5.0 CONCLUSIONS AND ADDITIONAL MITIGATION

The analysis presented in this Final EIS is based on information provided in 10 filings by TransCanada and was further developed from data requests; public and agency scoping; literature research; alternatives analysis; consultations with consulting parties under Section 106 of NHPA; government to government consultation with Indian tribes; and contacts with federal, state, and local agencies. Based on the information provided in Section 3.0 of this Final EIS and summarized below for each resource category, DOS concludes that the proposed Keystone Mainline Project and Cushing Extension, if designed, constructed, and operated in accordance with the Project Description in Section 2 of this Final EIS as amended by additional approaches and mitigations agreed to by Keystone as a result of this environmental analysis and as further amended by specific permit conditions to be assigned by the state and federal agencies with permit jurisdiction along the pipeline corridor would result in limited adverse environmental impacts. This conclusion assumes that the Keystone Mainline Project and Cushing Extension would be constructed and operated in accordance with applicable laws and regulations, and with Keystone's proposed CMR Plan (Appendix B) as amended prior to construction to include additional mitigation measures either agreed to by Keystone or included as permit conditions by regulatory agencies. Additional mitigation measures have been recommended through scoping and consultations with agency representatives, stakeholders, and the public that are not presently included in the CMR Plan (Appendix B). Keystone has agreed to many of these recommended measures, and they are summarized in the following subsections for each resource category.

5.1 GEOLOGY

5.1.1 Conclusions

The proposed project would not involve substantial topographical alteration and would not disturb any geological features protected by federal or state laws. Seismic activity is not expected to pose an unacceptable risk to the project.

The proposed pipeline route does not cross any active surface mines or quarries; however, it does cross 40 miles of underlying coal seams between Wood River and Patoka, Illinois, where coal is mined with underground methods (ENSR 2006a). The proposed route does not cross the well pads of any active oil and gas wells. Extraction of oil and gas resources would not be affected by routing operations because any new wells would be located outside of the pipeline ROW. The proposed pipeline would pass through deposits of sand, gravel, clay, and stone in North Dakota, South Dakota, and Nebraska but would restrict access to comparatively small areas of these deposits. In Kansas, Missouri, and Illinois, the proposed route lies adjacent to an existing pipeline, limiting impacts to potentially exploitable geologic resources.

A minimal risk of localized subsidence or collapse exists where the pipeline crosses karst formations or passes above historic coal mines. It is also possible that land clearing would increase the risk of erosion and localized landslides. Most of the proposed Keystone Project route is not located in landslide-prone terrain, but the proposed route does cross areas of high landslide potential, as described by NPMS at the Yankton and Mississippi River crossings. Keystone has considered landslide potential in its routing work and has selected crossings of these areas where the landslide potential is reduced.

Additional measures to protect geological resources are described in Section 5.1.2.

5.1.2 Additional Mitigation

(1) Keystone would prepare a blasting plan that is applicable to any locations where blasting would be necessary. Prior to construction, Keystone would file its blasting plan with applicable state or local jurisdictions, where required.

(2) Excavation and blasting along the ROW may uncover paleontological resources that may be of scientific value. Keystone would consult with the appropriate regulatory agencies in each state on the applicability and requirements for Paleontological Resource Protection Plans. Keystone would prepare and file plans addressing vertebrate fossils with any respective states, as may be required.

(3) There is a potential for rock slope instability in the vicinity of the Whitewater River crossing in Kansas. Keystone would complete site-specific crossing plans for this water body if required by the applicable regulatory agencies during federal or state permitting processes.

(4) Because national-scale karst maps may not be sufficiently detailed to identify all karst terrains along the pipeline corridor, Keystone would consult with the respective state geological survey departments to identify the most up-to-date sources of data on karst-related subsidence hazards along the proposed route.

(5) Because the proposed route does cross areas of high landslide potential, Keystone would follow TransCanada's Integrated Public Awareness (IPA) Plan. TransCanada's IPA Plan is consistent with the recommendations of API RP-1162; it includes distribution of educational materials to inform landowners of potential threats and information on how to identify threats to the pipeline. TransCanada has a toll-free telephone number (1-888-982-7222) in place for landowners to report potential threats to the integrity of the pipeline and other emergencies.

5.2 SOILS

5.2.1 Conclusions

Temporary or short term increases in soil erosion could occur during construction, particularly in areas classified as highly erosive. Receiving water bodies could be affected, and agricultural soils containing agrochemical products could be eroded. During construction, soil compaction is likely, increasing the possibility of runoff.

Approximately 17,000 acres of farmland or rangeland within the ROW would be taken out of production during the 18-month construction period. Some short- or long-term decreases in agricultural productivity are possible. In addition, tile drainage systems would be disturbed during construction. Keystone has proposed to avoid, replace, and/or repair any tile drainage system within the ROW.

There could be compaction-related decreases in productivity from non-agricultural vegetated land, particularly where soils are classified as hydric. It is also possible that boulders and rocks unearthed during construction would be concentrated near the surface at completion. There are also concerns that spills or leakage from equipment could contaminate soils. Keystone has proposed construction methods and mitigation measures to address these concerns.

In terms of operations impacts, differential settling around the proposed pipeline likely would be minor and would be addressed by mitigation measures. Soil temperature impacts would be limited to within

3 feet of the pipeline and would not result in serious soil moisture loss; mitigation would be adequately addressed through the additional measures included below.

5.2.2 Additional Mitigation

(1) In the CMR Plan (Appendix B), Keystone has proposed construction methods that are designed to minimize impacts resulting from soil erosion. The CMR plan does not include provisions for independent environmental inspection during construction. In areas where federal, state, and local authorities have jurisdiction, these authorities would provide oversight to ensure compliance with relevant permits. As a result of discussions with DOS and agency personnel during this environmental analysis, Keystone has agreed to designate at least one Environmental Inspector (EI) per construction spread, who would have the authority to stop work and/or order corrective action in the event that construction activities violate the provisions of the CMR Plan, landowner requirements, or any applicable permit. Prior to construction, the CMR Plan would be revised to include a description of the duties and authorities of the EIs. The CMR Plan would be further revised to include other additional mitigation measures agreed to by Keystone as a result of this environmental analysis and would also include any additional stipulations resulting from individual agency permitting procedures.

(2) Although as described in the CMR Plan, Keystone plans to minimize impacts on soil productivity that may result from construction activities, some short- to long-term decreases in agricultural productivity are possible. Keystone recognizes its responsibility to restore agricultural productivity on the pipeline ROW and to compensate landowners for demonstrated decreases in productivity that may result from any degradation of agricultural soils along the ROW. Keystone's easement agreements with landowners require Keystone to restore the productivity of the ROW and to compensate landowners for demonstrated losses from decreased productivity resulting from pipeline construction. Keystone has contacted each of the affected states' Departments of Agriculture. Only Illinois has requested that such a plan be prepared. An Agricultural Mitigation Plan has been developed and approved by the Illinois Department of Agriculture.

(3) Hydric and otherwise compaction-prone soils are particularly sensitive to the impact of construction activities during wet weather. Section 2.18 of the CMR Plan addresses the methodology to be utilized to determine when to restrict or stop work for wet weather and the methods to mitigate impacts of construction activities in wet conditions. Section 2.18 takes into account the depth of rutting by reference to whether rutting may cause mixing of topsoil and subsoil, on a location-specific basis. "Stop work" authority would be designated to the Chief Inspector but would be implemented when recommended by the EI. Section 2.18 also addresses construction procedures and mitigative measures to minimize compaction in wet conditions.

(4) Procedures to alleviate soil compaction as described in the CMR Plan may result in relatively excessive soil aeration and subsequent settling of soils within the ROW. Therefore, in the first year after construction, Keystone would inspect the ROW to identify areas of erosion or settling. Subsequently, Keystone will monitor erosion and settling through aerial patrols, which are part of Keystone's Integrity Management Plan, and through landowner reporting. Landowner reporting would be facilitated through use of Keystone's toll-free telephone number, which will be made available to all landowners on the ROW. Landowner reporting also may be facilitated through contact with Keystone's regional offices.

5.3 WATER RESOURCES

5.3.1 Conclusions

Overall, it is not anticipated that surface water or groundwater quality would be significantly affected by pipeline construction and normal operations, including disposal activities (such as disposal of hydrostatic test water), non-catastrophic spills, or minor leaks This conclusion assumes that Best Management Practices (BMP) as defined in the CMR Plan (Appendix B) as amended by additional measures agreed to by Keystone and any additional conditions on all applicable permits are conducted during pipeline construction and normal operations. Hydrostatic testing, which would involve the uptake and discharge of water, should not cause significant adverse impacts if Keystone's CMR Plan (Appendix B) is followed and if the discharges occur consistent with discharge permit conditions as determined by applicable regulatory authorities.

Many of the aquifers present beneath or in the vicinity of the proposed route are isolated by the presence of glacial till, which characteristically inhibits downward migration of water and contaminants into these aquifers. Although the pipeline has been routed to avoid most near-surface aquifers, in several areas shallow or near-surface aquifers are present beneath the proposed route. For these areas, measures have been proposed (such as containment structures) to reduce the potential impact of leaks and spills during construction. Keystone's CMR Plan (Appendix B) outlines procedures for contractor preparedness and emergency spill response to reduce the potential for contaminants to migrate into the aquifer during construction activities. Additionally, the risk of dewatering shallow groundwater aquifers or reducing groundwater quality through an increase in TSS during construction likely would be temporary, and these aquifers are expected to recover quickly following construction activities. Construction and normal operations therefore are not expected to result in a long-term significant impact on groundwater.

Keystone has proposed three construction methods for crossing surface water bodies: dry-cut methods, open cut wet crossings, and HDD. The HDD method would avoid any impacts on water bodies. The open cut wet method, involving trenching while water continues to flow, would entail a high risk of temporary siltation to streams and other water bodies. Dry-cut methods are not feasible for wider streams. The risks of open-cut trenching could be temporary (for the duration of construction) or longer term (where compromised stream bank stability or bank erosion occurs). Keystone's CMR Plan (Appendix B) includes several measures to reduce siltation and erosion. Additional measures are described in Section 5.3.2.

5.3.2 Additional Mitigation

(1) To ensure that groundwater resources are not negatively affected due to necessary blasting activities, Keystone's blasting plan would include provisions to avoid impacts to groundwater and to incorporate post-blasting testing for water wells within 150 feet of the centerline, to ensure that water wells are not negatively affected by blasting activities.

(2) To reduce impacts at crossings of larger water bodies where the HDD method is not proposed, Keystone would submit a site-specific Construction Mitigation and Restoration Plan for the following water body crossings: , Tongue River-North Dakota (MP 18), Sheyenne River-North Dakota (MP 167), James River-South Dakota (MP 424),, Shell Creek-Nebraska (MP 533), West Fork of the Big Blue River-Nebraska (MP 593), Turkey Creek-Nebraska (MP 600), Big Blue River-Kansas (MP 665), Platte River-Missouri (MP 765), Grand River-Missouri (MP 843), Little Blue River-Kansas (MP 4 Cushing Ext.), Smoky Hill River-Kansas (MP 77 Cushing Ext.),).

(3) Because the open-cut wet crossing method necessarily involves substantial disturbance and transport of sediments, these methods may not be appropriate to cross impaired or contaminated water bodies, water bodies upstream of HCAs, or sensitive or protected water bodies. Keystone would develop specific construction and crossing methods for open cuts in conjunction with COE permitting and USFWS consultation. Open-cut wet crossings can be an acceptable method at some of these water bodies. The appropriate method of crossing would be determined during permit consultation with COE and resource agencies as applicable.

(4) The implementation of appropriate measures to protect pipeline crossings from channel incision and channel migration can reduce the likelihood of washout-related emergencies, reduce maintenance frequency, limit adverse environmental impacts, and—in some cases—improve stream conditions. All water body crossings would be assessed by qualified personnel in the design phase of the Project with respect to the potential for vertical channel degradation and lateral channel migration. The level of assessment for each crossing would vary based on the professional judgment of the qualified design personnel. The pipeline would be installed as determined to be necessary to address any hazards identified by the assessment. The pipeline would be installed at the design crossing depth for at least 15 feet beyond the design lateral migration zone, as determined by qualified personnel. The design of the crossings also would include the specification of appropriate stabilization and restoration measures.

(5) Bank erosion rates can exceed several meters per year. Maintaining an adequate burial depth for pipelines 15 feet (5 meters) beyond either side of the active stream channel may necessitate bank protection measures that would increase both maintenance costs and environmental impacts. All water body crossings would be assessed by qualified personnel in the design phase of the Project with respect to the potential for vertical channel degradation and lateral channel migration. The level of assessment for each crossing would vary based on the professional judgment of the qualified design personnel. The pipeline would be installed as determined to be necessary to address any hazards identified by the assessment. The pipeline would be installed at the design crossing depth for at least 15 feet beyond the design lateral migration zone, as determined by qualified personnel. The design of the crossings also would include the specification of appropriate stabilization and restoration measures.

5.4 WETLANDS

5.4.1 Conclusions

Wetlands that would be affected within the ROW include emergent wetlands (403 acres), forested wetlands (80 acres), perennial riverine wetlands (37 acres), intermittent riverine wetlands (107 acres), and scrub-shrub wetlands (37 acres). While emergent wetlands would regenerate quickly after disturbance (within 3–5 years generally), forested and scrub-shrub wetlands would potentially experience long-term effects. Wetlands in parks or reserves have significant conservation value. Keystone would implement mitigation measures described in its CMR Plan (Appendix B), including restoration efforts in some cases. These are described in further detail in Section 3.4.3. Additional mitigation is described in Section 5.4.2.

5.4.2 Additional Mitigation

(1) In addition to the mitigation measures committed to by Keystone in the CMR Plan (Appendix B), all wetland areas within conservation lands or easements would be restored to a level consistent with any additional criteria established by the relevant managing agency.

(2) Implementation of the measures identified in Keystone's CMR Plan (Appendix B) would reduce impacts on wetlands. In addition, several other recommendations were made by USFWS staff during consultation. These recommendations are described in detail in Section 3.4.3 and include replacing topsoil and spreading to original contours with no crown over the trench, removing excess spoil and stabilizing wetland edges and adjacent upland areas in shallow-farmed easement wetlands, leaving a gap in the spoil so that no fill material is left in the wetlands, establishing 100-foot minimum buffer zones around wetland mitigation areas, monitoring wetland restoration areas for noxious and invasive species, and developing a plan to compensate for permanent wetland losses. The appropriate level of authorization and mitigation ultimately would be determined by COE regulatory offices, with input from USFWS Environmental Services field offices and state fish and wildlife agencies.

(3) Many state and federal agencies have expressed concerns and recommendations for compensatory mitigation of wetland losses. The requirements for compensatory mitigation would depend on final COE decisions on jurisdictional delineations. The appropriate level of authorization and mitigation ultimately would be determined by COE regulatory offices, with input from USFWS Environmental Services field offices and state fish and wildlife agencies.

5.5 TERRESTRIAL VEGETATION

5.5.1 Conclusions

Terrestrial vegetation classes include all the wetland classes in addition to grasslands, upland forest, and developed land. Grassland impacts due to pipeline construction are expected to be minimal, and affected vegetative communities generally are expected to reestablish within 2 years. Construction through 29 miles of previously untilled prairie could produce irreversible impacts, as prairie sod can take up to 100 years to recover. Impacts on upland forest and shrubland would be longer term than those anticipated for grassland because of the time required for these plant communities to reestablish and reach mature pre-construction conditions.

As described in Section 3.5.5, Keystone has identified several measures in its CMR Plan (Appendix B) to limit impacts on vegetation, and additional measures are summarized below in Section 5.5.2.

5.5.2 Additional Mitigation

(1) Keystone would consult with pertinent local, state, and federal regulatory agencies to (1) evaluate terrestrial vegetation impacts and habitat fragmentation impacts to COE lands in the Riverlands Management Area in St. Charles County, Missouri, and in the Carlyle Lake WMA in Fayette County, Illinois; and (2) determine with COE the required level of compensatory mitigation for impacts to these specific habitats.

(2) Prior to construction, Keystone would develop a Project-wide general Noxious Weed Management Plan, which would address pre-construction noxious weed infestation surveys,

control methods, herbicide application, equipment washing, and post-construction monitoring. The Plan would provide for cleaning or washing of clear and grade equipment at an appropriate location to avoid transfer of noxious weeds across the Kansas/Oklahoma state line.

(3) Keystone would implement BMPs for conducting vegetation control. Typical agricultural herbicides, developed in consultation with county or state regulatory agencies, would be used. Herbicides types would be determined based on the weed species requiring control.

5.6 WILDLIFE

5.6.1 Conclusions

Pipeline construction would result in short-term disturbance and long-term modification to wildlife habitats. Increased habitat fragmentation would be experienced by white-tailed deer and other large mammals. Although disturbance of dens during winter hibernation could be potentially fatal for newborn black bears cubs, the probability of this event is extremely low, as black bear habitat minimally overlaps the ROW. Small game birds and rodents would be affected through destruction of nests and burrows, death of young or loss of eggs, and loss of foraging areas and cover. However, the total habitat loss is expected to be small in the context of total available habitat.

In addition, the following recommendations relating to impacts associated with proposed transmission lines providing power to the pipeline pump stations should be implemented. Recommendations related to power lines are summarized herein because, while not being constructed by Keystone, they are considered to be connected actions.

5.6.2 Additional Mitigation

(1) Standard safe designs, as outlined in Suggested Practice for Avian Protection on Power Lines (APLIC 2006), should be included in the design of electrical distribution lines in areas of identified avian concern, to reduce collision and electrocution impacts on birds.

(2) Transmission line visibility should be increased using proven marking techniques, such as attached balls or flappers.

(3) Provide for a minimum 60-inch separation between conductors and/or grounded hardware and use recommended insulation materials and other applicable avian protection measures, depending on line configuration.

(4) Use standard raptor-proof transmission line designs, as outlined in Avian Protection Plan Guidelines, to prevent collision by foraging and migrating raptors in the Keystone Project area.

(5) Keystone would implement BMPs in the use of pesticides and herbicides along the pipeline corridor to reduce potential impacts to avian species.

5.7 FISHERIES

5.7.1 Conclusions

Possible impacts to fisheries could occur through siltation and disturbance of streams crossed by the proposed pipeline. Following the proposed mitigation procedures during construction would result in minor short-term impacts to aquatic habitats and organisms. Any short-term disturbance caused by instream activities likely would resemble natural high-flow events in the stream. To mitigate impacts, construction would involve dry-ditch techniques at crossings where the timing of construction does not adequately protect environmentally sensitive water bodies, as determined by the appropriate regulatory authority. HDD would be used at selected major and sensitive water bodies (ENSR 2006a 2007i).

There is a risk that non-native species could be introduced into receiving waters during the disposal of hydrostatic testing water. Keystone has proposed to undertake hydrostatic testing during the spring, summer, and autumn months, overlapping with key spawning months of April to July. This overlap could affect some sensitive species during breeding. Additional mitigation measures agreed to by Keystone are provided in Section 5.7.2.

5.7.2 Additional Mitigation

(1) To avoid breeding periods when fish and invertebrate larvae are present, Keystone would consult with state fisheries agencies with respect to applicable construction windows for each crossing. In the event that a construction window cannot be accommodated, Keystone would consult with the applicable regulatory agency with respect to alternative mitigation measures.

(2) Keystone would develop specific crossing plans for water bodies that contain recreationally or commercially important fisheries, or are classified as special use, in conjunction with the appropriate jurisdictional agency.

(3) Keystone would obtain all required permits to withdraw water from water bodies for hydrostatic testing and for the discharge of hydrostatic test waters. Keystone would comply with all applicable permit conditions regarding water withdrawal from water bodies and water discharges associated with hydrostatic testing activities. Withdrawals for hydrostatic testing from sensitive water bodies would generally be avoided until after August 1, unless permission is granted from the proper agencies.

(4) To avoid impacts from introduced species, Keystone plans to return hydrostatic test water directly back to the source water body or to a location in the immediate vicinity of the water body at the conclusion of the hydrostatic testing operation. No inter-basin transfers (discharge) of hydrostatic test water would occur.

5.8 THREATENED AND ENDANGERED SPECIES

5.8.1 Conclusions

Preliminary data identified 55 federally or state-listed threatened, endangered, or candidate species potentially occurring in or near the Keystone Project ROW. These include mammals, reptiles, insects, birds, fish, mollusks, and plants. Most affected habitat would include croplands (13,594 acres) and

grasslands (4,112 acres), followed by wetlands and open water (845 acres), and upland and riparian forests (1,078 acres). Loss of shrublands and wooded habitats would be long term (5–20 years) in reclaimed areas of the construction ROW.

Potential impacts on individual species are described in detail in Sections 3.8.1.6 and 3.8.2.6. These impacts include:

- Habitat loss, alteration, and fragmentation;
- Decreased breeding success due to disturbance from construction and operations noise and increased human activity;
- Direct mortality from project construction and operation and/or collision with or electrocution by power lines;
- Loss of individuals and habitats due to exposure to toxic materials or crude oil releases (addressed in Section 3.13);
- Reduced survival or reproduction due to decreased abundance of forage species; and
- Interruption of foraging activities due to exposure to construction and operations noise and increased human activity.

Additional mitigation measures for each of the federally or state-listed threatened, endangered, or candidate species have been suggested by agency reviewers during consultation and review activities. These recommendations are described in detail in Sections 3.8.1.6 (federally listed species) and 3.8.2.6 (state-listed species). Specific recommendations for certain notable listed species are included below.

5.8.2 Additional Mitigation

(1) Based on consultation with USFWS and applicable state wildlife agencies, Keystone proposes the following mitigation measures to avoid impacts on nesting or winter roosting bald eagles:

(a) Conducting aerial and/or ground surveys prior to construction to locate any newly constructed nests and to determine the status of nests from February 1 through August 15. For the active nests, no construction (i.e., ground-disturbing activities) would occur within 1.0 mile of the nest between February 1 and August 15 (January 1 and July 15 for Missouri), unless permitted by USFWS. The 1-mile restriction would end when the young have fledged or the nest is not being used. The protection zones would not preclude travel through an area; a travel lane would be established that protects nests from direct short-term impact.

(b) Training construction personnel to minimize disturbance to the birds.

(c) Developing measures for identified communal winter bald eagle roosts within 1 mile of the construction ROW that may include avoidance of construction activities from 3 p.m. to 10 a.m. between November 1 and April 1, unless otherwise permitted by USFWS or other resource agencies. If warranted, additional mitigation measures would be developed through ESA Section 7 consultation.

(2) Keystone would conduct a search for gray bats prior to any activity that would affect caves in Madison County, Illinois or in Lincoln County, Missouri.

(3) If cutting of identified potential roost trees in woodlands with a habitat suitability index of more than 0.6 for Indiana bats is necessary, Keystone would schedule this cutting prior to April 1, their expected arrival date. Also Keystone would not clear trees from April 1 to September 30 in woodlands that have not been surveyed to determine habitat suitability for this species. If any Indiana bat maternity roost trees are located, applicable mitigation for these trees would be developed in consultation with USFWS and state wildlife agency personnel. Keystone would implement conservation measures to address the loss of Indiana bat summer habitat by working with USFWS, MDC, Missouri Department of Natural Resources, IDNR, and other potential cooperators in development of conservation. Mitigation ratios would be determined by USFWS giving consideration to actual habitat assessment and loss.

(4) Based on consultation with the IDNR, Keystone is currently developing an Incidental Take Permit (ITA) for the Massasauga and Kirtland's snake (see February 6, 2007 IDNR/ COE meeting summary in the March 2007 Supplemental Filing). Also, Keystone would place biological monitors in areas of appropriate native prairie/wet prairie habitats to locate and remove snakes ahead of construction.

(5) To avoid impacts on pallid sturgeon, Keystone would consult with individual states concerning potential water withdrawal from the Platte River drainage. According to USFWS, there would be no timing restriction for which water cannot be withdrawn from the lower Platte River drainage as long as water is returned to the source within the same calendar month. Keystone would work with Nebraska DNR to resolve timing concerns, particularly during the irrigation season.

(6) As described in Keystone's Biological Assessment, Keystone would implement mitigation measures for Topeka shiner streams, including:

(a) In-stream construction activities would be prohibited during the spawning period (May 15 through July 31) at specific stream crossings identified in consultation with USFWS, unless HDD methods are used. Outside of the spawning season, if construction would disturb streams with pool depths of 3 feet or greater, those pools would be seined at least 1 week prior to construction, and fish would be relocated upstream to a pool or location of similar depth.

(b) Erosion control measures would be implemented as described in Keystone's CMR Plan (Appendix B). Erosion and sediment controls would be monitored daily during construction to ensure their effectiveness, particularly after storm events.

(c) Banks and beds of streams would be restored using erosion control and revegetation measures, as described in Keystone's CMR Plan (Appendix B).

(7) As described in Keystone's draft Hydrostatic Test Plan (subject to approval by USFWS), additional measures would be implemented to avoid impacts on federally protected species in the lower Platte River basin, including:

(a) Cleaning of the pipeline with a brush pig prior to testing. Chemicals would not be added to the test water. Test water discharges would not contain oils or other substances in sufficient amounts to create a visible sheen on the surface of the receiving waters.

(b) Discharging test water back to the withdrawal location or to the vicinity of the withdrawal (same watershed). Keystone would consult with individual states and would acquire all necessary permits needed for water withdrawal from the Platte River.

5.9 LAND USE, RECREATION AND SPECIAL INTEREST AREAS, AND VISUAL RESOURCES

5.9.1 Conclusions

Agricultural, rangeland, forestland, recreational/special use, commercial, and residential land use classes would be affected in areas intersected by the proposed ROW. The largest amount of acreage that would be affected by the Keystone Project would be agricultural land, followed by rangeland.

Keystone is planning to undertake construction over an 18-month period, during which agricultural lands in the ROW would not be farmed. Keystone has agreed to compensate landowners for crop and other losses on a case-by-case basis. Keystone also has developed mitigation plans for limiting impacts on soil drainage mechanisms, compaction, irrigation systems, farm access areas, windbreaks and living fences, and CRP lands. After construction, nearly all agricultural land along the ROW would be allowed to return to production, and productivity is not expected to be reduced significantly over the long term. Approximately 109 acres would be necessary for construction of aboveground facilities; these acres would be permanently removed from farming production. Keystone has further sought to minimize impacts on rangelands by developing range-specific mitigation measures.

Although it is unclear at present exactly how many CRP acres would be affected by pipeline construction and operation, FSA has estimated that, in a worst-case scenario, over 16,000 acres of CRP land would be affected during construction, with over 6,500 acres remaining affected due to pipeline operation. It is likely that total affected CRP acreage would be less than these estimates. Impacts on CRP lands would include tilling of grasslands and clearance and tillage of forested lands; if within the operational ROW, these lands would not be allowed to regenerate during the life of the Project. Thus, impacts on these lands would be localized but long term. Keystone would address these impacts, and any impacts to Farmable Wetland Program Lands and WRP lands, with landowners on a case-by-case basis. Overall impacts on residential and commercial land uses are expected to be minor and would be addressed by Keystone through landowner negotiations on a case-by-case basis.

Recreational lands potentially affected include bike trails, sightseeing areas, hiking trails, and wildlife viewing areas; public lands are limited along the ROW. Construction activities are anticipated to cause only temporary impacts. Keystone would coordinate with agency and land use managers to reduce conflicts between construction activities and recreational uses. Additional measures are described in Section 5.9.2.

5.9.2 Additional Mitigation

(1) Keystone understands that FSA rules require that individual landowners contact their local FSA offices with regard to construction across lands covered by CRP contracts. For all verified enrolled acreage in CRP and other FSA conservation program areas intersected by the ROW, Keystone would assist all appropriate landowners with this effort. Keystone would confer with all appropriate FSA offices to ensure that these consultations meet FSA requirements. Keystone would comply with remediation and restoration requirements required by FSA.

(2) Keystone would utilize the state-specific NRCS Field Office Technical Guide (Appendix M) for mitigation and revegetation of areas damaged by construction. Keystone would consult with the local NRCS representatives to determine the adequacy of Keystone's CMR Plan and would supplement the plan as needed during construction and reclamation.

(3) Keystone would address mitigation, reclamation, and remediation measures, including the possible use of non-vegetative remediation pertaining to impacts to windbreaks, shelterbelts, and living snow fences, with individual landowners and would comply with any applicable state requirements.

(4) To further decrease the impact of forest clearance on recreation, Keystone would consult with land managers on state and federal lands regarding any necessary construction and maintenance restrictions consistent with management and use of such lands. Damages from disruption of recreational uses of private lands would be the subject of compensation negotiations with individual landowners. Where the pipeline follows an existing ROW in forested areas, Keystone would attempt to route the pipeline as close as practical to the existing ROW.

(5) To mitigate potential impacts on recreational resources in privately owned conservation areas, Keystone would consult with the owners of private conservation areas regarding any concerns related to disruption of recreational uses of such areas. Damages from disruption of recreational uses of private lands would be the subject of compensation negotiations with individual landowners. Where the pipeline follows an existing ROW in privately owned conservation areas, Keystone would attempt to route the pipeline as close as practical to the existing ROW.

(6) To decrease possible conflicts with hunting and other recreational activities in wildlife management and public conservation areas, Keystone would negotiate with individual land managers. Where the pipeline follows an existing ROW in privately owned conservation areas, Keystone would attempt to route the pipeline as close as practical to the existing ROW.

(7) To further reduce visual impacts from aboveground pipeline facilities and structures, Keystone would comply with standard industry painting practices with respect to aboveground facilities. Keystone would address any visual aesthetics issues with landowners in individual consultations.

(8) For the Milford Wildlife Area, the primary concerns are limited access and conflicts with hunters during construction. Therefore, Keystone would develop a site-specific crossing plan for the Milford Wildlife Area.

5.10 SOCIOECONOMICS

5.10.1 Conclusions

The proposed pipeline construction has the potential to generate substantial direct and indirect economic benefits. Keystone is expected to utilize temporary local construction labor where possible; it is estimated that from 10 to 15 percent of the total construction work force could be hired from local communities. Likewise, it is estimated that from 2,800 to 3,600 non-local residents would temporarily move into the area of influence. This would translate into 2,900 housing units, 14,400 rental units, and 34,100 hotel rooms. Keystone estimates that, at the local level, construction income benefits are expected to total from

$28 to $48 million. Approximately 40 percent of the cost of construction goods and services, or from $44 to $52 million, would be spent locally.

Potentially negative impacts include agricultural losses, which would be compensated by Keystone during the easement procurement process, and increased demands on local highways and emergency services. Keystone does not anticipate any other increased public expenditure. Some disruption of traffic flows would be expected; Keystone would use public and preexisting private roads to access most of the ROW. Any impacts on local roads would be repaired by Keystone.

Operations impacts also are expected to be positive. The cost of operational goods and services is estimated at $1.3 million per year, plus an additional $46.5 million for electricity. About 90 percent of this ($43 million) would be spent locally in the Project area. Approximately 26 permanent full-time jobs would be associated with operation of the pipeline, representing an annual payroll of $5.5 million. The project would generate additional property tax revenues of approximately $46.7 million throughout the Project area.

Agricultural losses along the pipeline corridor would likely be relatively low; however, in a very unlikely "worst case" scenario, over 16,000 acres of CRP enrolled lands could be affected. This scenario assumes that all acreage enrolled in the program along the corridor would be sufficiently affected that the land would need to be removed from the program according to the rules of the CRP program. In reality, the actual acreage that would be removed is likely to be a fraction of the overall enrolled acreage. Nonetheless, if all of the acreage were removed, affected landowners would lose $802,000 in annual rental income payments. Keystone has agreed to address the actual economic impacts resulting from crossing CRP lands on a case-by-case basis with the individuals potentially affected. Property value effects at the community or regional scale would likely be negligible for two reasons: (1) land uses on parcels adjacent to the pipeline would not be affected, and land could continue to be used in its highest and best use; and (2) the proposed pipeline would be underground and therefore would not adversely affect the regional amenity values that contribute to property values. In addition, as part of the ROW procurement process, Keystone would negotiate with the affected landowners to obtain an easement, compensating for any losses, including potential decreases in property values.

Expansion of the Wood River Refinery in response to increased crude oil deliveries from the Keystone pipeline is expected to generate both positive and adverse socioeconomic effects. Expansion of the Wood River Refinery is estimated to cost approximately $1 billion, which likely would include expenditures on capital equipment, other goods and materials, services, and labor. To the extent that these expenditures are made in the local region, for example Madison County, and industries are present to meet Project demands, the Project would result in substantial regional economic benefits. Within an input-output model framework, these benefits would include increases in direct, indirect, and induced economic output; value added (i.e., labor income, other property income, and indirect business taxes); and employment in the region.

In the long term, expansion of the Wood River Refinery would result in greater refining capacity and increased production/output in the refined petroleum industry. Based on an estimated 340,000 bpd in increased crude oil shipments and an approximate crude oil contract price of $60 per barrel, the estimated value of refinery inputs is $20.4 million per day, or $744.6 million annually. Other socioeconomic parameters that could be affected by expansion of the Wood River Refinery include increases in fiscal revenues and increased demands for public services and other local resources.

Potentially adverse socioeconomic effects could occur—particularly during construction—as a result of increased demand for a range of public services, including law enforcement, fire protection, and medical aid. This could disproportionately affect lower income areas. Depending on the characteristics of the construction workforce, demands may increase for short-term housing in the region, such as hotels/motels

and rental units, driving rents up and affecting lower income or minority populations. Other environmental justice concerns, such as disproportionate air and water quality impacts to communities, would not be expected.

Mitigation to address impacts on CRP lands is summarized in Section 5.9.2. No additional mitigation measures have been recommended, other than those proposed by Keystone in Sections 3.9 and 3.10.

5.11 CULTURAL RESOURCES

5.11.1 Conclusions

Section 106 of the NHPA, as amended, requires the lead federal agency with jurisdiction over a federal undertaking (i.e., a project, activity, or program that is funded by a federal agency or that requires a federal permit, license, or approval) to assess effects to historic properties within the project's area of potential effect before that undertaking occurs. A historic property is defined as a cultural resource, such as a district, archeological site, building, structure, or object (including a traditional cultural property and/or sites of cultural and religious importance) that is listed, or eligible for listing, in the NRHP. Keystone, through its contractors, has examined those portions of the Keystone Mainline Project and Cushing Extension pipeline for which survey permission was obtained. Keystone also has purchased the rights to use cultural resources survey results for overlapping portions of the proposed REX natural gas pipeline in Nebraska, Kansas, and Missouri. The potential environmental impacts of the REX pipeline were assessed by FERC as part of FERC Docket No. CP06-354-000. DOS, the Nebraska SHPO, the Kansas SHPO, and the Missouri SHPO have approved Keystone's use of the REX survey results for the Keystone Project.

Reports filed by Keystone indicate that the combined Keystone Mainline Project, Keystone Cushing Extension, and REX cultural resources field inventory studies have identified 347 cultural resources within the Project APE as of November 2007. DOS, in consultation with the SHPOs and other consulting parties, have made the following determinations regarding eligibility of these resources for listing in the NRHP, based on the NRHP criteria of significance (36 CFR 60.4 [a-d]):

- One site identified within the Project APE, the 101 Ranch District in Kay County, Oklahoma is a National Historic Landmark that is listed in the NRHP.
- Three sites listed in Section 3.11.2 of the EIS have been determined Eligible for listing in the NRHP under 36 CFR 60.4(d) (the ability to yield information important to history or prehistory) and thus are considered historic properties under Section 106 guidelines.
- Ninety-five of the identified cultural resources listed in Section 3.11.2 of the EIS have been designated as "Unevaluated," meaning that insufficient data are available for DOS to state definitively that the cultural resource does, or does not, meet the criteria of significance for listing in the NRHP. They are thus considered potential historic properties.
- Two hundred forty-eight cultural resources listed in Section 3.11.2of the EIS have been determined Not Eligible for listing in the NRHP and thus are not considered historic properties under Section 106 guidelines.

An additional eight cultural resources were discussed within the documents filed by Keystone; however, their contractors determined through field investigations that these cultural resources did not extend into the Project APE or had been destroyed by previous land activities. No determination of eligibility of effect is required for these cultural resources.

All of the cultural resources identified to date have resulted from field studies conducted by Keystone's contractors. DOS continues its consultation with federally recognized Indian tribes to determine whether any TCPs or properties of cultural or religious significance are located within the Mainline Project or Cushing Extension APEs.

A Programmatic Agreement (PA), as permitted under 36 CFR 800, is being used to conclude Section 106 review. The PA is a binding protocol for its parties regarding the identification, evaluation, and treatment of historic properties during construction of the Mainline Project and Cushing Extension. The text of the PA can be found in Appendix R. If there is any disagreement between parties that have signed a PA and these recommendations, the process for resolving disagreements outlined in the PA shall be followed.

Keystone has stated that its preferred option will be to avoid adverse effects to all historic properties (Eligible properties) and potential historic properties (Unevaluated properties) that are identified within the APE of the Mainline Project and the Cushing Extension. Additional mitigation measures are listed in Section 5.11.2.

5.11.2 Additional Mitigation

(1) Keystone would file the evaluation, avoidance, and/or treatment plans necessary to make a determination of effect for all Eligible and Unevaluated properties that have been identified within the Project APE, using the format and list of properties presented in Section 3.11.2 of the EIS. Construction in these areas should not occur until DOS, in consultation with the SHPO and other relevant consulting parties, reviews and approves all plans and notifies Keystone in writing that it may proceed with the treatment plan or construction.

(2) Keystone has not yet completed cultural resources inventory and geoarcheological testing studies for portions of the Mainline Project and Cushing Extension, as described in Section 3.11.2 of the EIS. Keystone shall defer construction and use of each area until:

(a) Keystone files the additional required cultural resources inventory and geomorphological reports with DOS and the relevant SHPO (or federal agency, if federally managed lands are involved);

(b) DOS has had the opportunity to consult with Indian tribes, SHPOs, federal and state agencies, and the public; to assess all report findings; and make determinations of eligibility for all cultural resources identified within the currently unreported areas;

(c) DOS has consulted with Indian tribes, SHPOs, or other interested and consulting parties, where applicable, to ensure that newly proposed project areas do not conflict with TCPs and/or properties of cultural or religious importance;

(d) DOS has provided the evaluation, avoidance, and/or treatment plans necessary to make a determination of effect for all cultural resources within the Project APE that are determined by DOS to be Eligible historic properties or Unevaluated properties, using the format described in Section 3.11.2 of the EIS;

(e) DOS, along with the Indian tribes, SHPOs, ACHP, and other federal and state agencies, have been provided an opportunity to review and comment on any mitigation or treatment plans that are filed for historic or potential historic properties that would be adversely affected by Project construction; and

(f) DOS has notified Keystone in writing that it may proceed with the treatment plan or construction.

All material filed with DOS that contains 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."

(3) The South Dakota SHPO, upon reviewing the filed technical reports, has recommended that Keystone conduct some additional cultural resource surveys and has indicated to DOS that subsurface testing may be warranted in some areas that are still undergoing SHPO review. Keystone would conduct the additional survey requested by the South Dakota SHPO and report these findings to both the SHPO and DOS for evaluation, prior to construction commencing.

5.12 AIR AND NOISE

5.12.1 Conclusions

Construction of the proposed Keystone Project would be similar to other pipeline projects in terms of schedule, equipment used, and types of activities. Because pipeline construction would move through an area relatively quickly, air emissions typically would be localized, intermittent, and short term. Emissions from fugitive dust, construction equipment combustion, open burning, and temporary fuel transfer systems and associated tanks would be controlled to the extent required by state and local agencies, as explained above. Because Keystone would be required to comply with applicable regulations, emissions from construction-related activities would not significantly affect local or regional air quality. Project operations would not produce significant air quality impacts, and only minor emissions from the backup gasoline generator and fugitive emissions from valves, tanks, and pumping equipment would occur. Because operating emissions are expected to be minimal, no operational permits would be required.

Construction would increase noise levels in the vicinity of Project activities; noise levels would vary during the construction period, depending on the construction phase. Residential, agricultural, and commercial areas within 500 feet of the Mainline Project and the Cushing Extension ROW would experience short-term inconvenience from construction equipment noise. Noise impacts from construction would be mitigated in accordance with Keystone's CMR Plan (Appendix B) to reduce effects on individuals, sensitive areas, and livestock. To limit disturbance of residential and commercial areas within 500 feet of construction activities by increased noise levels, Keystone would give advanced notice to landowners prior to construction, limit the hours during which construction activities with high-decibel noise levels are conducted, and ensure that construction proceeds quickly through such areas. Additional recommendations are summarized in Section 5.12.2.

During operation of the pipeline, the noise associated with the electric pump stations would be limited to the immediate vicinity of the facilities. Although noise impacts from the electric pump stations are projected to be minor, Keystone would perform a noise assessment survey during operations to confirm the level of noise at each listed noise-sensitive area. Project-related operations therefore are not expected to result in a significant effect on the noise environment. Additional mitigation is described in Section 5.12.2.

5.12.2 Additional Mitigation

(1) Dust control measures in addition to those described in the CMR Plan (Appendix B) may be required by state or local ordinances. Keystone would comply with all applicable state and local regulations with respect to truck transportation and fugitive dust emissions.

(2) Keystone would set up a toll-free telephone line for landowners to report any construction noise-related issues.

(3) It is understood that during occasional, short-term intervals, noise levels would exceed 55 dBa. There are no regulations in rural areas along the pipeline route applicable to construction noise. In municipal areas, pipeline construction noise levels would comply with any applicable municipal regulations. In areas near residences and businesses where construction activities or noise levels may be considered disruptive, Keystone would coordinate work schedules to minimize disruption.

5.13 RELIABILITY AND SAFETY

5.13.1 Conclusions

The Keystone pipeline system would be designed, constructed, and maintained in a manner that meets or exceeds industry standards and regulatory requirements. The proposed Keystone Project would be built within an approved ROW. Signage would be installed at all road, railway, and water crossings—indicating that a pipeline is located in the area—to help prevent third-party damage or impact to the pipeline. Keystone would manage a crossing and encroachment approval system for all other operators. Keystone would ensure safety near its facilities through a combination of programs encompassing engineering design, construction, and operations; public awareness and incident prevention programs; and emergency response programs.

The reliability and safety of the Keystone project can be expected to be well within industry standards. Further, the low probability of large, catastrophic spill events and the routing of the pipeline to avoid most sensitive areas suggest a low probability of impacts to human and natural resources. Nevertheless, some potential for construction- and operations-related spills can be expected. Commitments and procedures described for reliability and safety in this section and in Appendices B and C are intended to mitigate spill effects, particularly when considered in combination with rapid and effective response and clean-up procedures.

To prevent or mitigate potential oil spills during pipeline construction, measures would be implemented at each construction or staging area where fuel, oil, or other liquid hazardous materials are stored, dispensed, or used. In addition to the mitigation included in the CMR Plan (Appendix B), Keystone has agreed to the mitigation measures in Section 5.13.2.

5.13.2 Additional Mitigation

(1) For all locations subject to CWA Section 311, Keystone would prepare a site-specific oil SPCC Plan that contains all requirements of 40 CFR Part 112 for every location used for staging fuel or oil storage tanks and for every location used for fuel or oil transfer—even if the site-specific oil capacity is below the threshold stated in that rule to require such a plan.

Each SPCC Plan would be prepared and submitted prior to introducing the subject fuel, oil, or hazardous material to the subject location.

(2) Prior to construction, all project personnel would be given an orientation outlining the environmental permit requirements and environmental specifications, including the requirement that fuel or oil storage tanks cannot be placed closer than 100 feet to wetlands or water bodies.

(3) Environmental inspectors would place signs a minimum of 100 feet from the boundaries of all wetlands and water bodies prior to construction. The construction contractor would not be allowed to place a fuel or oil storage tank without first getting the EI to inspect the tank site for compliance with the 100-foot setback requirement and receiving approval of the tank site from the EI.

(4) During construction, no fuel or storage tank would be allowed to be relocated within or to a new construction yard by the contractor without first getting the EI to inspect the tank site for compliance with the 100-foot setback requirement and receiving approval of the tank site from the EI.

(5) Fuel and storage tanks would be placed only at contractor yards. No fuel and storage tanks would be placed on the construction ROW.

(6) No oil or hazardous material storage, staging, or transfer other than refueling would occur within 50 feet of any surface water body, surface drainage, storm drain drop inlet, or HCA.

(7) Any fuel truck that transports and dispenses fuel to construction equipment or Keystone Project-related vehicles along the construction ROW or within equipment staging and material areas would carry an oil spill response kit and spill response equipment onboard at all times. In the event that response materials are depleted through use, or their condition is deteriorated through age, the materials would be replenished prior to placing the fueling vehicle back into service.

(8) Oil and other hazardous materials stored in 350-gallon totes, 55-gallon drums, 5-gallon pails, smaller retail-sized containers or other portable containers would be staged or stored in areas with a secondary means of containment.

(9) Fixed-fuel dispensing locations would be provided, with a means of secondary containment to capture fuel from leaks, drips, and overfills.

5.14 REFERENCES

APLIC. See Avian Power Line Interaction Committee.

Avian Power Line Interaction Committee. 2006. Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006. Edison Electric Institute, APLIC, and the California Energy Commission. Washington, DC and Sacramento, CA. Available online at: <http://www.aplic.org/>. Accessed on December 6, 2006.

ENSR. 2006a. Keystone Pipeline Project Environmental Report. Updated November 15, 2006.

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