BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

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| IN THE MATTER OF THE APPLICATION BY TRANSCANADA KEYSTONE PIPELINE, LP FOR A PERMIT UNDER THE SOUTH DAKOTA ENERGY CONVERSION AND TRANSMISSION FACILITIES ACT TO CONSTRUCT THE KEYSTONE XL PROJECT | : | HP 14-001<br><br>TRANSCANADA KEYSTONE PIPELINE, LP'S RESPONSES TO CINDY MYERS' FIRST INTERROGATORIES AND REQUEST FOR PRODUCTION OF DOCUMENTS |

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Applicant TransCanada makes the following responses to interrogatories pursuant to SDCL § 15-6-33, and responses to requests for production of documents pursuant to SDCL § 15-6-34(a). These responses are made within the scope of SDCL 15-6-26(e) and shall not be deemed continuing nor be supplemented except as required by that rule. Applicant objects to definitions and directions in answering the discovery requests to the extent that such definitions and directions deviate from the South Dakota Rules of Civil Procedure.

GENERAL OBJECTION

Keystone objects to the instructions and definitions contained in Cindy Myers' First Set of Interrogatories and Requests for Production of Documents to the extent that they are inconsistent with the provisions of SDCL Ch. 15-6. *See* ARSD 20:10:01:01.02.

Keystone's answers are based on the requirements of SDCL §§ 15-6-26, 15-6-33, 15-6-34, and 15-6-36.

INTERROGATORIES AND REQUEST FOR PRODUCTION OF DOCUMENTS

1. Please identify the person or persons providing each answer to an Interrogatory or portion thereof, giving the full name, address of present residence, date of birth, business address and occupation.

ANSWER: Given the extremely broad scope volume of more than 800 discovery requests received by Keystone in this docket, a range of personnel were involved in answering the interrogatories. Keystone will designate the following witnesses with overall responsibility for the responsive information as related to the Conditions and proposed changes to the Findings of Fact, which are identified in Appendix C to Keystone's Certification Petition: Corey Goulet, President, Keystone Projects, 450 1st Street S.W., Calgary, AB Canada T2P 5H1; Steve Marr, Manager, Keystone Pipelines & KXL, TransCanada Corporation, Bank of America Center, 700 Louisiana, Suite 700, Houston, TX 77002; Meera Kothari, P. Eng., 450 1st Street, S.W., Calgary, AB Canada T2P 5H1; David Diakow, Vice President, Commercial, Liquids Pipeline, 450 1st Street S.W., Calgary, AB Canada T2P 5H1; Jon Schmidt, Vice President, Environmental & Regulatory, exp Energy Services, Inc., 1300 Metropolitan Boulevard, Suite 200,

Tallahassee, FL 32308; Heidi Tillquist, Senior Associate, Stantec Consulting Ltd., 2950 E. Harmony Rd., Suite 290, Fort Collins, CO 80528.

2. Prior to answering these interrogatories, have you made due and diligent search of all books, records, and papers of the Applicant with the view of eliciting all information available in this action?

ANSWER: Yes, to the extent reasonably practicable in attempting to respond to over 800 discovery requests within the time allowed.

2(a). Describe how TransCanada will comply with these Acts as they apply to the project in relation to rivers, ground water and water system crossings in South Dakota.

ANSWER: Keystone will comply with Clean Water Act 404 by permitting the crossing of all jurisdictional waterbodies in South Dakota under the US Army Corps of Engineers Nationwide General Permit (NWP) 12. As part of the permitting process of the Project route in South Dakota, Keystone will submit a NOI to the US Army Corps of Engineers, South Dakota Regulatory Office and will consult as required with the South Dakota Regulatory Office.

No waterbody crossing in South Dakota requires permitting under the Section 10 Rivers and Harbor Act.

2(b). Provide research entailing migration of benzene in watersheds, rivers and ground water.

ANSWER: The fate and transport of benzene and other crude oil constituents is discussed in numerous studies and articles, including those in the Department of State SFEIS Appendix P, 2009 Keystone XL Risk Assessment, such as:

Freeze, R. A. and J. A. Cherry. 1979. Groundwater. Prentice Hall, Inc. Englewood Cliffs, New Jersey. 604 pp.

Minnesota Pollution Control Agency. 2005. Assessment of Natural Attenuation at Petroleum Release Sites. Guidance Document c-prp4-03, Petroleum Remediation Program, Minnesota Pollution Control Agency. April 2005. 11 pp.

Neff, J. M. 1979. Polycyclic aromatic hydrocarbons in the aquatic environment. Applied Science publ. Ltd., London. 262 pp.

Newell, C. J. and J. A. Connor. 1998. Characteristics of Dissolved Petroleum Hydrocarbon Plumes: Results from Four Studies. American Petroleum Institute Soil / Groundwater Technical Task Force. December 1998.

Spence, L. R., K. T. O'Reilly, R. I. Maagaw, and W. G. Rixey. 2001. Chapter 6 – Predicting the fate and transport of hydrocarbons in soil and groundwater. in: risk-based decision-making or assessing petroleum impacts at exploration and production sites. Edited by S. McMillen, R. Magaw, R. Carovillano, Petroleum Environmental Research Forum and US Department of Energy.

United States Geological Service (USGS). 1998. Groundwater Contamination by Crude Oil near Bemidji, Minnesota. US Geological Survey Fact Sheet 084-98, September 1998.

Additional references on this subject from the FSEIS include:

American Petroleum Institute (API). 1992. Review of Natural Resource Damage Assessments in Freshwater Environments: Effects of Oil Release into Freshwater Habitats. API Publ. No. 4514.

API. 1997. Petroleum in the Freshwater Environment: An annotated Bibliography 1946-1993. API Publ. No. 4640.

Grimaz, S., S. Allen, J. Steward, and G. Dolcetti. 2007. Predictive evaluation of the extent of the surface spreading for the case of accidental spillage of oil on ground. Selected Paper IcheaP8, AIDIC Conference series, Vol. 8, 2007, pp. 151-160.

Hult, M.F. 1984. Groundwater Contamination by Crude Oil at the Bemidji, Minnesota, Research Site: U.S. Geological Survey Toxic Waste—Ground-Water Contamination Study. Papers presented at the Toxic-Waste Technical Meeting, Tucson, Arizona, March 20-22. USGS Water Investigations Report 84-4188.

Weaver, J.W., R.J. Charbeneau, J.D. Tauxe, B.K. Lien, and J.B. Provost. 1994. The hydrocarbon spill screening model (HSSM) Volume 1: User's guide. USEPA/600/R-94/039a.U.S. Environmental Protection Agency, Office of Research and Development, Robert S. Kerr, Environmental Research Laboratory, Ada, OK.

8(a). Explain what changes have been made in the Emergency Response Plan and Integrity Management Plan since 2010.

OBJECTION: To the extent that this request seeks production of the Emergency Response Plan, the request seeks information that is beyond the scope of the PUC's jurisdiction and Keystone's burden under SDCL § 49-41B-27. This request also seeks information addressing an issue that is governed by federal law and is within the province of PHMSA. The PUC's jurisdiction over pipeline safety is preempted by federal law. *See* 49 C.F.R. Part 194; 49 U.S.C. § 60104(c). This request further seeks information that is confidential and proprietary. Public disclosure of the emergency response plan and the integrity management plan could commercially disadvantage Keystone. In addition, Keystone is not required to submit its Emergency Response Plan

to PHMSA until sometime close to when the Keystone Pipeline is placed into operation. Keystone's Emergency Response Plan is addressed in The Final Supplemental Environmental Impact Statement at http://keystonepipeline-xl.state.gov/documents/organization/221189.pdf.

8(b). Provide the Emergency Response Plan.

OBJECTION: The request seeks information that is beyond the scope of the PUC's jurisdiction and Keystone's burden under SDCL § 49-41B-27. This request also seeks information addressing an issue that is governed by federal law and is within the province of PHMSA. The PUC's jurisdiction over pipeline safety is preempted by federal law. *See* 49 C.F.R. Part 194; 49 U.S.C. § 60104(c). This request further seeks information that is confidential and proprietary. Public disclosure of the emergency response plan could commercially disadvantage Keystone. In addition, Keystone is not required to submit its Emergency Response Plan to PHMSA until sometime close to when the Keystone Pipeline is placed into operation. Keystone's Emergency Response Plan is addressed in The Final Supplemental Environmental Impact Statement at http://keystonepipeline-xl.state.gov/documents/organization/221189.pdf.

8(c). Provide the Integrity Management Plan.

OBJECTION: The request seeks information that is beyond the scope of the PUC's jurisdiction and Keystone's burden under SDCL § 49-41B-27. This request also

seeks information addressing an issue that is governed by federal law and is within the province of PHMSA. The PUC's jurisdiction over pipeline safety is preempted by federal law. *See* 49 C.F.R. Part 194; 49 U.S.C. § 60104(c). This request further seeks information that is confidential and proprietary. Public disclosure of the integrity management plan could commercially disadvantage Keystone. In addition, Keystone is not required to submit its Integrity Management Plan to PHMSA until sometime close to when the Keystone Pipeline is placed into operation.

18(a). Where will fuel storage facilities be located within 200 feet of private wells and 400 feet of municipal wells?

ANSWER: The locations of the fuel storage facilities have not been determined at this point in the planning process. The fuel storage facility locations will be determined at the time of construction. Refer to Section 2.1.5.3, Fuel Transfer Stations of the DOS FSEIS (2014). Wells will be identified prior to the fuel storage facility final locations and will adhere to HP 09-001, Condition 18.

18(b). How will minimizing and exercising vigilance be enforced?

ANSWER: Keystone will minimize and exercise vigilance by providing adequate training and supervision of its contractors with respect to this provision.

21(a). Define "frac-out."

ANSWER: "Frac-out" is addressed in the FSEIS in Section 4.3.3.2 at page 4.3-21, which provides:

> In some instances, pressurized fluids and drilling lubricants used in the HDD process have the potential to escape the active HDD bore, migrate through the sills, and come to the surface at or near the crossing construction site, an event commonly known as a frac-out. Measures identified in a required HDD contingency plan would be implemented, including monitoring of the directional drill bore, monitoring downstream for evidence of drilling fluids, and mitigation measures to address a frac-out should one occur.

21(b). What are concerns and safety issues related to a "frac-out."

ANSWER: This question is addressed at page 4.8-20 of the FSEIS:

> The HDD method avoids direct disturbance to the river, channel bed, or banks. While the HDD method poses a small risk of frac-out (i.e., release of bentonite-based drilling fluids), potential releases would be contained by best management practices that would be described within the HDD Contingency Plans required for drilled crossings. Most leaks of HDD fluids occur near the entry, exit locations for the drill, and are quickly contained and cleaned up. Frac-outs that may release drilling fluids into aquatic environments are difficult to contain primarily because bentonite readily disperses I flowing water and quickly settles in standing water. Should this type of release occur, bentonite is non-toxic but in sufficient concentration may physically inhibit respiration of adult fish and eggs.

It is also addressed at pages 4.7-11 to -12 of Section 4.7.3.2 of the FSEIS:

> The HDD method for crossing waterbodies would be used to minimize disturbance to aquatic habitat, stream banks, and recreational or commercial fisheries. Impacts could occur if there is an unintended release of drilling fluids (i.e., a frac out) during the HDD operation. A frac out could release bentonitic drilling mud into the aquatic environment. The released drilling mud would readily disperse in flowing water or eventually settle in standing

water. Although bentonite is non-toxic, suspended bentonite may produce short-term impacts to the respiration of fish and aquatic invertebrates due to fouled gills. Longer-term effects could result if larval fish are covered and suffocate due to fouled gills and/or lack of oxygen. If the frac out occurred during a spawning period, egg masses of fish could be covered, thus inhibiting the flow of dissolved oxygen to the egg masses. Benthic invertebrates and the larval stages of pelagic organisms could also be covered and suffocate.

To minimize the potential for these impacts to occur, a contingency plan would be implemented to address an HDD frac out. This plan would include preventive and response measures to control the inadvertent release of drilling fluids. The contingency plan would also include instructions for downstream monitoring for any signs of drilling fluid during drilling operations, and would describe the response plan and impact reduction measures in the event a release of drilling fluids occurred. Drill cuttings and drilling mud would be disposed of according to applicable regulations; disposal/management options may include spreading over the construction ROW in an upland location or hauling to an approved off-site, licensed landfill or other approved sites.

21(c). Provide "frac-out plan."

ANSWER: Keystone currently has no contractors retained to undertake construction. When Keystone employs a pipeline contractor, that contractor will develop the plan. *See* Section 7.4.5 and Appendix G.

34(a). Describe what progress has been made in the evaluation and performance assessment activities regarding high consequence areas since 2010.

OBJECTION: To the extent that this request seeks a list of High Consequence Areas, the identity and location of High Consequence Areas is confidential

and Keystone is required by PHMSA to keep this information confidential. To the extent that this request seeks production of the Emergency Response Plan, the request seeks information that is beyond the scope of the PUC's jurisdiction and Keystone's burden under SDCL § 49-41B-27. This request also seeks information addressing an issue that is governed by federal law and is within the province of PHMSA. The PUC's jurisdiction over pipeline safety is preempted by federal law. *See* 49 C.F.R. Part 194; 49 U.S.C. § 60104(c). This request further seeks information that is confidential and proprietary. Public disclosure of the emergency response plan could commercially disadvantage Keystone. In addition, Keystone is not required to submit its Emergency Response Plan to PHMSA until sometime close to when Keystone Pipeline is placed into operation. Keystone's Emergency Response Plan is addressed in The Final Supplemental Environmental Impact Statement at http:///keystonepipeline-xl.state.gov/documents/organization/221189.pdf.

34(b). Define "high consequence area."

OBJECTION: To the extent that this request seeks a list of High Consequence Areas, the identity and location of High Consequence Areas is confidential and Keystone is required by PHMSA to keep this information confidential. Without waiving the objection, the definition of high consequence area can be found in Department of State SFEIS chapter 3 Section 3.13.4.1 and Code of Federal Regulation 49

CFR 195.450.

34(c). Provide a completed list of high consequence areas.

OBJECTION: The identity and location of High Consequence Areas is confidential and Keystone is required by PHMSA to keep this information confidential.

34(d). Explain how project inhabitants and local communities will be informed and educated about high consequence areas.

ANSWER: TransCanada Public Awareness Program is designed to increase awareness of pipeline safety to protect the public, environment and TransCanada facilities. The PA Program reaches out to affected public, excavators/contractors, emergency officials and local public to ensure they are engaged and education about living and working safely near TransCanada facilities. This includes awareness of areas that have been defined as high consequence areas.

34(c). Provide a copy of the Emergency Response Plan. (Requested above with #8.)

OBJECTION: To the extent that this request seeks production of the Emergency Response Plan, the request seeks information that is beyond the scope of the PUC's jurisdiction and Keystone's burden under SDCL § 49-41B-27. This request also seeks information addressing an issue that is governed by federal law and is within the province of the U.S. Department of Transportation, Pipeline and Hazardous Materials

Safety Administration (PHMSA). The PUC's jurisdiction over the emergency response plan is preempted by federal law. *See* 49 C.F.R. Part 194; 49 U.S.C. § 60104(c). This request further seeks information that is confidential and proprietary. Public disclosure of the emergency response plan could commercially disadvantage Keystone.

34(f). Provide Integrity Management Plan. (Requested above with #8.)

OBJECTION: The request seeks information that is beyond the scope of the PUC's jurisdiction and Keystone's burden under SDCL § 49-41B-27. This request also seeks information addressing an issue that is governed by federal law and is within the province of PHMSA. The PUC's jurisdiction over pipeline safety is preempted by federal law. *See* 49 C.F.R. Part 194; 49 U.S.C. § 60104(c). This request further seeks information that is confidential and proprietary. Public disclosure of the integrity management plan could commercially disadvantage Keystone. In addition, Keystone is not required to submit its Integrity Management Plan to PHMSA until sometime close to when the Keystone Pipeline is placed into operation.

19. Explain what has been discussed with the SD Geological Survey, the Dept. of Game Fish and Parks, local landowners and govt. officials.

ANSWER: Keystone referenced publicly available data/reports from the SD Geological Survey. Discussion between Keystone and the South Dakota Dept. of Game, Fish, and Parks focused on the identification of the potential biological resources that may

be impacted by the Project route in South Dakota and the potential mitigation measures that could be implemented to minimize impacts.

The following is a summary of Keystone consultation history with SD Game, Fish, and Parks as documented in the USFWS issued May 2013 Biological Opinion (Appendix H of the of the Department of State FSEIS (2014))

- June 10, 2008: Keystone met with staff from USFWS and South Dakota Department of Game, Fish, and Parks (SDGFP), at the SDGFP office in Pierre, South Dakota, to discuss issues pertaining to wildlife, special status species, and sensitive habitat that could potentially occur in the Project area. The goal of the meeting was to gather input on agency recommendations based on the information sent to them in April 2008 for species occurrence, habitat assessments, and future field surveys. Keystone incorporated comments from the meeting into survey protocols and BMPs for future agency verification.

- January/February 2009: Keystone initiated section 7 consultation with the USFWS. Keystone continued discussions with BLM, and state wildlife agency offices for South Dakota that included state-specific special status species survey protocols and BMPs for the species identified as potentially occurring during the 2008 meetings. A summary of the findings from the 2008 biological field surveys was included in the discussions.

- January 27, 2009: Keystone met with staff from the USFWS and SDGFP at the SDGFP office in Pierre, South Dakota, to discuss issues pertaining to special status species surveys. The goals of the meeting were to verify Keystone's survey approach, BMPs, discuss required field surveys, and review the information that was sent to the USFWS in the January/February 2009, informal consultation package. The USFWS and SDGFP provided additional recommendations to Keystone's sensitive species mitigation approach to be updated prior to final agency concurrence.

- October 23, 2012: A meeting was held between the USFWS, Department, SDGFP, BLM, and Keystone regarding the greater sage–grouse and a compensatory mitigation plan for the species in South Dakota. Discussions included a management plan and avoidance, minimization, and mitigation strategies.

35(a). Provide the Integrity Management and Emergency Response Plans. (Requested above.)

OBJECTION: The request seeks information that is beyond the scope of the PUC's jurisdiction and Keystone's burden under SDCL § 49-41B-27. This request also seeks information addressing an issue that is governed by federal law and is within the province of PHMSA. The PUC's jurisdiction over pipeline safety is preempted by federal law. *See* 49 C.F.R. Part 194; 49 U.S.C. § 60104(c). This request further seeks information that is confidential and proprietary. Public disclosure of the emergency

response plan and the integrity management plan could commercially disadvantage Keystone. In addition, Keystone is not required to submit these documents to PHMSA until sometime close to when the Keystone Pipeline is placed into operation. Keystone's Emergency Response Plan is addressed in The Final Supplemental Environmental Impact Statement at http://keystonepipeline-xl.state.gov/documents/organization/221189.pdf.

35(b). Define "Unusually Sensitive Areas."

ANSWER: Unusually Sensitive Areas are defined by U.S. federal pipeline safety regulations (49 CFR 195.6) as:

> As used in this part, a USA means a drinking water or ecological resource area that is unusually sensitive to environmental damage from a hazardous liquid pipeline release.
>
> (a) An USA drinking water resource is:
>
> (1) The water intake for a Community Water System (CWS) or a Non-transient Non-community Water System (NTNCWS) that obtains its water supply primarily from a surface water source and does not have an adequate alternative drinking water source;
>
> (2) The Source Water Protection Area (SWPA) for a CWS or a NTNCWS that obtains its water supply from a Class I or Class IIA aquifer and does not have an adequate alternative drinking water

source. Where a state has not yet identified the SWPA, the Wellhead Protection Area (WHPA) will be used until the state has identified the SWPA; or

(3) The sole source aquifer recharge area where the sole source aquifer is a karst aquifer in nature.

(b) An USA ecological resource is:

(1) An area containing a critically imperiled species or ecological community;

(2) A multi-species assemblage area;

(3) A migratory waterbird concentration area;

(4) An area containing an imperiled species, threatened or endangered species, depleted marine mammal species, or an imperiled ecological community where the species or community is aquatic, aquatic dependent, or terrestrial with a limited range; or

(5) An area containing an imperiled species, threatened or endangered species, depleted marine mammal species, or imperiled ecological community where the species or community occurrence is considered to be one of the most viable, highest quality, or in the best condition, as identified by an element occurrence ranking (EORANK) of A (excellent quality) or B (good quality)."

35(c). Define "Hydrologically Sensitive Areas."

ANSWER: Hydrological sensitive areas were defined by the South Dakota Public Utilities Commission Amended Final Order as "the High Plains Aquifer area in southern Tripp County," as well as "other similarly vulnerable and beneficially useful surficial aquifers that Keystone is aware of."

35(d). Explain how unusually sensitive areas and hydrologically sensitive areas are addressed differently compared to other areas.

ANSWER: Unusually sensitive areas are High Consequence Areas (HCAs), as defined by 49 CFR 195.6. Keystone has elected to treat "hydrologically sensitive areas," as defined in the South Dakota Public Utilities Commission Order Condition 35, as operator-defined HCAs. By designating these segments as operator-defined HCAs, these locations are treated by Keystone as if they were PHMSA-identified HCAs . Portions of the pipeline that could potentially affect HCAs are subject to high levels of inspection and repair criteria, as mandated by 49 CFR 195.

35(e). Confirm that you are not fully aware of all vulnerable and beneficially useful aquifers and your intent is to only become aware of them during construction and route evaluation not yet completed.

ANSWER: Keystone does not confirm these statements. Keystone has consulted with groundwater staff with South Dakota's Department of Natural Resources (SD

DENR) and rural water districts regarding Keystone's route relative to aquifers in South Dakota. Keystone also used data available on the SDDENR website http://denr.sd.gov/data.aspx and published literature regarding the geology and hydrology of the along and near the pipeline ROW to assist in identifying vulnerable aquifers in South Dakota. Geological references and hydrogeological references are listed in Chapters 3 and 4 in the Department of State Supplemental FEIS. Some pertinent additional references are:

- Gutentag (1984): USGS Prof. Paper 1400-B
- Downey (1986): USGS Prof. Paper 1402-E
- Thamke et al (2014): USGS Scientific Inv. Report SIR 2014-5047.
- In addition, lithologic logs available from the SD DENR at

http://denr.sd.gov/des/wr/dblog.search.aspx and http://denr.sd.gov/data.aspx provide aquifer thickness data.

35(f). Define "unconfined aquifers."

ANSWER: From Applied Hydrogeology (1994) *"Unconfined Aquifer: Aquifer close to the surface with materials of high permeability extending from the land surface to the base of the aquifer. Water table aquifer."*

Source: Fetter, C.W. (1994.) Applied Hydrogeology. Prentice Hall. 680 pp.

35(g). List known unconfined aquifers to be crossed by the project.

ANSWER: Department of State Table 3.3-2 (SFEIS) presents a list of unconfined aquifers in South Dakota crossed by the Keystone XL Pipeline Project. Along the route in South Dakota, the High Plains Aquifer (Ogallala Formation) in Tripp County is often unconfined. Other areas with unconfined aquifers include alluvial aquifers associated with streams, and occasional unconfined stretches in the Hell Creek, Fox Hills, and Pierre Shale aquifers. However, along the majority of the route, aquifers crossed by the Keystone XL pipeline are confined.

35(h). Explain the concern of routing through unconfined aquifers.

ANSWER: In South Dakota, unconfined aquifers are found mainly associated with streams (alluvial aquifers) and in portions of the High Plains Aquifer (Ogallala Formation) in Tripp County (FSEIS). Table 3.3-2 (FSEIS) presents the unconfined aquifers in South Dakota. The Keystone XL pipeline in South Dakota was routed to reduce impacts to a number of valuable resources, including but not limited to, unconfined aquifers.

35(i). Describe how it could be possible to route through an unknown, unconfined aquifer during construction.

ANSWER: Keystone has attempted to identify vulnerable aquifers through consultation with State agencies and rural water districts, as well as data provided South Dakota Department of Environment and Natural Resources (SD DENR)

(http://denr.sd.gov/data.aspx), and published literature. The location of unconfined aquifers is documented in the literature on the hydrogeology of South Dakota and the SD DENR website provides well logs for wells near the pipeline ROW, so that unconfined conditions can be identified.

It is possible that, during construction and through discussion with landowners crossed by the Project, Keystone may identify shallow wells located in unconfined aquifers. Many water-bearing units in South Dakota may be unmapped due to their small size and type of geological formation that has limited use due to low water productivity and generally lower water quality. If present, these wells are often associated with agricultural uses (e.g., livestock stock tanks).

35(j). Provide documentation of further route evaluation since 2010, including assessments for aquifers and hydrologically sensitive areas.

OBJECTION AND RESPONSE: This request is vague, overlybroad, and unduly burdensome. Without waiving the objection, since 2010, Keystone has continued to identify groundwater resources through agency consultation use of the South Dakota Department of Environment and Natural Resources (SD DENR) website (http://denr.sd.gov/data.aspx) and the following publications. Geological references and hydrogeological references are listed in chapters 3 and 4 in the FSEIS. Some pertinent additional references are:

- Gutentag (1984): USGS Prof. Paper 1400-B
- Downey (1986): USGS Prof. Paper 1402-E
- Thamke et al (2014): USGS Scientific Inv. Report SIR 2014-5047.

In addition, lithologic logs available from the SD DENR at http://denr.sd.gov/des/wr/dblog.search.aspx and http://denr.sd.gov/data.aspx provide aquifer thickness data. Since 2010, the Keystone XL pipeline route was evaluated using these data sources to identify hydrologically sensitive areas.

35(k). Explain how you will deem an aquifer vulnerable and beneficially useful?

ANSWER: Keystone relies on two primary sources to identify vulnerable and beneficially useful aquifers: Pipeline and Hazardous Materials Safety Administration (PHMSA)-identified unusually sensitive areas for drinking water, as defined in 49 CFR 195.6, and Source Water Protection Areas for groundwater as identified by the South Dakota Department of Environment and Natural Resources (SD DENR). Both PHMSA and the SD DENR have provided these data confidentially to Keystone.

35(l). This condition states: "...in some reaches of the Project in southern Tripp County, the High Plains Aquifer is present at or very near ground surface and is overlain by highly permeable sands permitting the uninhibited infiltration of contaminants." Sandy soil and ground water at or above the surface means a pipe with expected pinhole leaks will be immersed in ground water. This is the exact type of situation of soil/ground

water which caused the route change in Nebraska. If this was reason to change the route in Nebraska, explain why it is still acceptable in South Dakota.

OBJECTION AND RESPONSE: This request is argumentative and assumes facts not in evidence. Without waiving the objection, "*Pipeline routing is optimized to reduce impacts and risks to the environment, population, and to reduce integrity concerns.*" Routing decisions in each state were made in consultation with the various local state and federal agencies. Reroutes in Nebraska were determined based on public and agency input during the NEPA process. Routes approved in South Dakota were based on consultation with South Dakota local agencies. All routing decisions took into account the screening options outlined in the FSEIS Section 2.2.2.2 Major Pipeline Route Alternatives and Section 2.2.5.1 Screening of Major Route Alternatives. The first round of screening included the following criteria:

- "Meeting the proposed Project's purpose and need, including the extent to which additional infrastructure (pipeline) is necessary to access Bakken crude oil;
- Consistency with the proposed border crossing and therefore the approved routing in Canada;
- Availability;
- Reliability;

- Length within the United States;
- Total length of the pipeline, including both the United States and Canada;
- Estimated number of aboveground facilities;
- Length co-located within an existing corridor;
- Acres of land directly affected during construction; and
- Acres of land directly affected permanently." (FSEIS Section 2.2.2.2 pg 2-2-2).

The second round of screening included the following criteria:

- "Total length of the pipeline, including both the United States and Canada;
- Use of the Canadian-approved Keystone XL pipeline ROW outside of the United States;
- Approximate acres affected by construction of the proposed Project (based on a typical 110-foot construction ROW)
- Federal lands crossed (miles);
- Principal aquifers crossed (miles);
- American Indian lands crossed (miles);
- Total wetlands crossed (miles);
- USFWS critical habitat for threatened and endangered species crossed (miles);

- Known cultural resource sites (listed on National Register of Historic Places) within 500 feet of proposed pipeline;
- Number of waterbodies crossed; and
- Soils designated as highly erodible by wind crossed (miles)." FSEIS Section 2.2.5.1 pg 2.2-59)

Rerouting away from the environmentally sensitive Nebraska Department of Environmental Quality (NDEQ)-identified Sand Hills Region was based on input from the NDEQ and the public.

South Dakota Public Utilities Commission's (SD PUC) Amended Order identified the southern portion of Tripp County as having a "hydrologically sensitive area" for groundwater resources due to the sandy soils and presence of unconfined portions of the High Plains Aquifer. As discussed previously, Keystone will treat "hydrologically sensitive areas", as defined in the SD PUC Order Condition 35, as operator-defined high consequence areas (HCAs). By designating these segments as operator-defined HCAs, these locations are treated by Keystone as if they were Pipeline and Hazardous Materials Safety Administration (PHMSA)-identified HCAs. Portions of the Keystone XL pipeline that could potentially affect HCAs are subject to high levels of inspection and repair criteria, as mandated by 49 CFR 195.

Where soils are fragile (i.e., sandy soils that exhibit conditions similar to the Nebraska Department of Environmental Quality-identified Sand Hills Region that are highly susceptible to erosion by wind), special considerations and measures also would be undertaken in proposed Project areas to protect environmentally sensitive resources.

> "Approximately 76 percent (11,664 acres) of the overall proposed Project would affect soils characterized as highly erodible by either wind or water (see Figure 4.2.1-1). Erosion control measures would be implemented wherever soil is exposed, steep slopes are present, or erosion potential is high. To enforce use of these methods, an environmental inspector (EI) would be assigned to each construction spread. In addition, specific procedures have been developed to address concerns related to potential erosion to the fragile soils in the southern South Dakota and northern Nebraska region; the proposed Project right-of-way (ROW) through these fragile soils would be monitored for several years to ensure that reclamation and revegetation efforts are successful (see Section 4.2.3.2, Operation Impacts)." (FSEIS Section 4.2 Soils, pg 4.2-2)
>
> "**Fragile Soils in Southern South Dakota and Northern Nebraska**
>
> In southern South Dakota and northern Nebraska, the proposed Project

route would enter an area with fragile soils (i.e., landscapes where the soil exhibits conditions similar to the NDEQ-identified Sand Hills Region and the soils are very susceptible to wind erosion; see Soils Environmental Setting Sections 3.2.2.2, South Dakota, 3.2.2.3, Nebraska, and Figure 3.2.2-2, Highly Wind Erodible Soils). To address concerns related to potential erosion in the region, specific construction, reclamation, and post-construction procedures have been developed, as described in Section 4.15 of the CMRP, Fragile Soil Clean Up and Reclamation/Revegetation, (see Appendix G). This document provides site-specific reclamation plans that itemize construction, erosion control, and revegetation procedures for these fragile areas. Additionally, Keystone would implement micro-routing adjustments where practicable and appropriate to minimize steep topography with fragile soils.

To reduce potential impacts related to severe wind and water erosion, the following provides a summary of proposed Project best management practices (BMPs) that would be implemented during construction, reclamation, and post-construction. These BMPs are included in the CMRP for fragile soil areas. Additional procedures are also described in Sandy Prairie Construction/Reclamation Unit Plan (see Appendix R,

Construction/Reclamation Plans):

- Keystone would educate construction personnel regarding the necessity to strictly adhere to the proposed Project BMPs designed to minimize impacts to fragile soil landscape areas.
- Minor route re-alignments would be incorporated through these fragile areas to avoid particularly erosion-prone locations, such as ridgetops and existing blowouts as much as practicable.
- Keystone would avoid highly saturated areas, such as wetlands, to the maximum extent possible.
- Construction soil handling procedures would strive to reduce the width of disturbance to the native prairie landscape by adopting Trench-line or Blade-width stripping procedures where practicable.
- Topsoil conservation would be conducted on all areas where excavation occurs.
- Topsoil piles would be protected from erosion through matting, mulching, watering, or tackifying as deemed practicable.
- Traffic management limitations would be employed on specific areas possessing high erosion potential or sensitive habitat.
- Native seed mixes would be developed with input from the local

NRCS offices and through collaboration with regional experts. All seed would be certified noxious weed-free and would be calculated on a pure live seed basis.

- Straw or native prairie hay may be used as mulch, applied to the ROW, and crimped into the soil to prevent wind erosion. All mulch would be documented as noxious weed-free.
- Land imprinting may be employed to create impressions in the soil, thereby reducing erosion, improving moisture retention, and creating micro-sites for seed germination. (Land imprinting adds a waffle-like texture to the soil, forming indentations that capture and absorb rainwater that otherwise runs off untreated land.)
- Sediment logs (barriers in the form of logs used to control soil erosion) or straw wattles would be used in place of slope breakers (short terraces) that are constructed of soil. Using sediment logs would result in less soil disturbance to the ROW.
- Photodegradable matting would be applied on steep slopes or areas prone to extreme wind exposure such as north- or west-facing slopes and ridge tops. Biodegradable pins would be used in place of metal staples to hold the matting in place.

- Keystone would work with landowners to evaluate fencing the ROW from livestock, or alternatively, provide compensation to rest a pasture until vegetation can become established.
- Management concerns such as livestock access to water or movement within a pasture would be addressed as necessary by Keystone working with the landowner.
- As part of post-construction monitoring and repair, Keystone would monitor reclamation on the ROW for several years and would repair erosion and reseed poorly revegetated areas as deemed necessary by Keystone. During monitoring, landowners would be informed of these efforts and intended actions going forward.
- A noxious weed management plan would be established based on consultation with state and county experts.

**Fragile Soils in Southern South Dakota and in Northern Nebraska**

To address concerns related to potential erosion in the fragile soil areas in southern South Dakota and northern Nebraska, specific construction, reclamation, and post-construction procedures have been developed as described in the Fragile Soils section within the CMRP (see Appendix G). This document provides a site-specific reclamation plan that itemizes

construction, erosion control, and revegetation procedures for these fragile areas. Additional procedures are also described in Sandy Prairie Construction/Reclamation Unit Plan (see Appendix R, Construction/Reclamation Plans and Documentation). The proposed Project ROW through this region would be monitored for several years to ensure that reclamation and revegetation efforts are successful. Any proposed Project areas where reclamation and revegetation efforts are initially unsuccessful would be re-evaluated and restored.

Proposed Project areas that have been revegetated would be attractive as cattle forage. Due to potentially warmer soils in the immediate vicinity of the proposed pipeline, early forage may be concentrated along the ROW over time (Dave Wedin, personal communication, June 29, 2011). Additionally, animal trackways (i.e., a route of frequent travel by animals) can serve as incipient blowout areas. Keystone has agreed to inform landowners of this concern. Fencing of the ROW may be completed if required; however, fencing could be a serious impediment to landowner access. As described previously, Keystone would work with landowners to evaluate fencing the ROW from livestock, or alternatively, provide compensation to rest a pasture until vegetation can become established.

Also as previously indicated, Keystone would monitor reclamation on the ROW for several years and repair erosion and reseed poorly revegetated areas as necessary. Additionally, based on input received from the NRCS, Keystone would be required to employ a method of assessment of soil productivity such as yield comparison between ROW and non-ROW areas in areas where susceptible soils have been identified with the NRCS." (FSEIS, Section 4.2 Soils).

35(m). Explain TransCanada's follow-up with suggestion by DENR staff, given in testimony, to reroute the KXL pipeline around the city of Colome's source water area.

ANSWER: Routing is an iterative process where refinements to the route are continuously made as new, substantive data are obtained. In this case, Keystone had obtained HCA data from the Pipeline and Hazardous Materials Safety Administration (PHMSA) and consulted with the South Dakota Department of Environment and Natural Resources' (SD DENR) ground water Staff. During the consultation process, Keystone received Source Water Protection Area (SWPA) data. These data sets were integrated into the routing process and, upon identification of the route through the Colome SWPA, Keystone rerouted out of the area. Keystone consulted with the SD DENR's groundwater Staff and informed them of the issue with the initially proposed route and a proposed route refinement to avoid the SWPA. SD DENR staff confirmed that the reroute was acceptable.

36(a). Identify all emergency medical response planning contained within the emergency response plan.

OBJECTION: This request seeks information that is beyond the scope of the PUC's jurisdiction and Keystone's burden under SDCL § 49-41B-27. This request also seeks information addressing an issue that is governed by federal law and is within the exclusive province of PHMSA. The PUC's jurisdiction over the emergency response plan is preempted by federal law, which has exclusive jurisdiction over issues of pipeline safety. *See* 49 C.F.R. Part 194; 49 U.S.C. § 60104(c). This request further seeks information that is confidential and proprietary. See Amended Final Order, HP 09-001, Condition ¶ 36. Public disclosure of the emergency response plan would commercially disadvantage Keystone. In addition, Keystone is not required to submit its Emergency Response Plan to PHMSA until sometime close to when the Keystone Pipeline is placed into operation. Keystone's Emergency Response Plan is addressed in The Final Supplemental Environmental Impact Statement at http://keystonepipeline-xl.state.gov/documents/organization/221189.pdf.

36(b). What actions have been taken by TransCanada to ensure the medical communities in South Dakota are prepared and educated to treat people exposed to spills and water contamination from spills?

OBJECTION AND RESPONSE: To the extent that this request seeks production of the Emergency Response Plan, this request seeks information that is beyond the scope of the PUC's jurisdiction and Keystone's burden under SDCL § 49-41B-27. This request also seeks information addressing an issue that is governed by federal law and is within the exclusive province of PHMSA. The PUC's jurisdiction over the emergency response plan is preempted by federal law, which has exclusive jurisdiction over issues of pipeline safety. *See* 49 C.F.R. Part 194; 49 U.S.C. § 60104(c). This request further seeks information that is confidential and proprietary. See Amended Final Order, HP 09-001, Condition ¶ 36. Public disclosure of the emergency response plan would commercially disadvantage Keystone. In addition, Keystone is not required to submit its Emergency Response Plan to PHMSA until sometime close to when the Keystone Pipeline is placed into operation. Keystone's Emergency Response Plan is addressed in The Final Supplemental Environmental Impact Statement at http://keystonepipeline-xl.state.gov/documents/organization/221189.pdf. Without waiving the objection, TransCanada has provided educational information to possible affected public elected officials, excavators, and first responders. This educational material comes in the form of a pamphlet and is titled Oil Pipeline for Emergency Responders. It is marked as Keystone 1523-1538.

36(c). How will inhabitants and communities near the project area be notified of spills?

ANSWER: Keystone's response teams will use the National Incident Management System (NIMS) Incident Command System (ICS) to manage emergency response activities. First response to an incident will be provided by a Keystone local response team. Keystone's Regional Emergency Operations Center (EOC) will respond, to the degree necessary, to incidents exceeding local capability. Duties of the local responders are described in the TransCanada-Keystone Emergency Response Plan (see FSEIS, Appendix I) which will be adapted for use on Keystone XL.

Response teams will be led by an Incident Commander, and will include persons accountable for external notifications including a Public Information Officer (including media communications), and a Liaison Officer (including agency communications). External notifications are those made to entities outside of the Company including Federal, State and local regulatory agencies, as well as railroad and utility companies. These notifications include both verbal and written requirements. Landowners and appropriate public agencies will be notified in the case of potential groundwater contamination.

40(a). Provide documentation supporting your assertion that polyethylene water piping is permeable to BTEX.

ANSWER: Permeation of polyvinyl chlorine (PVC) and polyethylene (PE) pipes by any hydrocarbon is extremely rare (Gaunt et al. 2006). Permeation incidents were

reported at a frequency of one per 14,000 miles of mains and one per 1,000,000 miles of PE/PVC service connections (Gaunt et al. 2006).

A number of studies have been conducted on the topic of hydrocarbon permeation through PVC and PE water piping, including:

Gaunt, James A. et. al. 2006. "Performance of Plastic Pipes and Pipe Gaskets In Hydrocarbon Contamination: Field Experience and Laboratory Studies". Department of Civil, Construction, and Environmental Engineering Iowa State University, Ames, IA. American Waterworks Association.

Berens, A.R. 1985. "Prediction of organic chemical permeation through PVC pipe". JAWWA 77 (11), 57-64 (1985).

40(b). Explain health concerns related to BTEX.

ANSWER: BTEX consists of benzene, toluene, ethylbenzene, and xylenes. Benzene can result in health impacts from short term (i.e., acute) exposure or long-term (i.e., chronic) exposure. Acute effects can include drowsiness, dizziness, rapid heart rate, headaches, and unconsciousness. At extremely high concentrations, acute toxicity can result in mortality. Benzene levels at these concentrations would not be anticipated from a release from the Keystone XL Pipeline Project. Potential chronic health effects of benzene exposure include anemia and excessive bleeding. Long-term exposure to high concentrations of benzene in the air can lead to cancer (ATSDR 2007a, EPA 2015). Due

to emergency response cleanup, sampling, and monitoring, remedial actions, and the high volatility of benzene, benzene concentrations would largely dissipate within the first 24 hours, minimizing the potential for chronic effects in humans.

Toluene exposure may cause fatigue, confusion, and weakness (ATSDR 2001, EPA 2015). At extremely high levels, toluene may cause mortality. Toluene levels at this concentration would not be expected to occur due to a release along the Keystone XL Pipeline Project.

Ethylbenzene exposure may cause eye and throat irritation or dizziness (ATSDR 2010, EPA 2015). Chronic exposure to low levels of ethylbenzene (weeks to years) may cause damage to the inner ear or kidneys. Ethylbenzene has been identified as a possible human carcinogen.

High levels of xylene exposure, either acute or chronic, can cause headaches, lack of muscle coordination, confusion, and eye, skin, throat, and nose irritation. Extremely high levels can cause unconsciousness and mortality (ATSDR 2007b, EPA 2015). Xylene levels at this concentration would not be expected to occur due to a release along the Project. Studies by the International Agency for Research on Cancer and the EPA have not been able to rule xylene out as a carcinogen.

More detailed information is available through the Agency for Toxic Substances & Disease Registry (ATSDR; http://www.atsdr.cdc.gov/) and the US Environmental

Protection Agency (USEPA; http://water.epa.gov/drink/contaminants/).

Agency for Toxic Substances and Disease Registry. 2014. ATSDR Toxic Substances Portal. Available from: http://www.atsdr.cdc.gov/

Agency for Toxic Substances & Disease Registry (ATSDR). 2010. ToxFAQs for Ethylbenzene. Accessed January 20, 2015. http://www.atsdr.cdc.gov/toxfaqs/tf.asp?id=382&tid=66.

Agency for Toxic Substances & Disease Registry (ATSDR). 2001. ToxFAQs for Toluene. Accessed January 20, 2015. http://www.atsdr.cdc.gov/toxfaqs/tf.asp?id=160&tid=29.

Agency for Toxic Substances & Disease Registry (ATSDR). 2007a. ToxFAQs for Benzene. Accessed January 20, 2015. http://www.atsdr.cdc.gov/toxfaqs/TF.asp?id=38&tid=14.

Agency for Toxic Substances & Disease Registry (ATSDR). 2007b. ToxFAQs for Xylene. Accessed January 20, 2015. http://www.atsdr.cdc.gov/toxfaqs/tf.asp?id=295&tid=53.

US Environmental Protection Agency (EPA). 2015. Drinking Water Contaminants. Accessed January 20, 2015. http://water.epa.gov/drink/contaminants/.

Environmental Protection Agency. 2014. National Primary Drinking Water Regulations. Available from: http://water.epa.gov/drink/contaminants/

40(c). Provide an MSDS of all products to be transported in KXL, including the diluents.

ANSWER: Representative Material Safety Data Sheets are provided in Appendix Q of the FSEIS.

40(d). Provide list of ground water quality standards, specifically listing chemicals involved in tar sands oil product and diluents.

OBJECTION: Keystone does not determine ground water quality standards. They are established by the South Dakota Department of Environment and Natural Resources.

40(e). Describe how the decision was made to designate concern of BTEX only within 500 feet of the Project.

ANSWER: This decision was made by the PUC as part of Amended Permit Condition 40.

40(f). Confirm this safety measure will only be implemented at the request of a landowner or public water supply system.

ANSWER: Yes.

40(g). Explain why this measure is optional instead of mandatory.

ANSWER: This decision was made by the PUC as part of Amended Permit Condition 40.

40(h). TransCanada has agreed to do this: "At least forty-five days prior to commencing construction, Keystone shall publish a notice in each newspaper of general circulation in each county through which the Project will be constructed advising landowners and public water supply systems of this condition." What percent of inhabitants do you expect to reach by issuing a warning in this manner?

OBJECTION AND RESPONSE: This request is speculative and argumentative. A notice is not a "warning." Without waiving the objection, Keystone expects that notice in newspapers of general circulation would reach a substantial portion of the inhabitants.

46(a). Provide written plan as to how you will find and provide a permanent water supply for various locations along route if a well should become contaminated, including specific alternate sources.

ANSWER: In the unlikely event of a leak, petroleum hydrocarbons generally do not move more than 300 feet through the subsurface and substantive movement takes months to years offering ample time for emergency response and containment. Therefore, impacts to private and public wells are not anticipated. Further, Keystone will comply with the South Dakota Public Utilities Commission order (Condition of Permit #46): "In the event that a person's well is contaminated as a result of construction or pipeline operation, Keystone shall pay all costs associated with finding and providing a permanent

water supply that is at least of similar quality and quantity; and any other related damages, including but not limited to any consequences, medical or otherwise, related to water contamination."

46(b). Define "quantity" as it is used in this condition.

ANSWER: Keystone interprets "quantity" to have its ordinary meaning.

46(c). Provide cost estimates for providing water to the city of Colome, domestic wells or an entire ranching operation should water supplies become contaminated.

ANSWER: Please refer to DOS SFEIS Appendiz Z Mitigation Measures page 108 item 7. Keystone has committed, in the event that a spill contaminates potable water supplies, be responsible for cleanup and restoration. Keystone would be responsible for providing an appropriate alternative potable water supply of comparable volume and quality to those impacted or provide compensation, if this option is agreed upon by the affected parties and Keystone. For groundwater used for industrial or irrigation purposes, Keystone may provide either an alternate supply of water or appropriate compensation for those facilities impacted, as may be agreed upon among the affected parties and Keystone. If the permit were approved, Keystone would memorialize that agreement through an appropriate written agreement with the Environmental Protection Agency.

46(d). Explain how providing a permanent water supply will be ensured into perpetuity.

ANSWER: *See* answer to interrogatory no. 46(a).

46(e). Explain how people and cattle using private wells and public wells can be assured their water is free of contamination from undetected leakage, particularly in Tripp County.

ANSWER: Given the leak detection methodologies that are part of the project, undetected well contamination is unlikely.

46(f). Describe what experience South Dakota has had cleaning up tar sands oil product spills into rivers and ground water.

OBJECTION: This request seeks information that is not within Keystone's custody or control.

46(g). Describe any experience the State of South Dakota or any other state has had in "sparging" ground water in order to cleanse tar sands oil product from aquifers.

OBJECTION: This request seeks information that is not within Keystone's custody or control.

46(h). Describe types of spills which may be difficult or impossible to remediate.

ANSWER: Crude oil spills can be remediated. Initial contaminant and cleanup is important to limit the area affected and to remove as much product as quickly as possible. Any residual oil can be remediated through a variety of remediation technologies as well as through natural attenuation.

As discussed in Section 2.1 of the FSEIS, Keystone has reviewed the National Transportation Safety Board 2012 Marshall, Michigan Accident Report, including the conditions that led to operational failures on the pipeline that resulted in the spill. Keystone has stated they would include lessons learned from this spill, including the following:

- "Get big quick: timeliness of a tactical response to an oil spill into water is imperative. While Keystone has stated that it already uses this philosophy, the Kalamazoo spill reinforced this need to respond with as many resources as possible as quickly as possible. To that end, Keystone would strategically store equipment and employ personnel and contractors along the length of the pipeline to ensure a maximum 6-hour response time.
- Pre-qualify a large contractor network: Contractors would be used to supplement any response Keystone would make to an oil spill. By ensuring a large pool of trained/skilled contractors along the length of the pipeline have been pre-qualified and contracted with Keystone, the response time would be minimized and resources (equipment and personnel) available are maximized.
- Emergency response planning details need to include source

containment: source containment plans including strategies and tactics would be included in the overarching ERP.

- Equipment resources required for sunken and submerged oil: Keystone would further identify equipment resources required to respond to sunken and submerged oil and ensure personnel are appropriately trained on the equipment. A primary strategy for oil spill response would still be to contain and recover as much oil as possible as quickly as possible to prevent oil from weathering and therefore potentially becoming submerged and sinking. In addition, Keystone already owns and practices the use of containment devices that would prevent downstream migration of submerged and sunken oil such as dams. This type of equipment would be further identified and procured for the proposed Project."

Section 2.1 of the FSEIS also covers remediation of potential crude oil spills and construction related spills.

"Corrective remedial actions would be dictated by federal, state, and local regulations and enforced by the PHMSA Office of Pipeline Safety as well as appropriate state and/or local agencies. Required remedial actions may be large or small, dependent upon a number of factors including state

mandated remedial cleanup levels, potential effects to sensitive receptors, the volume and extent of the contamination, whether or not there is a violation of water quality standards, and the magnitude of adverse impacts caused by remedial activities. A large remediation action could include one or more of a number of approaches (such as excavation of soil, pumping and treating ground water, or natural attenuation). However, the selection of a remedial measure would be in coordination and agreement with the appropriate regulatory agency.

If, during construction, tanks or contamination are found, they would be managed according to federal, state, and/or local regulations. Further, Keystone would make individuals available who are trained in identifying and disposing of hazardous materials during construction.

If there is an accidental release from the proposed Project, Keystone would implement the remedial measures necessary to meet the federal, state, and local standards that are designed to help ensure protection of human health and environmental quality. Additional information on remediation is presented in Section 4.13 of the FSEIS, Potential Releases."

46(i). Identify responsible parties who will conduct water analysis to assure toxins from

undetected leaks have not migrated into water resources, including frequency of testing and who will assume cost of testing.

ANSWER: If a release were to occur, Keystone would implement its Emergency Response Plan (ERP). This ERP is responsive to the size of spill and resources potentially affected. In the event surface waters were impacted, Keystone would implement its ERP and notify appropriate federal and state agencies. If the release is significant, an Incident Command Team will develop a sampling plan, determined in consultation with the appropriate state and federal agencies that identifies the appropriate sampling, frequency, and responsible payee.

46(j). Describe potential scenarios in which medical costs related to contamination will be reimbursed.

ANSWER: If it is determined that medical costs are incurred and result of contamination caused by Keystone, Keystone will reimburse such costs.

46(k). Provide a detailed listing of potential toxins which could contaminate wells.

ANSWER: The South Dakota Department of Environment and Natural Resources (SD DENR) identifies a number of compounds that can potentially contaminate wells (refer to the following list [SD DENR 2009]). Many of these chemicals are not constituents of petroleum hydrocarbons but are associated with farming, industrial activities, and urban runoff.

- 1,1,1-Trichlorethane
- 1,1,2-Trichlorethane
- 1,1-Dichloroethylene
- 1,2 Dibromo-3-chloropropane (DBCP)
- 1,2,4-Trichlorobenzene
- 1,2-Dichloroethane
- 1,2-Dichloropropane
- 2,4,5-TP (Silvex)
- 2,4-d, 3-Hydroxycarbofuran
- Alachlor (Lasso)
- Aldicarb
- Aldicarb sulfone
- Aldicarb sulfoxide
- Aldrin
- Antimony (total)
- Arsenic (total)
- Atrazine
- Barium (total)
- Benzene
- Benzo[a]pyrene
- Beryllium (total)
- Butachlor
- Cadmium (total)
- Carbaryl
- Carbofuran
- Carbon tetrachloride
- Chlordane
- Chromium (total)
- cis-1,2-Dichloroethylene
- Dalapon
- Di(2-Ethylhexyl) adipate
- Di(2-ethylhexyl) phthalate
- Dicamba
- Dichloromethane (methylene chloride)
- Dieldrin
- Dinoseb
- Diquat
- Endothall
- Endrin
- Ethylbenzene
- Ethylene dibromide (EDB)
- Glyphosate
- Heptachlor
- Heptachlor epoxide
- Hexachlorobenzene (HCB)
- Hexachlorocyclopenta-diene
- Lindane
- m-Xylene
- Mercury (total inorganic)
- Methomyl
- cis-1,2-Dichloroethylene
- Dalapon
- Di(2-Ethylhexyl) adipate
- Di(2-ethylhexyl) phthalate
- Dicamba
- Dichloromethane (methylene chloride)
- Methoxychlor
- Metolachlor
- Metribuzin
- Monochlorobenzene (Chlorobenzene)
- Nitrate
- Nitrite
- o-Dichlorobenzene
- o-Xylene
- Oxamyl (Vydate)
- p-Dichlorobenzene
- p-Xylene
- Pentachlorophenol
- Picloram
- Propachlor
- Selenium (total)
- Simazine
- Styrene
- Tetrachloroethylene
- Thallium (total)
- Toluene
- Total polychlorinated biphenyls (PCBs)
- Toxaphene
- trans-1,2-Dichloroethylene
- Trichloroethylene
- Vinyl chloride

South Dakota Department of Environment and Natural Resources (SD DENR). 2009.

Tripp County Water User District Drinking Water Quality Report. Available from:

http://www.ewg.org/tap-water/whatsinyourwater2/SD/tripp-county-water-user-district/4600520.

46(l). Provide documentation detailing adverse health effects caused from exposure to these toxins, including the various routes of entry into the human body.

ANSWER: As stated in the previous response (#54), many of these compounds identified in the previous response are not constituents of crude oil.

The U.S. Environmental Protection Agency has a detailed listing of potential drinking water contaminants. This includes the toxins addressed above and their potential health effects on humans due to ingestion of contaminated drinking water. This information is available at http://water.epa.gov/drink/contaminants/.

Additionally, the Agency for Toxic Substances and Disease Registry (ATSDR) website includes detailed reports on potential health effects of these toxins as well as potential routes of entry into the human body. This information is available at http://www.atsdr.cdc.gov/.

Agency for Toxic Substances and Disease Registry. 2014. ATSDR Toxic Substances Portal. Available from: http://www.atsdr.cdc.gov/

Environmental Protection Agency. 2014. National Primary Drinking Water Regulations. Available from: http://water.epa.gov/drink/contaminants/.

18(a). Regarding an advisory warning issued in September, 2014 by the federal Pipeline

and Hazardous Materials Safety Administration, what are TransCanada's plans to ensure pipeline safety due to the fact different types of product will be transported in KXL?

OBJECTION AND RESPONSE: This request seeks information related to pipeline safety, which is within the exclusive jurisdiction of PHMSA. Without waiving the objection, PHMSA Advisory 2014-0040 is not applicable to Keystone. This advisory is related to flow reversal, product change (e.g., crude oil to refined product) and/or conversion to service (e.g., convert from natural gas to crude oil) and throughput capacity change.

18(b). PHMSA cautioned pipeline operators across the country about "the potential significant impact flow reversals, product changes and conversion to service may have on the integrity (safety) of a pipeline." The advisory adds: "Flow reversals, product changes, and conversions to service may impact various aspects of a pipeline's operation, maintenance, monitoring, integrity management, and emergency response. Pressure gradients, velocity, and the location, magnitude, and frequency of pressure surges and cycles may change. Operators may also consider increasing the throughput capacity of the pipeline. Increasing throughput may also impact the pressure profile and pressure transients. … Leak detection and monitoring systems may be affected."

OBJECTION AND ANSWER: This request is not a question and cannot be answered. It also relates to an issue that is within the exclusive jurisdiction of PHMSA

and is therefore not relevant or likely to lead to the discovery of admissible evidence. Without waiving the objection, PHMSA Advisory 2014-0040 is not applicable to Keystone. This advisory is related to flow reversal, product change (e.g., crude oil to refined product) and/or conversion to service (e.g., convert from natural gas to crude oil) and throughput capacity change.

18(c). Current regulations state: "Operators must review their integrity (safety) management program. … Operators must notify PHMSA if these changes will substantially affect their integrity management program, its implementation, or modifies the schedule for carrying out the program elements."

OBJECTION: This request is not a question and cannot be answered. It also relates to an issue that is within the exclusive jurisdiction of PHMSA and is therefore not relevant or likely to lead to the discovery of admissible evidence.

18(d). KXL is intended to transport two very different products, the much less dense and highly volatile Bakken oil product and the heavy diluted bitumen from Alberta. How will the two very different products affect KXL's operation, maintenance, monitoring, integrity management, and emergency response? How will the two very different products affect pressure gradients, velocity, and the location, magnitude, and frequency of pressure surges and cycles?

ANSWER: Please refer to Department of State FSEIS Chapter 3 Section 3.13.3. The Keystone pipeline is designed to transport a range of crude oils. The hydraulic analysis considers various inputs such velocity, surge and cyclic loading. The operation, maintenance, monitoring, integrity management, and emergency response plans consider the range of products transported.

33(a). Provide updated maps.

OBJECTION AND ANSWER: This request is vague, overlybroad, unduly burdensome, and seeks information that is not relevant or likely to lead to the discovery of admissible evidence. Without waiving the objection, please refer to the attached route variation maps marked as Keystone 0470-0583.

41(a). Provide map detailing all water bodies to be crossed in S.D., to include locations KXL would cross the Missouri and Yellowstone Rivers upstream from S.D.

OBJECTION: Keystone has previously filed with the PUC maps showing the route through South Dakota, which also show where the pipeline crosses rivers and other water bodies. Waterbody crossing permitting is within the control of the United States Army Corps of Engineers, and is beyond Keystone's control.

41(b). Provide map clearly depicting all waterways crossed by route which are tributaries into the Missouri River.

OBJECTION: Keystone has previously filed with the PUC maps showing the route through South Dakota, which also show where the pipeline crosses rivers and other water bodies.

41(c). Identify distances from KXL waterway crossings to point of confluence with the Missouri River.

OBJECTION: Keystone withdraws its previous objection. For the perennial stream crossings where the downstream portions of the stream are located with the boundaries of South Dakota and have a point of confluence with the Missouri River, the distance from the KXL pipeline crossing of each waterway to the Missouri River are in Table 1 below.

**Table 1. Downstream Distance to the Missouri River**

| Stream Name | Periodicity | Miles downstream to Missouri River |
|---|---|---|
| Cottonwood Creek | Perennial | 87.2 |
| Bad River | Perennial | 93.4 |
| South Fork Grand River | Perennial | 290.4 |
| Clarks Fork Creek | Perennial | 285.7 |
| South Fork Moreau River | Perennial | 290.4 |
| Pine Creek | Perennial | 222.7 |
| Dry Creek | Perennial | 86.5 |

41(d). Provide map(s) demonstrating all public water utility intakes on the Missouri River system.

OBJECTION: This request is overlybroad, unduly burdensome, and seeks information that is not within Keystone's custody or control. In addition, the location of the information is related to HCA's and deemed confidential by PHMSA.

41(e). By what date will permitting of water body crossings be completed?

OBJECTION: Permitting of water body crossings is within the control of the United States Army Corps of Engineers, and is beyond Keystone's control.

41(f). Provide a copy of the CMR Plan. Ex TC-1, 5.4.1, pp. 45-46.

ANSWER: A current copy of the CMR Plan is attached to Keystone's certification petition and is on file with the PUC.

41(g). Provide research which describes migration of spillage in these waterways.

OBJECTION: This request is vague, overlybroad, and unduly burdensome.

41(h). Please explain and describe water protection areas located downstream of major river crossings on the proposed route.

OBJECTION: This request is overlybroad, unduly burdensome, and seeks information that is not within Keystone's custody or control. In addition, the location of the information is related to HCA's and deemed confidential by PHMSA.

41(i). Explain risks of HDD, including possibility of contaminants being released into waterways during this process.

ANSWER: This issue is addressed in the FSEIS at pages 4.3-21, 4.8-20, and 4.7-11, 12.

50(a). Provide a map depicting the High Consequence Areas.

OBJECTION: This request seeks the identity and location of High Consequence Areas, which is confidential by statute, and Keystone is required by PHMSA to keep this information confidential.

50(b). Explain why the total length of pipe affecting HCA decreased from 34.3 miles to 19.9 miles.

OBJECTION AND ANSWER: To the extent that this request seeks the identity and location of High Consequence Areas, that information is confidential by statute and Keystone is required by PHMSA to keep this information confidential. Without waiving the objection, during the detailed engineering design phase of the Project, the route was adjusted. In doing so, the route deviated away from DOT designated HCA areas there by reducing total HCA miles crossed by the Project. Please refer to the attached route variation list and maps.

50(c). Explain how the statistic which states a spill could affect a HCA no more than once in 250 years.

OBJECTION AND ANSWER: To the extent that this request seeks the identity and location of High Consequence Areas, that information is confidential by statute and

Keystone is required by PHMSA to keep this information confidential. Without waiving the objection, page 4-21 of the 2009 KXL Risk Assessment shows that a spill affecting HCA in any state crossed by the Project has an occurrence interval of 53 years. This is calculated based on historical incident data from Pipeline and Hazardous Materials Safety Administration, as discussed in Section 3.0. This is calculated by taking the inverse of the incident frequency (measured as incidents per mile per year) multiplied by the miles of high consequence areas crossed (141.2 miles). The result is an estimate, in years, of the time between spills. This is similar to the concept of flood recurrence intervals (e.g., 100-year floods).

107(a). Provide the analysis by Dr. Michael Madden which professes the Project would not (ii) substantially impair the health, safety, or welfare of the inhabitants in the project area.

OBJECTION: Dr. Madden was PUC Staff's witness in Docket 09-001, and his direct testimony is a matter of public record.

107(b). Explain how the 2010 permit, which relies on the federal environmental impact statement prepared by the Department of State, addresses specific concerns of South Dakota, including the health, safety and welfare of South Dakota citizens.

OBJECTION: This request is vague, unclear, argumentative, and seeks information that is not relevant or likely to lead to the discovery of admissible evidence.

The PUC addressed the health, safety, and welfare of South Dakota residents in the Amended Final Decision and Order in Docket 09-001. In addition, South Dakota residents had notice and opportunity to participate in the lengthy NEPA process conducted by the Department of State.

107(c). Explain your interpretation of "substantially" as it is used in state law SDCL 49-41 B-22 which states the applicant for a facility construction permit has the burden of proof to establish that:

(3) "The facility will not substantially impair the health, safety or welfare of the inhabitants."

OBJECTION: This request seeks a legal opinion or conclusion and is therefore beyond the scope of discovery and not likely to lead to the discovery of admissible evidence under SDCL § 15-6-26(b). It was an issue for the PUC to determine in Docket HP 09-001.

107(d). State with 100% certainty that this project will have no impact on the health, safety or welfare of the people of South Dakota.

OBJECTION: This request is argumentative and seeks information that is not relevant or likely to lead to the discovery of admissible evidence. The PUC addressed the health, safety, and welfare of South Dakota residents in the Amended Final Decision and Order in Docket 09-001. Keystone has not asserted that the project would

have "no impact" on the health, safety, or welfare of the people of South Dakota.

107(e). Describe how areas of dense populations versus areas of sparse populations affect project decision.

OBJECTION AND RESPONSE: This request is vague and unclear. Without waiving the objection, to the extent feasible and consistent with other routing criteria, areas of dense population are avoided during project routing.

Dated this 5th day of February, 2015.

TRANSCANADA KEYSTONE PIPELINE, LP
by its agent, TC Oil Pipeline Operations, Inc.

By _____

Its Director, Authorized Signatory

Subscribed and sworn to before me

this 5th day of February, 2015.

_____

John W. Love, Lawyer
Notary Public - Canada

## OBJECTIONS

The objections stated to Cindy Myers' Interrogatories and Request for Production of Documents were made by James E. Moore, one of the attorneys for Applicant TransCanada herein, for the reasons and upon the grounds stated therein.

Dated this 6th day of February, 2015.

WOODS, FULLER, SHULTZ & SMITH P.C.

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## CERTIFICATE OF SERVICE

I hereby certify that on the 6th day of February, 2015, I sent by e-mail transmission, a true and correct copy of Keystone's Responses to Cindy Myers' First Interrogatories and Request for Production of Documents, to the following:

Cindy Myers, R.N.
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One of the attorneys for TransCanada