RST Exhibit 3

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"Clear Knowledge in the Over Information Age"

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To: The Rosebud Sioux Tribe

Re: Accufacts Expert Observations on Certain Aspects in the Matter of the TransCanada Keystone XL Pipeline Before the Public Utilities Commission of the State of South Dakota ("PUC")

1. Introduction

Accufacts Inc. ("Accufacts") was asked to review TransCanada's ("TC") latest submission for a permit approval to the PUC, and comment on various aspects related to the proposed 36-inch Keystone XL Pipeline as to its possible effect on the Rosebud Sioux Tribe ("RST"), especially their water resources. Given the apparent failure to clearly answer Information Requests ("IRs") to provide certain key information about the pipeline on an elevation profile within South Dakota, and the compressed as well as accelerated timing of the permit process, my observations will focus on three specific areas of concern:

1. Risk Assessment Approaches
2. Oil Spill Response Plans, and
3. related Worst-Case Scenarios.

The proposed routing in South Dakota is in areas of steep elevation changes containing high risk geohazards associated with possible massive landslide. Accufacts concludes that the 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. Such a rupture release would not, in all likelihood, threaten the RST water sources identified to Accufacts, although effective cleanup/remediation of ruptures into the rivers would be most unlikely, despite extensive and expensive efforts in this challenging terrain, and could be devastating to the state. No pipeline can be designed or appropriately mitigated to withstand abnormal loading forces from massive landslide that usually result in rupture, not even new so-called "robust" pipelines. The high risk of landslide identified in the Final Supplemental Environmental Impact Statement ("FSEIS") should be verified in South Dakota; if confirmed, the pipeline should be rerouted to avoid areas with high risk of landslide or additional valving installed to reduce draindown volume in the event of a rupture in these high-risk locations.[1]

As discussed below, a rupture will likely release a very large volume of oil in these unique and steep locations that will not be effectively mitigated in this challenging environment. An oil spill plan should also include dealing with a possible release in the critical Ogallala Aquifer; this type of release will also require a large remediation effort, but it will be very different from the effort required for a rupture. The Keystone XL oil spill plans should be independently reviewed and made public to assure their effectiveness when needed, given the many demonstrated past failures of such plans to be truly effective, the unusually high potential volume of oil that may be released in this terrain, and the remarkably low amount of released oil that will actually be recovered in the event of a spill.

2. Keystone XL Submitted Risk Assessments

The Pipeline Elevation Profile is Key to a PUC Keystone XL Evaluation

Elevation profiles, such as the attached Figure 1, are the soul of a liquid pipeline design, siting, operation, and risk management evaluation, and are basic to any liquid pipeline project consideration. To suggest that development of a pipeline elevation profile including related and required operational information (such as MOP and hydraulic profile that should be included on this important exhibit) is onerous as indicated by TC representatives, is disingenuous. Critical additional information should be placed on Figure 1 to convey simple but important concepts, such as prudent routing regarding this pipeline. It is worth noting that additional information requested in previous IRs related to the elevation profile (particularly RST IR 1 (Round 2)) has not been provided by TC to date. This information, which would permit a truly informed evaluation of the project route proposal in South Dakota, will be further discussed below.

Figure 1 is a "South Dakota Elevation Profile with Valves" finally produced by TC (after much effort by the RST attorney) with some additional information added by Accufacts. Accufacts has added:

1. river names that will be crossed by Horizontal Directional Drilling, or HDD,
2. pump station, or PS, numbers, and
3. general areas identified in the Keystone XL FSEIS as LSHR High Risk usually indicative of landslide sensitive areas.[2]

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[1] Keystone XL Project Final Supplemental Environmental Impact Statement, "Table 3.1-6, Location within LSHR High- Risk Category along the Proposed Project Corridor," p. 3.1-31.

In addition, Accufacts has added to Figure 1 the approximate Keystone milepost locations for: 1) two sensitive water source pipeline crossings, 2) the proposed pipeline segments that cross the Ogallala Aquifer including the approximate RST well locations in the aquifer in relation to the pipeline milepost, and 3) the Cheyenne River pipeline crossing. All of these have been identified as important water supply sources to the RST.

The nature of a pipeline release falls into two major categories: 1) leaks - lower rate releases through fixed pipe wall penetrations such as crack or pit hole corrosion, which can be intermittent, and 2) ruptures – high rate releases through large openings associated with pipe fracture mechanics associated with larger anomalies that can fail, or girth weld failure/separation from massive land movement that generates severe abnormal loading, such as a sudden "breakaway" landslide.

Accufacts concludes that the risk of the Keystone XL proposal to the two RST water supply pipeline crossings (see Figure 1) is not a substantial risk as pipeline operation can easily prevent interaction that could interfere with either the oil or water pipelines. It is my understanding that much of the state gets its water from the Missouri River so the impact on the state's overall water supply should the pipeline rupture and threaten this resource needs to be properly evaluated. An overall state water impact supply study was not done by Accufact's as our work scope was limited to water sources directly supplying RST. Likewise, the threat of oil spill contamination to the Cheyenne River, while a major source of water supply to RST, will not likely reach this RST water supply located more than 100 miles downstream of the oil pipeline's crossing that also has a dam before the water intakes. Accufacts by no means is trying to downplay the consequences of a Keystone XL Pipeline oil spill rupture in the Cheyenne River to the local economy. Of the RST water supplies reviewed, I see the greater potential threat to RST water concerns related to a possible pipeline leak release in the segment spanning the Ogallala Aquifer. Even a slow rate leak release, while very difficult to identify in a timely manner, would most likely, however, not endanger the RST aquifer water wells located some four miles distance from the pipeline. Release into the non-karst Ogallala Aquifer could be remediated as the spread of contamination would be restricted significantly when the released warmed oil thickens as it cools, slowing underground transport velocities. Thus Accufacts concludes, while the questions and concerns by the RST on water sources are understandable, the water sources are not really threatened by the pipeline's proposal.

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[2] Figure 1 still has important information missing that was requested of TransCanada in IRs to allow a more thorough analysis by Accufacts.

Keystone XL Submitted Risk Assessments

It is often a misconception that historical databases such as those currently utilized by the Pipeline and Hazardous Material Safety Administration ("PHMSA"), the federal agency charged with the jurisdiction of pipeline safety, actually capture risks associated with pipeline operation, especially a specific pipeline. While improvements have been made in the past decade in reporting pipeline incident data to this federal pipeline safety organization, these databases are far from complete, and there is no real penalty for introducing incomplete, misleading, or false data into the reporting databases (PHMSA is not even allowed to correct such misinformation). The fact of the matter is that government pipeline "accident" databases are not auditable by an independent party to assure completeness or accuracy. Thus, historical databases must be applied with a major degree of caution when trying to determine possible threat risks to a specific pipeline. It is also important that for a specific pipeline that is especially "different," that risk threat analysis focus on those threats that may be specific to the particular pipeline, its operation, and its location, which can be highly unique. Such is the case as demonstrated in Figure 1 where steep terrain located in areas of "High Risk" to landslides are present. In such situations historical "incident" databases are fairly irrelevant, even misleading, resulting in poor risk management practices that miss very real risks that can lead to rupture.

A "looking backward" risk assessment approach is especially incomplete given my many investigations in which the number of incidents and volume of oil spilled release estimates based on industry spill reports were historically inaccurate. Industry oil spill release reported volumes tend to understate the actual oil released, especially in rupture release events. This has been demonstrated in numerous pipeline releases where reported oil releases volumes were woefully understated and Oil Spill Response seriously delayed, ill equipped, inadequate, and ineffective resulting in very little released oil actually being recovered.[3] The critical issue is whether the proposed pipeline, for its flow rate and in its location, would be capable of releasing oil volumes that have nothing to do with unrelated past pipeline releases. The elevation profile and additional information that should be included on such a document, and as requested in submitted IRs, is the primary method utilized to ascertain possible risks and oil spill release volumes, especially as they relate to worst-case release estimates. Elevation profiles are also pivotal in decisions related to placing and establishing key pipeline equipment (such as valving), their operation and effectiveness evaluation (i.e., remote monitoring, actuation vs. manual), and other important pipeline considerations key to pipeline siting, design, safety, decisions as well as Oil Spill Response development.

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[3] For example, the Enbridge Marshall, MI, the Exxon Mobil Yellowstone River and Pegasus Pipeline, and the Poplar Pipeline Yellowstone River recent pipeline ruptures.

To perform a true risk assessment on a specific pipeline, the elevation profile (graph of pipeline elevation versus milepost) must:

1. include the milepost location of pump stations and mainline valves along the pipeline (including general valve type (e.g., check valve), and whether remotely or manually operated,
2. indicate the maximum operating pressure, or MOP, along the pipeline as its can vary, depending on design,
3. include the hydraulic profile (operating pressure vs milepost) for the stated maximum flow rate case,[4]
4. clearly identify areas of possible massive land movement or possible abnormal loading along the pipeline as such movement can result in pipeline rupture,
5. identify HCAs, such as sensitive water sources, and other areas along the pipeline that might be affected in the event of an oil release.

The above information incorporated in one document (depending on the segments being reviewed) along with certain other key pipeline information allows for easy and quick risk assessment screening on a specific pipeline.

Despite repeated IR requests for the above information, TC did not provide the information that would permit such a professional and prudent analysis. Some information, see Figure 1 (without the HCA designations), was finally produced by TransCanada and supplied to Accufacts on April 13, 2015 labeled as "South Dakota Elevation Profile with Valves." This elevation profile was supplemented with information from the FSEIS, as well as water resource information from representatives of the RST. And the supplemented elevation profile allowed Accufacts to perform a preliminary risk analysis based on certain key assumptions, such as to rate and reported geohazard analysis.[5] It has been stated that the capacity of Keystone XL will be 830,000 B/D, or barrels per day, which Accufacts has interpreted as barrels per calendar day (an annual rate) of heavy crude (e.g., dilbit).[6] Hydraulic profiles should be produced on the higher 24-hour B/SD, or barrels per stream day, rate of 922,000 B/SD.[7] There is no way at this time given the limited information provided,

[4] For example, some pipelines inject drag reducing agents, or DRA to increase the flow rate on a pipeline. Such a DRA case thus sets the maximum flow rate hydraulic profile that should be shown on the elevation profile.
[5] Keystone XL Project Final Supplemental Environmental Impact Statement, "Table 3.1-6, Location within LSHR High- Risk Category along the Proposed Project Corridor," p. 3.1-31.
[6] Energy Systems Battelle Memorial Institute, "Keystone XL Pipeline Independent Engineering Assessment Final Report," December 31, 2013, p. 66.
[7] I have assumed a 90% efficiency to convert B/CD to B/SD. This efficiency factor has been utilized in other dilbit pipeline applications such as those related to recent Presidential Permits.

to determine the impact that injection of drag reducing agent, or DRA, might have on increasing the stream day throughput to an even higher rate. Spill estimated volumes as discussed later will thus utilize a 922,000 B/SD rate.

Certain general conclusions, however, can be derived from the elevation profile information provided by TransCanada supplemented with additional information, as shown in Figure 1. Assuming that the pump stations have bypass arrangements with check valves and remotely operated valving, the pump stations are situated approximately every 50 miles, and mainline valving appears to have been placed to meet Special Condition PHMSA Recommendation No. 32, placing mainline valves at less than (though not much less than) 20 miles to isolate segments of the pipeline. While there is no exact science to valve placement on a pipeline, the elevation profile plays a major role in such valving decisions. When LSHR High Risk areas associated with possible landslide are incorporated as shown in Figure 1, and worst-case rupture scenarios calculated, it becomes clear that the proposed TC valving is seriously inadequate for a high throughput large diameter pipeline in a location of considerable elevation changes.

3. Oil Spill Response Plans

A review of Figure 1 will reveal that the most likely event that could cause rupture in South Dakota appears to be a landslide associated with natural hazards. Landslides are most likely to cause pipeline rupture as pipe cannot withstand the massive forces associated with such sudden breakaway events. The steepness of the terrain also indicates that a rupture release will result in considerable surface migration, either over the ground surface or via river transport should a rupture release reach a river that crosses the pipeline. The potential to rapidly spread in this environment raises a serious question as to whether the 12-hour or even the 6-hour Tier 1 time limit in federal regulations will be appropriate. Landslides are most likely to be associated with high water/rain events (e.g., flash floods) where rivers and streams will be at higher flow. As recent ruptures have indicated in the Yellowstone River, Oil Spill Response can be highly ineffective at containing or recovering spilled oil, which can rapidly spread tens of miles downstream in major riverways. As outlined in the next section, proposed TC valving as suggested from Special Condition Recommended by PHMSA No. 32 is inadequate in certain down sloping segments of this proposed large diameter pipeline located in high-risk landslide hazard areas. Dismissing landslide threats by suggesting they can be mitigated during construction are unrealistic as gravity is never turned off.

In Oil Spill Response plans, it is often problematic that low probability release events such as rupture are unwisely accepted as "no probability" events, resulting in poor planning and staging of equipment, which in turn undermines the effectiveness of such plans when they are actually needed. This illusion of "no probability" is further compounded by the deception that integrity management programs result in invincible pipe steel. In the cases of too many recent pipeline ruptures, the author has observed management teams whose plans failed to incorporate some degree of challenge or reality check to assure spill risk was really low. Consequently, these plans left companies highly unprepared for a release and especially a rupture. Missing or downplaying landslide risk associated with this poor routing proposal is a classic example of what I call "Space Shuttle Syndrome." By this I mean the erroneous belief that low risk is no risk, when a more frank analysis should easily demonstrate there are linkages that will drive the system to release, especially in environments where Oil Spill Response will not be effective (see Figure 1).

Within the Tripp County pipeline segment spanning the Ogallala Aquifer, Figure 1 clearly indicates that landslide is not a risk of concern for this sensitive RST water supply (see point 2 on Figure 1 for the closest milepost to RST water wells). I conclude that leaks are probably the most likely risk of concern to the water wells located approximately 4 miles from the proposed pipeline. In the event of a pipeline rupture the massive volume of release would show up on the surface of the ground. In the case of leaks, however, such a release cannot be assured to reach the surface to be discovered, but could migrate underground, possibly delaying discovery, especially as internal computer monitoring of this pipeline would make leak detection unreliable for such slower rate releases. It is my conclusion that on this sensitive segment, undiscovered leaks are the most insidious threats. The pipeline will be operating with primarily heavy crude oils (i.e., dilbit) with pipeline operating temperatures greater than 120 °F. Given the unique sensitivity of dilbit viscosity to temperature, it is my opinion that a leak release of dilbit in this area will cool quickly substantially increasing its viscosity and slowing underground migration until it eventually rises to the surface, where it would eventually be discovered well before it might possibly migrate to critical RST water wells. Oil Spill Response and remediation for this segment should focus on surrounding the release site with "reverse flow" injection and soil capture and remediation methods to limit its spread and involves removing underground soil contaminated from spill plumes that may be developed. Such a remediation effort would be very expensive and could take considerable time, but it is not a new science.

4. Worst-Case Release Scenarios

The Keystone XL Pipeline Project, to their credit, has agreed to design and operate their pipeline liquid full, which is called nonslack line, or no column separation. Liquid full design can improve the reliability of the internal remote computer monitoring pipeline systems to more rapidly identify pipeline rupture. Reliability can be improved only if proper transient dynamics have been incorporated into a rupture detection alarming system, and procedures are in place that require shutdown and isolation of pipeline segments along the system where a rupture may be suspected.[8]

While nonslack line operations are more likely to reduce time to remotely identify a rupture, the elevation profile (see Figure 1) indicates that a combination of factors such as the large pipeline diameter and static drainage will still release substantial volumes of oil in the event of rupture given the current valving proposal, which complies with Special Condition No. 32 for this project, but is still inadequate for this unique terrain. For a flow rate of 922,000 B/SD, identification and shutoff of mainline valves during a rupture within 15 minutes (a fairly aggressive and even optimistic response time given my extensive investigation experience) would produce a worst-case release of slightly over 60,000 barrels of oil subject to a wide variation given the highly transient calculation nature of rupture dynamics in this challenging steep terrain. Control Room pump shutdown response time is not the most leveraging to this value (i.e. not the most important variable affecting the worst-case discharge), but valve closure time is critical. An increase in Control Room pump shutdown response by 15 minutes (not unusual during Control Room emergencies) account for approximately 8,000 incremental barrels from pumping (as a sensitive case).

The drainage, or static draindown volume, at certain locations within South Dakota is the major contributing factor to this Worst-Case Scenario given the large diameter pipeline and the unique and steep elevation profile within landslide areas (which can result in full bore ruptures) in the state for this poor proposed pipeline route (See Figure 1). Additional valves could be added at certain downhill locations. However, gravity can move a lot of oil out of a steep downhill gradient pipeline very quickly. I would therefore advise that rerouting the pipeline out of landslide areas that can cause rupture is the prudent choice that avoids the significant threat to the pipeline at these locations. Given the wide variation in transient calculations associated with full bore rupture dynamics on a large diameter, high-pressure pipeline in steep downhill elevation terrains, the PUC should require TC to produce an estimated oil spill outflow versus pipeline milepost graph for the pipeline reflecting full bore rupture within South Dakota. Additional similar sensitivity graphs reflecting additional 15-minute valve closure intervals should also be produced. Accufacts believes this information will demonstrate the large amount of oil that can be released in this unique terrain for the proposed route.

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[8] As demonstrated by many recent pipeline rupture releases, not all pipelines are designed to permit control room operator emergency procedures that require that the pipeline be shut down and isolation valves quickly closed, isolating suspected release segments for various reasons.

5. Conclusions

First, TransCanada should be compelled to provide clear specific information requested in previous IRs (particularly RST IR 1 (Round 2)) concerning additional information that should be incorporated into Figure 1. 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.

Second, further information is warranted to clarify how much of this terrain identified as High Landslide Hazard Area is really at risk to such massive abnormal loading forces. 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.

Third, as described above, the PUC should require TC to produce an estimated oil spill outflow versus pipeline milepost graph for the pipeline reflecting full bore rupture within South Dakota, as well as additional similar sensitivity graphs reflecting additional 15-minute valve closure intervals.

Finally, 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. If a new permit application is needed, TC should consider mitigating the landslide risks by rerouting the Project.

The 59 Special Conditions Recommended by PHMSA underscore why pipeline operators do not want to only comply with minimum federal pipeline safety regulations. Of the 59 Conditions, some are more critical/leveraging toward preventing pipeline failure. None, however, can compensate for poor pipeline route selection through areas at risk from breakaway landslides. As mentioned above, a clear review of Figure 1 will show at-risk landslide segments that cannot be properly dealt with by meeting the Special Conditions (e.g., No. 32). These Special Conditions might be satisfactory for many pipelines, but not this pipeline on this proposed routing, given the very unique risks in South Dakota as discussed above. Rerouting out of such sensitive and risky areas is the only viable solution to preventing pipeline rupture.

While priority is usually not focused on Oil Spill Response planning in great detail for a pipeline that has not been authorized, such plans should eventually incorporate the considerable amount of oil that would be released in this unique and challenging terrain. This is a route where even staged spill response equipment may not be applied fast enough to prevent serious oil release and contamination in an environment where tourism driven by pristine environment is very important. Lastly, special detail is warranted that quantifies how leak releases in the sensitive Ogallala Aquifer would be remediated to assure that an effective and appropriate Oil Spill Response Plan has been developed in advance rather than trying to develop such a scheme when it becomes needed.

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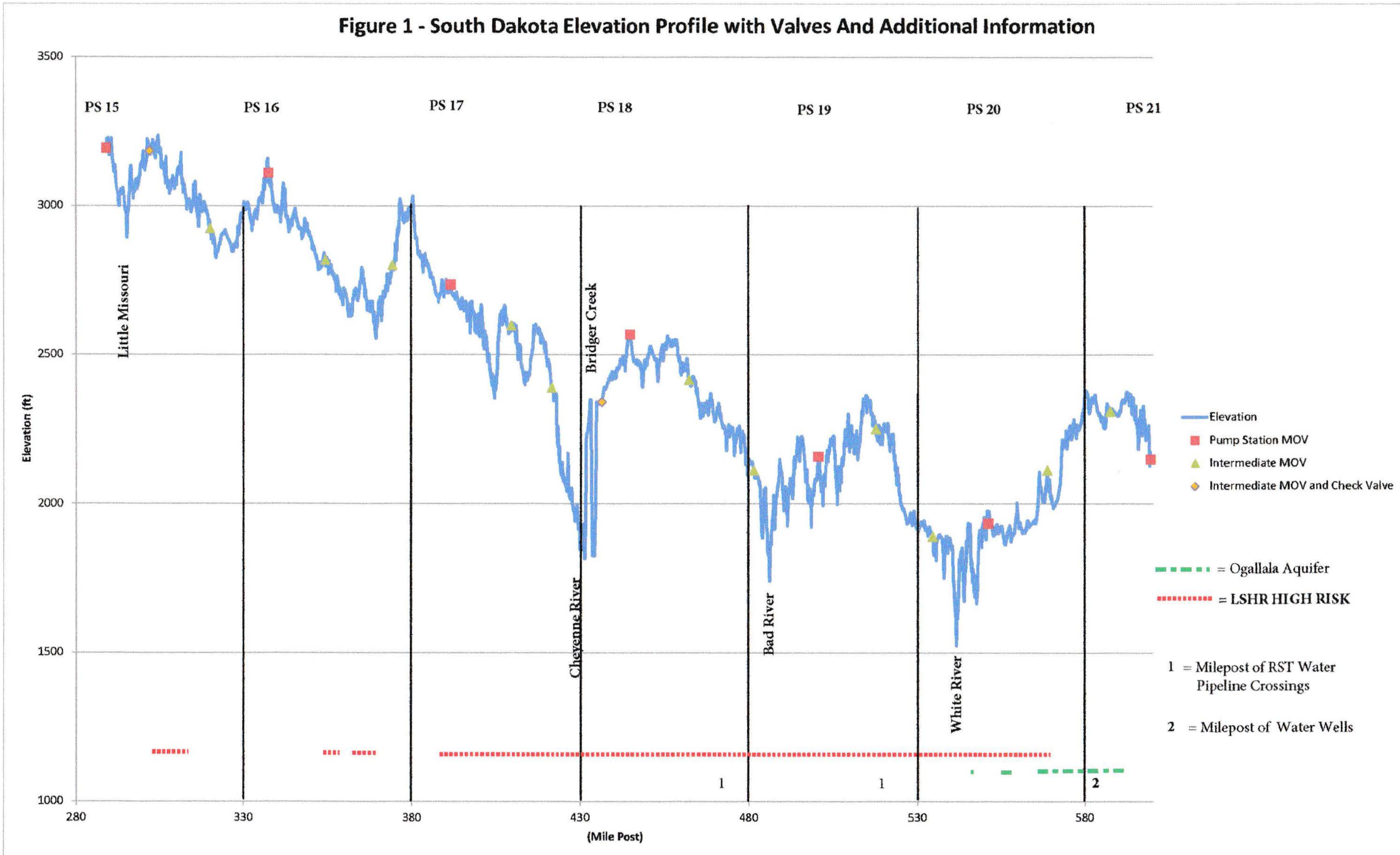

Figure 1 - South Dakota Elevation Profile with Valves And Additional Information
3500
3000
2500
2000
1500
1000
Elevation (ft)
280
330
380
430
480
530
580
(Mile Post)
PS 15
PS 16
PS 17
PS 18
PS 19
PS 20
PS 21
Little Missouri
Bridger Creek
Cheyenne River
Bad River
White River
1
1
2
Elevation
Pump Station MOV
Intermediate MOV
Intermediate MOV and Check Valve
= Ogallala Aquifer
= LSHR HIGH RISK
1 = Milepost of RST Water Pipeline Crossings
2 = Milepost of Water Wells