BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

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	)	Docket 14-001 **TESTIMONY OF EVAN VOKES ON BEHALF OF DAKOTA RURAL ACTION**

Statement for the South Dakota Public Utilities Commission

The current management of TransCanada is in my opinion, a very significant technical threat to the safety of pipelines, including the proposed KXL pipeline through South Dakota and Nebraska.

I have a Master's Degree in Materials Engineering and worked for five years at TransCanada Pipelines; I witnessed both firsthand and from the sidelines the effects of their political/business decisions that flew in the face of common sense and science. In 2012, I was terminated without cause, as I was pointing out how wrong the business model followed by management of this corporation was and what a threat to public safety they were. The reason why an employee such as myself knows so much is that my small department of 12 engineers operated as a small Engineering Specialist company within the corporation, although project managers did not have to engage us for projects. Our department owned many of the engineering specifications and my name appeared on several of these specifications, or I was a contributor to many core engineering specifications. As such, I saw the successes but more frequently, we saw the failures and firefighting required when a pipeline project was in trouble. I have given testimony on the public record before the Canadian Senate where I answered the question; what I did to stop the problem. The fact is the problem has not stopped because the same players are carrying on the same way.

Currently, in 2015, I have had to help another ex-TransCanada Pipelines employee that was being harmed by TransCanada and the National Energy Board after he spent a year bringing forward major code violations that were an immediate threat to the public, yet in the recent Reuters stories, in their official communications, TransCanada and the National Energy Board maintain the farcical position that nothing is wrong. As I have seen the evidence, TransCanada's and the regulators response to an employee's serious engineering allegations were not dealt with for over a year and some still are not. It reminds me of the recent crash landing of an AirCanada Flight in Halifax Nova Scotia, where the political powers called an obvious crash landing that destroyed a large commercial jet, "a hard landing" regardless of the fact that the plane contacted terra firma remote to the runway.

I have presented a lot of material over the last few years that is preserved as part of the permanent public record, but for now I want to start with a rupture of a new generation pipeline called the North Central Corridor Buffalo West section, consisting of 30 miles of 36 inch pipe that was the

best technology the world can expect to see from a technical engineering perspective. This TransCanada pipeline provides fuel gas to the Oil Sands extraction in Fort McMurray Alberta and is very relevant as it ruptured in October 2013 as a result of cost/schedule decisions that were made by my peers and project managers in August 2008, and the regulators not dealing with a major problem and falsification of documentation with this line in 2009. The last insult to public safety was after the line ruptured, when the regulators and TransCanada reported that no one was within 30 miles of the site – notwithstanding the existence of documentation showing that people were literally standing on rupture site hours before it blew up.

Notwithstanding all the other construction deficiencies, the long lead materials were understrength and failed pressure testing before construction commenced months later. Ordering new materials for large diameter pipelines takes quite a while. I did not know that the failed materials were used in North Central Corridor to preserve the construction schedule until PHMSA flagged expanded fittings on the Keystone Phase II expansion. When I was shown pictures of the metallographic cross sections of both Buffalo West and Keystone failed fittings in 2010, it was obvious that the necessary quality control steps were also ignored when the Keystone fittings were ordered. Approximately 600 of these fittings are in service in United States and an equal number in Canada. Neither PHMSA nor the National Energy Board have made a positive action requiring replacement of these substandard fittings since discovering them, regardless of the fact that this problem has now resulted in a rupture on North Central Corridor Buffalo West. From a purely metallurgical pipeline point of view there is no functional difference between an oil or gas pipeline. The only difference is in how the fluid is moved mechanically. However, the use of substandard materials have a further meaning in that the Keystone phase II pump-stations did not meet the minimum federal regulations or engineering design for construction, and the PHMSA special permit for construction which required mandatory quality control was not adhered to.

I had a history of involvement with Keystone from initial construction that persists to the present day as engineering work persists for incredibly long periods. I was heavily involved in the construction of Keystone in Canada for the 500 miles of new construction, spending over one month directly on-site for the automated ultrasonic inspection of girth welds. On Keystone Phase II we were forced into allowing the Keystone project to allow substandard inspection techniques at the direction of the then-Director of Engineering.

While my primary responsibility was Non-Destructive Examination, because of my flexibility afforded with respect to education and industry experience, my engineering opinions were engaged for materials and welding engineering consultations, information requests, and nonconformance dispositions. As such, my Engineering group had a ring-side seat to a most spectacular event, the deterioration of quality management practices in both Canada and United States on a pipeline with mandatory quality control. My peers and I were constantly overruled by management on code violations and other technical matters (which I can prove), while the Keystone project became a legend in inefficiency. Some of the examples of unskilled practice of engineering I saw submitted to regulators have had serious repercussions – yet no one has been held accountable. After fighting many levels of managers, I wrote a response to an invitation from CEO Russ Girling, who was surprised these projects were working out so poorly. I pointed out that many of these events were no surprise to me and my peers, but just the way science was working itself out independently of the “learned” opinions and business practices of managers.

I can assure you that trying to correct a management path at TransCanada was career-ending as I pointed out the misdeeds of company officials and managers. I sought the truth and made a series of information requests to the National Energy Board while I was still employed by TransCanada that resulted in my procuring documents that show clearly that TransCanada has too close a relationship and direct influence with regulators so as to allow TransCanada to ignore law. This situation has allowed and will continue to allow TransCanada to construct its pipelines in a manner which too often ignores quality control issues necessary for the pipeline to be capable of being operated in a manner which would be safe for the environment and in compliance with applicable laws, regulations and permit conditions. Indeed, PHMSA is aware of many of these misdeeds, such as entire pipeline sections that do not have a legitimate code-compliant inspection, yet the pipelines remain in service.

Significantly, and for example, the information requests reveal a problem with the original SNC Lavalin Engineering design of the Keystone pumpstations. I found out about this problem in 2011 when a TransCanada lawyer sent me information showing that the corporation victimized an inspector for a practice of contractor self-inspection. It was the Keystone project, and TransCanada lawyers that told the regulator they were implementing contractor self-inspections in a PowerPoint presentation months earlier. When things went wrong, they blamed the inspectors for a management policy for which I can produce evidence of both occurrence and response. There are many engineering problems with Keystone that persist unrectified to the present day, such as salt induced microcracking on large amount of pipe that was ordered for the Keystone XL section. I can show the pictures but I can't tell exactly which pipe it is.

If I had to pick an immediate threat to public safety, I could not, nor could anyone else; but I can tell you that there are hundreds of incidences of code violations and forbidden construction practices by TransCanada that are buried in ditches across North America and figuratively in files that many people take home containing proof, in case they become problems. Many of these problems are immediate danger issues waiting for something to disturb them before they propagate into failed pipelines, but they may never become problems.

On the Gulf Coast section of Keystone, the violations were obvious and were documented by landowners, activists and PHMSA, just the same as they always are. For instance, TransCanada maintains that they are just doing due diligence by removing 200 anomalies (which is a politically correct way of saying substandard workmanship) from the pipeline as sections. I have been on larger pipeline jobs here no anomalies had to be cut out, as the defects are reflective of construction contractors not following the code of construction and inspectors not enforcing rules. When TransCanada told everyone that the removal was due diligence, it wasn't. Removal of the sections containing those 200 anomalies have now resulted in 400 welds that are not pressure tested, which is the fundamental test to make sure the pipeline is safe to operate. After I was dismissed from TransCanada a former work peer forwarded a TransCanada Keystone project post mortem and ad nauseam, the PowerPoint repeats the same endless message that things will get better on the Keystone Gulf Coast project with all the lessons learned on Keystone I, II and Bison. If so, why was Keystone Gulf Coast just the same, and how will this renamed section of Keystone XL be better?

In the post mortem presentation, there were pictures where the pipe has fallen off the skid piles, and many references to substandard inspections, but additionally there are TransCanada internal reports showing incompetence in inspection that I did not write.

Keystone Gulf Coast pipe was photographed by landowners and activists with an extensive list of problems as follows: pipe falling off the skid piles or ready to fall off skid piles, heavy equipment marks consistent with collision with the pipes, serious coating damage present from the pipe not being handled according to minimum standards, repair coatings were shown as incorrectly applied, and extensive evidence of pipes installed on top of large rocks. The Non-Government Organization, Public Citizen, has hundreds of photographs of code violations and even the Houston Chronicle printed pictures of a code violation holding up construction activities in a manner that would soon be resulting in damage to the pipe. Humorously, the subject of the Houston Chronicle news article covered delays to the Keystone pipeline schedule while they were repairing the very subject matter of the photograph.

During Keystone Gulf Coast construction, I had written a letter to PHMSA admonishing them for substandard engineering oversight on Gulf Coast, which then issued warning letters for substandard practices to TransCanada. Obviously the same practices that CEO Russ Girling wrote about to us employees in 2011 are still at play – so how has any of this improved over the years before, during and after my presence at TransCanada? For all the promises, what has PHMSA done to proactively stop substandard pipeline from being buried? Keystone Gulf coast should have been pressure tested a second time, as it is now high risk.

The classic example is the 2010 Bison Wyoming to North Dakota project, where TransCanada directors called us into the pipeline project after the quality management people left the project for unknown reasons. It was a technical disaster and even PHMSA saw what a joke the inspection was as evidenced by the PHMSA inspection reports. There was so much wrong that it was going to be death by a thousand cuts. Essentially the environmental concerns were so overwhelming that the project could not maintain quality control measures. In response, TransCanada simply let the contractor do its own thing. The pipe was installed with dents, gouges, and welds that did not meet the minimum code requirements so they could avoid nesting schedules of owls and other environmental concerns; but PHMSA once again said nothing. During the initial phases of remediation after this pipeline was put into service, I was asked three times to write letters to PHMSA stating that dents were not associated with welds when the evidence in fact showed that dents were associated with welds. There is a strong documented history that the pressure by TransCanada managers to write a favorable report only stopped when the pipeline ruptured.

PHMSA's failure report of this pipeline is a travesty of engineering as it was a failure of inspection under the mandatory quality assurance system that led to the pipe being struck by a large excavator four times in one mile that caused the rupture. There are so many more lethal problems left with the line that a reoccurrence is likely. The report fails to address the adjacent weld that tore out as it was one of the welds with insufficient inspection. It is not relevant that PHMSA report could not conclude the metallurgical mechanism of the gouge that caused the failure. Gouges are lethal defects in any pipeline code. As part of my effort to stop the madness, I had even gone as far as to send TransCanada internal audit committee very clear pictures of Bison code and safety violations that were sanctioned by project management; yet the committee claimed the pictures were of

insufficient resolution. It could not be any clearer that what I saw and photographed, and PHMSA reported on, were all sanctioned by project management personal, who were all promoted after the pipeline ruptured.

All of these and many more problems are forbidden by TransCanada policies, but in reality are sanctioned by managers as low risk problems that benefit project cost and schedule. These sanctioned activities benefited managers before, during, and after my tenure at TransCanada. Many of these decision makers are non-professional or are professionals that have made very unskilled engineering decisions. Regardless of who made the decision, science does not care but rather asks its own questions based on matters of fact. TransCanada loves putting forward information far from the truth, but my story has been confirmed multiple times by both science and the regulators – refuting the position TransCanada takes in public.

As a comparison, you do not have to believe in gravity for it to work. Similarly, TransCanada's "experts" will tell the Commission that my opinion has no relevance. However, this does not change the fact that TransCanada is a corporation with no responsible direction. This is the future South Dakota faces as it makes the decision to permit construction of the Keystone XL Pipeline.

I would be happy to **testify before** the South Dakota Public Utility Commission and to produce evidence to support my claims, as this is a public safety issue that will not be going away anytime soon.

EVAN VOKES

April 2, 2015
Date

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

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	)	Docket 14-001 **TESTIMONY OF DR. ARDEN D. DAVIS, Ph.D., P.E., ON BEHALF OF DAKOTA RURAL ACTION**

My name is Arden D. Davis, Ph.D., P.E. My address is 1014 Milwaukee Street, Rapid City, South Dakota 57701.

This testimony is submitted regarding Findings of Fact 12(2)-(3), 20, 22, 33-34, 36, 37, 40-41, 43-53, 64, 77, 79, 82, 86, 94-95, 98-99, 101-104, 110, 113, and Amended Conditions: 22, 34-35, 37 of the Amended Final Decision and Order in HP 09-001.

Professional Qualifications and Background

I have been involved in the fields of ground water and environmental contamination since 1978. I hold a B.A. degree in Geology from the University of Minnesota, and M.S. and Ph.D. degrees in Geological Engineering from South Dakota School of Mines and Technology. I am a registered professional engineer in South Dakota (no. 4663). Since 1985, I have taught courses in ground water, ground-water contamination, geological engineering, and environmental pollution at South Dakota School of Mines and Technology. I have also presented expert witness testimony in numerous cases, and have assisted the State of South Dakota in ground-water contamination problems, including the Williams Pipe Line / Hayward Elementary School site in Sioux Falls.

Potential Impact of Keystone XL Pipeline on Water Resources in South Dakota

A crude-oil or diluted bitumen leak could have devastating effects on ground-water supplies, surface water, and environmental resources in South Dakota. The proposed Keystone XL Pipeline would cross the recharge areas of several shallow aquifers in the western part of the State, including the Ogallala aquifer and Sand Hills type material, especially in Tripp County. Other shallow aquifers that would be crossed by the proposed pipeline route are terrace gravel aquifers, eolian (wind-blown) aquifer materials, alluvial aquifers, and the Fox Hills aquifer.

The proposed pipeline also would have major stream crossings at water courses such as the Little Missouri River, the Grand River and its tributaries, the Moreau River, the Cheyenne River upstream from Oahe Reservoir, the Bad River, and the White River. These drainages have associated alluvial aquifers beneath and adjacent to the rivers, and dissolved hydrocarbon contaminants could be transported downgradient in surface water, in ground water within the aquifers, or both.

The proposed route is shown on Figure 1 (from U.S. Dept. of State, 2014) and would cross the western part of South Dakota in a northwest-to-southeast trend. The South Dakota state geologic map is shown on Figure 2, with the proposed route superimposed.

In Harding County, in the extreme northwestern part of South Dakota, the route would cross the Little Missouri River (Figure 3) and the Grand River (Figure 4). The Hell Creek Formation (shown as K_h on Figure 3 and Figure 4) contains bentonitic shale and is exposed in the river valleys at these crossings. The Little Missouri River flows northward into North Dakota, where it eventually joins the Missouri River. The Grand River flows generally eastward and joins the Missouri River in north-central South Dakota.

In Harding County the proposed route would cross permeable wind-blown deposits, shown as Q_e on Figure 4. These wind-blown deposits of silt and sand recharge from rainfall and snowmelt, and they are capable of supplying water to shallow wells in the area. The proposed route also would cross the Fox Hills aquifer (shown as K_{fh} on Figure 4) in Harding County. This sandstone aquifer is one of the most important ground-water reservoirs in northwestern South Dakota and supplies drinking water to public supplies for the City of Buffalo as well as a standby well for the City of Lemmon.

In Butte County the proposed route would cross the North Fork of the Moreau River (Figure 4), and in Perkins County the route would cross the Moreau River (Figure 4), which flows eastward and joins the Missouri River in north-central South Dakota.

In Meade County the proposed route would cross Cherry Creek and Red Owl Creek, as well as a large expanse of the exposed recharge area of the Fox Hills Formation (see Figure 5). As mentioned above, the Fox Hills aquifer is a major aquifer in northwestern South Dakota.

Near the border of Meade, Haakon, and Pennington counties, the proposed route would cross the Cheyenne River (Figure 6). This part of the Cheyenne River watershed is downstream from the Belle Fourche River, which drains the northern Black Hills, and the main branch of the Cheyenne, which drains the southern and eastern Black Hills. At this site, the Cheyenne River has gathered the surface-water drainage from the entire Black Hills. From here downstream, the Cheyenne River flows into the Oahe Reservoir on the Missouri River. The Pierre Shale (shown as K_p), which contains bentonite, is exposed along steep sides of the Cheyenne River valley and is prone to slope failures in western South Dakota. The proposed route also would cross the Bad River near Midland in Haakon County (Figure 7), where Pierre Shale also is exposed along the valley sides.

South of the Cheyenne River in Haakon County, the proposed route would cross permeable Quaternary terrace gravels (shown as Q_t on Figure 6) and wind-blown deposits (Q_e on Figure 6). The terrace gravels are stream-bed deposits of former flood plains. Both the terrace gravels and wind-blown deposits are permeable and are recharged by precipitation. In places they are capable of supplying water to wells, springs, and seeps, as well as providing soil moisture for trees and other vegetation.

In Jones and Lyman counties, the proposed pipeline route would cross permeable wind-blown deposits (shown as Q_e on Figure 8) and also would cross Quaternary terrace deposits north of the White River (shown as Q_t on Figure 8). The terrace deposits in this area have a shallow water table and are recharged by rainfall and snowmelt, which provide water for springs and seeps at the heads of streams that drain southward toward the White River. The shallow water table also supports small lakes, ponds, and wetlands in the area.

The proposed pipeline route would cross the White River at the border of Lyman and Tripp counties (Figure 8). The Pierre Shale is exposed in the White River valley at this location and is a concern because of potential slope failures.

In Tripp County, near the southeastern end of the proposed pipeline in South Dakota, the route would cross the Ogallala aquifer (shown as T_o on Figure 9). It also would cross wind-blown Sand Hills type material (shown as Q_e) above the Ogallala aquifer. According to Martin et al. (2004) the wind-blown material shown as Q_e on the South Dakota state geologic map includes the Sand Hills Formation. The hydrologic situation is similar to the Sand Hills of Nebraska, which form a permeable recharge zone above the Ogallala aquifer and therefore deserve consideration for special protection as a high-consequence area. As noted by Stansbury (2011), areas with shallow ground water that are overlain by permeable soils, such as Sand Hills type material, pose risks of special concern because leaks could go undetected for long periods of time

Contaminants and Potential Problems

The proposed Keystone XL pipeline would transport crude oil and diluted bitumen. As noted by Stansbury (2011), diluted bitumen is more corrosive than conventional crude oil transported in existing pipelines. Crude oil and diluted bitumen contain hydrocarbons, including benzene, toluene, ethylbenzene, and xylene. Benzene is of particular note because its maximum contaminant level (MCL) in drinking water is 5 parts per billion. Benzene is known to produce leukemia in humans. It has been identified as a human carcinogen by the Occupational Safety and Health Administration and the National Toxicology Program.

Benzene is soluble in water and can be transported downgradient toward receptors such as public water-supply wells, private wells, and springs or seeps. In certain cases, benzene can be transported more than 500 or 1000 feet downgradient in aquifers,

according to records of agencies such as the South Dakota Geological Survey, the South Dakota Department of Environment and Natural Resources, and the South Dakota Petroleum Release Compensation Fund. For example, a benzene contaminant plume from a leaking tank at the Williams Pipe Line / Hayward Elementary School site in Sioux Falls, South Dakota, was documented to have traveled about 800 feet downgradient from the tank (Iles et al., 1988). Because of benzene's solubility and its allowable limit of only 5 parts per billion in drinking water, a pipeline leak could contaminate a large volume of surface water or ground water in shallow aquifers of western South Dakota.

Leaks from pipelines have occurred in the past in South Dakota and have threatened ground-water supplies. These include a pipeline spill from Williams Pipe Line Company near water-supply wells for the City of Sioux Falls, and a large spill north of the City of Sioux Falls on glacial till near the Big Sioux aquifer. Reports of these are available in the files of the South Dakota Department of Environment and Natural Resources. A spill of more than 840,000 gallons in 2010 at Marshall, Michigan, caused extensive environmental damage and polluted the Kalamazoo River. The rupture and subsequent investigation resulted in new recommendations for pipeline safety from the National Transportation Safety Board. Two recent pipeline ruptures along the Yellowstone River in Montana were particularly serious and caused serious environmental problems. One, in 2011 near Laurel, Montana, resulted in the discharge of about 63,000 gallons of crude oil. The second, in 2015, released about 30,000 gallons of crude oil and contaminated the public drinking water supply of the City of Glendive, Montana.

A major concern involves the stability of steep slopes where the Pierre Shale or other bentonite-bearing shales are exposed, particularly along the breaks of major rivers, including the Cheyenne River, the White River, the Bad River, the Little Missouri River, the Grand River, and the Moreau River. Expansive clays such as bentonite are a particular concern because they can absorb large amounts of water during wet periods, leading to instability and potential failure. Slope failures are common along these river valleys, and could cause ruptures and serious leaks from the proposed pipeline. Additional safeguards for pipeline integrity should be undertaken in such locations. Leaks in these areas potentially could result in surface-water contamination downstream toward the Missouri River and its reservoirs

A report for TransCanada by DNV Consulting (Appendix A: Frequency-Volume Study of Keystone Pipeline), dated May 1, 2006, indicates on page 19, Table 5-2, that a leak rate of less than 1.5% could go undetected for 90 days for below-ground pipe. Page 20, Figure 5-1, of the same report indicates a leak detection and verification time of 138 min (2.3 hours) for a leak rate of 1.5%. The leak rate for this detection time is approximately 200 barrels per hour (BPH). This potentially could result in a leak of about 19,000 gallons (2.3 hr x 200 barrels/hr x 42 gallons/barrel). It appears, therefore, that larger volumes of oil could leak over a longer time (e.g., 90 days), if the leak rate is less than 1.5%. A leak of 19,000 gallons or greater could contaminate a large volume of ground-water supplies because of the solubility of crude oil components such as benzene and other volatile hydrocarbons.

The Final Supplemental Environmental Impact Statement for the Keystone XL Project (U.S. Department of State, 2014) stated that spill volumes from larger-diameter pipelines tend to be larger than those from smaller-diameter pipelines. It also stated that the primary releases causes, aside from failure of components such as valves, are outside forces and corrosion. In addition, the spill size and impact, for medium to large spills, are more sensitive to response time than for small spills. In other cases, smaller leaks might not be detected (U.S. Department of State, 2014).

The executive summary of the Final Environmental Impact Statement (U.S. Department of State, 2011) stated, "Although the leak detection system would be in place, some leaks might not be detected by the system. For example, a pinhole leak could be undetected for days or a few weeks if the release volume rate were small and in a remote area." The executive summary also stated, "In spite of the safety measures included in the design, construction, and operation of the proposed Project, spills are likely to occur during operation over the lifetime of the proposed Project. Crude oil could be released from the pipeline, pump stations, or valve stations." In addition, the executive summary mentioned 14 spills since 2010 from the existing Keystone pipeline system, including a spill of 21,000 gallons in North Dakota.

Stansbury (2011) stated concerns about questionable assumptions and calculations by TransCanada of expected frequency of spills from the proposed Keystone XL Pipeline. He noted that the pipeline would operate at higher temperatures and pressures than existing pipelines, and that the crude oil that would be transported in the Keystone XL Pipeline will be more corrosive than conventional crude oil. These factors would tend to increase spill frequency. Stansbury (2011) also stated that worst-case spill volumes from the proposed Keystone XL Pipeline are likely to be significantly larger than those estimated by TransCanada.

The Final Supplemental Environmental Impact Statement (U.S. Department of State, 2014) noted, "For all spills, especially those that reached water resources, the response time between initiation of the spill event and arrival of the response contractors would influence the potential magnitude of impacts to environmental resources." If a pipeline leak goes undetected and a spill of crude oil reaches a major water course such as the Cheyenne River, it could potentially be transported many miles downstream during high-velocity flows at certain times of the year. For example, the Cheyenne River can have a velocity of 7½ to 8 feet per second at times of high discharges (Dawdy, 1961). A river velocity of 8 feet per second is equivalent to about 5½ miles per hour. If a leak is undetected and a spill reaches the river under these conditions, it could potentially be transported about 60 miles downstream in 12 hours. If a leak cannot be controlled or is undetected for 24 hours, it could be transported about 120 miles downstream. This raises concerns about emergency response and mobilization in such a situation. For example, the straight-line distance is about 40 miles from the proposed pipeline route's crossing of the Cheyenne River to the Oahe Reservoir. This is in a remote, sparsely populated area. Assuming a channel sinuosity of about 2 to 2.5 for this reach of the Cheyenne River, the river's actual distance would be about 80 to 100 miles from this crossing to the Missouri River's reservoir. Thus, if a release occurred at this crossing and it could not be

controlled or went undetected for 12 to 24 hours, petroleum contaminants could reach the Missouri River, potentially affecting water supplies and surface-water users, and causing environmental damage.

Summary

The Keystone XL Pipeline, as currently proposed, would cross shallow aquifers including the Ogallala aquifer, Sand Hills type aquifer material, terrace gravel aquifers, wind-blown aquifer materials, alluvial aquifers along rivers, and the Fox Hills aquifer. Spills in these aquifers could pose serious health risks to ground-water users. The proposed route also would have river crossings at water courses that include the Cheyenne River upstream from Oahe Reservoir, the White River, and the Bad River, and other streams. The sides of these river valleys are vulnerable to large slope failures, especially where bentonite-containing shales are exposed, which potentially could cause pipeline rupture. At these river crossings and downstream, the proposed pipeline poses serious risks and could have devastating effects on surface water and associated environmental resources, potentially affecting water supplies and surface-water users.

References

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Iles, D.L., Meyer, M.R., Baron, L.R., and Markley, W.E., 1988, Assessment of hydrogeologic and ground water contamination data in the vicinity of the Hayward Elementary School, West 12th Street, Sioux Falls, South Dakota: Open File Report No. 44-UR, South Dakota Department of Water and Natural Resources.

Martin, J.E., Sawyer, J.F., Fahrenbach, M.D., Tomhave, D.W., and Schulz, L.D., 2004, Geologic map of South Dakota: South Dakota Geological Survey, Vermillion, South Dakota, 1 pl.

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Stansbury, John, 2011, "Analysis of frequency, magnitude, and consequence of worst-case spills from the proposed Keystone XL Pipeline."

I hereby affirm under penalty of perjury that the above testimony is true and correct.

Arden D. Davis
ARDEN D. DAVIS

April 2, 2015
(date)

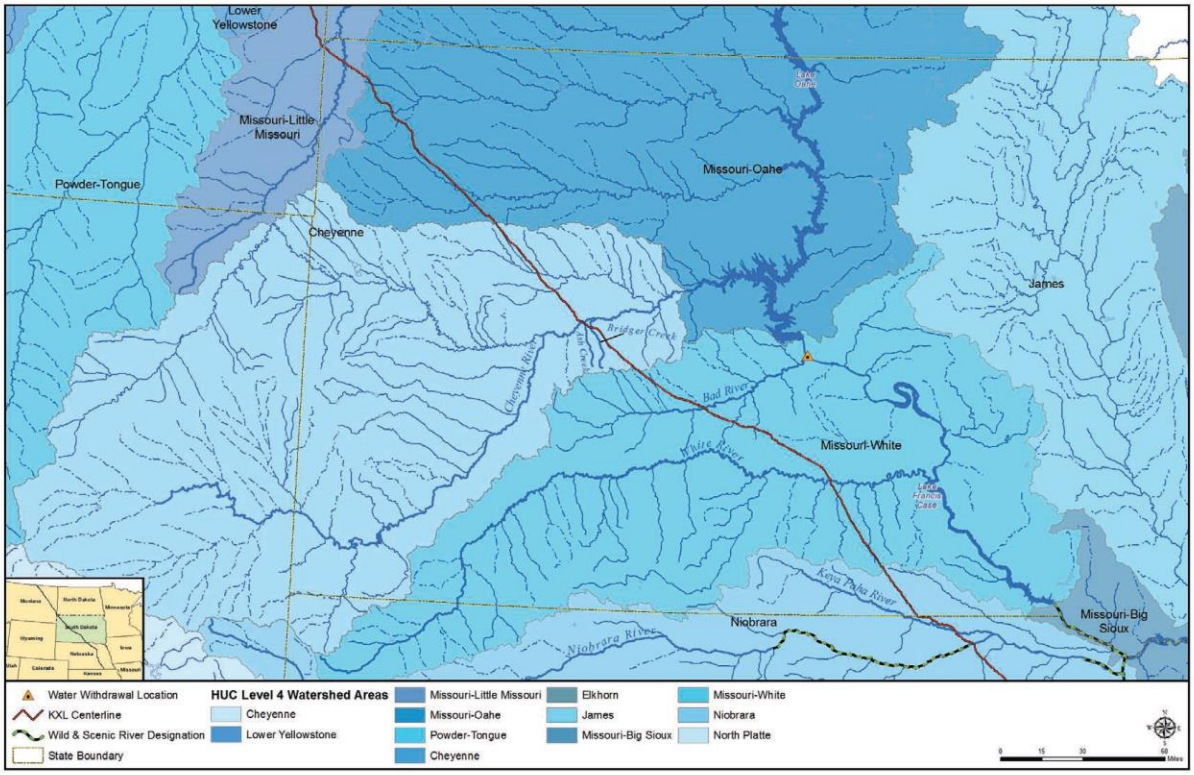

Figure 1. Water crossings of the proposed Keystone XL Pipeline in western South Dakota (from U.S. Dept. of State, 2014, p. 3.3-39.

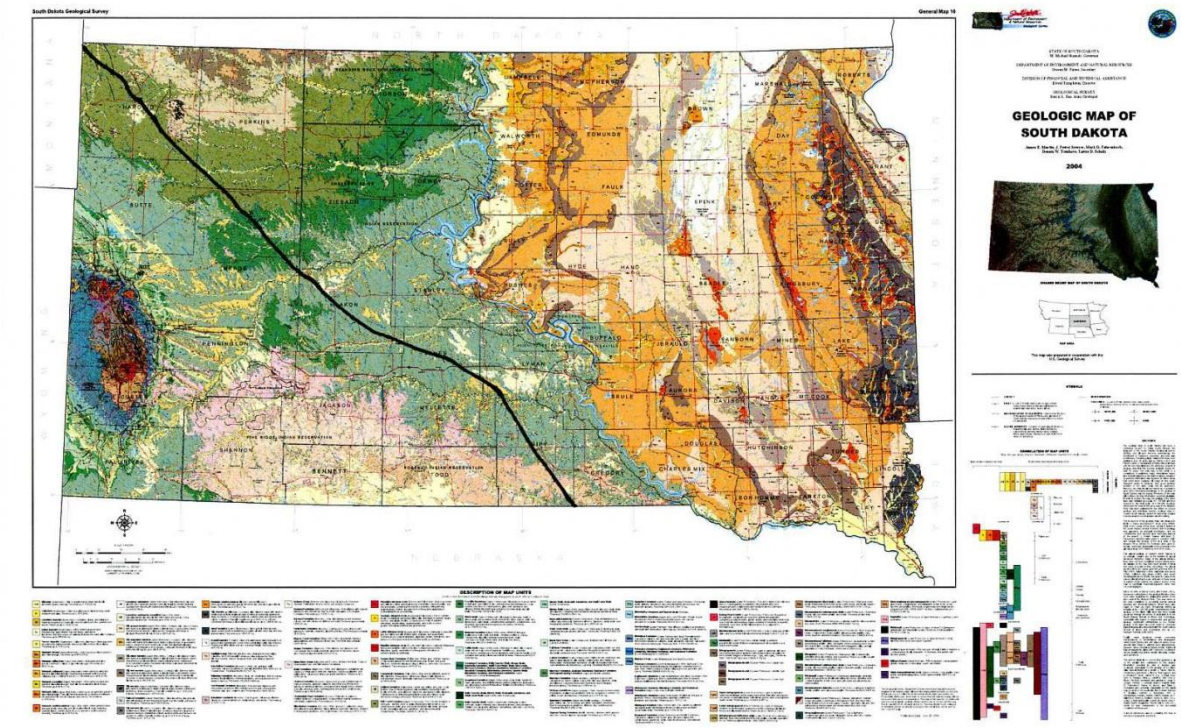

Figure 2. South Dakota geologic map (from Martin et al., 2004) with proposed Keystone XL route superimposed.

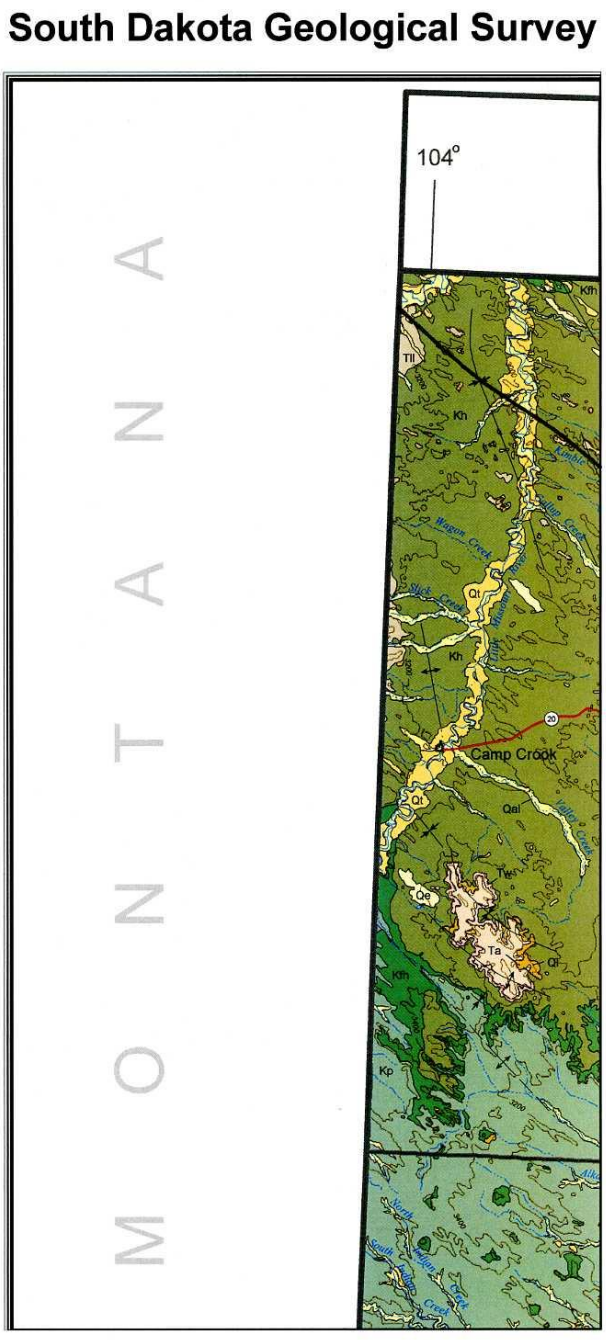

Figure 3. Part of the South Dakota geologic map (from Martin et al., 2004) in the northwestern part of Harding County, with proposed Keystone XL route superimposed.

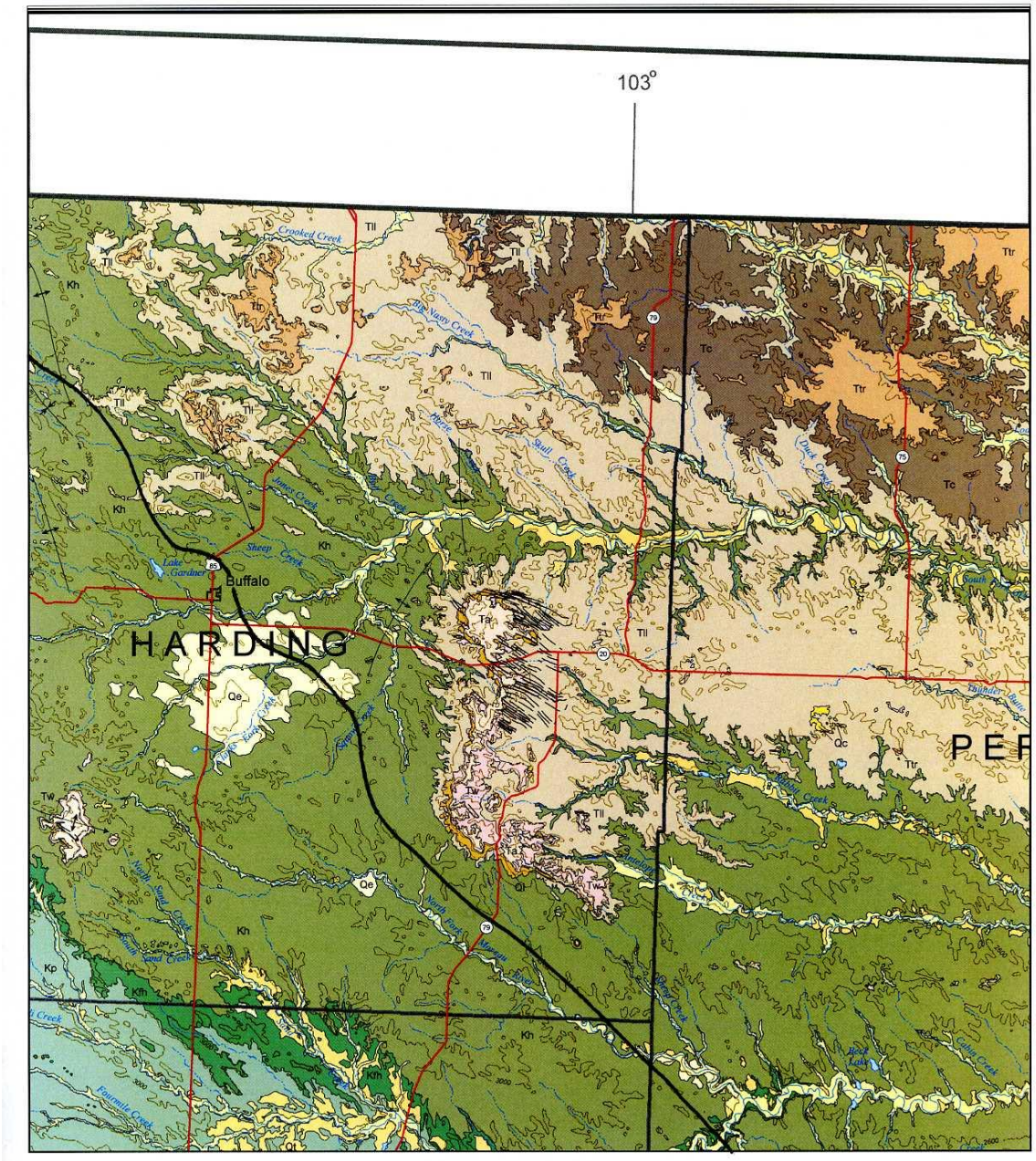

Figure 4. Part of the South Dakota geologic map (from Martin et al., 2004) in Harding and Perkins counties, with proposed Keystone XL route superimposed. The area shown as Q_e south and southeast of Buffalo is mapped as eolian (wind-blown) deposits.

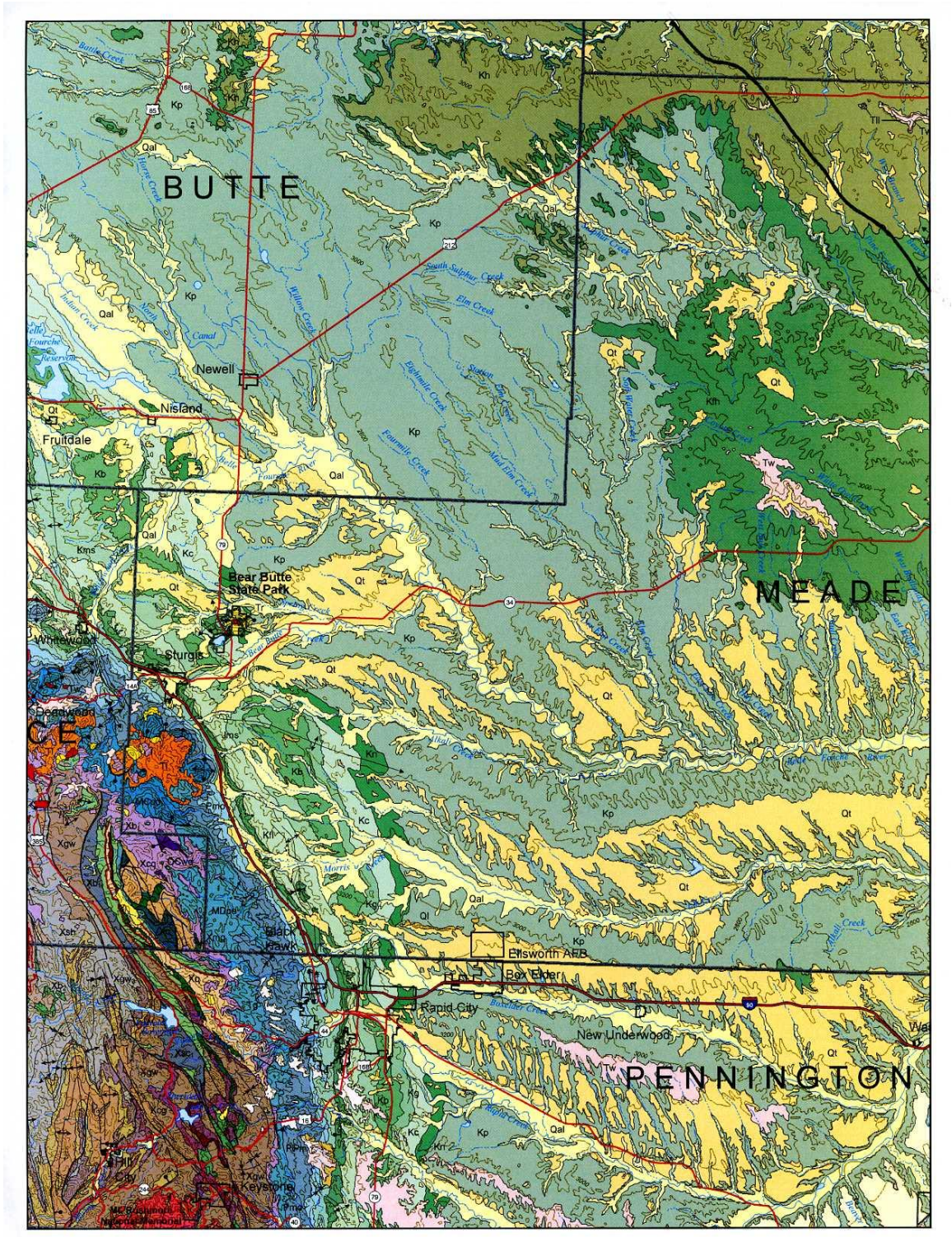

Figure 5. Part of the South Dakota geologic map (from Martin et al., 2004) in Perkins and Meade counties, with proposed Keystone XL route superimposed. The area shown as K_{fh} is mapped as the Fox Hills Formation.

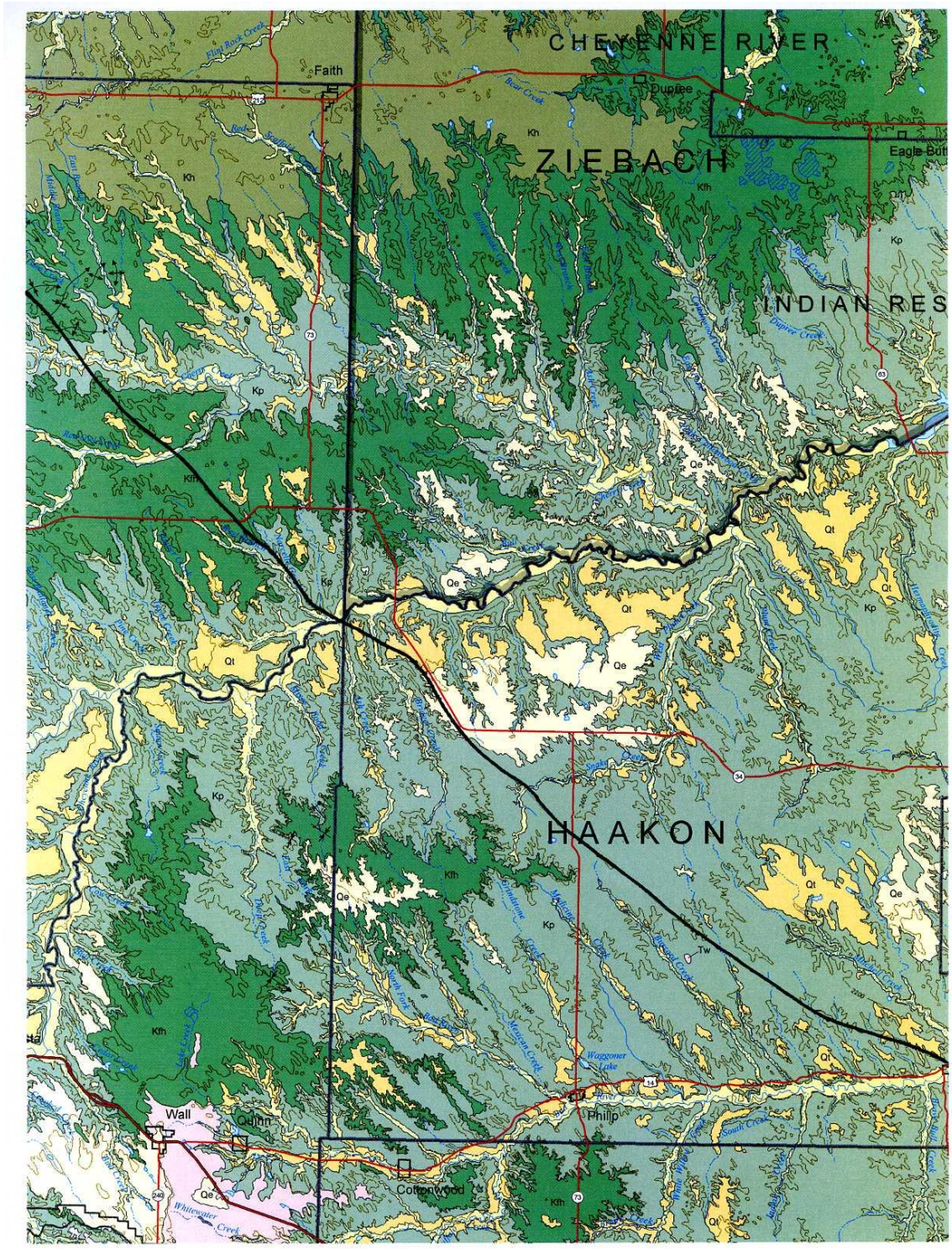

Figure 6. Part of the South Dakota geologic map (from Martin et al., 2004) in Meade and Haakon counties, with proposed Keystone XL route superimposed. The route would cross the Cheyenne River near the border of Meade and Haakon counties. The area mapped as Q_t refers to terrace deposits of streams in former flood plains.

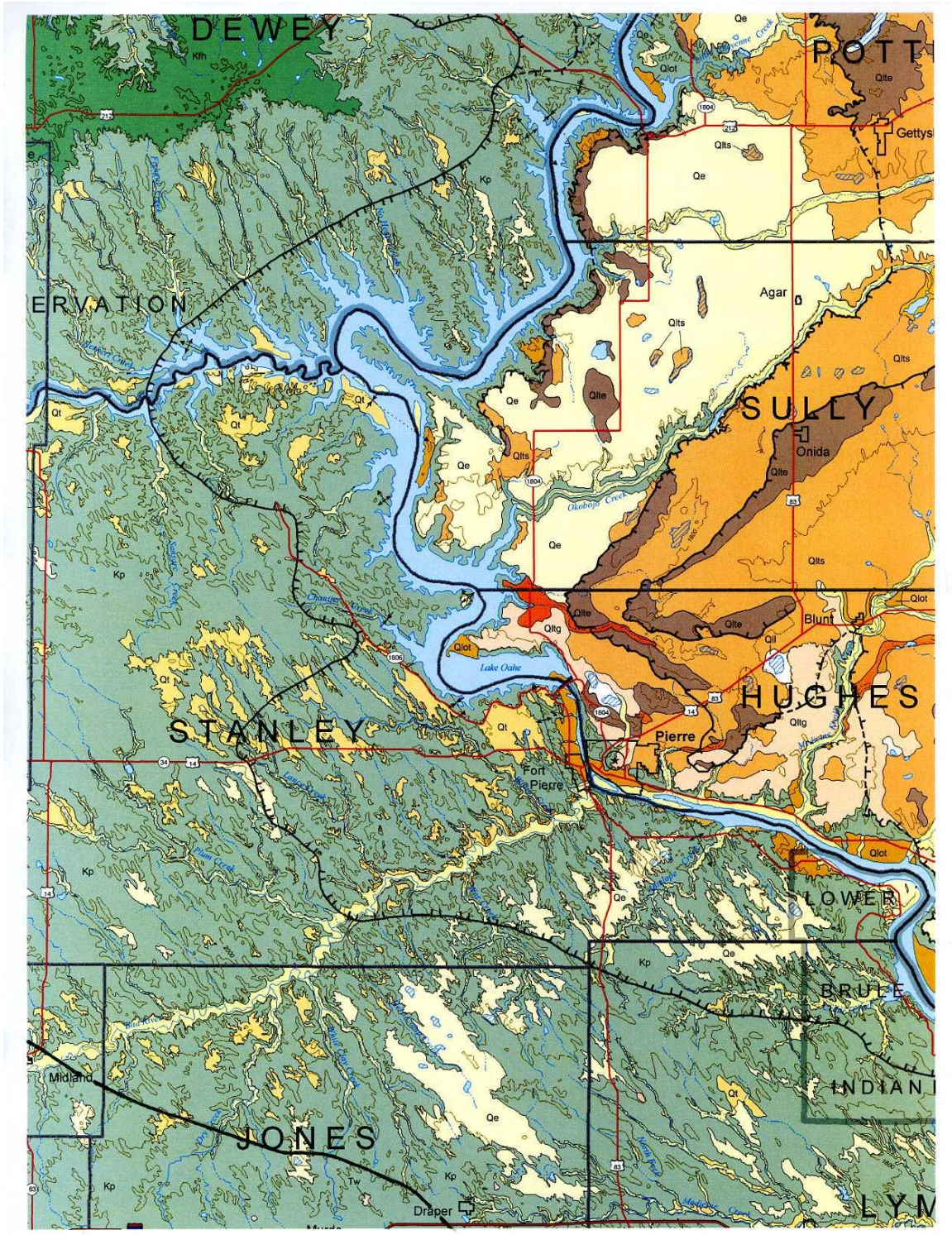

Figure 7. Part of the South Dakota geologic map (from Martin et al., 2004) in Haakon and Jones counties, with proposed Keystone XL route superimposed.

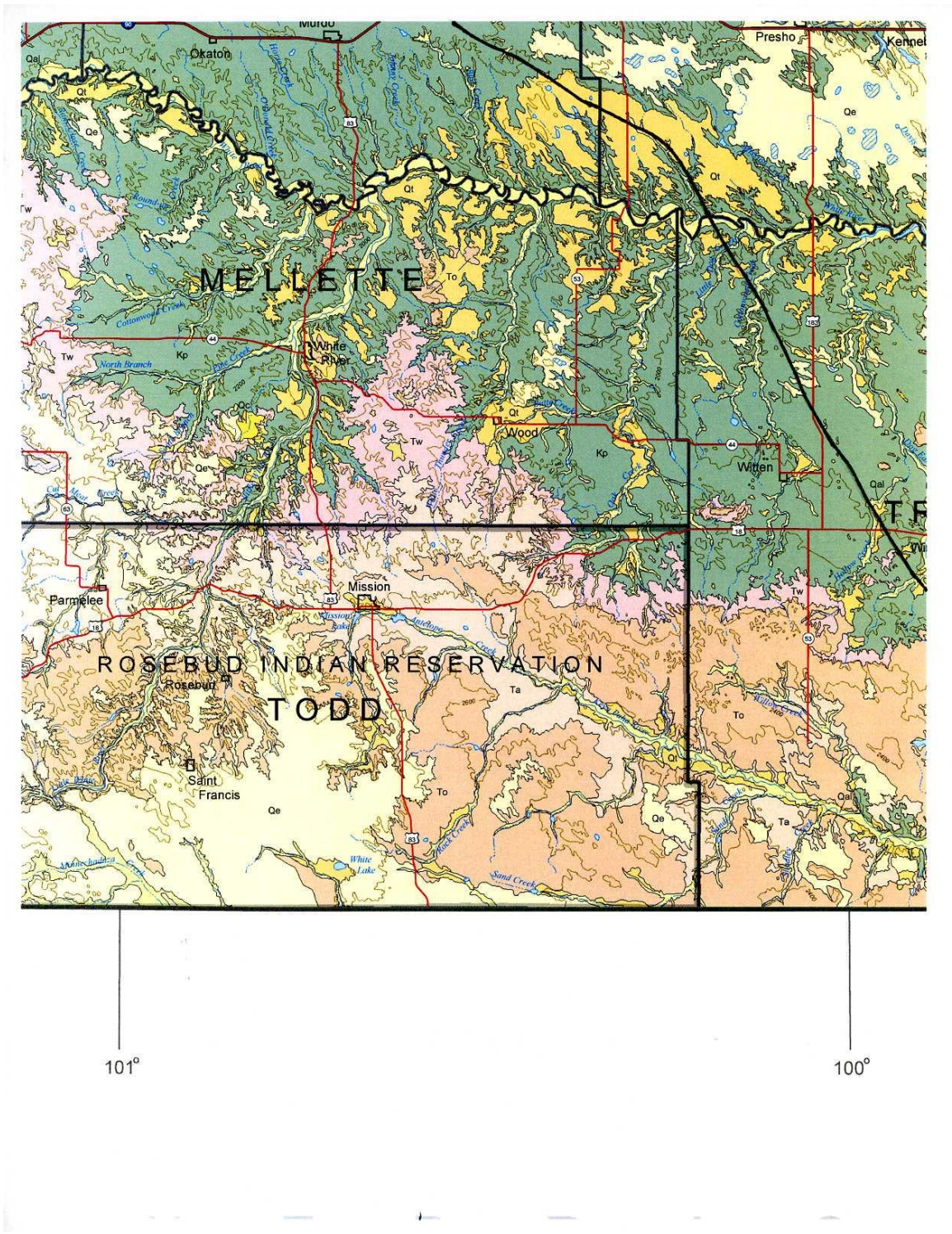

Figure 8. Part of the South Dakota geologic map (from Martin et al., 2004) in Jones, Lyman, and Tripp counties, with proposed Keystone XL route superimposed. The area mapped as Q_t shows terrace deposits of streams in former flood plains.

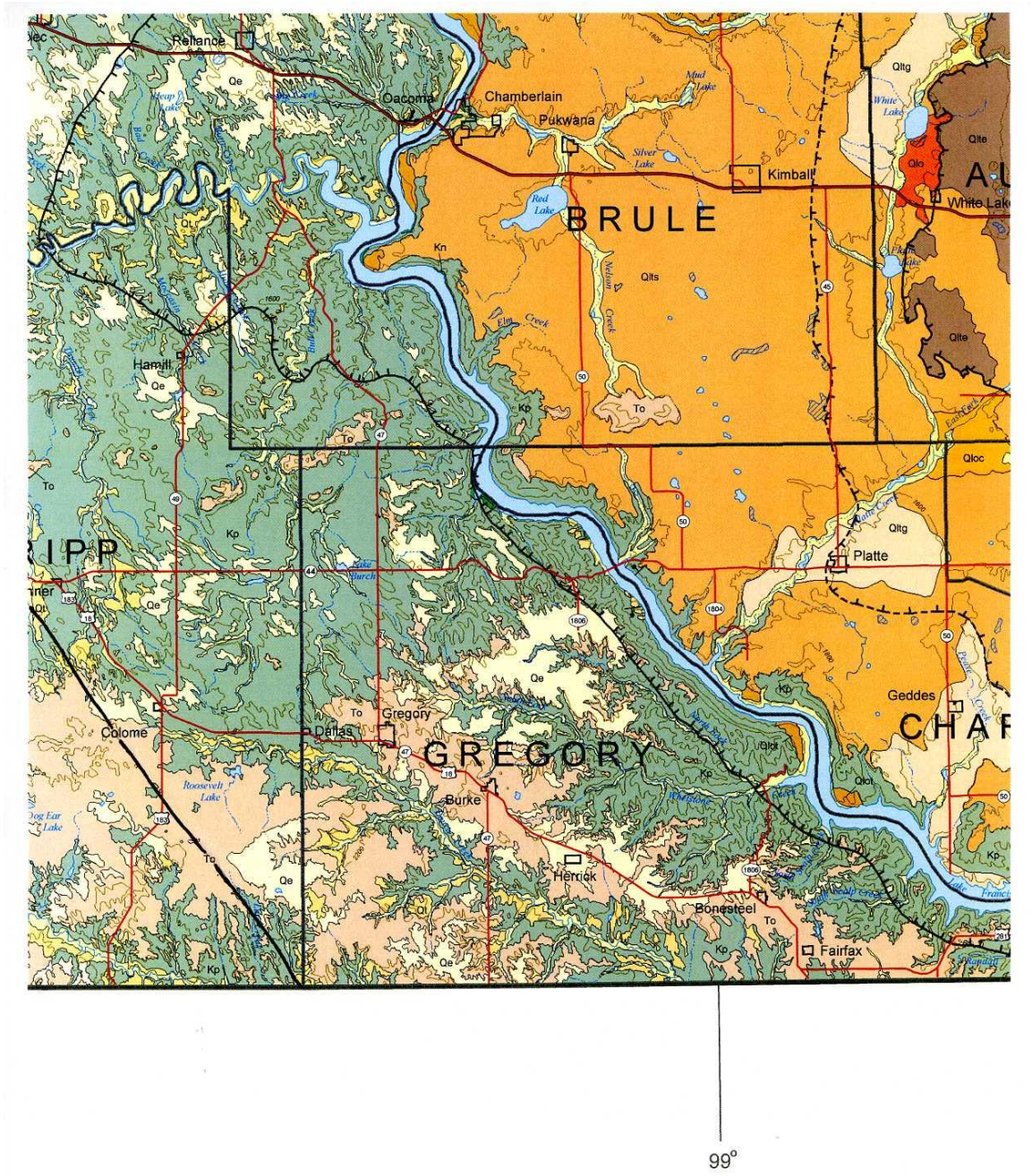

Figure 9. Part of the South Dakota geologic map (from Martin et al., 2004) in Tripp County, with proposed Keystone XL route superimposed. The area mapped as T_o shows the Ogallala aquifer. The areas mapped as Q_e show eolian (wind-blown) deposits, including Sand Hills type material.

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

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	)	Docket 14-001 **TESTIMONY OF SUE SIBSON ON BEHALF OF DAKOTA RURAL ACTION**

Statement for the South Dakota Public Utilities Commission

My name is Sue Sibson. My address is 23782 426th Avenue, Howard, South Dakota 57349.

This testimony is submitted regarding Amended Conditions: 13, 15, 16, 26, and 27 of the Amended Final Decision and Order in HP 09-001.

My husband, Mike Sibson, and I live in Miner County, Roswell Township, and we are lifelong South Dakota residents. My husband's parents purchased the farm where we live in 1972 and we currently raise grain and background feeder cattle. We also allow a lot of wildlife to live on our property.

We opposed TransCanada Corporation's original Keystone-I pipeline, which ultimately crossed our land, including crossing native grassland, farm ground, a wetland area, and a waterway. We were concerned about the effect that the pipeline would have on our land. Those fears have been born out, as TransCanada has not lived up to its promises and the conditions it was required to uphold with respect to reclamation of our land.

Effect of the Pipeline on our Land

In 2009 TransCanada continued construction, digging the trench for the pipeline on our land, even though we had over an inch of rain. Condition #34 that TransCanada was supposed to follow was that "Construction must be suspended when weather conditions are such that construction will cause irreparable damage, unless adequate protection measures approved by the Commission are taken." As of 2015, our land has been irreparably damaged by TransCanada's failure to follow the Commission's conditions.

Additionally, TransCanada failed to comply with the applicable construction mitigation and reclamation plan as to reclamation and re-vegetation. The objectives of the plan were to return the disturbed areas to approximately pre-construction use and capability. TransCanada failed to live up to this commitment and requirement.

For example, TransCanada planted the wrong native grass seed. TransCanada planted thickspike wheatgrass which is not native to our land, and which has resulted in a nightmare for us.

In 2011, after raising questions, TransCanada engaged in reseeding by replanting the thickspike wheat grass again, and they failed to provide us with grass seed tags. This failure on the part of TransCanada revealed itself in 2012, when the thickspike wheat grass was very thick on the areas seeded by TransCanada. Cattle will not eat it, and this grass has also proved to be very hard to get rid of. In 2014 TransCanada's reclamation crew again entered our land and even sprayed the grass with roundup, with little success. Our cattle haven't grazed the easement area TransCanada took from us since 2009.

TransCanada has made many half-hearted attempts to reclaim the land. The condition of the native grass reseeding shows it. TransCanada has failed to follow the conditions set by the Commission.

TransCanada Failed to Comply with other Conditions

Condition #18 established by the Commission was that rock exaction from the trench could be used to backfill the trench only to the top of the existing bedrock profile. All other rocks were to be considered construction debris. TransCanada failed to follow the signed construction agreement when their contractor buried rocks back into the easement area. In 2011, when another TransCanada contractor came on site to yet again engage in reclamation work, approximately 75 tons of rock were hauled away.

Even after pressing TransCanada, construction debris remained on our property. After TransCanada's cleanup crew went through twice, we wound up having to clean the easement area ourselves. We found a lot of debris, and felt that the clean-up crew didn't do their job. We ultimately sent TransCanada a damage bill for the rock and debris they left. We wouldn't have been placed in that position had TransCanada lived up to its obligations.

Finally, Condition #41 sets forth TransCanada's obligation for reclamation and maintenance of the right-of-way, which shall continue throughout the life of the pipeline. As landowners, we have continually had to get after TransCanada to get out to our land and perform the reclamation work they were obligated to do. When TransCanada's reclamation work was not effective and was failing on our land, TransCanada actually then wanted us to take over the reclamation of our land.

We have been asked to sign off on TransCanada's attempts at reclamation of our land by land agents on at least two separate occasions. At this time, we have no intention to ever do that because TransCanada has not lived up to its obligations, nor do we trust them to fulfill the conditions imposed on them by the Commission.

I hereby affirm under penalty of perjury that the above testimony is true and correct.

Susan Sibson

SUE SIBSON

April 2, 2015
(date)

CERTIFICATE OF SERVICE

I hereby certify that on this 2nd day of April 2015, the foregoing document on behalf of Dakota Rural Action in Case Number HP 14-001, was filed on the Public Utilities Commission of the State of South Dakota e-filing website. Also on this day, a true and accurate copy of the foregoing was transmitted via email to the following:

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