

Prepared for:
Keystone Pipeline Project



Keystone Pipeline Project Progress Report for Wetland Surveys on the Cushing Extension

ENSR Corporation
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Executive Summary

Wetlands, waterbodies (including rivers, streams, lakes, and ponds), and riparian areas have been identified along the proposed Cushing Extension of the Keystone Pipeline Project right-of-way (ROW) through ongoing field surveys and the review of aerial photographs for areas where reroutes have been developed. The purpose of this report is to review the methodologies being used to collect wetland and waterbody data, summarize the data that was collected for wetlands during the spring 2007 field effort and discuss projected wetland survey needs for summer 2007.

1.0 Introduction

As part of federal regulatory requirements under the Clean Water Act (CWA), wetland and other waters of the U.S. (WUS) inventories involving field surveys are required to evaluate the potential for adverse effects to WUS along the proposed pipeline right-of-way (ROW) and other associated areas of disturbance related to project construction. Information gathered during the inventories will be used to complete notification and permitting requirements under Section 401 and 404 of the CWA, as managed by the U.S. Army Corps of Engineers (USACE) and applicable state agencies. The Cushing Extension of the Keystone Pipeline Project crosses three USACE districts including the Omaha, Kansas City, and Tulsa districts. Each of these districts has slightly different surveying and permitting requirements. Meetings were held in 2006 with the Omaha (February 6, March 29), Tulsa (March 13), and Kansas City (March 27) districts to discuss surveying, permitting, and construction requirements.

Consultation with the various USACE districts resulted in the following general survey requirements:

- Omaha District (Nebraska): Field surveys along the Cushing Extension ROW route through Nebraska will be required only at specific locations. Information will be provided to the USACE on other crossings, such as ephemeral streams and farmed wetlands, using remote sensing and GIS.
- Kansas City District (Kansas): All wetland and drainage crossings along the Cushing Extension in Kansas will require ground surveys
- Tulsa District (Oklahoma): All wetland and drainage crossings along the Cushing Extension in Oklahoma will require ground surveys.

More specific information regarding discussions with the USACE districts' personnel, level of effort, wetland and other WUS delineation methodology and permitting requirements has been provided in a submittal to the Department of State (September 15, 2006). In partial fulfillment of USACE requirements, field surveys commenced in the spring of 2007 and will be completed by summer 2007. The remainder of this report provides a summary of data collection efforts for wetlands through March 2007 and discusses projected wetland survey needs for the summer of 2007.

2.0 Data Collection Methods for Wetlands and Other WUS

To initiate this project, ENSR completed a review of U.S. Geological Survey (USGS) topographic maps, National Wetland Inventory (NWI) maps, available soil surveys, and 2005 aerial photographs pertaining to the proposed ROW. The objectives of this data review were to identify wetlands and other WUS intercepted by the proposed pipeline route, including intermittent and ephemeral streams, and to identify specific wetlands and other WUS that will require field evaluation to confirm their status. Areas identified for field verification

included: 1) NWI-mapped wetlands intercepted by the pipeline route that are not farmed; 2) areas that appear to meet the wetlands three-parameter criteria (discussed below), but are not mapped on NWI maps; and 3) forested areas where wetland boundaries could not be estimated from aerial photographs. Additional areas to be field verified were included if recommended by the various USACE districts. Areas identified on the NWI maps as farmed wetlands or agricultural or roadway drainage ditches were eliminated from field delineations.

ENSR coordinated with USACE representatives regarding features requiring field verification and delineation. Preliminary survey areas were identified on maps of the proposed ROW previously provided by the district offices. For each site surveyed, a decision was made by the field team regarding the presence of wetlands and other WUS. For drainages with no wetland characteristics (e.g., unvegetated channel, defined bed and bank), a Stream Data Form developed by ENSR was completed to evaluate stream crossing characteristics. This form applied to stream crossings whether or not it supported adjunct wetland plant communities. If both wetlands and other WUS were present, a Stream Data Form and a Routine Wetland Determination Form was completed for the survey site.

The methods and techniques used to evaluate and delineate wetlands and other WUS on the maps of the proposed route corresponded to those specified for "routine on-site delineations" in the USACE Wetlands Delineation Manual (Manual; USACE 1987). The Manual identifies a "three-parameter" approach used for defining wetlands which requires that all three of the conditions listed below be met under normal circumstances for an area to be defined and delineated as wetland.

1. The prevalent vegetation consists of hydrophytic plants that have the ability to grow in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content and depleted soil oxygen levels.
2. Soils are present and are classified as hydric or possessing characteristics that are associated with reducing soil conditions. Hydric soils are poorly drained and have a seasonal high water table within 6 inches of the surface.
3. The area is inundated either permanently or periodically at mean water depths less than or equal to 6.6 feet or the soil is saturated to the surface at some time during the growing season of the prevalent vegetation (usually 12.5 percent of the growing season) (USACE 1987).

Vegetation, soil, and hydrology data was collected at each sample point within the wetlands and immediately adjacent uplands and was entered onto a standardized wetland delineation field data form. The form also included a field sketch, which illustrated the wetlands and uplands. Wetland/upland boundaries were delineated using a handheld Global Positioning System (GPS) receiver. Photographs showing a representative view of each wetland visited also were taken. In addition to collecting sufficient data for "routine on-site delineations" and channel characteristics data for drainage crossings, wetland survey teams collected sufficient data (e.g., defined bed and bank and connectivity to navigable waters) for the USACE to make jurisdictional determinations for all wetlands and drainage crossings surveyed in the field.

Wetlands and other WUS along the proposed route were delineated in accordance with the direction provided by the USACE – Omaha, Kansas City, and Tulsa districts. The requirements and level of effort to complete wetland other WUS delineations differed within each district. The level of effort completed within each of the respective states has been provided below.

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- Nebraska: Preliminary identification of wetlands and other WUS was based on the review of aerial photographs. Delineations of wetlands and other WUS will be initiated and completed in the spring/summer of 2007.

- Kansas: Preliminary identification of wetlands and other WUS was based on the review of aerial photographs. Delineations of wetlands and other WUS will be initiated and completed in the spring/summer of 2007.
- Oklahoma: Preliminary identification of wetlands and other WUS was based on the review of aerial photographs. Delineations of all wetlands and other WUS will be initiated and completed in the spring/summer of 2007.

A table of all potential wetlands identified which require ground-verification/field delineation in Nebraska and Kansas may be found in Appendix A.

3.0 Results of Spring 2007 Wetland Surveys

Maps of the proposed route, including USGS topographic maps and high resolution aerial photography overlaid with NWI wetland polygons, were evaluated for wetland crossings. Based on this evaluation, priority wetland survey areas were identified along the Cushing Extension ROW. Based on surveys conducted to date, a total of 145 wetlands have been field delineated along the Cushing Extension ROW in Nebraska, Kansas, and Oklahoma.

Of the 145 wetlands identified to date, the vast majority are classified as palustrine emergent (PEM) wetlands (**Figure 1**), representing 64 percent of all identified. PEM wetlands are dominated by persistent and nonpersistent grasses, rushes, sedges, forbs and other herbaceous or grass-like plants. The second most common wetland type identified is palustrine forested (PFO) wetlands, comprising 29 percent of the total. PFO wetlands are dominated by woody vegetation, generally greater than ten feet in height. One percent of wetlands identified are classified as palustrine scrub-shrub (PSS) wetlands (dominated by shrubs), while 6 percent are classified as wetlands dominated by open water (OW). A complete list of wetlands identified to date for the Cushing Extension may be found in Appendix B.

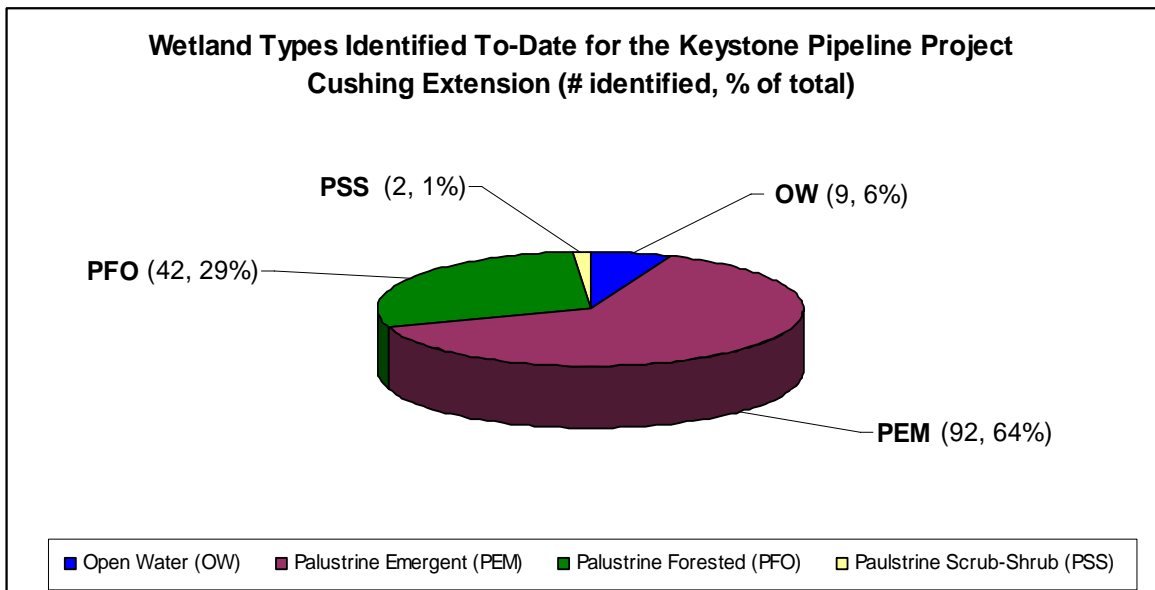


Figure 1 Wetland Types Identified To-Date on the Cushing Extension

Currently, wetland survey status for the Cushing Extension of the Keystone Pipeline Project is variable by state. Nebraska is currently complete, with further surveys necessary in Kansas and Oklahoma (**Table 1**). The current wetland survey status by state is provided in detail below:

- Nebraska: Wetland delineations are 100 percent complete. Of 10 total locations requiring survey, all 10 have been completed.
- Kansas: Wetland delineations are approximately 84 percent complete, based on pre-survey location estimates. Delineations have been completed for 190 of the 226 locations identified prior to survey initiation. Based on mileage, wetland and WUS surveys in Kansas are approximately 80 percent complete. Further wetland surveys will be conducted in spring/summer 2007 on tracts where permission was recently obtained and for any potential reroutes.
- Oklahoma: Wetland delineations are approximately 50 percent complete. Of the 80 total miles requiring wetland survey from the Kansas border to the Cushing Terminal, 40 miles have been successfully completed. Further wetland surveys will be conducted in spring/summer 2007 on tracts where permission was recently obtained and for any potential reroutes.

Table 1 Cushing Wetlands Survey Progress as of February 24, 2007

State	Locations (L) Requiring Pedestrian Survey ¹	Miles (M) Requiring Pedestrian Survey ¹	Total Locations (L) Surveyed ¹	Total Miles (M) Surveyed ¹	Percent Complete
Nebraska	10 (L)	---	10(L)	---	100
Kansas	226 (L)	210 (M)	190 (L) ²	170 (M)	84
Oklahoma	---	80 (M)	---	40(M)	50
Total locations	236 (L)	---	200 (L)	---	---
Total miles	---	290 (M)	---	210 (M)	---

¹Numbers of wetlands for survey subject to verification.

²Kansas requires 100 percent pedestrian survey. Location records have been kept to track survey progress. Mileage numbers reflect areas void of features, in addition to areas where survey crews have found and delineated wetlands.

4.0 Projected Survey Needs (Spring/Summer 2007)

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Remaining wetland survey work on the Keystone Pipeline Project Cushing Extension includes:

- Nebraska: Complete. No further surveys on the Cushing Extension required.
- Kansas and Oklahoma: Further wetland surveys will be conducted in spring/summer 2007 on tracts where permission was recently obtained and for any potential reroutes.

5.0 References

U.S. Army Corps of Engineers (USACE). 1987. Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. Available online at: <http://www.wes.army.mil/el/wetlands/pdfs/wlman87.pdf>.

Appendix A

**Potential Wetlands Identified for Field Verification/Delineation in
Nebraska and Kansas along the Cushing Extension**

Table A-1 Potential Wetlands Identified for Field Verification/ Delineation In Nebraska and Kansas Along the Cushing Extension¹

Enter MP	Exit MP	Miles Crossed	WL Type	Name	State	Survey Site Count
0.239	0.247	0.008	OW		NE	1
0.431	0.435	0.004	OW		NE	2
0.568	0.570	0.002	OW		NE	3
0.636	0.638	0.002	OW		NE	4
0.745	0.747	0.002	OW		NE	5
1.717	1.719	0.002	OW		NE	6
1.840	1.843	0.003	OW		NE	7
1.851	1.857	0.006	OW		NE	8
1.890	1.892	0.002	OW		NE	9
2.823	2.824	0.002	OW		KS	10
3.570	3.572	0.002	OW		KS	11
4.113	4.156	0.042	OW	Little Blue River	KS	12
4.822	4.847	0.026	PEM		KS	13
5.652	5.669	0.018	PEM		KS	14
7.452	7.467	0.015	PEM		KS	15
7.601	7.613	0.012	PEM		KS	16
7.758	7.771	0.013	PEM		KS	17
7.793	7.808	0.015	PEM		KS	18
7.985	8.029	0.043	PEM		KS	19
8.924	8.958	0.034	PEM		KS	20
9.071	9.089	0.018	PFO		KS	21
9.089	9.091	0.002	OW		KS	
9.091	9.098	0.008	PFO		KS	
9.631	9.640	0.009	PFO		KS	22
9.640	9.642	0.002	OW		KS	
9.642	9.657	0.015	PFO		KS	
10.888	10.929	0.041	PFO		KS	23
11.661	11.677	0.016	PFO		KS	24
12.046	12.056	0.010	PFO		KS	25
12.056	12.058	0.002	OW	Mill Creek	KS	
12.058	12.073	0.015	PFO		KS	
13.484	13.505	0.021	PFO		KS	26
13.505	13.507	0.002	OW	Mill Creek	KS	
13.507	13.520	0.012	PFO		KS	
15.793	15.807	0.013	PFO		KS	27
16.469	16.478	0.009	PEM		KS	28
16.773	16.783	0.010	PEM		KS	29
16.854	16.866	0.011	PEM		KS	30
17.050	17.062	0.011	PEM		KS	31
17.397	17.430	0.033	PEM		KS	32
18.353	18.384	0.031	PEM		KS	33
18.518	18.536	0.018	PEM		KS	34
20.004	20.036	0.032	PEM		KS	35

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Table A-1 Potential Wetlands Identified for Field Verification/ Delineation In Nebraska and Kansas Along the Cushing Extension¹

Enter MP	Exit MP	Miles Crossed	WL Type	Name	State	Survey Site Count
20.570	20.576	0.006	PEM		KS	36
21.703	21.710	0.007	PEM		KS	37
21.718	21.726	0.008	PEM		KS	38
21.737	21.743	0.006	PEM		KS	39
21.918	21.983	0.065	PEM		KS	40
22.625	22.635	0.010	PFO		KS	41
22.635	22.637	0.003	OW		KS	
22.637	22.655	0.018	PFO		KS	
23.620	23.636	0.016	PEM		KS	42
23.847	23.877	0.030	PFO		KS	43
24.088	24.155	0.067	PEM		KS	44
25.954	26.010	0.056	PFO		KS	45
28.697	28.699	0.002	OW		KS	46
29.649	29.651	0.002	OW		KS	47
30.263	30.283	0.020	PFO		KS	48
30.283	30.285	0.002	OW		KS	
30.285	30.297	0.011	PFO		KS	
30.475	30.477	0.002	OW		KS	49
31.315	31.317	0.002	OW		KS	50
32.135	32.137	0.002	OW		KS	51
33.251	33.253	0.002	OW		KS	52
34.699	34.701	0.002	OW		KS	53
36.284	36.297	0.013	PFO		KS	54
36.297	36.299	0.002	OW	West Fancy Creek	KS	
36.299	36.310	0.011	PFO		KS	
43.876	43.878	0.002	OW		KS	55
45.475	45.477	0.002	OW		KS	56
46.209	46.317	0.108	PEM		KS	57
46.357	46.390	0.033	PEM		KS	58
46.391	46.475	0.084	PEM		KS	59
50.288	51.130	0.842	PFO		KS	60
51.142	51.182	0.039	OW	Republican River	KS	
51.182	51.233	0.051	PFO		KS	
51.247	51.293	0.046	PEM		KS	61
52.514	52.516	0.002	OW		KS	62
53.989	54.028	0.038	PEM		KS	63
54.028	54.030	0.002	OW		KS	
54.030	54.050	0.020	PEM		KS	
54.114	54.253	0.139	PEM		KS	64
59.294	59.296	0.003	OW		KS	65
60.063	60.067	0.005	OW		KS	66
68.781	68.813	0.032	PFO		KS	67
68.813	68.815	0.002	OW	Chapman Creek	KS	
68.815	68.836	0.021	PFO		KS	
69.921	69.943	0.022	PFO		KS	68
69.950	69.981	0.031	PFO		KS	69

Table A-1 Potential Wetlands Identified for Field Verification/ Delineation In Nebraska and Kansas Along the Cushing Extension¹

Enter MP	Exit MP	Miles Crossed	WL Type	Name	State	Survey Site Count
70.234	70.246	0.012	PFO		KS	70
70.246	70.248	0.002	OW		KS	
70.248	70.261	0.013	PFO		KS	
70.627	70.643	0.016	PFO		KS	71
70.643	70.645	0.002	OW		KS	
70.645	70.652	0.007	PFO		KS	
71.899	71.903	0.003	PFO		KS	72
71.903	71.905	0.002	OW		KS	
71.905	71.908	0.004	PFO		KS	
72.024	72.027	0.002	OW		KS	73
72.052	72.055	0.003	OW		KS	74
72.100	72.105	0.005	OW		KS	75
76.080	76.253	0.174	PFO		KS	76
76.533	76.552	0.019	PFO		KS	77
76.552	76.582	0.030	OW	Smoky Hill River	KS	
76.582	76.604	0.022	PFO		KS	
78.920	78.944	0.024	PEM		KS	78
79.373	79.426	0.053	PFO		KS	79
80.022	80.037	0.015	PEM		KS	80
80.037	80.039	0.002	OW		KS	
80.039	80.052	0.013	PEM		KS	
81.427	81.429	0.002	OW		KS	81
81.429	81.438	0.009	PEM		KS	
81.899	81.904	0.006	PEM		KS	82
83.571	83.580	0.009	PEM		KS	83
83.580	83.582	0.002	OW		KS	
83.582	83.593	0.011	PEM		KS	
85.079	85.087	0.008	PEM		KS	84
85.087	85.088	0.002	OW		KS	
85.088	85.101	0.012	PEM		KS	
85.816	85.836	0.020	PEM		KS	85
86.206	86.217	0.012	PEM		KS	86
86.217	86.219	0.002	OW		KS	
86.219	86.233	0.014	PEM		KS	
86.919	86.932	0.012	PFO		KS	87
87.002	87.019	0.017	PFO		KS	88
87.053	87.068	0.015	PFO		KS	89
87.068	87.070	0.002	OW		KS	
87.070	87.073	0.003	PFO		KS	
87.622	87.635	0.013	PEM		KS	90
87.635	87.637	0.002	OW		KS	
87.637	87.652	0.015	PEM		KS	
89.604	89.616	0.012	PEM		KS	91
89.616	89.618	0.002	OW		KS	
89.618	89.634	0.016	PEM		KS	
90.990	91.028	0.038	PFO		KS	92

Table A-1 Potential Wetlands Identified for Field Verification/ Delineation In Nebraska and Kansas Along the Cushing Extension¹

Enter MP	Exit MP	Miles Crossed	WL Type	Name	State	Survey Site Count
91.028	91.032	0.004	OW		KS	
91.032	91.065	0.033	PFO		KS	
92.032	92.039	0.007	PFO		KS	93
92.039	92.040	0.002	OW		KS	
92.040	92.049	0.008	PFO		KS	
92.649	92.660	0.011	PEM		KS	94
95.169	95.234	0.065	PFO		KS	95
95.234	95.239	0.005	OW		KS	
95.239	95.246	0.007	PFO		KS	
95.841	95.848	0.007	PEM		KS	96
95.848	95.850	0.002	OW		KS	
95.850	95.866	0.016	PEM		KS	
96.294	96.320	0.026	PFO		KS	97
96.320	96.323	0.003	OW		KS	
96.323	96.337	0.014	PFO		KS	
97.013	97.068	0.056	PFO		KS	98
97.082	97.127	0.045	PFO		KS	99
97.163	97.174	0.011	PFO		KS	100
97.174	97.175	0.002	OW		KS	
97.175	97.195	0.020	PFO		KS	
98.759	98.772	0.012	PEM		KS	101
98.772	98.775	0.003	OW		KS	
98.775	98.780	0.005	PEM		KS	
99.967	99.979	0.012	PFO		KS	102
99.979	99.981	0.002	OW		KS	
99.981	99.986	0.005	PFO		KS	
101.615	101.652	0.037	PEM		KS	103
101.652	101.655	0.003	OW		KS	
101.655	101.673	0.018	PEM		KS	
105.113	105.121	0.008	PEM		KS	104
105.121	105.123	0.003	OW		KS	
105.123	105.127	0.004	PEM		KS	
105.127	105.130	0.002	OW		KS	
105.130	105.137	0.007	PEM		KS	
105.151	105.157	0.007	PEM		KS	105
105.157	105.160	0.003	OW		KS	
105.160	105.173	0.012	PEM		KS	
105.189	105.197	0.008	PEM		KS	106
105.197	105.201	0.004	OW		KS	
105.201	105.233	0.032	PEM		KS	
105.233	105.238	0.005	OW		KS	
105.238	105.272	0.034	PEM		KS	
106.301	106.311	0.010	PFO		KS	107
106.311	106.313	0.002	OW		KS	
106.313	106.384	0.071	PFO		KS	
108.685	108.700	0.016	PEM		KS	108

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Table A-1 Potential Wetlands Identified for Field Verification/ Delineation In Nebraska and Kansas Along the Cushing Extension¹

Enter MP	Exit MP	Miles Crossed	WL Type	Name	State	Survey Site Count
108.700	108.702	0.002	OW		KS	
108.702	108.709	0.007	PEM		KS	
109.386	109.394	0.008	OW		KS	
111.599	111.605	0.007	OW		KS	109
111.632	111.637	0.005	OW		KS	110
111.921	111.924	0.002	OW		KS	111
112.704	112.712	0.009	PEM		KS	112
112.712	112.714	0.002	OW		KS	113
112.714	112.730	0.016	PEM		KS	
114.106	114.128	0.022	PFO		KS	
114.128	114.141	0.013	OW		KS	114
114.141	114.175	0.034	PFO		KS	
116.928	116.930	0.002	OW		KS	
117.104	117.127	0.023	PFO		KS	115
117.127	117.134	0.007	OW	Cottonwood River	KS	116
118.852	118.854	0.003	OW		KS	
119.833	119.864	0.031	OW		KS	117
120.590	120.592	0.002	OW		KS	118
122.577	122.582	0.005	PEM		KS	119
122.582	122.585	0.003	OW		KS	120
122.585	122.592	0.007	PEM		KS	
123.385	123.426	0.041	PFO		KS	
123.438	123.442	0.003	OW		KS	121
124.211	124.216	0.005	OW		KS	122
124.265	124.267	0.002	OW		KS	123
126.606	126.615	0.008	PEM		KS	124
128.217	128.219	0.002	OW		KS	125
128.950	128.952	0.002	OW	Doyle Creek	KS	126
129.488	129.491	0.003	PEM		KS	127
129.491	129.493	0.002	OW		KS	
129.493	129.496	0.003	PEM		KS	
130.187	130.196	0.008	PEM		KS	128
130.196	130.200	0.005	OW		KS	
130.200	130.203	0.003	PEM		KS	
130.203	130.208	0.005	OW		KS	
130.208	130.216	0.008	PEM		KS	
130.253	130.258	0.005	PEM		KS	129
130.258	130.260	0.002	OW		KS	
130.260	130.264	0.004	PEM		KS	
130.275	130.283	0.008	PEM		KS	130
130.283	130.286	0.003	OW		KS	
130.286	130.288	0.002	PEM		KS	
130.359	130.361	0.002	PEM		KS	131
131.026	131.034	0.007	PEM		KS	132
133.040	133.043	0.003	OW		KS	133
133.044	133.046	0.002	OW		KS	134

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Table A-1 Potential Wetlands Identified for Field Verification/ Delineation In Nebraska and Kansas Along the Cushing Extension¹

Enter MP	Exit MP	Miles Crossed	WL Type	Name	State	Survey Site Count
133.063	133.066	0.002	OW		KS	135
133.402	133.408	0.006	OW		KS	136
134.420	134.436	0.015	PEM		KS	137
134.436	134.438	0.002	OW		KS	
134.438	134.458	0.021	PEM		KS	
134.494	134.511	0.016	PEM		KS	138
136.180	136.186	0.006	PEM		KS	139
136.186	136.188	0.002	OW		KS	
136.188	136.196	0.008	PEM		KS	
136.263	136.267	0.004	PEM		KS	140
136.267	136.269	0.002	OW		KS	
136.269	136.285	0.015	PEM		KS	
136.285	136.288	0.004	OW		KS	
136.288	136.300	0.012	PEM		KS	141
136.313	136.328	0.015	PEM		KS	
136.328	136.330	0.002	OW		KS	
136.330	136.338	0.008	PEM		KS	142
136.777	136.782	0.005	PEM		KS	
137.579	137.605	0.027	PEM		KS	143
140.116	140.117	0.002	OW		KS	144
140.203	140.219	0.016	OW		KS	145
142.530	142.532	0.002	OW		KS	146
144.043	144.055	0.012	OW		KS	147
144.964	144.966	0.002	OW		KS	148
147.481	147.545	0.064	PEM		KS	149
148.481	148.490	0.010	PEM		KS	150
148.717	148.720	0.002	OW		KS	151
148.897	148.907	0.011	PEM		KS	152
148.997	149.004	0.006	PEM		KS	153
149.004	149.006	0.002	OW		KS	
149.006	149.041	0.035	PEM		KS	
151.581	151.596	0.015	PSS		KS	154
151.596	151.598	0.002	OW		KS	
151.598	151.619	0.022	PSS		KS	
152.337	152.406	0.069	PEM		KS	155
153.524	153.550	0.026	PEM		KS	156
154.824	154.955	0.131	PFO		KS	157
154.955	154.957	0.002	OW		KS	
154.957	154.982	0.024	PFO		KS	
155.885	155.891	0.006	OW		KS	158
155.912	155.923	0.011	OW		KS	159
155.930	155.934	0.004	OW		KS	160
156.010	156.034	0.024	PFO		KS	161
156.034	156.042	0.008	OW		KS	
156.042	156.091	0.049	PFO		KS	
156.312	156.324	0.011	PEM		KS	162

Table A-1 Potential Wetlands Identified for Field Verification/ Delineation In Nebraska and Kansas Along the Cushing Extension¹

Enter MP	Exit MP	Miles Crossed	WL Type	Name	State	Survey Site Count
158.226	158.235	0.009	PFO		KS	163
158.235	158.250	0.015	OW	Whitewater River	KS	
158.250	158.265	0.015	PFO		KS	
159.066	159.090	0.024	PFO		KS	164
159.090	159.092	0.002	OW		KS	
159.092	159.109	0.018	PFO		KS	
159.928	159.939	0.011	PFO		KS	165
159.939	159.941	0.002	OW		KS	
159.941	159.978	0.037	PFO		KS	
160.600	160.603	0.003	OW		KS	166
164.050	164.063	0.013	PFO		KS	167
164.063	164.065	0.002	OW		KS	
167.295	167.367	0.072	PEM		KS	168
167.614	167.619	0.005	OW		KS	169
167.987	168.001	0.014	PFO		KS	170
168.001	168.004	0.003	OW	Fourmile Creek	KS	
168.004	168.019	0.015	PFO		KS	
169.524	169.589	0.066	PFO		KS	171
170.873	170.892	0.019	PEM		KS	172
170.892	170.894	0.002	OW		KS	
170.894	170.950	0.057	PEM		KS	
171.100	171.114	0.013	PEM		KS	173
171.469	171.497	0.029	PEM		KS	174
172.465	172.594	0.129	PFO		KS	175
173.135	173.170	0.034	PEM		KS	176
173.232	173.235	0.003	PEM		KS	177
174.827	174.842	0.015	PFO		KS	178
174.842	174.844	0.002	OW		KS	
174.844	174.879	0.035	PFO		KS	
175.744	175.752	0.009	PFO		KS	179
175.752	175.754	0.002	OW		KS	
175.754	175.762	0.008	PFO		KS	
176.421	176.433	0.013	PEM		KS	180
177.506	177.514	0.009	PFO		KS	181
177.522	177.524	0.002	PFO		KS	182
177.524	177.528	0.004	OW		KS	
177.528	177.545	0.018	PFO		KS	
178.120	178.122	0.002	OW		KS	183
178.782	178.785	0.003	PEM		KS	184
178.848	178.862	0.014	PFO		KS	185
178.862	178.865	0.003	OW		KS	
178.865	178.888	0.023	PFO		KS	
180.903	180.917	0.014	PFO		KS	186
180.917	180.919	0.002	OW	Polecat Creek	KS	
180.919	180.941	0.022	PFO		KS	
185.377	185.386	0.009	PFO		KS	187

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Table A-1 Potential Wetlands Identified for Field Verification/ Delineation In Nebraska and Kansas Along the Cushing Extension¹

Enter MP	Exit MP	Miles Crossed	WL Type	Name	State	Survey Site Count
185.386	185.388	0.002	OW		KS	188
185.388	185.407	0.019	PFO		KS	
185.465	185.470	0.005	PFO		KS	
185.470	185.472	0.002	OW		KS	
185.472	185.566	0.094	PFO		KS	
185.566	185.568	0.002	OW		KS	
185.568	185.588	0.021	PFO		KS	
186.961	186.966	0.005	OW		KS	
186.976	186.980	0.003	OW		KS	190
186.990	186.992	0.002	OW		KS	191
187.007	187.010	0.003	OW		KS	192
187.021	187.023	0.002	OW		KS	193
188.116	188.136	0.019	PFO		KS	194
188.136	188.141	0.005	OW		KS	
188.141	188.181	0.041	PFO		KS	
188.269	188.273	0.004	PFO		KS	195
188.273	188.275	0.002	OW		KS	
188.275	188.304	0.029	PFO		KS	
188.399	188.415	0.015	PFO		KS	
188.415	188.417	0.002	OW		KS	196
188.417	188.434	0.017	PFO		KS	
188.461	188.465	0.004	PFO		KS	197
190.211	190.228	0.017	PEM		KS	198
191.603	191.640	0.037	PEM		KS	199
192.277	192.338	0.061	PEM		KS	200
192.947	192.981	0.034	PFO		KS	201
193.288	193.319	0.030	PEM		KS	202
195.163	195.185	0.022	PEM		KS	203
196.122	196.152	0.030	PEM		KS	204
198.268	198.291	0.023	PEM		KS	205
202.951	202.967	0.016	PEM		KS	206
203.188	203.207	0.019	PEM		KS	207
205.059	205.104	0.045	PFO		KS	208
205.590	205.630	0.040	PFO		KS	209
205.630	205.740	0.110	OW	Arkansas River	KS	
205.740	205.818	0.078	PFO		KS	
206.897	206.911	0.015	PEM		KS	210
207.086	207.099	0.013	PEM		KS	211
209.666	209.689	0.023	PEM		KS	212
209.769	209.820	0.051	PEM		KS	213
210.197	210.265	0.067	PEM		KS	214

¹Analysis based on review of high resolution photography, topographic maps, and NWI polygons.

Locations requiring on-site verification/delineation were grouped for the purpose of tracking field survey progress.

Appendix B

**Wetlands Identified and Delineated To-Date Along the Cushing
Extension (Nebraska, Kansas, Oklahoma)**

Table B-1 Wetlands Identified and Field Delineated To-Date along the Cushing Extension (Nebraska, Kansas, Oklahoma)

Enter MP	Exit MP	Distance Crossed (miles)	Wetland Type	State
1.166	1.176	0.011	OW	NE
7.452	7.467	0.015	PEM	KS
7.601	7.613	0.012	PEM	KS
7.758	7.771	0.013	PEM	KS
7.793	7.808	0.015	PEM	KS
7.985	8.029	0.043	PEM	KS
16.855	16.858	0.003	PEM	KS
17.408	17.426	0.018	PEM	KS
18.353	18.384	0.031	PEM	KS
18.518	18.536	0.018	PEM	KS
23.620	23.636	0.016	PEM	KS
51.130	51.142	0.012	PFO	KS
51.182	51.233	0.051	PFO	KS
51.247	51.293	0.046	PEM	KS
53.989	54.028	0.038	PEM	KS
54.030	54.050	0.020	PEM	KS
54.114	54.253	0.139	PEM	KS
69.921	69.925	0.004	PFO	KS
69.925	69.932	0.007	PEM	KS
69.932	69.943	0.011	PFO	KS
69.950	69.961	0.010	PFO	KS
69.961	69.972	0.011	PEM	KS
69.972	69.981	0.009	PFO	KS
70.234	70.255	0.022	PFO	KS
70.260	70.261	0.002	PFO	KS
76.080	76.253	0.174	PFO	KS
78.920	78.944	0.024	PEM	KS
85.816	85.836	0.020	PEM	KS
86.206	86.217	0.012	PEM	KS
86.219	86.233	0.014	PEM	KS
87.654	87.672	0.018	OW	KS
105.117	105.201	0.084	PEM	KS
105.212	105.227	0.015	PEM	KS
105.234	105.260	0.026	PEM	KS
105.262	105.272	0.010	PEM	KS
108.704	108.718	0.013	PEM	KS
116.919	116.930	0.011	PEM	KS
136.777	136.782	0.005	PEM	KS
140.148	140.151	0.003	PEM	KS
140.184	140.186	0.003	PEM	KS

Table B-1 Wetlands Identified and Field Delineated To-Date along the Cushing Extension (Nebraska, Kansas, Oklahoma)

Enter MP	Exit MP	Distance Crossed (miles)	Wetland Type	State
147.509	147.518	0.010	PEM	KS
151.581	151.600	0.019	PSS	KS
151.603	151.619	0.016	PSS	KS
154.824	154.912	0.088	PFO	KS
154.928	154.982	0.053	PFO	KS
156.010	156.034	0.024	PFO	KS
156.042	156.091	0.049	PFO	KS
156.312	156.324	0.011	PEM	KS
158.226	158.235	0.009	PFO	KS
158.250	158.265	0.015	PFO	KS
159.066	159.090	0.024	PFO	KS
159.092	159.109	0.018	PFO	KS
159.928	159.939	0.011	PFO	KS
159.941	159.978	0.037	PFO	KS
167.295	167.367	0.072	PEM	KS
170.912	170.914	0.002	PEM	KS
171.107	171.113	0.006	PEM	KS
171.469	171.497	0.029	PEM	KS
172.495	172.497	0.002	OW	KS
173.135	173.170	0.034	PEM	KS
173.232	173.235	0.003	PEM	KS
174.825	174.847	0.022	PFO	KS
176.401	176.469	0.068	PEM	KS
178.778	178.779	0.001	OW	KS
185.377	185.386	0.009	PFO	KS
185.388	185.407	0.019	PFO	KS
185.465	185.470	0.005	PFO	KS
185.472	185.566	0.094	PFO	KS
185.568	185.588	0.021	PFO	KS
190.211	190.228	0.017	PEM	KS
191.603	191.640	0.037	PEM	KS
192.326	192.333	0.007	PEM	KS
192.947	192.981	0.034	PFO	KS
198.267	198.282	0.015	PEM	KS
202.951	202.967	0.016	PEM	KS
203.188	203.207	0.019	PEM	KS
205.059	205.104	0.045	PFO	KS
205.590	205.630	0.040	PFO	KS
205.740	205.818	0.078	PFO	KS
206.897	206.911	0.015	PEM	KS
207.086	207.099	0.013	PEM	KS
210.197	210.265	0.067	PEM	KS

Table B-1 Wetlands Identified and Field Delineated To-Date along the Cushing Extension (Nebraska, Kansas, Oklahoma)

Enter MP	Exit MP	Distance Crossed (miles)	Wetland Type	State
215.730	215.758	0.029	PEM	OK
216.503	216.511	0.007	PEM	OK
218.515	218.528	0.013	PEM	OK
218.932	218.941	0.010	PEM	OK
219.236	219.240	0.004	PEM	OK
220.038	220.041	0.003	PEM	OK
220.528	220.534	0.006	PEM	OK
221.285	221.304	0.019	OW	OK
222.997	223.012	0.015	PEM	OK
227.110	227.127	0.017	PEM	OK
228.087	228.110	0.024	PEM	OK
228.207	228.218	0.011	PEM	OK
228.522	228.549	0.027	PEM	OK
228.791	228.802	0.011	PEM	OK
230.650	230.672	0.022	PEM	OK
231.446	231.577	0.130	PEM	OK
232.575	232.578	0.003	PFO	OK
233.350	233.410	0.060	PEM	OK
233.583	233.606	0.023	PEM	OK
233.783	233.795	0.012	PEM	OK
235.645	235.677	0.032	PEM	OK
236.080	236.111	0.031	PEM	OK
236.195	236.228	0.033	PEM	OK
241.950	241.962	0.012	PEM	OK
243.188	243.198	0.010	PEM	OK
243.234	243.240	0.006	PEM	OK
243.813	243.818	0.005	PEM	OK
244.568	244.589	0.021	PEM	OK
245.540	245.661	0.121	PEM	OK
245.894	245.926	0.032	PEM	OK
248.311	248.322	0.011	PFO	OK
248.582	248.671	0.089	PFO	OK
248.744	248.887	0.143	PFO	OK
250.173	250.198	0.025	OW	OK
254.293	254.382	0.090	PEM	OK
254.680	254.709	0.029	PFO	OK
254.716	254.796	0.080	PFO	OK
255.087	255.307	0.220	PFO	OK
255.476	255.481	0.005	PEM	OK
255.913	256.013	0.100	PEM	OK
257.713	257.795	0.082	PEM	OK
257.797	257.861	0.063	PEM	OK

Table B-1 Wetlands Identified and Field Delineated To-Date along the Cushing Extension (Nebraska, Kansas, Oklahoma)

Enter MP	Exit MP	Distance Crossed (miles)	Wetland Type	State
259.596	259.627	0.030	PEM	OK
260.268	260.296	0.028	PEM	OK
260.298	260.323	0.026	PEM	OK
264.184	264.196	0.012	PFO	OK
264.199	264.219	0.020	PFO	OK
266.392	266.406	0.014	PFO	OK
268.358	268.369	0.011	OW	OK
269.426	269.451	0.025	PEM	OK
270.226	270.234	0.008	PEM	OK
270.304	270.328	0.024	PEM	OK
271.095	271.312	0.217	PFO	OK
271.312	271.323	0.011	PEM	OK
271.323	271.345	0.022	PFO	OK
272.399	272.425	0.026	PFO	OK
275.364	275.365	0.002	PEM	OK
283.450	283.455	0.004	PEM	OK
287.888	287.898	0.010	OW	OK
288.621	288.629	0.008	PEM	OK
288.640	288.664	0.024	PEM	OK
289.201	289.207	0.006	PEM	OK
289.882	289.926	0.045	OW	OK