

**Sandpiper Pipeline Project  
North Dakota Pipeline Company LLC  
Docket No.PU-13-848  
Late Filed Exhibits**



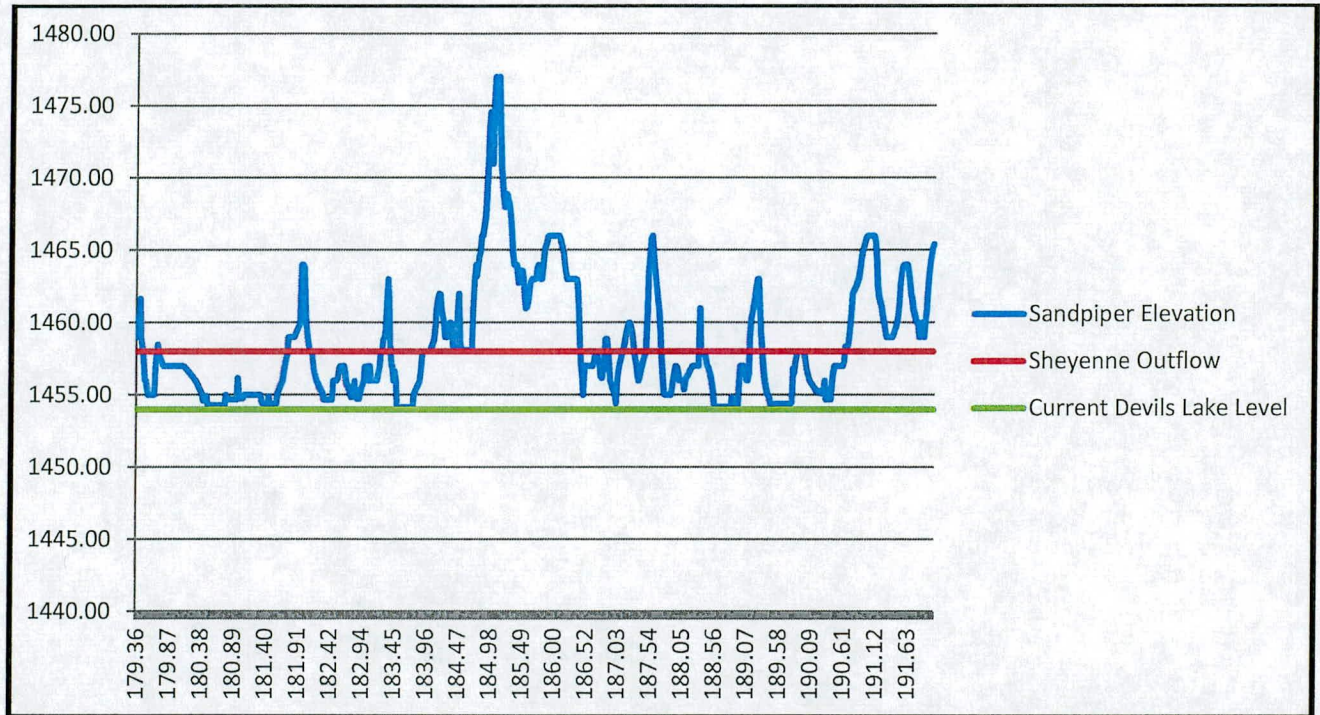
**Exhibit No. 5**

**Devil's Lake Water Level Study**

## Exhibit No. 5



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The Devils Lake basin has been greatly expanding in the last 19 years rising 28.88 feet from 1993 to 2010 and continuing to climb. To combat the ever rising water the State of North Dakota constructed an outlet in 2005 to the Sheyenne River capable of initially pumping 100 cubic feet of water per second from Devils Lake to the River, and later in 2010 upgraded to 250 cubic feet second. As depicted in the chart above, the Sheyenne overflow is at an elevation of 1458.00' above sea level and though some of the proposed Sandpiper pipeline falls below that elevation, much of it remains above.

North Dakota Pipeline Company ("NDPL") has taken lake levels into consideration throughout the design process. During the routing phase of design, routes were eliminated that directly impacted the lake such as co-location with Enbridge's existing Line 81, which parallels the BNSF railroad within its existing railroad right-of-way through the cities of Churchs Ferry and Grand Harbor. While both Line 81 and the BNSF railroad were installed when Devils Lake was at a lower water level, the recent rise in lake level has resulted in Line 81 being located under open water a significant portion of the area, directly impacting the lake and passing through the Snyder Lake National Wildlife Refuge. Routes through these cities are also not practical due to the encroachment and congestion of businesses and homes near the existing Line 81.

As such, NDPL began exploring other pipeline route options other than co-location with Line 81. An effort was made to co-locate with other utilities in and around the city of Devils Lake. However, these routes are no longer constructible because of the rising water level, with unavoidable direct impacts to



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the lake. In addition, many of these routes pass through or are in close proximity to environmentally sensitive areas including National Wildlife Refuges and Waterfowl Production Areas.

The proposed route chosen by NDPL for its Sandpiper Pipeline Project is near the northern end of the Devils Lake Basin. Efforts were made to place the proposed pipeline at elevations above the outlet elevation of the lake to mitigate possible flooding of valve sites and deep submergence of the Sandpiper pipeline. In going north, the proposed Sandpiper route avoids population centers, large lakes such as Lake Irvine and Lake Alice, and the Lake Alice National Wildlife Refuge.

NDPL also evaluated a northerly route ("Northerly Route"), which is located approximately 15 miles to the north of the proposed Sandpiper route. This Northerly Route was primarily co-located with an existing railroad grade with exception of the western-most segment, which was co-located with a major highway. This initial portion of the Northerly Route crossed over mostly agricultural land with little impact on residences or businesses. Shortly after turning east and joining up with the existing railroad easement, the Northerly Route encounters the first of many small communities. Similar to being co-located with existing Line 81 and the BNSF railroad, this would also require route deviations from the railroad easement around these communities to avoid impacting homes or businesses. NDPL also looked at placing the line within the railroad easement, since certain segments of the railroad tracks were abandoned and the rails removed. However, since the railroad easement still contains active railroad tracks along the Northerly Route, it was determined that the abandoned railroad segments may not be surrendered by railroad for the purpose of installing a new pipeline. Several waterfowl production areas along this Northerly Route would also be disturbed during construction in multiple counties. The Northerly Route would also add approximately 35 miles of pipe and would impact more landowners and sensitive wetlands. Additionally, the Northerly Route would impact approximately 245% more wetlands than the proposed Sandpiper route, according to the National Wetland Inventory,

As mentioned above, the proposed Sandpiper route would traverse some locations that have an elevation less than that of the outflow to the Sheyenne River. Considerations for this were made during the engineering phase of the design of the Sandpiper project by calculating the effects of the pipe in saturated soils. As Sandpiper is a liquids line, the weight of the crude oil itself in the pipeline will induce negative buoyancy and resist uplift due to groundwater or saturated soils. However, additional protection was designed to provide both a supplemental factor of safety during operation but also to help control buoyancy as the empty pipeline is installed prior to overlying soil compaction.

The first method of buoyancy control is through the use of set-on saddle bags filled with aggregate or gravel. Much like it sounds, the bags are placed over the pipe and hang down the side connected in the middle by heavy duty straps that cross over the top keeping the bags from sliding off, creating a saddle-type look when installed. The bags are sized and spaced to achieve slightly negative buoyancy on an



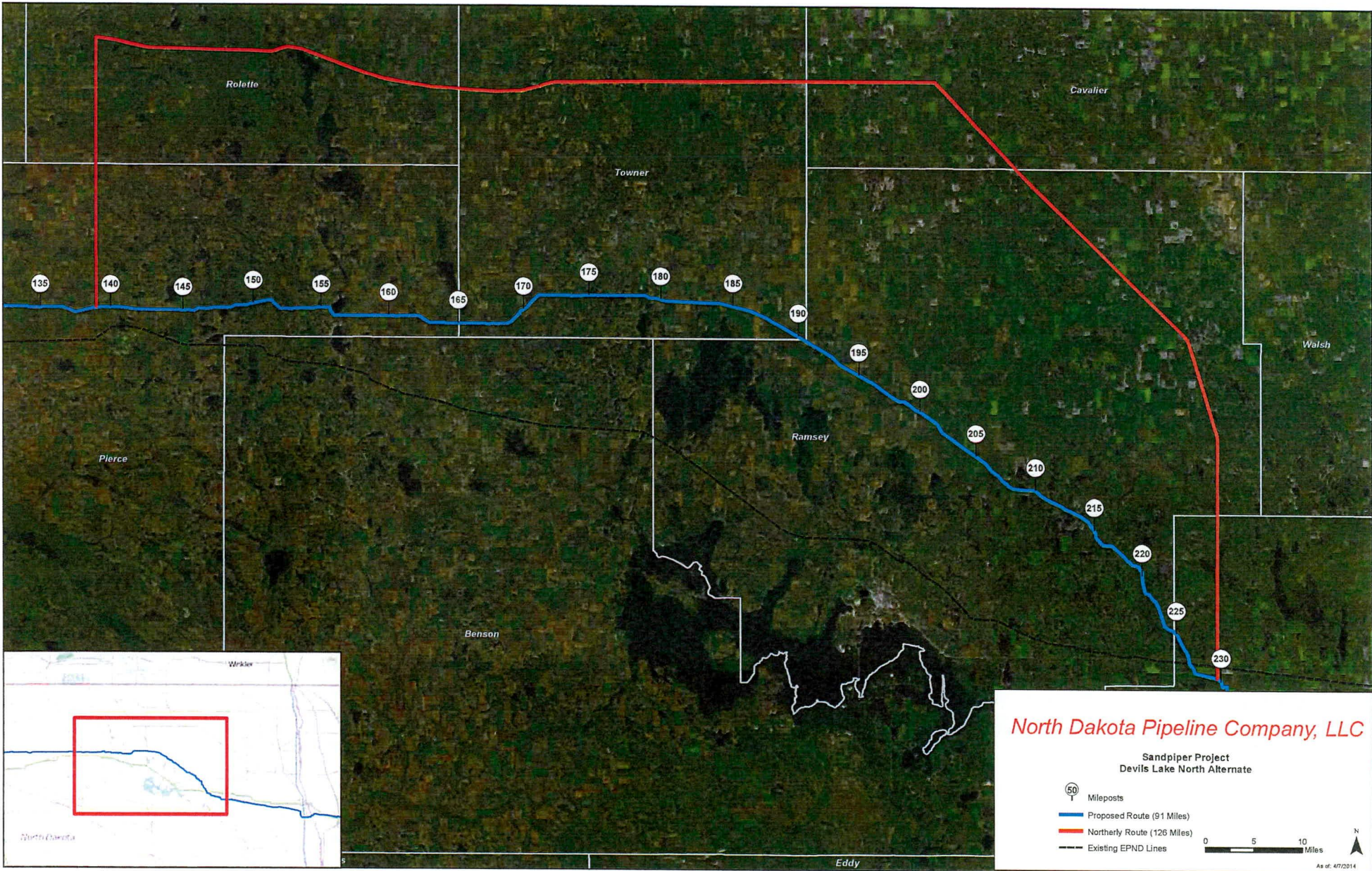
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empty pipeline. This method will be primarily used in areas where ground water infiltration in the installation trench can be managed through localized dewatering during installation of the pipeline.

The second method of buoyancy control chosen was coating the pipeline with concrete prior to installation. A layer of concrete thick enough to have a slightly negative impact on buoyancy will be applied to the pipe in a controlled, yard setting. Once the concrete has been allowed to cure, the pipe will be transported to the ROW and installed. This method of buoyancy control will be primarily used in situations where the pipe is installed conventionally below a flowing water body or in locations where it is difficult or cost prohibitive to dewater the installation trench.

It is with all the above facts that NDPL has landed on the proposed route for the Sandpiper project. NDPL also believes that due diligence has been served to provide a safe mode of transportation through the area of Devils Lake to carry the Bakken crude to market.

Information on Devils Lake Basin taken from  
<http://www.dlbasin.com/documents/DLFactSheetMay2010.pdf>



Rolette

Cavalier

Towner

Walsh

Ramsey

Pierce

Benson

Eddy

Winkler

North Dakota

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