Changes to the Economic Costs and Benefits of the Keystone XL Pipeline for South Dakota

Rebuttal Executive Summary for
Written Expert Testimony Prepared

by

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In the Matter of the Petition of TransCanada Keystone Pipeline, LP for Order Accepting Certification of Permit Issued in Docket HP09-001 to Construct the Keystone XL Pipeline - HP14-001

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1 Rebuttal Executive Summary

1.1 Changes in Underlying Facts Related to Economic Costs and Benefits

The Direct Testimony of The Goodman Group, Ltd. (TGG's Direct Testimony, the TGG Report or Exhibit RST-3), filed April 24, 2015, demonstrated the following with respect to changes in the underlying facts related to economic costs and benefits of the Project:

- A number of important underlying facts related to economic costs and benefits of the Project, on which the Final Amended Decision and Order (in HP09-001) was based, have changed.
- Keystone has not met its burden of proof to demonstrate that to the extent that there have been changes in the underlying facts related to economic costs and benefits, those changes are either neutral or positive to the Commission's concerns.
- On the contrary, there have been a number of important changes in the underlying facts (that determine both the Findings of Fact, as well as the Permit Conditions, under which the Decision was granted) related to the economic costs that are **negative** and in some cases **highly negative** to the Commission's concerns. Of particular concern are changes in the underlying facts that invalidate the risk assessment on which the Decision was based.
- Moreover, there have been small changes in the underlying facts related to the small economic benefits that are slightly negative in the case of employment and neutral to slightly positive in the case of property taxes.

1.2 Economic Cost-Benefit Analysis of the Project

Given TGG's evaluation that a number of important changes in the underlying facts result in changes that are negative to the Commission's concerns, TGG performed an economic cost-benefit analysis to determine if the costs of the Project for South Dakota exceed the benefits under a range of worst-case conditions.

In its review of the changes in underlying facts affecting the economic benefits of the Project, the TGG Report determined that the benefits of the Project are very small: the major benefit has been quantified at US$15-$17 million in annual property taxes, which will remain small even with increased costs for the Project. The employment impact has also been shown to be very small and mostly very short-term. Keystone may have somewhat overstated the benefits of the Project, but even using Keystone's estimates the benefits for South Dakota are quite small. TGG's main area of disagreement with Keystone is in regard to the economic cost of the Project. In particular, we are most concerned with the Worst-Case Scenario Costs that are possible in South Dakota given that the proposed route crosses over 200 miles of High Landslide Hazard Areas with steep elevation changes.

To calculate the economic costs related to worst-case conditions (i.e. Worst-Case Scenario Costs), TGG multiplies (a) Worst-Case Release Scenarios for the Project (estimated in the Direct Testimony of Richard Kuprewicz) and (b) a range of relevant and recent unit spill cost estimates for comparable crude oil pipelines. **TGG estimates a range of Worst-Case Scenario Costs starting at US$1 billion and escalating to $2 billion or more for a very high consequence event.**

In light of these very significant Worst-Case Scenario Costs, as well as our experience in analyzing liability issues for pipeline and crude by rail transportation, TGG has concerns with the adequacy of Keystone's financial assurances (and responsibility and willingness to compensate for all damages) in the event of a Worst-Case Release Scenario. As such, Keystone may not be able to meet Permit Conditions 45-49 related to Liability for Damage.

Based on our evaluation of the economic costs and benefits, TGG concludes that, under a range of worst-case scenarios, the costs of the Project will greatly exceed the benefits for South Dakota. As discussed, the benefits of the Project are very small (a few tens of millions in annual property taxes and very small and mostly short-term employment benefits), whereas the worst-case costs of a catastrophic spill are very large (ranging from US$1 billion to amounts in excess of $2 billion).

The ratio of benefits to costs for the Rosebud Sioux Tribe (RST) and Tripp County is particularly poor. In southern Tripp County, the pipeline crosses the Ogallala Aquifer, whereas the pipeline corridor in the northern half of Tripp County is in a High Landslide Hazard Area. Consequently, Tripp County is doubly threatened by the Project: Tripp County and the Rosebud Sioux Tribe will receive a tiny share of the very small benefits of the Project while bearing a disproportionate amount of risk.

1.3 Recommendations

In light of the findings in the TGG Report and the Direct Testimony of Richard Kuprewicz, the TGG Report recommended that the PUC should deny Keystone's petition in the current case because:

1. Keystone has failed to meet the burden of proof to demonstrate that the Project can continue to meet Permit Conditions 45 to 49 (related to Enforcement of Liability for Damage) in the event of a Worst Case Scenario.

2. TC has failed to meet the burden of proof to demonstrate that "[t]o the extent that there have been changes in the underlying facts, those changes are either neutral or positive to the Commission's concerns."

3. TGG concludes that there have been changes in the underlying facts related to the Project, such that the economic costs of the Project for South Dakota under a range of worst-case scenario conditions greatly exceed the benefits.

If despite TGG's strong recommendation to deny Keystone's petition, the PUC chooses to approve it, TGG Report recommended that the PUC direct Keystone to do the following:

1. Compel Keystone to provide clear specific information to determine the level of Keystone's financial coverage in the event of a major spill, and whether Keystone is in a position to meet Permit Conditions 45-49.

2. Implement specific financial insurance requirements, based on the estimated Worst-Case Scenario Costs for the Project (estimated at approximately US$1 billion (and in excess of US$2 billion for a very high consequence event). Beyond insurance requirements, financial coverage should include access to ready cash to cover the initial costs of a spill, core coverage and financial backstopping.

3. Implement the four recommendations in the Direct Testimony of Richard Kuprewicz (p. 9) (our emphasis and paraphrasing):
    a. Compel Keystone to provide clear specific information requested concerning additional information that should be incorporated into the Elevation Profile (RST-Exhibit 10). This information is essential to assist the PUC in making an informed and prudent decision concerning the Keystone XL routing in highly challenging and sensitive terrain within South Dakota.

    b. Obtain further information to clarify how much of the 200 miles of pipeline corridor in South Dakota (identified as High Landslide Hazard Area) is really at risk to such massive abnormal loading forces.

c. Require Keystone to produce an estimated oil spill outflow versus pipeline milepost graph (with sensitivity graphs for additional 15-minute valve closure intervals) for the pipeline reflecting full bore rupture within South Dakota.

d. If the high risk of landslide identified in the Final Supplemental Environmental Impact Statement (FSEIS) is confirmed with accompanying risk of a massive oil spill, **the pipeline should be rerouted to avoid areas with high risk of landslide.** If the PUC does not have the authority to require rerouting of the Project, then it should deny the current Petition. If a new permit application is needed, TC should consider mitigating the landslide risks by rerouting the Project.[1]

1.4 Relevance of the Direct Testimony of Richard Kuprewicz

The findings from the Direct Testimony of Richard Kuprewicz are of direct relevance in the main conclusions of TGG's Direct Testimony concerning:

1. changes in the underlying facts related to the economic costs of an oil spill, and particularly the inadequacy of Keystone's risk assessment, which is based on an outdated PHMSA data set that is irrelevant to the Project);
2. the determination of a range of Worst-Case Scenario Costs, which is based on (a) Mr. Kuprewicz' Worst-Case Release Scenario estimates for the Project of **60,000-68,000 barrels** (assuming a valve shutoff time of 15 minutes and 30

[1] On May 26, 2015, Keystone filed a motion to exclude most of the Testimony of Richard Kuprewicz. In response the PUC has made the following decision: "the Commission does not have the authority to order a reroute of the pipeline and finding that portions of Kuprewicz's testimony may be relevant to this proceeding, the Commission voted unanimously to grant the Motion, in part, only to the extent Kuprewicz's testimony relates to rerouting of the pipeline, and deny, in part, the rest of the Motion in its entirety."

In light of the PUC's decision, the first recommendation from the TGG Report that the PUC should deny Keystone's petition in the current case **is unchanged**. Similarly, if despite TGG's strong recommendation to deny Keystone's petition, the PUC chooses to approve the Project, the recommendations from the TGG Report are also unchanged **with the exception of 3d (above), which summarizes the fourth recommendation from the Kuprewicz testimony.** In light of the PUC's decision regarding Keystone's motion to exclude the Testimony of Richard Kuprewicz, 3d should be modified as follows: **If the high risk of landslide identified in the Final Supplemental Environmental Impact Statement (FSEIS) is confirmed with accompanying risk of a massive oil spill, ~~the pipeline should be rerouted to avoid areas with high risk of landslide. If the PUC does not have the authority to require rerouting of the Project, then it~~ the PUC should deny the current Petition. ~~If a new permit application is needed, TC should consider mitigating the landslide risks by rerouting the Project.~~**

> minutes respectively) and (b) TGG's unit spill cost estimates for comparable crude oil pipelines).

TGG is deeply concerned and surprised by the routing of the Project, which crosses over 200 miles of South Dakota land, designated by FEMA as High Landslide Hazard Areas with steep elevation changes. The Direct Testimony of Richard Kuprewicz warns that "[t]he proposed routing in South Dakota places the proposed pipeline at **undue risk of rupture with massive release of oil**, even with the proposed valving suggested under Special Conditions No. 32." (p. 1, emphasis added).

RST Exhibit 4: Landslide Hazard Areas provides a dramatic illustration of the extent of the South Dakota routing through high landslide hazard areas. And RST Exhibit 10: SD Elevation Profile with Valves and Additional Information (the Elevation Profile supplemented by Mr. Kuprewicz) further demonstrates the combination of steep elevation changes in High Landslide Hazard Areas.

Mr. Kuprewicz emphasizes that "[t]he proposed routing in South Dakota is in areas of steep elevation changes containing high risk geohazards associated with possible massive landslide." (p. 1) Consequently, the Worst-Case Scenario for the Project is a full bore rupture with massive release of crude caused by a breakaway landslide in areas of steep elevation change. He further warns that (our emphasis):

> No pipeline, even new modern "robust" steel pipeline, can withstand the massive abnormal loading forces associated with breakaway landslides. Such forces are much greater than those associated with earthquakes. The science of designing for earthquake faults is well developed, but to date no one has been able to design a pipeline that can withstand a massive landslide that usually results in pipeline rupture.
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> [...]
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> If the high risk of landslide identified in the Final Supplemental Environmental Impact Statement ("FSEIS") is confirmed with accompanying risk of a massive oil spill, **the pipeline should be rerouted to avoid areas with high risk of landslide. If the PUC does not have the authority to reroute the Project, then it should deny the current Petition.** (p. 9) [2]

In light of the very sobering concerns raised by the Direct Testimony of Richard Kuprewicz with respect to the Project routing and the Worst-Case Release Scenarios, and by the TGG Report with respect to the Worst-Case Scenario Costs, TGG urges the

[2] See footnote 1.

PUC to give serious consideration to the RST expert testimony and particularly to our recommendations.

1.5 Structure of the TGG Direct Testimony Document

Section 1 describes TGG's mandate to prepare expert testimony for the Rosebud Sioux Tribe. Sections 2 and 3 are notifications to the PUC from TGG. Section 2 constitutes a notification from TGG of the possibility of rebuttal testimony. Section 3 explains how our expert testimony has been heavily constrained by the limited and incomplete amount of information provided by Keystone. Section 4 provides an introduction to the Direct Testimony as well as an explanation of our methodology. Section 4.1 outlines the key questions before the PUC, as well as how TGG proposes to assist the PUC in determining the answers to these questions. And Section 4.2 explains TGG's economic cost-benefit methodology, which compares a narrow range of economic benefits estimates against a range of Worst-Case Scenario Cost estimates.

Section 5 analyzes the changes in Findings of Fact affecting economic benefits. These include Finding of Fact 107 related to property tax (Section 5.1) and Findings of Fact 107 and 109 related to employment (Section 5.2). Section 5.3 concludes that Keystone has not met its burden of proof to show that the changes in these Findings of Fact are neutral or positive to the Commission's concerns. For each Finding of Fact, TGG summarizes Keystone's position and then provides TGG's concerns and conclusions. Even using Keystone's own estimates, TGG determined that these benefits are very small.

Section 6 analyzes the changes in the changes in Findings of Fact related to economic costs of oil spills, which could affect the economic costs of the Project. These include Finding of Fact 50 concerning HCAs and Spill Risk Assessment (Section 6.1); Finding of Fact 32, concerning the Environmental Impacts in Table 6 (Section 6.2); Findings of Fact 22, 60 and 90, concerning the addition of the 59 PHMSA Special Conditions and Mitigation Recommendations (Section 6.3). For each Finding of Fact, TGG summarizes Keystone's position and then provides TGG's concerns and conclusions. Section 7 raises concerns with respect to changes in the underlying facts related to Permit Conditions 45 to 49, concerning Enforcement and Liability for Damage. The underlying facts related to these Permit Conditions are based on an inadequate and outdated risk assessment. And changes in these underlying facts are negative to the Commissions concerns.

For each of the Findings of Fact and Permit Conditions reviewed in Sections 5 to 7, Section 8 summarizes the evaluation of changes in underlying facts related to economic benefits and costs of the Project. For each of the changes in the Findings of Fact reviewed, TGG concludes that Keystone has not met its burden of proof to show that those changes are neutral or positive to the Commission's concerns. On the contrary, there have been a number of important changes in the underlying facts (that determine both the Findings of Fact, as well as the Permit Conditions, under which the Decision was granted) related to the economic costs that are **negative** and in some cases **highly negative** to the Commission's concerns. Moreover, there have been small changes in the underlying facts related to the small economic benefits that are slightly negative in the case of employment and neutral to slightly positive in the case of property taxes.

With respect to Permit Conditions 45 to 49 related to Enforcement of Liability for Damage, Keystone has failed to demonstrate how it would meet these conditions (particularly considering changes in the underlying facts related to the assessment). Given that the costs of a major pipeline rupture can range from US$1 billion to amounts in excess of $2 billion, TGG has some serious concerns about the adequacy of Keystone's financial assurances.

Section 9 explains how TGG calculates the range of economic costs of the Project under worst-case conditions. Section 9.1 summarizes the conclusions of Richard Kuprewicz regarding (a) concerns that the routing of the pipeline through High Landslide Hazard Areas places the Project at undue risk of rupture with massive release of oil; (b) estimates for Worst-Case Release Scenarios (**60,000-68,000 barrels** [assuming a valve shutoff time of 15 minutes and 30 minutes respectively]). Section 9.2 describes TGG's approach for estimating the range of Worst-Case Scenario Costs. Section 9.3 describes comparable crude oil pipelines (with recent and relevant worst-case unit spill cost estimates), which serve as a basis for estimates of the worst-case unit spill costs for the Project. These include: Kinder Morgan's Trans Mountain Expansion Project, Enbridge's Northern Gateway and Enbridge's Line 6B (and the spill costs estimates for the Marshall, MI rupture).

Section 9.4 calculates the range of Worst-Case Scenario Costs based on (a) Mr. Kuprewicz' Worst-Case Release Scenario estimates for the Project of **60,000-68,000 barrels** [assuming a valve shutoff time of 15 minutes and 30 minutes respectively] and (b) TGG's unit spill cost estimates for comparable crude oil pipelines.

Section 10 questions the adequacy of Keystone's financial assurances in the event of a major spill, as well as its ability to fulfill Permit Conditions 45 to 49, which concern the Enforcement of Liability for Damage. Given that a Worst Case Spill Scenario is estimated at approximately US$1 billion (and in excess of $2 billion for a very high consequence event), TGG is concerned that Keystone's current level of insurance coverage is not enough. Furthermore, TGG is also concerned about Keystone's availability of ready cash to cover the initial costs of a major spill, as well as access to financial backstopping via parental and other third party guarantees. TGG also has concerns about Keystone's responsibility and willingness to mitigate and compensate for all the potential damages for spills.

Section 11 compares the economic costs and benefits of the Project. As discussed above, based on our evaluation of the economic costs and benefits in Sections 5 and 9, TGG concludes that, under a range of worst-case scenarios, the costs of the Project will greatly exceed the benefits for South Dakota (with Worst-Case Spill costs, ranging from ranging from US$1 billion to amounts in excess of $2 billion greatly exceeding the very small property tax and employment benefits).

Finally, Section 12 provides TGG's recommendations. In light of the findings in RST's expert testimony by Mr. Kuprewicz and TGG, we recommend that the PUC should deny Keystone's petition in the current case. If despite TGG's strong recommendation to deny the petition, the PUC chooses to approve it, we suggest a number of conditions for the Project, including Mr. Kuprewicz' recommendations.[3]

[3] See footnote 1.