4.4 WETLANDS

4.4.1 Introduction

This section describes potential impacts to wetland resources associated with the construction and operation of the proposed Project and connected actions and discusses potential mitigation measures that would avoid or minimize the potential impacts. The information, data, methods, and/or analyses used in this discussion are based on information provided in the 2011 Final Environmental Impact Statement (Final EIS) as well as new circumstances or information relevant to environmental concerns that have become available since the publication of the Final EIS, including the proposed reroute in Nebraska. The information that is provided here builds on the information provided in the Final EIS as well as the 2013 Draft Supplemental EIS and, in many instances, replicates that information with relatively minor changes and updates; other information is entirely new or substantially altered.

Specifically, the following information, data, methods, and/or analyses have been substantially updated from the 2011 document and the Draft Supplemental EIS related to impacts to wetland resources:

- A new section (see Section 4.4.2, Impact Assessment Methodology) was added to explain the wetland assessment methodology used to evaluate potential wetland impacts associated with the proposed Project. This section describes how the assessment methodology used for the Final Supplemental Environmental Impact Statement (Final Supplemental EIS) evaluation differs in some respects from the methodology used for the Final EIS evaluation;
- Wetland acreage impacts have been updated due to route alterations and the modified wetland evaluation method, as described in Section 4.4.2, Impact Assessment Methodology;
- Impact procedures have been expanded to include additional measures and commitments from TransCanada Keystone Pipeline, LP (Keystone);
- Section 4.4.4, Additional Mitigation, has been added to describe the additional mitigation that would be required by regulatory agencies to avoid, minimize, and mitigate wetland impacts; and
- Updates were made to the connected actions based on additional data and information.

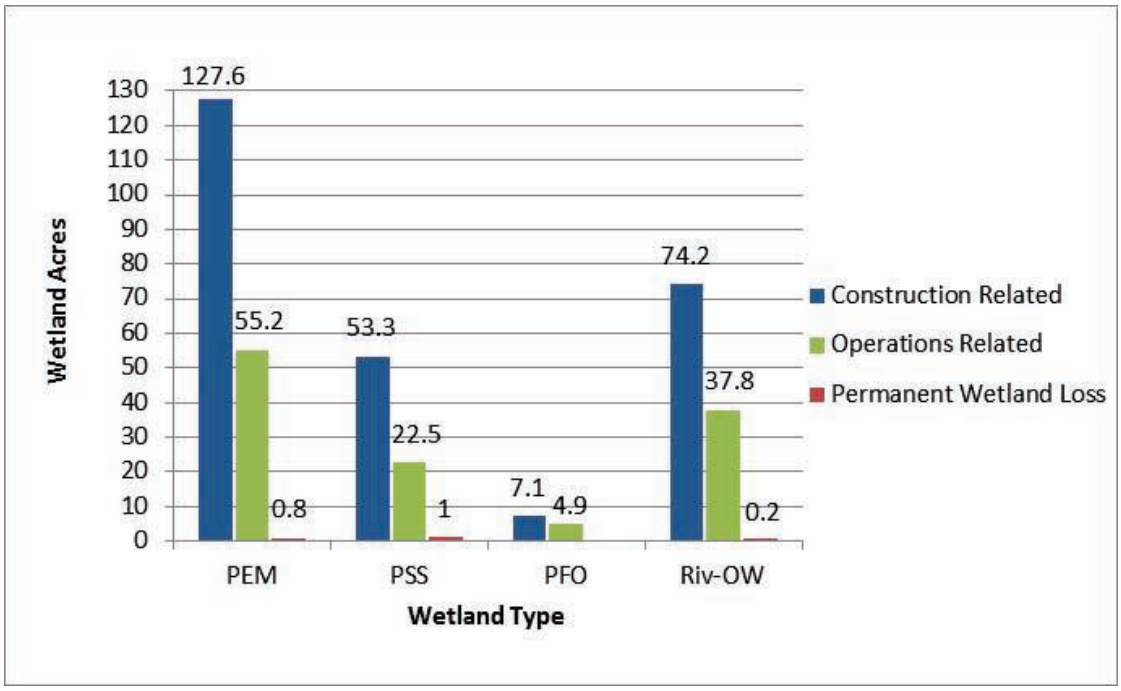
The following information, data, methods, and/or analyses have been substantially updated from the 2013 Draft Supplemental EIS:

- Bar charts have been added to graphically display potential wetland impact acreages that were previously summarized in text and table format only.
- Section 4.4.4, Additional Mitigation (previously Section 4.4.4, Recommended Additional Mitigation) has been revised to clarify the types of additional mitigation that could be applied to proposed Project area wetlands based on applicable regulatory requirements.
- In response to public and agency comments, text has been revised throughout the section where necessary.

Summary

Potential construction- and operations-related impacts to proposed Project-area wetlands include temporary, short-term, long-term and permanent impacts to wetland functions and values; conversion from one wetland type to another (e.g., conversion of forested wetland to herbaceous wetland); and permanent loss of wetlands due to fill for permanent project-related facilities (e.g., access roads). In addition, the proposed Project route would result in impacts to sensitive wetland types or wetlands of conservation concern, and would affect both jurisdictional (regulated) and non-jurisdictional (non-regulated) wetlands.

Construction of the proposed Project would affect approximately 128 acres of herbaceous wetlands (e.g., wet meadows), 53 acres of scrub-shrub wetlands, 7 acres of forested wetlands, and 74 acres of riverine and open water wetlands. Operation of the proposed Project would affect an estimated 55 acres of herbaceous wetlands, 23 acres of scrub-shrub wetlands, 5 acres of forested wetlands, and 38 acres of riverine and open-water wetlands (Figure 4.4.1-1).



Note: Cowardin et al. 1979; PEM-palustrine emergent; PSS-palustrine scrub-shrub; PFO-palustrine forested; Riv-OW-riverine-open water.

Figure 4.4.1-1 Cumulative Summary for Estimated Construction- and Operations-Related Wetland Impacts and Permanent Wetland Loss for Entire Proposed Project

The term *affected* wetland implies a temporary, short-term, long-term, or permanent impact. Keystone defines the impact durations as follows: a temporary impact would generally occur during construction with recovery following almost immediately afterwards; a short-term impact would have a duration of up to 3 years; a long-term impact would have a duration greater than 3 years but with recovery achievable over time; and a permanent impact would be an impact that persists over the life of the proposed Project or longer. Of the total affected wetland acreage noted above, an estimated 2 acres of permanent wetland loss (wetland to upland conversion) is

anticipated while the remaining affected wetland acreage would remain as wetlands, although impacted to varying degrees by the construction and operation of the proposed Project. Temporary, short-term, long-term and permanent impacts are based on the assumption that post-construction restoration efforts would be successful and no unforeseen conditions resulting from proposed pipeline operations (e.g., pipeline soil temperature effects, potential releases) delay anticipated recovery rates.

The estimated wetland acreages are based on field data collected by Keystone and wetland data provided by several national databases; however, there are some wetland types that are likely underestimated and not fully represented in the summary numbers listed above. Conversely, other factors may result in over-estimation of wetland impacts, as discussed in Section 4.4.3, Potential Wetland Impacts. Wetland types that may be underestimated include narrow wetland fringe along small streams and rivers; seasonal wetlands in topographic depressions; small depressional wetlands, particularly in the Prairie Pothole Region; wetland mosaics in forested areas, particularly in floodplains; wetlands in areas that are managed for agricultural purposes; and small riverine/open-water features. Also note that estimated wetland acreages presented in Section 4.4.3, Potential Wetland Impacts, and Section 4.4.5, Connected Actions, vary from those presented in Section 3.6, Wildlife, Section 4.5, Terrestrial Vegetation, and Section 4.9, Land Use, Recreation and Visual Resources, due to the different objectives of each study. Refer to Section 4.4.2, Impact Assessment Methodology, for a more complete description of data limitations.

Potential impacts to wetlands during the construction phase of the proposed Project and connected actions include cutting, clearing, or removing wetland vegetation within the construction work area. The primary impacts associated with the operations phase include, but are not limited to negative impacts to wetland vegetation, soils, and/or hydrology such that important wetland functions and values are degraded or lost; introduction of invasive species; permanent wetland loss due to improper construction and restoration techniques; permanent wetland loss or degradation due to inadequate monitoring and maintenance activities; unknown changes to wetland habitat quality due to increased temperature from the buried pipe (Appendix S, Pipeline Temperature Effects Study); and wetland impacts due to potential hazardous liquid spills and releases (see also Section 4.13, Potential Releases).

Wetlands are regulated primarily by Section 404 of the Clean Water Act (CWA), but other regulations could apply if, for example, a wetland area provides crucial habitat to a federally listed species. Section 404 requires that wetland impacts are avoided, minimized, and mitigated to the greatest practicable extent possible. Keystone has made numerous route modifications to avoid wetland areas (such as the Nebraska Department of Environmental Quality (NDEQ)-identified Sand Hills Region) and has prepared a Construction, Mitigation, and Reclamation Plan (CMRP) (see Appendix G) that summarizes the proposed wetland avoidance, minimization, and mitigation measures. These measures include staging, maintaining, and refueling equipment outside of wetlands to the greatest extent possible; employing special construction techniques for wetlands depending on how wet conditions are; and reclaiming impacted wetlands to near pre-construction conditions following pipeline installation. In addition, various agencies, such as the U.S. Army Corps of Engineers (USACE), could require additional mitigation as required by tribal, local, state, and federal permits and regulations.

Connected actions include the Bakken Marketlink Project, the Big Bend to Witten 230-kilovolt (kV) Transmission Line, and electrical distribution lines and substations. The potential wetland

impacts associated with the construction and operation of these connected actions would be similar in nature to those described for the proposed Project. These connected actions would be constructed in areas similar to the proposed Project. Compared to the proposed Project, temporary and short-term wetland impacts would likely be less for the electrical transmission and distribution line activities because overhead lines can span above most wetland areas except where poles are necessary for line support, leaving wetlands largely intact.

4.4.2 Impact Assessment Methodology

The potential wetland impacts for the proposed Project presented below are based on an evaluation of the wetland resources within the Project area, review of available Project reports and data, and public comments received during the Supplemental EIS scoping period and Draft Supplemental EIS public comment period.

Wetlands within the proposed Project area were mapped using a combination of wetland data from various Keystone sources, including the 2011 Final EIS, the TransCanada Keystone XL Pipeline Project: Supplemental Environmental Report for the Nebraska Reroute (exp Energy Services Inc. 2012a), the TransCanada Keystone Pipeline Project: Environmental Report (exp Energy Services Inc. 2012b), and additional 2012 field data gathered by Keystone during the development of this Final Supplemental EIS document. Wetland impacts described in previous Project reports relied primarily on field data, aerial photo interpretation, and National Wetland Inventory (NWI) data (U.S. Fish and Wildlife Service [USFWS] 2012a). According to information provided by Keystone, field data were collected by Keystone following routine USACE on-site delineation methods (USACE 1987 and USACE 2008a) and the wetland assessment performed by Keystone was in accordance with direction provided by the USACE Omaha District. For the purpose of the Final Supplemental EIS, wetland data presented in the above sources were supplemented by two additional national wetland datasets: National Land Cover Dataset (NLCD [Fry 2011]), and U.S. Geological Survey (USGS) Gap Analysis Program (GAP) (USGS 2011). In addition, a desktop analysis of 2010 National Aerial Imagery Program orthoimagery (National Aerial Imagery Program 2010 and 2011), National Hydrography Data (USGS 2012), and U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) soil data (USGS 2012) was used to check the quality of the wetland data from the above sources.

Potential wetland impacts for this Final Supplemental EIS were analyzed by assessing the area of wetlands overlapped by the proposed Project area. All of the field and desktop analysis data provided by Keystone were used in the analysis and were given priority, followed by wetland coverage in the NWI, NLCD, and GAP datasets, respectively. Data from these four sources were analyzed using ArcInfo GIS software whereby wetland data were mapped in the following order of priority: Keystone wetland data (all field data and desktop data), NWI wetlands, NLCD wetland communities, and GAP wetland communities. When more than one dataset provided wetland coverage for a given location, overlapping acreages were clipped (removed) to avoid double-counting following the order of data priority listed above. No further edits to the wetland boundaries and acreages resulting from the combined datasets were made.

While the additional wetland coverage from the combined datasets provides a more representative picture of potential wetland distribution throughout the proposed Project area, there are limitations to the data presented in the potential wetland impact analysis section (see Section 4.4.3, Potential Wetland Impacts):

- Field-based data, as provided by Keystone, have been incorporated into the estimated affected wetland acreage. All of the data Keystone provided were used in the analysis; however, as field data were not available for much of the area covered by the pipeline route, most of the wetland estimates are based on desktop analysis using the data sources noted. As a result, wetland boundaries and wetland acreages may be under- or over-estimated in some locations.
- Certain wetland types may be under-represented in this analysis because they would require additional field-based surveys to accurately evaluate wetland characteristics and wetland boundary locations. Wetland types that may be under-represented include narrow wetland fringe along small streams and rivers; seasonal wetlands in topographic depressions; small depressional wetlands, particularly in the Prairie Pothole Region; wetland mosaics in forested areas, particularly in floodplains; wetlands in areas that are managed for agricultural purposes, and small riverine/open water features. These wetlands tend to be seasonal (e.g., wet in the spring and dry in the summer), small or intertwined with upland areas, and impacted by land use practices (e.g., grazing or haying), making them difficult to accurately map using field and desktop techniques. As noted in Sections 3.4.4, Federal and State Regulatory Setting, and 4.4.3, Potential Wetland Impacts, while the impacts presented in the Supplemental Final EIS may not be fully quantified at this time, all existing wetlands would be accounted for during the Section 401 certification and Section 404 permitting process.
- There is uncertainty about how non-jurisdictional (non-regulated) wetlands would be managed during the permitting, construction, and operational phases of the proposed Project. Depending on the degree to which Keystone voluntarily manages non-jurisdictional wetlands, there may be greater temporary, short-term, long-term, and permanent impacts than what is estimated in Tables 4.4-1 and Table 4.4-2. The wetland avoidance, minimization, and mitigation measures outlined in the CMRP (see Appendix G) would apply to both jurisdictional and non-jurisdictional wetlands, which greatly reduces the potential for impacts to non-regulated wetlands that otherwise go unmanaged by established regulations. It is unknown at this time what proportion of the known wetland areas within the proposed Project area would be considered non-jurisdictional by the regulating agencies who oversee this determination as this determination would be made during the permitting process.
- It is also important to recognize that in some cases, the wetland acreages presented in Section 4.4.3, Potential Wetland Impacts, and Section 4.4.5, Connected Actions, are different than the acreages presented in other sections of this Final Supplemental EIS document, such as Section 3.6, Wildlife, Section 4.5, Terrestrial Vegetation, and Section 4.9, Land Use, Recreation, and Visual Resources. This is the result of incorporating additional wetland data sources into the wetlands analysis to more accurately describe impacts to the wetland types described in Table 3.4-1, which are the technical wetland definitions used by the USACE. Other sections such as Wildlife, Terrestrial Vegetation, and Land Use are interested in broader vegetation and land use classifications that have unique vegetation and land use categories drawn from different data sources. For example, a *farmed wetland* area would be considered a wetland in Section 4.4.3, Potential Wetlands Impacts, below, while in Section 4.5, Terrestrial Vegetation, it may be classified as the *Grassland/Pasture* vegetation type and in Section 4.9, Land Use, Recreation, and Visual Resources, it may be classified as an "agricultural" land use.

Table 4.4-1 Estimated Wetlands Affected by Proposed Project ROW and Ancillary Facilities

State	Impact Area	Length of Wetlands Crossed (miles)[b]				Wetland Area Affected During Construction (acres)[c]				Wetland Area Affected During Operations (acres)[d]			
Montana		**PEM[a]**	**PSS**	**PFO**	**Riv-OW**	**PEM**	**PSS**	**PFO**	**Riv-OW**	**PEM**	**PSS**	**PFO**	**Riv-OW**
	ROW	1.7	1.2	0.003	2.3	23.5	16.9	0.1	28.8	10.2	7.1	0.0	14.1
	Ancillary[e]	0.3	1.3	0.0	0.2	3.0	4.8	0.0	1.3	0.4	0.4	0.0	0.02
Subtotal		*2.0*	*2.5*	*0.003*	*2.5*	*26.5*	*21.7*	*0.1*	*30.1*	*10.6*	*7.5*	*0.0*	*14.2*
South Dakota													
	ROW	5.6	1.4	0.04	2.1	73.5	19.8	0.6	26.1	33.4	8.3	0.2	13.0
	Ancillary[e]	0.2	0.1	0.0	0.1	2.7	1.2	0.0	0.4	0.4	0.6	0.0	0.2
Subtotal		*5.8*	*1.4*	*0.04*	*2.2*	*76.2*	*21.0*	*0.6*	*26.5*	*33.8*	*8.9*	*0.2*	*13.2*
Nebraska													
	ROW	1.8	1.0	0.8	1.7	24.3	10.6	6.3	17.4	10.8	6.1	4.7	10.4
	Ancillary[f]	0.1	0.0	0.02	0.0	0.6	0.0	0.1	0.2	0.0	0.0	0.0	0.0
Subtotal		*1.9*	*1.0*	*0.8*	*1.7*	*24.9*	*10.6*	*6.4*	*17.6*	*10.8*	*6.1*	*4.7*	*10.4*
North Dakota													
	Ancillary[g]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Kansas													
	Ancillary[g]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grand Total		9.7	4.9	0.9	6.4	127.6	53.3	7.1	74.2	55.2	22.5	4.9	37.8

Sources: exp Energy Services Inc. 2012a, b; USFWS 2012a; Fry 2011; USGS 2011.

[a] Cowardin et al., 1979; PEM-palustrine emergent; PSS-palustrine scrub-shrub; PFO-palustrine forested; Riv-OW-riverine-open water.
[b] Length of wetlands crossed for ROW is the length of wetlands bisected by pipeline centerline; length of wetlands crossed for ancillary facilities length of wetlands bisected by access roads centerlines only. Subtotal errors of miles and acreages may result due to rounding.
[c] Construction ROW impacts calculated using a 110-foot general construction corridor width.
[d] Operational ROW impacts were calculated based on a 50-foot permanent ROW corridor width.
[e] Ancillary facilities located outside of the ROW include: access roads (30-foot easement), pump stations, pipe yards, contractor yards, rail sidings (North Dakota only), and construction camps.
[f] Ancillary facilities impacts for Nebraska include some but not all ancillary facilities such as construction camps, temporary staging areas, pipe yards, and contractor yards. Also included are wetland impacts associated with access roads, all of which are associated with construction and considered temporary impacts in Nebraska. The location of some Nebraska ancillary facilities is pending and would need to be evaluated during the permitting phase when it becomes available.
[g] There are no NWI data in these areas.

Table 4.4-2 Estimated Permanent Wetland Impacts[a]

Permanent Wetland to Wetland Conversions (acres)				Permanent Wetland to Upland Conversions (acres)			
	MT	SD	NE		MT	SD	NE[d]
PSS to PEM[b]	7.1	8.3	6.1	PEM to UPL	0.4	0.4	0.0
PFO to PEM	0.0	0.1	4.7	PSS to UPL	0.4	0.6	0.0
Riv/OW to PEM[c]	0.0	0.0	0.0	PFO to UPL	0.0	0.0	0.0
				Riv/OW to UPL	0.02	0.2	0.0
Total	7.1	8.4	10.8	Total	0.8	1.2	0.0

Sources: exp Energy Services Inc. 2012 a, 2012b; USFWS 2012a; Fry 2011; USGS 2011.

[a] Permanent wetland impacts include PSS/PFO conversions to PEM wetlands within the 50-foot-wide permanent ROW; and wetland to upland conversion resulting from fills associated with the construction of permanent ancillary facilities. For the purposed of this study, the term "permanent" refers to an impact that would persist for the life of the proposed Project or longer.
[b] Cowardin et al., 1979; PEM-palustrine emergent; PSS-palustrine scrub-shrub; PFO-palustrine forested; Riv-OW-riverine-open water; UPL-upland
[c] Refer to Section 4.3, Water Resources, for details related to surface water feature impacts.
[d] The exact locations of some ancillary facilities in Nebraska have not yet been determined.

4.4.3 Potential Wetland Impacts

An estimate of wetland acreage that would be affected by the proposed Project is summarized in Table 4.4-1 and Table 4.4-2 in tabular format, and graphically in Figure 4.4.3-1 through Figure 4.4.3-3 below. Refer to Appendix D, Waterbody Crossing Tables and Bureau of Reclamation Required Crossing Criteria for Reclamation Facilities (revised April 2013), for additional wetland data. Estimated impacts are based on the impact analysis methods described above and the best available information. Impacts are categorized by proposed Project phase (construction versus operations) and by location (Project right-of-way [ROW] versus ancillary facilities). The potential wetland impact discussion that follows applies to all identified wetland types, including 'sensitive wetlands' previously described in Section 3.4.3, Wetlands of Special Concern or Value. All of the wetlands that were identified using the data sources noted in Section 4.4.2, Impact Assessment Methodology, are included in the wetland impact analysis; no distinction was made between potentially jurisdictional versus non-jurisdictional wetlands during the impact assessment.

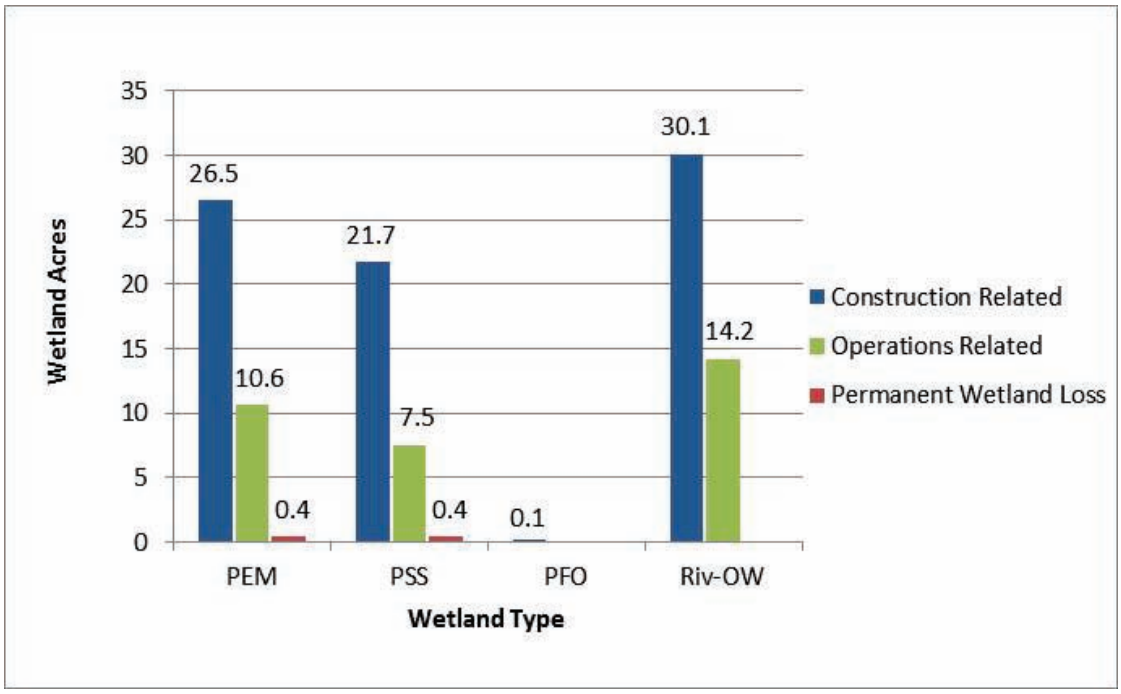


Figure 4.4.3-1 Estimated Construction- and Operations-Related Wetland Impacts and Permanent Wetland Loss for Montana

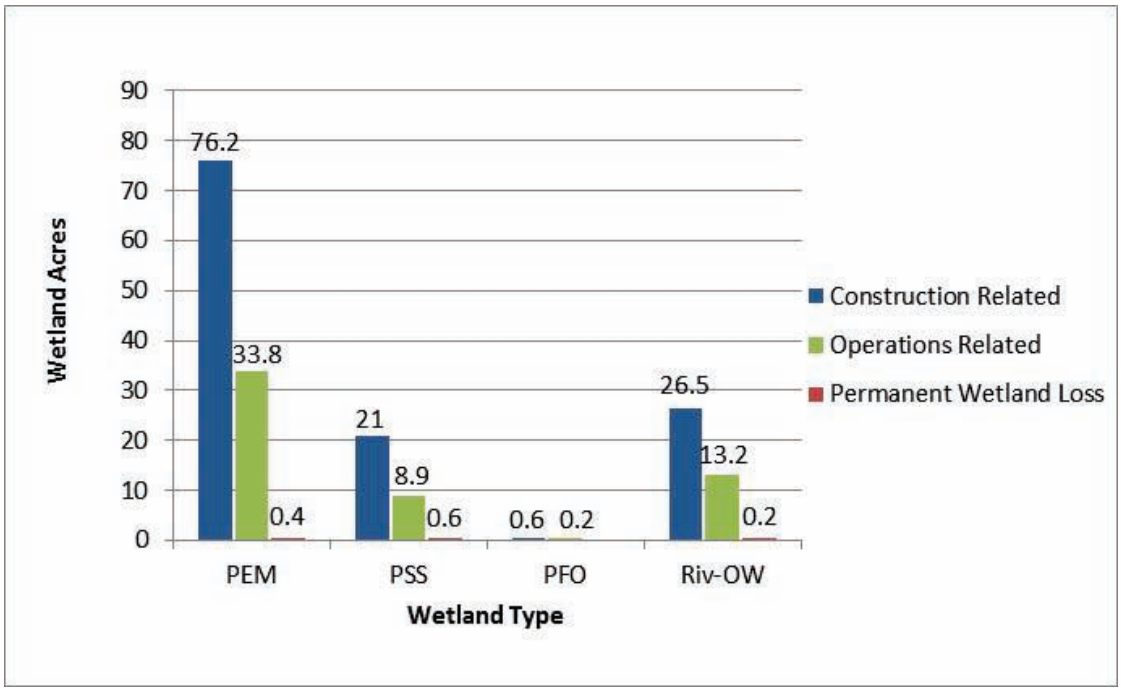


Figure 4.4.3-2 Estimated Construction- and Operations-Related Wetland Impacts and Permanent Wetland Loss for South Dakota

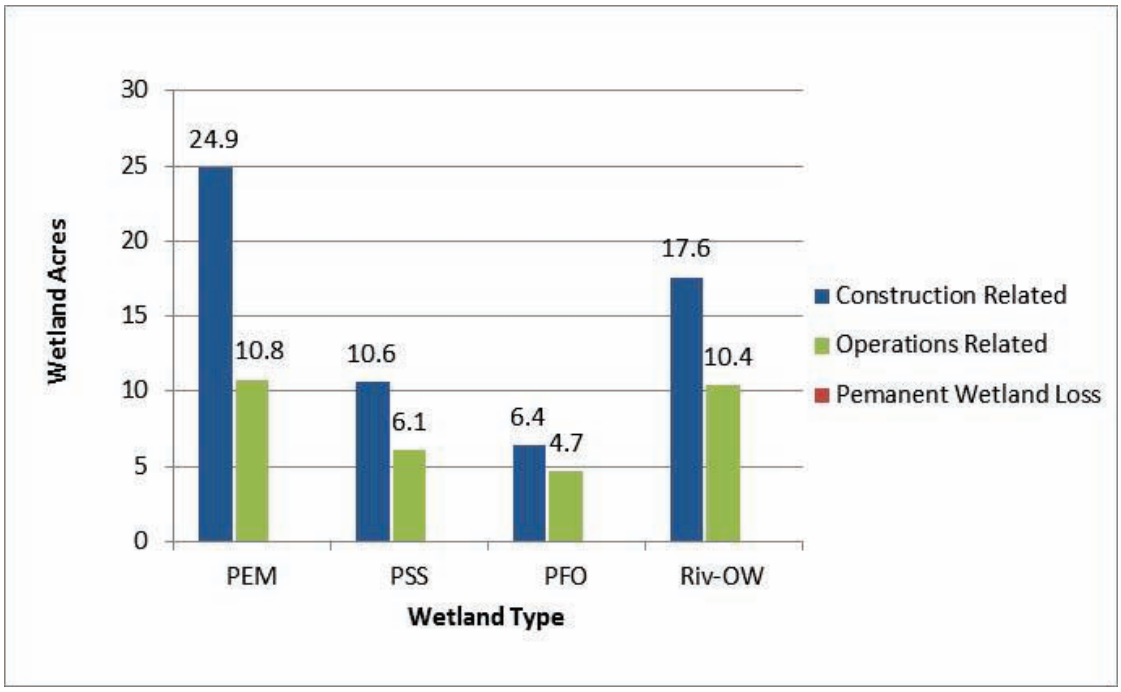


Figure 4.4.3-3 Estimated Construction- and Operations-Related Wetland Impacts and Permanent Wetland Loss for Nebraska

Construction-related wetland impacts are associated with construction activities occurring within the proposed Project ROW and in support of Project-related ancillary facilities. Operations-related wetland impacts are associated with both ROW and ancillary facilities that would persist for the life of the proposed Project. Construction-related impacts would occur within the 110-foot construction ROW as a result of proposed pipeline installation activities. The 110-foot construction corridor width would be reduced to 85 feet for wetlands in Montana and Nebraska, and 75 feet for wetlands in South Dakota, unless conditions require a wider construction corridor, per state requirements. For the purpose of this analysis, estimated construction-related ROW wetland impact calculations are based on a general 110-foot construction corridor to provide a high-end estimate.

Operations-related wetland impacts are those that are expected to occur within the 50-foot permanent operations ROW. Estimated operations-related wetland impact calculations are based on a general 50-foot permanent ROW, again as a high-end estimate.

Impacts associated with ancillary facilities include impacts for access roads, construction camps, staging areas, pipe yards, contractor yards, rail sidings, and pump stations. Construction-related ancillary facilities would only be used during construction and would be removed when the construction phase is complete. Operations-related ancillary facility impacts are considered permanent and would persist for the life of the proposed Project. Operations-related ancillary facilities include permanent access roads (30-foot ROW width for access roads), emergency response staging areas, and pump stations. The construction and operations wetland impacts summarized in Table 4.4-1 are not additive. Construction related wetland impacts include all impacts that would occur within the 110-foot construction corridor, including construction

impacts that would occur within the 50-foot permanent ROW. Operations impacts are those impacts that would persist within the 50-foot permanent ROW following the construction phase.

As noted in Section 3.4, Wetlands, there are Project-related ancillary facilities located in North Dakota (pipe yard and rail siding in Bowman County) and Kansas (one pump station in Clay County and another in Butler County). There are no known wetlands associated with these facilities; therefore, the remainder of Section 4.4 will focus the wetland discussion on Montana, South Dakota, and Nebraska.

Based on the impact assessment methodology described in Section 4.4.2, South Dakota has approximately half of the estimated wetland acreage that could be affected during pipeline construction (47 percent; 124.3 acres of 262.2 acres; Table 4.4-1). Emergent wetlands are the most common wetland type affected by the proposed Project. Total estimated palustrine emergent (PEM), palustrine scrub-shrub (PSS), palustrine forested (PFO), and riverine/open water (Riv-OW) wetlands affected during construction are 78.4 acres in Montana, 124.3 acres in South Dakota, and 59.5 acres in Nebraska. This does not imply a permanent loss of wetland acreage due to construction, but identifies the total number of wetlands acres that would be affected to some degree by construction related activities and may need minor to more involved post-construction reclamation. Approximately 1,073 waterbodies may be crossed by the proposed Project, see Sections 3.3 and 4.3, Water Resources, for further details.

Similar to construction, half of the estimated wetland acreage that would be affected by proposed pipeline operations is located in South Dakota (47 percent; 56.1 acres of 120.4 acres). Total wetland acres affected during operation are estimated at 32.3, 56.1, and 32.0 acres in Montana, South Dakota, and Nebraska, respectively. Again, this does not imply a permanent loss of wetland acreage due to the continued operation of the proposed Project. Many of the wetlands affected by operations would remain as functioning wetlands provided impact minimization and restoration efforts described in the Construction, Mitigation, and Reclamation Plan (CMRP) (see Appendix G, CMRP) are successful. Permanent conversion from one wetland type to another are estimated to be 7.1 acres in Montana, 8.4 acres in South Dakota, and 10.8 acres in Nebraska (see Wetland to Wetland Conversions in Table 4.4-2).

Wetland losses (wetland conversion to uplands) would only be associated with the construction of permanent ancillary facilities such as permanent access roads, pump stations, and emergency response staging areas. Permanent wetland losses due to operational ancillary facilities are estimated to be 0.82 acres in Montana and 1.2 acres in South Dakota (see Wetland to Upland Conversion in Table 4.4-2). At the time of this report the location of some Nebraska ancillary facilities were still unknown. For the purpose of the Final Supplemental EIS, the total number of wetlands that would be converted to uplands in Nebraska would likely be similar to the Montana and South Dakota totals. Where required, all permanent wetland impacts would be mitigated by following standard USACE and applicable state-required mitigation protocols and ratios, negotiated during the permitting phase.

As noted in the methodology section above, data presented in Table 4.4-1 and Table 4.4-2 have limitations and may underestimate the actual acreage of PEM, PSS, PFO, and riverine/open water wetlands that would be affected by the proposed Project (e.g., narrow wetland fringe along small streams and rivers; seasonal wetlands in topographic depressions; small depressional wetlands; wetland mosaics in forested areas). In addition, a large proportion of the proposed Project corridor passes through sub-irrigated agricultural lands that may include wetlands on

grazed, cultivated, or other agricultural lands. Wetlands occurring on lands that are actively managed for agricultural purposes are difficult to map from aerial photo interpretation, are not well represented in national wetland databases, and are difficult to accurately delineate in the field due to agricultural-related changes to the soil, vegetation, and hydrology. As a result, wetlands occurring on lands managed for agricultural use may also be under-represented by the acreages presented in Table 4.4-1 and Table 4.4-2. This under-representation may be balanced, at least in part, by the wider construction and operation corridor used in estimates of wetland impacts, as described above.

While acreages presented in the tables may not be fully quantified at this time, they would be accounted for during the subsequent federal and state permitting process. These data do, however, capture the wetland types (PEM, PSS, PFO, and riverine / open water) that are encountered within the proposed Project area, thus enabling reasonable discussions regarding impact analysis.

For the purpose of this analysis, impacts to riverine and open water features are addressed in Section 4.3, Water Resources, while the remainder of this section focuses on impacts to vegetated wetland communities (PEM, PSS, and PFO).

The term *affected* wetland implies a temporary, short-term, long-term, or permanent impact. Keystone defines the impact durations as follows: a temporary impact would generally occur during construction with recovery following almost immediately afterwards, a short-term impact would have duration of up to 3 years; a long-term impact would have duration greater than 3 years but with recovery achievable over time; and a permanent impact would be an impact that persists over the life of the proposed Project or longer. Temporary, short-term, long-term, and permanent impacts noted below are based on the assumption that post-construction restoration efforts would be successful and no unforeseen conditions resulting from proposed pipeline operations (e.g., pipeline soil temperature effects, potential releases) delay anticipated recovery rates. Note that a long-term or permanent *affect* or *impact* does not necessarily mean a permanent loss of wetland habitat. For example conversion of scrub-shrub or forested wetlands to herbaceous wetlands is considered a permanent impact to those woody wetland classes, but does not represent a complete loss of wetland habitat, whereas a permanent wetland loss would be a conversion of a wetland to an upland as a result of the construction of a pump station or access road.

Impacts to emergent wetlands affected within the proposed construction corridor width, which would encompass the permanently maintained operations ROW, would likely be short-term to long-term, with successful re-establishment within 3 to 5 years. All impacted emergent wetlands would be restored to near pre-construction conditions following proposed pipeline installation. Emergent wetlands would be allowed to persist outside of and within the permanent operations ROW for the life of the proposed Project. The only permanent loss of emergent wetlands would be associated with the construction of permanent ancillary facilities such as permanent access roads, emergency response staging areas, and pump stations where the wetland would be converted to upland areas due to fill. Permanent emergent wetland losses are estimated to be 0.4 acres in Montana and 0.4 acres in South Dakota. At the time of this report the location of some Nebraska ancillary facilities were still unknown, and those locations that are known are sighted in upland areas outside of mapped wetlands areas.

In forested and scrub-shrub wetlands, the effects of proposed construction would be longer term due to the longer period needed to regenerate a mature forest or shrub community. Prior to proposed pipeline installation, scrub-shrub and forested wetland vegetation within the construction corridor (area between the approximate 50-foot permanently-maintained operations ROW and 110-foot construction corridor limit) would be cut to ground level and root systems would be left in place. Once construction activities were completed, woody vegetation outside of the 50-ft permanently maintained corridor and outside of the footprint of permanent ancillary facilities would be restored to near pre-construction conditions and woody vegetation would be allowed to regrow. Shrubs and trees would also be allowed to regrow at horizontal directional drilling (HDD) locations within the permanent ROW after construction activities are complete. Scrub-shrub and forested wetlands that would be initially cleared (cut to ground surface) for construction, but would be allowed to regrow over time are estimated at 14.3 acres in Montana, 12.5 acres in South Dakota, and 6.2 acres of scrub-shrub/forested wetlands in Nebraska. This would be considered a long-term impact based on the slower growth rate of trees and shrubs, which may require decades for complete regeneration.

The 50-foot-wide permanently-maintained ROW would be kept free of woody vegetation regrowth for the life of the proposed Project. Woody vegetation within the 50-foot ROW would be cleared during construction and would be prevented from re-establishing due to periodic mowing and brush cutting during pipeline operation. Scrub-shrub and forest wetlands within the 50-foot ROW would be converted to emergent wetlands, which represents a permanent impact to the woody wetland class, but does not represent a permanent loss of wetland habitat. The emergent wetlands that would replace the woody wetland communities would likely sustain temporary impacts from periodic mowing and brush cutting maintenance activities (e.g., trampling and potential mowing of upper green stems). Scrub-shrub and forested conversion to emergent wetlands is estimated to be 7.1 acres, 8.4 acres, and 10.8 acres in Montana, South Dakota, and Nebraska, respectively (Table 4.4-2). The only permanent conversion of scrub-shrub and forested wetlands to uplands would be associated with the construction of permanent ancillary facilities such as permanent access roads, emergency response staging areas, and pump stations. Permanent scrub-shrub and forested wetland losses are estimated to be 0.4 acres in Montana and 0.6 acres in South Dakota. At the time of this report the location of some Nebraska ancillary facilities were still unknown, and those locations that are known are sighted in upland areas outside of mapped wetlands areas (Table 4.4-2).

Construction and operation of ancillary facilities would result in short-term, long-term and permanent impacts. Impacts associated with non-permanent ancillary facilities (e.g., temporary access roads) would be similar to those described above for emergent wetlands (short-term to long-term with recovery in 3 to 5 years), and long-term to permanent for scrub-shrub and forested wetlands. The continued operation of permanent ancillary facilities (e.g., permanent access roads, emergency response staging areas, and pump stations) would require permanent wetland fills and represent a permanent wetland loss (wetland to upland conversion) of approximately 0.82 acres in Montana and 1.2 acres in South Dakota. At the time of this report the location of some Nebraska ancillary facilities were still unknown, and those locations that are known are sighted in upland areas outside of mapped wetlands areas (Table 4.4-2).

Construction of the proposed pipeline would affect wetlands and their functions primarily during and immediately following construction activities; however, permanent changes also are possible (Federal Energy Regulatory Commission 2004). The following are important functions provided by wetlands that the proposed Project could affect:

- Providing habitat for foraging, nesting, spawning, rearing, and resting sites for aquatic and terrestrial species;
- Maintaining natural drainage patterns and reducing erosion by stabilizing soil and substrate with rooted vegetation;
- Acting as storage for stormwater and flood waters;
- Providing groundwater discharge and recharge functions;
- Maintaining water quality by wetland plants trapping sediments, nutrients, and pollutants and transforming chemical compounds;
- Providing habitat for microorganisms that remove nutrients and pollutants from water; and
- Through the accumulation of organic matter, sequestering carbon and acting as a sink for some nutrients and other chemical compounds, reducing the amounts of these substances in the water (USACE 2012a).

The degree to which a given wetland and its functions are impaired depends on a number of factors including wetland type (e.g., wet meadow versus forested), landscape position (riverine versus wet meadow), level of impairment or impact, and success of restoration efforts. Potential construction- and operations-related effects to wetland and their functions and values include the following:

- Permanent loss of wetlands as a result of permanent fill (e.g., backfilling at permanent ancillary facility locations or improper removal of temporarily staged soils in wetlands adjacent to the pipeline trench).
- Disturbances that result in permanent wetland loss as a result of improperly maintained wetland integrity (hydrology, hydric soil strata, or hydrophytic vegetation).
- Temporary to permanent modification of surface and subsurface flow patterns that could result in degradation of wetland productivity (rate of seed maturity, wildlife usage, etc.), wetland plant community diversity, and wetland to upland plant community conversion.
- Temporary to permanent modification of wetland vegetation community composition and structure from clearing and operational maintenance (e.g., conversion of scrub-shrub and forested wetlands to herbaceous wetlands within the permanent ROW).
- Loss or alteration of wetland soil integrity as a result of improperly restored hydric soil strata (topsoil and root stock, clays, and gravels/cobbles), rutting, and compaction that could result in altered biological activities and chemical conditions that could affect re-establishment and natural recruitment of native wetland vegetation after restoration.
- Temporary increase in water turbidity, temporary decrease in water quality, and temporary water drawdown due to construction activities (e.g., trenching, dewatering, hydrostatic test water withdrawals).

- Permanent alteration in water-holding capacity in the Prairie Pothole, Rainwater Basin and Playa regions due to alteration or breaching of water-retaining substrates.
- Introduction of invasive species to wetlands, degrading wetland habitat and negatively impacting wetland functions such as native plant richness, wildlife habitat quality, water quality, and shoreline stabilization.
- Wetland function and habitat degradation resulting from construction and operational disturbances and inadequate maintenance and monitoring activities include (but are not limited to) those noted above as well as loss or degradation of quality native plant communities, loss or degradation of quality wildlife habitat, displacement of wildlife species, soil integrity degradation, loss or degradation of natural drainage patterns and stormwater storage capacity, and erosion control problems.
- Permanent alteration in vegetation productivity and life-stage timing to wetlands located directly over the pipeline due to increased soil temperatures associated with heat generation of the pipeline (during the cooler months of January to May and November to December, operation of the proposed Project would cause increases of 4 degrees Fahrenheit [˚F] to 8˚F in soil temperatures at the soil surface directly over the proposed pipeline, and 10 to 15˚F at 6 inches below the surface directly over the pipeline [see Appendix S, Pipeline Temperature Effects Study]).
- Permanent alteration of freeze-thaw timing in wetlands directly over the proposed pipeline as a result of the increased soil temperatures associated with heat generation from the pipeline. In the event of a spill incident[1] along the proposed pipeline during the winter months, open-water areas that refreeze could hamper recovery efforts and lead to emergent wetland vegetation die-off or cause harmful effects to wildlife (amphibians, fish) as a result of further drops in dissolved oxygen.
- Permanent alteration of soil water availability, soil biological activity, and soil chemical conditions to wetlands located directly over the proposed pipeline due to the increased soil temperature associated with the heat generated by the pipeline.
- Short-term to long-term wetland loss or habitat degradation due to hazardous liquid spills. Wetland impacts associated with hazardous liquid spills during the construction (e.g., construction vehicle refueling) and operation phase (e.g., product spill) are addressed in Section 4.13.3, Spill Impact Assessment. Prior to beginning the proposed Project, Keystone would prepare and submit a Spill Prevention, Control, and Countermeasure Plan to avoid or minimize the potential for spills or leaks (see Appendix I) and a Pipeline Spill Response Plan to the Pipeline Hazardous Material Safety Administration. Keystone would also prepare an Emergency Response Plan as required by 49 Code of Federal Regulations 195.402 (Operation and Maintenance) for conducting normal operations and maintenance and handling of abnormal operations and emergencies. See Sections 2.1.7.1, Pipeline Design, and 2.1.7.2, Pipeline Construction Procedures, for additional details.

[1] The terms *incident* and *accident* can be used interchangeably or with specified definitions in various agency reports and databases. For the purposes of this report, the term *incident* has been selected for consistency.

- Long-term to permanent wetland impacts due to climate change include, but are not limited to changes to vegetation productivity and life-stage timing; changes in vegetation species composition; changes to freeze-thaw cycle; alterations to soil water availability through increased evapotranspiration; changes to the type, quantity, and duration of precipitation events; and alteration of biological and chemical activity in wetland vegetation, soils, and water. The potential effects of climate change on wetlands are discussed in Section 4.14, Greenhouse Gases and Climate Change, specifically 4.14.6.3, Wetlands, and are also addressed from a cumulative impacts perspective in Section 4.15.3.4, Wetlands.

Keystone has developed a CMRP for the proposed Project (see Appendix G), which outlines procedures that would be implemented to minimize potential construction- and operations-related impacts at all wetlands crossings, and states that wetlands affected by construction activities would be restored to the extent practicable. Implementation of measures in the CMRP would avoid or minimize many impacts on wetlands associated with construction and operation activities and would help to ensure that potential effects would be primarily short-term. Tribal and regulatory agencies may require additional wetland avoidance, minimization, and mitigation measures in the event that the current CMRP does not meet the requirements of tribal, local, state, and federal permitting agencies.

Keystone has made numerous route modifications to avoid known wetland areas and to generally minimize wetland impacts. These modifications have been implemented based on aerial mapping, field surveys, and consultation with agencies. Involvement of the USACE and USFWS, as well as other federal and state agencies, during the early phases of project routing and siting identified high quality wetlands (such as the NDEQ-identified Sand Hills Region) or areas requiring additional protection to be avoided. Data reviewed to avoid and minimize impacts to wetlands to the extent possible included: National Wetland Inventory maps, aerial imagery, soil surveys, and field wetland surveys. In addition to the procedures outlined in the CMRP, wetland impacts were further avoided or minimized by the use of HDD to avoid impacts at some water crossings, locating the route next to existing utilities to minimize impacts, perpendicular crossing of riparian wetland features to minimize impacts where possible, and route variations to reduce the total length of the wetland crossing to minimize impacts.

Commitments described in the proposed Project CMRP (see Appendix G, Sections 6 and 7) and additional Keystone correspondence to protect and restore wetlands include the following general measures (refer to the CMRP for additional details and figures):

- Avoid placement of aboveground facilities in a wetland, except where the location of such facilities outside of wetlands would preclude compliance with U.S. Department of Transportation pipeline safety regulations or the Project-specific Special Conditions developed by the Pipeline Hazardous Material Safety Administration (see Appendix G, CMRP).
- Reduce the width of the proposed construction ROW to 85 feet or less in Montana and Nebraska, and 75 feet or less in South Dakota in standard wetlands unless non-cohesive soil conditions require a greater width and unless the USACE or other regulatory authority authorizes a greater width.
- Avoid highly saturated areas, such as wetlands, to the maximum extent practicable.

- Develop emergency response procedures for all incidents (e.g., leaks, spills, fires, HDD frac-out) involving hazardous materials that could pose a threat to human health or the environment (including wetlands) prior to beginning work.
- Develop compensation for impacts to all wetland types according to tribal, local, state, and federal regulations. In addition, Keystone would develop compensation for impacts to non-jurisdictional forested wetland impacts in Nebraska.
- Clearly mark wetland boundaries with signs and/or highly visible flagging during construction and maintain markers until permanent seeding is completed.
- Minimize the construction of roads through wetlands. Other than the construction ROW, the only access roads that would be used in wetlands would be existing public and private roads. Locate extra work spaces at least 10 feet away from wetland boundaries, where topographic conditions permit.
- Apply specific construction methods for "dry wetland crossings" (wetlands that are dry enough to support equipment without supportive construction mats); "standard wetland crossings" (wetlands with saturated and non-cohesive soils); and "flooded wetlands" (wetlands with standing water over much of the surface area) to minimize disturbances based on site-specific conditions (see Section 6 of the CMRP [Appendix G]).
- Limit clearing of vegetation between extra work areas and the edge of the wetlands to the proposed construction ROW and limit the size of extra work areas to the minimum needed to construct the wetland crossing.
- Clear the construction ROW, dig the trench, fabricate and install the pipeline, backfill the trench, and restore the construction ROW using wide-track or low-ground pressure construction equipment and/or conventional equipment operating from timber and slash (riprap) cleared from the ROW, timber mats, or prefabricated equipment mats.
- Install and maintain sediment barriers at all saturated wetlands or wetlands with standing water across the entire construction ROW upslope of the wetland boundary and where saturated wetlands or wetlands with standing water are adjacent to the construction ROW as necessary to prevent sediment flow into the wetland.
- Limit the duration of construction-related disturbance within wetlands to the extent practicable.
- Use no more than two layers of timber riprap to stabilize the proposed construction ROW.
- Cut vegetation off at ground level leaving existing root systems in place and remove it from the wetland for disposal.
- Limit pulling of tree stumps and grading activities to directly over the trench line unless safety concerns require the removal of stumps from the working side of the construction ROW.
- Segregate and salvage all topsoil up to a maximum of 12 inches of topsoil from the area disturbed by trenching in dry wetlands, where practicable, and restore topsoil to its approximate original stratum after backfilling is complete.

- Dewater the trench in a manner to prevent erosion and to prevent heavily silt-laden water from flowing directly into any wetland or waterbody.
- Locate hydrostatic test manifolds outside wetlands and riparian areas to the maximum extent practicable.
- Prohibit storage of hazardous materials, chemicals, fuels, lubricating oils in wetlands, if possible. All storage tanks would have secondary containment structures that would provide 110 percent containment volume so potential spill materials are fully contained.
- Prohibit the performing of concrete coating activities within a wetland or within 100 feet of any wetland boundary, if possible.
- Avoid parking equipment overnight within 100 feet of a watercourse or wetland, if possible.
- Prohibit washing equipment in streams or wetlands.
- Install trench plugs and/or seal the trench to maintain the original wetland hydrology, where the pipeline trench may drain a wetland. Trench plugs would also be used at wetland and waterbody crossings, at the direction of the Environmental Inspector, to prevent diversion of water into upland portions of the pipeline trench and to keep any accumulated trench water out of the waterbody. Perform all equipment maintenance, repairs, and refueling of all construction equipment in an upland area at least 100 feet from a wetland boundary, if possible. Where this is not possible (e.g., trench dewatering pumps), the equipment would be fueled by designated personnel with special training in refueling, spill containment, and cleanup. Keystone would prepare a Spill Prevention, Control, and Countermeasure Plan prior to introducing the subject fuel, oil, or hazardous material to a given location.
- Stationary equipment would be placed within a secondary containment if it would be operated or require refueling within 100 feet of a wetland or waterbody boundary.
- Avoid sand blasting in wetlands to the extent practicable; if unavoidable, place a tarp or suitable material to collect as much waste shot as possible, clean up all visible wastes, and dispose of collected waste at an approved disposal facility.
- Prior to the application of epoxy powder, urethane epoxy, or other approved pipe coatings, place a tarp underneath the pipe in wetlands to collect any overspray of epoxy powder and liquid drippings. Excess powder, liquid, or other hazardous materials (e.g., brushes, roller, gloves) would be continuously collected and removed from the area and appropriately disposed of.
- Remove all construction debris, excess spoil, timber riprap, and prefabricated equipment mats upon completion of construction.
- Replace topsoil and restore original contours with no crown over trench to the greatest extent practicable.
- Stabilize wetland edges and adjacent upland areas by establishing permanent erosion control measures and revegetation, as applicable, during final cleanup.
- For each standard wetland crossed, install a permanent slope breaker at the base of slopes near the boundary between the wetland and adjacent upland areas. The trench breaker would be located immediately upslope of the slope breaker.

- Apply seeding requirements for agricultural lands or as required by the landowner, or relevant land managing agency, for farmed wetlands.
- Mulch adjacent upland areas within 100 feet of waterbodies and wetlands with weed-free mulch at an approximate rate of 3 tons per acre to reduce erosion and weed infestation potential.
- Use no application of fertilizer, lime, or mulch unless required by the appropriate land management or resource agency and with land owner permission.
- Prohibit use of herbicides or pesticides within 100 feet of any wetland (unless allowed by the appropriate land management, tribal agency, or state agency). See Section 2.13 of the CMRP (Appendix G) for weed management procedures in adjacent upland areas.
- Restore wetland areas within conservation lands or easements to a level consistent with any additional criteria established by the relevant managing agency.
- Monitor the pipeline ROW and all stream crossings for erosion and other potential problems that could affect the integrity of the pipeline. Address problems as expediently as practicable.
- Repair trench depressions on the ditch line that may interfere with natural drainage, vegetation establishment, or land use as expediently as practicable.
- Conduct post-construction monitoring inspections after the first growing season to determine success of revegetation, unless otherwise required by a permit. If, after the first growing season, revegetation is successful, no additional monitoring would be conducted unless otherwise required by a permit.
- Determine restoration to be successful if the surface condition is similar to adjacent undisturbed communities.

Implement weed control measures as required by any applicable plan and in conjunction with the landowner and applicable agencies.

4.4.4 Additional Mitigation

Proposed pipeline construction through wetlands must also comply with Executive Order 11990 (the "no net loss" wetland policy), USACE Section 404 permit conditions, and applicable state and local regulations. Under the authority of Section 404 of the CWA, USACE permits are required for the discharge of fill material into waters of the U.S. As noted in Section 3.4.4, Federal and State Regulatory Setting, waters of the United States include the area below the ordinary high water mark of stream channels and lakes or ponds connected to the tributary system, and wetlands adjacent to these waters, including wetlands that have a "significant nexus" to these waters. Isolated waters and wetlands, as well as man-made channels and ditches, may be waters of the U.S. in certain circumstances, which must be determined on a case-by-case basis by the USACE. Under the authority of Section 10 of the Rivers and Harbors Act, USACE permits are required for structures or work in, over, under or affecting navigable Waters of the United States.

All wetlands and waterways crossed by the proposed Project would be evaluated under the preliminary jurisdictional determination process. Under this process, all wetlands are tentatively considered jurisdictional until an approved determination is made by USACE (Regulatory

Guidance Letter No. 08-02 [USACE 2008b]). A more detailed explanation of wetland regulatory framework can be found in Section 3.4.4, Federal and State Regulatory Setting. Compensatory mitigation, where required by USACE or state agencies, would be provided for permanent losses of jurisdictional wetlands and water resources. Compensatory Mitigation Plans would be developed and carried out in accordance with Title 33 of the Code of Federal Regulations Part 332 (Compensatory Mitigation for Losses of Aquatic Resources) or applicable state standards. All non-permanent wetland fills due to construction activities would be restored in accordance with the proposed Project CMRP (see Appendix G).

The USACE Omaha District and applicable state and local agencies would be consulted to determine the additional mitigation that would be required for impacts to and losses of wetlands and water resources, including the permanent conversion of forested wetland to herbaceous wetland. The USACE would determine whether a nationwide permit (such as an NWP12) or an individual permit is more appropriate for the proposed Project. In general, nationwide permits are only applicable for projects that would have minor environmental impacts and valid only if the proposed activities comply with all the terms and conditions of the permit. If the conditions cannot be met, then a regional or individual permit would be required. Individual permits require a full 30-day public interest review where the final decision of the permit is generally based on the results of the public review balanced with the benefits and impacts of the project. An individual permit cannot be issued if the proposed activity is contrary to the public interest. Under Section 401, states and Indian tribes can review and approve, condition, or deny all Federal permits or licenses that might result in a discharge to state or tribal waters, including wetlands (U.S. Environmental Protection Agency 2013).

Mitigation requirements, general conditions, and regional conditions vary between nationwide permits. Mitigation requirements for individual permits are evaluated on a case-by-case basis by the USACE and are generally more rigorous than those required by the nationwide permits. In general these permits would require the following:

- Thorough delineation of all project area wetlands to determine which wetlands are jurisdictional (and therefore regulated under the CWA), which wetlands are non-jurisdiction (and therefore exempt from CWA requirements), and which wetlands may be regulated by other policies or agencies.
- Detailed construction and operations plans with updated wetland impact estimates. An updated detailed wetland avoidance, minimization, and mitigation plan would be submitted and evaluated for Section 404(b)1 compliance to ensure the proposed Project is the most Least Environmentally Damaging Practicable Alternative. Pre-construction notification packages would include the mitigation plans agreed upon with the USACE, states, and Indian tribes.
- Final restoration for all jurisdictional wetlands, and other wetlands of tribal, state, or federal concern, according to the USACE and other agencies and tribal entities as required.
- Compensation for wetland loss as required by tribal, local, state, or federal agencies. At a minimum, jurisdiction wetland loss would be compensated at a 1:1 ratio to ensure no net loss but higher ratios are often required.

- Approval by appropriate agencies for all seed mixes and revegetation materials used to restore wetlands or agricultural farmed wetlands.
- Monitoring of wetland mitigation sites for success according to applicable permit conditions.

More permit specific mitigation measures are described in the following USACE nationwide and individual permit resource documents. Note that many of the mitigation measures included in the CMRP (see Appendix G) are already tailored after Nationwide Permit 12 for Utility Line Activities:

- USACE 2012 Nationwide Permits Summary (USACE 2012b);
- USACE 2012 Nationwide Permits, Conditions, and Definitions, with Corrections (USACE 2012c);
- 2012 Nationwide Permits Regional Conditions Omaha District State of Montana (USACE 2012d);
- 2012 Nationwide Permits Regional Conditions Omaha District State of South Dakota (USACE 2012e);
- 2012 Nationwide Permits Regional Conditions Omaha District State of Nebraska (USACE 2012f); and
- USACE 2012 Individual permit application form and guidelines (USACE 2012g). Additionally, Keystone would follow state-specific impact reduction, mitigation, and reclamation plans as outlined in the following Project-related publicly available documents:
- Montana—Keystone XL Project: Supplemental Information for Compliance With the Montana Environmental Policy Act and Support for Decisions Under the Major Facility Siting Acting (signed March 30, 2012) (see Appendix N, Supplemental Information for Compliance with MEPA);
- South Dakota—South Dakota Public Utilities Commission Final Decision and Order (2010); and
- Nebraska—2012 Nebraska Supplement Environmental Report (NDEQ 2013).

In addition to the state and federal mitigation requirements noted above, the proposed Project would also need to comply with any additional mitigation required by other permitting agencies such as the USACE. In addition and as required under the Wild and Scenic Rivers Act, USACE will contact the National Park Service to determine the need for Section 7(a) evaluations at all pipeline river crossings including those upstream, downstream, and on tributaries to the Niobrara River for both the Niobrara National Scenic River and the Missouri National Recreational River. During the public comment review period several agencies had recommended additional mitigation measures for the proposed Project. Some or all of these additional recommended mitigation measures could be required during federal and state permitting.

4.4.5 Connected Actions[2]

4.4.5.1 Bakken Marketlink Project

Based on the wetland coverage provided by the NWI (USFWS 2012a), NLCD (Fry 2011), and GAP (USGS 2011) databases noted above in Section 4.4.2, Impact Assessment Methodology, a minimum of 0.03 acres of herbaceous (PEM) wetlands could be affected by the 5-mile pipeline. The pipeline would likely affect more wetlands including those associated with small perennial and intermittent streams; however, these impacts would need to be verified in the field. The additional wetland delineations and permit applications for these proposed projects would be reviewed and acted on by the appropriate agencies. Those agencies would conduct a detailed environmental review of the Bakken Marketlink Project. Potential wetland impacts would be evaluated during the environmental reviews for these projects and potential wetland impacts would be evaluated and avoided, minimized, or mitigated in accordance with direction from the appropriate USACE district offices. Refer to Section 2.1.12.1, Bakken Marketlink Project, and Figure 2.1.12-3 for a more detailed description of this proposed connected action.

4.4.5.2 Big Bend to Witten 230-kV Transmission Line

Upgrades to the power grid in South Dakota to support power requirements for pump stations in South Dakota would include construction of a new 230-kV transmission line and a new substation through Lyman and Tripp counties in south-central South Dakota. The Western Area Power Administration and Basin Electric Power Cooperative have identified a preferred corridor for the proposed Big Bend to Witten 230-kV Transmission Line project (Figure 2.1.12-4). This proposed connected action is more fully explained in Section 2.1.12.2, Big Bend to Witten 230-kV Transmission Line, and the in the Basin Electric Big Bend to Witten 230-kV Transmission Project Routing Report (see Appendix J).

As described in Basin Electric Power Cooperative's Routing Report, the Big Bend to Witten project would be constructed using 230-kV transmission structures that allow for an average span length of 650 to 950 feet. Surface water bodies and wetlands that are less than 950 feet wide could be spanned by the proposed transmission line; however, poles used to support the transmission line, might have to be placed within wetlands. Most surface water features and wetlands would be spanned; however, those that fall within the ROW would need to be delineated in localized areas prior to construction and measures to avoid impacts would be implemented. The applicant preferred route would cross approximately 1,600 surface water bodies and approximately 6,000 feet of wetlands, most of which could be spanned by the transmission line. Refer to Appendix J, Basin Electric Big Bend to Witten 230-kV Transmission Project Routing Report, for a complete discussion of the selected alternatives as well as the surface water and wetland analysis that was performed to estimate potential impacts.

The permit applications for the Big Bend to Witten project would be reviewed and acted on separately by the appropriate federal, state, and local regulatory agencies and those agencies would conduct more detailed environmental review of the project. Potential wetland impacts would be evaluated during the environmental reviews for these projects and potential wetland

[2] Connected actions are those that 1) automatically trigger other actions which may require environmental impact statements, 2) cannot or will not proceed unless other actions are taken previously or simultaneously, 3) are interdependent parts of a larger action and depend on the larger action for their justification.

impacts would be evaluated and avoided, minimized, or mitigated in accordance with direction from the appropriate USACE district offices.

4.4.5.3 Electrical Distribution Lines and Substations

Electrical distribution line construction and operation requires clearing of trees and shrubs, and maintaining vegetation under the power lines in an herbaceous state. Electrical distribution lines and substations that would be constructed to provide power for the proposed Project pump stations in Montana, South Dakota, Nebraska, and Kansas could affect wetland resources through the following:

- Temporary, short-term, long-term, and permanent modification of wetland vegetation community composition, community structure, potential increase in noxious weeds, and the wetland's capacity to perform existing wetland functions;
- Alteration of drainage patterns and wetland hydrology;
- Compaction and rutting of wetland soils from movement of heavy machinery and transport and installation of transmission structures, inhibiting seed germination, or increasing siltation; and
- Temporary increase in turbidity and water quality and changes in wetland hydrology.

In general, electrical distribution line construction impacts to wetlands would be temporary and short-term, as most lines would run alongside existing roadways and smaller wetlands might be spanned. Trees in forested wetlands crossed by the electrical distribution line ROW would be removed, and the ROW would be maintained free of woody vegetation. Table 4.4-3 provides preliminary estimates of wetland impacts in Montana, South Dakota, and Kansas. Impacts were calculated based on a 150-foot wide ROW corridor width, which provides a high-end estimate of potential wetland impacts. Specific location data for ancillary and ROW proposed Project components for this connected action are still to be determined; the impacts notes in Table 4.4-3 are considered interim. Electricity service providers would avoid and minimize impacts by spanning wetlands and selecting pole locations away from sensitive habitats. The exact locations of operational structures, such as poles, are still to be determined, however, permanent impacts are expected to be substantially lower than the estimated construction related impacts noted in Table 4.4-3.

Table 4.4-3 Estimated Impacts to Wetlands Associated with the Electrical Distribution Lines and Substations

State	Impact Area	Length of Wetlands Crossed (miles)[a]				Wetland Area Affected During Construction (acres)[b]			
		PEM[c]	PSS	PFO	Riv-OW	PEM	PSS	PFO	Riv-OW
Montana									
	ROW[d]	2.8	1.3	0.04	1.6	49.7	24.1	0.6	28.1
South Dakota									
	ROW[d]	1.8	0.6	0.1	1.9	31.9	11.0	0.7	35.8
Nebraska									
	ROW[d]	NA	NA	NA	NA	NA	NA	NA	NA
Kansas									
	ROW[d]	NA	NA	NA	NA	NA	NA	NA	NA
Grand Total		4.6	1.9	0.1	3.5	81.6	35.1	1.3	63.9

Sources: exp Energy Services Inc. 2012 a, b; USFWS 2012a; Fry 2011; USGS 2011.

[a] Length of wetlands crossed for ROW is the length of wetlands bisected by transmission centerline.
[b] Construction electrical distribution line impacts were calculated based on a 150-foot general construction corridor width. These impacts do not include ancillary impacts. Actual construction corridor width would be 80 feet, and expanded to 150-feet wide around pole structures. Pole structure location was unknown at the time of this report. This estimate represents the maximum extent of wetland impacts associated with this connected action. Actual wetland impacts would likely be significantly lower. Location of operational structures is to be determined, therefore wetland acreage affected by operations is undetermined at this time, but would likely be substantially lower than construction related impacts.
[c] Cowardin et al., 1979; PEM-palustrine emergent; PSS-palustrine scrub-shrub; PFO-palustrine forested; Riv-OW-riverine-open water; NA-Not Available.
[d] Complete data for the electric distribution lines and substations were not available for Nebraska or Kansas at the time of this report.

4.4.6 References

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