

**BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF SOUTH DAKOTA**

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IN THE MATTER OF THE APPLICATION	)	HP14-001
BY TRANSCANADA KEYSTONE	)	
PIPELINE, LP FOR A PERMIT UNDER THE	)	<b>KEYSTONE'S SUPPLEMENTAL</b>
SOUTH DAKOTA ENERGY CONVERSION	)	<b>RESPONSES TO DAKOTA RURAL</b>
AND TRANSMISSION FACILITIES ACT TO	)	<b>ACTION'S FIRST</b>
CONSTRUCT THE KEYSTONE XL	)	<b>INTERROGATORIES TO</b>
PROJECT	)	<b>TRANSCANADA KEYSTONE</b>
		<b>PIPELINE, LP</b>

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Applicant TransCanada makes the following supplemental 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. The supplemental responses are made in response to the Commission's order on Dakota Rural Action's motion to compel discovery, and are made in addition to the responses and objections previously stated.

**GENERAL OBJECTION**

Keystone objects to the instructions and definitions contained in Dakota Rural Action's 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**

INTERROGATORY NO. 7. For each incident since January 1, 2010 in which any pipeline transporting crude oil constructed by TransCanada and its Affiliates leaked or spilled pipeline contents, please provide the:

- A. Date;
  - B. Location;
  - C. Amount of materials leaked or spilled;
  - D. Duration of leak or spill before (i) the control center being notified, (ii) pump shut down, (iii) valve shutoff, (iv) national response center notified, and (v) arrival of responders on the scene;
  - E. Duration of reclamation of affected soil and/or water resources;
  - F. Established and documented cause of leak/spill;
  - G. For each such spill, provide a copy of the Integrity Management Plan, the operational manual for the pipeline, the specifications for the SCADA system, and the ERP for each spill in the US and Canada;
  - H. Identify the documents which support your answers, above.
- [Applicable Finding or Condition No.: Findings 12(2)-(3), 41-45, 47, 103; Amended Condition 32-38]

### **ANSWER:**

- a. Responsive information is contained in the spreadsheet previously produced as Keystone 0774-0784.
- b. Responsive information is contained in the spreadsheet previously produced as Keystone 0774-0784.
- c. Responsive information is contained in the spreadsheet previously produced as Keystone 0774-0784.
- d. Responsive information is contained in the spill incident reports, which are produced in a non-confidential FTP site, to which counsel will be provided access. In addition, the following incidents resulted in full shut downs of the pipeline:

Roswell Pump Station: 6/23/2010 full pipeline shut down 12:13 CST; 6/25/10 pipeline started up 07:30 CST.

Freeman Pump Station: 8/10/2010 full pipeline shut down 11:27 CST; 8/10/2010 pipeline started up 1:00 CST.

David City Pump Station: 2/02/2011 full pipeline shut down 19:30 CST; 2/4/2011 pipeline started up 06:09 CST.

Ludden Pump Station: 5/7/2011 full pipeline shutdown 05:30 CST; 05/14/2011 pipeline started up 16:53 CST.

Severance Pump Station: 05/28/2011 full pipeline shutdown 23:44 CST; 06/07/2011 pipeline started up 06/07/2011.

e. The only reclamation involved was at the Ludden Pump Station. Responsive information is contained in the incident report.

f. Responsive information is contained in the spreadsheet previously produced as Keystone 0774-0784.

g. The Integrity Management Plan for the Keystone Pipeline is included in the confidential FTP site subject to the Commission's protective order. The Operations Manual for the Keystone Pipeline is included in the confidential FTP site. The specification for Keystone's SCADA control system that is filed with PHMSA is included in the confidential FTP site. The Operations Manual and the SCADA specification are highly sensitive and proprietary documents that would substantially injure Keystone if disclosed to the public or its competitors. They should be confidential on the same basis as the IMP. The Keystone Pipeline ERP marked as Exhibit I to the FSEIS is included in the non-confidential FTP site.

- h. The responsive documents identified above are included in the FTP sites.

INTERROGATORY NO. 23: For each spill/leak incident which has occurred from a pipeline transporting WCSB crude oil operated by TransCanada and its Affiliates since 2009, state the dates on which transportation of the crude oil through that pipeline was disrupted by planned maintenance, unplanned maintenance, power outages, spills, leaks, or any other causes. Identify any documents upon which your answers to this Interrogatory was based. [Applicable Finding or Condition No.: Finding 28]

**ANSWER:** See the spreadsheet attached as Keystone 0774-0784. The duration of full pipeline shutdowns is provided in response to Interrogatory No. 7(d). The incidents described in the spreadsheet were not associated with planned or unplanned maintenance or power outages.

INTERROGATORY NO. 25: With regard to the plan for mainline valves to be remotely controlled, what guarantee can you give the PUC that TransCanada can prevent a cyber-security attack on the control system?

- A. Describe the worst case scenario which could occur in the event of a computer systems security breach on the control system for the KXL Pipeline.
- B. Describe the data security systems to be put in place to prevent any such system breach, identify any third-party vendor(s) providing system security software, hardware or monitoring, and identify the particular components or scopes of services such vendors will provide.
- C. Identify any documents used to support your answer to this Interrogatory.
- [Applicable Finding or Condition No.: Conditions 31-38; Finding 20]

**ANSWER:**

- a. The response to this entirely hypothetical question is that the worst case scenario would be an intentional, extremely sophisticated, elaborately-planned attack that coordinates multiple breaches. It would be a coordinated attack combined with other attacks against other non-TransCanada critical infrastructure designed to delay a response to the attack. The attacks would be an act of war, designed to cause a loss of physical integrity at a facility or along the pipeline. The consequences would depend on the location of the loss. A coordinated attack could also be intended for the purpose of shutting down the pipeline through cyber-attacks for the purpose of creating a commodity shortage and disrupting public markets.

b. Following a layered security approach, TransCanada secures its electronic information assets (infrastructure, application and data) as follows:

Protection from the internet is delivered through next-generation firewalls that are managed and monitored by an external Managed Security Services Provider (TELUS) 24x7x365, protection capabilities include network anti-virus scanning, network intrusion detection/prevention, denial of service protection, web content filtering.

Protection of assets within TransCanada's Data Centers is delivered through network segmentation, protected by internal firewalls and managed by our CIO teams – including network segmentation between TransCanada corporate networks and the KXL environment. At the local asset level, we deploy capabilities including malware protection, host intrusion detection/prevention, security patch management and vulnerability management – managed and monitored by our CIO teams.

From an access control perspective, we leverage two-factor authentication on our corporate assets, including our remote VPN service.

Security event logging, monitoring and analysis of all controls above are centrally handled through an internal SIEM (Security Incident Event Management) infrastructure – managed internally by our CIO teams.

Incident response is managed by our CIO teams leveraging TransCanada's Major Incident Process, forensics analysis is outsourced to 3rd party partners (IBM/TELUS). Threat Intelligence is managed by our CIO teams in collaboration with 3rd party partners (TELUS, Verisign, McAfee) and Government Agencies (FBI, DHS, US-CERT, CCIRC, CSIS).

ICS Protections (Please consider that to some degree these solutions are already in place)

- Isolation (logical segmentation) of industrial control system networks from corporate systems using multiple devices such as Firewalls, Routers, and Switches. This prevents unauthorized users from accessing the ICS. Relevance: Access to the ICS systems is required to achieve worst case scenario and these controls would need to be compromised (or Access Control instead).
- Access Control (Logical Access Management) – systems in place to limit and verify identities of users accessing the ICS systems from the corporate network. Relevance: Access to the ICS systems is required to achieve worst case scenario and these controls would need to be compromised (or Isolation instead).
- Control Logic – operational and safety systems in place to manage operation and anomalies on the pipeline. Relevance: These systems would mitigate actions of attackers trying to achieve the worst case scenario and would need to be compromised directly. This includes SCADA systems & Control Centre Operators, and shutdown logic.
- Physical Controls – systems in place to protect integrity (such as pressure relief valves) or mitigate loss of integrity (such as fire protection systems, fences). Relevance: These systems would mitigate any Cyber attempts to compromise integrity and the consequences if integrity is lost.
- Environmental Controls – systems in place to mitigate loss of integrity’s environmental impact (such as berms to contain leakage). Relevance: These systems reduce (mitigate) against impact of worst case situation in certain locations such as tank terminals.

Incident Management – internal TransCanada processes and procedures to respond quick to loss of integrity events. Relevance: These systems reduce (mitigate) against the breach’s Health, Safety, and Environment consequences.

c. TransCanada’s Information Security Policy is included in the non-confidential FTP site.

INTERROGATORY NO. 48: Calculate the worst case discharge and describe in detail the worst case scenario that would result from damage caused to the Keystone XL pipeline from the “high swelling potential” of the Cretaceous and Tertiary rocks located in the Missouri River Plateau due to this land form’s susceptibility to instability in the form of slumps and earth-flows, including landslides.

A. Provide the locations where such ground swelling can be anticipated;

B. Identify any documents which would support your answer;

[Applicable Finding or Condition No.: Finding 40, 77; Conditions 31-42]

**ANSWER:** By definition, a worst case discharge is a catastrophic breach of the pipeline, regardless of cause. The location of the discharge determines its volume. Keystone

has not calculated a worst case discharge specifically associated with soils with high-swelling potential. The volume of a worst case discharge does not directly correlate to the cause.

A. The locations where ground swelling can be expected are identified in Table 3.1-6 of the FSEIS. Keystone has calculated the worst case discharges for those locations: They are included in the confidential FTP site.

B. Section 3.1.2.5, Geologic Hazards, of the FSEIS (which includes Table 3.1-6) is included in the non-confidential FTP site.

INTERROGATORY NO. 56: Describe the worst case scenario of a worst case discharge into the Little Missouri, Cheyenne, and White River crossings. Identify any documents which would support your answers. [Applicable Finding or Condition No.: Findings 41-52, 68-69, 82-83; Conditions 31-42.

**ANSWER:** The answer is included in the confidential FTP site.

INTERROGATORY NO. 57: Describe the worst case scenario which could occur from the Keystone XL pipeline as it passes under channels, adjacent flood plains and flood protection levees. Identify any documents which would support your answers. [Applicable Finding or Condition No.: Findings 41-49; Conditions 31-42]

**ANSWER:** Keystone has not calculated worst case discharges for locations for the generic areas described in the interrogatory. Worst case discharges and potential consequences are discussed in the Risk Assessment for the Keystone XL Pipeline, which is Appendix P to the FSEIS. The Risk Assessment, including Appendix A, is included in the non-confidential FTP site.

INTERROGATORY NO. 58: In light of the spill risk assessment provided by TransCanada in the HP09-001 docket:

- A. Explain the number of leaks along the Keystone I pipeline since 2008;
- B. Explain the number of leaks from the other oil pipelines constructed and/or operated by TransCanada or its Affiliates;
- C. What would be a worst case scenario discharge from the KXL pipeline? Please explain your answer;

D. Identify any documents which would support your respective answers.  
[Applicable Finding or Condition No.: Findings 41-49, 51-52; Conditions 31-38]

**ANSWER:**

A. Keystone has safely delivered more than 830 million barrels domestic and WCSB oil to United States markets since it began operation in July 2010. The small number of leaks that have occurred on the pipeline have had nothing to do with the integrity of the pipe itself. They have all occurred at pump stations and other above-ground facilities and have been related to leakage from small-diameter fittings and seals. They have all been cleaned up with no environmental impact. Keystone designed the pipeline to ensure that all small diameter fittings, valves and seals are located above ground where they can be easily accessed for maintenance and repairs. All of Keystone's pump stations are designed to capture and contain oil on company property. In total, less than 450 barrels of oil, out of more than 830 million barrels transported, have come out of the pipeline since it began operations five years ago. TransCanada is constantly striving to improve its performance and working towards its goal of having zero leaks or safety incidents. All pipeline leaks are thoroughly investigated regardless of their size in order to understand the cause and prevent future such incidents. The leaks are identified in the spreadsheet attached as Keystone 0774-0784.

B. None.

C. See the Risk Assessment included in the non-confidential FTP site.

D. See the Risk Assessment included in the non-confidential FTP site.

INTERROGATORY NO. 60: Describe in detail the impact of a worst case scenario spill into the shallow and surficial aquifers in Tripp County from the proposed KXL Pipeline. Identify any documents which would support your answers. [Applicable Finding or Condition No.: Findings 43-49, 53; Conditions 16, 35]



**ANSWER:** Section 4 of the 2009 Keystone XL Risk Assessment (FSEIS, Appendix P) describes the impacts of a worst case spill scenario. The Risk Assessment is in the non-confidential FTP Site. Field investigations of more than 600 historical petroleum hydrocarbon release sites indicate the migration of dissolved constituents typically stabilizes within several hundred feet of the crude oil source area (Newell and Conner 1998; USGS 1998). Over a longer period, the area of the contaminant plume may begin to reduce due to natural biodegradation. Removal of crude oil contamination will eliminate the source of dissolved constituents impacting the groundwater.

Spills are also discussed in the FSEIS in Section 4.1.3.4, including those in shallow and surficial aquifers. The fate and transport of benzene and other crude oil constituents is discussed in numerous studies and articles, including those referenced in the 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

INTERROGATORY NO. 76: Identify the location(s) where slope instability poses a potential threat of ground movement along the Project route.

A. Identify TransCanada's most current Integrity Management Plan (IMP) showing incorporation of locations where slope instability poses a potential threat to the pipeline;

B. Identify documents upon which your answers are based.

[Applicable Finding or Condition No.: Finding 79; Conditions 8, 15, 20-21]

#### RESPONSE:

A. TransCanada's most-recent Integrity Management Plan is the Integrity Management Plan for the Keystone Pipeline that has been filed with the Commission in HP07-001. It is included in the confidential FTP site. The locations where slope instability poses a potential threat to the

pipeline are included in Table 3.1-6 of the FSEIS, which is included in the non-confidential FTP site.

B. See Table 3.1-6 of the FSEIS, which is included in the non-confidential FTP site.

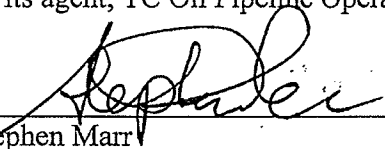
INTERROGATORY NO. 83: Identify the most recent IMP submitted to the Commission and other appropriate agencies, including but not limited to sections in it related to HCAs.  
[Applicable Finding or Condition No.: Finding 102; Conditions 1-2]

RESPONSE: The Integrity Management Plan for the Keystone Pipeline that was filed with the Commission as a confidential document in HP07-001 is included in the confidential FTP site.

Dated this 17<sup>th</sup> day of April, 2015.

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

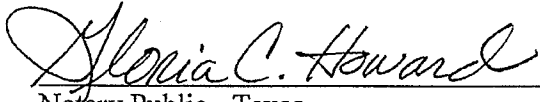
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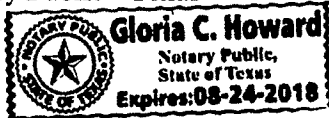
  
Stephen Marr

Its Director, Authorized Signatory

Subscribed and sworn to before me

this 17<sup>th</sup> day of April, 2015.

  
Notary Public - Texas



### CERTIFICATE OF SERVICE

I hereby certify that on the 17<sup>th</sup> day of April, 2015, I sent by e-mail transmission, a true and correct copy of Keystone's Supplemental Responses to Dakota Rural Action's First Interrogatories, to the following:

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