the proposed compressor station site during migration nor would individuals be encountered during construction. Additionally, as discussed in a meeting with FWS, Nebraska ESO on August 23, 2006, Rockies Express was not required to survey for this species at the Bertrand Compressor Station site (FWS, 2006f). No surveys have been required by FWS at the proposed compressor station site in Nebraska.

In October of each year, aircraft-led whooping cranes travel on a pre-determined migratory route through seven states between Wisconsin and Florida. The cranes migrate through Indiana during November (FWS, 2001). Because the aircraft pilots choose the locations for nightly stopovers, the flock would be unlikely to stop in an area of the Project route where construction is in progress. The cranes also pass over the Project area during the spring migration to Wisconsin, but adjacent lands are more suitable for the cranes' needs.

Compensation, Mitigation, and Monitoring

FWS commented on the possibility of encountering the whooping crane during construction of the Bertrand Compressor Station. To minimize the potential impacts on the whooping crane, **we recommend that:**

- **During construction, if any whooping cranes are encountered in the immediate vicinity of the construction work area, Rockies Express:**

  a. **Immediately stop construction in that area;**

  b. **Contact FWS and the FERC to determine what protection measure would be required; and**

  c. **Work may not resume in the area until Rockies Express has been notified by the Director of OEP in writing.**

Determination of Effect

Due to the low likelihood of encountering this species during construction, Rockies Express' commitment to halt construction and correspond with FWS to develop appropriate protection measures if an individual is identified near the compressor station and pipeline route during construction, and along with our recommendation, we have determined that the REX East Project would *not be likely to adversely affect* the whooping crane.

Candidate Species – Eastern Massasauga

The eastern massasauga is a candidate for federal listing as threatened or endangered. This snake species has the potential to occur along the route in Clinton, Fayette, Greene, and Warren Counties, Ohio, and is state-listed as endangered in Missouri, Illinois, Indiana, and Ohio. It inhabits marshy areas, wet prairies, sloughs, vegetation around marshes and lakes, and floodplains of major rivers (FWS, 1998). Crayfish burrows are the most common hibernacula for this species. The eastern massasauga has been observed within 1 mile of the Project, in the vicinity of MP 457.9. Hibernacula may exist within 2 miles of a sighting (ODNR, 2003).

Landscape fragmentation is expected to result from construction of the Project. As the right-of-way is cleared, open landscape would be present. Although it would be revegetated within 3 years, during those 3 years it is possible that the snake would either not use the land or could be easily open to predation. However, long-term impacts to the snake population are not expected. Operational impacts are not anticipated during the life of the Project.

Provided hibernacula are avoided if encountered or mitigated for, it is unlikely that this species would be adversely impacted. Currently Rockies Express is consulting with FWS regarding appropriate mitigation measures during construction to avoid impacts to the snake. These measures could include timing restrictions or exclusionary fencing near wetlands determined to be eastern massasauga habitat in the four documented counties. Rockies Express would also provide training for its workers and prohibit killing or harassment of wildlife.

Rockies Express consulted with ODNR to determine whether surveys would be needed. ODNR recommended habitat assessments for the eastern massasuga during fall of 2007, with possible follow-up surveys in suitable habitat areas during spring and summer 2008. Rockies Express filed a report titled "Report of Assessment of Potential Habitat for the Eastern Massasauga and Eastern Hellbender" with ODNR on November 30, 2007, and with FWS on December 10, 2007, which did not identify any suitable habitat. However, two sites could not be surveyed due to access denial from the landowner. Once access is granted, Rockies Express would complete the surveys and submit the results to ODNR and FWS.

Given the results of the Rockies Express survey and Rockies Express' commitment to complete the surveys once access is granted, we believe it is unlikely that there would be an adverse impact on this federal candidate species.

Mussels and Mussel Beds

Background

Four federally listed endangered mussel species (fat pocketbook, clubshell, northern riffleshell, and fanshell), and two federally listed candidate mussel species (rayed bean and spectaclecase) have the potential to occur along the pipeline route. Three of the four federally endangered species are known to occur in Ohio: the clubshell, northern riffleshell, and fanshell. The fourth, the fat pocketbook is known to occur in Missouri (FWS, 2006c,e). Mussel larvae, or glochidia, attach themselves to the gills or fins of specific fish species. The parasitic relationship minimizes the larval mortality rate by offering protection from increased turbidity and predation, as well as a food supply from the water passing though the gills. Juveniles eventually drop from the host and mature to adults (Bruenderman, 2002). This dispersal of juveniles via mobile species can aid in increasing the range of the species and introduce colonies into new areas. However, it can also increase mortality when the juveniles are dropped in areas with undesirable environmental conditions. Adult mussels typically live on the waterbody floor. Mussels have specific habitat preferences and some cannot withstand bottom types other than preferential substrate. Below are brief overviews of the four types of mussels.

<u>Fat Pocketbook</u>

- The fat pocketbook is known to occur in Pike and Ralls Counties, Missouri. This freshwater mussel is generally found in deep pools of large waterbodies, typically over a mixture of silt, mud, and sand (FWS, 1997d; MDC, 2000b). The fat pocketbook prefers sand, mud, and fine gravel bottoms of large rivers. It buries itself in the substrates in water ranging in depth from a few inches to 8 feet (INHS, 1997a). Within Pike and Ralls counties, Missouri, it is known

to occur only in three rivers, none of which would be crossed by the Project. In addition, according to NHI Data supplied by MDC, there are no known observations of the mussel within 1 mile of the pipeline route (MDC, 2006).

Clubshell

- The clubshell, known to occur in only 13 waterbodies throughout its range, has been identified in the following counties crossed by the Project route: Greene, Pickaway, and Fairfield Counties, Ohio. It is sensitive to disturbance and inhabits areas with low turbidity in medium to small waterbodies with loose sand or gravel substrate (FWS, 1997a). This species prefers clean, loose sand and gravel in medium to small rivers and streams. This mussel buries itself in the bottom substrate to depths up to 4 inches. It has been identified in Sugar Creek, the Flatrock River, Scioto River, and Deer Creek State Park (ODNR, 2006b).

Northern Riffleshell

- The northern riffleshell is known to occur in Pickaway County, Ohio, where it inhabits firm sand or gravel substrates in waterbodies of varying sizes (FWS, 1997e). This species is found in a variety of streams from small to large. It buries itself in bottoms of firmly packed sand or gravel. Reproduction requires stable, undisturbed habitat and sufficient host fish for food (FWS, 1997e). Dams and reservoirs have flooded most of this mussel's habitat, reducing its preferred gravel sand habitat. Natural heritage data identified it in Big Darby Creek and the Scioto River. Rockies Express' August 2007 survey identified two weathered specimens in Walnut Creek (MP 515.9). According to FWS, northern riffleshell is extirpated from Walnut Creek and it is not unusual to find weathered shells in streams where mussel species once lived.

Fanshell

- According to the Ohio natural heritage data, the fanshell is known to occur in Muskingum County, Ohio. This species is found in medium-to-large rivers with sand or gravel substrate of moderate current (FWS, 1997c). No known populations have been recorded along the Project route.

Rockies Express completed surveys for each mussel species along the Project right-of-way and did not identify any federally listed mussel species. In May 2007, FWS approved a Proposed Mussel Survey Protocol in Ohio and a Proposed Mussel Survey Protocol in the Mississippi River prepared by Rockies Express. Rockies Express completed surveys for listed mussel species in all waterbodies greater than 20 feet wide crossed by the proposed Project in Ohio during the summer of 2007. Of the 86 waterbodies in Ohio qualifying for survey, 78 have been surveyed. Of the remaining eight waterbodies, six were not surveyed due to lack of access by landowners, one was not surveyed due to unsafe field conditions (pH equal to 3.9), and another was not surveyed due to a temperature restriction. No federally listed threatened or endangered mussel species were found during surveys and none of the six waterbodies where survey was denied are known or suspected to contain listed mussel species. In addition, through discussions between Rockies Express and FWS, FWS recommended that Rockies Express not conduct mussel surveys in Big Darby Creek because another pipeline project with a nearby proposed crossing location recently completed a survey within the waterbody. FWS later indicated that the other survey did not identify listed mussels at Big Darby Creek. In the Mississippi River, Rockies Express had experienced malacologists survey the dredge site for mussels and mussel beds in May 2007. The survey documented 337 live unionids representing 13 species within the survey area; however, no federally threatened or endangered species were encountered.

Impact Assessment

Mussels are sensitive to heavy loads of silt, which affect mortality by changing the substrate type. Disturbance from construction activities would be short term, as crossing of intermediate waterbodies would take approximately 2 days and minor crossings would take 1 day. Major waterbodies would be crossed by HDD methods (see section 4.3, and appendix G-3), which would avoid/minimize impacts to mussels. As requested by FWS, Rockies Express would avoid construction activity between April 15 and June 15 in waterbodies containing freshwater mussel beds.

Rockies Express would implement its Procedures to reduce turbidity and siltation in all waterbodies crossed by the Project (CD Document B). Procedures for reducing turbidity and siltation include: installation of sediment barriers across the entire construction right-of-way to prevent the flow of sediments into the waterbody and the use of trench plugs at all waterbody crossings to prevent the diversion of water into upland portions of the pipeline trench. Rockies Express would implement measures in its HDD Contingency and Frac Out Plan (CD Document D) at HDD crossings to prevent impacts from unexpected frac-outs during HDD operations.

Following pipeline installation, hydrostatic testing would be performed at the waterbodies listed in table 4.3.6-1. To prevent negative impacts on mussels and mussel beds, the test water would be withdrawn close to crossing locations. Intake screens would be used to limit or prevent the entrainment of mussels, and discharged water would be deposited on upland areas or back into the water body. The water uptake rate would be regulated to prevent adverse impacts on the aquatic resources, specifically focused on not notably altering downstream instream flows. Energy-dissipating devices such as hay bale filters or sediment bags would be used to reduce the velocity of the water returning to the streams or rivers and limiting the suspended material and associated turbidity of the water. Rockies Express would comply with all permit requirements. Minor impacts from negligible decreases in instream flows and increases in turbidity are anticipated from withdrawal and release of hydrostatic test water. At test locations with known species sightings, Rockies Express would consult with FWS and implement mitigation measures to avoid adverse impacts on the mussel species. Specific impacts to each mussel species are as follows:

<u>Fat Pocketbook</u>

- No impacts.

<u>Clubshell</u>

- According to information provided by ODNR, clubshell populations have been identified in Big Darby Creek, Sugar Creek, Scioto River, and within Deer Creek State Park, all of which would be crossed by the Project (ODNR, 2006e). Big Darby Creek, the Scioto River, and Deer Creek would be crossed using the HDD method; therefore, no instream impacts associated with pipeline construction are anticipated.

  However, hydrostatic testing of the pipeline would require the intake and discharge of water from Big Darby Creek, Sugar Creek, Scioto River, and Deer Creek. The intake of water from these creeks and the river could directly impact the mussels by entrainment of the glochidia, juvenile mussels, or the ichthyoplankton of the host fish or indirectly impact the mussels due to water quality degradation or reduction in water quantity in the creek as discussed above. Rockies Express has agreed not to use Big Darby Creek or its tributaries for the intake or discharge water used for hydrostatic testing.

Northern Riffleshell

- NHI data identified historical populations of the northern riffleshell in the Scioto River and Big Darby Creek (FWS, 2006e). The Scioto River and Big Darby Creek would be crossed using the HDD method and no instream impacts associated with pipeline construction are anticipated.

  However, hydrostatic testing of the pipeline would require the intake and discharge of water from Big Darby Creek and Scioto River. The intake of water from the creek and river could directly impact the mussels by entrainment of the glochidia, juvenile mussels, or the ichthyoplankton of the host fish or indirectly impact the mussels due to water quality degradation or reduction in water quantity in the creek as discussed above. Rockies Express has agreed not to use Big Darby Creek or its tributaries for the intake or discharge water used for hydrostatic testing.

Fanshell

- Of the perennial waterbodies crossed in Muskingum County, four may be large enough to support fanshell populations. However, no known records of fanshell have been reported within 1 mile of the pipeline route (ODNR, 2006e).

- Hydrostatic testing of the pipeline would require the intake and discharge of water from the perennial waterbodies. The intake of water from the waterbodies could directly impact the mussels by entrainment of the glochidia, juvenile mussels, or the ichthyoplankton of the host fish, or indirectly impact the mussels due to water quality degradation or reduction in water quantity in the creek as discussed above. Rockies Express has agreed not to use Big Darby Creek or its tributaries for the intake or discharge water used for hydrostatic testing.

Compensation, Mitigation, and Monitoring

Adherence to the recommendations presented in section 4.3, relating to site-specific crossing plans that identify specific restoration and measures, alternative routes and crossing methods, and HDD contingency plans, would reduce some of the impacts on the mussels and mussel beds. In addition, as requested by FWS, Rockies Express would avoid construction activity between April 15 and June 15 in waterbodies containing freshwater mussel beds. Rockies Express would implement its Procedures to reduce turbidity and siltation in all waterbodies crossed by the Project (CD Document B). Procedures for reducing turbidity and siltation include installation of sediment barriers across the entire construction right-of-way to prevent the flow of sediments into the waterbody and the use of trench plugs at all waterbody crossings to prevent the diversion of water into upland portions of the pipeline trench. Rockies Express would implement measures in its HDD Contingency and Frac Out Plan (CD Document D) at HDD crossings to prevent impacts from unexpected frac-outs during HDD operations. Additional species-specific measures are presented below.

Fat Pocketbook

None

Clubshell, Northern Riffle Shell, and Fanshell

To minimize the potential impacts on the clubshell, northern riffle shell, and fanshell, **we recommend that:**

- **Prior to the start of construction, Rockies Express file with the Secretary completed mussel survey reports for the federally listed mussel species in Anderson Fork, East Fork Paint Creek, Little Walnut Creek, Tributary to Burley Run, Brush Creek, Buffalo Fork, Tributary to Crabapple Creek, and Cat Run in Ohio, documentation of its consultation with FWS and ODNR, and conservation measures necessary to minimize impact to mussel beds.**

- **During construction, Rockies Express not withdraw hydrostatic test water from Sugar Creek, the Scioto River, Deer Creek, and Big Darby Creek or the tributaries of these waterbodies in order to protect endangered mussels or glochidia/host fish or juveniles from direct impacts.**

- **In the event that a trenchless crossing fails at the Scioto River, Deer Creek in Deer Creek State Park, or Big Darby Creek, Rockies Express halt construction activities at the crossing(s) until Rockies Express files with the Secretary and receives written approval from the Director of OEP a site-specific alternate waterbody crossing plan developed in consultation with the FERC, COE, and FWS. The plan should include:**

  a. The specific reasons that the trenchless technique was not successful;

  b. A description of how Rockies Express would seal the abandoned drill hole;

  c. Scaled drawings identifying all areas that would be disturbed by an alternative crossing method; and

  d. A description of the mitigation measures that would be implemented to minimize the extent and duration of disturbance on the river and any mussels.

- **In addition, Rockies Express not begin an alternative crossing of the Scioto River, Deer Creek in Deer Creek State Park, or Big Darby Creek until:**

  a. The FERC evaluates the potential impact on the mussel species and the Commission staff complete consultation with FWS;

  b. The FERC, FWS, and COE determine that the alternative crossing method and mitigation plan are acceptable; and

  c. The Director of OEP notifies Rockies Express in writing that it may proceed with the alternative river crossing plan.

Determination of Effect

Due to the low likelihood of any mussel species being present at any of the river crossings, the construction measures and hydrostatic testing methods that Rockies Express would employ, and our recommendations, we have determined that the REX East Project would have *no effect* on the fat

pocketbook mussel and would *not be likely to adversely affect* the clubshell, the northern riffleshell, or the fanshell mussels.

Candidate Species – Rayed Bean and Spectaclecase Mussels

The rayed bean and spectaclecase are candidate mussel species for federal listing. The rayed bean mussel is a headwater species in Warren and Pickaway Counties, Ohio, and FWS has identified the spectaclecase as being present in the Mississippi River.

Rockies Express would cross the Mississippi River by the HDD method, which would avoid any direct impacts to mussels or mussel beds. However, limited dredging in the river would be required to install the pipeline by the HDD method. Dredging operations would temporarily increase sediment loads in the water and could affect mussels and mussel beds.

Rockies Express employed qualified malacologists to survey for the presence or absence of mussels in the waterbodies. Surveys for each species occurred from June 1 through August 31, 2007. No federally listed candidate species of concern were found during the surveys conducted in Missouri or Ohio. The Missouri mussel survey report was filed with the Secretary on August 14, 2007. The Ohio mussel survey report was filed with the Secretary on August 27, 2007.

Given the results of the Rockies Express mussel and mussel bed surveys and the conservation measures generated through consultation with FWS, we believe that the Project would *not be likely to adversely affect* these federal candidate species.

Running Buffalo Clover

Background

The federally endangered running buffalo clover was assumed to be extinct until 1985, when two populations of the species were discovered in West Virginia. Running buffalo clover requires open habitat in rich soils between open forest and prairies. It cannot tolerate full sun or full shade. The species requires moderate, periodic disturbance, but it is intolerant to severe disturbances. Successful colonies of running buffalo clover can be found in woodlots, mowed areas such as parks and cemeteries, along streams and trails, and on the fringe of forests and bottomland meadows (FWS, 1992; 2003).

Once presumed extirpated within the area affected by the Project, running buffalo clover is now found in isolated populations in Indiana, Missouri, and Ohio (DOI, 2005). This species is known to exist in areas with appropriate habitat within Warren County, Ohio. The pipeline route crossing of Warren County predominantly comprises agricultural land, which is unlikely to sustain populations due to severe disturbance and exposure and according to information provided by ODNR, there are no known occurrences of this species within 1 mile of the pipeline route (ODNR, 2006e).

In order to determine species presence in the Project area and in accordance with FWS recommendations, Rockies Express conducted a survey of areas of suitable habitat along the pipeline route. On April 26, 2007, the Reynoldsburg ESO provided approval of Rockies Express' proposed survey protocol for the running buffalo clover (FWS, 2006e). Following the plan approved by FWS, Rockies Express completed species-specific surveys during the flowering season in 2007, between mid-April and June, for the entire route in Warren County with the exception of 11 parcels for which property access was denied by landowners. No running buffalo clover individuals or populations were found. As stated in the Running Buffalo Clover Survey Report, submitted to FWS in August, 2007, it is unlikely that the species occurs in areas of denied access due to suspected poor habitat quality. Areas of potential

running buffalo clover habitat where survey access was denied in 2007 would be surveyed by Rockies Express in early summer 2008, before Project construction.

Impact Assessment

Although records of known occurrences for this species are scarce, areas with the appropriate habitat for running buffalo clover may be present along the pipeline route. Based on the results of running buffalo clover presence/absence surveys conducted during the flowering season in 2007 and the suspected lack of occurrence along the areas of the route yet to be surveyed, Rockies Express believes this species would not be impacted by the Project. Additionally, few areas of suitable habitat were identified during the survey efforts and, of the areas remaining for survey, few are expected to provide suitable habitat.

Compensation, Mitigation, and Monitoring

If individuals or populations of this species are identified during surveys of remaining parcels in Warren County, Ohio, Rockies Express stated that it would coordinate with FWS to evaluate potential measures to avoid or minimize impacts on the species, such as fencing off plants, transplanting individuals, or modifying the construction right-of-way configuration.

No individuals were identified during these surveys. However, 11 of the 75 sites were not surveyed because access was denied by the landowners. No surveys were conducted between MPs 439.4 and 452.7. To minimize the potential impacts on the running buffalo clover, **we recommend that:**

- **For the running buffalo clover Rockies Express should:**

  a. File with the Secretary completed survey reports and documentation of its consultation with FWS prior to the start of construction;

  b. Implement the following prior to the start of construction if running buffalo clover is identified within the action area during remaining surveys:

    i. If plants are located adjacent to or along the edge of the construction right-of-way, fence off the plants and avoid the area;

    ii. If plants are located within the construction right-of-way, modify the construction right-of-way configuration to avoid plants, retain tree cover in and around plants, and fence off the plants;

    iii. Use only approved native plant species during restoration of the right-of-way;

    iv. Prohibit herbicide applications within 200 feet of the plants and avoid mowing between May and June; and

    v. Consult with FWS to develop site-specific invasive plant control measures to include a monitoring plan. Rockies Express should file these measures with the Secretary for review and written approval by the Director of OEP.

  c. Not burn in or adjacent to any areas where an individual or population of running buffalo clover has been identified during construction.

Determination of Effect

Due to the low likelihood of this species being encountered during construction, Rockies Express' commitment to complete the surveys and implement measures to avoid impacts, and our recommendations, we have determined that the REX East Project would *not be likely to adversely affect* the running buffalo clover.

Decurrent False Aster

Background

The federally threatened decurrent false aster is a big river floodplain species that primarily inhabits wetlands and borders of marshes, lakes, oxbows, and sloughs. This species reportedly favors sites characterized by moist soil and regular disturbance, which maintains open areas with high light levels. Seeds are dispersed primarily by floodwater (MDC, 2000a). Excessive siltation is a major cause of this species' decline. Highly intensive agricultural activities in the region have increased topsoil runoff, which smothers seeds and seedlings (FWS, 1997b). Habitat destruction from floodplain conversion, channeling of rivers, flood-control measures, and wetland drainage has also contributed to reductions of decurrent false aster populations.

The decurrent false aster has been recorded in Pike County, Missouri and in Pike and Scott Counties, Illinois. NHI database records indicate that the decurrent false aster has not been observed within 1 mile of the pipeline route (MDC, 2006; ILDNR, 2006). However, suitable habitat for this species is present in the counties listed above at the Salt, Mississippi, Sny, and Illinois River crossings and may also occur in non-riparian areas.

Impact Assessment

Construction activities in aquatic and associated floodplain areas could increase sediment suspension and downstream displacement, and may contribute to reductions in this species' reproductive success. Temporary impacts on floodplain and river-shore wetlands would occur during staging and trenching activities. Rockies Express anticipates no permanent impacts on areas with suitable habitat for the decurrent false aster, as no aboveground facilities would be built on floodplains or river-shore wetlands in the counties with populations of this species.

Temporary impacts on suitable habitat, including trampling and soil mixing, may occur during staging and construction activities associated with the Project. Individual plants, in part or in whole, may be unintentionally removed during construction activities if located in the right-of-way and not appropriately identified prior to construction activities.

In a meeting on April 2, 2007, between Rockies Express and FWS, the FWS Marion ESO stated that since the Illinois River, the primary area of concern for this species, would be crossed by the REX East Project using the HDD method and associated floodplain impacts would be avoided, no impacts on the decurrent false aster are expected (FWS, 2007e). Similarly, in an email dated June 26, 2007 from the Columbia ESO, it was established that the REX East Project was unlikely to affect the decurrent false aster in Missouri and as such, surveys were unnecessary (FWS, 2007b). In addition, if populations are encountered during construction, Rockies Express would attempt to fence off the plants to avoid impacts. No surveys were required by FWS for the decurrent false aster along the proposed pipeline route.

Compensation, Mitigation, and Monitoring

None

Determination of Effect

Due to avoidance of the floodplain areas associated with the Illinois River, HDD activities avoiding other floodplain areas, and no documented occurrences of the species occurring along the Project corridor, we have determined that the REX East Project would have *no effect* on the decurrent false aster.

Eastern Prairie Fringed Orchid

Background

The eastern prairie fringed orchid is a federally threatened orchid that occurs in a wide variety of habitats, from mesic prairie to wetlands such as sedge meadows, marsh edges, and bogs. This species requires full sun and herbaceous habitat with little or no woody encroachment, and may benefit from disturbances that expose the soil to this orchid's seeds and reduce competition from established plants (FWS, 1999). The orchid colonizes areas that have natural patch areas of disturbance or continual disturbance events. The eastern prairie fringed orchid requires soil fungi and fire regimes for seeds to establish. Mature seed capsules are wind dispersed between late August and late September (FWS, 2005b). Individual plants regenerate from tubers, which are dormant during the winter (FWS, 1989a).

This orchid is listed as potentially occurring statewide in Illinois, in all counties containing dry/mesic/wet prairies. Historically, Illinois contained the largest population of this species, which extended across 33 counties in the northern two-thirds of the state. Known populations are currently concentrated in the six counties surrounding the Chicago area (FWS, 1989a). Historically threatened by the conversion of habitat to cropland, the eastern prairie fringed orchid is currently most threatened by the drainage and development of wetlands as well as competition from non-native species (FWS, 2005b). According to ILDNR NHI database, there are no known occurrences of this species within 1 mile of the pipeline route and there are no prairie regions in the general area of the Project (ILDNR, 2006).

Impact Assessment

In a meeting on April 2, 2007, between Rockies Express and FWS, the FWS Marion ESO confirmed that it had no concerns about the REX East Project affecting listed plant species in Illinois (FWS, 2007e). In addition, if populations are encountered during construction, Rockies Express would attempt to fence off the plants to avoid impacts.

Compensation, Mitigation, and Monitoring

None

Determination of Effect

This species is not expected to be present along the Project corridor. Based on our informal consultation with FWS and the informal consultation between Rockies Express and FWS, we have determined that the REX East Project would have *no effect* on the eastern prairie fringed orchid.

Prairie Bush Clover

Background

The federally threatened prairie bush clover is often found on the north-facing slopes of dry upland prairies. It is endemic to the tall-grass prairie region of the upper Mississippi River Valley in Iowa, Illinois, Minnesota, and Wisconsin. Throughout this region, the prairie bush clover is known to occur in 23 counties, where it is restricted to fewer than 40 sites (FWS, 2006g).

This clover is listed as potentially occurring statewide in Illinois in areas containing dry/mesic/wet prairies. However, roughly 90 percent of all known plants occur within a "core area" located in Iowa and Minnesota (CPC, 2000). In all 13 known Illinois populations, a total of approximately 250 plants remain. The rarity of this endemic species can be attributed primarily to the loss of tall-grass prairie habitat, specifically mesic to dry prairie (FWS, 2006g). Surviving populations occur primarily in areas that were not converted to cropland because the terrain is too steep or rocky (FWS, 2006g).

Impact Assessment

According to the ILDNR NHI database, there are no known occurrences of this species within 1 mile of the pipeline route and there are no prairie regions in the general area of the Project (ILDNR, 2006). In a meeting on April 2, 2007, between Rockies Express and the FWS, the FWS Marion ESO confirmed that it had no concerns about the REX East Project affecting listed plant species in Illinois (FWS, 2007e). No surveys were required along the pipeline route by FWS.

Compensation, Mitigation, and Monitoring

None

Determination of Effect

This species is not expected to be present along the Project corridor. Based on our informal consultation with FWS and the informal consultation between Rockies Express and FWS, we have determined that the REX East Project would have *no effect* on the prairie bush clover.

Conclusion

Twenty-three federally listed endangered or threatened species were initially considered as potentially occurring in the vicinity of the Project area. Ten of the 23 species were eliminated from detailed review because there is no habitat or we determined, after initial review, that the species would probably not occur in the Project area.

The remaining 13 federally listed species are addressed in the biological assessment (BA) (CD Document M) we prepared. Of the 13 species, 10 are federally listed threatened or endangered species and 3 are candidate species. Table 4.7.1-6 provides a summary of our determination for the 10 federally listed threatened or endangered species discussed in the BA.

Based on our analysis contained in the BA, the REX East Project would have *no effect* on 4 of the 10 federally listed threatened or endangered species (clubshell, decurrent false aster, eastern prairie fringed orchid, and prairie bush clover). We have determined that, with the implementation of Rockies

Table 4.7.1-6

Federally Listed Species That Potentially Occur in the Counties Crossed by the Rockies Express East Pipeline Project and the FERC Impact Determination

Species	Federal Status	State Status	FERC Impact Determination
Mammals			
Indiana bat (*Myotis sodalis*)	E	OH/E	May affect, not likely to adversely affect
Birds			
Whooping crane a/ (*Grus Americana*)	E	NE/E	May affect, not likely to adversely affect
Mussels			
Clubshell (*Pleurobema clava*)	E	OH/E	May affect, not likely to adversely affect
Fanshell (*Cyprogenia stegaria*)	E	OH/E	May affect, not likely to adversely affect
Fat pocketbook (*Potomalus capax*)	E	NL	No effect
Northern riffleshell (*Epioblasma torulosa rangiana*)	E	OH/E	May affect, not likely to adversely affect
Plants			
Decurrent false aster (*Boltonia decurens*)	T	NL	No effect
Eastern prairie fringed orchid (*Platanthera leucophaea*)	T	IL, OH/E	No effect
Prairie bush clover (*Lespedeza laptostachya*)	T	NL	No effect
Running buffalo clover (Trifolium stoloniferum)	E	NL	May affect, not likely to adversely affect

a/ Includes an experimental migratory population.
T = Threatened
E = Endangered
NL = Not listed

Express' proposed mitigation measures and our recommended mitigation measures contained herein, the REX East Project *may affect*, but *would not be likely to adversely affect* the remaining six federally listed threatened or endangered species (Indiana bat, whooping crane, fanshell, fat pocketbook, northern riffleshell, and running buffalo clover). However, Rockies Express would still be required to conduct additional preconstruction surveys for the Indiana bat, fanshell, fat pocketbook, northern riffleshell, and running buffalo clover before starting construction. The FERC has provided the BA to FWS for its review and concurrence.

4.7.2 State-listed Species

Rockies Express consulted with MDC, ILDNR, INDNR, and ODNR regarding state-listed species. State-listed species in the REX East Project area that are also federally listed are discussed in section 4.7.1 (see table 4.7.2-1).

Table 4.7.2-1
State-Listed Endangered or Threatened Species Potentially Occurring in the REX East Project area

Species	State Status	Counties/State	Preferred Habitat	Determination
Birds				
Bald eagle (*Haliaeetus leucocephalus*)	IL/T MO, IN, OH/E	All counties crossed by the pipeline route	Potential roosting, nesting, and feeding habitat occur along Project route.	Not likely to adversely affect
Greater prairie chicken (*Tympanuchus cupido*)	MO/E	Audrain/MO	Prefers prairie grasslands	Not likely to adversely affect
Loggerhead shrike (*Lainus ludovicianus*)	IN, OH/E	Clinton, Fayette, Greene, Pickaway, and Warren Counties/OH	Uses edge habitats along roads or fence rows in agricultural areas.	Eliminated from consideration in Indiana per consultations with INDNR. Not likely to adversely affect in Ohio
Northern harrier (*Circus cyaneus*)	OH/E	Greene, Muskingum/OH	Wetlands, meadows, prairies, and cultivated fields	Not likely to adversely affect
Trumpeter swan (*Cygnus buccinator*)	OH/E	Muskingum/OH	Wetlands near rivers, ponds, lakes, and forested areas with open canopies	Not likely to adversely affect
Amphibians				
Eastern hellbender	OH/E	Muskingum/OH	Prefers large, swift-flowing rivers with large, flat rocks for nesting	Not likely to adversely affect
Fish				
Toungetied minnow (*Exoglossum laurae*)	OH/T	Butler/OH	Rocky pools and runs in Seven Mile Creek	Not likely to adversely affect
Variegate darter (*Etheostoma variatum*)	IN/E	Franklin/IN	Stream riffles with swift currents and large cobble to small boulder substrates	Not likely to adversely affect
Mussels				
Fawnsfoot (*Truncilla donaciformis*)	OH/T	Warren, Pickaway, Muskingum/OH	Large rivers with sand or gravel substrate and low turbidity	Not likely to adversely affect
Long-solid (*Fusconaia subrotunda*)	OH/E	Pickaway/OH	Clear waterbodies with swift current over gravel substrate and low turbidity	Not likely to adversely affect
Rabbitsfoot (*Quadrula cylindrical*)	IN, OH/E	Johnson and Shelby/IN, Pickaway/OH	Clear waterbodies with swift current over gravel substrate and low turbidity	Not likely to adversely affect
Sharp-ridged pocketbook (*Lampsilis ovata*)	OH/E	Pickaway/OH	Large rivers with coarse sand or gravel	Not likely to adversely affect
Snuffbox (*Epioblasma triquetra*)	IN, OH/E	Johnson and Shelby/IN, Warren, Pickaway/OH	Prefers medium- to large-sized waterbodies with clear water over gravel substrate and low turbidity	Not likely to adversely affect
Washboard (*Megalonaias nervosa*)	OH/E	Pickaway/OH	Large rivers with slow current and mud or mudgravel substrate	Not likely to adversely affect
Plants				
Drummond's aster (*Aster drummundii*)	OH/T	Pickaway/OH	Prefers semi-open areas, but intolerant of overshading; thrives in maintained areas	Not likely to adversely affect

T = Threatened
E = Endangered

Bald Eagle

The bald eagle is listed as threatened in Illinois and as endangered in Indiana, and Ohio, and Missouri. Wyoming lists the bald eagle as a species of concern. Historically, populations of bald eagles were drastically reduced principally due to low productivity as a result of the bioaccumulation of pesticides. Since the banning of organochlorine pesticides, bald eagle numbers have been increasing. Effective August 8, 2007, the bald eagle is no longer federally listed as threatened in the lower 48 states. However, protection is provided to the bald eagle under the BGEPA and the MBTA and will continue to remain in place after the species is delisted. The BGEPA and MBTA, known collectively as the "Eagle Act" prohibit "disturbance" of eagles, their nests, or eggs. For a detailed discussion of the bald eagle and the Project's potential impacts, see section 4.5.3.

Greater Prairie Chicken

The greater prairie chicken is listed as an endangered species in Missouri. Historic populations of greater prairie chicken have been identified in Audrain County between MPs 1.1 and 3.4; 3.7 and 6.9; and 16.5 and 17.7. Rockies Express has consulted with MDC and no preconstruction surveys are required. It has been noted that if active leks are discovered along the proposed route, Rockies Express would consult with MDC on appropriate conservation measures. Rockies Express notified 34 landowners within potential greater prairie chicken habitat areas to determine if the bird had been identified in the Project area. No notified landowners responded with any sightings. MDC concurs with Rockies Express that no further actions are necessary to address the occurrence of the greater prairie chicken within the proposed route.

Provided conservation measures are put in place and leks, which are seasonal and recurrent, are not disturbed, it is unlikely that the Project would adversely affect the greater prairie chicken.

Loggerhead Shrike

The loggerhead shrike is endangered in Indiana and threatened in Ohio. Grassy areas with scattered shrubs and trees are preferred habitat for this songbird species. The loggerhead shrike uses edge habitat with nests along roads, hedgerows, or fence rows in agricultural areas (INDNR, 2007). Indiana historic records indicate occurrence of the species near MP 257.5. Ohio historic records place this species along the proposed route near MP 478.3 and on the 1-mile distance between MPs 511.4 and 512.4. Neither INDNR nor ODNR has requested surveys.

Rockies Express consulted with ODNR on measures to reduce impacts to the loggerhead shrike. In addition, Rockies Express stated that it would include the loggerhead shrike in Ohio in its Conservation Guidelines with FWS regarding the Migratory Bird Treaty Act. ODNR has requested that Rockies Express avoid construction in grassland or prairie habitat during its nesting season April 1 through August 2.

With the implementation of conservation measures established by ODNR, and its inclusion in the Conservation Guidelines, it is unlikely that the loggerhead shrike would be adversely impacted by the Project.

Northern Harrier

The northern harrier is an endangered bird in Ohio. It nests and hunts in wetlands, meadows, prairies, and cultivated fields (NatureServe Explorer, 2007). The northern harrier can be found in

Muskingum and Greene Counties. There are no historic records of the northern harrier within the Project area. ODNR has not requested surveys.

Rockies Express consulted with ODNR on measures to reduce impacts to the northern harrier. ODNR has requested that Rockies Express avoid construction in grassland or prairie habitat during its nesting period between May 15 and August 1.

With the implementation of conservation measures established by ODNR, it is unlikely that this species would be adversely impacted by the Project.

Trumpeter Swan

The trumpeter swan is an endangered bird in Ohio. Preferred habitat for the swan includes wetlands near rivers, lakes, ponds, forested areas with open canopies, and prairies (FWS, 2007g). Trumpeter swans build their nests close to the water, including on the shore, small islands, or near beaver or muskrat lodges (FWS, 2007g). This species of swan either does not migrate or migrates very short distances. The trumpeter swan can be found in Muskingum County. However, there are no historic records of the trumpeter swan within the Project area. ODNR has not requested surveys.

Rockies Express consulted with ODNR on measures to reduce impacts to the trumpeter swan. ODNR has requested that Rockies Express avoid construction in wetland habitat during the swan's nesting period of May 1 through August 1.

With the implementation of conservation measures established by ODNR, it is unlikely that this species would be adversely impacted by the Project.

Eastern Hellbender

This species of aquatic salamander is threatened in Ohio. Historically it was found from New York State to Missouri and Arkansas. It takes up oxygen through tiny vessels in the skin and is therefore highly susceptible to pollution and turbidity within the water (Johnson and Briggler, 2004).

Construction at waterbody crossings can increase turbidity in water. Increased turbidity can reduce the eastern hellbender's ability to take up oxygen. Surveys for the eastern hellbender were performed at six waterbodies in Ohio on October 9, 2007, using survey methods recommended by ODNR. No individuals were found. Of the six waterbodies, the Muskingum River was the only waterbody not surveyed for the eastern hellbender. There are no reliable standard techniques for performing eastern hellbender surveys in large, dark, turbid rivers. Therefore, accurate presence/absence surveys of the deep and dark Muskingum River could not be performed. Because the Muskingum River would be crossed by HDD methods, the eastern hellbender would not be impacted. ODNR commented on the survey results and determined that the proposed Project is not likely to impact the eastern hellbender.

Because no individuals were encountered within the survey corridor at the five surveyed waterbodies, it is unlikely that this species would be adversely impacted by the Project.

Tonguetied Minnow

The tonguetied minnow is listed as threatened in Ohio. The preferred habitat for this species includes rocky pools and runs in creeks and small- to medium-sized rivers that have vegetation or other forms of cover. The tonguetied minnow has been observed in Seven Mile Creek near MP 422.7, and may

also occur in the tributary to Seven Mile Creek. Loss of habitat due to siltation is the major cause of decline for this species (OJS, 1973).

Rockies consulted with ODNR on measures to reduce impacts to the tonguetied minnow. Rockies Express would avoid instream work between March 15 and June 30. ODNR has not requested surveys.

With the implementation of conservation measures established by ODNR, it is unlikely that this species would be adversely impacted by the Project.

Variegate Darter

The variegate darter is listed as endangered in Indiana. This fish is restricted to the Ohio River drainage in eastern Indiana and may exist in waterbodies crossed between MPs 382.1 and 398.4. Waterbodies in the Project area where this species potentially occurs include Big Cedar Creek, the Whitewater River, Little Cedar Creek, and their tributaries.

Rockies Express conducted surveys for this species. No individuals were identified within the survey corridor during the surveys. Because no individuals were encountered within the survey corridor during the surveys, it is unlikely that this species would be adversely impacted by the Project.

Mussels

Rabbitsfoot Mussel

The rabbitsfoot mussel is endangered in Indiana and Ohio. It may occur in the vicinity of MP 337.9 in Indiana and MP 514.5 in Ohio. The rabbitsfoot was once widespread throughout the Ohio River and Mississippi River Valleys. Construction impacts such as increased sedimentation loads downstream could affect either the host fish used by larval stages of the mussel or the substrate used by adults. INDNR indicated in a meeting on January 10, 2007, that Youngs Creek and Sugar Creek were waterbodies of concern regarding the rabbitsfoot mussel. Ohio ODNR has stated that Rockies Express should avoid construction activities in waterbodies containing freshwater mussel beds between April 15 and June 30.

The Scioto River in Ohio would be crossed by HDD methods; therefore, impacts to aquatic resources are not expected for that waterbody. Rockies Express is proposing an open-cut method to cross Sugar Creek and Youngs Creek, which would increase suspended sediment in the water column. However, if Sugar Creek has perceptible water flow at the time of construction, Rockies Express would use a dry-ditch crossing method.

Rockies Express conducted surveys of waterbodies in Indiana and Ohio, where suitable habitat for rabbitsfoot mussel were identified. No individuals were observed during the surveys. As discussed earlier, six sites in Ohio are yet to be surveyed because access was denied. These six sights would be surveyed once water temperatures reach 50 degrees Fahrenheit in the spring of 2008. Although INDNR initially indicated that Youngs Creek was a waterbody of concern for the rabbitsfoot mussel in consultation dated January 19, 2007, they did not require surveys at Youngs Creek.

Because no individuals were found during surveys, we believe it is unlikely that there would be an adverse impact to the rabbitsfoot mussel.

Snuffbox, Long-solid, Fawnsfoot, Washboard, and Sharp-ridged Mussels

The snuffbox is a mussel that may occur in Ohio, where it is endangered and inhabits intermediate to major rivers with clear, gravel riffles (INHS, 1997d). This species has been observed in the Little Miami River (south of MP 451.3) and Big Darby Creek (MP 509.2).

The long-solid mussel is an endangered species in Ohio that occurs in major rivers with gravel substrates. Historic records indicate that the species has been identified in the Project area in the Scioto River (MP 514.6).

The fawnsfoot is widespread and common throughout most of its range, preferring a sand or gravel substrate; however, it is listed as threatened in Ohio (INHS, 1997b). It has been observed in the Little Miami River (south of MP 451.3), Big Darby Creek (MP 509.2), and the Muskingum River (north of MP 577.3).

The washboard is an endangered species in Ohio that occurs in major rivers with slow current and mud or mudgravel substrate (KDWP, 2007). It is believed to be rare in the lower Big Darby River.

The sharp-ridged pocketbook is an endangered species in Ohio that occurs in large rivers in course sand or gravel (INHS, 1997c). It is believed to be rare in the Big Darby River.

Construction at waterbody crossings can increase turbidity in water. Increased turbidity of the water can have detrimental effects on mussels. Clouding the water as sediment falls to the surface of the streambed can cover the mussel and make the environment inhospitable. Suspended sediment can also interfere with the lifecycle of the mussel. Big Darby Creek, the Little Miami River, Muskingum River, and Scioto River are known to contain these state-listed species in Ohio, and all of these waterbodies would be crossed by the HDD method. Therefore, direct impacts to mussels and mussel beds would be avoided in these rivers.

Rockies Express conducted surveys from June 1 through August 31, 2007, in waterbodies where suitable habitat for the mussels was identified. No individuals were observed during any of the surveys. Therefore, we believe that the Project would not affect the mussel species of concern.

Drummond's Aster

This species is threatened in Ohio. Historical records indicates occurrence of Drummond's aster in the vicinity of MPs 510.1 and 510.2. At this location, a plant community has succeeded in the maintained right-of-way corridor through a wooded area. According to the ODNR Web page (ODNR, 1984), its recovery potential is presumed good.

Construction impacts related to destruction due to collision could result in mortality. Measures to ensure avoidance include a reroute if necessary—placing fencing around plants during construction—and consulting with agencies to determine conservation measures. Imported plants on equipment used for construction or maintenance during operation could also negatively impact the species. Noxious weeds are a threat to this species, and mechanical destruction due to mowing is also a concern.

Rockies Express performed construction surveys during the week of October 8, 2007. No individuals were found within the survey area. ODNR accepted the survey results and determined that the Drummond's aster would not be affected by the Project.

Because no individuals were encountered within the survey corridor and ODNR concurs with the survey results, it is unlikely that this species would be adversely impacted by the Project.

4.8 LAND USE AND VISUAL RESOURCES

The REX East Project would consist of approximately 639.1 miles of natural gas pipeline that would cross the states of Missouri, Illinois, Indiana, and Ohio. Aboveground facilities would include 19 meter stations (at 13 locations), 7 compressor stations (including 1 in Nebraska and 1 in Wyoming), 42 MLVs, 11 contractor/pipe yards, and 2.2 miles of newly constructed access roads.

This section examines the current uses of the land required for construction and operation of the Project and evaluates the Project-related impacts. In general, lands required for construction would be temporarily impacted, while lands required for operation of the Project would be permanently impacted. The Project would cross several land use types, the majority of which are agricultural land. This section quantifies the acreage of each land use type that would be affected and discusses measures that would be taken to avoid, minimize, or mitigate land use impacts. Impacts to recreational and special interest areas, as well as impacts on visual resources, are also presented. Detailed discussion of vegetation types along the Project route is presented in section 4.4, while discussion of waterbodies along the Project route is presented in section 4.3.

For the discussion that follows, impacts are classified as temporary, short-term, long-term or permanent based on the time it takes them to recover to pre-construction conditions. Temporary impacts are defined as those impacts that would occur during the construction phase only. Short-term impacts would extend beyond the timing of construction but no longer than a period of 3 years. Long-term impacts require more than 3 years to recover but less than the expected lifetime of the Project. Permanent impacts are defined as lasting as long as the life of the Project or longer.

4.8.1 General Land Use

Land use and land cover types crossed by the pipeline and facilities include six primary types: agricultural, forested, industrial/commercial, residential, open land, and open water. Table 4.8.1-1 presents the land use impacts that would occur from construction and operation of the Project. The primary land use that would be crossed by the pipeline route is agricultural (462.1 miles or about 72 percent of the total pipeline route). Other land uses that would be crossed by the pipeline route include forest land (144.7 miles or 23 percent of the total pipeline route); open land (25 miles or less than 4 percent of the total pipeline route); open water (1.6 miles or less than 1 percent of the total pipeline route); industrial/commercial land (4.0 miles or less than 1 percent of the total pipeline route); and residential land (1.3 miles or less than 1 percent of the total pipeline route). Of the estimated 14,334.4 acres affected by construction, 67 percent would be for the pipeline right-of-way and 29 percent for additional temporary workspaces. Aboveground facilities would impact approximately 153 acres (table 4.8.1-1). Approximately 59 percent of the pipeline (377.1 miles) would be collocated with existing pipeline rights-of-way. Following construction, lands used for temporary workspace and pipe and contractor yards would be allowed to revert to their pre-construction use type.

Approximately 99 percent of the Project route would cross privately owned land. One percent of the land crossed by the pipeline route is managed or owned by state agencies, federal agencies, or local municipalities. Negotiated easements would be used to confer rights-of-way by a landowner to the pipeline company, on either a permanent or temporary (usually for construction) basis. The easement would give the company the right to construct, operate, and maintain the pipeline within a permanent or temporary right-of-way. In return, the company would compensate the landowner for its use of the land. Typically, an easement agreement between the company and landowner would specify compensation for loss of use during construction, loss of resources, or damage to the property, and would specify allowable uses for the permanent right-of-way after construction is completed.

Table 4.8.1-1

REX East Project
Summary of Land Uses Affected by Construction and Operation of the REX East Project by State (in acres)

	Agriculture a/		Forested b/		Industrial/ Commercial c/		Residential d/		Open Land e/		Open Water f/		Total	
	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.
MISSOURI														
Pipeline g/	516.8	206.7	112.9	45.2	1.4	0.5	0.0	0.0	16.5	6.6	4.6	1.8	**652.1**	**260.9**
Interconnects and Laterals h/	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**	**0.0**
Additional Temporary Workspace	211.9	0.0	54.0	0.0	0.2	0.0	0.0	0.0	9.6	0.0	0.1	0.0	**275.8**	**0.0**
Aboveground Facilities i/	12.9	12.9	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**13.0**	**13.0**
Contractor/Pipe yards	22.6	0.0	11.6	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	**35.0**	**0.0**
Subtotal	764.2	219.6	178.6	45.3	1.6	0.5	0.0	0.0	26.8	6.6	4.7	1.8	**975.9**	**273.9**
ILLINOIS														
Pipeline g/	2,623.4	1,049.4	217.7	87.1	11.8	4.7	2.6	1.0	95.5	38.2	5.8	2.2	**2,956.8**	**1,182.7**
Interconnects and Laterals h/	5.1	3.1	0.3	0.2	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	**5.6**	**3.4**
Additional Temporary Workspace	1,077.5	0.0	86.1	0.0	1.0	0.0	0.0	0.0	3.9	0.0	0.0	0.0	**1,168.5**	**0.0**
Aboveground Facilities i/	24.1	24.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**24.2**	**24.2**
Contractor/Pipe yards	65.3	0.0	0.2	0.0	2.3	0.0	0.0	0.0	2.2	0.0	0.0	0.0	**70.0**	**0.0**
Subtotal	3,795.4	1,076.6	304.4	87.4	15.1	4.7	2.6	1.0	101.8	38.3	5.8	2.2	**4,225.1**	**1,210.3**
INDIANA														
Pipeline g/	1,826.2	730.5	579.9	231.9	10.3	4.1	0.0	0.0	97.9	39.1	3.4	1.4	**2,517.6**	**1,007.1**
Interconnects and Laterals h/	4.0	2.5	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	**4.2**	**2.7**
Additional Temporary Workspace	815.0	0.0	188.6	0.0	0.6	0.0	0.1	0.0	1.7	0.0	0.2	0.0	**1,006.1**	**0.0**
Aboveground Facilities i/	28.2	28.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**28.3**	**28.3**
Contractor/Pipe yards	62.2	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**63.0**	**0.0**
Subtotal	2,735.6	761.2	769.4	232.0	11.1	4.3	0.1	0.0	99.9	39.1	3.6	1.4	**3,619.3**	**1,038.1**
OHIO														
Pipeline g/	2,081.1	832.7	1,264.1	505.6	24.9	10.0	14.8	5.9	157.9	63.2	9.2	3.7	**3,552.0**	**1,421.1**
Interconnects and Laterals h/	7.9	5.0	2.8	1.7	0.3	0.2	0.0	0.0	15.9	11.4	0.0	0.0	**26.9**	**18.3**
Additional Temporary Workspace	1,175.1	0.0	532.0	0.0	1.8	0.0	2.3	0.0	0.9	0.0	0.5	0.0	**1,712.6**	**0.0**
Aboveground Facilities i/	41.0	41.0	13.7	13.7	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	**54.8**	**54.8**
Contractor/Pipe yards	74.6	0.0	30.8	0.0	28.2	0.0	0.0	0.0	1.0	0.0	0.5	0.0	**135.1**	**0.0**
Subtotal	3,379.7	878.7	1,843.4	521.0	55.2	10.2	17.1	5.9	175.8	74.7	10.2	3.7	**5,481.4**	**1,494.2**

Table 4.8.1-1 (continued)

REX East Project

Summary of Land Uses Affected by Construction and Operation of the REX East Project by State (in acres)

	Agriculture a/		Forested b/		Industrial/ Commercial c/		Residential d/		Open Land e/		Open Water f/		Total	
	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.
NEBRASKA														
Aboveground Facilities	17.7	17.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**17.7**	**17.7**
Subtotal	17.7	17.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**17.7**	**17.7**
WYOMING														
Aboveground Facilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	15.0	0.0	0.0	**15.0**	**15.0**
Subtotal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.0	15.0	0.0	0.0	**15.0**	**15.0**
REX EAST PROJECT														
Pipeline g/	7,047.5	2,819.3	2,174.6	869.8	48.4	19.3	17.4	6.9	367.8	147.1	23.0	9.1	**9,678.5**	**3,871.8**
Interconnects and Laterals h/	17.0	10.6	3.1	1.9	0.5	0.4	0.0	0.0	16.1	11.5	0.0	0.0	**36.7**	**24.4**
Additional Temporary Workspace	3,279.5	0.0	860.7	0.0	3.6	0.0	2.4	0.0	16.1	0.0	0.8	0.0	**4,163.1**	**0.0**
Aboveground Facilities i/	123.9	123.9	14.0	14.0	0.0	0.0	0.0	0.0	15.1	15.1	0.0	0.0	**153.0**	**153.0**
Contractor/Pipe yards	224.7	0.0	43.4	0.0	30.5	0.0	0.0	0.0	3.9	0.0	0.5	0.0	**303.1**	**0.0**
Total	**10,692.6**	**2,953.9**	**3,095.8**	**885.7**	**83.0**	**19.7**	**19.8**	**6.9**	**419.0**	**173.7**	**24.3**	**9.2**	**14,334.4**	**4,049.2**

NOTE: The numbers in this table have been rounded for presentation purposes. As a result, the totals may not reflect the exact sum of the addends in all cases. Totals may be off by 0.1 place.

a/ Agricultural land consists of actively cultivated or rotated croplands, pastures, or hayfields
b/ Forest land consists mainly of deciduous and mixed forest and forested wetlands. Does not include shelterbelts or similar features associated with agricultural areas.
c/ Industrial/Commercial land consists of commercial/industrial developments such as utility stations, rock quarries, strip mines, gravel pits, and major railroad and road crossings (i.e., greater than 100 feet).
d/ Residential land consists of existing and planned residential developments.
e/ Open land consists of grasslands, non-farmed areas, and non-forested wetlands.
f/ Open water consists of waterbody crossings 100 feet or greater in width.
g/ Assumes a 125-foot-wide construction right-of-way and a 50-foot-wide permanent right-of-way in all locations.
h/ Assumes a 50- to 100-foot-wide construction right-of-way and a 50-foot-wide permanent right-of-way.
i/ Includes construction and operational impacts associated with the compressor stations and meter stations and access roads to compressor stations and meter stations. Because mainline valves would be constructed within the construction right-of-way, land use impacts are accounted for with the pipeline. However, because mainline valves would result in a land use conversion, aboveground totals include permanent impacts associated with mainline valves. Temporary pig launchers and receivers would be used within the area to be disturbed by the compressor stations. Therefore, land use impacts resulting from these facilities are already accounted for in the construction impacts for aboveground facilities.

If an easement cannot be negotiated between the company and a private landowner, and the Project has been certificated by the FERC, Rockies Express may use the right of eminent domain granted to it under Section 7(h) of the NGA to obtain necessary right-of-way and additional workspace areas. In that event, Rockies Express would still be required to compensate the landowner for the right-of-way and damages that are incurred during construction. Under eminent domain, a court according to applicable state or federal law would determine the level of compensation, once Rockies Express has been issued a Certificate. In either case, Rockies Express would compensate landowners for use of their land.

Pipeline Facilities

Rockies Express has proposed a typical construction right-of-way width of 125 feet. The construction right-of-way would be reduced to 100 or 75 feet in wetlands. We have recommended that Rockies Express reduce the construction right-of-way to 75 feet in all wetlands (see section 2.3.2). In addition to the pipeline construction right-of-way, Rockies Express proposes to use additional temporary workspaces at various points along the pipeline route. The pipe would generally be installed using the trenching method in upland areas. Other installation techniques, such as conventional boring or HDD methods, would be used to cross some water bodies, roads, and other areas in order to reduce construction-related impacts to these features. Section 2 provides a description of the different construction methods that would be utilized for the Project. The REX East Plan and Procedures (CD Documents A, B) describe measures that Rockies Express would implement in order to minimize the impacts of construction on the land required for the Project.

Following construction, a 50-foot-wide permanent right-of-way would be maintained by Rockies Express. The permanent right-of-way may overlap other permanent rights-of-way where the pipeline is collocated with existing rights-of-way. Areas within the permanent right-of-way would generally be allowed to revert to pre-construction usage with certain restrictions. For example, no permanent structures or trees would be allowed within the permanent right-of-way. The permanent right-of-way would be maintained as described in the REX East Plan and Procedures. Use of the land for cultivation and pasture would be able to resume after construction. Uncultivated areas would be maintained with an herbaceous cover. In general, periodic maintenance procedures would prevent forested areas from recovering within the permanent right-of-way during operation of the Project.

Aboveground Facilities

Aboveground facilities would require 153 acres for operation. Of the 42 MLVs, 6 would be located entirely within the footprint of a compressor station and would not require additional land for operation. The remaining 36 would be located on the right-of-way and would each require less than 0.1 acre additional to the right-of-way for operation, requiring 2.2 acres in total. The MLVs would be located within the pipeline right-of-way or within the footprint of a compressor facility, and therefore would not require the use of additional land. Of the 153 acres for aboveground facilities, 81 percent (123.9 acres) would be agricultural land. Construction and operation of aboveground facilities would result in a conversion of those lands to commercial/industrial use for the life of the Project. Lands impacted by operation of large aboveground facilities such as compressor stations would typically be purchased from the current landowners.

Access Roads

Rockies Express intends to use 87 existing public and private roads and to construct 54 new roads to gain access to the pipeline right-of-way during construction and operation of the Project. The Project would require a total of 141 access roads. The location of new access roads and existing roads to be modified are provided on the accompanying CD (CD Document I). Routine road maintenance such as

grading may be required to maintain the private and public dirt and gravel roads in a passable condition. Existing roads may be widened in some areas. Based on an average width of 40 feet, a total of 4.2 acres of land would be impacted for maintenance of existing roads.

Fifty-four new permanent access roads would be constructed by Rockies Express. The length of newly constructed roads would range from 16 to 2,083 feet, with an average length of 216 feet. Based on average widths of 30 feet (compressor and meter stations) and 16 feet (MLV access roads), new permanent roads would occupy approximately 6.7 acres. In addition, two existing roads would provide permanent access to the ANR Pipeline meter station (MP 342.3) and the MLV 12 (MP 233.8).

Specific impacts of construction and operation of the Project on the different land use types affected are discussed below.

4.8.2 Agricultural Land

We define agricultural land as areas that are actively cultivated or rotated croplands, pastures, or hayfields. Construction of the Project would affect approximately 10,692.6 acres of agricultural land. Agricultural land in the Project area is generally used to grow corn, soybean, alfalfa, and hay or as pasture. During operation of the Project, the permanent pipeline right-of-way and aboveground facilities would affect 2,953.9 acres of agricultural land.

General Agricultural Impacts

Pipeline Facilities

Rockies Express has proposed a typical construction right-of-way width of 125 feet for agricultural lands, with pipe installed using the standard trenching method (see section 2.2.1). Rockies Express has requested additional 35-foot-wide temporary workspaces across agricultural fields for the segregation of topsoil. Although we believe some temporary workspaces may be needed in these areas, for road, waterbody, and utility crossings, we believe generally this additional 35 feet for topsoil storage is not justified. However, landowners should understand that the additional temporary work space may be beneficial to ensure proper segregation of topsoil, especially in areas where full right-of-way width topsoil stripping has been requested. Landowners should have the option of determining which is more important to them, reducing the area of impact or providing extra space for the topsoil stockpile. We have included a recommendation in section 2.2 that Rockies Express not use eminent domain for work spaces related to soil segregation, but that it may negotiate with the landowner for the use of the additional 35 feet.

Construction activities such as clearing, grading, trenching, stripping, and backfilling would potentially impact agricultural lands by causing soil erosion, by damaging surface or subsurface irrigation or drainage systems, and by degrading fertile soils through mixing and compaction. These impacts could result in direct loss of crops or pasture, as well as reduced crop productivity in future planting seasons.

Rockies Express has proposed a number of mitigation measures to address impacts on agricultural lands, as described in the REX East Plan and the AIMP (appendix I). Rockies Express proposes to restore all disturbed agricultural areas associated with the construction of the REX East Project in accordance with the AIMP, its Plan, and all other applicable federal, state, and local permit requirements. Typical mitigation measures include topsoil segregation, decompaction, and repair/ replacement of irrigation and drainage structures. The measures Rockies Express proposes are discussed further below.

Fields would generally be taken out of production for one growing season while the pipeline is constructed. Rockies Express would compensate landowners for crop losses resulting from removal of standing crops, disruption of planned seeding activities, disruption of general farming activities, or other losses resulting from construction of the pipeline facilities as negotiated with the landowners.

Crops, other than trees, would be allowed to be cultivated within both the construction and permanent rights-of-way once construction has been completed. As such, unless the land is used for orchards, maple syrup production, or other tree-related farming,[1] no permanent change in land use or permanent reduction in the amount of land available for cultivation would be associated with the pipeline facilities. Rockies Express has proposed to compensate landowners for reduced crop yields due to construction of the pipeline facilities and use of the easement. Restoration of lands would be considered successful if crop yields are similar to adjacent undisturbed portions of the same lands. Rockies Express would conduct post-construction monitoring of revegetation in affected agricultural areas for 3 years after revegetation. We do not believe 3 years is sufficient. Some issues such as damage to or poor repair of drain tiles may take longer to show up due to weather conditions following construction. Therefore, **we recommend that:**

- **Rockies Express develop and implement a 5-year post-construction monitoring program to evaluate crop productivity in areas impacted by the construction of the Project. Rockies Express should file with the Secretary quarterly reports for a period of 5 years following construction documenting any crop-related problems, including soil heating near compressor stations, identified by the company or landowner and describing any corrective action taken to remedy those problems. If any landowner agrees that revegetation and crop productivity are successful prior to the 5-year requirement, Rockies Express should provide documentation in its quarterly reports, indicating which landowners have agreed that monitoring is no longer necessary. This documentation should include the landowner name, tract number, and the date of agreement. Copies of the quarterly reports should be provided to all landowners and tenants of properties being monitored.**

If crop yields in restored areas are not similar to or greater than those on adjacent undisturbed croplands, Rockies Express would develop and implement remedial measures in conjunction with the AI, appropriate agency personnel, and landowners (see appendix I).

Agricultural Inspectors

Rockies Express has committed to having one AI per spread. These inspectors would be in addition to Rockies Express' EIs and would concentrate on agricultural issues. Several state agencies and members of the public have questioned whether one AI per spread could adequately inspect all of the agricultural construction on a spread, because of the length of some of the spreads and the amount of agricultural land on those spreads, particularly the western five spreads. We agree. Some of the spreads are over 100 miles long while others are closer to 50 miles long. We believe that one AI for about every 50 miles is reasonable, therefore, **we recommend that:**

- **Rockies Express employ two AIs for Spreads 1, 2, 3, 4, and 5.**

[1] Removal of trees from the permanent right-of-way would be considered as a permanent impact. Normally trees are not allowed to be replanted on the permanent right-of-way. Rockies Express would compensate the landowner for the loss of trees for orchards, maple syrup operations, and other tree-related agricultural uses.

Aboveground Facilities

Aboveground facilities would require 153 acres of agricultural land during construction and operation of the Project. The land required for aboveground facilities would be converted to commercial/industrial use for the life of the Project.

Rockies Express' Agricultural Impact Mitigation Plan and Agreements

In March 2008, Illinois signed an Agricultural Impact Mitigation Agreement with Rockies Express. The status of other state agricultural agreements is unknown.

Rockies Express has developed AIMPs for each state (see appendix I for a representative example of the AIMP) for dealing with construction and restoration issues unique to agricultural areas. We have identified only three differences among the plans. The Ohio AIMP requires repairs be made in accordance with ODNR standards; this AIMP also allows for the decompaction of subsoil and the replacement of topsoil as weather permits due to generally unsuitable weather in late autumn and winter. We have identified no issue with requiring repairs to meet state standards. The Illinois AIMP requires the pipeline be buried with at least five feet of cover in croplands and pasture land or other agricultural land with prime soils, as recommended by IDOA. The Indiana and Ohio AIMPs both require only four feet of cover. The issue of pipeline cover is discussed in greater detail in the subsection, *Pipeline Depth of Cover* in this section of the EIS.

The purpose of the AIMP is to help protect and conserve agricultural lands that may be affected by construction and/or operation of the proposed pipeline. Rockies Express would follow the policies outlined in the AIMP for all activities occurring on privately owned farmland. A copy of the AIMP would be provided to the landowner, the local Soil and Water Conservation Districts, and the local Farm Bureau offices. Landowners may negotiate any action in advance of construction as long as the changes are acceptable to Rockies Express, the FERC, and any permitting agency. Prior to the start of construction, Rockies Express would provide the landowners with a telephone number and address to contact them regarding any work performed on the property or any construction-related concerns. The AIMP extends to any future construction and maintenance that may occur. All actions outlined in the AIMP would be implemented to the extent that they do not conflict with any federal, state, or local regulations.

When the proposed pipeline crosses surface drains, diversions, grassed waterways, open ditches and streams, at least 60 inches (5 feet) of cover over the pipeline would be maintained. In areas where rock is the natural formation, the minimum depth would be 24 inches (2 feet).

Prior to trenching, Rockies Express proposes to remove up to 16 inches of topsoil. Upon removal, topsoil would be kept separate from removed subsoil to prevent intermixing of the two layers. During backfilling of the trench, the subsoil material would be replaced first and all rocks greater than 3 inches would be removed from the surface of all exposed subsoil. In sections of the right-of-way crossed by construction vehicles and equipment where the topsoil was stripped, the subsoil would be decompacted by ripping the subsoil to a depth not to exceed 16 inches prior to topsoil replacement. After ripping has occurred, all rocks greater than 3 inches would be removed. Backfilling and replacement of topsoil would be crowned to account for any future soil settling so that original depth and contours of the topsoil would be restored. Unless originally present in the topsoil, all rocks greater than 3 inches would be removed from the topsoil surface following final restoration.

No backfilling would be done in water-filled trenches. Any freestanding water would be removed prior to backfilling. Pumping of water from the trenches would be done in a manner to minimize or avoid damaging adjacent agricultural lands and crops. If damages cannot be avoided, the landowner would be compensated.

If drain tile lines are affected by the construction of the proposed pipeline, all necessary actions and precautions would be taken to ensure proper functioning of the tiles. Prior to construction, Rockies Express would make an effort to locate all drain tile lines within the right-of-way and contact the landowners and the local county Soil and Water Conservation Districts. If drain tile lines are damaged, cut, or removed during construction, the lines would be distinctly marked and these markers would not be removed until the line has been repaired and approved by the landowner and the AI. Before completing permanent drain tile repairs, all tile lines would be examined on both sides of the trench for the entire length within the right-of-way to check for damage that may have occurred due to construction equipment. Upon completion of the proposed pipeline, all permanent repairs are to be made within 14 days as long as weather and soil conditions permit.

After completion of the proposed pipeline, the right-of-way would be restored to its original elevation and contour. Landowners would be provided with contact information to alert Rockies Express of the need to provide further leveling services, with Rockies Express performing these services within 45 days of the landowner's written notice. Rockies Express would also work with landowners to find a reasonable method to control excessive erosion. Rockies Express would monitor the areas that are subject to erosion, checking that the depth to the pipeline does not decrease to less than 3 feet.

Landowners would be compensated for any construction-related damages caused by Rockies Express on or off the construction work area. If there were trees of commercial or other value to the landowner that must be removed, Rockies Express would compensate the landowner at a fair market value. Removal and disposal of trees and brush would follow the landowners' wishes and federal, state, and local regulations. If the proposed pipeline intersects an operational spray irrigation system, Rockies Express would establish with the landowner an acceptable amount of time that the system could be offline. If crops were damaged during this time, the landowner would be compensated for the damaged crops.

Routes used to enter and exit the proposed pipeline right-of-way would be agreed upon by Rockies Express and the landowner. Temporary roads would be negotiated with the landowner and would be designed not to impede surface drainage and built to minimize soil erosion. If agreed upon by landowners, and allowed by regulatory agencies, temporary roads may be left intact after completion of the proposed pipeline. If temporary roads are to be removed, the area that the roads were constructed through must be returned to its previous use.

Following placing the pipeline in service or the completion of initial right-of-way restoration, a monitoring and remediation period of no less than 3 years would commence. As we have said previously, we do not believe 3 years is sufficient, and we have recommended that monitoring continue for up to 5 years. Rockies Express would be responsible for the cost of monitoring and remediation. This phase would be used to identify any remaining impacts due to construction that are in need of correction. Conditions to be monitored are topsoil thickness, rock content, trench settling, crop production, drainage, and repair of fences. Onsite monitoring of agricultural lands would occur a minimum of three times during the growing season. The affected landowners would be periodically updated by the AI on the duration of remediation.

Agency Concerns

Rockies Express submitted the AIMP to various state agencies and agricultural groups. No state agricultural agency has approved the AIMP. Comments provided by IDOA identified the following areas of concern:

- identification of all encountered, severed, and /or damaged tile lines;
- drain tile repair;
- pipeline depth of cover;
- topsoil segregation;
- working in wet fields;
- repairing current soil and water conservation structural practices; and
- landowners having the ability to negotiate for other/additional mitigation.

Drain Tile Repair

Drainage systems, such as drain tiles or diversion terraces, are used to improve the productivity of crops by diverting water from areas subject to saturation. The REX East pipeline would cross agricultural lands that make use of such systems. Rockies Express has indicated they would consult with landowners, tenants, and drainage district officials prior to construction to identify existing and planned drainage systems along the proposed pipeline right-of-way. Rockies Express has proposed to restore agricultural drainage systems to their original conditions or better, and would continue restoration until systems are operating fully. Specific requirements for drain tile repair are described in the REX East AIMP (see appendix I). Terraces and drainage trenches would be restored to their original contours, as much as practicable, to ensure proper function.

Rockies Express has indicated that the pipeline contractor would be given the option of repairing the tiles themselves or hiring local drain tile contractors. We do not believe that this is acceptable. The design and installation of drain tiles is precision work that should be done by professionals who are knowledgeable of both drain tiles and local conditions. Therefore, **we recommend that**:

- **Rockies Express hire local drain tile contractors to install/repair drain tiles that are damaged or need to be rerouted due to construction activities.**

The identification and marking of all encountered, severed, and/or damaged tile lines is important for reference in the event of future drainage problems on affected agricultural lands. Therefore, **we recommend that:**

- **During construction, Rockies Express identify and mark all encountered, severed, and/or damaged tile lines on each affected landowner's property using GPS coordinates accurate to 1 meter. Rockies Express should provide this information to the landowner, and the local county Soil and Water Conservation District, and the information should be kept in the company's landowner records for future reference.**

Pipeline Depth of Cover

As previously stated, Rockies Express proposes to install its pipeline with 3 (in Missouri), 4 (in Ohio and Indiana) or 5 (in Illinois) feet of cover. Deeper burial may be required for the crossings of some drain tile systems, as well as underground utilities. After examining the farming practices in the area, including the depth of drain tile placement, and discussing this issue with state agencies, the Farm

Bureau, and landowners, we have concluded that 5 feet should be the minimum depth of cover in agricultural areas, without shallow bedrock (within 5 feet of the surface). Placing the pipeline at shallower depths could interfere with existing or future drain tile placement. Rockies Express has indicated that it would be willing to place the pipeline deeper, but only in areas where it would not be parallel to an existing pipeline that is at a shallower depth. We disagree with this exemption. The existing pipeline may be interfering with the proper placement of the drain tiles; there is no reason to expand this area of interference. Therefore **we recommend that:**

- **Rockies Express bury the pipeline at a minimum depth of 5 feet where the pipeline would cross agricultural fields unless otherwise negotiated with landowners.**

In the draft EIS, this recommendation was limited to fields with prime soils. We have removed that restriction because of our discussions with state agencies, the Farm Bureau, and landowners. Agricultural fields without prime soils are more likely to have and to need drain tiles, which are the main reason for this recommendation.

In addition, concerns have been raised that some landowners have signed easement agreements without knowing that we have recommended a deeper burial of the pipeline in agricultural fields. We feel that these landowners should not be penalized for signing early. Therefore **we recommend that:**

- **Prior to the start of construction, Rockies Express file documentation with the Secretary demonstrating that landowners who have already signed an easement agreement with the provision for 3 feet of cover in agricultural fields were offered the opportunity to request 5 feet of cover.**

Following construction, Rockies Express would implement measures to monitor depth of cover over the pipeline in agricultural areas. Rockies Express would implement a surveillance plan that includes monthly aerial pipeline patrolling to inspect for excavation-related effects, ground movement, wash-outs, leakage, and/or other activities. Within one year of installation, a survey would be conducted along the pipeline right-of-way. If any excavation activities such as ground movement, wash-out, or any other signs of reduction or disturbance of the right-of-way, aside from typical farming practices (e.g., planting, discing, harvesting) are observed, Rockies Express would initiate a corresponding depth survey in the respective area, and if warranted would take necessary corrective actions including importing additional soil material or line lowering.

In addition to monitoring, Rockies Express would conduct an outreach program that includes landowner and tenant communication to address pipeline location, operations, maintenance, and emergency reporting. The landowner and tenant outreach program would facilitate ongoing company and landowner communications and education, including appropriate land use practices within the permanent easement during and after right-of-way restoration.

Topsoil Segregation

For soil removal and replacement, a qualified AI or soil scientist would assess the topsoil, determine the depth that needs to be removed, and monitor during the removal phase. When construction requires the cut-and-fill of the soil profile across grades, stockpiling of the topsoil would be located on the up-slope of the right-of-way. In locations where topsoil cannot be separately stored on the up-slope side, right-of-way space would be provided on the down-slope side to ensure the segregation of the topsoil. Upon removal, topsoil would be kept separate from removed subsoil to prevent intermixing of the two layers. During backfilling of the trench, the subsoil material would be replaced first and all rocks greater than 3 inches would be removed from the surface of all exposed subsoil. In sections of the right-of-way

crossed by construction vehicles and equipment where the topsoil was stripped, the subsoil would be fractured by deep ripping to a depth not to exceed 16 inches prior to topsoil replacement. After ripping has occurred, all rocks greater than 3 inches would be removed. Replacement of the topsoil would be done in a way that after settling occurs, the original depth and contours of the topsoil would be restored. Unless originally present in the topsoil, all rocks greater than 3 inches would be removed from the topsoil surface following final restoration.

Working in Wet Fields

Rockies Express has stated that segregation of topsoil across the entire construction right-of-way would allow construction activities to continue even in wet weather. We disagree; subsoil can also be damaged by rutting and compaction in wet weather. In addition, full right-of-way topsoil segregation can cause extensive ponding on the right-of-way, increasing issues with runoff of heavily silt-laden water. In section 4.2.1 we have recommended that Rockies Express develop an Agricultural Wet Weather Contingency Plan to provide for additional mitigation during wet conditions. IDOA also strongly supports the development and implementation of an Agricultural Wet Weather Contingency Plan.

Landowners Having the Ability to Negotiate for Other/Additional Mitigation

Rockies Express' proposed AIMP allows landowners to negotiate for different and/or additional mitigation in agricultural areas. We encourage landowners to work with Rockies Express during the construction and restoration on their property.

Other Agricultural Concerns

Irrigation and Livestock Systems

Irrigation and/or livestock systems would be crossed by the pipeline route at MPs 17.1 (irrigation); 17.3 (irrigation); 17.7 (irrigation); 228.3 to 228.5 (livestock); 248.2 (irrigation); 248.6 to 249.3 (irrigation); 337.4 to 337.9 (irrigation); 604.4 to 604.9 (irrigation and livestock); 606.0 to 606.9 (livestock); and 636.3 to 636.8 (irrigation). Several construction-related activities may damage or interrupt irrigation and/or livestock systems during construction, including clearing, trenching, grading, and backfilling. If the flow of water is disrupted for a prolonged period, crops may be damaged and crop yields reduced or livestock may be harmed. Rockies Express would coordinate disruption of irrigation systems or livestock systems with each landowner and compensate the landowner for damages. Rockies Express would also repair damaged irrigation systems and livestock systems. Impact and mitigation would be site-specific and based on agreements and/or easement conditions with the affected landowners or tenants. Because these impacts would be temporary and/or mitigated, we believe that construction and operation of the pipeline would not have a significant adverse affect on irrigation systems. For additional discussion of impacts to irrigation systems, see section 4.2.

Soil Heating

Heated soils may occur along the pipeline right-of-way in areas near compressor stations. Heated natural gas flowing through the pipeline could raise the temperature of the surrounding soil, causing water evaporation and thereby reducing crop yields. Gravelly and sandy soils would be the most susceptible soil types due to the deeper rooting depths required in these soils. Our recommended cover of 5 feet in agricultural areas would reduce the impact of this soil heating.

Horse Farms

We received comments expressing concern for potential Project-related effects to horse training/boarding/breeding businesses during construction (between MP 523 and MP 524 and at MP 460). As described above, Rockies Express would implement special construction and monitoring procedures through agricultural lands, including pastureland, to minimize adverse effects and ensure proper restoration. Construction through pastureland could have a temporary effect on some livestock operations, and some landowners may incur additional costs for supplemental livestock feed or for boarding of livestock elsewhere during construction. Compensation for such losses would be accomplished through the easement negotiation process. To ensure the safety of livestock during construction, **we recommend that:**

- **Prior to the start of construction in the vicinity of affected properties, Rockies Express file site-specific mitigation plans, developed in consultation with the affected landowners with the Secretary for review and written approval by the Director of OEP describing how potential impacts to the horses and the operation of the businesses would be avoided, minimized, or mitigated between MP 523 and MP 524, and at MP 460. The plans should indicate how Rockies Express would protect the horses during construction and restoration. Rockies Express should also provide the two landowners with a copy of the plan for their property.**

Specialty Crops/Land Use

Wilson Friendly Maple Farm

The proposed pipeline route would cross the Wilson Friendly Maple Farm between MP 457.3 and MP 457.6. Maple syrup production began in 1861. Rockies Express has stated that they would reduce the number of maple trees to be removed during construction by narrowing the construction right-of-way through the farm to 110 feet. The impacts to the farm would be long-term or permanent in areas where trees are removed, depending on whether trees could be replanted. A route alternative could not be identified that would avoid the maple trees on the Wilson Friendly Maple Farm. The alternative is discussed in section 3.5.20 and is called the Jones and Mowrey Alternative. We believe that in addition to using the alternative the construction right-of-way should be reduced further in the forested areas of the Wilson Friendly Maple Farm. Therefore, **we recommend that**:

- **Rockies Express should reduce the construction right-of-way to 75 feet through the forested portion of Wilson Friendly Maple Farm.**

Conclusions Regarding Agricultural Land Use

We believe that implementation of the mitigation measures discussed above would minimize or mitigate the potential impacts to agricultural land uses. However, construction of the pipeline may affect the fertility of the agricultural fields for several years. Operation of the aboveground facilities would have a permanent impact on agricultural lands, and operation of the pipeline would impose permanent restrictions on some agricultural land uses, including the construction of barns and other structures and the planting of windrows or other trees within the permanent pipeline right-of-way.

4.8.3 Residential Land

Pipeline Facilities

A discussion of construction techniques in residential areas can be found in section 2.3.2. Construction of the pipeline would impact residential properties, mainly from increased noise, heavy vehicle traffic, and dust. These adverse affects would be short-term, lasting only a few weeks at any particular location. Typical concerns of landowners regarding the impact of construction and operation of proposed facilities on residences include impacts on landscaping, property use rights, general disruption/disturbances/damages, safety issues, and the use of eminent domain. Details regarding the measures that would be taken to minimize impacts to residences are discussed below. As discussed above, Rockies Express would acquire easements for temporary and permanent rights-of-way for construction and operation of the Project, respectively. Landowners would be compensated for the use of their land through the easement negotiation process. Landowners would have the opportunity to request that specific measures be undertaken or that development plans for their property be considered. Most existing developed land uses would continue following construction. There will be no restrictions on the ability to subdivide a property for inheritance purposes, or otherwise sell or transfer ownership of a property. However, there would be some restrictions regarding the use of land in the permanent right-of-way, such as restrictions on the construction of new permanent structures. During easement negotiations, landowners would have the opportunity to request that development plans for their property be considered during pipeline construction.

There are 66 residences located within 50 feet of the proposed construction work areas (table 4.8.3-1). An additional 18 non-residential structures (e.g., grain bins, silos, outbuildings) have been identified within 50 feet of the construction right-of-way. Rockies Express has provided site-specific construction plans for all of the residences (see appendix D).

Table 4.8.3-1

Residences Within 50 Feet of Right-of-Way

State/County	Milepost	Dist from Centerline to residence (ft)	Dist from construction work area (ft)	Direction from pipeline	Comments	Drawing ID
MISSOURI						
Pike	23.4	229.0	31.0	N	Residence	MO-PI-016.000
ILLINOIS						
Scott	79.3	36.0	11.0	N	Residence	IL-SC-043.000
Scott	79.6	138.0	38.0	N	Residence	IL-SC-046.000
Scott	81.5	134.0	25.0	N	Residence	IL-SC-054.N01
Morgan	95.9	241.0	42.0	N	Residence	IL-MO-040.N01
Sangamon	126.3	191.0	25.0	S	Residence	IL-SA-224.001
Sangamon	131.1	36.0	25.0	S	Residence	IL-SA-259.000
Macon	165.7	153.0	28.0	S	Residence	IL-MC-082.000
Moultrie	186.6	188.0	27.0	S	Residence	IL-MU-048.001
Edgar	234.2	30.0	5.0	S	Residence	IL-ED-076.000
INDIANA						
Putnam	270.8	173.0	41.0	N	Residence	IN-PU-022.N01
Putnam	272.8	178.0	25.0	N	Residence	IN-PU-035.000
Hendricks	292.2	87.0	47.0	S	Residence	IN-HE-214.000
Hendricks	301.7	168.0	43.0	S	Residence	IN-HE-273.S01
Hendricks	301.8	176.0	49.0	N	Residence	IN-HE-274.000
Franklin	384.4	130.0	25.0	N	Residence	IN-FR-053.010
Franklin	384.5	134.0	25.0	N	Residence	IN-FR-054.N10
Franklin	396.1	76.0	36.0	N	Residence	IN-FR-139.001

Table 4.8.3-1 (continued)

Residences Within 50 Feet of Right-of-Way

State/County	Milepost	Dist from Centerline to residence (ft)	Dist from construction work area (ft)	Direction from pipeline	Comments	Drawing ID
Franklin	401.7	34.0	9.0	S	Residence	IN-FR-165.000
Franklin	401.8	90.0	25.0	S	Residence	IN-FR-170.000
OHIO						
Butler	406.0	86.0	21.0	N	Residence	OH-BU-006.000
Butler	406.4	225.0	40.0	N	Residence	OH-BU-009.N01
Butler	406.4	47.0	22.0	N	Residence	OH-BU-009.N02
Butler	408.2	90.0	25.0	N	Residence	OH-BU-022.000
Butler	408.5	119.0	46.0	S	Residence	OH-BU-027.000
Butler	408.5	46.0	21.0	N	Residence	OH-BU-028.000
Butler	409.0	131.0	43.0	N	Residence	OH-BU-039.000
Butler	411.7	79.0	9.0	S	Residence	OH-BU-059.000
Butler	418.8	74.0	25.0	N	Residence	OH-BU-110.000
Butler	419.8	60.0	10.0	N	Residence	OH-BU-119.N01
Butler	419.9	64.0	25.0	N	Residence	OH-BU-120.N01
Butler	423.1	153.0	25.0	S	Residence	OH-BU-145.000
Butler	425.9	131.0	25.0	S	Residence	OH-BU-157.S01
Butler	431.7	46.0	21.0	N	Residence	OH-BU-177.000
Butler	431.7	130.0	25.0	S	Residence	OH-BU-178.000
Butler	431.7	60.0	25.0	N	Residence	OH-BU-179.000
Warren	444.9	177.0	25.0	S	Residence	OH-WA-028.000
Warren	451.7	91.0	27.0	S	Residence	OH-WA-066.000
Warren	451.7	170.0	25.0	N	Residence	OH-WA-065.N02
Warren	452.3	43.0	18.0	S	Residence	OH-WA-075.N02
Clinton	472.1	56.0	15.0	N	Residence	OH-CT-074.000
Greene	474.3	139.0	25.0	S	Residence	OH-GR-009.000
Fayette	485.2	157.0	25.0	S	Residence	OH-FY-026.S01
Fayette	485.2	42.0	16.0	N	Residence	OH-FY-026.N01
Pickaway	518.7	98.0	25.0	S	Residence	OH-PW-103.S01
Pickaway	518.8	95.0	45.0	S	Residence	OH-PW-105.000
Pickaway	527.9	56.0	25.0	S	Residence	OH-FF-016.000
Fairfield	536.4	79.0	29.0	S	Residence	OH-FF-076.000
Fairfield	544.8	115.0	30.0	S	Residence	OH-FF-108.S01
Fairfield	545.1	81.0	25.0	S	Residence	OH-FF-118.S04
Fairfield	545.2	54.0	29.0	S	Residence	OH-FF-120.S01
Fairfield	545.8	51.0	21.0	S	Residence	OH-FF-124.S05
Perry	550.4	46.0	16.0	N	Residence	OH-PY-007.002
Perry	554.5	53.0	25.0	N	Residence	OH-PY-031.000
Perry	560.6	100.0	40.0	N	Residence	OH-PY-051.000
Perry	561.3	131.0	46.0	S	Residence	OH-PY-053.000
Muskingum	566.5	97.0	25.0	S	Residence	OH-MK-001.000
Muskingum	566.6	40.0	10.0	S	Residence	OH-MK-003.000
Muskingum	567.4	132.0	50.0	S	Residence	OH-MK-010.000
Muskingum	566.9	196.0	27.0	S	Residence	OH-MK-005.000
Muskingum	568.5	91.0	46.0	N	Residence	OH-MK-108.000
Muskingum	576.2	130.0	45.0	S	Residence	OH-MK-151.000
Muskingum	576.7	54.0	12.0	N	Residence	OH-MK-152.000
Muskingum	578.8	99.0	27.0	S	Residence	OH-MK-168.S01
Guernsey	602.0	86.0	21.0	S	Residence	OH-GN-078.000
Guernsey	609.9	74.0	14.0	S	Residence	OH-GN-128.000

Rockies Express would adopt the following mitigation measures for residences within 50 feet of a construction work area in order to minimize or mitigate impacts on residences:

- access to residences, including emergency access, would be maintained at all times during construction;
- removal of trees and landscaping would be avoided unless necessary to construct the pipeline or for the safe operation of the construction equipment;
- lawns and landscaping within the construction work area would be restored promptly after backfilling the trench;
- construction fencing would be installed and maintained at the edge of the construction work area for a distance of 100 feet on either side of a residence during the open-trench phases of the pipe installation or longer;
- dust minimization techniques would be used onsite;
- all litter and debris would be removed daily from the construction work area; and
- a copy of site-specific construction plans would be provided to each landowner or tenant of residences within 50 feet of a construction work area.

Rockies Express has stated that it would maintain access to all residences during construction. However, we have noticed that on some of the site-specific plans the entire driveway for the residence is shown within the construction work area. On January 14, 2008, Rockies Express filed updated plans for these residences that explained how access would be maintained for each impacted residence. The majority of the driveways impacted would be crossed by the trenching and stringing construction techniques described in section 2.3. These construction methods require a short construction timeframe, typically less than 24 hours, during which time temporary methods, such as steel plates, would be used to allow access to the residence.

We received a comment raising similar concerns for access to the Chester Township Fire Station, as the proposed route would cross the parking lot of a fire station at approximately MP 460. In section 3.5.20, we recommend an alternative route in this area that would avoid direct impacts to the fire station. However, general construction activities would occur in close proximity to the station, including the crossing of County Road 61 (Mound Road) and State Road 380. Therefore, **we recommend that:**

- **Prior to the start of construction in the vicinity of Chester Township Fire Station, Rockies Express, in consultation with local emergency response officials, develop a plan to maintain safe egress at the Chester Township Fire Station.**

There are 18 residences within 25 feet of a proposed work area, of which 3 are within 10 feet of the proposed work area. Because of the proximity to construction activities, we believe that additional mitigation is needed. Therefore, **we recommend that:**

- **Rockies Express file site-specific plans with the Secretary for review and written approval by the Director of OEP prior to the start of construction that:**

a. **Describe the measures that would be taken to minimize construction impacts on each residence within 25 feet of a construction work area, including but not limited to reduced pipeline separation, centerline adjustment, use of stove-pipe or drag-section techniques, working over existing pipelines, pipeline crossover, bore, or a minor route variation;**

b. **Include discussion of how Rockies Express would ensure that the trench is not excavated until the pipe is ready for installation and that the trench is backfilled immediately after pipe installation; and**

c. **Include evidence of landowner concurrence if the construction work area and fencing would be located within 10 feet of a residence.**

Noise would also impact residences in the vicinity of the construction. The amount and duration of the impact would depend on the construction activity and the distance from that activity. Activities such as HDD installations or the construction of a compressor station would produce noise in an area longer than normal pipeline construction. In either case, this would be a short-term, temporary impact.

Operational noise impacts would usually be limited to the operation of the compressor stations. These impacts would last for the life of the Project. A more complete discussion of the impact of noise on residences is presented in section 4.11.2 of this EIS.

Site-specific Impacts

We have received numerous letters from landowners and other stakeholders requesting that the proposed route either be changed or the Project denied, however no environmental justification for such action was provided. In several cases, these letters were from landowners who have not allowed Rockies Express access to their property to survey for the presence of features that may warrant a change in the route, identify the need for additional mitigation, or changes in construction technique. Therefore we have no basis to evaluate these requests in this EIS.

We received letters from landowners expressing concern about the pipeline crossing their property and damaging various resources or limiting their potential to develop the property in the future. In all of these cases, the presence of the resources of concern has not been verified by surveys, typically because access to the property has not been granted and there are no plans for development at this time. Therefore, this EIS is not able to evaluate the need for a route variation and determine where that variation would have to go to avoid the stated resources of concern or the development. Instead, we address these landowner concerns by including recommendations that require Rockies Express to complete all necessary surveys and consultations, and to evaluate appropriate route variations or other measures to avoid impacts to those resources, prior to construction (see sections 4.7 and 4.10).

We do, however, have sufficient environmental justification for evaluating a number of route variations based on letters from landowners and other stakeholders, as well as our own independent analysis and field visits of the Project route and possible route variations. See section 3.5 of this EIS.

In the draft EIS, we identified four residences, located at MP 384.3, MP 384.4, and MP 446.8 (2) which would be within the proposed permanent right-of-way. We recommended route variations that would move the pipeline so that the residences would not be on the permanent right-of-way. In their February 19, 2008, filing, Rockies Express committed to adopting route variations to avoid these residences, but these routes are not reflected in the current alignment sheets. These properties are

discussed in section 3.5.26 and 3.5.27 of this EIS and we recommend Rockies Express adopt a route variation to avoid the houses.

Numerous comments were received from residents in Franklin and Johnson Counties, Indiana, concerned with the development potential of property in the south Indianapolis area. Some cited safety concerns of a pipeline near developed residential communities. Many of these residents proposed that the pipeline be re-routed north of Indianapolis. An alternative to the proposed route that would pass north of the city is discussed further in section 3.4.4 but is not considered preferable to the Project route.

Numerous comments were received from landowners along the pipeline route with a generalized concern about the aesthetic impacts of the Project. These concerns are related to the effects the pipeline route would have on vegetation, and consequently on the overall aesthetic or visual impacts to the landscape. Rockies Express has developed procedures that will minimize the impacts of construction on vegetation, including collocating the pipeline as much as possible with existing easements. There would, however, be visual impacts within the permanent right-of-way in places where mature forest trees would be removed. The impacts of the project on vegetation are discussed in detail in section 4.4.

In the draft EIS, we had a recommendation for a site-specific plan for construction on Tract IL-MC-028.051 in Macon County, Illinois. Rockies Express has filed a plan that would extend the bore of County Road 29 and reduce the right-of-way to 75 feet (see appendix D). We believe that this plan would help preserve the landscaping on the property and have removed the recommendation.

During scoping, property owners in Warren County, Ohio (Tract OH-WA-066.000 to OH-WA-066.002) have indicated that pipeline construction would inhibit their ability to build a retirement home on their land. The REX East right-of-way crosses the Little Miami River and extends through this linear property along the long axis, encumbering much of the lot. Alternative crossings of the Little Miami have been proposed in section 3. The right-of-way, as currently proposed, follows the TETCO right-of-way in the vicinity of this lot. We reviewed the area to identify a route variation but houses to the north and south prevent a re-route. We also evaluated two major route alternatives that would avoid this property, Little Miami Route Alternative (section 3.4.6) and Mowrey Route Alternative (section 3.4.7). These route alternatives are not environmentally preferable to the Project route. Rockies Express filed detailed construction plans on February 29, 2008, which identified an adjacent lot owned by the same property owners. This lot is of sufficient size to construct a home away from the Project easement. Additionally, once the right-of-way is restored, there is sufficient space within the narrower plots to build a home along the road. We believe these plans adequately address the landowners' concerns.

Septic Systems

Pipeline construction could damage septic systems – including septic tanks, distribution piping, and drain fields – during trenching of the pipeline right-of-way. Rockies Express has developed a Septic System Contingency Plan describing efforts to avoid septic systems where possible and mitigate or restore systems where necessary. If damage occurs during construction, a temporary system sufficient to meet existing needs would be provided. Following construction, Rockies Express would relocate, restore, or replace the septic system depending on the details of the easement negotiated with the individual landowner.

Based on preliminary landowner contacts, Rockies Express has currently identified that septic systems that would be crossed by the pipeline route at MPs 297.8, 448.9, 449.9, 473.8, 593.5, 595.7, and 597.1. Rockies Express would continue to verify the locations of septic tanks and, in consultation with individual landowners, would develop mitigation measures to prevent or minimize disruptions to these facilities during construction. Therefore, **we recommend that:**

- **Rockies Express identify all septic systems prior to the start of construction, present each property owner with a copy of the Septic System Contingency Plan, and restore, relocate, or replace all septic systems damaged during construction, whether or not such mitigation was part of the easement negotiation.**

Aboveground Facilities

The aboveground facilities associated with the REX East Project include the seven compressor stations. Construction of the seven facilities would have a longer duration than pipeline construction. Additionally, the compressor stations have different operational impacts than the pipeline, including visual, noise, and air emissions. Analysis of potential noise impacts on residences during construction and operation of the compressor facilities found levels to be lower than EPA's recommended threshold and lower than existing noise levels at the residences. See section 4.11.2 for a detailed discussion of noise impacts. See section 4.11.1 for a detailed discussion of air emissions. The visual impacts of these facilities are discussed in section 4.8.6 below.

Conclusions Regarding Residential Land Use

The construction impacts of the Project on residential land use, including noise, dust, and vehicle traffic would be temporary. They would last only for the duration of construction, which in most cases would be no more than 1 or 2 weeks at a single location. Rockies Express established procedures to minimize these impacts during construction. Rockies Express has also developed mitigation measures for potential impacts to septic systems. We believe that the Project would have temporary impacts on residences, that the procedures developed by Rockies Express along with the mitigation we have recommended would minimize these, and that implementation of the mitigation measures would also minimize the impacts of the Project on residences. The permanent easement on residential properties would be considered a permanent impact in that it restricts the use of that portion of the property. Compressor stations would emit noise for the life of the station. For a further discussion of the noise impact see section 4.11.2.

4.8.4 Planned Residential Developments

Rockies Express has identified 10 planned residential developments within 0.25 mile of the Project right-of-way. Planned development projects would include those that are permitted but not yet constructed, or those with submitted permit applications that have been filed but not yet approved. Table 4.8.4-1 presents the planned developments that would be located within 0.25 mile of the Project.

Rockies Express has taken the following measures to minimize potential impacts regarding planned residential developments:

- Siting the pipeline route along property boundaries; and
- Collocating the pipeline with existing rights-of-way, which typically follow lot lines.

We believe that implementation of the identified mitigation measures would minimize or mitigate the impacts of the Project on planned residential developments. Construction would result in temporary impacts.

Table 4.8.4-1

Planned Developments Crossed by the REX East Pipeline Route

County, State	MP	Crossing Length (miles)	Development Name	Comment
Macon, Illinois	162.8	0.2	Circle Z Addition	The housing development is under review with the county. Rockies Express sited its pipeline along the southern property line to minimize disturbance.
Hendricks, Indiana	297.5	0.5	Disney Residential Development	The housing development was platted in 1978. No construction has begun. Rockies Express has sited its pipeline route along the property lines to minimize disturbance.
Morgan, Indiana	311.7 to 312.0	0.3	Morgan's Hideaway	Subdivision has been submitted to the County and turned down. Landowner intends to re-file the submission.
Butler, Ohio	430.8	0.3	Tall Oaks Subdivision	The residential subdivision is currently under construction. Rockies Express is collocated with the existing power line and is sited on the property lines.
Butler, Ohio	431.3	0.4	Todd Glen Reserve	The residential subdivision has been platted and has not been approved. Rockies Express is collocated with the existing power line.
Warren, Ohio	436.4	1.1	Valley View Farms	The residential subdivision has been platted and has not been approved. Rockies Express' proposed route is sited on the property lines.
Fairfield, Ohio	535.5	0.1	Dominion Homes	The residential subdivision has been platted and has been approved. The development is currently under construction. Rockies Express is collocated with Texas Eastern's existing pipeline and the proposed route follows the lot lines.
Fairfield, Ohio	538.3	0.1	Thomas Vejan Homes	The residential subdivision has been platted and has been approved. The development is currently under construction. Rockies Express is collocated with Texas Eastern's existing pipeline and traverses the corner of two lot lines.
Fairfield, Ohio	539.1	0.3	Fairfield Homes	The residential subdivision has been platted and has not been approved. Rockies Express is collocated with Texas Eastern's existing pipeline and the proposed route follows the lot lines.
Fairfield, Ohio	539.4	0.2	Thomas American (also called Diyanni Homes)	The residential subdivision has been platted and has been approved. The development is currently building. Rockies Express is collocated with Texas Eastern's existing pipeline and the proposed route follows the lot lines.
Fairfield, Ohio	544.9	0.2	Holder Properties	The residential subdivision has been platted and has not been approved. The development is currently building. Rockies Express is collocated with Texas Eastern's existing pipeline and the proposed route follows the lot lines.

Table 4.8.5-1

Recreation and Special Land Uses Crossed by the REX East Pipeline Route

State/County	MPs	Crossing Length (miles)	Acres Affected During Construction/ Acres Affected During Operation (Acres)	Name	Management/Ownership	Proposed Crossing Method
MISSOURI						
Pike	33.4 to 42.2	8.8	133.4 / 53.3	Grassy Creek Conservation Opportunity Area	Missouri Department of Conservation (MDC)	Conventional
Pike	40.0	<0.1	1.5/ 0.0	Scenic Byway - Little Dixie Highway along State Highway 79	Missouri Department of Transportation	Horizontal Bore
Pike	42.6 to 42.9	0.3	5.4 / 0.5	Upper Mississippi (Blackburn Island) Conservation Opportunity Area	Missouri Department of Conservation a/	HDD
ILLINOIS						
Pike	43.5	<0.1	0.0 / 0.0	Sny Levee	Sny Levee Drainage District	HDD
Sangamon	122.0	<0.1	2.6 / 0.0	Scenic Highway – U.S. Route 66	Illinois Department of Transportation	Horizontal Bore
Sangamon	125.2	1.3	0.0 / 0.0	Hunter Lake Reservoir	City of Springfield, Illinois	Conventional
Douglas	202.9	<0.1	0.0 / 0.0	Embarras River	Illinois Department of Natural Resources	HDD
INDIANA						
Vermillion/Parke	RR 2032-MP 242.9+4	0.1	0.0 / 0.0	Indiana Canoe Crossing – Wabash River	Indiana DNR – State of Indiana	HDD
Parke	250.8	<0.1	0.0 / 0.0	B&O Trail	B&O Trail Association	Horizontal Bore
Putnam	268.4	<0.1	0.5 / <0.1	Byrd Branch within Cecil M. Harden Lake	U.S. Army Corps of Engineers (COE)	Open-cut
Putnam	269.9	<0.1	1.8 / 0.1	Big Raccoon Creek within Cecil M. Harden Lake	COE	Open-cut
Putnam	269.9	<0.1	0.5 / <0.1	Tributary to Big Raccoon Creek - within Cecil M. Harden Lake boundary	COE	Open-cut
Putnam	281.5	<0.1	0.0 / 0.0	Big Walnut Creek	Indiana Department of Natural Resources (INDNR)	HDD

Table 4.8.5-1 (continued)

Recreation and Special Land Uses Crossed by the REX East Pipeline Route

State/County	MPs	Crossing Length (miles)	Acres Affected During Construction/ Acres Affected During Operation (Acres)	Name	Management/ Ownership	Proposed Crossing Method
Hendricks	298.4 to 298.5	0.1	2.6 / 0.0	Historic National Road – U.S. Highway 40	Indiana Department of Transportation	Horizontal Bore
Morgan	315.8	<0.1	0.1 / <0.01	Indiana Canoe Crossing – Tributary to West Fork White River	Indiana DNR –State of Indiana	Dry Ditch
Shelby	340.8	<0.1	3.2 / 0.0	Big Blue River	INDNR	HDD
Decatur	375.1 to 375.3	0.2	2.6 / 1.2	Camp Woodsmoke	Lions Club (private)	Conventional
Franklin	393.2	<0.1	0.0 / 0.0	Indiana Canoe Crossing – Whitewater River	Indiana DNR – State of Indiana	HDD
OHIO						
Butler	421.6 to 421.7	0.1	0.0 / 0.0	Four Mile Creek	Ohio Department of Natural Resources (ODNR)	HDD
Butler	422.7	<0.1	0.0 / 0.0	Seven Mile Creek	ODNR	HDD
Butler	430.7 to 430.8	0.1	0.0 / 0.0	Great Miami River	ODNR	HDD
Warren	450.7	0.1	8.3 / 0.0	Scenic Byway – Accommodation Line	ODNR	Horizontal Bore
Warren	451.3 to 451.4	0.1	0.0 / 0.0	Little Miami River	NPS/ODNR	HDD
Warren	451.6 to 451.7	0.1	0.1 / <0.1	Little Miami Scenic State Park	ODNR	Horizontal Bore
Clinton	459.5 to 459.8	0.2	2.6 / 1.0	Caesar Creek State Park and Wildlife Area	ODNR	HDD and Conventional
Fayette	486.4	<0.1	0.1 / <0.1	Paint Creek	ODNR	Dry Ditch
Pickaway	498.8 to 499.4	1.1 <0.1	16.7 / 6.7	Deer Creek Wildlife Area	ODNR	Conventional
Pickaway	499.9 to 500.8 500.8 to 500.9	0.9 0.1	15.1 / 6.1	Deer Creek State Park	ODNR	HDD/Conventional/ Horizontal Bore
Pickaway	509.2 to 509.3	0.1	4.2 / 0.0	Big Darby Creek	NPS/ODNR	HDD

Table 4.8.5-1 (continued)

Recreation and Special Land Uses Crossed by the REX East Pipeline Route

State/County	MPs	Crossing Length (miles)	Acres Affected During Construction/ Acres Affected During Operation (Acres)	Name	Management/ Ownership	Proposed Crossing Method
Perry	558.5 to 558.7 558.9 to 559.9	0.2 1.0	18.1 / 7.3	Perry State Forest	ODNR	Conventional
Muskingum	581.6 to 582.7	1.1	16.7 / 6.7	Blue Rock State Forest	ODNR	Conventional
Guernsey	607.7 to 608.5 b/	Unknown b/	Unknown b/	White Oak Exotic Hunting Preserve	Privately owned	Conventional
Belmont	624.6 to 625.1	0.5	7.5 / 2.8	Captina Creek Preserve	Privately owned c/	Conventional
Belmont	628.5 to 630.3	1.8	27.3 / 10.9	Raven Rocks	Privately owned	Conventional

a/ Blackburn Island is owned by COE, leased to FWS, and managed by the Missouri Department of Conservation.

b/ MPs are approximate. A recommendation has been included that Rockies supply additional information on the White Oak Exotic Hunting Preserve.

c/ While Captina Creek Preserve is currently not formally recognized as a preserve we have included it in this analysis.

4.8.5 Recreation and Special Land Use Areas

The proposed REX East facilities would cross recreation and special land use areas in: Missouri (3), Illinois (4), Indiana (11), and Ohio (16). These areas are listed in table 4.8.5-1 along with the proposed construction methods (discussed in section 2.3) for crossing each. Rockies Express continues to coordinate with the landowners and managers of these special interest areas.

As no recreation or special interest areas were identified within 0.25 mile of any proposed aboveground facility, it is not expected that recreational and special use areas would be impacted by the proposed aboveground facilities.

General Impacts

Construction of the Project facilities could impact recreation and special land use areas in several ways. First, resident habitats and wildlife may be affected by the clearing of vegetation, the generation of noise, and or the generation of dust. Second, construction of the Project facilities could result in a disruption of recreational uses potentially including but not limited to hiking, fishing, camping, bird watching, picnicking, and environmental education. Disruptions to recreational uses could potentially occur if access is reduced due to construction activity or if construction activities change the recreational quality of the area.

Operational impacts would be associated with permanent changes in vegetation associated with right-of-way maintenance and potential visual impacts associated with these features and aesthetics.

At a minimum Rockies Express would implement the requirements and mitigation included in its Plan and Procedures (CD Documents A, B; also see section 2.3). As discussed throughout this EIS, implementation of these requirements would generally minimize and to some extent mitigate potential impacts to resources and activities in recreation and special use areas.

Where conventional construction methods are used, construction of the pipeline would typically result in disturbances such as noise, dust, and construction-related traffic along the pipeline route. These impacts would be temporary, generally lasting between a few days and a few weeks in any given location. Conventional construction would involve the clearing of vegetation in the construction right-of-way and disturbance of the surface through trenching. In some cases recreational infrastructure, such as trails, may be cut or removed during construction. Open-cutting of recreational waterbodies would preclude their use during construction.

Following construction, the 50-foot-wide permanent right-of-way would be maintained in an herbaceous state, while the temporary construction right-of-way would be allowed to return to pre-construction conditions. The duration of recovery for the temporary right-of-way would depend on the type of vegetation. For nonforested areas, recovery may occur within 5 years or less. For forested areas, recovery within the construction right-of-way could take 50 years or more, depending on the age and type of trees. Agricultural land, grassland, and open land would typically be allowed to return to pre-construction conditions within the construction and permanent right-of-ways. In forested areas, the permanent right-of-way would undergo periodic vegetative maintenance in order to maintain access to the pipeline.

Construction techniques such as boring or HDD can be used to avoid impacts to more sensitive resources, such as rivers. They can also be used to cross roadways to avoid disturbance to traffic. Because these methods involve installing the pipeline without disturbing the surface directly above a portion of the pipeline, they avoid impacts to the surface. These methods generally require additional

temporary workspaces for staging, so while a sensitive resource such as a stream may have less impact, there would be additional land affected near the stream. Like the conventional open-cut methods, these construction techniques would still have associated noise, dust, and construction traffic. These impacts would be temporary and would last up to 3 months in any given location. The areas would be restored and revegetated after construction. Revegetation may take one growing season for herbaceous vegetation or decades for trees. Normal right-of-way maintenance activities (mowing) would permanently preclude the establishment of trees on the permanent right-of-way. Rockies Express has agreed not to mow areas that would be crossed by the HDD method. In addition, we have recommended that Rockies Express not cut any trees between the drill work area and the exit work area.

Dry crossing construction methods (e.g., dam and pump or flume) for waterbody crossings involve temporarily redirecting the flow of water from the stream channel and would be utilized primarily on ephemeral streams and certain intermittent waterbodies. These techniques would have similar noise, dust, and construction traffic as other construction methods. Stream flow would be maintained during construction activities; however there would be short-term impacts to visual aesthetics and recreational use (e.g., boating) of the stream due to the temporary redirection of water flow. Natural stream flow would be expected to be returned within 24 hours for small streams (less than 10 feet wide) and 48 hours for intermediate streams (between 10 and 100 feet wide). Streambed and bank stabilization would be completed before returning flow to the channel and the area would be revegetated.

As the quality of outdoor recreation depends in part on the quality and characteristics of natural resources, impacts to natural resources within recreation and special use areas could indirectly impact recreation within these areas. As noted above, the impacts to natural resources would vary depending on construction technique. If conventional construction is used, there may be permanent changes in natural resources associated with vegetation maintenance within the permanent right-of-way. In forested areas, recovery of the construction right-of-way could be short-term or long-term, depending on the age and type of trees. All other impacts would typically be short-term. If boring or HDD methods are used, then impacts to sensitive natural resources would be avoided, but there would still be impacts to any associated temporary workspaces.

In addition, construction-related noise, dust, and traffic could indirectly impact recreation at these special use areas. Impacts due to changes in access could result if traffic flows within a recreation or special use area would be disrupted. These impacts would be temporary, lasting a few days to a few weeks in any given location. In general, the severity of impacts from noise, dust, and viewscape alteration would depend on the distance between the Project and areas where recreationalists would be located (e.g., campgrounds, picnic areas, trails). The timing of Project construction may also be important, as recreation is often seasonal.

Site-specific Impacts

Location, crossing method, and current land uses impacted are discussed for each recreation and special use area. This information is used to determine the expected impact duration.

To evaluate the magnitude of the potential impacts, we identify the specific resources, or recreational activity for which areas are managed and identify potential direct impacts to those resources. Indirect impacts are evaluated in light of direct impacts and after considering the proximity of the recreation infrastructure to the Project.

We received a comment from the Ohio Power Siting Board raising concerns about potential issues during construction near the Fairfield County Airport (between MP 534 and MP 535). The Board believes that the height of the construction equipment to be used for installation of the pipeline would fall

within the 100:1 slope restrictions that exist within 20,000 feet of the airport runway. Construction activities would be within 0.25 mile of the runway. Therefore, **we recommend that:**

- **Prior to the start of construction in the vicinity of the Fairfield County Airport, Rockies Express consult with the Federal Aviation Administration and the Ohio Department of Transportation Office of Aviation about any restrictions in the vicinity of the Fairfield County Airport during construction. Rockies Express should make the appropriate filings with these agencies prior to starting construction in the vicinity of the airport.**

Missouri

Grassy Creek and Upper Mississippi Conservation Opportunity Areas

The proposed pipeline route would traverse two areas in Missouri identified as COAs. The MDC identifies these tracts of land as places where opportunity exists for wildlife conservation.

Grassy Creek COA

The Grassy Creek COA (also referred to as the Ted Shanks COA), contains 6,705 acres, consisting of bottomland hardwood timber, freshwater marshes, emergent wetlands, agricultural row crops, oxbow lakes and sloughs, fields, and upland woods. Of the 6,705 acres, 3,827 acres of public land are managed by MDC and 2,878 acres of private land are managed under a cooperative agreement among the MDC, FWS, and COE. Grassy Creek COA contains the Ted Shanks Alluvial Complex, an Important Bird Area (IBA) as defined by BirdLife International and the National Audubon Society. Deer and waterfowl hunting are common activities at the COA.

The pipeline route would use conventional upland construction techniques to traverse the Grassy Creek COA from MP 33.4 to MP 42.2. Several roads and highways that provide access to the site would also be traversed. Construction through this area would impact 9.2 acres of open land, 96.9 acres of forested land, and 27.3 acres of agricultural lands. As noted above, construction would result in clearing of vegetation from the affected land. The permanent right-of-way would include 38.8 acres of forest lands, 3.6 acres of open land, and 10.9 acres of agricultural lands.

During construction individuals attempting to access the site may experience temporary delays associated with construction-related traffic congestion and or construction-related detours. Noise and activity associated with construction may frighten deer and ducks away from the vicinity of the activities temporarily. Most wildlife would return after the completion of construction. Indirect effects associated with habitat modification are not expected to affect duck or deer populations or the quality of hunting on the site in the long-term. However, the removal of trees may have a long-term or permanent impact on wildlife that depends on trees.

Visual impacts would be primarily to passing users, including hunters, and would be primarily short-term in nature lasting 1 to 2 weeks during the construction phase in the area. Permanent visual impacts would occur as a result of tree removal within the permanent right-of-way as part of operational maintenance, which would occur every 2 to 3 years over the life of the Project.

Upper Mississippi COA

The Upper Mississippi COA (also referred to as Blackburn Island) is an island that separates the Mississippi River from the Salt River in Missouri. Blackburn Island is leased to FWS by COE and is

managed by MDC. Outdoor activities occurring on and around Blackburn Island include fishing, waterfowl hunting, bird watching, and boating.

The pipeline route would cross Blackburn Island from MP 42.6 to MP 42.9. Rockies Express would cross both the waterbodies on either side of the island (the Mississippi River and the Salt River) using the HDD method. A drill entry workspace would be located on Blackburn Island, approximately 300 feet from the Mississippi River. This single drill entry workspace would be used for both the westward HDD crossing of the Salt River and the eastward crossing of the Mississippi River.

MDC has recommended and Rockies Express has agreed to the following mitigation measures when crossing the area:

- inspect equipment and remove any mud, soil, trash, plants, or animals before leaving a waterbody or work area;
- drain water from equipment before leaving a waterbody, wash and rinse all equipment with hard spray or hot water;
- whenever possible, dry equipment in the sun before using it again;
- inspect and remove seeds, mowing debris, and soil from tires and tracks, the decks of mowers, trailers, and other equipment; and
- properly dispose of all plant materials to prevent regrowth or introduction into new areas.

Construction activities and noise may cause wildlife to leave the area temporarily. Construction activities and noise may also impact the public's ability to enjoy fishing, boating, bird watching, and hunting in the vicinity during construction.

Visual impacts would be primarily to passing users, including hunters and/or river users, and would be primarily short-term in nature during the 3-month construction phase in the area. Use of the HDD crossing method would reduce the need for tree removal as part of routine maintenance during operation of the pipeline.

We believe that the use of HDD and utilizing a single drill entry workspace on Blackburn Island to cross both the Mississippi and Salt Rivers minimizes potential environmental impacts in the area. The duration of impacts such as noise, dust, and clearing of herbaceous vegetation would range from temporary to short-term. However, the clearing of trees would be a long-term or permanent impact.

Little Dixie Highway – Scenic Byway

The proposed pipeline would cross the Little Dixie Highway at MP 40.0 in Pike County, Missouri. This scenic highway is located adjacent to the Mississippi River, and offers scenic views of the river along the 30-mile stretch of highway. Rockies Express intends to cross the Little Dixie Highway via horizontal bore.

Potential impacts to traffic on the byway would be avoided, as the pipeline would be bored under the highway. Scenic views from the road would be impacted during construction, as construction activities would be within view of the byway. Because construction activities would take place in an agricultural field that would be allowed to return to agricultural production after construction, impacts in this area would be short-term.

There would also be short-term visual impacts to those traveling on the highway as a result of construction, which is expected to last about 1 to 2 weeks. These visual impacts would be a result of construction activities and equipment, and the disturbance of 1.5 acres of agricultural land used for additional temporary workspace alongside the highway. Depending on the construction, restoration, and rotation schedule, the fields may be replanted the year following construction thus there would be no long-term visual impacts.

We believe that the use of conventional boring methods would minimize impacts on the Little Dixie Highway. Impacts would be limited to dust, noise, and views of equipment during construction. After construction the surrounding area would appear unchanged to those driving by.

Illinois

Sny Levee

The Project would cross the Sny Levee near MP 43.5 in Pike County, Illinois. The Sny Levee was built in the 1870s by the state of Illinois and financed by a state bond act. The term Sny referred to a natural arm of the Mississippi that entered the river about 6 miles north of Hannibal, Missouri. The name Sny is a shortened English version of a name given by French explorers. The levee has experienced several infamous breeches, including the Great Floods of 1880 and 1881 when water levels rose 19 feet above the low water mark. In response, Congress authorized COE in 1895 to repair the Sny, and build two adjacent levees, making the Sny Levee system the first federally funded flood control system on the Mississippi. More recently, the upper Mississippi experienced another "Great Flood" in 1993.

The purpose of the Sny Levee is to protect adjacent portions of Illinois from the Mississippi River during potential flood stages. The most significant impact to the levee would be if the construction of the pipeline affected the integrity of the levee structure. Affecting the integrity of the levee could result in long-term or permanent impacts to the surrounding area, if the levee were to fail.

The Sny Island Levee Board has requested that Rockies Express cross the levee by placing the pipeline over top of the levee, to preserve its integrity. Four alternate crossings of the Mississippi have been evaluated, and are described in section 3.4.1. All would require crossing the Sny Levee. Since the publication of the draft EIS, Rockies Express has agreed to construct the pipeline over the levee and has filed the construction plan (appendix F). The revised construction plan shows the HDD exit point would be located next to a public access point (boat ramp) to the Mississippi River and that the pipe laydown area may block public access. Therefore, **we recommend that:**

- **Prior to the start of construction of the Mississippi River Crossing, Rockies Express maintain public access to the boat ramp adjacent to the exit site for the HDD for the Mississippi River crossing. If access cannot be maintained, Rockies Express should file with the Secretary a plan for mitigating the impact.**

Old Route 66 – Scenic Highway

The Project would cross Old Route 66, a scenic highway, at MP 122.0 in Sangamon County, Illinois. The crossing would be located in an agricultural field about 1,000 feet east of Interstate 55.

Potential traffic delays on Old Route 66 would be avoided by boring under the highway. Because agricultural land would be allowed to return to agricultural production, impacts in this area would be

short-term. Route 66 is listed on the NRHP, but construction procedures would avoid use of heavy machinery on the historic roadway, and the Illinois SHPO has concurred with the findings.

There would be short-term visual impacts to those traveling on the highway as a result of construction, which is expected to last about 2 weeks. These visual impacts would be a result of construction activities and equipment, and the disturbance of 2.6 acres of agricultural land adjacent to the highway used for additional temporary workspace. Regeneration of this area would likely take one to two growing seasons, thus there would be no long-term visual impacts.

We believe that the use of conventional boring methods would minimize impacts on Route 66. Impacts would be limited to dust, noise, and views of equipment during construction. After construction the location of the pipeline would not be apparent to a driver on Route 66.

Hunter Lake Reservoir

The pipeline would cross the proposed site of Hunter Lake Reservoir at MP 125.2 in Sangamon County, Illinois. Hunter Lake Reservoir is a water supply reservoir proposed by the City of Springfield, Illinois. The city applied for a permit from COE in 1999 and the EIS was published on November 24, 2000. Currently, the permit for the project is still pending approval by COE. The REX East Project would traverse 1.3 miles of Hunter Lake Project lands and would have a direct impact on 20 acres during construction. Since the pipeline would be buried 4 to 5 feet deep and no aboveground facilities are proposed within the limits of the reservoir, no adverse effects are anticipated. Rockies Express is planning to install weights on the segments of its pipeline that may be inundated by the proposed reservoir to ensure negative buoyancy. Additional details about the proposed reservoir can be found in sections 4.3.5 and 4.13.

Embarras River – Illinois Natural Areas Inventory

The Embarras River, which would be traversed at MP 202.9 in Douglas County, Illinois is listed on the Illinois Natural Areas Inventory, and is identified as a biologically significant stream as well as a recreational area. The Embarras River is discussed in further detail in section 4.3.

Rockies Express intends to cross the Embarras River using the HDD method. The drill entry hole and workspace would be located on the eastern side of the Embarras River, separated from the river by 500 feet of agricultural land and about 200 feet of wetland forest. The drill exit hole and workspace located on the western side of the River would be 1,000 feet from the river and separated by wetland forest, agricultural land, and open areas.

The use of the HDD method to cross the river would avoid disturbance to the streambed, stream banks, wildlife, and uplands in the immediate vicinity of the crossing. Locating the temporary workspaces associated with the HDD several hundred feet from the river in agricultural areas would minimize potential impacts to the public's use of the river. The public's ability to travel the river should not be impacted during construction. The main temporary impact would be from noise and additional traffic on the local roads during construction. Since trees would not be cleared along the banks of the river, after construction the location of the pipeline may not be noticeable to a person traveling down the river.

Although construction activities would be at least 500 feet from the river's edge, some changes to the visual setting would likely be noticeable to those using the river and adjacent areas during the approximate 3-month construction period. The presence of construction equipment and activities would

result in short-term visual impacts for these users. Use of the HDD crossing method would minimize surface disturbance, thus long-term visual impacts would not be expected.

Indiana

Indiana Canoeing Trails

The Project would cross three waterbodies in Indiana that are designated as canoeing trails (the Wabash River, the West Fork White River, and the Whitewater River). The Wabash River would be crossed in Vermillion and Parke Counties (RR 2032-MP 242.9 + 4) near the town of Montezuma. The West Fork White River would be crossed in Morgan County (MP 315.8) near Mooresville. The Whitewater River would be crossed in Franklin County (MP 393.2) near the town of Brooksville. The Wabash River and Whitewater River are both classified as Indiana outstanding rivers.

Rockies Express proposes to cross the Wabash and Whitewater Rivers using the HDD method. The proposed drill entry and exit holes and their associated temporary workspaces would be located several hundred feet from the river in agricultural land that is separated from the river by mature forest.

The use of the HDD method to cross these rivers would avoid disturbance to the streambed, stream banks, wildlife, and uplands in the immediate vicinity of the crossing. Locating the associated temporary workspaces several hundred feet from the river in agricultural areas would minimize potential viewshed alterations. Use of the HDD method would allow the public to continue using the waterbodies during construction, although noise from construction activities would be noticeable by the public. After construction, the pipeline should have no impact on users of these waterbodies.

Changes to the visual setting along the Wabash and Whitewater Rivers would generally result in short-term visual impacts to recreationalists and others using the rivers and adjacent areas during the approximately 3 months of construction. The presence of a dense forest corridor along the banks of these rivers would limit the visibility of construction activities and equipment for those recreating alongside or in the river. Therefore, any potential visual impacts would be short-term in nature.

West Fork White River

Rockies Express initially proposed to cross the West Fork White River using open-cut techniques; however, state agencies indicated that they preferred the HDD crossing method. Rockies Express conducted a geotechnical study to assess the feasibility of an HDD installation at the proposed crossing location of the West Fork White River. The study confirmed that subsurface conditions (gravel and cobbles) are not suitable for an HDD crossing. Rockies Express now proposes to cross the West Fork White River using dry crossing techniques (i.e., dam and pump or flume).

A dry crossing would result in a temporary closure of the waterbody at the crossing site to boaters and others during construction. Rockies Express has indicated that prior to construction it would post warning signs regarding waterbody construction both upstream and downstream of the crossing site to warn boaters. We do not believe this is sufficient; therefore, **we recommend that:**

- **Prior to the start of construction at the West Fork White River, Rockies Express file with the Secretary for review and written approval by the Director of OEP a plan for setting up a safe portage for canoeists who wish to traverse the crossing area of the West Fork White River during construction. This plan should include assistance transporting canoes around the work area for those who request help.**

Visual impacts at the West Fork River crossing would be more severe, due to the presence of construction activities within the river. Rockies Express has indicated they would work to preserve wooded banks and trees where possible and would restore the river bank contours to their original condition. The removal of about 0.1 acre of forested land would comprise long-term to permanent visual impacts to users of this area.

B&O Trail

The B&O trail, which includes portions of an abandoned railroad bed, crosses through Parke, Putnam, Hendricks, and Marion Counties. The trail is used for biking, hiking, and wildlife viewing.

Rockies Express states that it would traverse the B&O Trail using conventional boring methods at MP 250.8 in Parke County, Indiana; however alignment sheets indicate that a workspace for the crossing of County Road 325N would cover the trail. The placement of this workspace would prevent the use of the trail, in this location, during construction. Noise and dust during construction would have a temporary impact on trail users. It would also result in the clearing of about 0.5 acre of trees along the path, a long-term or permanent impact. Rockies Express has indicated that it would pay for any damage to the trail.

We believe that in order to preserve the public's safe use of the trail during construction and reduce the long-term or permanent impacts resulting from the removal of tree along the trail, more needs to be done. Therefore, **we recommend that:**

- **Rockies Express maintain public access to the B&O trail and avoid tree cutting at the crossing location.**

Areas within Cecil M. Harden Lake

The area within the Cecil M. Harden Lake (also known as Raccoon Lake) boundary is managed by COE for recreational activities including: boating, camping, fishing, hiking, and picnicking. The area has infrastructure for recreational vehicles, water sports, and wildlife viewing. The area is also managed to provide flood reduction in downstream areas. The pipeline route would cross three waterbodies in Indiana that are located within the Cecil M. Harden Lake boundary: Byrd Branch at MP 268.4, Big Raccoon Creek at MP 269.9, and a tributary to Big Raccoon Creek at MP 269.9. The lake itself would not be crossed. The pipeline would for the most part parallel an existing PEPL pipeline.

Rockies Express has proposed open-cut construction techniques to cross Byrd Branch, Big Raccoon Creek, and the tributary to Big Raccoon Creek. As discussed in section 4.3, Rockies Express would maintain appropriate flow rates to protect aquatic life and prevent interruption to downstream uses. There would be no change to the stream's capacity during construction. About 0.5 acre of open water would be temporarily affected by each crossing and impacted by construction. All three waterbodies are bordered by forested land, which would be used for additional temporary workspace. At both Byrd Branch and the tributary to Big Raccoon Creek, about 0.5 acre of forested land would be required for temporary workspace. The Big Raccoon Creek crossing would require 1.8 acres of forested land.

Construction impacts on the public's use of Cecil M. Harden Lake would consist of an increase in noise during construction and possibly some silty water entering the lake. People hiking in the vicinity of the crossing or traveling on County Road 150 would likely notice noise, equipment, and possibly dust during construction. The changes in the visual setting during construction, especially during instream construction, would likely result in short-term impacts to individuals using these areas. Removal of trees in the right-of-way would result in long-term or permanent impacts to these users, although this impact

would be somewhat mitigated because Rockies Express would be enlarging an existing cleared right-of-way.

Big Walnut Creek and Big Blue River – Nationwide Rivers Inventory

NPS maintains the NRI database for river segments that are eligible for federal protection under the WSR of 1968. These rivers are valued for their fish, wildlife, and recreational significance and are considered Indiana navigable waterbodies.

The proposed pipeline route would cross two waterbodies in Indiana that are part of the NRI. Big Blue River would be crossed at MP 340.8 and Big Walnut Creek would be crossed at MP 281.5.

The Big Blue River would be crossed using the HDD technique. Approximately 3.2 acres of forested land around the waterbody would be used for additional temporary workspace associated with drill entry and exit holes. There are three wetlands that are part of the NWI, which would be avoided by the drill (see section 4.3.7).

The use of HDD to cross the river would avoid disturbance to the streambed, stream banks, wildlife, and uplands in the immediate vicinity of the crossing and would minimize potential viewshed alterations and potential impacts of noise and dust. No direct impacts to the Big Blue River are expected. Persons using the Big Blue River for recreation and viewing would likely be temporarily impacted by construction activities, including noise and dust. Since the extra workspaces for this crossing are set well back from the river and are in agricultural fields, after construction the crossing location should not be apparent to river users. Further, the dense forest surrounding the crossing site would help to mitigate visual impacts, making construction activities less visible to water-based users.

Rockies Express proposes to cross Big Walnut Creek using the HDD method. Big Walnut Creek would be crossed in a scenic area about 1.0 mile downstream of a covered bridge. The use of the HDD technique to cross the river would avoid disturbance to the streambed, stream banks, wildlife, and uplands in the immediate vicinity of the crossing and would minimize potential viewshed alterations and potential impacts of noise and dust. No direct impacts to Big Walnut Creek are expected. Persons using Big Walnut Creek for recreation and viewing would likely be temporarily impacted by construction activities, including noise and dust.

Changes to the visual setting along Big Walnut Creek would generally result in short-term visual impacts to recreationalists and others using the rivers and adjacent areas during the approximately 3 months of construction. The presence of a dense forest corridor along the banks of this waterbody would limit the visibility of construction activities and equipment for those recreating alongside or in the waterbody. Therefore, any potential visual impacts would be short-term in nature.

U.S. Highway 40 – National Historic Road

The pipeline route would cross U.S. Highway 40, a National Historic Road, at MP 298.4 to MP 298.5 in Hendricks County, Indiana. This historic road was once a coast-to-coast route. In recent years, however, the entire segment west of Salt Lake City, Utah, has been decommissioned.

Potential traffic delays on U.S. Highway 40 would be avoided by boring under the highway. However, as construction activities would be within view of the highway, scenic views from the road would be impacted. Approximately 0.4 acre of forested land and 2.2 acres of agricultural land, used mainly for irrigated and non-irrigated winter wheat, wheat, corn, and soybeans, on either side of the

highway would be used to store excavated trench spoil. This area would be allowed to return to its pre-construction state.

Rockies Express would follow requirements included in its Plan and Procedures. Any and all road damage would be repaired and no permanent structures would be placed alongside the highway. We believe that the use of conventional boring methods would minimize impacts on Route 40 which would be limited to dust, noise, and views of equipment during construction. After construction the surrounding area would be returned to agricultural activities. However, impacts to forested land within the permanent right-of-way and subsequent alterations to the viewshed would be permanent.

Camp Woodsmoke

Camp Woodsmoke is operated by the Lions Club, District 25F, and does not charge admission for the Scout groups, churches, and over 6,000 special-needs children who go there yearly.

The proposed pipeline would cross the camp between MPs 375.1 and 375.3. The property would be traversed in a forested area at its southern end. Construction work would be greater than 2,000 feet from the developed campground areas. Rockies Express intends to use standard upland construction techniques, along with conventional boring, to cross Camp Woodsmoke. Construction at any one point would last approximately 8 to 12 weeks. Approximately 2.6 acres of forested land would be temporarily impacted by construction; this forested land consists primarily of mixed hardwood species including elm, ash, maple, oak, and numerous others. Impacts to the camp during construction would include noise, dust, traffic, and machinery emissions, as well as loss of trees. However, because Rockies Express has not indicated when construction would take place through the camp and construction impacts would be more significant if campers are present, **we recommend that:**

- **Rockies Express work with Camp Woodsmoke to determine a schedule for crossing the camp. Rockies Express should discuss with the camp the need for any additional safety mitigation (fencing, signs) during construction in the camp. The results of this consultation should be filed with the Secretary prior to the start of construction in Camp Woodsmoke.**

Short-term visual impacts to visitors to the camp are not anticipated as the proposed crossing route is more than 2,000 feet from the camp through a densely forested tract of land. However, others in the vicinity of construction may experience short-term visual impacts from the presence of equipment and workers associated with construction activities. These visual impacts are expected to last no longer than 1 to 2 weeks. Permanent visual impacts would occur as the result of tree removal (1.2 acres) within the permanent right-of-way as part of operational maintenance, which would occur every 2 to 3 years over the life of the Project.

Ohio

National Wild and Scenic River (Little Miami River and Big Darby Creek)

Little Miami River and Big Darby Creek are designated National Wild and Scenic Rivers, per the provisions of Section 2(a)(ii) of the WSR. Under the authority of that provision, the State of Ohio has the responsibility to manage Big Darby Creek pursuant to the WSR. The Secretary of the Interior, through NPS, retains jurisdictional authority for certain water resources projects. Section 7(a) of the WSR affords substantial protection to designated rivers and to congressionally authorized study rivers.

Prior to approval of a Section 404 permit by COE and construction of the pipeline, NPS must prepare a Section 7(a) determination to evaluate whether a proposed water resources project would have a direct and adverse effect on the values for which a designated river was established, namely its free-flowing condition, water quality, and ORVs. The Little Miami River's ORVs are recreation and scenery. The Big Darby Creek's ORVs include its diverse fish and mussel communities.

Little Miami River

The Little Miami River extends south approximately 100 miles from Clark County, Ohio to the Ohio River. The OEPA has classified the Little Miami River as a major and sensitive waterbody due to special status species and major crossing features. See section 4.3.5 for additional discussion about this crossing.

The Little Miami River would be crossed using the HDD technique. The HDD entry and exit points would be in open fields, avoiding impacts to the forested riparian areas along the river bank. We have recommended in section 4.4.1 that minor brush clearing take place within a 3-foot-wide path for the HDD tracking system. Use of the HDD method would avoid disturbance to the streambed, stream banks, and upland area in the immediate vicinity of the crossing. Following construction these areas would be allowed to revert to pre-construction conditions. After construction, Rockies Express has agreed not to conduct normal maintenance (mowing) on its permanent right-of-way between the entrance and exit points of the drill. Although we believe the HDD crossing of the Little Miami would limit temporary construction impacts to noise and dust and would result in no permanent impacts, we also believe other impacts are possible. We have also recommended additional mitigation in section 4.3.5.

The tributaries of the Little Miami River are also protected under the WSR. Rockies Express has committed to using dry crossing techniques (e.g., dam and pump or flume) at all tributaries to the Little Miami River, with the exception of Caesar Creek, which would be crossed by HDD method. Rockies Express anticipates that the open-cut method would be used only to cross tributaries where there is no perceptible water flow at the time of construction (e.g., primarily ephemeral streams and certain intermittent waterbodies). A site-specific plan has been developed for the crossing of each tributary of the Little Miami River. Impacts from dry crossing are expected to be temporary and would be associated with noise, dust, and visual aesthetics. Dry crossing would result in a temporary closure of the waterbody at the crossing site to boaters and others during construction. Because the tributaries to the Little Miami River are primarily ephemeral or intermittent, these impacts are expected to be minor or non-existent.

Rockies Express anticipates that the dry crossing of the tributaries would be completed in approximately 1 or 2 days depending on the width of the waterbody. Permanent impacts include the removal of trees to widen the existing corridor. Rockies Express has indicated they would work to preserve wooded banks and trees where possible and would restore the river bank contours to their original condition.

Because impacts to these tributaries have the potential to impact the Little Miami River, **we recommend:**

- **Prior to the start of construction of each crossing, Rockies Express file with the Secretary and provide to the NPS, a site-specific plan for the crossing of each tributary of the Little Miami River, developed in consultation with the NPS. These plans should include:**

  a. Dry-crossing method;
  b. Minimization of tree clearing;

c. Erosion controls that would minimize downstream siltation; and
d. A restoration and revegetation plan.

Changes to the visual setting along the Little Miami River would generally result in short-term visual impacts to people using the river and adjacent areas during construction. A few residences in the vicinity of construction may also experience short-term visual impacts from the presence of equipment and workers associated with construction activities. Due to the chosen crossing method and the riparian forest buffering the construction activities, minimal visual impacts are expected. There would also be short-term visual impacts as a result of the disturbance of agricultural land for site access and equipment staging areas. Use of the HDD crossing method would minimize surface disturbance, thus long-term visual impacts would not be expected.

Two alternatives for crossing the Little Miami have been identified. They are described in section 3 as the Little Miami Alternative (3.4.6) and the Mowrey Alternative (3.4.7). Neither is recommended as preferable. We have made a recommendation in section 4.3.5 that the Little Miami Alternative be used if an HDD or microtunneling crossing cannot be successfully completed at the Project route location and that Rockies Express successfully complete the drill before the overland pipeline is constructed in the vicinity of the Little Miami River.

Big Darby Creek

Big Darby Creek would be crossed by the REX East Project at MP 509.2 in Pickaway County. Big Darby Creek is designated as both a state and national scenic river. The creek is nationally noted for its biological diversity, and its abundance of aquatic and terrestrial plants and animals. The creek's banks are lined with native vegetation that varies considerably in width; at some points there is only a narrow line of trees while other areas exhibit deep and extensive forests. Low-lying areas contain floodplain trees that tolerate periods of inundation such as buckeye, sycamore, silver maple, and box elder. Species more adapted to drier soils such as oak and sugar maple line the valley walls.

Rockies Express intends to cross Big Darby Creek using the HDD method. Use of HDD would avoid disturbance of the streambed, stream banks, and upland in the immediate vicinity of the crossing. Big Darby Creek would be crossed west to east with the drill entry point and additional workspace approximately 1,000 feet from the waterbody. The nearest residential area would be approximately 650 feet south of the southeast corner of the workspace. The workspace would overlap with one foreign pipeline and would be bordered by three additional foreign pipelines. The exit point and workspace is in cultivated agricultural land approximately 400 feet east of the waterbody and 350 to 400 feet south of four foreign pipelines. Measuring from the entry hole to the exit hole along the surface, the total length of the drill path would be 2,128 feet. Approximately 3.3 acres of agricultural land and 0.9 acre of open land would be temporarily impacted in association with the entry and exit drill points within the additional temporary workspaces.

During the construction period, visual impacts would occur to creek visitors. Due to the chosen crossing method of Big Darby Creek, the dense forest buffering the construction activities, and the distance of the construction from the creek, minimal visual impacts are expected. These visual impacts would be short-term in nature, resulting from the disturbance of agricultural land while accessing the site.

Although we believe the HDD crossing of the Big Darby Creek would limit temporary construction impacts to noise and dust and would result in no permanent impacts we know other agencies have concerns about the crossing of this National Wild and Scenic River. In a meeting on July 10, 2007, NPS expressed concern about the possibility of a frac-out, in which the HDD drilling fails and there is an

inadvertent release of drilling fluids into the River. In order to protect water quality, Rockies Express has established procedures in its HDD Contingency and Frac-Out Plan for failed drills (CD Document D).

We have examined a route alternative in section 3.4.9 that would avoid crossing Big Darby Creek. We have made a recommendation in section 4.3.5 that this alternative be used if an HDD or microtunneling crossing cannot be successfully completed.

In addition, the tributaries of Big Darby Creek are also protected under the WSR. Rockies Express has committed to using dry crossing techniques (e.g., dam and pump or flume) at all tributaries to the Big Darby Creek and anticipates that the open-cut method would be used only to cross tributaries where there is no visible water flow at the time of construction (e.g., primarily ephemeral streams and certain intermittent waterbodies). A site-specific plan has been developed for the crossing of each tributary of Big Darby Creek. Impacts from dry crossing are expected to be temporary and would be associated with noise, dust, and visual aesthetics. Dry crossing would result in a temporary closure of the waterbody at the crossing site to boaters and others during construction. Because the tributaries to the Big Darby Creek are primarily ephemeral or intermittent, these impacts are expected to be minor or non-existent.

Rockies Express anticipates that the dry crossing of the tributaries would be completed in approximately 1 or 2 days depending on the width of the waterbody. Permanent impacts include the removal of trees to widen the existing corridor. Rockies Express has indicated they would work to preserve wooded banks and trees where possible and would restore the river bank contours to their original condition.

One of the reasons Big Darby Creek was designated a Wild and Scenic River is because of the fish and state- and federally listed mussels that have been documented to occur in the stream. Rockies express consulted with ODNR and FWS regarding mussels. According to these agencies, waterbodies with estimated widths of less than 20 feet are too small to support mussels. Because the tributaries to Big Darby Creek are less than 20 feet wide, mussel surveys were not conducted. Therefore, **we recommend that:**

- **Prior to the start of construction, Rockies Express consult with NPS to determine which, of the tributaries of Big Darby Creek that would be crossed, should be surveyed for mussels and fish spawning areas. Rockies Express should file the results of any required surveys with the Secretary prior to the start of construction, along with any correspondence with NPS.**

Nationwide Rivers Inventory (Four Mile Creek, Great Miami River, Paint Creek, and Seven Mile Creek

The pipeline route would cross four waterbodies in Ohio that are listed in the NRI: Four Mile Creek at MP 421.6, the Great Miami River at MP 430.7, Paint Creek at MP 486.4, and Seven Mile Creek at MP 422.7.

Four Mile Creek

Four Mile Creek is listed on the NRI list for its recreational and scenic values, as well as for its fishery resources. Rockies Express intends to cross Four Mile Creek using the HDD method. Use of the HDD method to cross the other waterbodies would avoid disturbance of the streambed, stream banks, and upland in the immediate vicinity of the crossing. Using this method would avoid the need for re-

contouring approaches and stream banks and the challenges of re-establishing vegetation adjacent to these features.

Construction activities would result in temporary impacts on recreational activities. However, locating the temporary workspaces associated with the HDD several hundred feet from the rivers in un-forested areas would minimize potential viewshed alterations and potential impacts from dust and construction equipment. Further, users of Four Mile Creek would be partially shielded from construction activities by trees along the banks that would not be impacted. Construction activities should not preclude any water-based activities, although construction noise would likely be heard on Four Mile Creek and users may catch glimpses of the construction activities. After construction, the pipeline corridor should not be apparent to users of Four Mile Creek.

Great Miami River

The Great Miami River is listed for its fish, wildlife, and recreational values. OEPA has also classified it as a major and sensitive waterbody due to exceptional warm-water features. Rockies Express intends to cross the Great Miami River using the HDD method. Use of the HDD method to cross the other waterbodies would avoid disturbance of the streambed, stream banks, and upland in the immediate vicinity of the crossing. Using this method would avoid the need for re-contouring approaches and stream banks and the challenges of re-establishing vegetation adjacent to these features.

The HDD entry site and extra workspace would be on the east side of the Great Miami River approximately 1,000 feet from the river, and the exit site would be about 500 feet from the river. Although both work areas would be in forest, neither would be in the riparian corridor along the river. Neither work area should be visible to river users, except possibly in the winter and spring when the leaves are off the trees. Temporary impacts to recreational users include noise, dust, additional road traffic in the area, and possible season glimpses of construction equipment. Construction activities would not preclude recreational activities on the river. The only long-term or permanent impacts would be as the result of tree removal for the HDD.

Paint Creek

Paint Creek is listed on the NRI list for its fish, wildlife, and recreational values. Rockies Express proposes to cross Paint Creek using dry crossing techniques (i.e., dam and pump or flume). An existing TETCO pipeline right-of-way would be used to the extent possible for access and work space. A dry crossing would result in a temporary closure of the waterbody at the crossing site. Paint Creek Lake is known for boating, kayaking, and canoeing. However, the crossing location for Paint Creek is about 23 miles upstream of the lake, and is not known for its recreation opportunities.

Other temporary impacts during construction would result from the generation of noise and dust, as well as the visual impacts to individuals using areas adjacent to Paint Creek. These would occur during construction due to the presence of equipment within the waterbody. Permanent impacts include the removal of trees to widen the existing corridor. Rockies Express has indicated they would work to preserve wooded banks and trees where possible and would restore the river bank contours to their original condition.

In the draft EIS, we had recommended that Rockies Express develop a plan to warn boaters of construction activities and to provide safe portage. However, based on further investigation of the crossing location, including site visits by the FERC staff, we do not feel these additional mitigation measures are warranted. Therefore, we have removed the recommendation.

Seven Mile Creek

Seven Mile Creek is listed on the NRI list due to its high-quality water. Rockies Express intends to cross Seven Mile Creek using the HDD method. Use of the HDD method to cross the waterbody would avoid disturbance of the streambed, stream banks, and upland in the immediate vicinity of the crossing. Workspaces for the HDD would be at a minimum 600 feet from the waterbody. Changes to the visual setting along Seven Mile Creek would generally result in short-term visual impacts to recreationalists and others using the rivers and adjacent areas during construction. However, locating the temporary workspaces associated with the HDD several hundred feet from the rivers in nonforested areas, would minimize potential viewshed alterations and potential impacts from dust and construction equipment. Use of the HDD crossing method, along with implementation of the Project's Procedures should result in no temporary or permanent impacts on the water quality in Seven Mile Creek.

Accommodation Line – Scenic Byway

The pipeline route would cross U.S Highway 42 at MP 450.7 in Warren County, Ohio. The highway at this location is a Scenic Byway known as Accommodation Line. Accommodation Line was an early nineteenth century stagecoach route dotted by historic farms with a large historic district at each end. Large sections of the Accommodation Line were used in the Underground Railroad during the nineteenth century.

Rockies Express intends to cross the Accommodation Line using traditional boring. Boring would avoid some impacts to the Accommodation Line and the associated traffic. Persons using the Accommodation Line would be temporarily affected by construction activities, including noise and dust and additional traffic on the road. In addition, short-term visual impacts would occur from the disturbance of about 8.3 acres of agricultural land and a small wetland area alongside the highway. There should be no significant permanent impacts to the Accommodation Line or its users.

Little Miami Scenic State Park

The Little Miami Scenic State Park roughly parallels the Little Miami River and is managed by ODNR. It is a linear park with a bicycle path on a former railway bed and runs parallel to Corwin Road. The proposed pipeline route would cross approximately 100 feet of the park at MP 451.3 in Warren County, Ohio. Rockies Express proposes to cross the park by horizontal bore. This crossing method would allow for continued use of the trail during construction and preserve the tree canopy that exists at the crossing site. Further, the horizontal bore method helps to reduce the amount of dust, noise, and overall disruption of the existing viewscape due to the presence of construction equipment and activities. However, because Rockies Express has not provided a site-specific plan for crossing the park, therefore, **we recommend:**

- **Prior to the start of construction, Rockies Express file with the Secretary a plan for the construction and restoration of the Little Miami Scenic State Park. Rockies Express should also include a plan for maintaining safe public access through the construction area and revegetating the disturbed areas by planting native vegetation. This plan should be developed in consultation with ODNR.**

Caesar Creek State Park and Wildlife Area

Caesar Creek State Park and Wildlife Area would be crossed between MPs 459.5 and 459.8 in Clinton County, Ohio. The park consists of 7,940 acres of land and 2,830 acres of water. Caesar Creek Lake was created by COE. The park is a cooperative management effort among COE and ODNR –

Divisions of Parks and Recreation, Wildlife, and Natural Areas and Preserves. The state park offers outdoor recreation such as boating, fishing, hiking, and camping with a peak season throughout the summer months. The 2,500-acre wildlife area offers hunting and fishing, with a peak season of October through December.

Both Caesar Creek State Park and the Wildlife Area would be crossed using standard upland construction methods. Upland construction of the proposed pipeline across these lands would temporarily impact 2.6 acres of agricultural land comprised primarily of winter wheat, wheat, corn, and soybeans and a of mixed deciduous forests of elm, ash, hickory, birch, maple cherry, cottonwood, oak, willow, and poplar. Caesar Creek itself would be crossed by the HDD method. This crossing would temporarily affect about 2.0 acres of agricultural land within the state park and the wildlife area for additional temporary workspace. Post construction, approximately 0.8 acre of agricultural land and about 0.2 acre of forest land would remain permanent right-of-way.

We have identified two trails within the path of the proposed route: a bridle trail located along the west side of Caesar Creek and Buckeye Trail, a 1,444-mile statewide trail, which runs along the same or similar path as the bridle trail. Because the creek and the trails would be crossed using the HDD method, direct use of these trails would not be disrupted. The HDD workspace on the west side of Caesar Creek would be in an open field and would not require the cutting of any trees. A narrow path, about 3 feet wide would be cleared between the workspace and Caesar Creek using hand tools only. People using the trail, which for the most part is in the woods, may catch a glimpse of the construction equipment and would hear construction activities. On the other side of the creek, the construction workspace would be in an open field. Trees would screen the public using the trails or creek from construction activities.

We have identified a boat ramp located on Caesar Creek, approximately 0.25 mile south of the planned pipeline crossing. While the pipeline would not directly impact the boat ramp, Rockies Express has identified the road as an access road to be utilized during construction. This would result in limited and/or restricted access to the boat ramp during construction.

Other activities within the park and wildlife area include hunting and camping. Impacts to hunters would primarily depend on the timing of construction relative to hunting seasons. Noise from construction during hunting season could scare game in the area. The proposed route is approximately 0.25 mile from the nearest campsite and the fee station. Noise from construction would mainly occur during the daytime, however early morning construction activities may disturb some campers.

In general, temporary impacts may include the loss of revenue as the result of potential park visitors who decide to stay away during construction. Other visitors may be inconvenienced by construction traffic, noise, and dust during construction. Trees would not be removed between the HDD entrance and exit. This means that users of the creek and trail would not notice any difference in the viewshed along the trails and creek after the construction of the pipeline. Trees removed during construction at the edge of the open fields may be visible to some park users. The removal of 0.2 acre of trees would be a permanent impact.

Because Rockies Express has not provided a site-specific plan for crossing these areas, **we recommend that:**

- **Prior to the start of construction, Rockies Express file with the Secretary a site-specific crossing, mitigation, and restoration plan for pipeline construction activities in Caesar Creek State Park and Wildlife Area developed in consultation with ODNR and COE. Rockies Express should also include a plan for maintaining safe public access through**

the construction area and revegetating the disturbed areas by planting native vegetation. This plan should be developed in consultation with ODNR and COE.

Two alternative routes have been developed for this general vicinity and are described in section 3. The Mowrey Alternative (3.4.7) would cross more land within Caesar Creek State Park. The Little Miami Alternative (3.4.6) would avoid the Park altogether.

Deer Creek State Park

The proposed pipeline would cross Deer Creek State Park between MPs 499.9 and 500.9 in Pickaway County, Ohio. The park is federal property managed by COE, Huntington District. Completed in 1968, the 2,337-acre park is centered on the Deer Park Reservoir, formed by a man-made dam, that offers various water activities for visitors. Recreational use of the park includes hunting, as well as fishing, swimming, and numerous hiking trails. Deer Creek Wildlife Area, located at MP 498.8 to MP 499.9, is adjacent to the park and is managed by ODNR.

Rockies Express intends to use a mixture of HDD and standard open-cut construction techniques to cross Deer Creek State Park. During construction, approximately 15.1 acres of agricultural land and mixed deciduous forest would be temporarily impacted. The agricultural land is comprised primarily of winter wheat, wheat, corn, and soybeans, and the mixed deciduous forests contain elm, ash, hickory, birch, maple cherry, cottonwood, oak, willow, poplar, and woody wetlands. Construction impacts through Deer Creek Wildlife Area would impact 16.7 acres of agricultural and forest land similar to that of the state park. The 100-foot-wide pipeline right-of-way would be kept free of trees and large shrubs, potentially causing habitat fragmentation and altering the appearance of the area (see section 4.5). Other impacts would include noise and emissions from construction equipment. Temporary impacts may include the loss of revenue as the result of potential park visitors who decide to stay away during construction. Other visitors may be inconvenienced by construction traffic, noise, and dust during construction.

We evaluated two route alternatives to reduce or minimize impacts to the Park. The Little Miami River Alternative would avoid crossing Deer Creek State Park and Wildlife Area. Because this alternative would avoid crossing federal property and would not require the issuance of a federal real estate permit, it would be considered the No Action Alternative for COE. As discussed in detail in section 3.4.6, this alternative route was found to have greater environmental impacts than the proposed route due to the increased length of the alternative. The second route alternative we considered, the Deer Creek State Park Alternative, is discussed in detail in section 3.4.8. This alternative attempted to reduce impacts to the park by collocating with an existing right-of-way through the Park. Our evaluation shows that this alternative would result in a longer crossing of the park and would directly impact an existing campground, recreational area, and Deer Creek Lake. Therefore, we find the Project route to be environmentally preferable.

The portion of Deer Creek within the park and wildlife area that would be crossed using HDD crossing methods would prevent direct impacts to users of the creek for fishing or boating activities. Where the state park would be crossed, conventional or horizontal boring crossing methods impacts would vary depending on the types of land cover and use of the area.

We have identified several park facilities that would potentially be impacted during construction of the Project. Within the park is a golf course less than 0.5 mile north of the proposed construction area. While there would be no visual impacts to users of the golf course, there would be temporary noise impacts during periods of construction. Additionally the pipeline crosses a road within the state park, which provides access to a playground, basketball court, volleyball area, and amphitheater. During

construction, access to these locales may be affected by construction traffic and equipment crossings that could slow or temporarily restrict traffic flow. There would be no direct impact on the recreational infrastructure in the park. However, to limit visual impacts and reduce temporary construction related impacts, **we recommend that:**

- **Prior to the start of construction, Rockies Express file with the Secretary a site-specific crossing (including the HDD crossing of Deer Creek Lake), mitigation, and restoration plan for pipeline construction activities in Deer Creek State Park and Wildlife Area developed in consultation with ODNR and COE. This plan should also include provisions for maintaining safe public access through the construction area. This plan should be provided to ODNR and COE.**

Perry State Forest and Blue Rock State Forest

Perry State Forest is located in Perry County, Ohio between MPs 558.5 and 558.7, and again between MPs 558.9 and 559.9. Blue Rock State Forest is located in Muskingum County, Ohio, and would be crossed by the Project between MPs 581.6 and 582.7. Both of these state forests are managed by ODNR for purposes of timber harvest, habitat preservation, and recreational opportunities.

Rockies Express intends to use standard open-cut construction techniques to cross these areas. Approximately 18.1 acres of forested lands, comprised mostly of evergreen and deciduous tree species such as pine, spruce, or cedar and elm, ash, hickory, birch, maple, cherry, cottonwood, oak, willow, or poplar, would be temporarily impacted during construction through Perry State Forest. Visual impacts to park visitors and/or recreationalists would be primarily due to the removal of large specimen trees. Impacts from operation of the proposed pipeline would primarily result from the 10-foot-wide corridor that would be planted and maintained with herbaceous cover. Trees and large shrubs would not be allowed to re-grow in this area, which would result in a permanent visual impact associated with 7.3 acres of forested land.

Construction through Blue Rock State Forest would temporarily impact about 16.7 acres of forested land of similar composition as described above. Following construction, trees and shrubs would be able to regenerate except for 6.7 acres within a 10-foot-wide corridor to be regularly maintained in an herbaceous state.

Temporary impacts may include the loss of revenue as the result of potential park visitors who decide to stay away during construction. Other visitors may be inconvenienced by construction traffic, noise, and dust during construction.

Rockies Express has not provided a plan for crossing these state forests; therefore, **we recommend that:**

- **Prior to the start of construction, Rockies Express file with the Secretary a site-specific crossing, mitigation, and restoration plan, developed in consultation with ODNR, for pipeline construction activities in Perry State Forest and Blue Rock State Forest. A copy of this plan should be provided to ODNR.**

White Oak Exotic Hunting Preserve

The Project would cross the White Oak Exotic Hunting Preserve at approximately MP 607.7 in Guernsey County, Ohio. The property is a privately owned tract (Tract OH-GN-120.000) used for recreational hunting.

The owners of the White Oak Exotic Hunting Preserve indicate that they have already lost an estimated $20,000 of income as a result of survey activities along the right-of-way in the fall of 2006. The FERC expects that any loss of revenue due to the REX East Project would be addressed in the easement negotiations. Because little is currently known of this private reserve, the Project would have unknown impacts on vegetation and wildlife. These impacts could potentially affect future revenue from the hunting preserve. The environmental impacts to the White Oak Exotic Hunting Preserve are unclear, and we have not yet identified a resolution to this issue. Therefore, **we recommend that:**

- **Prior to the start of construction, Rockies Express should work with the owners of White Oak Hunting Preserve to determine construction timing to minimize disruption to their business.**

Raven Rocks

Raven Rocks is a privately-owned reserve located between MPs 628.5 and 630.3 in Belmont County, Ohio. Raven Rocks, Inc. (Raven Rocks) was established in 1970 to preserve about 850 acres of scenic ravines, hills, and woodlands. Since then, an additional 410 acres have been added to the preserve. The area is known for dramatic rock formations, high bluffs, and spectacular vistas. Several rock arches are located nearby. In addition to public education and outreach efforts, the members of Raven Rocks raise and sell Christmas trees to support the reserve. The proposed pipeline route crosses a hemlock-hardwood forest and non-calcareous cliff community along an existing power line right-of-way.

Rockies Express intends to use standard upland construction techniques to cross Raven Rocks Reserve. Approximately 0.6 acre of agricultural land primarily consisting of row crops and pasture/hay fields, 6.8 acres of open land, and 19.9 acres of forest land comprising mixed pines and deciduous species would be temporarily impacted during construction through Raven Rocks. Following construction, 0.2 acre of agricultural land, 2.7 acres of open land, and 8.0 acres of forest would be in the permanent right-of-way.

The crossing in Raven Rocks parallels an existing power line right-of-way, and construction would not cross areas of the reserve commonly used for recreational and educational purposes. Additionally, the construction of the pipeline would be buffered by forest so that noise, dust, and visibility impacts would be minimized.

During the construction period, visual impacts to Raven Rocks visitors and/or recreationalists, would primarily be limited to the presence of construction equipment and vehicles, as the proposed crossing is located several hundred feet from activity areas. Further, the proposed pipeline route would be collocated with an existing right-of-way corridor, which helps to minimize the long-term impacts to the viewshed. Due to forest land buffering the construction area, and the distance of the construction from the use areas, minimal visual impacts are expected.

Captina Creek Preserve

The Captina Creek Preserve is a privately owned preserve located between MPs 624.6 and 625.1 of the proposed right-of-way in Belmont County, Ohio. The woodland preserve contains Captina Creek, one of the few creeks in Ohio that is designated as an exceptional warm-water habitat by EPA and supports many species of aquatic habitat. While the pipeline would cross the preserve, it would not cross Captina Creek.

Rockies Express intends to use standard upland construction techniques to cross the Captina Creek Preserve. Construction would temporarily impact 7.5 acres of agricultural land consisting primarily of row crops and pasture/hay fields and forest land consisting of mixed pines and deciduous species. Following construction, 2.8 acres of both agricultural and forest land would be impacted as part of the permanent right-of-way. Agricultural land would be allowed to revert to pre-construction condition while the forested land would be maintained clear of trees and large shrubbery.

During the construction period, visual impacts would occur to visitors of the preserve. This would be most notable with the removal of large specimen trees within the permanent right-of-way, which would be prevented from re-establishing trees and other large vegetation.

4.8.6 Visual Resources

The proposed pipeline right-of-way predominantly crosses privately owned agricultural lands. Private lands are not subject to federal or state visual management standards. Visual resources on private lands are a function of geology, climate, and historical processes, and are influenced by topographic relief, vegetation, water, wildlife, land use, human uses, and development. The topography varies along the proposed pipeline route from lowlands in eastern Missouri, flat topography in Illinois, Indiana, and Nebraska, to rolling hills in eastern Ohio and Wyoming.

This section provides a general discussion of visual impacts and specific impacts of aboveground facilities. For discussion of specific visual impacts in recreation and special use areas see section 4.8.5 (table 4.8.5-1).

Pipeline Facilities

Rockies Express proposes to use a 125-foot-wide construction right-of-way for the majority of the proposed pipeline route, which would be widened in some locations for additional temporary workspace areas. Visual impacts associated with the construction right-of-way and additional temporary workspace areas would include the removal of existing vegetation and the exposure of bare soils, as well as earthwork and grading scars associated with heavy equipment tracks, trenching, blasting, rock formation alteration or removal, and machinery and tool storage. Other visual effects may result from the removal of large individual trees that have intrinsic aesthetic value; the removal or alteration of vegetation that may currently provide a visual barrier; or landform changes that introduce contrasts in visual scale, spatial characteristics, form, line, color, or texture.

Visual impacts would be greatest where the proposed pipeline route parallels or crosses roads, trails, recreational waterbodies, overlooks, historic properties and districts, and where the pipeline right-of-way would be seen by passing motorists or recreational users. The visual impacts would vary depending on vegetation type. The recovery timeframe would be shortest on agricultural and open lands consisting of herbaceous and shrub communities, where the re-establishment of vegetation following construction would be relatively fast (between one or two growing seasons). Short-term impacts to developed lands would also be minor due to the previously disturbed nature of these areas and the quick recovery time.

The greatest potential for visual impact would be from the removal of large, mature forests, which would take a longer time to regenerate than other vegetation types, and would be prevented from re-establishing on the permanently-maintained 50-foot-wide right-of-way. Clearing of forested areas would produce long-term and permanent impacts. Clearing would convert existing forested areas to open areas and result in a new corridor with distinctive edges. Rockies Express has attempted to collocate the pipeline with existing rights-of-way through forested areas, reducing new visual impacts. In general,

visual impacts would diminish over time as the affected areas gradually blend in with the surrounding landscape.

The landscape setting along the pipeline route is generally flat, and views of the construction activities may extend for some distance. However, the construction work areas would be restored as near as possible to pre-construction contours and in some areas, revegetation would occur. Once revegetation is complete, there would be no significant alteration of the landscape of the region.

Site-specific Visual Impacts

Because of these considerations, we conclude that construction of the REX East Pipeline would not significantly alter the visual resources of the areas crossed.

Aboveground Facilities

Aboveground facilities would be the most visible features constructed as part of the Project, and would result in a long-term change to the appearance of the landscapes where they are located. Aboveground facilities associated with the REX East Project consist of five compressor stations on the main REX East route from Missouri to Ohio, and one each in Phelps County, Nebraska and Carbon County, Wyoming. Additionally, 19 meter stations would be constructed along the Project route in 13 locations, all but 4 of which would be located within the footprint of a proposed compressor station. The project would include 42 MLVs, but these would be relatively small facilities compared to other aboveground facilities. The compressor stations and meter stations would be more readily visible. These facilities are listed in table 4.8.6-1, which also gives the distance to the nearest viewshed that has the potential to view the proposed compressor stations and meter stations.

Table 4.8.6-1

Potential Visual Impacts Associated with Major REX East Aboveground Facilities a/

State/County	Facility	MP	Nearest Public Viewshed	Visual Impact	Distance from Facility to Viewshed (feet)
MISSOURI					
Audrain	Mexico Compressor Station	0.0	Road 441	Highly visible from immediate surrounding roads	334
ILLINOIS					
Christian	Blue Mound Compressor Station	144.1	North 1400 East Road	Highly visible from immediate surrounding roads	369
Moultrie	NGPL	178.7	Unnamed Road	Visible from adjacent road	158
Moultrie	Ameren Power Company Meter Station	180.4	Hammond Road	Visible from adjacent road	128
Douglas	Trunkline Gas Company Meter Station	195.7	North County Road 800 East	Visible from adjacent road	120
Edgar	Midwestern Meter Station	231.9	North 1700th Street	Visible from adjacent road	130

Table 4.8.6-1 (continued)

Potential Visual Impacts Associated with Major REX East Aboveground Facilities a/

State/County	Facility	MP	Nearest Public Viewshed	Visual Impact	Distance from Facility to Viewshed (feet)
INDIANA					
Putnam	Panhandle Eastern Pipe Line Company Meter Station	274.5	West Cord 850 North Road	Visible from adjacent road	176
Putnam	Bainbridge Compressor Station	277.3	North County Road 25 West	Highly visible from immediate surrounding roads and Walnut Creek	656
Morgan	Citizen Gas & Coke Utility Meter Station	305.9	Greencastle Road	Visible from adjacent road	174
Johnson	Indiana Gas Company Meter Station	316.4	Old Road	Visible from adjacent road	394
Shelby	ANR Meter Station	342.3	South 600 West Road	Visible from adjacent road	851
OHIO					
Warren	Hamilton Compressor Station	437.3	Emerald Way Road	Visible from adjacent road	581
Warren	Lebanon Hub – Dominion, TETCO, Texas Gas, Vectren, and Columbia Gas Meter Station	444.0	Unnamed Road	Visible from adjacent road	342
Fairfield	Columbia Gas Meter Station	539.6	Old Millersport Road NE	Visible from adjacent road	315
Muskingum	Chandlersville Compressor Station	575	Irish Ridge Road	Visible (moderately) from road	1,214
Guernsey	Tennessee Gas Meter Station	592.4	Spencer Road	Visible from adjacent road	615
Noble	Dominion Transmission, Inc Meter Station	612.3	Saint John Road	Visible from road	1,362
Monroe	Clarington Hub – Dominion Transmission, Dominion East Ohio, and TETCO Meter Station	639.1	Township Highway 964	Visible from adjacent road	1083

a/ The Arlington and Bertrand compressor stations would not have visual impacts.

The compressor stations would be built at various locations throughout the pipeline right-of-way. With the exception of the Hamilton Compressor Station, they would be located on primarily agricultural lands with a generally flat topography. The Hamilton Compressor Station would be located on primarily agricultural and industrial lands with rolling topography. On flat land, compressor stations would be fairly visible due to their height relative to surrounding areas.

Each of the meter stations would be installed at locations with aesthetics and topography similar to that described for the pipeline and any nearby compressor station. The meter stations would be installed on primarily agricultural and open land. They would be visible from nearby roads, but are not

expected to create a unique visual impact on the area. Meter stations serve as interconnects with other pipeline systems, and would be located close to existing, previously disturbed and cleared pipeline rights-of-way.

Most MLVs are expected to be located in agricultural or open areas where minor visual impacts on nearby viewers may occur. In general, the impacts on visual resources resulting from the construction and operation of the MLVs would be minimal as each site would be less than 0.06 acre in size and would be operated within the pipeline right-of-way or within a proposed aboveground facility (e.g., compressor station site). MLVs would be enclosed within a chain-link security fence. As previously discussed, MLVs are relatively small and are not expected to present a significant change in the visual quality of areas surrounding the pipeline right-of-way. Rockies Express does not intend to visually screen MLVs as this would necessitate a larger land area and may impede current farming practices. Maintaining smaller, yet viewable, MLV sites on agricultural land would preclude the need to permanently remove agricultural land from production.

Our review indicates that construction and operation of the REX East Project would not result in significant adverse impacts on visual resources. Temporary impacts could result from the presence of construction equipment along the right-of-way, but the remote location and short duration of the construction sequence would minimize these impacts.

4.9 SOCIOECONOMICS

The REX East Project would involve the construction and operation of a 639.1-mile-long natural gas pipeline that would cross 34 counties in four states: Illinois, Indiana, Missouri, and Ohio. Seven compressor facilities would also be constructed. Five compressor stations would be constructed along the REX East pipeline route in these states, while the two other compressor stations would be constructed in Carbon County, Wyoming and in Phelps County, Nebraska along the REX West pipeline (for a total of 36 counties). Additional temporary workspaces along the pipeline right-of-way would be necessary at multiple locations to support construction activity. Although existing roads would be utilized to access the construction right-of-way to the extent practicable, the Project would include the modification and extension of some existing roads and the construction of new roads. The use of several contractor/pipe yards would also be required during construction. See sections 2 and 4.8 for more information regarding the Project facilities, their proposed locations, and land requirements.

For the purposes of this socioeconomics section, the term "Project area" refers generally to the 36 counties in which Project pipeline and the Project facilities would be located. The following sections discuss the existing socioeconomic conditions in the REX East Project area, the anticipated socioeconomic impacts of the Project on this area, any planned mitigation measures, our analysis, and our recommendations. Potential impacts of the Project on socioeconomic conditions in the Project area include potential impacts associated with a Project-related increase in population, potential local and regional economic impacts, potential impacts on transportation, and potential impacts on property values. Potential impacts associated with Project-related increases in population include impacts on employment, housing, and the provision of public services. Potential local and regional economic impacts include impacts on tax revenues and economic activities within areas crossed by the Project. Potential impacts on transportation include potential disruptions of traffic and potential increases in traffic. Potential impacts of property values include changes in property value associated with the presence of the Project facilities.

In accordance with EO 12898 on Environmental Justice, all public documents, notices, and meetings were made readily available to the public throughout the REX East Project area during Project development. The mailing list for the Project has been continuously updated during the EIS process. The public has been notified of all official proceedings of the various Project components with the issuances of Notice of Intent (NOI) and scoping meetings in the Project area. Section 1.3 of this EIS further describes the public participation and notification process. Much of the proposed route is collocated with other utility or transportation corridors. The REX East Project would not significantly impact urban or residential areas, and no disproportionately high and adverse human health or environmental effects on minority or low-income communities or Native American tribes have been identified.

4.9.1 Existing Socioeconomic Conditions in the Project Area

Table 4.9.1-1 presents selected demographic and socioeconomic data existing in the counties and states that would be affected by the Project.

The total population in counties affected by the Project is over 2.2 million. Fewer than half the counties (15 of 36) have populations greater than 40,000. The populations among the individual counties vary from 5,412 to 350,412. Although the majority of the counties crossed by the Project are moderately populated, the Project area includes both rural and metropolitan areas. The average population density for all 36 counties within the Project area is 123.8 persons per square mile, although 7 counties have more than 200 persons per square mile. The average annual per capita income for the states affected by the Project is $32,197 compared to an average annual per capita income of $26,848 for the counties affected by the Project area. The average county workforce is about 33,000 persons and varies from fewer

Table 4.9.1-1

Demographic and Socioeconomic Conditions for States and Counties Crossed by the REX East Project

State/ County	Population a/	Population Density (persons/square mile) a/	Per Capita Income (in annual dollars) a/	Civilian Labor Force (persons) b/ c/	Unemployment Rate (percentage) b/ c/	Major Industry (percentage) a/
Missouri	**5,842,713**	**81.2**	**30,475**	**3,017,000**	**5.7**	**Education, health, social services (20.4)**
Audrain	25,739	37.3	23,694	11,806	4.6	Manufacturing (23.4)
Ralls	9,925	20.4	25,111	5,400	5.0	Manufacturing (21.3)
Pike	18,566	27.3	21,881	8,707	5..3	Manufacturing (19.1)
Illinois	**12,831,970**	**223.4**	**34,721**	**6,386,000**	**6.1**	**Education, health, social services (19.4)**
Pike	16,840	20.9	25,290	8,605	4.5	Education, health, social services (20.3)
Scott	5,377	22.1	23,090	2,812	5.3	Education, health, social services (19.3)
Morgan	35,666	64.4	26,224	17,800	4.9	Education, health, social services (25.2)
Sangamon	193,524	217.6	32,736	108,444	4.2	Education, health, social services (22.3)
Christian	35,063	49.9	26,605	27,195	6.6	Education, health, social services (20.9)
Macon	109,309	197.6	30,667	54,604	5.3	Education, health, social services (20.1)
Moultrie	14,383	42.6	26,117	8,175	3.6	Manufacturing (26.9)
Douglas	19,791	47.8	27,461	10,349	4.2	Manufacturing (22.7)
Edgar	19,183	31.6	24,527	10,695	4.8	Manufacturing (27.0)
Indiana	**6,313,520**	**169.5**	**30,204**	**3,160,000**	**5.3**	**Manufacturing (22.9)**
Vermillion	16,645	65.4	26,633	8,216	6.5	Manufacturing (23.2)
Parke	17,021	38.8	23,007	8,015	5.5	Manufacturing (23.6)
Putnam	36,978	75.0	25,113	18,157	5.3	Manufacturing (20.5)
Hendricks	131,204	254.9	32,060	71,508	3.6	Education, health, social services (17.7)
Morgan	70,290	164.1	29,485	38,288	4.5	Manufacturing (19.0)
Johnson	133,316	359.8	31,583	72,115	3.9	Education, health, social services (18.6)
Shelby	44,114	105.3	29,376	24,335	4.4	Manufacturing (28.1)
Decatur	24,948	65.9	27,194	12,631	4.4	Manufacturing (37.0)
Franklin	23,373	57.4	26,908	12,246	5.7	Manufacturing (29.8)

Table 4.9.1-1 (continued)

Demographic and Socioeconomic Conditions for States and Counties Crossed by the REX East Project

State/ County	Population a/	Population Density (persons/square mile) a/	Per Capita Income (in annual dollars) a/	Civilian Labor Force (persons) b/ c/	Unemployment Rate (percentage) b/ c/	Major Industry (percentage) a/
Ohio	**11,478,006**	**277.3**	**31,161**	**5,884,000**	**6.3**	**Manufacturing (20.0)**
Butler	354,992	712.2	31,332	189,698	5.6	Manufacturing (21.7)
Warren	201,871	396.3	32,745	105,550	4.9	Manufacturing (23.2)
Clinton	43,399	98.7	27,073	24,218	4.8	Manufacturing (20.4)
Greene	152,298	356.5	32,497	77,420	5.1	Education, health, social services (23.8)
Fayette	28,305	69.9	27,280	16,261	5.0	Manufacturing (24.0)
Pickaway	53,606	105.1	24,842	24,206	5.8	Education, health, social services (16.2) Manufacturing (16.2)
Fairfield	140,591	243.0	30,383	74,172	4.8	Education, health, social services (17.7)
Perry	35,313	83.2	20,484	16,593	7.4	Manufacturing (26.1)
Muskingum	86,125	127.3	25,883	39,092	7.2	Manufacturing (24.8)
Guernsey	40,876	78.2	22,817	20,011	6.5	Manufacturing (21.8)
Noble	14,165	35.2	17,145	5,883	7.2	Manufacturing (23.5)
Belmont	68,771	130.7	25,259	32,494	5.9	Education, health, social services (23.4)
Monroe	14,606	33.3	22,291	5,105	11.3	Manufacturing (24.8)
Wyoming	**515,004**	**5.1**	**34,279**	**282,000**	**3.8**	**Education, health, social services (21.5)**
Carbon	15,325	2.0	28,438	7,939	3.4	Education, health, social services (17.1)
Nebraska	**1,768,331**	**22.3**	**32,341**	**990,000**	**3.8**	**Education, health, social services (20.7)**
Phelps	9,442	18.1	33,305	5,231	2.2	Education, health, social services (18.9)

a/ U. S. Census Bureau, 2000.
b/ U.S. Department of Labor, Bureau of Labor Statistics, 2004.
c/ U.S. Department of Labor, Bureau of Labor Statistics, 2006.

than 3,000 to more than 189,000. The unemployment rate also varies substantially across counties within the Project area, from 2.2 percent to 11.3 percent with an average of 5.3 percent. In terms of number of persons employed, the two main industries in the Project region are manufacturing and the social services industry, which includes education and health. Agricultural production encompasses much of the acreage.

4.9.2 Employment

Potential impacts of the REX East Project on employment within the Project area could result from the influx of construction personnel and operational staff. The civilian labor force and unemployment rates for counties within the Project area are shown in table 4.9.1-1. The number of civilian laborers per county for counties within the Project area ranges from fewer than 3,000 to more than 185,000. Unemployment rates for counties within the Project area are generally comparable to corresponding state levels, with the exception of Monroe County, Ohio, which is approximately twice that of the state.

Pipeline construction would occur over seven "spreads," which are sections of the pipeline that would be constructed independently. Construction of the 7 spreads would begin simultaneously in the spring of 2008, and each would require between 420 and 520 workers. Therefore, the total number of construction workers necessary for pipeline construction would be between 2,940 and 3,640. In addition, a total of 560 to 700 workers would be needed to construct the 7 compressor stations (80 to 100 workers per site). Construction of the compressor stations would begin in the spring of 2008, except for the Chandlersville and Arlington Compressor Stations, which would begin construction in January 2009. Construction of meter stations, laterals, and interconnects would not require additional workers beyond those estimated above for construction of the pipeline and aboveground facilities. The total construction workforce would be 3,500 to 4,340. The construction workforce estimates are presented in table 4.9.2-1.

Table 4.9.2-1
Estimated REX East Construction Workforce

	Number of Workers (Local and Non-local) a/
Pipeline Facilities	
Construction workforce per spread	420–520
Total construction workforce (7 spreads)	2,940–3,640
Aboveground Facilities	
Construction workforce per compressor station	80–100
Total construction workforce (7 spreads)	560 to 700
Total Construction Workforce	**3,500-4,340**

a/ This includes workforce for the meter stations, laterals, and interconnects.

Project construction would use local workers supplemented by workers from outside the Project area, as required. Pipeline industry labor agreements stipulate that local labor unions must provide at least 50 percent of the construction workforce. If non-union labor is used or local unions cannot provide at least 50 percent of the necessary workforce, additional non-local workers would be used. Rockies Express expects that about half the total construction workforce (between 1,750 and 2,170 workers) would be non-local. If the maximum workforce for a single spread is present within a single county, the increase in county population due to the influx of non-local workers would range from 0.1 percent to 4.8

percent during construction. Therefore, we believe that the construction of the REX East Project would provide a minor, temporary increase in construction-related employment in the Project area.

Following construction, 20 permanent full-time employees would be required to operate the new pipeline and aboveground facilities. The Mexico, Blue Mound, Bainbridge, Hamilton, Chandlersville, and Bertrand Compressor Stations each would have three full-time staff, and the Arlington Compressor Station would have two full-time staff. The small number of permanent staff required for operation of the proposed facilities would be a minor permanent increase in the local employment rate in the Project area.

4.9.3 Housing

Potential impacts on housing in the Project area would be from the temporary influx of pipeline construction workers and the relocation of permanent non-local employees into the Project area.

The estimated availability of temporary housing within the Project area is shown in table 4.9.3-1. The average number of estimated available units per county is about 3,000, but ranges considerably across counties within the Project area, from fewer than 500 units to just over 12,000.

Rockies Express estimates that about 50 percent of the total construction workforce would come from outside the Project area. This means that 1,750 to 2,170 workers would require temporary housing. Over the 7 construction spreads, this is an average of 250 to 310 workers requiring temporary housing per spread, including compressor station personnel. Non-local workers would likely choose various types of temporary accommodations including daily, monthly, and weekly rentals in motels and hotels, campgrounds, recreational vehicles and mobile homes, apartments, and houses. Based on past pipeline construction experience, Rockies Express expects that about 30 percent of the workers would use their own campers or trailers for temporary housing. Therefore, only 175 to 215 units would be required per spread, including compressor station personnel.

For purposes of this analysis, we assume that the workforce associated with an average spread would be located within only one county at a time. We then compared the number of available temporary housing units in each county to the estimated number of required units (which range from 175 to 215). The estimated number of temporary housing units available in each county is greater than the number of units required for an average spread. Therefore, we believe that the number of temporary units within the Project area would be sufficient to accommodate the temporary housing demand associated with non-local construction workers.

The availability of temporary accommodations would vary depending on local activities and tourism. Tourist and local activities in the Project area include, but are not limited to, outdoor recreation at state parks and National Forests, festivals and concerts, sporting events, and visitation to historical activities and sites. Construction activities would occur during the peak visitation period to many of the tourist attractions located within the Project area when hotels and campgrounds already have limited vacancies. If vacancy shortages occur during times of peak demand, non-local construction workers would need to seek accommodations in communities adjacent to the Project area and face a longer commute to their worksite. If such shortages occur, we expect that they would be localized and of limited duration (such as isolated weekends). We believe that construction of the REX East Project would have a minor temporary impact on temporary housing availability in the Project area.

As noted above, 20 permanent workers would be required for operation of the Project. The housing markets of the communities within the Project area would easily accommodate the small number of permanent employees seeking new housing. We believe that operation of the Project would result in negligible impacts on the housing market.

Table 4.9.3-1

Temporary Accommodations for Counties within the REX East Project Area

State/County	Rental Vacancy Rate (percent) a/	Hotel/Motel Units b/	Mobile Home Spaces a/	Vacant Rental Units a/	Vacant Units for Seasonal, Recreational, or Occasional Use a/	Total Available Units
Missouri						
Audrain	10.5	162	1,056	299	69	1,586
Ralls	16.3	485	979	130	437	2,031
Pike	12.4	64	1,177	238	317	1,796
Illinois						
Pike	7.3	41	1,024	124	342	1,531
Scott	6.9	0	342	37	57	436
Morgan	11.5	298	1,389	542	81	2,310
Sangamon	10.3	3,351	5,569	2,715	240	11,875
Christian	9.3	8	939	341	63	1,351
Macon	11.0	1,178	2,364	1,628	139	5,309
Moultrie	4.6	165	382	56	31	634
Douglas	6.2	205	591	115	32	943
Edgar	8.0	37	675	175	57	944
Indiana						
Vermillion	8.3	37	794	126	79	1,036
Parke	6.7	127	1,383	91	592	2,193
Putnam	5.2	326	1,731	146	409	2,612
Hendricks	10.1	1,082	1,893	713	168	3,856
Morgan	7.5	142	2,345	400	168	3,055
Johnson	10.1	708	2,356	1,124	261	4,449
Shelby	7.5	445	855	357	94	1,751
Decatur	6.3	239	861	170	106	1,376
Franklin	6.1	156	1,451	95	310	2,012
Ohio						
Butler	7.3	3,850	4,994	2,775	390	12,009
Warren	7.5	2,909	1,025	973	178	5,085
Clinton	8.1	248	1,561	422	146	2,377
Greene	7.0	1,461	871	1,266	270	3,868
Fayette	7.2	275	680	285	41	1,281
Pickaway	6.5	219	2,293	312	65	2,889
Fairfield	6.2	1,315	1,570	711	462	4,058
Perry	6.4	29	2,464	176	293	2,962
Muskingum	7.9	597	3,701	738	338	5,374
Guernsey	8.9	573	3,120	417	1,086	5,196
Noble	5.7	52	1,175	55	536	1,818
Belmont	8.5	383	2,760	659	380	4,182
Monroe	7.1	8	1,454	88	140	1,690

Table 4.9.3-1 (continued) Temporary Accommodations for Counties within the REX East Project Area						
State/County	Rental Vacancy Rate (percent) a/	Hotel/Motel Units b/	Mobile Home Spaces a/	Vacant Rental Units a/	Vacant Units for Seasonal, Recreational, or Occasional Use a/	Total Available Units
Wyoming						
Carbon	16.9	617	1,678	360	1,050	3,705
Nebraska						
Phelps	8.6	62	302	96	32	492

a/ U.S. Census Bureau, 2007.
b/ HotelsTravel, 2007.
World Web, 2007.
Access Vermillion County, 2007.
Parke County Chamber of Commerce, 2007.
Sullivan Chamber and Economic Development, 2006.
Scott County Courthouse, 2007.

4.9.4 Public Services

Public services in the Project area include law enforcement, fire and emergency response, medical treatment, and education. Construction and operation of the Project could result in impacts on the provision of public services. The potential impact on public services resulting from Project construction and operation would vary from community to community depending on the number of non-local workers relocating in each location, the duration of their stay, and the size of the community.

Table 4.9.4-1 summarizes the educational, medical, police, and fire full-time equivalents (FTE) for all counties and states within the Project area. For the services that have the most potential to be affected by the Project – medical, police and fire protection public services – there are an average of 181 medical, 115 police, and 53 fire FTEs in the counties crossed by the Project. Many counties, however, have fewer than 10 FTEs employed in these public services. As table 4.9.4-1 details, there are 8 counties with fewer than 10 fire FTEs; 4 counties with fewer than 10 medical FTEs; and one county with fewer than 10 police FTEs in the Project area. Additionally, there are 5 counties with zero (0) fire FTEs and 3 with zero (0) medical FTEs.

Emergency response to potential construction accidents could impact local police and emergency medical services. The magnitude of this impact would depend on the frequency and severity of such accidents. Rockies Express has stated that it would coordinate with local police, fire, and emergency medical services to minimize impacts of Project construction on public services.

Given Rockies Express' commitment to coordinate with public service purveyors, we believe that impacts related to the need for emergency services during construction of the Project would be minor and temporary.

Table 4.9.4-1

Educational, Medical, Police, and Fire Full-time Equivalents within the REX East Project Area a/

State/County	Education	Health and Hospitals	Police Protection	Fire Protection	Total Full-Time Equivalent (excluding education)
Missouri	**122,120**	**12,167**	**14,380**	**5,692**	**32,239**
Audrain	577	1	55	3	59
Ralls	134	5	18	0	23
Pike	445	157	58	25	240
Illinois	**251,680**	**22,108**	**39,335**	**15,205**	**76,648**
Pike	449	52	34	0	86
Scott	190	0	9	0	9
Morgan	768	79	90	26	195
Sangamon	4,080	148	469	242	859
Christian	993	24	82	40	146
Macon	2,059	59	255	160	474
Moultrie	227	4	38	19	61
Douglas	370	0	28	2	30
Edgar	484	14	42	16	72
Indiana	**126,426**	**25,692**	**12,520**	**6,316**	**44,528**
Vermillion	443	201	29	5	235
Parke	345	23	23	4	50
Putnam	998	241	45	13	299
Hendricks	1,946	712	166	94	972
Morgan	1,450	407	109	43	559
Johnson	2,135	473	210	91	774
Shelby	895	387	85	35	507
Decatur	523	248	47	20	315
Franklin	338	5	18	1	24
Ohio	**215,400**	**29,059**	**27,383**	**14,160**	**70,602**
Butler	5,668	293	611	385	1,289
Warren	2,458	326	243	112	681
Clinton	849	1,092	78	18	1,188
Greene	2,739	172	295	171	638
Fayette	593	271	57	14	342
Pickaway	996	370	120	121	611
Fairfield	1,901	69	211	134	414
Perry	732	64	50	5	119
Muskingum	1,888	163	196	74	433
Guernsey	701	38	85	22	145
Noble	249	35	20	0	55
Belmont	1,174	145	128	37	310
Monroe	367	55	45	1	101
Wyoming	**16,430**	**4,324**	**1,420**	**343**	**6,087**
Carbon	520	167	78	7	252
Nebraska	**42,378**	**4,577**	**3,512**	**1,200**	**9,289**
Phelps	378	0	20	0	20

a/ U.S. Census Bureau, 2004.

The influx of non-local workers could result in impacts on public services that are typical for an increase in population, such as increased demand for police and fire response, non-emergency medical services, and educational services. The degree of impact would vary from community to community depending upon the number of non-local workers and any accompanying family members that reside in each community, how long they stay, and the size of the community. The total population in the Project area is more than 2.2 million, as discussed above. Fewer than 2,170 non-local workers would temporarily relocate into the Project area during construction, and only 20 workers would relocate during operation of the Project. We believe that the relocation of these workers would result in minor temporary (during construction) and permanent (during operation) impacts on public services.

4.9.5 Transportation

Construction activities could result in temporary impacts on transportation infrastructure. These impacts could include disruption to traffic flow due to the movement of construction equipment, materials, and crew members; construction of pipeline facilities across existing roads and railways; and damage to local roads from the movement of heavy construction equipment and materials.

We expect that the transportation infrastructure would be minimally and temporarily impacted by the REX East construction activities. Any temporary impacts would include damage to local unpaved roadways and disruption of traffic flow, particularly during initial staging, which requires the transport of bulk construction equipment and materials to the respective spread areas, as well as disruption associated with roads open-cut for pipeline installation.

To minimize disruption to traffic flow from construction activities taking place across major roadways, Rockies Express would install the pipeline by horizontal boring underneath all paved roadway crossings, where possible. Where roads are crossed with an open-cut, temporary travel measures, such as steel plates, would be available during active construction to allow passage of emergency vehicles. Unlike horizontal boring, this technique may impact traffic by requiring road closures or the use of detours for the 1 to 2 days normally needed to perform the task. When no feasible detour is available, one lane of the road would remain open until full-road closure is necessary to install the pipe.

Proper signage would be used to notify drivers of construction activity and flaggers would be used to direct flow at high traffic road crossings. Road closures during peak traffic periods would be avoided to mitigate impacts on road traffic. Therefore, **we recommend that:**

- **Rockies Express consult with each state's Department of Transportation and local traffic authorities regarding road closures and appropriate detours. Rockies Express should file documentation of this consultation with the Secretary and provide the opportunity for local authorities to provide additional input as local conditions may require during construction.**

Project construction could also impact transportation within the Project area through damage to roadways or safety concerns from the movement and operation of construction equipment. Rockies Express would take several measures to mitigate these impacts including the following:

- observance of vehicle weight and width restrictions;
- removal of soil and other materials from roadways; and
- use of mats or other methods to ensure that equipment would not damage paved roadways.

We believe that implementation of the measures described above would avoid, minimize, or mitigate potential construction-related impacts on transportation infrastructure; these impacts would be minor and temporary.

Another potential impact is an increase in congestion on the roads from construction-related traffic. Construction-related traffic would occur each day to and from sites at each spread, and would remain relatively constant throughout the construction period. These trips are typically distributed along the spread, so areas of concentrated congestion would be avoided.

Rockies Express provided estimates of daily traffic volume for larger roadways (30 interstates and U.S. highways identified as such) that would be crossed by the proposed pipeline route. Because all such roadways would be crossed by horizontal boring, potential transportation impacts would be primarily related to construction and worker traffic. The average annual daily traffic on these routes is 30,000 vehicles per day, ranging from 1,230 to 93,130 vehicles per day. Based on the anticipated peak workforce for a site, we estimated that on average construction activities would result in an additional 175 vehicles per day. This results in an average increase in traffic volume of 0.6 percent on the roadways, with the volume ranging from a 14.2 percent increase on the least traveled roads to a 0.2 percent increase on the most heavily traveled roadways. These increases in construction-related traffic would be small relative to existing traffic within the Project area. We believe that transportation impacts resulting from construction-related traffic would be temporary and minor.

Therefore, in general, we believe that during construction, impacts on local traffic levels would not be significant because of the short duration of activities located within each construction spread and the generally rural locations in which most of the REX East Project would take place. Furthermore, pipeline construction work schedules typically begin and end outside of peak commuting hours.

The only impacts on transportation during Project operations would result from the presence of the small number of operational employees within the Project area. We believe that operational employees moving into and commuting to the Project area would have a negligible impact on transportation.

4.9.6 Economy and Tax Revenues

Construction and operation of the REX East Project would impact the economies and tax revenues of the Project area. During construction, Project-related spending on local goods and services and tax revenues paid for such goods and services would temporarily provide additional income in the Project area. During operation, annual property tax revenues would provide additional income to local governments.

However, both construction and operation could adversely impact the local economy through disruption to agriculture or commercial properties. These types of impacts are highly correlated with impacts on land use, and are discussed further in section 4.8. Another potential economic impact of the Project is effects on property values; these are discussed in a separate section below. Finally, revenue of parks or other recreational areas could be reduced if the Project resulted in a decrease in tourism and a corresponding decrease in user fees. An analysis of the impacts of the Project on recreational and special interest areas is discussed in section 4.8. Based on that analysis, we believe that any reductions in user fees would be minor. The remainder of this section focuses on the impact of Project-related spending on local goods and services and tax revenue.

During construction, some portion of the construction payroll would be spent locally for the purchase of goods and services, such as housing, food, gasoline, entertainment, and luxury items. The

amount would depend on the number of construction workers and the length of their employment. Some portion of the construction materials likely would be purchased locally. These direct payroll and materials expenditures would have a positive impact on local economies and would stimulate indirect expenditures within the region as inventories are restocked or new workers are hired to meet demands. Local sales taxes would be paid on all goods and services purchased with payroll monies or for construction materials.

To estimate the economic impact of workforce payroll, Rockies Express assumes that 30 percent of the workforce payroll would be spent locally on goods and services, such as housing, food, fuel, entertainment, and luxury items. The increase in expenditures on goods and services would have a direct impact on the local economy and could generate local tax revenues estimated up to $3.5 million.[1] The estimated workforce payroll and associated sales tax revenues are shown in table 4.9.6-1. Using Rockies Express' assumption that 50 percent of the construction workers would be local, the total pay to local workers (a maximum of 2,170 workers) during construction would be about $25 million. Therefore, the Project would add tax revenues to those states within the Project area during construction, providing a temporary and minor positive impact.

Table 4.9.6-1

REX East Project Payroll and Sales Tax Revenues by State

State	Estimated Construction Payroll (dollars) a/	Estimate of Spending of Construction Payroll (dollars)	Estimated State Consumer Use Tax Revenues (dollars)b/	Estimated Sales Tax Revenues from Workforce Local Spending (dollars) c/
Missouri	$11,352,000	$3,405,600	$47,622	$204,336
Illinois	$51,480,000	$15,444,000	$9,286,299	$1,235,520
Indiana	$43,296,000	$12,988,800	$7,810,016	$779,328
Ohio	$61,512,000	$18,453,600	$11,095,937	$1,291,752
Wyoming	$240,000	$72,000	$336,000	$16,800
Nebraska	$240,000	$72,000	$336,000	$16,800
Total	**$168,120,700**	**$50,436,000**	**$28,911,874**	**$3,544,536**

a/ Rockies Express estimated construction payroll by multiplying the estimated total payroll by the amount of construction that would occur in each state.
b/ Rockies Express estimated consumer use tax revenues by multiplying estimated use sales tax on average for each state by the anticipated costs of non-local materials purchased.
c/ Rockies Express estimated that the total workforce local spending is equal to 30% of total construction payroll. This amount was multiplied by the estimated sales tax rate. The sales tax rates used for calculation are 6.9% for Missouri (average from range of 4.2% to 9.6%), 7.6% for Illinois (average from range of 6.25% to 9.0%), 6% for Indiana, 6.8% for Ohio (average from range of 6.0% to 7.5%), 6% for Carbon County, Wyoming, and 6.25% for Nebraska (average from range of 5.5% to 7.0%).

As mentioned in section 4.9.2, Rockies Express anticipates hiring 20 new permanent employees to operate the proposed pipeline and compressor station facilities, which would also generate additional state and local tax revenues.

[1] The total tax revenues generated by the expenditures of non-local workers within the Project area would depend on the temporary housing type that they choose. Taxes would be paid on hotel and motel rooms, but taxes would not be paid on rent for an apartment or house. This estimate assumes that all expenditures within the Project area would generate sales tax.

Economic and fiscal impacts during Project operations would result from the property taxes paid on underground and aboveground facilities. These ad valorem taxes would vary depending on the size, type, and location of the facility. For example, tax revenues paid to localities with compressor facilities are larger than those revenues related to the pipeline because of the high capital costs of compressor facility construction. The estimated property taxes paid to each state for pipeline and major aboveground facilities are shown in table 4.9.6-2. We believe that property taxes paid on underground and aboveground facilities would have permanent, minor, and positive impacts on localities within the Project area.

Table 4.9.6-2

REX East Estimated Annual Ad Valorem Taxes (2009—2028) a/

Facility/State	Estimated Annual Ad Valorem Taxes Generated
Pipeline	
Missouri	$16,966,000
Illinois	$0 b/
Indiana	$42,555,000
Ohio	$350,057,000
Subtotal	**$409,578,000**
Major Aboveground Facilities	
Carbon County, Wyoming	$6,046,000
Phelps County, Nebraska	$6,630,000
Audrain County, Missouri	$26,402,000
Christian County, Illinois	$880,000
Putnam County, Indiana	$11,025,000
Butler County, Ohio	$106,950,000
Muskingum County, Ohio	$68,509,000
Subtotal	**$226,442,000**
Total	**$636,020,000**

a/ Ad valorem taxes are a property tax on public utility equipment. Ad valorem taxes generate revenue for the counties along the pipeline route.
b/ The state of Illinois does not tax pipeline facilities but does tax aboveground facilities.

4.9.7 Property Values

Landowners typically have the following concerns regarding potential impacts on property values: devaluation of property if encumbered by a pipeline easement; being the responsible party for property taxes within a pipeline easement; paying potential landowner insurance premiums for Project-related effects; and negative economic effects resulting from changes in land uses.

Prior to initiating construction, Rockies Express would acquire easements on private lands for both the temporary (construction) and permanent (operation) rights-of-way. The easement would provide Rockies Express the right to construct, operate, and maintain the pipeline, and establish a permanent right-of-way. In return, Rockies Express would compensate the landowners for use of the land and the temporary loss of crops or other land use. Where the pipeline route crosses public land, Rockies Express would coordinate with the managing agencies to obtain any required easements or permits.

If an easement cannot be negotiated with the landowner and a project has been certificated by the Commission, Rockies Express may use the right of eminent domain granted to it under Section 7(h) of the NGA to obtain the right-of-way and additional workspaces identified in the Certificate. Section 7(h) implies that eminent domain is a remedy of last resort, to be used "when any holder of a Certificate cannot acquire by contract, or is unable to agree with the owner of property to the compensation to be paid for, the necessary right-of-way." Under eminent domain, Rockies Express would still be required to compensate the landowner for the right-of-way and for any damages incurred during construction. However, the level of compensation would be determined by a court according to state law.

The impact that a natural gas project may have on the value of any land parcel depends on many factors, including the size of the parcel, the parcel's current value, land use, and the value of other nearby properties. However, subjective valuation is generally not considered in appraisals. This is not to say that the Project would not affect resale values. Potential purchasers may make a decision based on intended future use and, if the presence of the Project would make that use infeasible, it is possible that that potential purchaser may not acquire the parcel. However, each potential purchaser has differing criteria and means.

Landowners are responsible for all property taxes levied against parcels, and this responsibility would be independent of the existence of any Project-related pipeline easement. However, if a landowner felt that the Project, should it be constructed, reduced the value of their property, the landowner could appeal the assessment and subsequent property taxation to the local property taxation agency. If the parcel were reappraised, the landowner would then be responsible for property taxes based upon an appraisal that directly incorporated the easement.

Regarding the potential for insurance premium adjustments associated with pipeline proximity, insurance advisors consulted on other natural gas projects reviewed by the FERC have indicated that LNG terminals and associated pipeline infrastructure do not have an impact on homeowner insurance rates (FERC, 2004). As such, the FERC believes that homeowners' insurance rates are unlikely to change as a result of construction and operation of the Project facilities.

As described in section 4.8, construction and operation of the Project would result in a permanent conversion of some lands currently used for agriculture or forestry operations to a maintained, utility right-of-way. As part of the right-of-way procurement process, Rockies Express would negotiate with the affected landowners to obtain an easement agreement that would compensate the landowner for lost economic production on agricultural or forested lands. Potential impacts to these types of land are discussed further in section 4.8.

4.10 CULTURAL RESOURCES

Section 106 of the NHPA, as amended, requires the FERC to consider the effects of its undertakings (including the issuance of permits, licenses, or authorizations) on historic properties and provide ACHP an opportunity to comment. Rockies Express is assisting the FERC in meeting our obligations under Section 106 and the implementing regulations at 36 CFR 800.

4.10.1 Cultural Resource Surveys

Rockies Express conducted cultural resources surveys for the proposed facilities, including the pipeline rights-of-way, laterals, expanded work areas, pipe/contractor yards, compressor stations, meter stations, and access roads. Phase I survey reports for surveys completed to date were submitted to the FERC and SHPO of each state crossed by the Project. Cultural resources investigations included archival research, as well as archaeological and architectural surveys. In general, a corridor 200 to 250 feet wide was surveyed along the pipeline route, with block survey at aboveground facilities and yards. Various survey methods were utilized as appropriate, including pedestrian survey, shovel testing, and auguring. Deep testing was conducted at river crossings and other areas where geomorphological conditions suggested the possibility for deeply buried deposits. Historic architecture within or adjacent to the Project corridor was documented. For both archaeological and architectural resources, eligibility for listing on the NRHP was assessed. Rockies Express has not yet completed cultural resources investigations. Additional field surveys and evaluations are ongoing. A summary of the status of cultural resources surveys to date for the Project is presented in table 4.10.1-1 and described below.

Table 4.10.1-1
Cultural Resources Surveys Status as of February 12, 2008

Factor	Missouri	Illinois	Indiana	Ohio	Wyoming	Nebraska
Number of Miles Surveyed to Date	43.02	188.2	155.4	230.5	N/A	N/A
Percentage of Miles Surveyed	100%	96.5%	93.5%	98.2%	N/A	N/A
Total Acreage Surveyed to Date	1,335	5,348.4	5,847.8	6,167.6	20.0	17.7
Total Number of Archaeological Sites Identified to Date	91	440	758	584	1	0
Total Number of Aboveground Resources (Architectural) Identified to Date	2	41	99	55	0	0

N/A = not applicable

Missouri

Pipeline

Rockies Express conducted cultural resources survey of 43.02 miles (100 percent) of the Project right-of-way within Missouri. Surveys have identified 93 resources, 91 archaeological sites, and 2 historic structures. Of the 91 archaeological sites, 45 were recommended as potentially eligible for listing on the NRHP. These included 42 prehistoric sites, 1 historic site, and 2 sites with both prehistoric and historic components.

Two architectural resources were identified; one farmstead complex (AU-1), and one agricultural shed (AU-2). Both structures have been recommended as not eligible for listing on the NRHP. No cemeteries are located within or immediately adjacent to the Project right-of-way. In letters dated May 1, 2007 and August 13, 2007, Missouri SHPO concurred with the recommendations presented in the Phase I survey reports. We also concur.

Rockies Express has also completed surveys for the access roads, meter stations, laterals, and pipe/contractor staging yards. Rockies Express would complete surveys for any newly identified pipeline reroutes, access roads, or pipe/contractor staging yards once permission to survey is obtained from landowners. Survey results would be summarized in a supplemental survey report that Rockies Express would file with the FERC and submit to Missouri SHPO.

Of the 45 archaeological sites potentially eligible for the NRHP, Rockies Express has completed Phase II evaluations on 35. Rockies Express recommended that 33 sites are not eligible and two sites are eligible for the NHRP (sites 23PI365 and 23PI294). Two potentially eligible sites have been avoided by reroutes, and no further testing is required. Results of Phase II investigations are pending for one site. Additionally, for seven of the sites recommended for Phase II evaluations access has been denied. Rockies Express has submitted a Phase II evaluation report for 10 sites: 23AU1145, 23PI1313, 23PI1319, 23PI1320, 23PI1327, 23PI1328, 23PI1330, 23PI1331, 23PI1332, 23PI1333. All 10 of these sites were recommended not eligible for the NRHP. In a letter dated November 27, 2007, the Missouri SHPO concurred with these recommendations. We concur as well.

Rockies Express plans to complete testing once access has been granted. Rockies Express plans to file the results of the Phase II evaluations with the FERC in supplemental reports in April 2008. Avoidance is recommended for sites determined NRHP-eligible. If avoidance is not practicable, Rockies Express would develop plans for site treatment or mitigation at these locations in consultation with SHPO and the FERC. Therefore, **we recommend that:**

- **Rockies Express develop and file with the Secretary prior to the start of construction plans for avoidance or mitigation at sites 23PI365 and 23PI294, and documentation of SHPO comments on the plans.**

In addition, fragmentary human remains were recently recovered from one site in Missouri. Notification was made to the Missouri SHPO and the Native American tribes that requested notification. No responses from these tribes have been received to date. Because consultation is ongoing, **we recommend that:**

- **Rockies Express provide quarterly updates on the consultation among Rockies Express, the Missouri SHPO, interested Native American tribes, and the landowner concerning the human remains identified in Missouri, until the final disposition of those remains is agreed upon.**

Rockies Express would submit survey reports to Missouri SHPO and file copies with the FERC. Rockies Express would file with the FERC copies of all future correspondence with Missouri SHPO, including comments on the survey and evaluation reports. Due to the high probability of sensitive archaeological sites between MPs 38.1 and 40.75 in Missouri, **we recommend that:**

- **Rockies Express provide an archaeological monitor during construction between Missouri State Road AD and the HDD exit point for the Salt River.**

Mexico Compressor Station

The Mexico Compressor Station was previously surveyed and reported as part of the REX West Project (Docket No. CP06-354-000). As part of the REX East Project, Rockies Express re-examined a small portion (approximately 8.4 acres) of the planned construction footprint and relocated site 23AU141 during the current survey. It was determined that the site was not eligible for the NRHP, and no further work is recommended. Missouri SHPO concurred that site 23AU141 does not meet the criteria for listing on the NRHP and no additional fieldwork is necessary. We concur as well. No historic structures or cemeteries are situated within or immediately adjacent to the Mexico Compressor Station.

Federal Land–Blackburn Island, Missouri

COE manages Blackburn Island in the Mississippi River. Historic maps indicate that, in the 1870s, the Mississippi flowed against the bluff north of Louisiana, Missouri and Blackburn Island was just starting to form as a sand bar. The area is first depicted as an island on the 1903-05 map. Geomorphological testing also suggests the island is a relatively recent geologic feature. No cultural resources were found by field survey or geomorphological testing. No further work is recommended on Blackburn Island (Collins et al., 2007).

Illinois

Pipeline

Rockies Express conducted cultural resources survey of 188.2 miles (96.5 percent) of the proposed pipeline corridor in Illinois. A total of 481 resources were identified, including 440 archaeological sites and 41 historic structures. Rockies Express recommended that 59 sites are eligible or potentially eligible for listing on the NRHP. These include 43 prehistoric sites, 1 historic site, and 15 sites with both prehistoric and historic components. Five archaeological sites (four prehistoric and one site with both prehistoric and historic components) have been recommended as eligible for listing on the NRHP (11PK89, 11PK1599, 11PK1595, 11SG1344, and 11M245). Four of the 59 eligible or potentially eligible sites are prehistoric mound sites (11PK89, 11PK1245, 11PK1709, and 11PK1733). Rockies Express has developed a plan to avoid the Montezuma Mound Group (11PK1245). In a letter dated August 23, 2007, Illinois SHPO concurred that the proposed reroute would result in no adverse effect on the site. To ensure construction does not inadvertently encroach on the mound group, **we recommend that:**

- **Rockies Express provide an archaeological monitor during construction in the vicinity of the Montezuma Mound Group (11PK1245) from the exit point of the HDD west to a point of inflection at approximately MP 69.7.**

In a letter dated September 10, 2007, Illinois SHPO indicated that in accordance with Illinois law (Human Skeletal Remains Protection Act [20ILCS 3440]), the other two mound sites (11PK1709 and 11PK1733) must be avoided as well. Attempts to reroute the pipeline in this area have encountered additional archaeological sites, including another mound site (11PK89). Rockies Express is evaluating options for avoidance and reroutes in this area. Therefore, **we recommend that:**

- **Prior to the start of construction, Rockies Express file with the Secretary plans for traversing the prehistoric mound sites 11PK89, 11PK1709 and 11PK1733, including measures to avoid and/or protect the sites, and documentation of Illinois SHPO comments on the plan.**

An additional 13 sites have pending determinations but are being treated as potentially eligible at this time. Rockies Express plans to file survey reports regarding the eligibility of these sites in April 2008.

In letters dated June 15, 2007, September 7, 2007, and January 25, 2007, Illinois SHPO concurred with the findings of the Phase I survey reports for archaeology. We concur as well.

Architectural survey

Architectural survey in Illinois identified 53 architectural resources in the project area, 12 of which were eliminated from further study during the initial field survey. Evaluation of the remaining structures identified four that are eligible for the NRHP. These include a farmstead complex (PK-2) in Pike County dating from the mid-nineteenth through the mid-twentieth centuries. The Cumberland Sugar Creek Cemetery, a 19th-century-era cemetery, was identified in Sangamon County. In Edgar County, ED-16, a concrete grain elevator constructed between 1917 and 1920 was identified as significant. All three properties are located outside of the pipeline right-of-way, and construction is not expected to directly affect them. Additionally, viewshed impacts during construction would be temporary. Finally, the Sny Levee Drainage District in Pike County was found eligible for the NRHP under criteria A and C for its role in navigation, agriculture, recreation, and engineering. Although the pipeline crossing would result in an effect to the NRHP-eligible property, it would not result in an adverse effect.

Rockies Express identified a segment of the historic U.S. Route 66 that is listed on the NRHP and is located immediately adjacent to the Project in Sangamon County. The brick-and-concrete roadbed may be affected by heavy vehicle traffic associated with the Project if used as an access road. Rockies Express would limit usage of the road to light-duty vehicle traffic to minimize adverse effects.

One additional cemetery was identified in Sangamon County during architectural survey, the Zion Cemetery. The cemetery was found not eligible for the NRHP. It is located north of the proposed pipeline corridor, and would not be affected by construction.

In a letter dated January 25, 2008, Illinois SHPO concurred with the survey reports (dated March 2007, August 2007, and December 2007) that no aboveground structures would be adversely affected by this Project. We concur as well.

Rockies Express would complete surveys for any newly identified pipeline reroutes, access roads, or pipe/contractor staging yards once permission to survey is obtained from the landowner. Survey results would be summarized in supplemental reports that Rockies Express would file with the FERC and submit to the Illinois SHPO.

Of the 59 archaeological sites recommended for Phase II evaluation, 5 sites have been avoided by reroutes, and no further testing is required. Rockies Express has completed Phase II evaluations for 39 sites. Rockies Express has recommended that 11 sites are eligible for the NHRP (11PK1733, 11PK1713, 11PK1718, 11PK1599, 11PK1595, 11PK1662, 11PK1664, 11ST544, 11ST547, 11SG1344, and 11M245), and the remaining 28 have been recommended not eligible for the NRHP. Additional testing also was undertaken at site 11PK89. Results of Phase II investigations are pending for the remaining 20 sites. Three sites have been denied access for Phase II evaluations; Rockies Express plans to complete testing once access has been granted. Rockies Express has submitted Phase II evaluation reports for 11 sites. Seven of these sites were recommended not eligible for listing on the NRHP (11PK1604, 11ST511, 11ST496, 11MG411, 11MG414, 11MT249, 11EI25). Four were recommended as eligible (11PK1599, 11PK1593, 11SG1344, and 11M245). In a letter dated December 14, 2007, the Illinois SHPO concurred with those recommendations. We concur as well.

Rockies Express plans to file the results of the Phase II evaluations with the FERC in supplemental reports in April 2008 and July 2008. Avoidance is recommended for the sites determined NRHP-eligible. If avoidance is not practicable, Rockies Express would develop plans for site treatment or mitigation at these locations in consultation with SHPO and the FERC.

Rockies Express would submit any supplemental reports to Illinois SHPO and file copies with the FERC. Rockies Express would file with the FERC copies of all future correspondence with Illinois SHPO, including comments on the survey and evaluation reports.

Blue Mound Compressor Station

Rockies Express surveyed the planned construction footprint of the Blue Mound Compressor Station, plus a small buffer zone (approximately 18.3 acres). One archaeological site (11CN497) was recorded within the survey area. The site represents a dense concentration of early 20th-century industrial artifacts. Rockies Express found that the site did not meet the criteria for listing on the NRHP and recommended no additional fieldwork. Illinois SHPO concurred. We also concur.

Federal Land–Illinois

There are no federal lands in Illinois that would be crossed by the proposed pipeline.

Indiana

Pipeline

Rockies Express conducted cultural resources surveys of 155.4 miles (93.5 percent) of the Project within Indiana. A total of 857 resources have been identified, including 758 archaeological sites and 99 historic structures. Of the 758 archaeological sites, Rockies Express has recommended that 57 sites are eligible or potentially eligible for listing on the NRHP and recommended for Phase II evaluation. In letters dated May 10, 2007, September 17, 2007, and February 1, 2008, the Indiana SHPO commented on the recommendations of the Phase I survey reports. They requested an additional Phase I survey for four sites. Rockies Express plans to file survey and evaluation reports for these sites in April and July 2008.

Additionally, in their comments on the draft EIS, Indiana SHPO indicated that although site 12FR125b did not appear to be the location of the Magnesia Mound group, the area had high potential for cultural resources, and indicated that additional testing in the vicinity of the site would be needed. SHPO requested that a research plan be submitted to their office for review prior to archaeological investigations. Therefore, **we recommend that:**

- **Rockies Express submit research plans to Indiana SHPO for additional testing in the vicinity of 12FR125b, and file the reports and SHPO comments on the reports with the Secretary for review and written approval by the Director of OEP prior to the start of construction.**

Of the 57 archaeological sites recommended for Phase II, 22 are prehistoric sites, 6 are historic, and 29 have both prehistoric and historic components. One site (12FR437) was determined eligible for the NRHP after initial Phase I testing. Rockies Express completed Phase II evaluations for 31 sites. Rockies Express recommended that 21 sites are eligible for the NHRP (12DE745, 12DE772, 12DE809, 12DE811, 12DE815, 12FR310, 12FR336, 12FR343, 12FR355, 12FR360, 12FR377, 12FR394, 12FR395, 12FR398, 12FR401, 12FR403, 12HE347, 12JO536, 12MG402, 12PM362, 12VE586). Rockies Express

recommended that 20 sites are not eligible for NRHP. Three potentially eligible sites have been avoided by reroutes, and no further testing is required (12PM345, 12VE562, 12VE565). Rockies Express has submitted Phase II evaluation reports for five sites. Sites 12PM325, 12DE773, 12FR307, were recommended as not eligible for listing on the NRHP. There was insufficient data to make a determination for site 12P638, however the portion of the site within the project area did not have significant intact deposits, and no additional work was recommended. One site, 12FR310 was recommended eligible for listing on the NRHP. In a letter dated December 14, 2007, the Indiana SHPO concurred with these findings. We concur.

Results of Phase II investigations are pending for the remaining sites. Additionally, two sites have been denied access for Phase II evaluations; Rockies Express plans to complete testing once access has been granted. Rockies Express plans to file the results of the Phase II evaluations with the FERC in supplemental reports in April 2008 and July 2008. Avoidance is recommended for the sites determined NRHP-eligible. If avoidance is not practicable, Rockies Express would develop plans for site treatment or mitigation at these locations in consultation with SHPO and the FERC.

Rockies Express would submit survey reports to Indiana SHPO and file copies with the FERC. Rockies Express would file with the FERC copies of all future correspondence with the Indiana SHPO, including comments on the survey and evaluation reports.

In letters dated May 10, 2007, September 17, 2007, December 14, 2007, and February 1, 2008, the Indiana SHPO provided comments on the survey reports. The SHPO also requested additional information regarding a brick kiln site (12VE565, formerly 2-92). As a result of the Wabash reroute, site 12VE565 is now more than 1.5 miles outside the Project area. The Indiana SHPO also noted that another site (12SH12) at one time consisted of burial mounds, and requested notification of any unanticipated discoveries of human remains at that site. Therefore, **we recommend that:**

- **Rockies Express provide an archaeological monitor during construction for work in the vicinity of former mound site 12SH12 from the Van Pelt Ditch to County Road 5 25 E.**

Architectural survey

Architectural survey has been completed for Indiana. Ninety-nine architectural resources were identified. Survey of western Indiana (MP 238.2 to MP 301.1) identified 48 structures rated as contributing historical structures, but the assessment of effects, which included physical impact as well as noise and visual, found that no aboveground historical structures would be adversely affected and no further work was recommended. A separate study along the pipeline route in eastern Indiana (MP 301.1 to MP 404.7) identified 51 historic structures for evaluation of eligibility. Five properties were recommended as eligible, but it was determined that the Project would have no adverse effects on them. One potentially eligible resource could not be evaluated because access was denied to surveyors. In a letter dated January 17, 2008 Indiana SHPO asked for additional information on nine historic properties as well as on project components so they could assess potential effects to the characteristics of the properties. On January 29, 2008 some of these materials were submitted to SHPO, but it is unclear if this was all of the requested information. Therefore, **we recommend that:**

- **Rockies Express provide the Indiana SHPO the project documents requested to evaluate historic properties, and file SHPO comments on the architectural survey reports with the Secretary for review and written approval by the Director of OEP prior to construction.**

Archival research indicated that the pipeline would traverse Highway 40, the National Road, at MP 298.4 in Hendricks County. Rockies Express would bore under the road, resulting in no adverse effects to the highway. Additionally, the Project would cross a portion of the abandoned B&O Railroad, which has been converted into a hiking trail. The NRHP-eligibility for this resource has not been assessed. Because Rockies Express would bore under the trail, however, there would be no impact to the former railroad bed. No additional evaluation is required for either of these resources. Three cemeteries were identified in the vicinity of the Project right-of-way. The Lane Cemetery is located outside the Project area approximately 175 feet from the centerline. The Project would not impact this cemetery. The Brockman Cemetery, a nineteenth through twentieth-century community cemetery registered with the state, was identified adjacent to the pipeline corridor. Additionally, site 12FR332, a small historic cemetery consisting of two marked graves and two possibly unmarked graves, was identified within the Project corridor. The graves represent members of the Beeler family, and one is dated 1878. Rockies Express has made route adjustments to avoid the two cemeteries.

The Project right-of-way would cross two historic canals in Indiana: the Wabash & Erie Canal and the Whitewater Canal. The Wabash & Erie Canal is located at MP 247.6 in Park County. The canal is listed on the Indiana Register of Historic Sites and Structures. Field survey found that canal features in this location retain a high degree of integrity. Rockies Express conducted Phase II evaluations and found this section of the canal not eligible for the NRHP. Results of the Phase II testing would be submitted to SHPO and the FERC in April 2008. Ineligible sections of the canal would be impacted by the HDD stringing area and mainline pipe route. In a meeting with SHPO February 5, 2008, Rockies proposed to rebuild the canal in this area after construction. It is unclear whether these treatment procedures have been approved by SHPO. Therefore, **we recommend that:**

- **Prior to the start of construction, Rockies Express file with the Secretary for review and written approval by the Director of OEP a treatment plan for the Wabash & Erie Canal, and the Indiana SHPO comments on the plan.**

The Whitewater Canal is located at MP 394.0 in Franklin County. Although field investigation found much of the canal was destroyed by adjacent railroad construction and erosion, the towpath of the canal was intact. This portion of the canal was assessed as potentially eligible for the NRHP. Rockies Express proposes to bore beneath the towpath as well as the adjacent railroad and State Highway 52 to avoid adverse effects to this resource. In a letter of December 21, 2007 SHPO asked that the bore be at least 8 feet below the canal elements, and that they continue to be consulted on the plans. In a meeting February 5, 2008 Rockies indicated that, due to the water table in this location, they would prefer to bore between 3 and 5 feet below the canal features. SHPO has yet to provide comments. Additionally, waterbody crossing plans still show the Whitewater canal being crossed by the open-cut method. Therefore, **we recommend that:**

- **Prior to the start of construction, Rockies Express file with the Secretary for review and written approval by the Director of OEP a site-specific construction plan for a horizontal bore to cross the Whitewater Canal. The plan shall be developed in conjunction with Indiana SHPO, and shall describe how the archaeological features associated with the Whitewater Canal would be avoided.**

Rockies Express has not yet completed all Phase I cultural resources survey in Indiana. Rockies Express would complete surveys for these areas and for any newly identified pipeline reroutes, access roads, or pipe/contractor staging yards once permission to survey is obtained from the landowner. Survey results would be summarized in a supplemental report that Rockies Express would file with the FERC and submit to Indiana SHPO.

Bainbridge Compressor Station

Rockies Express surveyed the planned construction footprint of the Bainbridge Compressor Station, plus a small buffer zone (approximately 19.1 acres). No cultural resources were identified. In a letter dated May 10, 2007, Indiana SHPO concurred with the finding of the survey report. We also concur.

Federal Land–Cecil M. Harden Lake, Indiana

Phase I cultural resource survey identified no cultural resources on COE property associated with Cecil M. Harden Lake (Stevens et al., 2007). Five archaeological sites were identified near the lake area: 12PM326, 12PM325, 12PM327, 12PM328, and 12PM329. Only site 12PM325 was recommended for Phase II, and it was determined not to be eligible (Hornum et al., 2007a).

Ohio

Pipeline

Rockies Express conducted cultural resources surveys for 230.5 miles (98.2 percent) of the Project within Ohio. A total of 639 historic resources have been identified, including 584 archaeological sites and 55 historic structures. Of those 584 archaeological sites, 63 sites were found eligible or potentially eligible for listing on the NRHP and recommended for Phase II evaluation. Two of those sites, 33PE351 and 33PE362, represent portions of established NRHP-eligible sites. In letters dated May 9, 2007 and September 6, 2007, the Ohio SHPO provided comments on the survey reports. The SHPO agreed with many of the recommendations, but requested additional information for 37 sites. SHPO comments for reports submitted in December are pending. An initial assessment is pending for another 39 sites, so these sites are being treated as potentially eligible. Rockies Express plans to file survey reports regarding the eligibility of these sites in April 2008.

Of the 63 archaeological sites recommended for Phase II, 32 are prehistoric sites, 7 are historic, and 24 have both prehistoric and historic components. Rockies Express recommended that 9 sites are eligible for the NRHP (33CN433, 33FA1740, 33PE362, 33PE176, 33PE351, 33PE175, 33PE794, 33WA797, 33BU1019). Another 9 were found not eligible, and results are pending for 32 evaluations. Six sites have been avoided by reroutes, and no further testing is required. Rockies Express submitted Phase II evaluations for 10 sites in Ohio (33BU1014, 33BU1019, 33FA1737, 33FA1740, 33PE173, 33PE794, 33PI1881, 33WA795, 33WA796, 33WA803). In a letter dated February 7, 2008, the Ohio SHPO concurred that sites 33FA1740 and 33PE794 are eligible for the NRHP, while sites 33FA1737, 33PE173, are not eligible. We concur.

Rockies Express plans to file the results of the Phase II evaluations with the FERC in a supplemental report in April 2008 and July 2008. Avoidance is recommended for the sites determined NRHP-eligible. If avoidance is not practicable, Rockies Express would develop plans for site treatment or mitigation at these locations in consultation with SHPO and the FERC.

Rockies Express would file with the FERC copies of all future correspondence with the Ohio SHPO, including comments on the survey and evaluation reports.

Architectural survey

In eastern Ohio (MP 514 to MP 639.1), architectural surveys identified 13 structures for evaluation for the NRHP. Intensive survey was conducted on seven, and access was denied for eight.

One of the seven properties intensively surveyed was determined eligible, but the Project would have no adverse effects on the property. Archaeological surveys of route variations in the area identified four additional structures that should be evaluated. In western Ohio (MP 404.7 to MP 514) 30 historic properties were identified for evaluation. One was recommended as eligible, but the Project would have no adverse effect on the property. The Ohio investigations of architectural resources are not complete, because of denied access, as well as newly identified properties.

The Hunt-Forman Farm is a NRHP-listed property in Warren County, Ohio. Rockies Express proposes to cross one of the farm's fields. Access to the property for surveying has been denied by the landowner. Rockies Express has initiated a desktop review of the Hunt-Forman Farm utilizing field visits from public rights-of-way, historic maps and aerials, and archival research, including resources identified by SHPO, to better understand the architectural and cultural landscape of the property. This information would be used to aid in determining affects of the Project on the resource. Therefore, **we recommend that:**

- **Prior to the start of construction, Rockies Express file with the Secretary for review and written approval by the Director of OEP the assessment of effects of the Project on the NRHP-listed Hunt-Forman Farm and, as necessary, a treatment plan for the property, and the Ohio SHPO comments on the assessment and plan.**

A landowner in Warren County, Ohio commented in a letter that the proposed pipeline would cut through maple trees on the Wilson Friendly Farm, a family maple farm that has been in operation since the late 19th century. The Wilson Friendly Farm in Warren County (approximate milepost 458) is discussed in detail under State Structure Number WAR-1396-3 in the report by Schneider et al. (2007). The house and outbuildings were evaluated, and it was found they did not retain integrity of design and materials due to modern improvements. Therefore, the farmstead is recommended not eligible for the NRHP. Rockies Express filed the results of this investigation with Ohio SHPO and the FERC on December 21, 2007. Ohio SHPO comments on the report would be filed with the FERC when they are received.

The pipeline would parallel the NRHP-eligible "Big Inch" and "Little Big Inch" pipelines through portions of Ohio. Because these are buried pipelines and Rockies Express construction activities would be approximately 50 feet away, the proposed work would have no impact on these historic properties, and no additional resource evaluations are recommended in regard to these pipelines. Additionally, the REX East pipeline route would cross U.S. Highway 42, in Warren County, Ohio, which was constructed over the Accommodation Line, an early 19th century stagecoach route. The Project's impact on the NRHP-eligibility of the Accommodation Line has not been assessed. Because Rockies Express intends to bore under the current highway, no additional evaluation of the former stagecoach route is recommended. There are no known cemeteries within proximity of the pipeline route in Ohio.

Five historic canals would be crossed by the proposed pipeline route in Ohio; the Warren County Canal, the Miami & Erie Canal, the Ohio & Erie Canal, the Hocking Valley Canal, and the Muskingum River Improvement Canal. The Ohio SHPO considers the state canal system to be historically significant. No trace of the Warren County Canal was identified and no additional fieldwork was recommended. Rockies Express is planning to use the open-cut method of construction at this crossing. Identification-phase cultural resources surveys were conducted at the proposed crossings of the other four historic canals. Survey found that the embankments, towpath, and prism of the Miami & Erie Canal at MP 430.8 in Butler County were largely intact. The Ohio & Erie Canal is a National Heritage Corridor. The survey indicated that the canal prism at the Ohio & Erie Canal at MP 516.0 in Pickaway County was intact. At the Hocking Valley Canal at MP 534.1 in Fairfield County, both the canal prism and towpath were reported as intact. The Muskingum River Improvement Canal, located at MP 575.6 in Muskingham

County, was listed on the NRHP as the Muskingum River Navigation Historic District in February 2007. Field investigations found no traces of the canal in the area of the proposed crossing, although the canal prism was observed north and south of the crossing location. The canal has likely eroded into the river at the location of the proposed pipeline crossing. Rockies Express is planning to cross beneath each of these canals using the HDD method, thereby avoiding adverse effects to the structural and visual integrity of these properties. In a letter dated September 6, 2007, Ohio SHPO concurred with the findings and recommendations for these historic canals. We also concur.

Rockies Express has not yet completed all Phase I cultural resources surveys in Ohio. Rockies Express would complete surveys for these areas and for any newly identified pipeline reroutes, access roads, or pipe/contractor staging yards once permission to survey is obtained from the landowner. Survey results would be summarized in a supplemental report that Rockies Express would file with the FERC and submit to Ohio SHPO.

Hamilton Compressor Station

Rockies Express surveyed the area for the proposed Hamilton Compressor Station. Verbal testimony at the Technical Conference February 20, 2008 indicated that no cultural resources were identified at this location. Rockies anticipates submitting reports to the FERC and SHPO in April 2008.

Chandlersville Compressor Station

Rockies Express surveyed an area of approximately 23.5 acres that included the proposed Chandlersville Compressor Station and a proposed access road. No cultural resources were identified. In a letter dated September 6, 2007, SHPO concurred with the recommendations of the survey report. We concur as well.

Federal Land–Deer Creek Lake State Park, Ohio

Deer Creek Lake State Park is owned by COE's Huntington District. Phase I survey of the proposed mainline route through Deer Creek Lake State park identified three archaeological sites in the Fayette County portion of the park: sites 33FE261, 33FE262, and 33FE263 (Hornum et al., 2007b). In agreement with the COE field methodology, no artifacts were collected; instead they were examined in the field and left in place. Site 33FE261 consisted of two stone flakes recovered from the plow-zone and is interpreted as a short-term lithic reduction site with no diagnostic characteristics. No further work is recommended at the location. Site 33FE262 consisted of one stone flake and eight fragments of prehistoric grit-tempered pottery. The recovery of prehistoric pottery suggests the site may have research potential, and additional testing was recommended. Site 33FE263 consisted of 11 pieces of stone debitage recovered from the plow-zone, with no temporal diagnostic characteristics. No further work was recommended. Subsequent delineation of site 33FE262 identified the site as a small Woodland period settlement, based on projectile point fragments, but found the site was largely destroyed and recommended it as not eligible for the NRHP (Schneider et al., 2007).

Additional survey identified site 33FE292 within the stringing area of the proposed HDD crossing for Deer Creek (Schneider et al., 2007). The site consisted of one chert flake and a slate celt fragment, both found in the plow zone. No further work was recommended.

Two sites were identified during survey of one of the access roads at Deer Creek: sites 33FE293 and 33FE294. Site 33FE293 is a possible school building remnant with 198 historic artifacts. Historic maps from the late nineteenth century suggest architectural remains are from a school or church, but the

artifacts identified are from the twentieth century. The site extends beyond the area of potential effects, and the eligibility of the site as a whole was not made. Therefore, **we recommend that:**

- **Rockies Express provide documentation/alignment sheets showing how site 33FE293 would be avoided or would conduct Phase II evaluation testing. Rockies Express should file with the Secretary for review and written approval by the Director of OEP the Phase II report and the Ohio SHPO comments on the report, prior to the start of construction.**

One archaeological site was identified on the Pickaway side of Deer Creek Lake State Park. Site 33PI556 was identified at a bend in the proposed mainline right-of-way. The site consisted of 21 historic artifacts, and maps suggest they are associated with a former building in this location. Very little was identified within the pipeline area of potential effects, and no further work was recommended for the site. A letter report on the cultural resources work at Deer Creek was submitted to COE on May 3, 2007 (Hornum, 2007).

Federal Land–Caesar Creek, Ohio

The Louisville District of COE oversees Caesar Creek Dam. Survey of the Caesar Creek mainline route identified no cultural resources (Hornum, et al., 2007b; Schneider, et al., 2007). A letter report on cultural resources investigations at Caesar creek was submitted to the COE on September 7, 2007 (Schneider 2007).

Wyoming

Arlington Compressor Station

The Arlington Compressor Station was previously surveyed for the REX Entrega Project (Docket No. CP04-413-000). One isolated prehistoric artifact was identified, and assessed not eligible for NRHP listing. Rockies Express filed the relevant sections of that survey report, and Wyoming SHPO's concurrence dated August 9, 2005 with that report, in a supplemental filing. We concur that no historic properties would be affected by this component of the Project.

Nebraska

Bertrand Compressor Station

The Bertrand Compressor Station was previously surveyed for the REX West project (Docket No. CP06-354-000). No cultural resources were identified and no further work was recommended for the area. Rockies Express filed the relevant sections of that survey report, and the Nebraska SHPO concurrence with the report dated July 14, 2006, in a supplemental filing. We concur as well.

4.10.2 Native American Consultations

We sent our NOI for the Project, issued August 16, 2006, to 31 Indian tribes and Native American groups. Rockies Express sent consultation letters regarding the Project to 43 Indian tribes and Native American groups who either historically occupied the Project area or who might attach religious or cultural significance to sites in the region (table 4.10.2-1). Second and third attempts were made to contact tribes who did not respond to the initial mailing. A total of 22 tribes responded to the Rockies Express contact program. Two tribes, the Iowa Tribe of Kansas and Nebraska and the Wea Indian Tribe,

Table 4.10.2-1 Tribal Consultations		
Tribe	**Response**	**Comment**
Kickapoo Tribe of Kansas	No	No response
Kickapoo Tribe of Oklahoma	Yes	Notify if items falling under NAGPRA are discovered
Kickapoo Traditional Tribe of Texas	Yes	Declined to participate
Sac & Fox Tribe of the Mississippi in Iowa	Yes	Notify if items falling under NAGPRA are discovered
Sac & Fox Nation of Missouri in Kansas and Nebraska	Yes	Notify if items falling under NAGPRA are discovered
Sac & Fox Nation of Oklahoma	Yes	Notify if items falling under NAGPRA are discovered
Iowa Tribe of Kansas and Nebraska	Yes	Wishes to participate in consultation
Iowa Tribe of Oklahoma	No	No response
Peoria Tribe of Oklahoma	Yes	Notify if items falling under NAGPRA are discovered
Prairie Band of Potawatomi Indians	Yes	Notify if items falling under NAGPRA are discovered
Forest County Potawatomi Community of Missouri	No	No response
Gun Lake Potawatomi	No	No response
Huron Potawatomi Nation	No	No response
Pokagon Band of Potawatomi Indians of Michigan	Yes	Notify if items falling under NAGPRA are discovered
Citizen Potawatomi Nation	Yes	Notify if items falling under NAGPRA are discovered
Wea Indian Tribe	Yes	Wishes to participate in consultation
Delaware Tribe of Western Oklahoma	Yes	Notify if items falling under NAGPRA are discovered
Miami Tribe of Oklahoma	Yes	Notify if items falling under NAGPRA are discovered
Miami Nation of Indians of Indiana Council	No	No response
Eastern Shawnee Tribe of Oklahoma	Yes	Notify if items falling under NAGPRA are discovered
Loyal Shawnee Tribe	No	No response
Shawnee Nation United Remnant Band	Yes	Expressed interest, but has not provided further detail
Absentee-Shawnee Tribe of Oklahoma	Yes	Notify if items falling under NAGPRA are discovered
Turtle Mountain Band of Chippewa Indians	No	No response
Ottawa Tribe of Oklahoma	Yes	Declined to participate
Seneca Nation of Indians	Yes	Declined to participate
Seneca-Cayuga Tribe of Oklahoma	Yes	Expressed interest, but has not provided further detail
Cayuga Nation	No	No response
The Eastern Band of Cherokee Indians	Yes	Declined to participate
Tallige Cherokee Nation	Yes	Expressed interest, but has not provided further detail
Wyandotte Nation	Yes	Notify if items falling under NAGPRA are discovered
Northern Ute Indian Tribe	No	Contacted September 2007
Eastern Shoshone Tribe	No	Contacted September 2007
Northern Arapahoe Tribe	No	Contacted September 2007
Northern Cheyenne Tribe	No	Contacted September 2007
Kiowa Indian Tribe of Oklahoma	No	Contacted September 2007

Table 4.10.2-1 (continued) Tribal Consultations		
Tribe	**Response**	**Comment**
Comanche Nation	No	Contacted September 2007
Oglala Sioux Tribal Council	No	Contacted September 2007
Rosebud Sioux Tribal Council	No	Contacted September 2007
Crow Tribal Council	No	Contacted September 2007
Pawnee Nation of Oklahoma	No	Contacted September 2007
Cheyenne-Arapahoe Tribes of Oklahoma	No	Contacted September 2007
Plains Apache Tribe of Oklahoma	No	Contacted September 2007

NAGPRA = Native American Graves Protection and Repatriation Act

wished to participate in the consultation process. Three tribes expressed interest in parts of the Project, but have not responded to further inquiries. These include the Shawnee Nation United Remnant Band, Seneca-Cayuga Tribe of Oklahoma, and the Tallige Cherokee Nation. Seventeen tribes either declined to participate in the process or asked only to be notified if human remains or associated burial items were encountered during construction. The remaining 21 tribes have not yet responded.

Rockies Express sent copies of survey reports completed as of April 2007 to the Wea Indian Tribe and the Iowa Tribe of Kansas and Nebraska on April 10, 2007, at their request. To date, neither tribe has responded with comments on the reports. Rockies Express would file with the FERC copies of any future correspondence with the Indian tribes and Native American groups, including any comments on the survey reports.

On January 11, 2008, notification that human remains had been recovered from a site in Missouri was sent to 15 tribes with historical ties to the region. No responses have been received to date.

4.10.3 Comments from Other Interested Parties

The following comments were received prior to issuance of the draft EIS. Subsequent comments have been addressed in appendix K.

The City of Springfield voiced concerns about cultural resources on property associated with the Hunter Lake Water Reservoir Project in Sangamon County, Illinois. Similar concerns were raised by the Regulatory Affairs Manager for Public Utilities. The Hunter Lake Water Reservoir Project encompasses discontinuous tracts between MPs 123.1 and 124.5, MPs 125.7 and 126.2, MPs 127.1 and 127.2, and MPs 127.5 and 127.8. These areas were surveyed and three sites were recorded (11SG1343, 11SG1333, and 11SG1342), with none recommended as eligible for the NRHP.

The Decatur County Freedom Trails Association expressed concern about "Underground Railroad" sites in Decatur County, Indiana. As described by the Decatur County Freedom Trails Association, the Underground Railroad operated in the area. A public comment received also expressed concern that the proposed pipeline route would cross the National Freedom Trail historical site and archaeological study area. Surveys of the pipeline route in this area recorded no evidence of Underground Railroad activities; archaeological survey identified no historic sites. Three prehistoric sites

in the area, 12DE694, 12DE701, and 12DE713, were recommended for further testing to determine eligibility. Results of additional testing would be filed with the FERC when they become available.

A landowner of a parcel situated in Johnson County, Indiana between MPs 336.9 and 337.4 expressed concerns about the effects of the Project on historic properties. The landowner's concerns have been addressed. A cultural resource survey has been completed on the site, and while two cultural sites were identified, they were determined not eligible for listing on the NRHP. Similarly, a landowner voiced concerns about potential impacts on cultural resources on his property between MPs 358.4 and 358.8 in Decatur County, Indiana. The landowner, however, has denied access for cultural resource surveys. Rockies Express continues to work with the landowner to address the concerns about historic properties. The results would be filed in a supplemental report as soon as they are completed.

A landowner voiced concerns about potential impacts on cultural resources and a graveyard on the property at MP 376.4 in Franklin County, Indiana. The landowner, however, has denied access for cultural resource surveys. Rockies Express would continue to work with the landowner to address the concerns about historic properties. The results would be filed in a supplemental report as soon as they are completed.

A landowner in Franklin County, Indiana near MP 393.7 expressed concern over a cemetery and artifacts on the property. Rockies Express surveyed the area and found two sites. Site 12FR336 is a multi-component prehistoric/historic site found not eligible for the NRHP. Site 12FR125b is a high potential area and will receive additional testing, as discussed above. No historic cemetery was identified by the survey.

A resident of Decatur County, Indiana expressed concern over Native American burials on his properties. The landowner, however, has denied access for cultural resource surveys. Rockies Express would continue to work with the landowner to address the concerns about historic properties. The results would be filed in a supplemental report as soon as they are completed.

In a letter to the FERC, the landowner of a parcel in Warren County, Ohio between MPs 441.8 and 442.5 expressed concern about the effects of the Project on the NRHP-listed Hunt-Forman farm. The landowner initially denied access for cultural resource surveys, and the effects on the historic property were not assessed. Rockies Express would continue to work with the landowner to assess the impacts, and if necessary, to develop any necessary avoidance or treatment plans. The results would be filed in a supplemental report. Additional comments from this landowner are addressed in appendix K.

NPS expressed concern about potential impacts on several federally designated Wild and Scenic Rivers, National Natural Landmark properties, and National Historic Landmarks. The REX East Project does not affect any of the identified National Natural Landmark properties or National Historic Landmarks; however, the Project would cross the Little Miami River and the Big Darby Creek, both Wild and Scenic Rivers. Two archaeological sites were identified at the Little Miami River crossing. Neither site is eligible for the NRHP, and no additional testing is recommended. At the Big Darby crossing, site 33PI931 was identified on the eastern bank, but was also determined not eligible for the NRHP.

A landowner of property situated in Perry County, Ohio between MPs 554.6 and 555.4 voiced concerns about the effects of the Project on historic properties and natural geologic resources. The cultural resources survey for this area has been completed and three archaeological sites were identified. Two of these sites are potentially eligible for the NRHP and additional testing is recommended; the third site is not eligible for the NRHP. Rockies Express has modified the right-of-way since the fieldwork was completed to avoid this location. Rockies Express would complete the survey of the final route and provide the results of that investigation in a supplemental report.

4.10.4 Unanticipated Discovery Plans

Rockies Express has developed state-specific Unanticipated Discovery Plans for the Project specifying procedures for the handling of unanticipated discoveries of cultural material or human remains found during construction. Each state-specific plan has been submitted to the respective SHPO for review. On May 14, 2007, Ohio SHPO concurred with the Ohio Unanticipated Discovery Plan. Indiana and Missouri SHPOs concurred with revised state-specific discovery plans on May 21, 2007 and May 24, 2007, respectively. The Illinois SHPO concurred with the Illinois plan on June 18, 2007.

In Wyoming and Nebraska, Rockies Express submitted Unanticipated Discovery Plans that it developed for previous undertakings. In a letter dated August 9, 2005, Wyoming SHPO concurred with the Wyoming plan developed for the REX Entrega Project (Docket No. CP04-413-000) for construction of the proposed Arlington Compressor Station. In a letter dated March 29, 2006, Nebraska SHPO concurred with the Nebraska plan prepared for its REX West Project for construction of the proposed Bertrand Compressor Station (Docket No. CP06-354-000). These plans were updated for the REX East Project and submitted to the respective SHPOs. No additional comments have been received to date.

4.10.5 Impact and Mitigation

Construction and operation of the pipeline and associated facilities could affect historic properties. Project impacts could be direct or indirect. Direct impacts could include the physical destruction or damage to all or a portion of a site, or alteration or removal of a property. Indirect impacts could include the introduction of visual, atmospheric, or audible elements that would diminish the integrity of the site or alter settings associated with historic properties.

Mitigation measures may range from data recovery, including the scientific excavation of archaeological sites; to detailed documentation, including architectural drawings of historic buildings; to the use of landscaping techniques to screen visual intrusions and maintain site settings.

Because survey and evaluation is ongoing, the FERC has yet to determine whether any historic properties would be adversely affected. However, Rockies Express would be required to provide plans indicating how impacts on historic properties would be mitigated. The plans would be reviewed and approved by SHPO(s) and the FERC. Implementation of the plans would occur only after the FERC issues any certificate for the Project and provides written notification to proceed.

4.10.6 Compliance with the NHPA

Compliance with Section 106 of the NHPA has not been completed for the Project. Survey and evaluation is ongoing. If any property listed on, or determined eligible for listing on, the NRHP would be adversely affected by the Project, the FERC would consult the SHPOs, and other parties, as appropriate, to resolve adverse effects, and would afford the ACHP opportunity to participate in accordance with 36 CFR 800.6(a)(1). Rockies Express would be required to produce site-specific treatment plans for the mitigation of unavoidable adverse effects to historic properties. These treatment plans would be reviewed and approved by the appropriate parties. Specified treatment measures would be implemented only after the Commission issues any order authorizing the Project. The FERC would ensure that treatment is carried out before construction is allowed in any given area.

To ensure that the FERC's responsibilities under the NHPA and its implementing regulations are met, **we recommend that:**

- **Rockies Express defer construction and use of facilities, staging, storage, temporary work areas, and new or to-be-improved access roads until:**

  a. **Rockies Express files with the Secretary all additional required cultural resource inventory and evaluation reports, avoidance or treatment plans, and any additional information that SHPOs have requested;**

  b. **Rockies Express files with the Secretary copies of the appropriate SHPO comments on all reports and plans;**

  c. **The ACHP has been provided an opportunity to comment on whether any historic properties would be adversely affected; and**

  d. **The Director of OEP reviews and approves all reports and plans and notifies Rockies Express in writing that it may proceed with treatment or construction.**

  All material filed with the Commission containing location, character, and ownership information about cultural resources must have the cover and any relevant pages therein clearly labeled in bold lettering: "CONTAINS PRIVILEGED INFORMATION—DO NOT RELEASE."

4.11 AIR QUALITY AND NOISE

4.11.1 Air Quality

Air quality would be affected by construction and operation of the Project. Though air emissions would be generated by operation of equipment during construction of the pipeline and aboveground facilities proposed by Rockies Express, most air emissions associated with the Project would result from the long-term operation of the compressor stations.

The REX East Project would consist of the installation of approximately 639.1 miles of new natural gas pipeline, construction of five new compressor stations along the new REX East Project pipeline route, construction of one new compressor station located along the REX West Project pipeline route, and construction of one new compressor station located along the REX Entrega pipeline route. The construction of the Project's facilities would impact six states: Illinois, Indiana, Missouri, Nebraska, Ohio, and Wyoming. Table 4.11.1-1 identifies each of the proposed compressor stations.

Table 4.11.1-1
REX East Proposed Compressor Stations

Pipeline Route	Compressor Station	Location	Total Horsepower
REX West	Arlington	MP 237.0, Carbon County, Wyoming	19,794
REX Entrega	Bertrand	MP 286.8, Phelps County, Nebraska	34,210
REX East	Mexico	MP 0.0, Audrain County, Missouri	41,000
REX East	Blue Mound	MP 144.1, Christian County, Illinois	35,174
REX East	Bainbridge	MP 277.3, Putnam County, Indiana	41,000
REX East	Hamilton	MP 437.3, Warren County, Ohio	35,000
REX East	Chandlersville	MP 575.0, Muskingum County, Ohio	19,538

Rockies Express proposes to construct the Arlington Compressor Station near Arlington in Carbon County, Wyoming; the Bertrand Compressor Station near Loomis in Phelps County, Nebraska; the Mexico Compressor Station near Mexico in Audrain County, Missouri; the Blue Mound Compressor Station near Blue Mound in Christian County, Illinois; the Bainbridge Compressor Station near Bainbridge in Putnam County, Indiana; the Hamilton Compressor Station near Hamilton in Warren County, Ohio; and the Chandlersville Compressor Station near Chandlersville in Muskingum County, Ohio.

At the Arlington Compressor Station, Rockies Express proposes to install three Caterpillar 16CM34 natural-gas fired reciprocating engines rated at 6,598 hp each, totaling 19,794 hp, one 820-kilowatt (kW) natural-gas fired emergency generator, one 0.75-million British thermal units per hour (MMBtu/hr) natural-gas fired fuel gas heater, and five storage tanks. Rockies Express has completed the air dispersion modeling portion of the permit application for the Arlington Compressor Station.

At the Bertrand Compressor Station, Rockies Express proposes to install two Caterpillar 12CM34 and three Caterpillar 16CM34 natural-gas fired reciprocating engines rated at 5,699 hp and 7,604 hp, respectively, totaling 34,210 hp. Rockies Express also proposes to install a 1,246-hp natural-gas fired emergency generator, one 0.75-MMBtu/hr natural-gas fired fuel gas heater, and five storage tanks.

At the Mexico Compressor Station, Rockies Express proposes to install two Solar Titan 130 gas turbines rated at 20,500 hp each, totaling 41,000 hp, a 566-hp natural-gas fired emergency generator, one 0.75-MMBtu/hr natural-gas fired fuel gas heater and two storage tanks.

At the Blue Mound Compressor Station, Rockies Express proposes to install two Caterpillar 12CM34 and three Caterpillar 16CM34 natural-gas fired reciprocating engines rated at 5,860 hp and 7,818 hp respectively, totaling 35,174 hp. Rockies Express also proposes to install a 1,246-hp natural-gas fired emergency generator, one 0.75-MMBtu/hr natural-gas fired fuel gas heater, and five storage tanks.

At the Bainbridge Compressor Station, Rockies Express proposes to install two Solar Titan 130 gas turbines rated at 20,500 hp each, totaling 41,000 hp, a 566-hp natural-gas fired emergency generator, one 0.75-MMBtu/hr natural-gas fired fuel gas heater and two storage tanks.

At the Hamilton Compressor Station, Rockies Express proposes to install two electric driven centrifugals rated at 17,500 hp each, totaling 35,000 hp, a 355-hp diesel fired emergency generator, and one 0.75-MMBtu/hr natural-gas fired fuel gas heater. Since the proposed Hamilton Compressor Station would have electric, motor-driven compressor units, the station would only have short-term, construction-related air quality emissions, and very small, long-term operational air quality impacts associated with the operation of the heater and generator.

At the Chandlersville Compressor Station, Rockies Express proposes to install two Caterpillar 12CM34 and one Caterpillar 16CM34 natural-gas fired reciprocating engines rated at 5,860 hp and 7,818 hp respectively, totaling 19,538 hp. Rockies Express also proposes to install an 880-hp natural-gas fired emergency generator, and one 0.75-MMBtu/hr natural-gas fired fuel gas heater, and five storage tanks. Rockies Express has completed the air permit application for the Chandlersville Compressor Station. Information contained in their air permit application, including the number of storage tanks and the final compressor station power rating and their associated emissions is necessary for verification of the air quality analysis.

Rockies Express has filed the necessary applications for air quality construction permits as described in section 1. In general these permits may require that air dispersion modeling be conducted for each compressor station. Each station would be required to comply with the federal, state, and local air quality permitting requirements.

Existing Air Quality

The REX East Project would involve the construction and operation of a 639.1-mile-long natural gas pipeline that would cross 34 counties in four states: Illinois, Indiana, Missouri, and Ohio. These include: Pike, Scott, Morgan, Sangamon, Christian, Macon, Moultrie, Douglas, and Edgar Counties in Illinois; Vermillion, Parke, Putnam, Hendricks, Morgan, Johnson, Shelby, Decatur and Franklin Counties in Indiana; Audrain, Ralls and Pike Counties in Missouri; and Butler, Warren, Clinton, Greene, Fayette, Pickaway, Fairfield, Perry, Muskingum, Guernsey, Noble, Belmont and Monroe Counties in Ohio. Five of the seven compressor facilities would be constructed along the proposed REX East pipeline route, while the two other compressor stations would be constructed in Carbon County, Wyoming and in Phelps County, Nebraska (for a total of 36 counties). The regional climate along the Project is continental with frequent precipitation; however the Arlington Compressor Station in Wyoming is located in a more semi-arid climate and is considerably drier and cooler. Representative annual average maximum temperature, minimum temperature, precipitation, and snowfall for each compressor station are presented in table 4.11.1-2.

Table 4.11.1-2

Representative Annual Average Meteorological Conditions at REX East Compressor Station Sites a/

Station	Meteorological Monitor Location	Maximum Temperature (°F)	Minimum Temperature (°F)	Precipitation (inches)	Total Snowfall (inches)
Arlington	Rawlins, Wyoming b/	55	30	9.0	51.9
Bertrand	Holdrege, Nebraska c/	63	39	25.2	29.3
Mexico	Mexico, Missouri c/	65	42	39.6	20.2
Blue Mound	Decatur, Illinois d/	64	42	39.7	21.9
Bainbridge	Greencastle, Indiana d/	62	43	44.2	27.0
Hamilton	Middletown, Ohio d/	62	44	39.7	12.4
Chandlersville	Zanesville, Ohio d/	63	40	36.7	23.5

a/ High Plains Regional Climate Center, 2007a;b; Midwestern Regional Climate Center, 2007.
b/ Based on 56 years (1951–2006).
c/ Based on 59 years (1948–2006).
d/ Based on 30 years (1971–2000).
°F = Degrees Fahrenheit

The CAA designates six pollutants as criteria pollutants for which the National Ambient Air Quality Standards (NAAQS) are promulgated: carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter based on a particle size of 10 microns or less (PM_{10}) and a particle size of 2.5 microns or less ($PM_{2.5}$), nitrogen dioxide (NO_2), ozone (O_3), and lead (Pb). NAAQS were developed to protect human health (primary standards) and public welfare (secondary standards). Individual state air quality standards cannot be less stringent than the NAAQS. All states the Project crosses have adopted the NAAQS, as defined in 40 CFR 50 except for Wyoming. Wyoming has standards that differ from the federal standards for SO_2. Table 4.11.1-3 lists the NAAQS and Wyoming's ambient air quality standards for the criteria pollutants.

Air Quality Control Regions and Attainment Status

The Air Quality Control Regions (AQCRs) were established in accordance with Section 107 of the CAA as a means to implement the CAA and to comply with the NAAQS through State Implementation Plans (SIPs). The AQCRs are intra- and interstate regions such as large metropolitan areas where the improvement of the air quality in one portion of the AQCR requires emission reductions throughout the AQCR. Each AQCR, or portion thereof, is designated as attainment (areas in compliance with the NAAQS), unclassifiable, maintenance, or non-attainment (areas not in compliance with the NAAQS). Areas where the ambient air pollutant concentration is determined to be below the applicable ambient air quality standard are designated attainment. Areas where no data are available are designated unclassifiable. Unclassifiable areas are treated as attainment areas for the purpose of permitting a stationary source of pollution. Areas where the ambient air concentration is greater than the applicable ambient air quality standard are designated non-attainment. Areas that have been designated non-attainment but have since demonstrated compliance with ambient air quality standard(s) are designated maintenance for that pollutant. For permitting of stationary sources, maintenance areas are treated similarly to attainment areas. However, the state's approved maintenance plan may contain specific provisions for the permitting of stationary sources to ensure that the air quality in the area would continue to comply with the NAAQS.

Table 4.11.1-3

Federal and State Ambient Air Quality Standards

Pollutant	Averaging Period	NAAQS	WAAQS a/	All Other States b/
CO	1-Hour c/	35 ppm (40,000 μg/m^3)	40,000 μg/m^3	40,000 μg/m^3
	8-Hour c/	15 ppm (10,000 μg/m^3)	10,000 μg/m^3	10,000 μg/m^3
SO_2	3-Hour c/	0.5 ppm (1,300 μg/m^3)	1,300 μg/m^3	1,300 μg/m^3
	24-Hour c/	0.14 ppm (365 μg/m^3)	260 μg/m^3	365 μg/m^3
	Annual d/	0.03 ppm (80 μg/m^3)	60 μg/m^3	80 μg/m^3
PM_{10}	24-Hour c/	150 μg/m^3	150 μg/m^3	150 μg/m^3
	Annual d/	None	50 μg/m^3	50 μg/m^3
$PM_{2.5}$	24-Hour e/	35 μg/m^3	Not Applicable	35 μg/m^3
	Annual f/	15 μg/m^3	15 μg/m^3	15 μg/m^3
NO_2	Annual d/	0.053 ppm (100 μg/m^3)	100 μg/m^3	0.053 ppm
O_3	8-Hour g/	0.08 ppm (157 μg/m^3)	0.08 ppm	0.08 ppm
Pb	3-Month d/	1.5 μg/m^3	1.5 μg/m^3	1.5 μg/m^3

a/ Wyoming Ambient Air Quality Standards.
b/ Nebraska, Missouri, Illinois, Indiana and Ohio.
c/ Not to be exceeded more than once per year.
d/ Arithmetic mean not to exceed.
e/ The 3-year average of the 98th percentile of 24-hour concentrations must not exceed.
f/ The 3-year average of the annual arithmetic mean concentrations from a single or multiple local monitors must not exceed.
g/ The 3-year average of the 4th highest daily maximum 8-hour average concentrations at each location over a year must not exceed ppm parts per million.
μg/m^3 micrograms per cubic meter.
( ) value in parentheses is an approximate equivalent concentration.

The compressor stations for the Project would all be located in attainment areas for all criteria pollutants with the exception of the Hamilton Compressor Station. The Hamilton Compressor Station would be located in Warren County, Ohio, which is currently designated as non-attainment for both O_3 and $PM_{2.5}$. The pipeline portion of the Project would cross multiple non-attainment counties. Hendricks, Morgan, and Johnson Counties in Indiana and Warren and Fairfield Counties in Ohio are currently designated non-attainment for both O_3 and $PM_{2.5}$. Shelby County, Indiana and Clinton County, Ohio are designated non-attainment for O_3. Greene and Belmont Counties, Ohio are currently designated as maintenance for O_3 and non-attainment for $PM_{2.5}$. All other Project counties are classified as attainment for all pollutants.

Air Quality Monitoring

EPA and state and local agencies have established a network of ambient air quality monitoring stations to measure and track the background concentrations of the criteria pollutants across the United States. To characterize the background air quality in the regions surrounding the proposed compressor stations, data from a number of existing representative air quality monitoring stations were obtained. These monitoring stations are located near the proposed compressor station sites and provide information on regional ambient air quality conditions. For some criteria pollutants, ambient air quality monitoring

data in the vicinity of the proposed compressor stations were not available; therefore, the best available data were used to represent the air quality at those stations. A summary of the regional background air quality concentrations for each natural-gas fired compressor station is presented in tables 4.11.1-4 and 4.11.1-5.

Regulatory Requirements

Federal Regulations

The CAA, 42 US Code 7401 et seq. as amended in 1977 and 1990, and 40 CFR Parts 50 through 99 are the basic federal statutes governing air pollution. The provisions of the CAA that are potentially relevant to the Project include the following:

- New Source Review (NSR)/Prevention of Significant Deterioration (PSD);
- New Source Performance Standards (NSPS);
- National Emission Standards for Hazardous Air Pollutants (NESHAP);
- Title V Operating Permits; and
- General Conformity.

New Source Review/Prevention of Significant Deterioration

NSR refers to the preconstruction permitting programs under Parts C and D of the CAA that must be satisfied before construction can begin on new major sources or major modifications to existing major sources located in attainment or unclassified areas. This review may include a PSD review. This review process is intended to keep new air emission sources from causing existing air quality to deteriorate beyond acceptable levels codified in the federal regulations. For sources located in non-attainment areas the Non-attainment New Source Review (NNSR) program is implemented for the pollutants for which the area is classified as non-attainment. The Arlington, Bertrand, Mexico, Blue Mound, Bainbridge, and Chandlersville Compressor Stations would be located in attainment areas and would potentially be subject to PSD review. The Hamilton Compressor Station would be located in a non-attainment area and would potentially be subject to NNSR.

The PSD review regulations apply to proposed new major sources or major modifications to existing major sources located in an attainment area. The PSD regulations (40 CFR 52.21) define a "major source" as any source type belonging to a list of named source categories that emit or have the potential to emit 100 tons per year (tpy) or more of any regulated pollutant. A major source under PSD can also be defined as any source not on the list of named source categories with the potential to emit such pollutants in amounts equal to or greater than 250 tpy. Modifications to existing major sources have lower emission thresholds, called "significant emission increases;" amounts over these thresholds trigger PSD review. The REX East Project would not include facilities or operations included on the list of named source categories to which the 100-tpy trigger applies. Also, the REX East Project does not include any existing major sources under the PSD program; therefore the Arlington, Bertrand, Mexico, Blue Mound, Bainbridge, and Chandlersville Compressor Stations are all subject to the 250-tpy threshold.

The PSD review evaluates existing ambient air quality and the potential impacts of the proposed source on ambient air quality (noting in particular whether the source would contribute to a violation of the NAAQS), and reviews the Best Available Control Technology in order to minimize emissions. The PSD regulations contain restrictions on the degree of ambient air quality deterioration that would be allowed. These increments for criteria pollutants are based on the PSD review classification of the area.

Table 4.11.1-4

REX East Regional Background Air Quality Concentrations a/

Station	CO (ppm)		SO_2 (ppm)			PM_{10} ($\mu g/m^3$)		$PM_{2.5}$ ($\mu g/m^3$)		NO_2 (ppm)	O_3 (ppm)
	1-Hour	8-Hour	3-Hour	24-Hour	Annual	24-Hour	Annual	24-Hour	Annual	Annual	8-Hour
Arlington	4.3	3.0	0.025	0.006	0.002	61	26	17	3.9	0.005	0.068
Bertrand	5.4	3.1	0.128	0.049	0.003	86	36	23	8.3	0.017	0.104
Mexico	4.7	3.0	0.025	0.011	0.002	35	17	37	12.9	0.009	0.080
Blue Mound	4.3	1.5	0.039	0.020	0.004	48	22	42	14.5	0.016	0.075
Bainbridge	3.1	2.7	0.081	0.022	0.005	59	23	53	19.1	0.013	0.081
Hamilton	5.7	2.5	0.072	0.031	0.007	56	27	54	17.9	0.021	0.098
Chandlersville	4.4	2.6	0.276	0.071	0.008	85	35	33	13.3	0.022	0.090

a/ EPA, 2007a. Data are based on the years 2004 through 2006. Concentrations for averaging periods of 1-hour, 3-hour, 8-hour and 24-hour are based on second highest concentration over the entire 3-year period.

ppm = parts per million

$\mu g/m^3$ = micrograms per cubic meter

Table 4.11.1-5

REX East Source of Regional Background Air Quality Concentrations a/

Station	CO (ppm) 1-Hour and 8-Hour	SO_2 (ppm) 3-Hour, 24-Hour, and Annual	PM_{10} (µg/m^3) 24-Hour and Annual	$PM_{2.5}$ (µg/m^3) 24-Hour and Annual	NO_2 (ppm) Annual	O_3 (ppm) 8-Hour
Arlington	Ft. Collins, CO Site ID 0806991004	Riverton, WY Site ID 560136001	Laramie, WY Site ID 560010801	Antelope Site 3, WY Site ID 560090819	Antelope Site 3, WY Site ID 560090819	15 miles SSW of Gillette, WY Site ID 560050456
Bertrand	Lincoln, NE Site ID 311090018	Omaha, NE Site ID 310550053	Cozad, NE Site ID 310470001	Grand Island, NE Site ID 310790004	Kansas City, KS Site ID 202090021	Kansas City, KS Site ID 202090021
Mexico	St. Louis, MO Site ID 295100086	Mark Twain State Park, MO Site ID 291370001	Mark Twain State Park, MO Site ID 291370001	Columbia, MO Site ID 290190004	Alton, MO Site ID 291831002	Mark Twain State Park, MO Site ID 291370001
Blue Mound	Springfield, IL Site ID 171670008	Decatur, IL Site ID 171150013	Nilwood, IL Site ID 171170002	Decatur, IL Site ID 171150013	East St. Louis ID 171630010	Effingham, IL Site ID 171170002
Bainbridge	Pittsboro, IN Site ID 180630002	Pittsboro, IN Site ID 180630003	Pittsboro, IN Site ID 180630001	Indianapolis, IN Site ID 180910043	Pittsboro, IN Site ID 180630001	Avon, IN Site ID 180630004
Hamilton	Norwood, OH Site ID 390614002	Hamilton, OH Site ID 390170004	Middletown, OH Site ID 390170015	Fairfield, OH Site ID 390170016	Cincinnati, OH Site ID 390610040	Hamilton, OH Site ID 390170004
Chandlersville	Columbus , OH Site ID 390490005	Morgan County, OH Site ID 391150003	Columbus , OH Site ID 390490024	Gifford State Forest, OH Site ID 390090003	Cleveland, OH Site ID 390350060	Centerburg, OH Site ID 390830002

a/ EPA, 2007a. Data are based on the years 2004 through 2006. Concentrations for averaging periods of 1-hour, 3-hour, 8-hour and 24-hour are based on second highest concentration.

Based on the emissions data available for each proposed station (presented in tables 4.11.1-6 through 4.11.1-12), the estimated potential emission rates for each pollutant would be below the 250-tpy threshold. Therefore PSD permitting is not applicable to the REX East Project.

NNSR also has major source thresholds depending on the pollutant of concern. For O_3 and $PM_{2.5}$ NNSR, a major source is defined as any source with emissions of nitrogen oxides (NO_x), volatile organic compounds (VOC), or $PM_{2.5}$ in exceedence of 100 tpy. As shown in table 4.11.1-11, the potential emissions from the electrically driven Hamilton Compressor Station are expected to be well below 100 tpy for all criteria pollutants and would, therefore, not be subject to NNSR.

Air Quality Control Regions and PSD

AQCRs are categorized as Class I, Class II, or Class III. Class I areas are designated specifically as pristine natural areas or areas of natural significance and have the lowest increment of permissible deterioration, which precludes development near these areas. Class III designations, intended for heavily industrialized zones, can be made only on request and must meet all requirements outlined in 40 CFR 51.166. The remainder of the United States is classified as Class II. Class II areas are designed to allow moderate, controlled growth. All of the Project would be located in Class II areas. However, the Arlington Compressor Station in Carbon County, Wyoming would be located within 62 miles of two Class I areas. The Mount Zirkel Wilderness area is approximately 55 miles south-southwest of the proposed compressor station and the Rawah Wilderness area is located approximately 59 miles south-southeast of the proposed compressor station. A third Class I area, Rocky Mountain National Park, is located approximately 83 miles south-southeast of the proposed compressor station.

Class I areas have special protection under the PSD program. The PSD program established air pollution increment increases for new or modified air pollution sources. If the new source is required to comply with the PSD program and is near (within 62 miles [100 kilometers] of) a federal Class I area(s), the source is required to determine its impacts on that federal Class I area(s). The source is also required to notify the appropriate federal land manager(s) of the specific federal Class I area(s). As discussed earlier, none of the compressor stations would be subject to the PSD regulations, and therefore would not be required to demonstrate compliance with the PSD Class I increments.

New Source Performance Standards

The NSPS, codified in 40 CFR Part 60, apply to new, modified, or reconstructed stationary sources in specific source categories. NSPS requirements include emission limits, monitoring, reporting, and record keeping. The following NSPS requirements were identified as potentially applicable to the specified sources at the compressor stations.

Subpart Kb of 40 CFR 60, Standards of Performance for Volatile Organic Liquid Storage Vessels, lists affected emission sources as storage vessels containing volatile organic liquids. Regulatory applicability is dependent on the construction date, size, and vapor pressure of the storage vessel and its contents. Subpart Kb applies to new tanks, unless otherwise exempted, that have a storage capacity between 75 cubic meters (19,813 gallons) and 151 cubic meters (39,890 gallons) and contain VOCs with a maximum true vapor pressure greater than or equal to 15.0 kilopascals (kPa). Subpart Kb also applies to tanks that have a storage capacity greater than or equal to 151 cubic meters and contain VOCs with a maximum true vapor pressure greater than or equal to 3.5 kPa. The proposed storage tanks at each of the proposed compressor stations would be 10,000 gallons or less, which is below the regulated capacity. Therefore, the REX East Project would not be subject to NSPS Subpart Kb standards.

Table 4.11.1-6

Proposed Emissions for the Arlington Compressor Station

Emission Source	NO_X (tpy)	CO (tpy)	VOC (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	HAPs (tpy)
Reciprocating Engine (CAT 16CM34)	44.60	14.87	25.48	1.72	1.72	0.10	6.56
Reciprocating Engine (CAT 16CM34)	44.60	14.87	25.48	1.72	1.72	0.10	6.56
Reciprocating Engine (CAT 16CM34)	44.60	14.87	25.48	1.72	1.72	0.10	6.56
Fuel Gas Heater	0.34	0.29	0.02	0.03	0.03	<0.01	<0.01
Emergency Generator	0.42	0.61	0.23	0.02	0.02	<0.01	0.20
Space Heaters	0.44	0.37	0.02	0.03	0.03	<0.01	<0.01
Storage Tanks	0.0	0.0	2.06	0.0	0.0	0.0	<0.01
Sumps	0.0	0.0	0.27	0.0	0.0	0.0	<0.01
Fugitive Emissions	0.0	0.0	0.52	0.0	0.0	0.0	0.04
Total	**135.00**	**45.88**	**79.56**	**5.24**	**5.24**	**0.30**	**19.92**

Table 4.11.1-7

Proposed Emissions for the Bertrand Compressor Station

Emission Source	NO_X (tpy)	CO (tpy)	VOC (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	HAPs (tpy)
Reciprocating Engine (CAT 12CM34)	40.72	12.1	22.01	1.46	1.47	0.09	5.63
Reciprocating Engine (CAT 12CM34)	40.72	12.1	22.01	1.46	1.47	0.09	5.63
Reciprocating Engine (CAT 16CM34)	54.34	16.15	29.37	1.95	1.96	0.12	7.51
Reciprocating Engine (CAT 16CM34)	54.34	16.15	29.37	1.95	1.96	0.12	7.51
Reciprocating Engine (CAT 16CM34)	54.34	16.15	29.37	1.95	1.96	0.12	7.51
Fuel Gas Heater	0.32	0.27	0.02	0.02	0.02	<0.01	<0.01
Emergency Generator	1.79	1.37	0.41	0.02	0.02	<0.01	0.20
Space Heaters	0.41	0.35	0.02	0.03	0.03	<0.01	<0.01
Storage Tanks	0.0	0.0	1.96	0.0	0.0	0.0	0.02
Sumps	0.0	0.0	0.38	0.0	0.0	0.0	<0.01
Fugitive Emissions	0.0	0.0	1.48	0.0	0.0	0.0	0.11
Total	**246.97**	**74.64**	**136.41**	**8.84**	**8.84**	**0.53**	**34.14**

Table 4.11.1-8

Proposed Emissions for the Mexico Compressor Station

Emission Source	NO_X (tpy)	CO (tpy)	VOC (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	HAPs (tpy)
Gas Turbine (Solar Titan 130 20502S)	40.16	43.43	4.67	19.79	19.79	2.26	2.14
Gas Turbine (Solar Titan 130 20502S)	40.16	43.43	4.67	19.79	19.79	2.26	2.14
Fuel Gas Heater	0.32	0.06	0.02	0.02	0.02	<0.01	<0.01
Emergency Generator	6.64	1.87	0.09	0.01	0.01	<0.01	0.04
Space Heaters	0.41	0.35	0.02	0.03	0.03	<0.01	<0.01
Storage Tanks	0.0	0.0	1.99	0.0	0.0	0.0	<0.01
Fugitive Emissions	0.0	0.0	0.52	0.0	0.0	0.0	0.04
Total	**87.71**	**89.14**	**11.98**	**39.66**	**39.66**	**4.55**	**4.35**

Table 4.11.1-9

Proposed Emissions for the Blue Mound Compressor Station

Emission Source	NO_X (tpy)	CO (tpy)	VOC (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	HAPs (tpy)
Reciprocating Engine (CAT 12CM34)	40.74	11.88	22.07	1.51	1.51	0.09	5.65
Reciprocating Engine (CAT 12CM34)	40.74	11.88	22.07	1.51	1.51	0.09	5.65
Reciprocating Engine (CAT 16CM34)	54.35	15.85	29.44	2.01	2.01	0.12	7.53
Reciprocating Engine (CAT 16CM34)	54.35	15.85	29.44	2.01	2.01	0.12	7.53
Reciprocating Engine (CAT 16CM34)	54.35	15.85	29.44	2.01	2.01	0.12	7.53
Fuel Gas Heater	0.32	0.27	0.02	0.02	0.02	<0.01	<0.01
Emergency Generator	1.79	1.37	0.41	0.02	0.02	<0.01	0.20
Space Heaters	0.41	0.35	0.02	0.03	0.03	<0.01	<0.01
Storage Tanks	0.0	0.0	1.87	0.0	0.0	0.0	0.02
Sumps	0.0	0.0	0.38	0.0	0.0	0.0	<0.01
Fugitive Emissions	0.0	0.0	0.52	0.0	0.0	0.0	0.04
Total	**247.07**	**73.32**	**135.69**	**9.14**	**9.14**	**0.53**	**34.12**

Table 4.11.1-10

Proposed Emissions for the Bainbridge Compressor Station

Emission Source	NO_X (tpy)	CO (tpy)	VOC (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	HAPs (tpy)
Gas Turbine (Solar Titan 130 20502S)	42.11	48.65	5.43	19.70	19.70	2.28	2.13
Gas Turbine (Solar Titan 130 20502S)	42.11	48.65	5.43	19.70	19.70	2.28	2.13
Fuel Gas Heater	0.32	0.27	0.02	0.02	0.02	<0.01	<0.01
Emergency Generator	6.64	0.47	0.09	0.01	0.01	<0.01	0.07
Space Heaters	0.41	0.35	0.02	0.03	0.03	<0.01	<0.01
Storage Tanks	0.0	0.0	1.81	0.0	0.0	0.0	<0.01
Fugitive Emissions	0.0	0.0	0.52	0.0	0.0	0.0	0.04
Vehicle Traffic (unpaved roads)	0.0	0.0	0.0	0.14	0.14	0.0	0.0
Total	**91.59**	**98.39**	**13.32**	**39.6**	**39.6**	**39.6**	**4.36**

Table 4.11.1-11

Proposed Emissions for the Hamilton Compressor Station

Emission Source	NO_X (tpy)	CO (tpy)	VOC (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	HAPs (tpy)
Fuel Gas Heater	0.32	0.27	0.02	0.02	0.02	<0.01	<0.01
Emergency Generator	2.60	0.56	0.21	0.19	0.19	0.17	<0.01
Total	**2.92**	**0.83**	**0.23**	**0.21**	**0.21**	**0.17**	**<0.01**

Table 4.11.1-12

Proposed Emissions for the Chandlersville Compressor Station

Emission Source	NO_X (tpy)	CO (tpy)	VOC (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	HAPs (tpy)
Reciprocating Engine (CAT 12CM34)	39.61	11.89	19.86	1.51	1.51	0.09	3.62
Reciprocating Engine (CAT 12CM34)	39.61	11.89	19.86	1.51	1.51	0.09	3.62
Reciprocating Engine (CAT 16CM34)	52.85	15.85	26.50	2.01	2.01	0.12	4.83
Fuel Gas Heater	0.34	0.29	0.02	0.03	0.03	<0.01	<0.01
Emergency Generator	0.97	0.85	0.36	0.02	0.02	<0.01	0.12
Space Heater	0.44	0.37	0.02	0.03	0.03	<0.01	<0.01
Storage Tanks	0.0	0.0	1.73	0.0	0.0	0.0	<0.01
Sumps	0.0	0.0	0.38	0.0	0.0	0.0	<0.01
Fugitive Emissions	0.0	0.0	0.52	0.13	0.50	0.0	0.04
Total	**133.82**	**41.14**	**69.25**	**5.24**	**5.61**	**0.30**	**12.23**

On June 12, 2006, EPA proposed a new NSPS (40 CFR 60 Subpart JJJJ) for stationary spark ignition (SI) internal combustion engines. The proposed compressor stations contain natural-gas fired compressor engines and/or emergency generators that may be potentially subject to 40 CFR 60 Subpart JJJJ. The proposed standard for stationary SI engines applies to all new, modified, and reconstructed stationary SI engines regardless of size. The pollutants to be regulated by the proposed NSPS for stationary SI engines are NO_x, CO, and non-methane hydrocarbons. The spark ignition internal combustion engines to be installed at the proposed REX East Project compressor stations (reciprocating engines) would comply with the applicable requirements of NSPS JJJJ once promulgated.

On July 6, 2006, the EPA published the final NSPS Subpart KKKK (Standards of Performance for Stationary Gas Turbines). NSPS Subpart KKKK applies to new, modified, or reconstructed stationary gas turbines with a heat input at peak load of greater than or equal to 10 MMBtu/hr. Two turbines are proposed for installation at both the Mexico and Bainbridge Compressor Stations, with each turbine having a total heat input of 144 MMBtu/hr. Thus, both the Mexico and Bainbridge Compressor Stations would be required to comply with applicable NSPS Subpart KKKK requirements. The Mexico and Bainbridge compressors are designed to have emission factors of 0.059 lb/MMBtu/hr for NO_x and 0.0034 pounds of SO_2/MMBtu/hr, which would meet the Subpart KKKK requirements. In addition, Rockies Express would comply with the Subpart KKKK requirements for monitoring, recordkeeping, and reporting.

NSPS Subpart GG applies to stationary gas turbines with a heat input at peak load equal to or greater than 10 MMBtu/hr, based on the lower heating value of the fuel fired. Since the stationary gas turbines associated with the proposed Mexico and Bainbridge compressor stations would be constructed after February 18, 2005, they would be subject to the requirements of NSPS Subpart KKKK. Also, in accordance with Section 60.4305, stationary gas turbines subject to NSPS KKKK are exempt from the requirements of NSPS Subpart GG.

National Emission Standards for Hazardous Air Pollutants

The NESHAP, codified in 40 CFR Parts 61 and 63, regulates hazardous air pollutant (HAP) emissions. Part 61 was promulgated prior to the 1990 Clean Air Act Amendments (CAAA) and regulates eight types of hazardous substances (asbestos, benzene, beryllium, coke oven emissions, inorganic arsenic, mercury, radionuclides, and vinyl chloride).

The 1990 CAAA established a list of 189 HAPs, resulting in the promulgation of Part 63. Part 63, also known as the Maximum Achievable Control Technology (MACT) standards, regulates HAP emissions from major sources of HAP emissions and specific source categories that emit HAPs. Part 63 defines a major source of HAPs as any source that has the potential to emit 10 tpy of any single HAP or 25 tpy of HAPs in aggregate. MACT standards are intended to reduce emissions of air toxics or HAPs through installation of control equipment rather than enforcement of risk-based emission limits. The total HAP emissions from all equipment are above the 25-tpy major source threshold for the Bertrand and Blue Mound Compressor Stations (as shown in tables 4.11.1-7 and 4.11.1-9), and total emissions of formaldehyde (the HAP emitted in the greatest amount) are over the 10-tpy threshold for the Arlington Compressor Station (11.47 tpy).

The turbines would potentially be subject to 40 CFR Part 63 Subpart YYYY, which requires MACT to reduce emissions of HAPs through the installation of control equipment rather than through risk-based emission limits. Natural-gas fired combustion turbines typically have low HAP emissions; thus, additional control technologies may not be required for MACT compliance. Neither the Mexico nor Bainbridge Compressor Stations are expected to be a major HAP source and therefore would not need to demonstrate compliance with 40 CFR Part 63.

The reciprocating engines would potentially be subject to 40 CFR Part 63 Subpart ZZZZ if the station is a major source of HAPs or if the engine rating is greater than 500 hp regardless of the size. The Arlington, Bertrand, and Blue Mound Compressor Stations would be major sources of HAPs, and they all have a rating greater than 500 hp and therefore would be subject to the MACT standard in 40 CFR Part 63 Subpart ZZZZ. Emission rates as shown in tables 4.11.1-6 through 4.11.1-12 do not reflect these emission reductions for HAPs. Rockies Express would comply with all of the applicable requirements of Subpart ZZZZ and demonstrate compliance through the permitting agency.

Title V Operating Permits

The Title V permit program, as described in 40 CFR Part 70, requires sources of air emissions to obtain federal operating permits if their criteria pollutant emissions reach or exceed major source levels. These permits list all applicable air regulations and include a compliance demonstration for each applicable requirement. The major source threshold level in attainment areas is 100 tpy of NO_x, SO_2, CO, PM_{10}, $PM_{2.5}$, and VOC. Emissions of NO_x at the Arlington, Bertrand, Blue Mound, and Chandlersville Compressor Stations and emissions of VOC at the Bertrand and Blue Mound Compressor Stations would exceed the 100-tpy criteria pollutant threshold, as shown in tables 4.11.1-6 through 4.11.1-12. Therefore, the Arlington, Bertrand, Blue Mound, and Chandlersville Compressor Stations would require a Title V permit. None of the criteria pollutants would be emitted at the 100-tpy level at the Mexico, Bainbridge, or Hamilton Compressor Stations; therefore, Title V permits would not be required for those facilities.

General Conformity

The EPA promulgated the General Conformity Rule on November 30, 1993 in Volume 58 of the FR Page 63214 (58 FR 63214) to implement the conformity provision of Title I, Section 176(c)(1) of the CAA. Section 176(c)(1) requires that the federal government not engage, support, or provide financial assistance for licensing or permitting, or approve any activity not conforming to, an approved CAA implementation plan.

The General Conformity Rule is codified in Title 40 CFR Part 51, Subpart W and Part 93, Subpart B, determining Conformity of General Federal Actions to State or Federal Implementation Plans. A conformity determination must be conducted by the lead federal agency if a federal action's construction and operational activities is likely to result in generating direct and indirect emissions that would exceed the conformity threshold levels (*de minimis*) of the pollutant(s) for which an air basin is in non-attainment or maintenance. According to the conformity regulations, emissions from sources that are major for any criteria pollutant with respect to the NNSR or PSD permitting/licensing are exempt and are deemed to have conformed.

Section 176(c)(1) of the CAA (Title 40 CFR 51.853), states that a federal agency cannot approve or support any activity that does not conform to an approved SIP. Conforming activities or actions should not, through additional air pollutant emissions:

- cause or contribute to new violations of the NAAQS in any area;
- increase the frequency or severity of any existing violation of any NAAQS; or
- delay timely attainment of any NAAQS or interim emission reductions.

As noted earlier, the Hamilton Compressor Station would be located in Warren County, Ohio, which is currently designated as non-attainment for 8-hour O_3 and $PM_{2.5}$. While no other compressor stations are located in non-attainment areas, the pipeline route would cross Hendricks, Morgan, and Johnson Counties in Indiana and Butler, Warren and Fairfield Counties in Ohio, which are currently

designated non-attainment Subpart 1 Basic for O_3 and non-attainment for $PM_{2.5}$. The pipeline would cross Greene and Belmont Counties, Ohio, which are currently designated as maintenance for O_3 and non-attainment for $PM_{2.5}$. Also, the pipeline route would cross Shelby County, Indiana and Clinton County, Ohio, which are designated non-attainment Subpart 1 Basic for O_3. Hendricks, Morgan, Johnson, and Shelby Counties, Indiana are all located in the same Indianapolis, Indiana AQCR. Therefore, emissions occurring in these counties are combined and compared to the threshold values. Butler, Warren, and Clinton Counties, Ohio are all located in the Cincinnati-Hamilton, Ohio-Kentucky-Indiana AQCR, and emissions are combined and compared to the threshold values. Greene, Fairfield, and Belmont Counties, Ohio are located in the Dayton-Springfield, Ohio AQCR, Columbus, Ohio AQCR, and the Wheeling, West Virginia-Ohio AQCR, respectively.

The O_3 Subpart 1 Basic non-attainment general conformity applicability thresholds are 100 tpy for either NO_x or VOC. The O_3 maintenance general conformity applicability thresholds are 100 tpy for NO_x, NO_2, or VOC. The $PM_{2.5}$ non-attainment general conformity applicability thresholds are 100 tpy of $PM_{2.5}$, SO_2, NO_x (unless determined not to be significant precursors), and VOC or ammonia (if determined to be significant precursors).

The emissions estimated to be generated from the construction of the Project in the non-attainment AQCRs were compared to the *de minimis* levels and are included in table 4.11.1-13. As shown, the total construction emissions in each of the AQCRs would be expected to be below the applicable thresholds for each pollutant and the requirements of General Conformity would not apply. In addition, the estimated annual emissions associated with the operation of the proposed Hamilton Compressor Station as shown in table 4.11.1-11 to be located in Warren County would be below the applicable thresholds for each pollutant and the requirements of General Conformity would not apply.

Table 4.11.1-13

Total Emissions by Non-attainment Air Quality Control Regions during the Construction Phase of the REX East Project

Non-attainment Air Quality Control Region	Pollutant			
	NO_x (tpy)	VOC (tpy)	SO_2 (tpy)	$PM_{2.5}$ (tpy)
Indianapolis, IN	84.53	13.23	17.3	13.10
Cincinnati-Hamilton, OH-KY-IN	97.01	17.16	18.7	15.31
Dayton-Springfield, OH	3.27	0.5	0.67	0.71
Columbus, OH	29.22	4.6	5.9	6.19
Wheeling, WV–OH	18.63	2.91	3.8	3.99
General Conformity Threshold	100	100	100	100

The construction emissions provided were based on the assumption that the compression-ignition construction equipment would be made up of over 40 percent Tier 2 technology, less than 50 percent Tier 3 technology, and no Tier 4 equipment. Spark-ignited equipment was assumed to meet Phase 1 regulatory emission standards. Rockies Express has indicated it would require contractors utilizing nonroad construction equipment in the non-attainment areas of the Project to use the best available nonroad construction equipment in their fleets.

In response to the draft EIS, Rockies Express indicated that due to the number of vehicles that would be utilized by the project, and because, at any given point in time, a myriad of factors would result in moving construction equipment in and out of non-attainment areas constantly. Rockies Express notes that this would make it difficult to track on a weekly basis the use of each vehicle on the project. The percentages of Tier 2 and Tier 3 technology assumed by Rockies Express for construction were used to

account for an age distribution of construction equipment. However, the percentages chosen are unsupported in the record. Also, any equipment that is not the best available non-road construction equipment in the contractor's fleets should not be moved in and out of the non-attainment areas constantly, since the best available equipment must be utilized in the non-attainment areas as Rockies Express previously committed to requiring.

In its response to the draft EIS, Rockies Express also indicated that the construction emissions in the nonattainment and maintenance areas would be sufficiently below the General Conformity Thresholds. However, the projected construction emissions in the Indianapolis, Indiana and the Cincinnati-Hamilton, Ohio-Kentucky-Indiana non-attainment areas would be 85.5 tpy and 97 tpy of NO_x, respectively, very close to the General Conformity Thresholds. Therefore, we believe that additional information and assurances are needed to adequately address the air quality concerns.

The ratio of Tier 2 and Tier 3 construction equipment assumed by Rockies Express for construction emissions were used to account for an age and/or emission control technology distribution of construction equipment. In response to the draft EIS, Rockies Express indicated that due to the large numbers of construction equipment that would be utilized by the project, and the fact that equipment would be moved in and out of non-attainment areas constantly, it would be difficult to track on a weekly basis the use of each vehicle on the Project. If construction equipment is constantly moving in and out of the non-attainment area, this contradicts Rockies Express's previous commitment to require the best available non-road construction equipment in the contractor's fleets be utilized in the non-attainment areas. Therefore, we believe this commitment is insufficient to demonstrate that Rockies Express would remain below General Conformity Thresholds.

To ensure the protection of the non-attainment areas and in an effort to ensure that the actual Project construction emissions generated do not exceed the General Conformity thresholds, **we recommend that:**

- **Prior to the start of construction, Rockies Express file with the Secretary for review and written approval by the Director of OEP, a plan indicating measures Rockies Express would implement within the Indianapolis, Indiana and Cincinnati-Hamilton, Ohio-Kentucky-Indiana non-attainment regions to demonstrate and monitor compliance with the Tier 2 and Tier 3 emissions assumed in Rockies Express' construction emission calculations as well as ensure emissions would remain under the General Conformity Thresholds.**

State Regulations

In addition to the federal regulations described above, Illinois, Indiana, Missouri, Nebraska, Ohio, and Wyoming have state air quality regulations. The Wyoming Department of Environmental Quality manages air quality issues in Wyoming, Nebraska Department of Environmental Quality manages air quality in Nebraska, MODNR manages Missouri's air quality, ILEPA manages air quality issues in Illinois, in Indiana air quality issues are managed by IDEM, and in Ohio air quality is managed by OEPA. Subject to EPA approval, these agencies manage the statewide air permitting, compliance, and enforcement programs. The Arlington Compressor Station would be operated and permitted under Wyoming's Permitting Requirements Standards and Regulations as described in Chapter 6, Section 3. The Bertrand Compressor Station would be authorized under Nebraska's Title 129 and would operate under conditions of its air quality permit. The Mexico Compressor Station would be authorized under MODNR 10 Code of State Regulations 10-6, which incorporates much of the federal regulatory requirements for air quality and would be authorized under the conditions of its air permit. The Blue Mound Compressor Station would be authorized under ILEPA's applicable state air regulations contained

in 35 Illinois Administrative Code Subtitle B under conditions of its air quality permit. The Bainbridge Compressor Station would be authorized under Indiana's Title 326 of the Indiana Administrative Code Article 2 and under the federal air permit conditions. The Chandlersville Compressor Station would be authorized under Ohio's Revised Code for general permits, Ohio Administrative Code rule 3745-31-29, and Ohio rule 3745-35-08 Permit-to-Install and Operate.

General Impacts and Mitigation

Construction Impacts

Construction of the pipeline and access roads would generate air emissions during grading, trenching, backfilling, and operation of construction vehicles along unpaved areas. The Project would use existing roads to the extent possible. Some roads used for access would be improved during construction by widening or adding drain pipes, gravel, or grading; and some new roads and road extensions would be constructed. Some roads would remain after construction to provide access to the pipeline for maintenance purposes. These activities could generate dust and particulate emissions from earth-moving activities and construction equipment engine exhaust.

Construction of the compressor stations would be performed with mobile equipment similar to that typically used for pipeline and road construction. In addition to the compressor stations, Rockies Express would construct other aboveground facilities consisting of meter/regulator stations.

Construction would be expected to cause a minor and temporary impact to local ambient air quality as a result of fugitive dust and combustion emissions generated by construction equipment. Criteria pollutant emissions during operation of the fossil-fueled construction equipment would occur from combustion products resulting from the use of gasoline and diesel fuels, primarily NO_2, CO, VOCs, PM_{10}, small amounts of SO_2, and small amounts of HAPs (e.g., formaldehyde, benzene, toluene, and xylene) produced by the construction equipment engines. Impacts from construction equipment would be temporary and would be expected to result in an insignificant impact on air quality. Emissions from fugitive dust and construction activities would be controlled through best management practices (e.g., intermittent watering of roadways and construction areas). Table 4.11.1-13 shows the construction emissions for the non-attainment regions over which the pipeline would traverse, which are below *de minimis* levels for conformity. Similar emission rates during construction are anticipated for attainment areas.

Operational Impacts

Operational emissions resulting from the Project would be associated with the operation of the six natural-gas fired compressor stations and one electric compressor station proposed by Rockies Express. Combustion emissions from these stations would mainly consist of NO_x, CO, HAPs, and VOCs with small amounts of SO_2 and $PM_{10}/PM_{2.5}$. Emissions would be minimized through the use of natural gas as fuel for all compressor units, most emergency generator units, and heaters.

Each compressor station would include an emergency shut down (ESD) system, pursuant to DOT requirements. Activation of the ESD system would vent the piping (expel the natural gas) to the atmosphere in case of an emergency. The ESD would be used only in the event of an emergency. Compressor unit blowdowns would occur as needed to relieve pressure when a unit is taken offline. Natural gas blowdowns are not part of routine operation.

Tables 4.11.1-6 through 4.11.1-12 list the anticipated emissions of criteria pollutants and HAPs from the operation of each compressor station. Rockies Express has filed air permit applications or

notifications for the Bertrand, Mexico, Blue Mound, Bainbridge, Arlington, and Hamilton Compressor Stations with the respective air permitting agencies. Rockies Express is completing the air permit application for the Chandlersville Compressor Station and will provide the FERC a copy of the application as recommended above. As part of their operational permitting process, emissions compliance testing would be required to ensure that the stations would be operating within their federal, state, and local permit conditions.

Rockies Express has conducted air quality modeling for NO_2 and CO using EPA's AERMOD modeling system (EPA, 2004) for the Bainbridge, Mexico, Bertrand, Arlington, Chandlersville, and Blue Mound Compressor Stations. Table 4.11.1-14 contains the modeling results from the six compressor stations. The results show that the impacts from the individual compressor stations, in combination with the background concentration for each station's area, are below the NAAQS for NO_2 and CO. The Hamilton Compressor Station was not modeled since there would be no emissions from the electric-driven compressor units (the primary source of emissions at a compressor station).

Table 4.11.1-14

Air Quality Modeling Impacts and Comparison to National Ambient Air Quality Standards for the Six Natural-Gas Fired Compressor Stations

Compressor Station	Pollutant	Averaging Period	Maximum Modeled Compressor Station Impact ($\mu g/m^3$)	Compressor Impact plus Background a/ ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
Arlington, Carbon County, Wyoming	CO	1-Hour	397.5	6,123.5	40,000
		8-Hour	278.3	3,026.7	10,000
	NO2	Annual	13.9	18.9	100
Bainbridge, Putnam County, Indiana	CO	1-Hour	229.1	2,232.8	40,000
		8-Hour	174.4	2,006.4	10,000
	NO2	Annual	3.4	65.4	100
Bertrand, Phelps County, Nebraska	CO	1-Hour	311.6	7,881.6	40,000
		8-Hour	197.8	2,527.8	10,000
	NO2	Annual	38.9	53.9	100
Blue Mound, Christian County, Illinois	CO	1-Hour	543.5	4,782.5	40,000
		8-Hour	408.7	2,012.7	10,000
	NO2	Annual	47.7	75.7	100
Chandlersville, Muskingum County, Ohio	CO	1-Hour	231.2	5,041.0	40,000
		8-Hour	158.0	2,448.4	10,000
	NO2	Annual	11.0	42.6	100
Mexico, Audrain County, Missouri	CO	1-Hour	330.2	2,055.2	40,000
		8-Hour	277.3	1,657.3	10,000
	NO2	Annual	19.1	24.8	100

a/ Background concentrations are those specified by the state agency for which the air quality modeling was conducted in support of obtaining a state air quality permit

$\mu g/m^3$ = micrograms per cubic meter

Operation of the aboveground meter stations and block valves would not result in substantial air emissions under normal operating conditions. Typically, only minor emissions of natural gas, called

"fugitive emissions," occur from small connections at meter station and valve sites. Since such emissions are very small, they are not regulated by permit or source-specific requirements.

Use of the access roads for maintenance would generate occasional, minor, and short-term increases in dust similar to that generated on other unpaved roads in the area. Use of these roads by maintenance and operation personnel would have a negligible effect on air quality.

We received a comment regarding the emissions of greenhouse gases (GHGs) from the Project. The principal GHGs are methane, carbon dioxide (CO_2), nitrous oxide (N_2O), and various fluorinated gases. GHG emissions are vital to life on earth because they help to maintain ambient temperatures; however, excess GHG emissions augment this effect and are considered by many experts to contribute to overall global climatic changes, typically referred to as global warming. Global warming may ultimately contribute to a rise in sea level, destruction of estuaries and coastal wetlands, and changes in regional temperature and rainfall pattern, with significant agricultural and coastal community implications. There are no federal regulations at this time limiting the emissions of CO_2; however emissions of N_2O are limited through limitations of NO_x emissions under NSPS and federal permits. Methane emissions are limited by valve and pipe leak standards.

No fluorinated gases would be emitted by the Project. Construction of the Project would generate emissions of non-regulated GHG. CO_2 would be formed as a primary product of combustion of the diesel and gas engines used to power construction equipment and vehicles. Emissions of GHG could occur during facility operation. Direct releases of methane could occur as a result of pipeline repair or maintenance operations. These releases would be infrequent over the lifetime of the Project and would likely involve only an isolated section of pipeline resulting in a negligible increase in GHG emissions. Natural gas facility projects typically average construction emission estimates less than $1/1000^{th}$, and operational emissions less than 1/100th of 1% of the 2005 U.S. Greenhouse Gas Inventory (EPA 2007d) of 7.2 gigatons.

Construction of the Project would be expected to result in temporary minor impacts to air quality. Operation of the Project would be expected to result in long-term minor impacts to air quality.

4.11.2 Noise

Noise would affect the local environment during both the construction of the Project facilities and operation of each of the proposed compressor stations associated with the Project. At any location, both the magnitude and frequency of environmental noise may vary considerably over the course of the day and throughout the week. This variation is caused in part by changing weather conditions and the effects of seasonal vegetative cover. Two measures used by federal agencies to relate the time-varying quality of environmental noise to its known effect on people are the 24-hour equivalent sound level [$L_{eq}(24)$] and the day-night average sound level (DNL). The $L_{eq}(24)$ is the level of steady sound with the same total (equivalent) energy as the time-varying sound of interest, averaged over a 24-hour period. The DNL is the $L_{eq}(24)$ with 10 decibels on the A-weighted scale (dBA) added to sound levels between the hours of 10 p.m. and 7 a.m., to account for people's greater sensitivity to sound during nighttime hours. The A-weighted scale is used because human hearing is less sensitive to low and high frequencies than mid-range frequencies. A person's threshold of perception for a change in noise level is considered to be 3 dBA.

Regulatory Requirements

In 1974, EPA published *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety* (EPA, 1974). This document provides

information for state and local governments to use in developing their own ambient noise standards. EPA has determined that, to protect the public from activity interference and annoyance outdoors in residential areas, noise levels should not exceed a DNL of 55 dBA. We have adopted this criterion and use it to evaluate the potential noise impact from operation of each of the proposed compressor stations.

Based on a review of state regulations, no applicable noise regulations were identified for natural gas compressor station facilities constructed and operated in Indiana, Missouri, Nebraska, Ohio, and Wyoming. Title 35 of the Illinois Administrative Code Subtitle H, Chapter I, Part 900 and Part 901 contains requirements for noise pollution from a property-line-noise-source in Illinois. The proposed Blue Mound Compressor Station would be constructed and operated in compliance with the applicable sound emission standards and limitations for property-line-noise-source of Part 901.

In addition, no applicable local (i.e., township, city, county) noise regulations were identified for the facilities associated with this Project.

Existing Noise Levels

Impacts are determined at receptors known as Noise Sensitive Areas (NSAs). NSAs include residences, schools, daycare facilities, hospitals, long-term care facilities, places of worship, libraries, and parks and recreational areas specifically known for their solitude and tranquility, such as wilderness areas. Each compressor station has been evaluated for adjacent NSAs and surrounding ambient noise levels.

The Arlington Compressor Station would be located in Carbon County, Wyoming, just north of the town of Arlington, Wyoming. The closest NSA (NSA #1) is a residence located approximately 900 feet southwest of the site center (i.e., the anticipated location where the station would be built) and other residences are located farther southwest of the site center. Hoover and Keith Inc. (H&K), an acoustical consultant for Rockies Express, measured ambient sound on February 2, 2007. At the NSA sound measurement positions, the noise associated with the nearby Southern Star Compressor Station unaffiliated with the Project, contributed significantly to the measured daytime sound levels although there was also some wind-related noise. During the nighttime, the ambient levels should be approximately equal to the measured daytime levels since the ambient noise was dominated by the noise of the nearby gas pipeline facility, which probably operates 24 hours per day. Measured daytime sound levels at NSA #1 ranged from 51.3 to 52.6 dBA with a calculated DNL of 58.4 dBA.

The Bertrand Compressor Station would be located in a rural area of Phelps County, Nebraska, approximately 10 miles west-northwest of Holdrege, Nebraska and approximately 6 miles southeast of Bertrand, Nebraska. The land immediately surrounding the site is agricultural. The two closest NSAs consist of a home located approximately 1,900 feet northeast (NSA #1) and 3,800 feet northwest (NSA #2) of the site center. H&K measured ambient sound on June 6, 2007. At the NSA sound measurement positions, the noise of wind blowing in the grass/trees and the sound of birds/cattle were the observed noise sources that significantly influenced the measured daytime sound levels. Measured daytime sound levels at NSA #1 ranged from 29.9 to 34.4 dBA with a calculated DNL of 37.8 dBA. Measured daytime sound levels at NSA #2 ranged from 35.2 to 35.7 dBA with a calculated DNL of 41.2 dBA.

The Mexico Compressor Station would be located in a rural area of Audrain County, Missouri, 6 miles northeast of Mexico, Missouri. The land immediately surrounding the site is primarily agricultural. The closest NSA is a residence (NSA #1) located approximately 1,700 feet north of the site center. Other nearby NSAs are located 2,900 feet southwest and 3,400 feet east-northeast from the site center (NSA #2 and NSA #3). H&K measured ambient sound on February 1, 2007. At the sound measurement positions near the NSAs, the noise of wind blowing in the grass/trees and the sound of birds were the observed noise sources that significantly influenced the measured daytime sound levels. At times, the noise of

high-altitude aircraft and distant farm machinery were also audible. Measured daytime sound levels at NSA #1 ranged from 29.3 to 29.8 dBA with a calculated DNL of 35.5 dBA. Measured daytime sound levels at NSA #2 ranged from 30.3 to 34.4 with a calculated DNL of 38.5 dBA. NSA #3 was assumed to have the same noise level as NSA #1.

The Blue Mound Compressor Station would be located in a rural area of Christian County, Illinois, approximately 8 miles west of Blue Mound, Illinois and approximately 18 miles southwest of Decatur, Illinois. The land immediately surrounding the site is primarily agricultural. One residence (NSA #1) is located approximately 2,100 feet south of the site center. Other nearby NSAs are approximately 1 mile or more from the site center. H&K measured ambient sound on April 6, 2006. At the NSA sound measurement positions, the noise of wind blowing in the grass/trees and the sound of birds/cattle were the observed noise sources that significantly influenced the measured daytime sound levels. Measured daytime sound levels at NSA #1 ranged from 35.8 to 44.4 dBA, with a calculated DNL of 46.6 dBA. NSAs #2 and #3 were assumed to have the same noise level as NSA #1.

The Bainbridge Compressor Station would be located in a rural area of Putnam County, Indiana, approximately 1 mile south of Bainbridge, Indiana. The land immediately surrounding the site is primarily agricultural. There are a few scattered residences located around the site, and the closest NSAs consist of two residences located approximately 1,460 feet west-northwest of the site center (NSA # 1 and NSA #2). Other nearby NSAs include residences located 1,980 feet west and 3,220 feet north of the site center (NSA #3 and NSA #4). H&K measured ambient sound on January 31, 2007. At the sound measurement positions near the NSAs, the noise of distant vehicle traffic, wind blowing in the grass/trees, and the sound of birds were the observed noise sources that significantly influenced the measured daytime sound levels. At times, the noise of high-altitude aircraft and the sound of distant dogs barking were also audible. Measured sound levels at NSA #1 ranged from 36.8 to 37.6 dBA with a calculated DNL of 43.5 dBA. Measured sound levels at NSA #2 ranged from 35.9 to 37.3 dBA with a calculated DNL of 43.8 dBA. Measured sound levels at NSA #3 ranged from 37.2 to 38.3 dBA with a calculated DNL of 45.3 dBA. Measured sound levels at NSA #4 ranged from 39.4 to 42.6 dBA with a calculated DNL of 47.6 dBA.

The Hamilton Compressor Station would be located in Warren County, Ohio on the southeast side of Middletown, Ohio. The land immediately surrounding the site is primarily industrial with relatively distant residential areas, and the proposed Station site is located just west of Interstate Highway 75 (IH-75). There are a few scattered residences located around the proposed new site of the Station, and the closest NSA consists of a residence along Greentree Road, located approximately 1,900 feet northeast of the Station site center (i.e., anticipated location of the compressor building). Other surrounding NSAs (i.e., primarily residences) are located between 2,400 feet and 3,600 feet from the site center. H&K measured ambient sound during the daytime of January 10, 2008, and the nighttime of January 9, 2008. At the sound measurement positions near the NSAs, the noise of vehicle traffic was the observed noise source that significantly influenced the measured daytime and nighttime sound levels. At times, the noise of industrial activity, sound of birds (daytime only), wind-related noise, and sound of distant dogs barking were also audible. Measured sound levels at NSA #1 ranged from 58.1 to 63.9 dBA with a calculated DNL of 70.0 dBA. Measured sound levels at NSA #2 ranged from 58.9 to 60.7 dBA with a calculated DNL of 66.1 dBA. Measured sound levels at NSA #3 ranged from 54.9 to 57.9 dBA with a calculated DNL of 63.9 dBA.

The Chandlersville Compressor Station would be located in Muskingum County, Ohio, approximately 7 miles southeast of Zanesville, Ohio. The closest NSAs consist of residences located between 1,100 feet and 1,300 feet from the anticipated location of the compressor building. The closest NSAs consist of residences located between 700 feet and 850 feet from the site center. H&K measured ambient sound on October 2, 2007. At the NSA sound measurement positions, the noise of wind blowing

in the grass/trees and the sound of birds/cattle were the observed noise sources that significantly influenced the measured daytime sound levels. Measured sound levels at NSA #1 ranged from 45.1 to 45.4 dBA with a calculated DNL of 47.7 dBA. Measured sound levels at NSA #2 ranged from 44.1 dBA to 44.2 dBA with a calculated DNL of 47.3 dBA. Measured sound levels at NSA #3 ranged from 42.8 to 43.6 dBA with a calculated DNL of 47.0 dBA.

General Impacts and Mitigation

Construction Noise

Construction of the Project is expected to be typical of other pipeline projects in terms of schedule, equipment used, and types of activities. Construction would increase sound levels in the vicinity and the sound levels would vary during the construction period. Pipeline construction generally would proceed at rates ranging from several hundred feet to 1 mile per day. However, due to the assembly-line method of construction, activities in any one area could last from several weeks to several months on an intermittent basis. Noise associated with construction at the compressor stations would be concentrated in the vicinity of the stations. Construction equipment would be operated on an as-needed basis during those periods and would be maintained to manufacturers' specifications to minimize noise impacts.

Nighttime noise levels would normally be unaffected because most pipeline construction would take place only during daylight hours. The possible exceptions would be at the HDD sites (e.g., at the crossings of waterbodies and highways). At HDD locations, drilling equipment may operate on a 24-hour-per-day and 7-day-per-week basis. In addition to EPA's 55 DNL standard, noise level changes are categorized as follows: a 3-dBA increase is considered noticeable, a 6-dBA increase is considered clearly noticeable, and a 9-dBA increase is considered significantly noticeable. An acoustical assessment was prepared for all of the planned HDD sites with NSAs within 1 mile of HDD locations to show existing sound levels and noise levels due to HDD activity.

H&K performed detailed noise assessments that included both a site ambient sound survey and an acoustical analysis for the entry and exit points associated with each of the proposed HDD locations that have the potential to exceed 55 DNL. The NSAs, their distance and direction from each site, and the measured and estimated noise levels are summarized in table 4.11.2-1. In order to mitigate significant impacts due to HDD activity, Rockies Express has committed to using a temporary noise barrier at least 16 feet high and to ensure any diesel engines associated with HDD activities would include an adequate exhaust muffler to reduce noise levels at the nearest NSAs.

Table 4.11.2-1

REX East Project Locations with Predicted Horizontal Directional Drill Noise Impacts Greater than 55 DNL a/

Milepost	Location of Each HDD Site	Entry or Exist Point	Approximate Distance (feet)/Direction from the Drill Site to NSA	Estimated DNL if Noise Mitigation Not Employed	Estimated DNL if Noise Mitigation Employed	Ambient DNL	DNL of HDD plus Ambient	Increase Above Ambient
42.0	Salt River	Entry	900 ft. (SW)	58.3 dBA	48.3 dBA	40.3	48.9 dBA	8.6 dBA
42.6	Miss River	Entry	700 ft. (South)	60.7 dBA	44.2 dBA	39.0	45.3 dBA	6.3 dBA
70.6	Illinois River	Entry	1,000 ft. (NE)	58.4 dBA	50.4 dBA	47.0	52.1 dBA	5.1 dBA
202.8	Embarras River	Entry	1,000 ft. (NE)	58.9 dBA	50.4 dBA	51.2	53.8 dBA	2.6 dBA
312.3	Pennington Rd	Entry	600 ft. (East)	63.7 dBA	53.1 dBA	54.1	56.6 dBA	2.5 dBA

Table 4.11.2-1 (continued) REX East Project Locations with Predicted Horizontal Directional Drill Noise Impacts Greater than 55 DNL a/								
Milepost	Location of Each HDD Site	Entry or Exist Point	Approximate Distance (feet)/Direction from the Drill Site to NSA	Estimated DNL if Noise Mitigation Not Employed	Estimated DNL if Noise Mitigation Employed	Ambient DNL	DNL of HDD plus Ambient	Increase Above Ambient
312.6	Pennington Rd	Exit	400 ft. (North)	57.4 dBA	47.3 dBA	43.5	48.8 dBA	5.3 dBA
340.7	Big Blue River	Entry	1,000 ft. (NNE)	58.7 dBA	50.2 dBA	50.1	53.2 dBA	3.1 dBA
421.4	Four Mile Creek	Entry	260 ft. (NW)	73.1 dBA	54.9 dBA	52.2	56.8 dBA	4.6 dBA
422.4	Seven Mile Crk	Entry	400 ft. (South)	69.0 dBA	51.7 dBA	51.9	54.8 dBA	2.8 dBA
509.0	Big Darby Crk	Entry	650 ft. (SSE)	64.9 dBA	53.9 dBA	56.9	58.7 dBA	1.8 dBA
577.0	Muskingum Riv	Entry	800 ft. (East)	58.7 dBA	48.7 dBA	48.2	51.5 dBA	3.3 dBA

a/ Hoover and Keith, 2007a.

As shown in table 4.11.2-1, the noise levels greater than or equal to 55 DNL associated with the HDD activities would be significantly mitigated by implementing the recommended mitigation measures documented in the acoustical assessment report and would result in less than a 55-DNL and 9-dBA increase above current ambient noise levels at each of the nearest identified NSAs. Additional noise mitigation measures at the proposed HDD locations, if required, may include but would not be limited to:

- temporary housing in a nearby hotel;
- compensation to landowner to mitigate inconvenience and disturbance;
- partial and/or total enclosure of the power unit;
- partial and/or total enclosure of parts of drilling rig;
- adequate muffler for engine exhaust systems; and/or
- silencer for the engine air intake system.

To ensure noise from these new HDD sites and all other HDD activities does not become significant, **we recommend that:**

- **Prior to the start of construction, Rockies Express file with the Secretary for review and written approval by the Director of OEP updated site-specific plans for each HDD entry or exit site where it proposes to implement noise mitigation as shown in table 4.11.2-1. The updated plans should identify any noise walls or barriers, equipment locations, equipment barriers, or any other mitigation measures.**

- **Prior to the start of construction, Rockies Express file a noise analysis, for review and written approval by the Director of OEP, for all HDD sites that are not evaluated in the final EIS. This analysis should identify any NSAs within one-half mile of the HDD entry or exit location, and the proposed length of time HDD activities would occur. The analysis should also include background noise levels and estimated drilling noise contributions at the nearest NSAs at each HDD entry and exit location with NSAs within one-half mile, along with any measures Rockies Express would implement to control noise from the HDDs.**

Operational Noise

During operation of the Project, potential noise impacts would be limited to the vicinity of the new compressor stations. Principal noise sources would include the air inlet, exhaust, and casing of the turbines. Secondary noise sources would include yard piping and valves. Noise from the relief valves, blowdown stacks, and emergency electrical generation equipment would be infrequent.

All compressor stations would include design measures to minimize sound generation. Noise control measures could be applied to motors and associated compressors and appropriate building materials to enclose turbines and engines would be used. Adequate mufflers could be installed for turbine exhaust systems or engine exhaust systems and silencers could be installed for the engine or turbine air intake system. Acoustical insulation for aboveground piping may be installed if necessary to meet the applicable sound criteria. An air ventilation system for electric motors designed and specified to meet stringent noise requirements may be installed. Also, unit blowdown silencers may be added to reduce noise levels.

A detailed noise assessment that included both a site ambient sound survey and an acoustical analysis was performed at each of the proposed compressor station locations. The results are shown in table 4.11.2-2.

As shown in table 4.11.2-2, the proposed compressor stations with recommended noise mitigation measures implemented are expected to comply with the FERC's 55-DNL noise limit at the nearest NSAs. The analysis for the proposed Blue Mound compressor station indicates that the noise attributable to the new station should be below the Illinois Noise Regulations. Rockies Express has indicated that if noise levels during operation of the proposed compressor stations become an issue with a resident, additional noise mitigation measures beyond those recommended for implementation would be considered.

We note that the addition of the Arlington and Hamilton Compressor Stations, where existing ambient noise levels are already at or above 55 DNL, would result in an increase in the future noise levels. However, the increases shown at these two locations are all approximately 1 dBA or less, and would not be significant. Based on the analyses conducted, and the data presented above, we conclude that no significant noise impacts would occur with Project operations.

During operation of the Project, the potential noise impacts from the pipeline would be limited to the vicinity of the new valve and metering stations. Principal noise sources would include gas flow through valves and metering equipment. Such gas flow noise is typically not noticeable more than a short distance from the equipment. Underground sections of the pipeline are not a significant source of noise.

Minor short-term noise impacts are expected during the Project construction, provided that equipment is maintained to the manufacturers' specifications to minimize noise. This assessment assumes that temporary noise barriers would be installed at the HDD sites listed in table 4.11.2-1 and that mufflers would be installed on engines.

Minor long-term noise impacts are expected from compressor station operation during the life of the Project and would not result in a significant effect on the noise environment. These minor impacts would result from the normal operation of compressor station equipment, as well as from blowdown events.

Table 4.11.2-2

REX East Project Estimated Noise Levels at Noise-Sensitive Areas Near the Proposed Compressor Stations

Location / Noise-Sensitive Area (NSA)	Ambient DNL (dBA)	L_{eq} Attributable to New Station (dBA)	DNL Attributable to New Station (dBA)	DNL Attributable to New Station and Background (dBA)	Noise Increase at NSA (dBA)
Arlington Compressor Station a/					
NSA1	58.4	47.1	53.5	59.6	1.2
Bertrand Compressor Station b/					
NSA1	37.8	34.1	40.5	42.4	4.6
NSA2	41.2	42.8	49.2	49.8	8.6
Mexico Compressor Station c/					
NSA1	35.5	36.9	43.3	44.0	8.5
NSA2	38.5	31.5	37.9	41.2	2.7
NSA3	35.5	29.8	36.2	38.9	3.4
Blue Mound Compressor Station d/					
NSA1	46.6	42.0	48.4	50.6	4.0
NSA2	46.6	31.4	37.8	47.1	0.5
NSA3	46.6	30.7	37.1	47.1	0.5
Bainbridge Compressor Station e/					
NSA1	43.5	44.0	50.4	51.2	7.7
NSA2	43.8	40.3	46.7	48.5	4.7
NSA3	45.3	40.3	46.7	49.1	3.8
NSA4	47.6	35.9	42.3	48.7	1.1
Hamilton Compressor Station f/					
NSA1	70.0	40.7	47.1	70.0	0.0
NSA2	66.1	37.3	43.7	66.1	0.0
NSA3	63.9	31.0	37.4	63.9	0.0
Chandlersville Compressor Station g/					
NSA1	47.7	43.6	50.0	52.0	4.3
NSA2	47.3	42.6	49.0	51.2	3.9
NSA3	47.0	41.6	48.0	50.6	3.6

a/ Hoover and Keith, 2007b.
b/ Hoover and Keith, 2007c.
c/ Hoover and Keith, 2007h.
d/ Hoover and Keith, 2007d.
e/ Hoover and Keith, 2007e.
f/ Hoover and Keith, 2008.
g/ Hoover and Keith, 2007g.

To ensure that noise levels from operation of the Project facilities do not adversely impact surrounding areas, therefore, **we recommend that:**

- **Rockies Express make all reasonable efforts to ensure its predicted noise levels from the Arlington, Bertrand, Mexico, Blue Mound, Bainbridge, Hamilton, and Chandlersville Compressor Stations are not exceeded at nearby NSAs and file noise surveys showing this data with the Secretary no later than 60 days after placing each of the Arlington, Bertrand, Mexico, Blue Mound, Bainbridge, Hamilton, and Chandlersville Compressor**

Stations in service. However, if the noise attributable to the operation of the Arlington, Bertrand, Mexico, Blue Mound, Bainbridge, Hamilton, or Chandlersville Compressor Stations at full load exceeds a DNL of 55 dBA at any nearby NSAs, Rockies Express should file a report on what changes are needed and should install additional noise controls to meet the level within 1 year of the in-service date. Rockies Express should confirm compliance with this requirement by filing a second noise survey with the Secretary no later than 60 days after it installs the additional noise controls.

4.12 RELIABILITY AND SAFETY

The transportation of natural gas by pipeline involves some risk to the public in the event of an accident and subsequent release of gas. The greatest hazard is a fire or explosion following a major pipeline rupture.

Methane, the primary component of natural gas, is colorless, odorless, and tasteless. It is not toxic, but is classified as a simple asphyxiate, posing a slight inhalation hazard. If breathed in high concentration, oxygen deficiency can result in serious injury or death.

Methane has an ignition temperature of 1,000 degrees Fahrenheit and is flammable at concentrations between 5.0 percent and 15.0 percent in air. Unconfined mixtures of methane in air are not explosive. However, a flammable concentration within an enclosed space in the presence of an ignition source can explode. It is buoyant at atmospheric temperatures and disperses rapidly in air.

4.12.1 Safety Standards

DOT is mandated to provide pipeline safety under Title 49, U.S.C. Chapter 601. The Pipeline and Hazardous Materials Safety Administration (PHMSA) Office of Pipeline Safety (OPS) administers the national regulatory program to ensure the safe transportation of natural gas and other hazardous materials by pipeline. It develops safety regulations and other approaches to risk management that ensure safety in the design, construction, testing, operation, maintenance, and emergency response of pipeline facilities. Many of the regulations are written as performance standards, which set the level of safety to be attained and allow the pipeline operator to use various technologies to achieve safety. PHMSA ensures that people and the environment are protected from the risk of pipeline incidents. This work is shared with state agency partners and others at the federal, state, and local levels. Section 5(a) of the Natural Gas Pipeline Safety Act provides for a state agency to assume all aspects of the safety program for intrastate facilities by adopting and enforcing the federal standards, while Section 5(b) allows a state agency that does not qualify under Section 5(a) to perform certain inspection and monitoring functions. A state may also act as DOT's agent to inspect interstate facilities within its boundaries; however, DOT is responsible for enforcement action. Most states have either Section 5(a) certifications or Section 5(b) agreements, while nine states act as interstate agents.

The DOT pipeline standards are published in 49 CFR Parts 190–199. Part 192 of 49 CFR specifically addresses natural gas pipeline safety issues.

Under a Memorandum of Understanding on Natural Gas Transportation Facilities (Memorandum) dated January 15, 1993 between DOT and the FERC, DOT has the exclusive authority to promulgate federal safety standards used in the transportation of natural gas. Section 157.14(a)(9)(vi) of the FERC's regulations requires that an applicant certify that it will design, install, inspect, test, construct, operate, replace, and maintain the facility for which a Certificate is requested in accordance with federal safety standards and plans for maintenance and inspection, or shall certify that it has been granted a waiver of the requirements of the safety standards by DOT in accordance with Section 3(e) of the Natural Gas Pipeline Safety Act. The FERC accepts this certification and does not impose additional safety standards other than the DOT standards. If the Commission becomes aware of an existing or potential safety problem, there is a provision in the Memorandum to promptly alert DOT. The Memorandum also provides for referring complaints and inquiries made by state and local governments and the general public involving safety matters related to pipelines under the Commission's jurisdiction.

The FERC also participates as a member of DOT's Technical Pipeline Safety Standards Committee, which determines if proposed safety regulations are reasonable, feasible, and practicable.

The pipeline and aboveground facilities associated with the Project must be designed, constructed, operated, and maintained in accordance with the DOT Minimum Federal Safety Standards in 49 CFR Part 192. The regulations are intended to ensure adequate protection for the public and to prevent natural gas accidents and failures. Part 192 specifies material selection and qualification, minimum design requirements, and protection from internal, external, and atmospheric corrosion.

Part 192 also defines area classifications, based on population density in the vicinity of the pipeline, and specifies more rigorous safety requirements for populated areas. A class location unit is an area that extends 220 yards on either side of the centerline of any continuous 1-mile length of pipeline. The four area classifications are defined as follows:

Class 1: Location with 10 or fewer buildings intended for human occupancy.

Class 2: Location with more than 10 but fewer than 46 buildings intended for human occupancy.

Class 3: Location with 46 or more buildings intended for human occupancy or where the pipeline lies within 100 yards of any building, or small well-defined outside area occupied by 20 or more people at least 5 days per week for 10 weeks in any 12-month period.

Class 4: Location where buildings with four or more stories aboveground are prevalent.

Class locations representing more populated areas require higher safety factors in pipeline design, testing, and operation. Pipelines constructed on land in Class 1 locations must be installed with a minimum depth of cover of 30 inches in normal soil and 18 inches in consolidated rock. Class 2, 3, and 4 locations, as well as drainage ditches of public roads and railroad crossings, require a minimum cover of 36 inches in normal soil and 24 inches in consolidated rock. All pipelines installed in navigable rivers, streams, and harbors must have a minimum cover of 48 inches in soil or 24 inches in consolidated rock.

Class locations also specify the maximum distance to a sectionalizing block valve (i.e., 10 miles in Class 1, 7.5 miles in Class 2, 4 miles in Class 3, and 2.5 miles in Class 4). Pipe wall thickness and pipeline design pressures, hydrostatic test pressures, MAOP, inspection and testing of welds, and frequency of pipeline patrols and leak surveys must also conform to higher standards in more populated areas.

Preliminary class locations for the REX East Project have been developed based on the relationship of the pipeline centerline to other nearby structures and manmade features. Table 4.12.1-1 shows the area classifications for the Project. Approximately 89 percent of the proposed pipeline route would cross Class 1 locations, approximately 9 percent of the route would cross Class 2 locations, and only 2 percent of the route would cross Class 3 locations. No Class 4 areas would be crossed by the REX East Project.

If a subsequent increase in population density adjacent to the right-of-way indicates a change in class location for the pipeline, Rockies Express would reduce the MAOP or replace the segment with pipe of sufficient grade and wall thickness, if required to comply with the DOT code of regulations for the new class location.

Table 4.12.1-1

Pipe Class Location by County

State	County	Class 1 (miles)	Class 2 (miles)	Class 3 (miles)	Total (miles)
MISSOURI	Audrain	15.8	0.0	0.0	15.8
	Ralls	4.0	0.0	0.0	4.0
	Pike	23.3	0.0	0.0	23.3
Subtotal		43.1	0.0	0.0	43.1
ILLINOIS	Pike	27.8	0.0	0.4	28.2
	Scott	15.1	0.0	0.0	15.1
	Morgan	20.1	0.0	0.0	20.1
	Sangamon	26.3	0.0	0.0	26.3
	Christian	18.4	0.0	0.0	18.4
	Macon	21.0	0.0	0.0	21.0
	Moultrie	15.4	0.0	0.0	15.4
	Douglas	25.9	0.0	1.3	27.2
	Edgar	23.5	0.0	0.0	23.5
Subtotal		193.5	0.0	1.7	195.2
INDIANA	Vermillion	8.1	0.6	0.0	8.7
	Parke	19.6	1.1	0.3	21.0
	Putnam	19.0	0.0	0.0	19.0
	Hendricks	11.3	5.8	0.4	17.5
	Morgan	12.6	2.0	0.0	14.6
	Johnson	20.3	0.0	0.0	20.3
	Shelby	19.4	0.0	0.0	19.4
	Decatur	18.2	0.0	0.0	18.2
	Franklin	24.5	3.3	0.0	27.8
Subtotal		153.0	12.8	0.7	166.5
OHIO	Butler	13.2	12.7	6.0	31.9
	Warren	14.9	6.0	1.9	22.8
	Clinton	14.2	0.0	0.0	14.2
	Greene	2.8	0.0	0.0	2.8
	Fayette	21.5	1.9	0.0	23.4
	Pickaway	21.5	2.3	0.3	24.1
	Fairfield	9.5	12.3	2.7	24.5
	Perry	14.1	3.2	0.7	17.9
	Muskingum	23.0	2.4	0.0	25.4
	Guernsey	19.6	0.0	0.0	19.6
	Noble	6.7	0.0	0.0	6.7
	Belmont	14.3	1.5	0.0	15.8
	Monroe	3.7	1.6	0.0	5.3
Subtotal		179.0	43.8	11.5	234.3
Project Total		**568.6**	**56.6**	**13.9**	**639.1**

NOTE: The numbers is this table have been rounded for presentation purposes. Totals may be off by 0.1 place.

Per Rockies Express' request, PHMSA granted a waiver of compliance from the pipeline safety regulation that prescribes the design factor to be used in the design formula for steel pipe (FR, July 11, 2006). Rockies Express requested a variance to increase the design factor for a natural gas pipe from a design factor of 0.72 to a design factor of 0.80 (i.e., decreasing pipe wall thickness) in Class 1 locations. A higher design factor allows Rockies Express to increase pressures and therefore improve pipeline efficiency. In response to comments received on the draft EIS, we have included this waiver as appendix L of this EIS.

The waiver also grants Rockies Express relief from equipment requirements for pressure-relieving and limiting stations. The Grant of Waiver provides all of the required conditional control and prevention measures (supplemental safety criteria) necessary to mitigate the increased risks associated with using a thinner wall pipe. Rockies Express would follow the measures set forth in the Grant of Waiver.

In 2002, Congress passed an act to strengthen the Nation's pipeline safety laws. The Pipeline Safety Improvement Act of 2002 (HR 3609) was passed by Congress on November 15, 2002, and signed into law by the President in December 2002. No later than December 17, 2004, gas transmission operators must develop and follow a written integrity management program that contains all the elements described in Section 192.911 and addresses the risks on each covered transmission pipeline segment. Specifically, the law established an integrity management program that applies to all high consequence areas (HCAs). DOT (68 FR 69778, 69 FR 18228, and 69 FR 29903) defines HCAs as they relate to the different class zones, potential impact circles, or areas containing an identified site as defined in Section192.903 of the DOT regulations.

OPS published a series of rules from August 6, 2002 to May 26, 2004 (69 FR 29903) that defines HCAs as areas where a gas pipeline accident could do considerable harm to people and their property and requires an integrity management program to minimize the potential for an accident. This definition satisfies, in part, the Congressional mandate in 49 U.S.C. 60109 for OPS to prescribe standards that establish criteria for identifying each gas pipeline facility in a high-density population area.

The HCAs may be defined in one of two ways. In the first method, an HCA includes:

- Current Class 3 and 4 locations;
- Any area in Class 1 or 2 where the potential impact radius[1] is greater than 660 feet and there are 20 or more buildings intended for human occupancy within the potential impact circle;[2] or
- Any area in Class 1 or 2 where the potential impact circle includes an identified site.[3]

In the second method, an HCA includes any area within a potential impact circle that contains:

- Twenty or more buildings intended for human occupancy; or
- An identified site.

Once a pipeline operator has determined the HCAs on its pipeline, it must apply the elements of its integrity management program to those segments of the pipeline within HCAs. The DOT regulations specify the requirements for the integrity management plan at Section 192.911. The HCAs have been determined based on the presence of Class 3 locations. Of the 639.1 miles of proposed pipeline route,

[1] The potential impact radius is calculated as the product of 0.69 and the square root of the MAOP of the pipeline in psi multiplied by the pipeline diameter in inches.

[2] The potential impact circle is a circle of radius equal to the potential impact radius.

[3] An identified site is an outside area or open structure that is occupied by 20 or more persons on at least 50 days in any 12-month period; a building that is occupied by 20 or more persons on at least 5 days per week for any 10 weeks in any 12-month period; or a facility that is occupied by persons who are confined, are of impaired mobility, or would be difficult to evacuate.

Rockies Express has identified approximately 14 miles that would be classified as an HCA. The pipeline integrity management rule for HCAs requires inspection of the HCAs along the entire pipeline every 7 years.

Part 192 prescribes the minimum standards for operating and maintaining pipeline facilities, including the requirement to establish a written plan governing these activities. Under Section 192.615, each pipeline operator also must establish an emergency plan that includes procedures to minimize the hazards in a natural gas pipeline emergency. Key elements of the plan would include procedures for:

- Receiving, identifying, and classifying emergency events, gas leakage, fires, explosions, and natural disasters;
- Establishing and maintaining communications with local fire, police, and public officials, and coordinating emergency response;
- Emergency shutdown of system and safe restoration of service;
- Making personnel, equipment, tools, and materials available at the scene of an emergency; and
- Protecting people first and then property, and making them safe from actual or potential hazards.

Part 192 requires that each operator establish and maintain liaison with appropriate fire, police, and public officials to learn the resources and responsibilities of each organization that may respond to a natural gas pipeline emergency, and to coordinate mutual assistance. The operator must also establish a continuing education program to enable customers, the public, government officials, and those engaged in excavation activities to recognize a gas pipeline emergency and report it to appropriate public officials. Rockies Express would provide the appropriate training to local emergency service personnel before the pipeline is placed in service. No additional specialized local fire protection equipment would be required to handle pipeline emergencies.

Landowners near Monroe, Ohio submitted comments on the draft EIS asking about the safety of compressor stations. In addition to pipeline safety standards, 49 CFR Parts 192.731 and 192.736 establishes guidelines for inspections, hazardous materials storage, and monitoring at compressor stations. Rockies Express compressor stations would be constructed with gas and fire detection equipment inside the compressor buildings, which would have the ability to automatically shut down the compressor station, close the valves isolating the station from the pipeline, and vent the gas inside the compressor station to a location that would not create a hazard. Individual pieces of equipment such as compressors would be equipped with sensors and control systems that would shut down the equipment if there were an indication of an impending failure. A telemetry system would notify personnel locally and at the gas control headquarters about the activation of safety systems and alarms, who would in turn instruct maintenance personnel to investigate and take proper corrective action. Rockies Express' operations personnel would be located to facilitate all pipeline operations, including emergency response.

Scoping comments were received regarding the safety of the pipeline and blasting at nearby quarries that exist near MP 347.5 in Shelby County, Indiana. The effects of blasting from a source, such as a quarry, should not compromise the integrity of the pipeline, or present a danger to health or to the environment, provided the blasting pattern used is designed by qualified professionals. Furthermore, Rockies Express has established procedures to address possible damages that may result from blasting near the pipeline. These procedures include specifications for damage inspection, repair, and leakage

surveys to verify the integrity of the pipeline. Other comments received cited concerns on the effects of earthquakes on pipeline safety. See section 4.1.3 for a discussion on earthquake effects on pipelines.

Comments were received concerning the safety of using the HDD crossing method to install the pipeline under the Sny Levee (associated with the Mississippi River crossing). Rockies Express has agreed to install the pipeline over the top of the levee using conventional construction methods and its Plan, with some additional measures to protect the integrity of the levee. These measures include a 12-inch gravel base overlaid by geotech fabric in the trench to assist with distributing the weight of the pipe, and at least 3 feet of cover with an additional 6 inches of gravel over the top to assist with erosion control. Additional discussion of this issue is provided in section 3.4.1 and section 4.8.5. With the pipeline installed over the levee, there may be settling. After installation of the pipeline, Rockies Express would install survey monuments on the levee for settlement monitoring. Rockies Express has indicated that these surveys would be conducted every six months for a period of two years and the results of the surveys would be provided to the Sny Levee District. However, to ensure the reliability and safety of the pipeline and Sny Levee, **we recommend that:**

- **Rockies Express file with the Secretary and the Sny Levee District the survey results for levee settlement monitoring every 6 months for a period of 5 years after installation over the levee.**

4.12.2 Pipeline Accident Data

Since February 9, 1970, 49 CFR Part 191 has required all operators of transmission and gathering systems to notify DOT of any reportable incident and to submit a report on form F7100.2 within 20 days. Reportable incidents are defined as any leaks that:

- Caused death or a personal injury requiring hospitalization;
- Required taking any segment of transmission line out of service;
- Resulted in gas ignition;
- Caused estimated damage to the property of the operator, or others, or both, of a total of $5,000 or more;
- Required immediate repair on a transmission line;
- Occurred while testing with gas or another medium; or
- In the judgment of the operator was “significant,” even though it did not meet the above criteria.

DOT changed reporting requirements after June 1984 to reduce the amount of data collected. Since that date, operators must report only incidents that involve property damage of more than $50,000, injury, death, or release of gas, or those that are otherwise considered “significant” by the operator. Table 4.12.2-1 presents a summary of incident data for 1970 to 1984, as well as more recent incident data for 1986 through 2005, recognizing the difference in reporting requirements. The 14.5-year period from 1970 through June 1984, which provides more data and more basic reporting information than subsequent years, has been subject to detailed analysis, as discussed in the following sections (Jones, et al., 1986).

During the 14.5-year period, 5,862 service incidents were reported over the more than 300,000 total miles of natural gas transmission and gathering systems nationwide. Service incidents, defined as failures that occur during pipeline operation, have remained fairly constant over this period with no clear upward or downward trend in annual totals. In addition, 2,013 test failures were reported. Correction of test failures removed defects from the pipeline before operation.

Additional insight into the nature of service incidents may be found by examining the primary factors that caused the failures. Table 4.12.2-1 provides a percentage distribution of the causal factors, as well as the annual frequency of each factor per 1,000 miles of pipeline in service.

Table 4.12.2-1

Natural Gas Service Incidents by Cause

	1970 – 1984		1986 – 2005	
	Incidents per 1,000 Miles of Pipeline	**Percentage**	**Incidents per 1,000 Miles of Pipeline**	**Percentage**
Outside force	0.70	53.8	0.10	38.5
Corrosion	0.22	16.9	0.06	23.1
Construction or material defect	0.27	20.8	0.04	15.4
Other	0.11	8.5	0.06	23.1
Total	**1.30**	**100%**	**0.26**	**100%**

The dominant incident cause is outside forces, comprising 53.8 percent of all service incidents. Outside forces incidents result from the encroachment of mechanical equipment such as bulldozers and backhoes; earth movements due to soil settlement, washouts, or geologic hazards; weather effects such as winds, storms, and thermal strains; and willful damage. Table 4.12.2-2 shows that human error in equipment usage was responsible for approximately 75 percent of outside forces incidents. Since April 1982, operators have been required to participate in One Call public utility programs in populated areas to minimize unauthorized excavation activities in the vicinity of pipelines. The One Call program is a service used by public utilities and some private-sector companies (e.g., oil pipelines and cable television) to provide pre-construction information to contractors or other maintenance workers on the underground location of pipes, cables, and culverts. The 1986 through 2005 data show that the portion of incidents caused by outside forces has decreased to 38.5 percent.

Table 4.12.2-2

Outside Forces Incidents by Cause (1970–1984)

Cause	Percentage
Equipment operated by outside party	67.1
Equipment operated by or for operator	7.3
Earth movement	13.3
Weather	10.8
Other	1.5

The pipelines included in the data set in table 4.12.2-2 vary widely in terms of age, pipe diameter, and level of corrosion control. Each variable influences the incident frequency that may be expected for a specific segment of pipeline.

The frequency of service incidents is strongly dependent on pipeline age. While pipelines installed since 1950 exhibit a fairly constant level of service incident frequency, pipelines installed before that time have a significantly higher rate, partially due to corrosion. Older pipelines have a higher frequency of corrosion incidents, since corrosion is a time-dependent process. Further, new pipe generally uses more advanced coatings and cathodic protection to reduce corrosion potential.

Older pipelines have a higher frequency of outside forces incidents partly because their location may be less well known and less well marked than newer lines. In addition, the older pipelines contain a disproportionate number of smaller diameter pipelines, which have a greater rate of outside forces incidents. Small diameter pipelines are more easily crushed or broken by mechanical equipment or earth movements.

Table 4.12.2-3 clearly demonstrates the effectiveness of corrosion control in reducing the incidence of failures caused by external corrosion. The use of both an external protective coating and a cathodic protection system, required on all pipelines installed after July 1971, significantly reduces the rate of failure compared to unprotected or partially protected pipe. The data show that bare, cathodically protected pipe actually has a higher corrosion rate than unprotected pipe. This anomaly reflects the retrofitting of cathodic protection to actively corroding spots on pipes.

Table 4.12.2-3
External Corrosion by Level of Control (1970–1984)

Corrosion Control	Incidents per 1,000 Miles per Year
Non-bare pipe	0.42
Cathodic protection only	0.97
Coated only	0.40
Coated and cathodic protection	0.11

4.12.3 Impact on Public Safety

The service incident data summarized in table 4.12.3-1 include pipeline failures of all magnitudes with widely varying consequences. Approximately two-thirds of the incidents were classified as leaks, and the remaining one-third were classified as ruptures, implying a more serious failure.

Table 4.12.3-1 presents the average number of annual fatalities that occurred on natural gas transmission and gathering lines from 1970 to 2005. Fatalities between 1970 and June 1984 have been

Table 4.12.3-1
Annual Average Fatalities—Natural Gas Transmission and Gathering Systems a/

Year	Employees	Nonemployees	Total
1970 – June 1984 b/	2.4	2.6	5.0
1984 – 2005 c/	-	-	3.6
1984 – 2005 c/	-	-	2.8 d/

a/ All data unless otherwise noted from U.S. Department of Transportation, 2006.
b/ Jones, et al. 1986.
c/ Employee/nonemployee breakdown not available after June 1984.
d/ Without 18 offshore fatalities occurring in 1989 – 11 fatalities resulted from a fishing vessel striking an offshore pipeline and 7 fatalities resulted from explosion on an offshore production platform.

separated into employees and nonemployees, to better identify a fatality rate experienced by the general public. Of the total 5.0 nationwide average, fatalities among the public averaged 2.6 per year over this period. The simplified reporting requirements in effect after June 1984 do not differentiate between employees and nonemployees. However, the data show that the total annual average for the period 1984 through 2005 decreased to 3.6 fatalities per year. Subtracting two major offshore incidents in 1989, which do not reflect the risk to the onshore public, yields a total annual rate of 2.8 fatalities per year for this period.

The nationwide totals of accidental fatalities from various manmade and natural hazards are listed in table 4.12.3-2 to provide a relative measure of the industry-wide safety of natural gas pipelines. Direct comparisons between accident categories should be made cautiously, however, because individual exposures to hazards are not uniform among all categories. Nevertheless, the average 2.6 public fatalities per year is relatively small considering the approximately 301,000 miles of transmission and gathering lines in service nationwide. Furthermore, the fatality rate is approximately two orders of magnitude (100 times) lower than the fatalities from natural hazards such as lightning, tornados, floods, and earthquakes.

Table 4.12.3-2

Nationwide Accidental Deaths a/

Type of Accidents	Fatalities
All accidents	90,523
Motor vehicles	43,649
Falls	14,985
Drowning	3,488
Poisoning	9,510
Fires and burns	3,791
Suffocation by ingested object	3,206
Tornado, flood, earthquake, etc., (1984–93 average) b/	181
All liquid and gas pipelines,	27
Gas transmission and gathering lines, Nonemployees only (1970–84 average)c/	2.6

a/ All data, unless otherwise noted, reflect 1996 statistics from the "Statistical Abstract of the United States 118th Edition" (U.S. Census Bureau, 1998).
b/ U.S. Department of Transportation, "Annual Report on Pipeline Safety - Calendar Year 1987."
c/ Jones, et al., 1986.

The available data show that natural gas pipelines continue to be a safe, reliable means of energy transportation. Based on approximately 301,000 miles in service, the rate of public fatalities for the nationwide mix of transmission and gathering lines in service is 0.01 per year per 1,000 miles of pipeline. Using this rate, the REX East Project might result in a public fatality every 156-plus years. This would represent a slight increase in risk to the nearby public.

4.12.4 Terrorism

We received comments during scoping regarding the susceptibility of the Project to terrorist attack. In the aftermath of the terrorist attacks that occurred on September 11, 2001, terrorism has become a very real issue for the facilities under the FERC's jurisdiction. The FERC, like other federal agencies, is faced with a dilemma in how much information can be offered to the public while still

providing a significant level of protection to energy facilities. Consequently, the FERC has removed energy facility design plans and location information from its Internet Web site to ensure that sensitive information is not readily available (Docket Nos. RM02-4-000 and PL02-1-000, issued February 20, 2003).

Since September 11, 2001, the FERC has been involved with other federal agencies in developing a coordinated approach to protecting the energy facilities of the United States and continues to coordinate with these agencies to address this issue. In addition, interstate natural gas companies are actively involved with several industry groups to chart how best to address security measures in the current environment. A Security Task Force has been created and is addressing ways to improve pipeline security practices, strengthen communication within the industry and the interface with government, and extend public outreach efforts.

Increased security awareness has occurred throughout the industry and the nation. The Office of Homeland Security was established with the mission of coordinating the efforts of all executive departments and agencies to detect, prepare for, prevent, protect against, respond to, and recover from terrorist attacks within the United States. The FERC, in cooperation with other federal agencies and industry trade groups, has joined in the efforts to protect the energy infrastructure, including the approximately 300,000 miles of interstate natural gas transmission pipelines. The Rex East pipeline system would be inspected by air and on the ground in accordance with DOT surveillance requirements, as discussed in sections 4.12.1 and 4.8.2. Security measures at the aboveground facilities would include secure fencing, locked buildings, security lighting, and automated alarm systems. Employees would be required to wear identification cards, and approved visitors would need to sign in and wear identification badges.

Safety and security are important considerations in any action undertaken by the FERC. The attacks of September 11, 2001 have changed the way pipeline operators, as well as regulators, must consider terrorism, both in approving new projects and in operating existing facilities. However, the likelihood of future attacks of terrorism or sabotage occurring along the Project pipeline, or at any of the myriad of natural gas pipeline or energy facilities throughout the United States, is unpredictable given the disparate motives and abilities of terrorist groups. The continuing need to construct facilities to support the future natural gas pipeline infrastructure is not diminished from the threat of any such future acts. Moreover, the unpredictable possibility of such acts does not support a finding that this particular Project should not be constructed.

4.13 CUMULATIVE IMPACTS

4.13.1 Introduction

The CEQ regulations for implementing NEPA require the FERC to consider the potential cumulative impacts associated with construction and operation of the REX East Project. Cumulative impacts are defined in the CEQ regulations at 40 CFR 1508.7 as "the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions regardless of what agency (federal or non-federal) or person undertakes such other actions." These actions can include previously approved or conducted actions as well as pending actions with the FERC or other federal, state, and local agencies, plus privately financed projects when they have overlapping impacts on the environmental resources that the REX East Project would substantially impact.

The commonly accepted reasons for completing a cumulative impact analysis are to use its results to reconsider and modify alternatives if adverse cumulative impacts have been identified and may be avoidable; to determine if additional or more appropriate Project mitigation is necessary; and to include effective monitoring of any impact(s) of concern in Project implementation.

Consequently, to meaningfully address and achieve these purposes and to avoid lengthy discussions of inconsequential impacts and projects, the cumulative impact analysis for the REX East Project was conducted in the following manner.

- The geographic scope and timeframe of the cumulative impacts analysis varied depending on the environmental resource category under consideration. For example, some resource impacts, such as water quality, forest fragmentation, wetlands, air quality, and wildlife, could occur far beyond the proposed pipeline corridor and thus a larger geographic area was used for analysis.

- The temporal range, or how far into the future the analysis looked, was based on whether the effects would be temporary, long-term, or permanent. Most impacts would occur during the construction phase of the REX East Project, projected to occur from May 2008 to December 2008, plus six additional months for two compressor stations to be completed. The temporal range was extended for any impacts due to construction or operation of the REX East Project that would result in long-term or permanent impacts. Examples of long-term or permanent impacts include conversion or loss of forests or forested wetlands and habitat fragmentation.

- Other federal, state, and local government and private actions having impacts on resources that overlap with impacts predicted as a result of the REX East Project were identified from information provided by Rockies Express, field reconnaissance, Internet research, scoping comments, and communications with federal, state, and local agencies. Where the analysis indicated a potential for cumulative impacts, information has been quantified to the extent feasible (e.g., acres of disturbed wetlands); however, the potential impacts from some actions can be described only qualitatively, especially those in the reasonably foreseeable future that are not yet clearly defined. In addition, not all quantitative information is additive because of different methodologies or regions of influence.

- Potential cumulative impacts are discussed for each resource category analyzed in the EIS. For each resource, first the direct and indirect impacts of the REX East Project are briefly summarized. Then, any past impacts from other projects on that resource are described.

Finally, any potential impacts from present and reasonably foreseeable future actions are considered.

4.13.2 Other Actions

Following is a description of existing or reasonably foreseeable actions that are expected to occur within the geographic and temporal boundaries set for the analysis and that therefore may contribute to cumulative impacts. Table 4.13.2-1 provides a summary of these actions including general locations, descriptions of the activities, and construction schedules.

Table 4.13.2-1
Other Projects and Activities Within the General Area of the Project

Project or Activity	Intersecting State/ County	Description	Anticipated Date of Construction/ Project Status
Energy Projects			
Texas Eastern Incremental Market Expansion II (TIME II) Project	OHIO Monroe Pickaway	Replacement of 6.4 miles and construction of 4 miles of natural gas pipeline	Completion in 2008
Panhandle Eastern's (PEPL) Tuscola East Replacement Project	ILLINOIS Douglas INDIANA Parke	Replacement of 31.3 miles and removal of 29.4 miles of natural gas pipeline and installation of new pig launchers/receivers	Construction began in summer 2007
Eastern Market Expansion Project	OHIO Hocking	Expansion of storage field capacity	A Notice of Availability was issued on October 1, 2007; completion estimated by spring 2009
REX West Project	NEBRASKA Phelps WYOMING Carbon	Construction of a 795.6-mile natural gas pipeline	Began late spring 2007; completion in December 2009/under construction
Keystone Oil Pipeline Project	MISSOURI Audrain	Construction of a 1,845-mile petroleum pipeline from Canada to the midwestern United States	Begin in 2008/under construction
Continuation of REX East Pipeline to Princeton, New Jersey	OHIO Monroe	Construction of 375-mile pipeline from the terminus of the REX East pipeline in Clarington, Ohio to Princeton, New Jersey	Issued a non-binding open season in October 2007; service on the proposed pipeline expected to start in late 2010
Dresden Energy Electric Facility	OHIO Muskingum	500-megawatt combined-cycle gas turbine electric generating facility	Completion expected in 2009 or 2010
Phelps County Ethanol LLC (PCE)	NEBRASKA Phelps	100-million gallon per year ethanol production plant	Began construction in July 2007
Other Small-scale Energy Projects	Project-wide	Construction of various energy projects, such as electric transmission lines, electric generating facilities, or intra-state pipelines	Varies

Table 4.13.2-1 (continued) Other Projects and Activities Within the General Area of the Project			
Project or Activity	**Intersecting State/ County**	**Description**	**Anticipated Date of Construction/ Project Status**
Highways and Roads			
I–69	INDIANA Morgan Johnson	Construction of a 2,100-mile long interstate highway	Tier 2 draft EIS in progress
Macon County Southeast Beltway	ILLINOIS Macon	Construction of a highway that would pass by the south side of Mt. Zion Village, Illinois	Right-of-way acquisition to begin in 2009
Small-scale Transportation Projects	Project-wide	Construction to expand existing road capacity (e.g., expand two lanes into four)	Varies
Other Projects			
Residential and Commercial Development	Project-wide	Construction of housing units and associated commercial buildings	Varies
Coal Mining	Project-wide	Coal extraction through strip mining and underground operations	Varies
COE Lock-and-dam Projects	MISSOURI Pike Ralls	Expansion of lock chamber capacity from 600 feet to 1,200 feet	Consideration for expansion in progress
Hunter Lake Water Supply Project	ILLINOIS Sangamon	Construction of a 3,010-acre supplemental water supply reservoir	Section 404 permit pending

Energy Projects

Texas Eastern Incremental Market Expansion II Project

On April 4, 2006, TETCO filed its application with the FERC for a Certificate for the Texas Eastern Incremental Market Expansion II (TIME II) Project (FERC Docket No. CP06-115). The TIME II Environmental Assessment was issued on March 30, 2007. The purpose of this project would be to construct, replace, and operate pipeline facilities in Ohio and Pennsylvania to provide a capacity of 150,000 Dth/d. The facilities would be in Pickaway and Monroe Counties, Ohio and Somerset, Bedford, Franklin, Bucks, Fayette, and Adams Counties, Pennsylvania. The REX East Project would cross through Pickaway and Monroe Counties, Ohio.

The TIME II Project has a proposed construction completion date in 2008. The TIME II Project would include the removal of 6.3 miles of 24-inch-diameter pipeline and replacement with 36-inch-diameter pipeline in Pickaway County, Ohio at the Five Points Discharge area, and construction of a 4-mile-long, new 36-inch-diameter pipeline loop in Monroe County, Ohio at the Berne Discharge area (FERC, 2007a). The REX East Project would run parallel to the TIME II Pipeline for all 6.3 miles of pipeline in Pickaway County and in close proximity to the 4 miles of pipeline in Monroe County.

Tuscola East Replacement Project on the PEPL Pipeline

PEPL's Tuscola East Replacement Project along the existing PEPL pipeline (FERC Docket No. CP06-428) was approved by the FERC on May 4, 2007. The Tuscola East Replacement Project consists of replacing about 31.3 miles of pipeline and abandoning or removing about 29.4 miles of existing pipelines corresponding to the new replacement lines in Douglas County, Illinois and Parke, Marion, Boone, and Hamilton Counties, Indiana. The REX East Project would run parallel to the PEPL pipeline, where the Tuscola East Replacement Project occurs, through the majority of Douglas County, Illinois and Parke County, Indiana.

In June 2007, Panhandle Eastern began construction for the Tuscola East Replacement Project, which includes the following activities:

Douglas County, Illinois – Tuscola 100 and 200 Lines

- replacing 6.7 miles of existing 20-inch-diameter pipeline with 36-inch-diameter pipeline;
- replacing 1.9 miles of existing 36-inch-diameter pipeline with 20-inch-diameter pipeline; and
- installing a new pig launcher/receiver.

Parke County, Indiana – Montezuma 100 Line

- replacing 6.6 miles of 20-inch-diameter pipeline with 36-inch-diameter pipeline; and
- installing a new pig launcher/receiver.

Eastern Market Expansion Project

On November 7, 2006 the NOI for Columbia Gas Transmission Corporation's Eastern Market Expansion Project (FERC Docket No. PF06-35) was issued (CP07-367; Certificate application filed on May 3, 2007). The Environmental Assessment was published in the Federal Register on October 9, 2007 (72 FR 57321). The project would consist of expanding storage field capacity in Hocking County, Ohio and Kanawha County, West Virginia; installing additional horsepower at compressor stations in West Virginia; and constructing three sections of a 26- to 36-inch-diameter pipeline loop for a total of 15.5 miles in Clay and Randolph Counties, West Virginia and Warren, Clarke, and Fauquier Counties, Virginia. Columbia Gas anticipates beginning construction by April 2008 with an in-service date of April 2009. The REX East Project would be located in Fairfield County, Ohio, which is directly north of Hocking County, Ohio. Both projects would cross the Hocking watershed and impacts would be cumulative if the construction schedules overlap, as described in the analysis below.

REX West Project

The REX West Project consists of facilities proposed by three interstate pipeline companies in three separate Certificate applications filed with the FERC. Rockies Express (Docket No. CP06-354-000) proposes the construction and operation of pipeline, compression, and ancillary facilities in Colorado, Wyoming, Nebraska, Kansas, and Missouri. TransColorado (Docket No. CP06-401-000) proposes construction and operation of new and expanded compression stations on its existing interstate natural gas pipeline system in New Mexico and Colorado. Overthrust, a wholly owned subsidiary of Questar Pipeline Company (Docket No. CP06-423-000) proposes construction and operation of pipeline, compression, and ancillary facilities in Lincoln and Sweetwater Counties, Wyoming. We view these three applications as related projects that are necessary components of a larger, combined natural gas transportation project referred to as the REX West Project. The FERC Certificate for the REX West

Project was issued on April 19, 2007; the REX West Project is under construction and was granted permission to commence deliveries on a portion of the project on December 27, 2007.

The purpose of the REX West Project is to provide natural gas transportation service from supply basins in the Rocky Mountains to demand-intensive markets in the Midwest. The REX West Project will transport natural gas from the Cheyenne Hub in Colorado to its terminus at the PEPL Company interconnect in Audrain County, Missouri, which would allow deliveries to various markets in the Midwest including Kansas City, St. Louis, and Chicago. Along the proposed route, Rockies Express will construct five interconnects for deliveries from the REX West Project pipeline to other pipeline systems. The REX West Project includes construction and operation of about 795.6 miles of natural gas pipeline and a total of 237,320 hp of new compression. Following completion of construction, the REX West Project will transport up to 1.5 million Dth/d of natural gas (or about 1.5 bcf/d). Cumulative impacts in areas where the REX West Project and the REX East Project would occur are described below. These locations would be in: Phelps County, Nebraska for the REX East Project Bertrand Compressor Station; Carbon County, Wyoming for the REX East Project Arlington Compressor Station; and Audrain County, Missouri, for the REX East Project Mexico meter station.

Keystone Oil Pipeline Project

The proposed Keystone Oil Pipeline would extend about 1,845 miles from Hardisty, Alberta, Canada, to midwestern markets in Wood River and Patoka, Illinois. It would have an initial nominal capacity to transport about 435,000 barrels per day of crude oil. The Keystone Oil Pipeline Project right-of-way would be collocated with the proposed REX West pipeline right-of-way. Potential cumulative impacts from these two pipeline projects are addressed in the REX West final EIS.[1] The proposed Keystone Oil Pipeline Project and the REX East Project both would be in Audrain County, Missouri, and the construction schedules would likely overlap. The projects would not be collocated along a shared right-of-way as the REX East Project would start east of Mexico, Missouri and the proposed Keystone Oil Pipeline would progress at a southeasterly route west of Mexico, Missouri. The draft EIS for the Keystone Oil Pipeline Project was published in the Federal Register August 9, 2007 (72 FR 44908).

Dresden Energy Electric Facility

OPSB granted Dresden Energy a Certificate of Environmental Compatibility and Public Need on February 12, 2001, for the construction of a 500-megawatt combined-cycle gas-turbine electric generating facility in northern Muskingum County, Ohio (OPSB, 2001). Construction of the facility has progressed slowly, but the facility is expected to become fully operable sometime in 2009 or 2010 (OPSB, 2007). Construction remains incomplete at the main facility's administration building but has been completed for the water processing facility, which includes a pump house on the Muskingum River. The underground pipes that deliver the water to this facility have also been completed; the pipes draw water from the Muskingum River (OPSB, 2007). On August 20, 2007, the Certificate of Environmental Compatibility and Public Need was transferred from Dresden Energy, LLC to American Electric Power (AEP) Generating Company, which purchased the facility earlier that month (OPSB, 2007; AEP, 2007). The REX East Project also plans to withdraw and discharge hydrostatic test water from and into the Muskingum River in Muskingum County, Ohio.

[1] The REX West Project was approved by the Commission in Docket Nos. CP06-354-000, CP06-401-000, and CP06-423-000 on April 19, 2007.

Phelps County Ethanol, LLC

Phelps County Ethanol, LLC is developing and constructing an ethanol plant on an 88-acre site southwest of Holdrege, Nebraska. Construction was scheduled to begin in July 2007. With an estimated annual grind of 40 million bushels, Phelps County Ethanol, Inc. would produce 100 million gallons of ethanol per year at this facility. This facility would be located about 1 to 2 miles from the proposed Bertrand Compressor Station.

REX East Pipeline Extension

Kinder Morgan Energy Partners and Sempra Energy are proposing a 375-mile extension of the REX East Project pipeline from its terminus in Clarington, Ohio, to Princeton, New Jersey. In October 2007 the companies issued a non-binding open season, soliciting bids from interested customers for contract terms of 10 years or more. Service on the proposed pipeline extension would start in January 2011. No indications of a timeline for pre-filing with the FERC have been given for this proposed project. Additional potential pipeline projects that may connect to the REX East Project pipeline, if built, are described in section 2.7. Most of these projects have yet to initiate pre-filing with the FERC.

Highways and Roads

Interstate 69

Interstate 69 (I-69) is part of a national proposal to connect the United States to Canada and Mexico by means of an interstate highway located in Arkansas, Indiana, Kentucky, Louisiana, Michigan, Mississippi, Tennessee, and Texas. This national corridor, designated by Congress in the Intermodal Surface Transportation Act of 1991, extends more than 2,100 miles. I-69 would traverse Morgan and Johnson Counties, southeast of Indianapolis, Indiana. The REX East Project would cross I-69 in Morgan County, and both the REX East Project and the I-69 Project would pass through Johnson County.

In December 2003, a final Tier 1 EIS for I-69 was issued; in March 2004, the Federal Highway Administration (FHWA) selected alternative 3C as the preferred alternative in its Record of Decision (FHWA, 2003, 2004). Alternative 3C runs from Evansville to Indianapolis, Indiana and is one of the easternmost alternatives analyzed in the final Tier 1 EIS. Alternative 3C was selected in part because it had the fewest impacts of the alternatives considered. For example, alternative 3C had the lowest impact on wetlands and farmland, and about 35 percent of this alternative would include upgrading an existing road, State Road (SR) 37, which would minimize social and environmental impacts.

Since 2004, Indiana's DOT (INDOT) has been conducting additional environmental surveys (INDOT, 2007). Analyses are currently being conducted for the Tier 2 draft EIS, which will examine three or four additional alternative highway routes and provide a more indepth analysis of the environmental impacts. The publication date for the Tier 2 draft EIS has not been finalized, although it may occur in the summer of 2008 (HNTB Corp., 2007). Therefore, the construction of the I-69 Project would occur after the REX East Project has been constructed, if approved by the FERC.

Macon County Southeast Beltway

The REX East Project would cross Macon County, Illinois to the south of the Village of Mt. Zion. This alignment would be in the same area as the county's proposed Southeast Beltway. The alignment for the beltway, although not final, is fairly certain at this time, and purchase of the right-of-way may begin in 2009.

Other Transportation Infrastructure Projects

Additional transportation projects that would result in new or expanded roadways have been identified in many of the counties that would be crossed by the REX East Project. However, most of these projects are relatively small, and would not result in significant impacts on the resources analyzed in this cumulative impacts analysis. Therefore, they are not described in individual detail in the analysis below. Examples of these smaller construction projects include the following:

- MacArthur Boulevard Extension Project in Sangamon County, Illinois. The MacArthur Boulevard Extension Project began construction in 2007 and will take about 2 years to complete. The project consists of 3.6 miles of a new, four-lane road with a new interchange at I-72 south of Springfield, Illinois (ILDOT, 2007).

- SR 73 in Clinton County, Ohio. SR 73 began construction in April 2007 and should be completed by April 2008. This project includes the construction of 1.4 miles of new road along the relocated SR 73 and the widening of U.S. 22/3 from two to four lanes (OHDOT, 2007).

Residential and Commercial Developments

The REX East Project would cross through several areas of ongoing and future residential development. The majority of these areas have been converted from farmland into residential developments, and to a lesser extent, forests and wetlands have also been directly and indirectly affected by such development (Johnson County Planning and Zoning, 1997; MDC, 2007c). The REX East Project would cross 10 planned residential and commercial developments that have been permitted but not yet constructed, many of which are located near waterbodies and other natural resources that would be affected by the REX East Project (see table 4.8.4-1). There has been rapid residential and urban growth in many areas outside of the REX East Project right-of-way. For example, from April 2000 to July 2004, there was a 12.6 percent increase in the number of new housing units in Johnson County, which is about double the statewide average of 6.3 percent (STATS Indiana, 2005).

Coal Mining

Coal deposits are located in the vicinity of the REX East Project. The REX East pipeline and facilities would be located in three coal-producing regions—the Interior, Appalachian, and Western regions. Coal is extracted in the Project area through surface strip mining and underground operations, including longwall mining. There has been a history of coal mining in the Project area since the 1800s and future mining projects are expected.

Navigation Projects

The REX East Project would cross the Mississippi River at its confluence with the Salt River. As part of a larger navigation proposal, the COE's existing Lock-and-dam projects that are located on the Mississippi River both upstream and downstream from the proposed pipeline crossing location are under consideration for expansion. The upstream Lock-and-dam is located at Saverton, Missouri and would be about 14 miles upstream from the Project. About 9 miles downstream from the REX East Project would be the COE's Lock-and-dam at Clarksville, Missouri. The COE's proposed expansions would extend the lock chambers from their current length of 600 feet to 1,200 feet to accommodate larger barges. A funding request for the proposal has been submitted to Congress. The construction period for the Lock-and-dam projects is unlikely to overlap with the construction period for the REX East Project.

Construction for the lock expansion may occur several years later, if all approvals and funding are received.

Hunter Lake Water Supply Project

The City of Springfield Office of Public Utilities in Sangamon County, Illinois has proposed developing Hunter Lake, a 3,010-acre supplemental water supply reservoir, for the city (COE, 2007). An EIS was prepared for the Hunter Lake Project and published in the Federal Register [65 FR 70568] on November 24, 2000 (COE, 2000). Currently, the COE Section 404 permit is pending the Illinois Environmental Protection Agency (IEPA) issuance of Section 401 water quality certification. In addition, the City Council is reviewing an engineering study of an alternative to the project. Presently, the timing of this project is unknown.

Other Projects

Other potential projects may exist, but they would be considered speculative and not reasonably foreseeable at this point. For example, the Eastern Shawnee Tribe is considering building a casino in Monroe, Ohio, but there has been no formal agreement on a specific location for the casino. In addition, the building of a casino has not been permitted by any local, state, or federal agency at this time.

4.13.3 Cumulative Impacts Analysis

Geology

Mineral Resources

Over the past 200 years, the REX East Project area has experienced impacts on and losses of geological resources due to resource extraction and development, including: building and crushed stone, sand and gravel, clay, peat, fluorite, lead, zinc, oil and gas, coal, salt, and mercury. Future mineral development would be permanently prohibited within the REX East Project right-of-way, and likely within a certain distance from the right-of-way due to safety reasons. Appropriate compensation for loss of geologic resources would be negotiated with affected landowners.

Generally, linear projects, such as pipeline and roadway construction, in the affected region would have impacts on mineral resources similar to those of the REX East Project. Mineral resources are not commercially exploited in areas where the REX West and the Eastern Market Expansion Projects would be in the vicinity of the REX East Project. The preferred alternative in the Tier 1 final EIS for the I-69 Project would pass through areas containing mineral resources such as oil, gas, sand reserves, limestone, coal, shale, clay, and gypsum. In the area where I-69 and the REX East Project would intersect, both projects would cross areas with sand and gravel pits. In Macon County, Illinois, where the Macon County Southeast Beltway Project would be located, the REX East Project would not cross areas with sand and gravel pits; sand, gravel, or crushed stone; or oil and gas wells.

Construction and operation of the Dresden Energy Electric Facility would not have an impact on local mineral resources.

The Hunter Lake Project would potentially limit access to geologic resources under the reservoir. The COE Lock-and-dam projects are not expected to impact geologic resources at the sites. Future urban and suburban development projects as well as small-scale transportation projects would also potentially have an impact on access to geologic resources.

We do not believe that the construction and operation of the REX East Project would add significantly to the cumulative impacts to mineral resources because of Rockies Express' proposed and our recommended mitigation plans.

Paleontological Resources

Historically, the affected region's paleontological resources have been affected by development, road construction, resource extraction, and unauthorized collection (MODNR, 2002; ILDNR, 2007a; Indiana Geology Survey, 2007; ODNR, 2007f).

As described in section 4.1.4, the Illinois State Museum identified areas in Illinois where the REX East route crosses potentially significant fossil assemblages. The potential to affect these paleontological resources would occur in the vicinity of other Illinois construction projects, such as the Tuscola East Replacement Project, Macon County Southeast Beltway, coal mining projects, and the Hunter Lake Project. These projects could have adverse cumulative impacts as a result of the exposure and potential loss of scientifically valuable fossils. However, we have recommended mitigation for the REX East Project that would reduce its potential for adverse impact.

Other pipeline projects, including TIME II and REX West; energy projects, including Dresden Energy Electric Facility; transportation projects, including I-69; and the COE Lock-and-dam projects would not lead to cumulative impacts on paleontological resources because they occur in areas with relatively low density fossiliferous formations.

The Eastern Market Expansion Project would impact marine limestone and terrestrial fossils associated with coal beds. However, these fossils are not rare, and are not geographically limited to Hocking County. Therefore, the impacts would be minimal. Future urban development projects and small-scale transportation projects would potentially have an impact on paleontological resources if they were to be built in areas where the resources occur.

We do not believe that the construction and operation of the REX East Project would add significantly to the cumulative impacts on paleontological resources because Rockies Express and the other projects would not necessarily cross the same fossil beds. In addition, we have recommended mitigation that would reduce impacts to the paleontological resources that Rockies Express would cross.

Soils

Historically, soils in the REX East Project area have been affected by erosion and sedimentation, decreased soil productivity, and soil loss due to agricultural activities, development, and resource extraction (MODNR, 2007b; Illinois Department of Agriculture, 2001; Indiana Department of Agriculture, 2007; ODNR, 2007e).

Other pipeline projects would have impacts similar to those of the REX East Project. Adverse cumulative impacts to soils could occur in areas where the REX East pipeline would be located near the Keystone Oil Pipeline, collocated with TIME II and the Tuscola East Replacement Projects, or where the REX East Project interconnects with the REX West Project. The Eastern Market Expansion Project will temporarily affect soils and the Keystone Project would cross areas with poor soil drainage along much of its proposed route in central Missouri.

Construction of the Dresden Energy Electric Facility in Muskingum County would also have a temporary impact on soils from grading activities and swale-and-ditch construction, but this would not occur during the same time period as construction of the REX East pipeline. The Hunter Lake Water

Supply Project would permanently impact 3,781 acres of cropland (COE, 2007). The I-69 Project, other smaller-scale transportation projects, and urban and suburban development would potentially impact soils and increase erosion due to cleared vegetation and bare soils.

Coal mining within the Project area could result in adverse cumulative impacts on soils as a result of increased erosion. Exposed loose soil and spoil in areas of active mining, and in abandoned mining sites that have not been successfully restored to pre-mining conditions, can result in increased soil erosion. Reclamation of abandoned mining sites, such as regrading the mine spoil to pre-mining contours, replacing the topsoil, and establishing a vegetation cover, would minimize erosion and impact to soils. Cumulative impacts to soil erosion could occur during construction of the REX East Project along the portion of the right-of-way that crosses abandoned mining sites that have not been restored to pre-mining conditions. Surface strip mining can also result in changes to the physical characteristics and a decrease in the diversity and activity of soil microfloral communities (Lawrey, 1997). These impacts would be localized.

Cumulative impacts from these projects and the REX East Project could occur, especially if the period of construction is similar and if activities occur in areas with highly erodible soils. Temporary or short-term increases in soil erosion could occur during construction. However, the REX East Project and the other pipeline projects would mitigate these impacts by implementing their own construction and mitigation plans.

In addition, projects with aboveground structures (buildings, including compressor stations) or pavement (roads or parking lots) would have a permanent impact on soils, by either permanent removal or covering of topsoil. This would include projects such as: REX East Project (compressor and meter stations); I-69 (road); Dresden and Phelps (buildings); and housing developments (residences).

Therefore, although we believe our mitigation would reduce the impacts on soils, construction and operation of the REX East Project would add to the cumulative impacts to soil resources.

Water Resources

Groundwater

Prior to 1900, groundwater in the REX East Project area was used primarily to supply the agriculture-driven economy. During the first half of the twentieth century, industry that relied upon groundwater supplies, such as mining and thermoelectric power plants, grew rapidly and began to adversely affect the groundwater supply. This trend continued through the twentieth century and water levels continued to decline into the 1950s.

Construction of the TIME II, REX West, Keystone, Tuscola East, and other pipeline projects could cause impacts similar to those described for the REX East Project. These impacts could include altering overland flow and groundwater recharge and contaminating groundwater from spills and HDD frac-outs. Cumulative impacts could occur in areas where the REX East pipeline would be collocated with or near another pipeline that is under construction.

The Dresden Energy Electric Facility would obtain water for operations from the Muskingum River. Depending on flow conditions within this river, withdrawal could affect the amount of water available for groundwater recharge.

Coal mining can result in impacts to groundwater due to subsidence-related fracturing and subsequent contamination of groundwater. In a study on the effect of longwall mining in Illinois, Booth

(2006) concluded that most upper aquifers are not affected by longwall mining, although groundwater levels often decline due to fracture dilation. The study found that the change in water levels frequently return to pre-mining conditions. Cumulative impacts to groundwater could occur if construction of the REX East Project overlaps with mining activities in areas where groundwater levels decline. However, this impact would be temporary.

Two locations were analyzed to estimate the impacts of the Hunter Lake Project on local groundwater levels, and this analysis concluded that there would be no impacts to the local water table due to development and operation of this project (Anliker, 1997).

Surface Water

Historical impairment and degradation of waterbodies within the REX East Project area have occurred primarily as a result of agricultural runoff, pollution from industry, channel modification, habitat modification, and resource extraction.

The REX East Project would cross 1,485 surface waters including 326 perennial, 447 intermittent, 689 ephemeral, 22 open water, and 1 classified as ephemeral/intermittent. Thirty-four of these crossings would occur at major and sensitive waterbodies (see appendix G) and Rockies Express proposes to cross 22 of them using the HDD method.

Impacts to surface water resources due to construction of the REX East Project and other pipeline projects would generally be similar. Instream construction would cause temporary increases in sedimentation. These impacts would be reduced by the mitigation measures required for the Project, including setbacks, sediment barriers, and streambank stabilization. Further, our Procedures include restoration and revegetation measures. Crossing waterbodies using HDD or other dry crossing methods would significantly reduce impacts to surface water resources.

The REX East Project and TIME II Project would cross several of the same waterbodies in Pickaway County, Ohio, including Dry Run; Big Darby Creek, a designated National Wild and Scenic River and an Outstanding State Water in the Ohio State Scenic Rivers Program; and tributaries to Big Darby Creek. Rockies Express and TIME II would use the HDD method to cross Big Darby Creek, thereby minimizing or avoiding impacts to the riparian corridor, stream banks, or surface water quality of Big Darby Creek. However, cumulative impacts could occur if both projects experience frac-outs, which would result in a short-term increase in sedimentation and turbidity. The Time II Project would minimize these impacts through implementation of its Frac-Out Contingency Plan. Similarly, Rockies Express would use its HDD Contingency and Frac-Out Plan (CD Document D) and Rockies Express has agreed to cross all tributaries of the Big Darby using a dry-ditch crossing method. The TIME II Project plans to cross Dry Run and the tributaries to the Big Darby Creek using the open-cut method. Cumulative impacts on water quality impacts could result if construction for both projects occurs within a similar timeframe, although the incremental impacts from the REX East Project would be minor because the REX East Project would cross the Big Darby Creek and all tributaries using HDD or dry-ditch crossing methods. Implementing both projects' mitigation plans during construction would minimize impacts.

The Hocking River, an impaired waterbody, would be crossed by the REX East Project in Fairfield County, Ohio and by an Eastern Market Expansion Project well line in Hocking County, Ohio. Rockies Express proposes to cross the Hocking River using the open-cut method and Columbia Gas would employ either an open-cut or a dry crossing method. Temporary cumulative impacts could occur if the projects' construction schedules overlap; however, such impacts would be minimized by implementing each company's Plan and Procedures.

Rockies Express would use the Muskingum River as a supply and discharge source for hydrostatic test water and the Dresden Energy Electric Facility would use the Muskingum River as a permanent water supply for operations. Rockies Express anticipates that the water withdrawal and discharge rate would be approximately 334 cubic feet per minute (2,500 gpm) from the Muskingum River. Rockies Express would not add any chemicals to the water. The Dresden Energy Electric Facility would withdraw a maximum of 13.3 cubic feet of water per second, which is approximately 0.2 percent of the river's average flow rate. The facility would discharge 4.5 cubic feet of water per second after proper treatment (OPSB, 2001). Potential cumulative impacts on surface water from the withdrawal and discharge of water may include the alteration of river flow and changes to water temperature and dissolved oxygen levels.

Residential and commercial development and transportation projects, including the I-69 Project, occurring near surface waters that would be crossed by the REX East Project could result in adverse cumulative impacts on water quality. For example, an EPA study of an Ohio watershed found that residential, industrial, and commercial construction projects were the major sources of stress (i.e., sedimentation, interference with flow regime, pollution) on the watershed, which can result in adverse, long-term effects (EPA, 2000).

Coal mining projects occurring near waterbodies that would be crossed by the REX East Project could result in adverse cumulative impacts on water quality as a result of increased sedimentation. Increased erosion occurs as a result of exposed loose soil and spoil in areas of active mining, and in abandoned mining sites that have not been successfully restored to pre-mining conditions. During periods of heavy rainfall, runoff from the mining sites can lead to significant increases in suspended-sediment concentrations, load rates, and yields within local watersheds (Bonta, 2000).

Constructing and operating the Hunter Lake Reservoir would result in a lake, which would change the surface water's physical conditions. For example, there may be a stronger temperature gradient and decreased dissolved oxygen levels. COE Lock-and-dam projects would have localized effects on water quality from dredging activities. Such impacts would include increased turbidity and sedimentation.

Construction of the described projects would contribute to the cumulative impact of the REX East Project. Impacts may result directly from disturbance of a waterbody due to the open-cut construction method, instream construction, potential spills of hazardous materials, and indirectly due to sediment transport from disturbed upland areas into waterbodies. However, the various projects would implement appropriate erosion controls, mitigation measures, and spill prevention to minimize or avoid these impacts. Furthermore, the REX East Project would cross several waterbodies by HDD or other dry crossing methods, which would further reduce impacts on surface water, thereby reducing cumulative impacts. Operation of the pipeline and road construction projects would not have long-term impacts on surface waters. We believe there would be cumulative impacts to surface water resources due to construction and operation of these projects, but the contribution from the REX East Project would be small.

Wetlands

Historically, the great majority of wetlands in Illinois, Indiana, Missouri, and Ohio have been converted or lost. For example, from the late 1700s to the mid-1980s, the percentage of wetlands lost in Illinois, Indiana, Missouri, and Ohio has been 85, 87, 87, and 90 percent, respectively (Dahl, 1990). The wetland loss in these states is approximately 32 to 37 percent above the national average within the continental United States (Dahl, 1990). Most historical wetland loss has been due to the draining of wetlands for agriculture (INDNR, 1996; OHEPA, 2007; MDC, 2004; Mitsch and Gosselink, 2000).

Current threats to wetlands include residential and urban development, hydrologic alteration, increased pollution, and competition from non-native species. Because of the extreme amount of historical wetland loss in the Midwest, natural resource agencies have determined that all remaining wetlands in Illinois, Indiana, Missouri, and Ohio should be considered important for conservation (INDNR, 1996; ILDNR, 2007b; MDC, 2004).

The REX East Project would permanently convert 5.6 acres of wetland, 5.3 acres of which are ecologically valuable palustrine forested wetlands and 0.3 acre of which are palustrine scrub-shrub wetlands. When construction is completed, these wetlands would eventually transition back to a functionally similar wetland. However, it may take 50 to 100 years or longer for forested wetlands to regenerate and 1 to 3 years for scrub-shrub wetlands to regenerate. Therefore, impacts to forested wetlands are considered long-term. Wetlands would be permanently affected by periodic maintenance activities within the permanent right-of-way.

The REX East Project and the Time II Project would be collocated in Pickaway and Monroe Counties in Ohio and both projects propose to cross Big Darby Creek at a similar location and time. There would be cumulative impacts to wetlands from the REX East Project and the Time II Project (see table 4.13.3-1). Both projects would cross Big Darby Creek using the HDD method and would be collocated. This would minimize impacts to the riparian corridor. If each project would cross Big Darby separately, but during similar timeframes, re-disturbance of the area by the second pipeline crossing could increase the length of time needed to restore and revegetate the area to its pre-construction condition.

Table 4.13.3-1

Cumulative Wetland Impacts from the REX East Project and the Time II Project in Pickaway and Monroe Counties in Ohio a/

Project	Area of Comparison	Wetlands	Temporary Impacts	Long-term and Permanent Impacts
Time II Project	Pickaway and Monroe Counties	Palustrine emergent	Less than 0.3 acre	0.1 acre
REX East Project	Pickaway and Monroe Counties	Palustrine emergent	1.9 acres	
		Scrub-shrub		0.1 acre
		Forested		2.9 acres

a/ FERC, 2007a.

The REX East Project and the Tuscola East Replacement Project along the PEPL pipeline would be collocated in Douglas County, Illinois and Parke County, Indiana. Table 4.13.3-2 summarizes wetlands affected by these projects. Both projects would permanently affect less than 1.0 acre of wetlands and both projects would implement their Plans and Procedures to mitigate impacts to wetlands.

The REX East Project and the Keystone Oil Pipeline Project would both occur in Audrain County, Missouri, but would not be collocated. Table 4.13.3-3 shows the wetland impacts that would occur from both projects in Missouri. Impacts to forested wetlands by the Keystone Oil Pipeline Project would require 6:1 compensatory mitigation for conversion and temporal loss.

The REX East Project would cross I-69 in Morgan County, Indiana and both the REX East Project and I-69 would pass through Johnson County, Indiana. Impacts to wetlands from I-69 would be different than pipeline projects because the permanent right-of-way would be wider and wetlands would

Table 4.13.3-2

Cumulative Wetland Impacts from the REX East Project and the Tuscola East Replacement Project in Douglas County, Illinois and Parke County, Indiana a/

Project	Area of Comparison	Wetlands	Temporary Impacts	Long-term and Permanent Impacts
Tuscola East Replacement Project	Douglas County and Parke County	Palustrine emergent Scrub-shrub		0.2 acre < 0.1 acre
REX East Project	Douglas County and Parke County	Palustrine emergent Forested	1.2 acres	 0.9 acre

a/ FERC, 2007b.

Table 4.13.3-3

Cumulative Wetland Impacts from the REX East Project and the Keystone Oil Pipeline Project in Missouri a/

Project	Area of Comparison	Wetlands	Temporary Impacts	Long-term and Permanent Impacts
Keystone Oil Pipeline	Missouri	All wetlands Forested	141 acres	31 acres 47 acres
REX East Project	Missouri	All wetlands Forested	8.0 acres	0.8 acre 5.6 acres

a/ DOS, 2007.

be permanently removed rather than temporarily affected or converted. Wetland impacts from the projects are summarized in table 4.13.3-4. If construction for both I-69 and the REX East Project occur within a year or two of each other, re-disturbance of wetlands in the area where the projects cross in Morgan County could increase the length of time needed to restore and revegetate the area to its pre-construction condition.

Table 4.13.3-4

Cumulative Wetland Impacts from the REX East Project and I-69 in Morgan County and Johnson County, Indiana a/

Project	Area of Comparison	Wetlands	Temporary Impacts	Long-term and Permanent Impacts
I-69 Preferred Alternative b/	Indiana	All wetlands Forested wetlands Scrub-shrub		75 acres 65 acres 5 acres
REX East Project	Morgan and Johnson Counties	Emergent	0.8 acre	

a/ FHWA, 2003.

b/ The preferred location for I-69 may be revised in the Tier 2 draft EIS (HNTB, 2007). Therefore, the amount of affected wetlands may change.

The REX East Project would cross the Hunter Lake Project in Sangamon, Illinois. Wetland impacts from the two projects are summarized in table 4.13.3-5. Wetlands in the Hunter Lake Project area would be permanently inundated by the enlarged Hunter Lake (COE, 2000). The Hunter Lake Project and REX East Project construction and operation would result in adverse cumulative impacts on wetlands within the Horse Creek and Brush Creek watersheds.

Table 4.13.3-5

Cumulative Wetland Impacts from the REX East Project and the Hunter Lake Project in Sangamon, Illinois a/

Project	Area of Comparison	Wetlands	Temporary Impacts	Long-term and Permanent Impacts
Hunter Lake Project	Horse and Brush Creeks watersheds	All wetlands		102 acres
		Forested		77.8 acres
REX East Project	Horse and Brush Creeks watersheds	Scrub-shrub	0.2 acre	
		Forested		0.1 acre

a/ COE, 2000.

Residential and urban development is one of the main threats to wetland conversion and deterioration (OHEPA, 2007). The land and water interface associated with the location of wetlands make them a desirable area for development, which often results in the direct loss and conversion of wetlands. Development could also increase indirect cumulative impacts on wetlands because changes to the land contours and increases in impervious surfaces can alter local hydrologic conditions over the longer term. In addition, runoff near urbanized areas often contains higher amounts of pollutants, nutrients, and pesticides that can degrade wetland habitats. Given the past trend of wetland loss from residential and urban development, and future predictions in residential growth within watersheds similar to those crossed by the REX East Project, residential and urban development would likely cause adverse cumulative impacts on wetlands.

Coal mining projects can result in cumulative impacts on wetlands. For surface strip-mining, the entire area is cleared of all vegetation that can lead to increased erosion and decreased water quality, as discussed above. Reclamation of abandoned mining sites, such as regrading the mine spoil to pre-mining contours, replacing the topsoil, and establishing a vegetation cover, act to minimize erosion and impacts to wetlands. Adverse cumulative impacts would occur in watersheds where the REX East Project and coal mining projects result in decreased water quality or loss of wetlands.

Given the widespread historical loss of wetlands, the projected development of pipelines and reservoirs, increased residential developments along the REX East Project right-of-way, and the Project's long-term and permanent impacts to forested wetlands, we believe that adverse cumulative impacts to wetlands would occur. However, we have minimized potential wetland impacts by reducing the construction right-of-way and evaluating alternative routes to avoid wetlands where practicable. Appropriate wetland compensation plans would be developed pursuant to COE permit requirements.

Vegetation

Historically, substantial loss of forested land has occurred in the REX East Project area. In the midwestern United States, the amount of forested land decreased substantially from the 1800s to the 1900s. Much of the original forested land has been converted for agriculture, urban/suburban

development, roads and highways, utility corridors, and other uses, which has resulted in the direct loss of forests and increased forest fragmentation. For example, in Indiana, forest cover declined more than 90 percent, from 19,500,000 acres in the 1800s to 1,500,000 acres in the early 1900s. Since the 1950s, the amount of forested area has increased 8.7 percent in Indiana, from 4,140,000 acres in 1950 to 4,501,300 acres in 1998. A similar trend of forest cover has also been documented in Missouri, Illinois, and Ohio. Although the total amount of forested area has increased slightly in the latter part of the 1900s, the size of forest patches has decreased over time. For example, a study in Illinois in the late 1980s indicated that the average size of a forest parcel is 358 acres, and 44 percent of all forest parcels in Illinois were less than 100 acres (Iverson et al., 1989). These smaller patches of forest provide poorer quality habitat than large parcels of forests, as described below in wildlife resources.

Construction for the REX East Project would temporarily disturb a total of 14,227.1 acres of vegetated lands, of which, 10,692.6 acres (75 percent) are agricultural land; 3,095.8 (22 percent) are forested lands; and 438.7 acres (3 percent) are herbaceous vegetation. Impacts would be short-term on herbaceous vegetation and agricultural lands, as they would regrow within 1 to 3 years. Impacts would be long-term with limited permanent impacts for forested areas, and it may take 50 to 100 years or longer to return to pre-construction conditions. Operations of the REX East Project would impact approximately 4,020.1 acres of vegetated land, of which, 2,953.9 acres (73 percent) are agricultural land; 885.7 (22 percent) are forested lands (including forested wetlands); and 180.7 acres (4 percent) are herbaceous vegetation (grassland areas including pasture land and emergent wetlands).

There is a higher likelihood of cumulative impacts to forested areas because these areas would require the greatest amount of time to regenerate and because, as compared to agriculture and herbaceous areas, forested areas are the least abundant vegetation type that would be impacted by the REX East Project. The REX East Project would cause adverse impacts to forested land within the Project area. Conventional construction would involve the clearing of vegetation in the construction right-of-way and disturbance of the surface through trenching. Following construction, Rockies Express has agreed to limit the maintained right-of-way to 30 feet in upland forested areas of fragmentation concern. The permanent right-of-way in these areas would include 10 feet in the center of the right-of-way that would be maintained in an herbaceous state, 10 feet on each side of the herbaceous area that could return to shrub/scrub habitat, and 10 feet on each side of the scrub-shrub areas that could return to forested habitat.

The TIME II Project and the REX East Project would affect forests as presented in table 4.13.3-6. Collocating the projects would minimize the conversion of forest acres, as well as the amount of new forest edge that would be created. In certain areas, Rockies Express proposes to leave a 10-foot wide strip in between its and the adjacent pipeline. Rather than centering its pipeline within the 50-foot-wide permanent right-of-way, Rockies Express would place it 40 feet from the abutting pipeline right-of-way.

Table 4.13.3-6

Cumulative Forest Impacts from the REX East Project and the Time II Project in Pickaway and Monroe Counties in Ohio a/

Project	Area of Comparison	Long term and Limited Permanent Impacts	Permanent Impacts
Time II Project a/	Pickaway County	4.5 acres	4.2 acres
	Monroe County	21.6 acres	19.2 acres
REX East Project	Pickaway County	53.6 acres	21.5 acres
	Monroe County	56.2 acres	22.5 acres

a/ FERC, 2007a.

In section 2.2.1 we recommend that Rockies Express center the pipeline within the permanent right-of-way in areas where it is currently shown within 10 feet of the edge of the permanent right-of-way.

The Tuscola East Replacement Project on the PEPL pipeline and the REX East Project would parallel each other through Douglas County, Illinois and Parke County, Indiana. Because the Tuscola East Replacement Project would be within an existing right-of-way, no forested areas would be affected by the PEPL pipeline in Douglas County, Illinois and Parke County, Indiana. The REX East Project would be collocated with the PEPL pipeline in these counties. Collocation of the right-of-ways would minimize the cumulative impacts to forests in these areas.

The REX West Project would involve clearing of trees within upland forest communities, which would result in adverse impacts to vegetation in forested areas. However, the effects would generally be small relative to the available habitat in the region. The Keystone Oil Pipeline Project would have a long-term impact on 538 acres of upland forests and permanently impact 119 acres of upland forests in Missouri.

The REX East Project would cross I-69 in Morgan County and both the REX East Project and I-69 would pass through Johnson County, Indiana. Both projects would increase fragmentation due to the linear nature of the disturbances. The preferred alternative for I-69 (alternative 3C) would directly affect 1,150 acres of forest and indirectly affect 325 to 400 acres of forest between Evansville and Indianapolis (FHWA, 2003). I-69 would also bring increased access to previously undeveloped locations, which may in turn induce secondary development in the area, such as the development of truck stops, restaurants, motels, residential communities, additional roads, utilities and associated power lines, and other infrastructure associated with suburban development. The REX East Project would temporarily affect 19.8 acres and 65.2 acres of forest during construction, and 7.9 acres and 26.1 acres of undisturbed forest would be permanently converted in Johnson and Morgan Counties, respectively. Adverse cumulative impacts due to forest loss and fragmentation could occur in Morgan and Johnson Counties, depending on the additional development that may occur if I-69 is built. Other small-scale transportation projects and urban and suburban development would likely cause adverse impacts to vegetation through site clearing for construction.

The proposed alignment for the REX East Project in Macon County, Illinois would pass around the south side of the Village of Mt. Zion, which is close to the area where the county's Southeast Beltway is proposed for construction. Construction of the Southeast Beltway would result in some direct loss of forests and would increase forest fragmentation. Additional permanent impacts and forest fragmentation in the REX East Project area would likely continue as urbanization often leads to new roads, utilities and associated power lines, additional residences, and other infrastructure. In Macon County, Illinois, the REX East Project would affect 13.9 acres of forest during construction and 5.6 acres would be permanently converted to maintain the permanent easement.

Coal mining projects can result in cumulative impacts on vegetation, since the entire mining area is often cleared of vegetation. Reclamation of abandoned mining sites, such as regrading the mine spoil to pre-mining contours and establishing a vegetation cover, would minimize impacts to vegetation. Recent studies examining the reclamation efforts in the Midwest have indicated that the diversity and species composition within reclaimed grasslands are significantly different than non-disturbed grasslands (DeVault et al., 2002; Scott et al., 2002). Cumulative impacts would occur in areas where the REX East Project and coal mining projects have resulted in the loss of vegetation.

The REX East Project would cross the site of the proposed Hunter Lake Reservoir in Sangamon County, Illinois. The proposed reservoir would permanently convert 1,526 acres of existing forest into

aquatic habitat (COE, 2000). This amount of forest represents a substantial portion of the existing forest within the Horse Creek and Brush Creek watersheds (COE, 2000). The REX East Project would cross 4,224.0 feet of undisturbed forest in Sangamon County, which would have a long-term effect on 11.4 acres and permanently convert 4.5 acres of forest to open habitat. The vegetation along this segment of the REX East Project would be re-disturbed permanently by the subsequent construction and operation of the Hunter Lake Project. Most cumulative impacts on vegetation would be short-term and not significant since most of the affected vegetation would be agricultural and herbaceous. However, due to the historic reduction of forests in the REX East Project area and because temporary disturbance of this resource would be long-term, cumulative impacts would be adverse. However, REX East Project development included evaluation of alignments that would minimize forest clearing and fragmentation, and the use of HDD crossing for several waterbodies would further minimize impacts on riparian areas. Impacts to forested areas would be further mitigated through Rockies Express' Implementation of the Conservation Guidelines (CD Document L). Therefore, although cumulative impacts on forests would be adverse, Rockies Express' proposed and our recommended mitigation would minimize cumulative impacts to the greatest extent practicable.

Given the historical loss and fragmentation of forested areas, the projected development of pipelines and reservoirs, increased residential development along the REX East Project right-of-way, and the Project's long-term and permanent impacts to forests, additional habitat loss would contribute to cumulative impacts on forested areas. Because of the historical loss and likely future loss and fragmentation of forested areas, further habitat loss and fragmentation need to be avoided, minimized, or mitigated. Therefore, we conclude that cumulative impacts to forested areas would occur. The incremental impacts contributed by the REX East Project would be substantially reduced as a result of implementing the Conservation Guidelines, which would mitigate impacts to forested areas.

Wildlife

General Wildlife Resources

Activities that have contributed to the historical decline of wildlife and wildlife resources within the Project area include unregulated hunting, fishing, and trapping, as well as extensive tracts of forests that been converted into agricultural land. Loss and fragmentation of wildlife habitat in recent decades are primarily a result of the increase in residential and suburban development, as described above for vegetation.

Construction and operation of the REX East Project along with other linear projects mentioned in table 4.13.2-1, such as pipelines and roadways, would temporarily displace mobile species and may result in direct mortality to immobile species. Long-term and permanent impacts to forested areas would result in a decline of habitat quality because of increased fragmentation. Impacts to wildlife from loss and fragmentation of forested habitats may adversely affect certain species of fauna and flora because biophysical conditions near the forest's edge can be significantly different from those found in the center or core of the forest. In addition, cleared areas may increase vulnerability and prevent some wildlife from safely migrating to various patches of forest and therefore impede the ability of some wildlife to forage, breed, or find refuge from predators. This potential for adverse impacts is greater for species that have limited habitat in the Project area or are otherwise more sensitive to disturbance. Collocating pipelines reduces the amount of new edge habitat that is created.

The Hunter Lake Project would directly and permanently affect wildlife because the terrestrial and aquatic habitat in the area would be altered significantly. Most of these affected wildlife species are mobile, wide-spread, and relatively common in Illinois.

I-69 and the Macon County Southeast Beltway would result in long-term and permanent loss of forested habitats. Direct impacts to wildlife would occur during operations if wildlife are struck by vehicles. Other small-scale transportation projects and urban and suburban development could cause similar adverse impacts to wildlife through forest fragmentation and loss of habitat, but on a smaller scale.

Construction and operation of these projects would not result in significant cumulative impacts on wildlife in general. Impacts would be more adverse where permanent or long-term impacts to forests or forested wetlands would occur, particularly where more forest edge would be created. However, the REX East Project would be collocated along existing rights-of-way where possible to minimize fragmentation to the extent practicable. Impacts would be further minimized through implementation of Rockies Express' Conservation Guidelines.

Raptors and Other Migratory Birds

In the past, forest fragmentation in the REX East Project area from land development and deforestation has resulted in a substantial decline in habitat availability and a decline in migratory birds. In addition, there has been a concurrent decline in some species of migratory birds that are most sensitive to such habitat alteration. Migratory BCC within the Project area that are sensitive to habitat fragment include the king rail, prothonotary warbler, cerulean warbler, hooded warbler, worm-eating warbler, Kentucky warbler, and Bewick's wren. These species are generally distributed throughout the Project area and there have been observances of many of these species in locations along the Project right-of-way that would be further fragmented. Of particular concern is one of the largest king rail populations in the Midwest that resides in or near the Ted Shanks State Wildlife Area in Missouri. The prothonotary warbler is thought to breed on islands and in bottomland forests in the Upper Mississippi Wildlife Refuge along the Illinois side of the Mississippi River (FWS, 2007d). FWS has expressed concern over forest fragmentation in four stretches of pipeline in Indiana that occur in or near known breeding sites for the cerulean warbler, and likely breeding sites for the worm-eating warbler, hooded warbler, and Kentucky warbler (FWS, 2007d). In several townships and counties crossed by the proposed pipeline in Ohio, species of concern include the cerulean warbler worm-eating warbler, hooded warbler, and Bewick's wren. These areas include Perry, Muskingum, Belmont, and Monroe Counties. A breeding pair of great blue herons was reported by landowners south of the Dry Fork Whitewater River, and another was reported east of Caesar Creek approximately 0.9 mile south of the Scioto River crossing in Pickaway County, Ohio.

Construction activities would start during spring 2008 and would overlap with the nesting season for many birds. Direct effects that would occur in breeding grounds and adjacent to nesting individuals during this time would include the loss of nesting trees, nests, and young. Indirect effects resulting from noise and human disturbance could result in nest abandonment, which would subsequently result in the chilling or mortality of eggs and young or premature fledging and ejection from the nest. Long-term and permanent impacts to forested habitats in this area would result in a cumulative impact on habitat quality in important breeding areas. Collocation of the pipelines within these counties, and adherence to the REX East Plan and Procedures, would minimize impacts to these species. Impacts would also be mitigated through the Conservation Guidelines (CD Document L), which would mitigate impacts to forested habitats.

In a letter received on September 12, 2007, FWS noted that the American golden-plover and Smith's longspur have nationally important staging areas in Edgar and Douglas Counties, Illinois, where the Tuscola East Replacement Project on the PEPL pipeline and REX East Project would be collocated. Neither species nests in these counties; instead they utilize the area for a number of weeks as a stopover during their migration from their wintering grounds in Patagonia to their summer breeding grounds in the

Arctic tundra. Therefore, forest fragmentation is not expected to adversely affect the American golden plover or Smith's longspur in this area.

As discussed in the vegetation sub-section above, a number of other projects within the cumulative impacts analysis boundary for the REX East Project would adversely affect forest resources that serve as raptor and migratory bird habitat. Thus, there is a potential for adverse cumulative impacts on these species resulting from the total loss of forested habitat from all of the projects combined when added to impacts caused by the REX East Project. However, the incremental impacts contributed by the REX East Project would be substantially reduced because we recommend that Rockies Express comply with the Conservation Guidelines developed in consultation with FWS (CD Document L), which would mitigate impacts to forested habitats and migratory birds.

Because multiple bald eagle nests have been identified along the proposed right-of-way, a more detailed analysis for this species is described below.

Bald Eagles

Historically, there may have been as many as 100,000 nesting bald eagles in the United States prior to the 1800s. By the 1940s, the population precipitously declined primarily due to loss of nesting habitats and hunting. In addition, the introduction of DDT had a large effect on the eagle population, as contaminated eagles failed to lay eggs or produced thin eggshells that broke during incubation. In recent years, the bald eagle population has greatly increased in part due to the ban of DDT in 1972 and from protection afforded under the ESA. For example, the number of documented breeding pairs from 1963 to 2006 has increased from 487 to 9,789. Due to the recovery of this species, the bald eagle was removed from the Endangered Species list on June 28, 2007.

Pipeline construction would have impacts on the bald eagle that are similar to those of the REX East Project. These impacts could include temporary displacement as a result of disturbing construction activities and the removal of roost trees. In addition, construction near waterbodies may temporarily disrupt foraging individuals. Transient bald eagles could be present in the area where the TIME II Project pipeline would be collocated with the REX East Project. In part because the bald eagles are transient and would likely avoid the Project areas during construction, the Ohio Field Office of FWS indicated that no impacts to this species are anticipated. The Tuscola East Replacement Project along the PEPL pipeline, which is also collocated with the REX East Project, is not likely to adversely impact bald eagles, and there are no known bald eagle nests within the vicinity of both projects (FERC, 2007b). The Keystone Oil Pipeline Project would cross through areas of bald eagle roosting habitat in Audrain County, Missouri. To mitigate potential cumulative impacts to bald eagles, we are recommending that Rockies Express consult with FWS and ODNR if bald eagles are observed in the Project area during construction activities as described in section 4.5.3.

There may be direct impacts adversely affecting bald eagles associated with the risk of death from vehicle collisions after the I-69 highway is constructed and becomes operational. I-69 may also impact bald eagles as a result of tree clearing in critical habitat and declining water quality due to increased erosion, sedimentation, contamination from pesticides, or other accidental chemical spills that could lower the abundance and diversity of fish that bald eagles prey on. Bald eagles were not reported in Morgan or Johnson Counties, Indiana where I-69 would cross the REX East Project. However, most bald eagles along the proposed highway were reported near White River, which the REX East Project would cross. Other small-scale transportation projects and urban and suburban development could cause similar adverse impacts to bald eagles.

Fisheries

The REX East Project would cross 1,485 waterbodies, all of which are warmwater fisheries and 59 of which are designated as fisheries of special concern, as defined by the MSFCMA. Temporary impacts to fisheries could result during construction from sedimentation, turbidity, blasting, erosion, water contamination from spills and frac-outs, and water withdrawal for hydrostatic testing or dust control. Rockies Express would mitigate these impacts by implementing its Plan (CD Document A) and Procedures (CD Document B), Blasting Plan (CD Document C), HDD Contingency and Inadvertent Release Plan (CD Document D), and SPCC Plan (CD Document E), as described in detail in section 4.6.1. As one mitigation measure, Rockies Express would not withdraw water from any state-designated exceptional waters or waterbodies designated as public water supplies (unless granted written permission from the appropriate federal, state, or local agency). As another measure, Rockies Express would designate restricted refueling areas in locations where the typical 100-foot buffer between fueling activities and waterbodies could not be maintained.

Historically, fisheries in the affected region have been adversely impacted by urban development, increased non-point source pollution, increased stormwater runoff, and the introduction of invasive species (MDC, 2007c; INHS, 2007; INDNR, 2007a; ODNR, 2007d).

Pipeline projects, including the Tuscola East Replacement Project, the TIME II Project, and the Keystone Oil Pipeline Project would have temporary impacts on local fisheries during the construction period and depending on the construction method used for crossing; but, longer-term adverse impacts would be minimal once construction was completed. Adverse impacts potentially include sedimentation and turbidity, removal of stream cover, introduction of water pollutants, entrainment of fish, or the introduction of new species. Hydrostatic testing in any of the pipelines would also have temporary impacts on fisheries due to withdrawal and discharge of the test water. Specifically, the TIME II Project and the REX East Project would cross the Big Darby Creek, which would potentially impact the health of the Darby Creek fisheries. However, this waterbody would be crossed by using HDD or microtunnelling. The REX East Project would cross Sugar Creek, which is recognized for having outstanding ecological importance in Indiana. We are recommending that it be crossed by a dry crossing method to minimize impacts. The REX West Project in the vicinity of the REX East Project does not impact any sensitive fisheries. Operation of these projects would not have significant cumulative impacts on fisheries. Disturbed construction work areas would be minimized and appropriate erosion controls would be installed and maintained.

The Dresden Energy Electric Facility, located in Muskingum County, Ohio could also potentially cause adverse impacts. It would divert 13.3 cubic feet per second of water, a diversion of 0.2 percent of the total average flow rate of the Muskingum River during operation. However, the Ohio Power Siting Board would approve the final route map, mitigation measures, and construction techniques for the water intake and discharge structures. These plans would place special emphasis on design features intended to minimize impingement and entrapment of aquatic organisms and to lessen any adverse impacts on aquatic life. Therefore, there would likely be mitigation measures to lessen the adverse impacts on fisheries and aquatic species during operation.

Construction of the I-69 Project could cause adverse impacts to fisheries. I-69 may have channel impacts, including channel realignments. Both direct disturbances at the construction site and habitat disruption from sediment downstream may result from instream work. Future residential and commercial development such as the Macon County Southeast Beltway Project and small transportation projects completed near fisheries would also have similar potential impacts on fisheries health.

The Hunter Lake Project is expected to cause major adverse impacts to local fisheries due to construction of new impoundments to convert the free-flowing stream to a lake-like condition. Species that require flowing water, well-oxygenated gravel/sand riffles for egg deposition, or other natural stream attributes would potentially be reduced in numbers or eliminated. Qualitative changes in the phytoplankton and periphyton flora are expected. A sewer pipeline that is part of the Hunter Lake Project would also have potential fishery impacts at 18 stream crossings. The COE Lock-and-dam projects would have impacts on fisheries where the expansion changes the water flow conditions.

Cumulative impacts on fisheries could occur if there is a decrease in water quality in waterbodies that would be affected by the construction and operation of the REX East Project and the identified other projects, as described in the surface water section. If these other projects have construction schedules that differ from the REX East Project, cumulative impacts on fisheries would be minimized. However, if construction is concurrent, it could contribute to cumulative sedimentation impacts on fisheries. However, these impacts would be short-term due to each project's use of mitigation measures and other revegetation plans and construction techniques to minimize impacts while crossing waterbodies, such as using equipment bridges, controlling sediments and erosion, and using crossing procedures. Cumulative impacts would also be significantly reduced for waterbodies that Rockies Express crosses using the HDD or other dry crossing methods.

Special Status Species

Consultation with FWS and field studies indicate that multiple federal special status species may be located within the REX East Project area. Cumulative impacts from other projects could result if special status species occur in areas where multiple projects occur in the same area. Lead agencies for federal projects would be required to consult with federal, state, and local agencies to determine which species may occur within its project area, to evaluate potential impacts on those species as a result of construction and operation, and to implement measures to avoid, minimize, or mitigate impacts on special status species and their habitats. Our analysis indicates that the cumulative impacts to federal special status species may occur for the Indiana bat and various threatened and endangered mussel species, as described in more detail below.

Indiana Bat

Human activities have been a major cause of declining bat populations throughout the REX East Project area. The decline of the Indiana bat is due in part to commercialization of roosting caves, human disturbance, and possible insecticide poisoning (FWS, 2007c). The present total population of this species is fewer than 360,000 with more than 85 percent hibernating at only 9 locations in Missouri, Indiana, and Kentucky. Within the range of the Indiana bat, there is currently less forest land than there was prior to European settlement (Smith et al., 2003). In addition, the loss of continuous core habitat in highly fragmented forests may result in degraded habitat quality for Indiana bats, especially near roosting habitats (FWS, 2007c). Some studies have shown that Indiana bats rely upon forested travel corridors when leaving and returning to roosting nests (Sparks et al., 2005).

The Indiana bat is federally endangered and listed as occurring in every county that would be crossed by the REX East Project. In addition, summer foraging and roosting habitat is known to be present along the pipeline route.

Residential and commercial development could have a cumulative indirect impact on Indiana bat habitat resulting in the loss of habitat and a decline in habitat quality with the increase in fragmentation. The current greatest single cause of forest conversion within the range of Indiana bat habitat is urbanization and development (USFS, 2007). A study by Sparks et al. (2005) suggests that Indiana bats

avoid highly populated residential and urban areas. Given the past trend of habitat loss from residential and urban development and future predictions in residential growth in areas surrounding the REX East Project corridor, residential and urban development may contribute to adverse cumulative impacts on the Indiana bat.

The TIME II Project would cross Big Darby Creek adjacent to the REX East Project right-of-way. In an initial survey near the proposed crossing, six Indiana bats were found, and four of the six were lactating (FERC, 2007a). In addition, FWS identified Big Darby Creek as important habitat for the Indiana bat. The presence of lactating females may indicate maternity colonies, which would be vulnerable to direct and indirect impacts from construction activities while crossing Big Darby Creek and working within the riparian zone. Construction of the pipeline and HDD crossings would temporarily increase noise levels, and deter the Indiana bat from the REX East Project area. This temporary adverse impact would be long-term if both projects cross the Big Darby Creek during a similar, but non-overlapping timeframe. The TIME II Project proposes to use the HDD method to cross the creek and has stated that no trees would be cleared in the Big Darby Creek riparian zone. Rockies Express would not affect the forested areas along Big Darby Creek since this waterbody would be crossed by using the HDD method and the entrance and exit points for the HDD would lie in open fields. However, the temporary noise impacts from construction of the REX East and TIME II Projects would contribute to cumulative adverse impacts on the Indiana bat in this area.

The REX West Project would affect Indiana bat habitat primarily in Missouri. REX West is evaluating avoidance measures in coordination with FWS and MDC and they would not initiate construction in areas identified as potential summer roosting areas from April 1 through September 31. Thus, adverse impacts would be minimized. The Keystone Oil Pipeline Project would also have impacts similar to the REX West Project. The REX East Project would also affect Indiana bat habitat in Missouri.

In consultation for the Tuscola East Replacement Project on the PEPL pipeline, FWS (Bloomington, Indiana and Marion, Illinois) stated that the PEPL pipeline is within the range of the Indiana bat and suitable habitat occurs in several areas along the right-of-way in Indiana. FWS suggested that PEPL refrain from clearing trees from April 1 to September 30 to avoid incidental take from removal of an occupied roost tree. However, adverse impacts to suitable habitat may still occur.

The Eastern Market Expansion Project would potentially impact Indiana bats. A mist net survey would be completed in its project area at appropriate locations, and the results would be provided to FWS for further evaluation and consultation.

The Indiana bat would potentially inhabit or use the Dresden Energy Electric Facility Project site for foraging, but individuals were not identified during project surveys. To minimize species impact during construction, no trees with exfoliating bark would be removed during the roosting season. Since the facility site is larger than 17 acres, FWS recommended that project construction occur in the area only from November 15 through March 31, and a survey must be completed to evaluate the percentage of suitable habitat that would remain within a 2-mile radius from the project center. Otherwise, a mist net survey must be completed. No impacts on Indiana bat populations are expected after construction is completed.

The I-69 Project may result in the following direct and indirect impacts to the bat and its habitat: forest conversion and fragmentation could lead to loss of roosting and foraging habitat; construction noise and vibration may cause bats to leave roosts, increasing predation; high-speed traffic could increase road kills; and hibernacula may be at greater risk of vandalism. In a revised Biological Opinion, FWS (2007a) determined that the I-69 Project is not likely to adversely affect the Indiana bat or its critical habitat. The acreages affected represent less than 1 percent of the available foraging and roosting habitat and the

FHWA's proposed mitigation and conservation measures would be implemented. I-69 would have temporary adverse impacts from construction noise, which would temporarily disturb the bats from their foraging and potential roosting habitat.

The Macon County Southeast Beltway, other small-scale transportation projects, and urban and suburban development, would also have potential adverse impacts on Indiana bat habitat as a result of construction activities. It would affect the bat if project construction results in disturbance to local caves and mines, small riparian corridors, or upland forest areas.

Quarry and mining operations can result in adverse impacts to the Indiana bat as a result of loss of roosting habitat, loss of summer foraging habitat, noise and other disturbance to hibernating bats, and physical alterations to hibernacula that may result from changes to cave environments (FWS, 2007c). Cumulative impacts on Indiana bat habitat would occur where mining activities and the REX East Project result in the loss and fragmentation of forested areas.

The environmental analysis for the Hunter Lake Project did not identify any impacts on the Indiana Bat.

Construction of COE Lock-and-dam projects would potentially temporarily adversely impact summer roosting habitat.

The REX East Project is not likely to adversely affect the Indiana bat because of recommended mitigation measures. Given the historical loss of habitat and the decline in Indiana bat populations, any impacts from noise and disturbance to roosting and summer habitat would add to cumulative impacts on the species.

Mussels

Historically, mussel species in the United States have been threatened by river damming, the introduction of chemicals and artificial nutrients from runoff, increased sedimentation due to changes in land use and urban development, and the introduction of exotic species to their habitat.

Along the proposed route, four species of mussels are federally listed as endangered: clubshell, northern riffleshell, fanshell, and fat pocketbook. There are also mussels that are candidate species and mussels listed as threatened and endangered by various states.

Clubshell and northern riffleshell populations have been identified within 1 mile of the pipeline route, but fat pocketbook and fanshell populations have not. Waterbodies that have not yet been surveyed are not likely to contain listed mussel species, so direct impacts on mussels are not expected. Crossing waterbodies using the open-cut method would temporarily adversely affect mussels. If a frac-out occurs during an HDD crossing, localized mortality for mussels in the immediate area of the frac-out may result due to increased turbidity. The Mississippi River crossing would involve the combined use of HDD techniques and instream dredging near Blackburn Island resulting in a minor impact on the turbidity in the Mississippi River, which may affect the listed mussels.

Due to the low likelihood of any mussel species being present at any of the river crossings, the construction measures, hydrostatic testing methods, and the location for water withdrawal that would be employed, and our recommendations, we have determined that the REX East Project would not likely adversely affect the clubshell, the northern riffleshell, or the fanshell mussels. However, indirect adverse impacts to mussels downstream of crossing areas could occur due to sedimentation associated with the open-cut construction method. The REX East Project would not affect the fat pocketbook.

The TIME II Project would potentially have adverse effects on the federally listed clubshell and riffleshell mussels, the state-listed fawnsfoot and snuffbox mussels, as well as the rayed bean mussel that may also be present in Big Darby Creek. However, a mussel survey would be completed for this project prior to construction, and mussel relocation would occur if any species were found. Big Darby Creek would not be used as a water source during hydrostatic testing.

Other pipeline and energy projects, including the Tuscola East Replacement Project, the Keystone Oil Pipeline Project, and the Eastern Market Expansion Project would not adversely affect mussel species. The clubshell and rayed bean mussels have a range that includes Parke County, Indiana, but they have not been identified in the Project area. The Dresden Energy Electric Facility would implement special precautions at its intake and discharge locations on the Muskingum River to minimize impacts on sensitive aquatic species during operation.

The I-69 EIS evaluated the potential impacts on two federally endangered mussel species that are also being evaluated for the REX East Project: fanshell mussels and the fat pocketbook. It concluded that no federally or state-listed endangered, threatened, or special concern mussels are in the area. After consulting with FWS, FHWA concluded that the construction and maintenance of the I-69 Project are not likely to adversely affect these mussels.

The Macon County Southeast Beltway, other small-scale transportation projects, mining activities, and urban and suburban development could cause adverse impacts on mussel species during construction and operation if they increase sedimentation to waterbodies containing mussels, or otherwise contribute to decreases in water quality.

Special status mussel species would not be affected by the creation of the reservoir for the Hunter Lake Project. COE Lock-and-dam expansion projects would have a localized, temporary effect on water quality, which would potentially impact downstream mussel populations during construction, if mussels are present in the area. If mussels are present where the dredging occurs, the dredging activities would cause direct impacts and mortality.

Cumulative impacts on mussels may occur if water quality declines due to the REX East Project and other project construction. Increased development and infrastructure construction around affected surface waters may result in a decline in water quality. For example, an EPA study found that in a watershed system in Ohio, residential, industrial, and commercial construction projects contributed to a decline in water quality and an increase in sedimentation and turbidity (EPA, 2000). Increased sedimentation can lead to eutrophication and loss of special status species such as threatened and endangered mussels. The REX East Project has developed Procedures to control erosion and sedimentation and by following these Procedures, Rockies Express would limit its indirect impact on mussels. Direct impacts to mussels would be minimized by the proposed HDD crossings of certain waterbodies with mussels and our recommendation that hydrostatic test water would not be withdrawn from waterbodies where endangered mussels could be impacted. Surveys would be completed to identify additional areas with freshwater mussels that would allow us to complete our consultation with FWS.

Other Special Status Species

Federally listed special status species identified in section 4.7.1, other than Indiana bat or mussels listed above, include the whooping crane, eastern massasauga, spectaclecase mussel, decurrent false aster, eastern prairie fringed orchid, prairie bush clover, and the running buffalo clover. State-listed special status species identified in section 4.7.2 include the bald eagle, greater prairie chicken, the loggerhead shrike, northern harrier, trumpeter swan, eastern hellbender, tonguetied minnow, variegate darter,

drummond's aster, and the fawnsfood, long-solid, rabbitsfoot, sharp-ridged pocketbook, snuffbox, and washboard mussels.

Historically, special status species in the REX East Project region have been affected by habitat destruction and land use change due to urban and suburban development; agricultural encroachment; over-hunting; water pollution from urban, industrial, and agricultural runoff; the construction of impoundments, channeling structures, and reservoirs; and the introduction of exotic species.

Federally Listed Species

Whooping cranes would potentially be encountered at the proposed REX East Bertrand Compressor Station during migration. A nonessential experimental population also migrates through the REX East Project area in Indiana and Ohio, and would potentially be affected by construction activities in the vicinity. The REX West Project will also have potential impacts on the whooping crane in parts of Nebraska in which hydrostatic testing would lower the water levels of waterbodies important to the species. However, we expect minimal cumulative impacts.

The eastern massasauga has the potential to occur along the route in Clinton, Fayette, Greene, and Warren Counties, Ohio. It is state-listed as endangered in Missouri, Illinois, Indiana, and Ohio. This snake species has been observed within 1 mile of the pipeline route area. Landscape fragmentation is expected to result from construction of the REX East Project and temporary habitat fragmentation is expected to result from Project construction. The eastern massasauga has a range that overlaps with the REX West pipeline in Missouri, but it does not overlap with the counties included in the REX East Project where this snake has a potential to occur. Therefore, we do not expect long-term cumulative impacts to the snake population.

The eastern prairie fringed orchid is listed as potentially occurring statewide in Illinois, in all counties containing dry/mesic/wet prairies. However, there are no known occurrences of this species within 1 mile of the pipeline route and there are no prairie regions in the general area of the REX East Project. The REX East Project is not likely to adversely affect the eastern prairie fringed orchid. The Tuscola East Replacement Project would potentially intersect east prairie fringed orchid populations in Douglas County, Illinois. However, mitigation and avoidance measures would be used to protect the species. Therefore, we do not expect adverse cumulative impacts to this species.

There are no known occurrences of prairie bush clover within 1 mile of the proposed REX East pipeline route, and no impacts are expected. Prairie bush clover populations may be crossed by the Tuscola East Replacement Project in Douglas County, Illinois. However, mitigation and avoidance measures would be used to protect the species. Therefore, we do not expect significant cumulative impacts to this species.

State-Listed Species

Historic populations of greater prairie chicken have been identified in Audrain County, Missouri. The REX West Project could potentially adversely impact the greater prairie chicken during its nesting season in areas of Nebraska and Missouri. Impacts would result from construction and increased exposure to human activity. The greater prairie chicken population in Audrain County, Missouri would be monitored and conservation measures developed in cooperation with MDC would be used. In other locations, mitigation and avoidance measures would be used, and construction in counties where the REX East Project would also be routed would not occur at the same time. The Keystone Oil Pipeline Project could potentially affect the greater prairie chicken. However, construction is not likely to affect nesting,

brood-rearing, or foraging greater prairie chickens, as this species is not likely to occur within the right-of-way of this project. We expect no significant cumulative impacts for this species.

Drummond's aster has historically been found in the REX East Project area. Drummond's aster has a habitat range that also overlaps with the TIME II pipeline. However, no aster populations were identified during surveys. If aster plants are identified during construction, fences would be placed around the plants to limit impacts. We expect no significant cumulative impacts for this species.

EISs or EAs published for the projects listed in table 4.13.2-1 do not indicate that there would be impacts to the following species: northern harrier, the trumpeter swan, the tonguetied minnow, loggerhead shrike, eastern hellbender, the variegated darter, the snuffbox, long-solid, fawnsfoot, washboard, rabbitsfoot, rayed bean and sharp-ridged mussels, running buffalo clover, and the decurrent false aster. The Macon County Southeast Beltway, other small-scale transportation projects, and urban and suburban development could have cause adverse impacts on these species during construction and operation if the species are present in the project areas.

Land Use and Visual Resources

Land Use

General Land Use

The majority of land in the REX East Project area is used for agriculture. Since early settlement, agricultural land has been one of the most valuable natural resources within the four states, and it continues to be. Three of the four states within the REX East Project area, Ohio, Indiana and Illinois, have more than 50 percent of their land area classified as prime farmland. The current trend in the past several years is a loss of farmland in each state.

In general, projects that have a permanent aboveground component, such as buildings, pavement, or lakes (which would inundate the land), would have more significant impact on agricultural land since they would preclude the use of the land for agriculture. For example, construction of the Phelps County Ethanol, Inc. Project would result in the permanent loss of 88 acres of farmland and the Bertrand Compressor Station, which would also be located in Nebraska, would result in permanent loss of 17.7 acres of agricultural land.

The I-69 Project would permanently affect 4,500 acres of agricultural land although not all of the land would be paved; most interstate rights-of-way are fenced off from adjacent agricultural fields.

The Hunter Lake Project would permanently alter current land use practices in its project area. Terrestrial lands would become aquatic, which would decrease agricultural uses and potentially increase recreational uses associated with the reservoir.

Mining in the Midwest has resulted in a loss of agricultural land (Foggin, 1977). Future mining in the location would also likely result in a loss of agricultural land.

Pipeline projects, except for the aboveground facilities (valves, compressor stations, and meter stations), would have only a short-term or temporary impact on agricultural land. In addition, since the aboveground facilities are relatively small (20 acres or less) in comparison to other projects in the area and the thousands of acres of farmland in the Midwest, their contribution to the cumulative impact is not significant.

Construction of projects may affect nearby residences. Pipeline construction would have temporary impacts including increased noise and dust and heavy vehicle traffic. These impacts are localized and since construction of these projects is not expected to occur in the same area at the same time, the effects of construction impacts would not be cumulative. Long-term impacts would include noise and air emissions. See the noise and air quality sections (below) for further discussion.

The cumulative effect of multiple contiguous easements is more apparent through forested areas than through agricultural lands. Multiple easements through agricultural areas would normally not impair the continued use of the land for cultivation or pasturing. That is, pipeline easements in agricultural areas typically continue in their function with little in the way of restrictions on the landowner. However, if land use conversion were intended as a future use, the landowner would face restrictions on structural development over the pipelines. Consequently, there would be some cumulative impact to landowners that are facing the addition of a new easement on their property.

Recreation and special land use areas could be temporarily impacted by construction noise and dust, and permanently impacted along the right-of-way by vegetative clearing for maintenance.

Wild and Scenic Rivers

The REX East Project and the TIME II Project would cross Big Darby Creek, a designated National Wild and Scenic River and an Outstanding State Water in the Ohio State Scenic Rivers Program, in the same area. Since both the REX East Project and Time II Project would cross Big Darby Creek using HDD or microtunneling methods, the riparian corridor, stream banks, surface water quality, special status species residing in or near the waterbody, and the waterbody's free-flowing condition would not be impacted. If the projects do not cross during similar timeframes, re-disturbance of the area by Rockies Express construction could increase the length of time needed to restore and revegetate the area to its pre-construction condition. Visual impacts would occur to creek visitors and recreationists during and immediately after the construction period at the drill sites; however, the impacts would be temporary and minor, as revegetation would occur at the workspace sites and use of the HDD or microtunneling methods to cross this waterbody would minimize or avoid impacts since right-of-way clearing across the waterbody would not be required. If a frac-out were to occur, the potential adverse impacts would be minimized through the Time II Project's Frac-Out Contingency Plan and the Rockies Express HDD Contingency and Inadvertent Release Plan (CD Document D). Therefore, the cumulative impact from the two projects would not be significant.

Visual Resources

The visual landscape of the Project area has changed dramatically over time, and has been most recently affected by increased development of both residential and commercial buildings. Industrial activities have also diminished visibility due to emissions haze. Roadbuilding requiring the removal of vegetation and the creation of the roadway have contributed to impacts on the beauty of historic and scenic locations.

Visual impacts associated with the REX East Project construction right-of-way and additional temporary workspace areas would include the removal of existing vegetation and the exposure of bare soils, as well as earthwork and grading scars associated with heavy equipment tracks, trenching, blasting, rock formation alteration or removal, and machinery and tool storage. Visual impacts would be greatest where the pipeline route would parallel or cross roads, trails, recreational waterbodies, overlooks, historic properties and districts, and where the pipeline right-of-way may be seen by passing motorists or recreational users. There would be permanent visual impacts in forested areas where the permanently maintained right-of-way would be a different vegetation type (lower lying herbaceous plants) than the

surrounding area (tall trees in forested habitats). There would also be permanent visual impacts at aboveground facility sites. However, Rockies Express would build the aboveground facilities on sites that are less than 0.06 acre in size and in areas that are sparsely populated and generally remote. About 59 percent of the REX East Project would be collocated with existing utility rights-of-way and about 75 percent would cross agricultural land. This would minimize visual impacts during operation because permanent changes to vegetation would be minimized. Therefore, the REX East Project would not significantly alter the visual resources of the areas crossed.

Energy projects, including the Eastern Market Expansion Project, Keystone Oil Pipeline Project, the Tuscola East Replacement Project, and TIME II Project would primarily have visual impacts that are similar to those of the proposed Project. However, the Tuscola East Replacement Project would have minimal visual impacts, because it would replace an existing pipeline and would affect a previously disturbed area and any aboveground structures built would be small. The TIME II and Keystone Oil Pipeline Projects would remove some vegetation from the pipeline corridor, and new facilities would become new visual impairments on the landscape.

The Dresden Energy Electric Project is expected to become operational in 2009 or 2010. It would require vegetation removal and construction on 30 acres of land. Two transmission lines will be constructed, primarily along previously disturbed areas. The new facility buildings would be visible from some locations, as would the intake and discharge sites along the western bank of the Muskingum River. The intake and discharge sites would disturb less than 0.25 acre of land, including a limited amount of riparian trees.

The preferred alternative for the I-69 Project would affect 5,860 acres of land, including 4,470 farmland acres and 1,150 forest acres. It would cross predominantly rural rolling to hilly terrain, passing through agricultural and grazing lands. All newly constructed sections of the roadway would create new aboveground visual elements in the landscape. Lighting from roadway lights, interchanges, and vehicles would create new night-time visual impacts. The Macon County Southeast Beltway and other smaller scale transportation projects would have similar visual impacts, though for a smaller area.

The Hunter Lake Project would change the viewshed from bottomland forests and farm fields to an aquatic landscape. The COE Lock-and-dam expansion projects would also have visual impacts along the riverbanks and downstream of the project during the time of construction. It would change the landscape adjacent to current facilities from vegetated areas to dam facilities due to expansion of the existing facility. This would not add new visual elements to the landscape, because existing facilities would be involved.

Future urban and suburban development and mining activities would also affect the visual resources of the project area through removal of vegetation or change of land use.

The REX East Project is not expected to have a significant cumulative impact on visual resources.

Socioeconomics

The REX East Project would temporarily affect employment, housing, property values, transportation, and the local economy and tax revenue in areas along the right-of-way during construction. Operation of permanent facilities would require a total of 20 employees, which would not significantly impact long-term population, housing, transportation, and economic trends in the area because this would be a relatively small increase.

Historically, the economy of the affected area has been supported by agriculture, manufacturing, resource extraction, service, education, tourism, and technology fields (Missouri Department of Economic Development, 2007; State of Illinois, 2007; IEDC, 2007; ODOD, 2007).

Transportation projects, including the I-69 Project, would greatly impact the socioeconomic characteristics in the REX East Project area, both adversely and beneficially. The preferred alternative for the I-69 Project could permanently beneficially impact transportation patterns in the area. It would have both benefits and adverse impacts on residences and commercial businesses depending on how it changed the flow of traffic around those areas, and it would adversely affect cemeteries and Amish communities. Construction activity would have a beneficial impact through substantial increases in employment.

The other pipeline projects, the TIME II Project, the Keystone Oil Pipeline Project, and Tuscola East Replacement Project, are expected to have impacts similar to the REX East Project. In counties where the REX East Project would overlap with the REX West Project, socioeconomic impacts are expected to be beneficial, based on the tax revenue that would accrue to the counties where the facilities would be located and on the new jobs created to run the compressor stations. Potentially negative impacts include temporary agricultural crop losses during construction, and increased demands on local highways and emergency services. Some disruption of traffic flows would be expected. Potentially adverse socioeconomic effects would include increased demand for public services and inexpensive housing could disproportionately affect lower income areas.

The Dresden Energy Electric Facility and the Eastern Market Expansion Project in Ohio would be permanent working facilities. The Dresden facility has displaced seasonal cottages and housing trailers along the water intake area. After the completion of construction, the facilities would create approximately 12 to 24 new permanent jobs in the region. This small increase in jobs would not have significant impacts on local public services or facilities.

The Macon County Southeast Beltway Project would occur only in a small section of the entire REX East Project area, and it is expected to have moderate positive socioeconomic impact on transportation patterns, residential areas and commercial businesses, but could also have adverse socioeconomic impacts if it moves traffic flow away from some businesses or into residential areas.

The Hunter Lake Project is expected to result in permanent adverse socioeconomic impacts from property tax loss and the displacement of 69 residences. However, the project would have beneficial impacts through increased employment. The REX East Project would have small permanent impacts on the socioeconomics in the area where the two projects occur, but would not result in any residential displacement. Thus, the REX East Project would have a very small incremental contribution to cumulative impacts in the Hunter Lake Project area. Construction of the COE Lock-and-dam expansion Projects would cause temporary adverse impacts on housing and transportation, and temporary beneficial impacts through employment increases with the influx of construction workers but would not have long-term socioeconomic impacts.

The REX East Project would not result in significant cumulative adverse impacts on the socioeconomics in the Project area.

Cultural Resources

Historically, cultural resources have been adversely affected by agriculture and land development activities, including the construction of buildings, roads, railroads, and utilities. Since NHPA was enacted in 1966, federally regulated projects, such as the pipeline projects described above, the Hunter Lake

Project, and the I-69 Project, have been required to conduct cultural resources surveys and identify historic properties that may be affected by those projects. In accordance with 36 CFR Part 800, the ACHP's regulations for implementing Section 106 of the NHPA, the lead federal agencies for those projects would consult with the appropriate SHPOs, Native American tribes, and other consulting parties, and mitigate impacts on any historic properties that may be adversely affected. Non-federal actions would need to comply with any identification procedures and mitigation measures required by the state.

Rockies Express has completed the cultural surveys for the proposed access roads, meter stations, laterals, and pipe/contractor staging yards. The majority of the proposed right-of-way has been surveyed, except where access has been denied. Phase II evaluations of sites are ongoing. To date, the REX East Project evaluations have identified 2, 14, 8, and 11 sites eligible for listing in the NRHP in Missouri, Illinois, Indiana, and Ohio, respectively.

The cultural resources survey for the TIME II Project found three archeological sites that were potentially NRHP-eligible, and one of those sites contained human remains, most likely of Native American origin. TIME II agreed to avoid all three sites. The human remains would be reburied following consultation with Native American groups. In a letter dated July 13, 2006, Ohio SHPO found that the TIME II Project would not adversely affect any of the three archeological sites.

The Tuscola East Replacement Project would have minimal impacts on cultural resources, because construction activities would occur on an existing right-of-way that has already been disturbed during previous construction. Illinois did not require cultural resources surveys, and no archeological sites were found during surveys for the Montezuma and Zionsville pipelines in Indiana. Cultural resource reports were submitted to the Indiana SHPO in November of 2006, and SHPO's comments are pending.

The Eastern Market Expansion Project could potentially cause adverse impacts on cultural sites through construction activities. Surveys for the project identified three aboveground architectural resources and one archaeology site in Ohio that are eligible for or listed on the NRHP. The company is currently in consultation with Ohio SHPO regarding impacts to the archaeological site.

The REX West Project completed archeological and historic surveys. In Wyoming, three archaeological sites were recommended as eligible for the NRHP. The REX West Project avoided one prehistoric site, and would have no effect on two historic properties, the historic Lincoln Highway and the Historic Union Pacific Railroad. None of the 19 archeological sites identified in Nebraska were eligible for the NRHP. In Missouri, five potentially eligible archaeology sites and one historic cemetery were identified within the pipeline corridor. Construction would attempt to avoid all culturally significant sites and monitoring would be done to guarantee that the sites are not adversely affected.

Eleven archeological sites, none of which are NRHP-eligible, are located within 1 mile of the Dresden Energy Electric Facility. Only one of the archeological sites is within the construction area for the facility. Another two potentially significant prehistoric sites fall along the water intake pipeline for the facility and would require a Phase II survey.

The Keystone Oil Pipeline Project would avoid all sites that are listed on or potentially eligible for listing on the NRHP based on operational plans that have been filed with Nebraska, Kansas, and Missouri SHPOs.

The preferred alternative for the I-69 Project would pass near 14 sites potentially eligible for the NRHP, one current National Register property, one Historic District, and one potentially eligible district. It would also pass near 190 recorded archaeological sites, of which 158 are prehistoric, 6 are historic, 16 have both historic and prehistoric components, and 10 are of undetermined cultural affiliation. The

Macon County Southeast Beltway and other small-scale transportation projects could have adverse impacts on archeological sites if construction occurs in areas with sensitive cultural areas.

The Hunter Lake Project includes 117 historic properties that are potentially eligible for the NRHP, 89 of which are located within inundation or shoreline impact areas. Historic properties within these impact areas cannot be avoided and would require a determination of effect. The additional 28 potentially eligible historic properties are located in upland areas where impacts are unlikely. Surveys would still need to be conducted for large areas of this project. The COE Lock-and-dam expansion projects would also have impacts on archeological sites if they fell within the expansion project. But, since these projects are still in development, their impact on cultural resources has not been assessed. Urban and suburban development could also have adverse impacts on archeological sites if the projects are constructed in areas with sensitive cultural and historical resources.

Although Phase I cultural resource surveys have not yet been completed for the REX East Project, surveys conducted to date have identified numerous sites that may be eligible for listing on the NRHP. Evaluation of eligibility and consultation with the various state SHPOs is ongoing. We anticipate that most NRHP-eligible sites would be avoided. For those eligible sites that cannot be avoided, appropriate consultation plans for documentation or data recovery to mitigate the adverse effects would be developed. Therefore, we do not expect significant cumulative impacts to cultural resources due to construction and operation of the REX East Project.

Air Quality and Noise

Air Quality

Air quality would be affected by construction and operation of the REX East Project and other reasonably foreseeable future projects. Construction of these projects would temporarily impact air quality by generating emissions from operation of fossil-fueled construction equipment and fugitive dust from land clearing, grading, excavation, concrete work, and vehicle traffic on paved and unpaved roads. However, the majority of impacts to air quality would occur during operation of these projects.

Construction of the TIME II, Tuscola East Replacement, Eastern Market Expansion, Keystone Oil Pipeline, Macon County Southeast Beltway, COE Lock-and-dam, and Hunter Lake Projects would occur in the same counties or AQMDs as portions of the REX East Project that would contain pipeline construction that are designated as attainment. The REX West Project would contain pipeline construction in the same attainment AQMDs as the Arlington and Bertrand Compressor Stations. The two compressor stations would have localized construction-related emissions for the duration of construction and permanent operating emissions that would meet all applicable air quality standards. Pipeline construction-related air emissions would be temporary and local in these areas. For these reasons, we believe the REX East Project would be unlikely to contribute significantly to cumulative air quality impacts in these areas.

The I-69 corridor in Indiana would occur in the same Indianapolis, Indiana non-attainment AQCR as a portion of the REX East Project. This region is currently proposed for redesignation to attainment/maintenance. The construction emissions associated with the Project in this region were compared with the General Conformity *de minimis* levels and were less than those levels; therefore, they do not require a full General Conformity Determination. Also, REX East Project facilities in this region would not include any new permanent emission sources (only construction-related emissions). Therefore, due to the construction-related, temporary and local emissions, comparison with General Conformity thresholds, the potential for redesignation to attainment, and no permanent emissions sources, the REX East Project would be unlikely to contribute significantly to cumulative air quality impacts in this area.

The Dresden Energy Electric Facility would be located in Muskingum County, Ohio, the same attainment AQCR as the Chandlersville Compressor Station and a pipeline portion of the REX East Project. Dresden Energy Electric would equip its natural gas turbines with low NO_x combustion and selective catalytic reductions to reduce NO_x emissions to 3.5 ppmvd and 21.9 ppmvd with fuel oil. The facility would run primarily on natural gas and would use inlet-air fogging when operating on fuel oil to control NO_x emissions. Also, the facility would install a continuous emissions monitoring system to monitor the emissions concentrations. The Chandlersville Compressor Station would use natural-gas-fired reciprocating engines that would have emissions below all standard required emissions levels for CO, SO_x, $PM_{2.5}$, PM_{10}, NO_2, and lead. Also, a preliminary screening analysis for the Chandlersville Compressor Station indicates that emissions would not cause an exceedence of the NAAQS. The pipeline portion of the REX East Project would not contribute any permanent operating sources. Due to the control devices or mitigation measures, the attainment status of the AQCR, the requirement for each facility to meet all applicable federal and state air quality standards and air permitting requirements, and the screening results for the Chandlersville Compressor Station, we believe that the cumulative impact to air quality due to the REX East Project would be relatively minor.

The Phelps County Ethanol plant would be located in the same attainment AQCR (Phelps County, Nebraska) as the Bertrand Compressor Station. The Bertrand Compressor Station would use natural-gas-fired reciprocating engines that would meet all emission requirements. A detailed dispersion modeling analysis, using EPA's approved AERMOD modeling system, indicates that emissions from the Bertrand Compressor Station would be well below the NAAQS. Furthermore, each of these two facilities would be required to meet all applicable federal and state air quality standards and air permitting requirements. Therefore, we believe that the REX East Project would be unlikely to contribute significantly to cumulative air quality impacts in this area.

Noise

Potential noise impacts associated with the REX East Project and those projects listed in table 4.13.2-1 would occur during construction and operation. Because of the linear nature of these projects, construction-related noise impacts would tend to be of short duration in a given area. Furthermore, because most construction activities would be limited to daylight hours, construction-related noise impacts would not occur at night for the most part. The REX East Project would cause potential impacts at NSAs near HDD sites. However, Rockies Express has committed to mitigation measures including a temporary noise barrier at least 16 feet high during HDD activities at sites with potential impacts.

Potential noise-related impacts during operation of the REX East Project and other pipeline projects listed in table 4.13.2-1 would primarily be limited to the vicinity of the associated compressor stations. As described in section 4.11.2, the estimated noise that would be generated by each of the proposed compressor stations would meet acceptable levels at the nearest NSAs, and we are recommending monitoring to ensure that no impacts occur. Noise emissions from compressor station operations may be additive with noise-generating elements of other reasonably foreseeable future projects if they are located near a common NSA. However, no other compressor station, roadway improvement, or other noise-generating source for the identified projects would be located within 1 mile of any of the proposed compressor stations. Therefore, we believe that cumulative impacts resulting from additional noise would be negligible.