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Re: Revised Proposal for Mitigation Funding to Offset Potential Impacts from the Keystone XL Pipeline Project On Sage Grouse in South Dakota.

Dear Mr. Kirschenmann:

The Keystone XL project team (Keystone) would like to take this opportunity to thank your staff for meeting with us and the U.S. Fish and Wildlife Service (Service) on October 23, 2012 regarding the greater sage-grouse (sage-grouse) mitigation opportunities available to the Keystone XL pipeline project (Project). During that meeting it was agreed that Keystone would revise the previous South Dakota sage-grouse habitat mitigation proposal that had been submitted to you on November 7, 2011. The intent of this letter is to provide a revised proposal for mitigation funding as an additional measure to offset impacts to sage-grouse in South Dakota.

The attached mitigation proposal, *Proposal for Mitigation Funding to Offset Potential Impacts from the Keystone XL Pipeline Project On Sage Grouse in South Dakota*, summarizes affected sage-grouse habitats along the project. Habitat quality assessments relative to potential sage-grouse use were derived from habitat mapped along the right-of-way during pedestrian surveys, and classified according to dominant plant species. The financial value of these types of habitats was then determined based on land values in northwestern South Dakota as well as mitigation ratios and land values that have been utilized in other project-related mitigation efforts.

Keystone proposes to enter into an agreement to establish a mitigation fund with a mutually acceptable conservation entity for use in habitat mitigation opportunities as discussed in previous meetings.

We look forward to further discussion of this proposal with your staff. Should you have further questions please contact Jon Schmidt at 850-385-5441 (jon.schmidt@exp.com) or Stephen Craycroft at 713-693-6467 (stephen_craycroft@transcanada.com). Thank you for your attention to this matter.

Sincerely,

Stephen N. Marr,
Manager – Keystone XL
Keystone Pipeline

Proposal for Mitigation Funding to Offset Potential Impacts from the Keystone XL Pipeline Project On Sage-grouse in South Dakota

1.0 Introduction

TransCanada Keystone Pipeline, L.P. (Keystone) is proposing to construct and operate the Keystone XL pipeline (Project), which is a crude oil pipeline and related facilities that would extend from Hardisty, Alberta, Canada, to the existing Keystone pipeline near Steele City, Nebraska in the United States (US).

The proposed route of the Project crosses the habitat utilized by the greater sage-grouse (*Centrocercus urophasianus*) in portions of Montana and South Dakota. Due to declines in numbers and distribution throughout much of its historical range, the greater sage-grouse (sage-grouse) is a South Dakota Department of Game, Fish and Parks (SDGFP) "species of greatest conservation need", a Bureau of Land Management (BLM) "sensitive species", and in early 2010 the U.S. Fish and Wildlife Service (USFWS) identified the sage-grouse as a "candidate species" under the Endangered Species Act of 1973, as amended (ESA).

Keystone developed and presented a strategy to minimize impacts of the project to sage-grouse to SDGFP on June 2, 2011 entitled "*An Approach for Implementing Mitigation Measures to Minimize the Effects of Construction and Operation of the Keystone XL Pipeline Project on Greater Sage-Grouse in South Dakota.*" This strategy was supplemented with compensatory mitigation that was outlined in a proposal submitted on SDGFP on November 7, 2011. This current mitigation proposal revises the previous South Dakota strategy and provides additional mitigation for potential habitat loss and disturbance as a result of project activities.

2.0 Sage-grouse Habitat Analysis and Mitigation Calculations

Sage-grouse habitat was mapped along the Project during field surveys in 2009, 2010, and 2011. Habitat types were classified according to dominant plant species and then combined into primary cover types based on dominant plant morphology. For example, field surveyors mapped native grassland types by communities such as western wheatgrass/needle-and-thread (*Pascopyrum smithii/Hesperostipacomata*) or western wheatgrass/blue grama (*Pascopyrum smithii/Bouteloua gracilis*) and then consolidated these types into more general cover types such as Mixed Grassland to facilitate habitat analysis and reclamation planning. Sagebrush communities were mapped according to the dominant sagebrush species and dominant understory grass species. The average canopy cover and height of sagebrush within each overall stand was also visually estimated. In South Dakota, the majority of sagebrush stands were dominated by Wyoming big sagebrush (*Artemisia tridentata ssp. wyomingensis*), although silver sagebrush (*Artemisia cana*) was occasionally intermixed with Wyoming big sagebrush or occurred as a separate community, primarily near drainages or on low terraces. Canopy cover of both species of sagebrush was typically between 10 and 20 percent; typical sagebrush height was between 10 and 24 inches. Although Wyoming big sagebrush is typically preferred over silver sagebrush by sage-grouse, both types of sagebrush were considered potential sage-grouse habitat. Further, several small alkali

flats occur within native grassland and sagebrush communities in northwestern South Dakota. These areas, termed salt pans, typically support one or both species of sagebrush and provide suitable habitat for sage-grouse.

Keystone defined sage-grouse habitat based on seasonal forage and cover components and did not consider only areas dominated by sagebrush to be potential habitat for sage-grouse. For example, sage-grouse forage varies by season. Seasonal forage requirements are generally described in terms of higher amounts of grasses, forbs, and insects in spring and summer, and higher amounts of sagebrush in fall and winter, although sagebrush is consumed in the spring and summer also (Wallestad 1975). Juvenile sage-grouse in Montana consume primarily forbs (76 percent of diet) and insects (24 percent of diet) until approximately 12 weeks of age (Peterson 1970). Adult sage-grouse in Montana consume primarily sagebrush and forbs (97 percent of diet by volume) and insects (3 percent of diet) (Wallestad *et al.* 1975). Sagebrush is usually the only food consumed by adult birds between December and February, but can vary between 1 percent and 19 percent of their diet (by volume) between June and September when forbs are primarily consumed (Wallestad *et al.* 1975). Primary forbs consumed by juvenile and adult sage-grouse include fringed sagewort (*Artemisia frigida*), salsify (*Tragopogon dubius*), dandelion (*Taraxacum officinale*), prickly lettuce (*Lactuca serriola*), and alfalfa (*Medicago sativa*) (Peterson 1970, Wallestad *et al.* 1975). Forbs are known to contain high amounts of protein and nutrients such as calcium and phosphorus that improve the nutritional status of hen sage-grouse and reproductive success (Barnett and Crawford 1994, Hess and Beck 2010).

Similar to forage, sage-grouse have different seasonal cover requirements for breeding display, nesting, brood-rearing, and wintering. Primary elements of sage-grouse seasonal habitat include the following (based on Braun *et al.* 2005, Southwest Wyoming Sage-Grouse Working Group 2007, Atamian *et al.* 2010, Doherty *et al.* 2010):

- Spring – Lek habitat includes areas with low amounts of sagebrush but extensive cover of low grasses and forbs. Nesting habitat includes areas with abundant sagebrush and substantial grasses and forbs. Sagebrush cover in spring habitats varies from 15 to 25 percent.
- Summer – Summer habitats provide adequate forage, especially succulent forbs, and escape cover. These habitats include pastures and grasslands, mesic drainages, and the edges of agricultural fields. Habitat adjacent to these open areas includes shrub stands that provide escape and resting areas. Sagebrush cover in these escape and resting areas varies from 10 to 25 percent.
- Fall – Similar to summer habitat, fall habitat includes areas where succulent forbs are present, but also includes areas with higher amounts of sagebrush. North-facing slopes are often preferred since green forage persists later in the year at these sites. Extensive sagebrush stands, with canopy cover greater than 20 percent begin to be used with greater frequency than in the summer.
- Winter – Winter habitat includes areas with extensive sagebrush as well as windswept ridges with more limited sagebrush cover. Sage-grouse tend to prefer south to southwest aspects

where snow accumulation is less. Sagebrush canopy cover varies from 10 to 30 percent (Braun *et al.* 2005, Southwest Wyoming Sage-Grouse Working Group 2007).

In summary several types of habitats are important to sage-grouse at different times of year. However, sagebrush habitat is clearly a primary component of all seasonal habitats. Native grassland communities, particularly those where sagebrush or other shrubs may be widely scattered, also provide occasional habitat for sage-grouse. Finally, non-native pasture or hayland (termed Improved Pasture/Hayland on the Keystone project) may be rarely used by sage-grouse for foraging at certain times of year. Based on the typical amount of use each type of habitat receives by sage-grouse, Keystone assigned a habitat quality rating to each major habitat type. Sagebrush was considered high quality sage-grouse habitat, native mixed grassland was considered medium quality sage-grouse habitat, and improved pasture/hayland was considered low quality sage-grouse habitat.

Sage-grouse habitat will be affected by the proposed Project. Revegetation within these habitats will require different lengths of time to resemble adjacent, undisturbed conditions. Improved Pasture/Hayland typically resembles adjacent conditions within 2 to 3 growing seasons as non-native agronomic species establish quickly. Native perennial herbaceous revegetation is expected to require 3 to 5 years to appear similar to adjacent herbaceous habitat. For example, approximately 60 percent of the Express Pipeline right-of-way through Montana had native perennial grasses and forbs equal to 90 percent of that in adjacent habitats within 3 years, and 94 percent of the Express pipeline right-of-way met the 90 percent performance criteria within 5 years (WESTECH 1999, 2001). Keystone will use revegetation mixtures and methods similar to that used on the Express Pipeline; revegetation results should be similar to that on the Express Pipeline.

Shrub habitats require longer time periods to reestablish. Wyoming big sagebrush and silver sagebrush, either individually or in combination, are the primary shrub habitats on the Project. Wyoming big sagebrush, can require several decades (e.g., more than 70 years) to recover to pre-disturbance shrub densities following fire (Cooper *et al.* 2007) although other studies show recovery to pre-disturbance conditions in approximately 40 years following fire, and approximately 20 years to recover to pre-disturbance conditions after spraying or plowing (Watts and Wambolt 1996). Silver sagebrush can recover to pre-disturbance shrub densities in less than 10 years (Wright and Bailey 1982). In contrast to natural re-establishment of sagebrush, seeding sagebrush following disturbance can reduce the amount of time required for sagebrush density to recover to pre-disturbance levels. Seeding high rates of Wyoming big sagebrush can result in sagebrush density equal to 1 shrub per meter² in less than 5 years (Hild *et al.* 2006). Keystone intends to seed high rates of Wyoming big sagebrush and silver sagebrush on the Project in areas where it occurs using similar methods to those described by Hild *et al.* (2006). Using these methods sagebrush density on the Project should provide suitable habitat for sage-grouse within 5 to 10 years.

Keystone analyzed the various habitats near sage-grouse leks to determine potential impacts to sage-grouse from construction of the Project. Permanent and temporary impacts were based on definitions in the Keystone XL Final Environmental Impact Statement (FEIS). Temporary impacts included construction activities that are associated with construction of the pipeline ROW, since the ROW will be

revegetated and provide habitat for sage-grouse and other species. Permanent impacts included permanent footprints where habitat has been replaced by facilities. Potential impacts to sage-grouse from temporary construction activities were analyzed within three miles of the following active sage-grouse leks: Gallup Creek (lek7) KXL 310, KXL 335, Squaw Creek (lek 8), KXL 196, Little Cowboy Creek (lek 10), and KXL 195 (Hoover). The locations of affected sagebrush, mixed grassland, salt pan, and improved pasture/hayland habitat within three miles of these leks are shown in Table 1.

Table 1. Habitat Type and Quality on the Keystone XL Project within 3 Miles of Active Sage-grouseLeks in South Dakota.						
State	County	Milepost Start	Milepost End	Length (mi)	Habitat Type	Sage-Grouse Habitat Quality
South Dakota	Harding	305.80	306.39	0.59	Sagebrush	High
South Dakota	Harding	306.39	307.00	0.61	Mixed Grassland	Medium
South Dakota	Harding	307.00	307.56	0.56	Sagebrush	High
South Dakota	Harding	307.56	307.96	0.40	Improved Pasture/Hayland	Low
South Dakota	Harding	307.96	309.02	1.05	Mixed Grassland	Medium
South Dakota	Harding	309.02	309.69	0.67	Sagebrush	High
South Dakota	Harding	309.69	310.40	0.71	Mixed Grassland	Medium
South Dakota	Harding	310.40	310.57	0.17	Sagebrush	High
South Dakota	Harding	310.57	310.62	0.05	Salt Pan	Salt Pan
South Dakota	Harding	310.62	311.23	0.61	Sagebrush	High
South Dakota	Harding	311.23	311.37	0.14	Mixed Grassland	Medium
South Dakota	Harding	311.37	311.55	0.18	Sagebrush	High
South Dakota	Harding	311.55	311.96	0.40	Mixed Grassland	Medium
South Dakota	Harding	311.96	312.13	0.18	Salt Pan	High

Table 1. Habitat Type and Quality on the Keystone XL Project within 3 Miles of Active Sage-grouse Leaks in South Dakota.						
State	County	Milepost Start	Milepost End	Length (mi)	Habitat Type	Sage-Grouse Habitat Quality
South Dakota	Harding	312.13	313.35	1.22	Mixed Grassland	Medium
South Dakota	Harding	331.30	331.51	0.21	Sagebrush	High
South Dakota	Harding	331.51	332.10	0.59	Mixed Grassland	Medium
South Dakota	Harding	332.10	332.62	0.52	Mixed Grassland	Medium
South Dakota	Harding	332.62	332.70	0.08	Mixed Grassland	Medium
South Dakota	Harding	332.70	332.86	0.17	Mixed Grassland	Medium
South Dakota	Harding	332.86	340.54	7.68	Mixed Grassland	Medium
South Dakota	Harding	342.47	347.25	4.78	Sagebrush	High
South Dakota	Harding	347.25	348.47	1.22	Mixed Grassland	Medium
South Dakota	Harding	348.47	348.59	0.12	Salt Pan	High
South Dakota	Harding	348.59	349.38	0.78	Mixed Grassland	Medium
South Dakota	Harding	349.38	349.41	0.03	Salt Pan	High
South Dakota	Harding	349.41	350.71	1.30	Mixed Grassland	Medium
South Dakota	Harding	350.71	350.75	0.04	Sagebrush	High
South Dakota	Butte	PY-12	PY-12	--	Mixed Grassland	Medium

The amount of acreage contained within the areas noted in Table 1 is presented in Table 2 by habitat type.

Habitat Type	Acreage
Improved Pasture/Hayland	6.1
Mixed Grassland	332.5
Salt Pan	6.2
Sagebrush	50.9
TOTAL	395.7

¹Note that this acreage includes 30 acres of temporary impact to Mixed Grassland at pipe yard (PY) 12.

In order to determine compensatory mitigation values to offset temporary impacts to sage-grouse habitat, Keystone applied mitigation ratios to habitat acreages based on the importance of the habitat to sage-grouse and the length of time typically required for habitat restoration to occur. These ratios were also used in Keystone’s Special Purpose Permit Application to the Service for impacts to migratory bird habitat and provide a common basis for habitat mitigation. Non-native pastures that receive relatively little use by sage-grouse and that recover quickly from disturbance were assigned a mitigation value of 0.50. Mixed grasslands that require relatively short time frames to resemble adjacent conditions, and that are subject to widely ranging management, were assigned a mitigation value of 0.75. Sagebrush was assigned a mitigation value of 1.00 due to its higher use by sage-grouse and the longer periods of time that are required to re-establish this type of habitat.

Permanent impacts to sage-grouse habitat would occur at PS-16 which is within 3 miles of the Squaw Creek lek. Habitat at PS-16 is comprised of sagebrush interspersed with native grasslands but was classified as sagebrush habitat for this exercise. Mitigation ratios for temporary impacts in sagebrush are 2:1; to account for permanent impacts as a result of the pump stations.

Impacted acreage was multiplied by the mitigation ratios noted above to derive the amount of mitigated acreage by habitat type. This acreage was then multiplied by the average cost of rangeland in South Dakota. The average cost of rangeland was obtained from South Dakota State University (SDSU 2012). Table 3 presents the amount of affected and mitigated acreage as well as the resulting compensatory mitigation value.

In addition to mitigation for affected acreage, Keystone has agreed to fund research to determine if pipeline construction negatively affects sage-grouse. Keystone recommends that a conceptual research study plan be developed and approved by SDGFP and Keystone to evaluate the effects of construction at different locations along the Project. Keystone recommends that a Before-After Control-Impact (BACI) study design be used. Keystone believes that the goal of a post-construction study should be to determine what level of pipeline construction activities, if any, during the breeding season result in longer-term measurable negative impacts to sage-grouse. Keystone would contribute \$75,000 in support of this study. Total mitigation funding, including compensatory mitigation for affected habitat and research dollars is presented in Table 3.

Table 3. South Dakota Sage-grouse Mitigation Acreage and Compensatory Value. Keystone XL					
HabitatType	Affected Acreage	Mitiation Ratio	Mitigated Acreage	Land Value (ac)	Habitat Compensation Value
Improved Pasture/Hayland	6.1	0.50	3.1	\$611	\$1,864
Mixed Grassland	332.5	0.75	249.4	\$611	\$152,368
Salt Pan	6.2	1.00	6.2	\$611	\$3,788
Sagebrush	50.9	1.00	50.9	\$611	\$31,100
Subtotal Compensatory Mitigation for Temporary Impacts in Sage-grouse Habitat					\$189,120
Habitat Quality for Sage-grouse	Affected Acreage	Mitiation Ratio	Mitigated Acreage	Land Value (ac)	Habitat Compensation Value
Sagebrush	11.3	2.00	22.6	\$611	\$13,809
Subtotal Compensatory Mitigation for Permanent Impacts in Sage-grouse Habitat					\$13,809
Funding to Research the Effect of Pipeline Construction on Sage-Grouse					\$75,000
Total Compensatory Mitigation for Impacts in Sage-grouse Habitat					\$277,928

3.0 Distribution of Compensatory Mitigation Funds

On August 26, 2011, SDGFP and Keystone participated in discussions on potential sage-grouse habitat mitigation. On August 29, 2011, SDGFP provided Keystone with a summary of proposed sagebrush mitigation options. On October 23, 2012 Keystone, SDGFP, and the Service met to review mitigation options. These options included providing funds to support opportunities for SDGFP to cooperatively enhance sagebrush on private and public lands through habitat enhancement programs, providing funds for establishment of sagebrush conservations easements, providing funds for fee-title lands acquisition by SDGFP, and for research projects.

SDGFP indicated during discussions on August 26, 2011 and October 23, 2012 that mitigation funds might best be managed by a third party conservation group. To that end, Keystone will enter into an agreement to establish a mitigation fund in the amount of \$202,928, as determined above, with a mutually acceptable conservation entity the Intermountain West Joint Venture, or Pheasants Forever for use in habitat mitigation opportunities as described by SDGFP. The mitigation fund will be established in addition to implementing the measures described in *"An Approach for Implementing Mitigation Measures to Minimize the Effects of Construction and Operation of the Keystone XL Pipeline Project on Greater Sage-Grouse in South Dakota"*. The mitigation fund will be used to enhance and preserve sagebrush communities within the sagebrush ecosystem in South Dakota, which is found within the following counties: Butte, Custer, Fall River, and Harding counties and to a lesser degree, Perkins and

Meade counties. An emphasis will be put towards locating sagebrush mitigation activities within the primary range of sage-grouse in South Dakota (Harding and Butte counties) with a particular focus on Harding County where the majority of the Project impacts will occur. Annual reports prepared by the fourth quarter of each year, summarizing accomplishments and providing the status of on-going projects funded through this initiative will be and provided to interested parties.

Keystone will also provide \$75,000 to fund research that is designed, with input from SDGFP and Keystone, to evaluate the effects of pipeline construction on sage-grouse. It is Keystone's preference that these funds be utilized through a third-party research facility such as a state university. In total Keystone will provide \$277,928 in compensatory mitigation funding to offset impacts to sage-grouse habitat and provide research funding to determine the effect of pipeline construction on sage-grouse.

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