BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

IN THE MATTER OF THE APPLICATION OF DAKOTA ACCESS, LLC FOR AN ENERGY FACILITY PERMIT TO CONSTRUCT THE DAKOTA ACCESS PIPELINE

DOCKET NO. HP14-002

Direct Testimony of Derric L. Iles
On Behalf of the Staff of the South Dakota Public Utilities Commission
July 6, 2015

Q: Please state your name and business address.

A: Name: Derric Iles
Business address: Geological Survey Program, DENR
Akeley-Lawrence Science Center
414 East Clark Street
Vermillion, SD 57069-2390

Q: Describe your educational background.

A: 1977: Master of Science degree in Geology, Iowa State University
1975: Bachelor of Arts degree in Geology, University of Northern Iowa

Q: By whom are you now employed?

A: Geological Survey Program, South Dakota Department of Environment and Natural Resources

Q: What work experience have you had that is relevant to your involvement on this project?

A: I have been the State Geologist and Administrator of the Geological Survey Program, South Dakota Department of Environment and Natural Resources, since January 1998. In that capacity, I am responsible for planning, organizing, and directing activities conducted by the Geological Survey Program staff designed to locate, describe, map, and evaluate the natural resources of South Dakota.

Prior to that, beginning in 1977, I was a geologist/hydrologist with the Geological Survey Program and am the geologist of record on more than 800 test holes/wells in eastern South Dakota. During my time with the Geological Survey Program prior to January 1998, I performed the following functions.

- Designed and directed hydrogeologic investigations focused on water quantity, water quality, and the vulnerability of certain aquifers to surface sources of contamination.
- Planned and directed research on the movement of ground water through low permeability glacial till. Utilized test drilling, well installation, laboratory and field testing of sediment permeability, general water chemistry, stable isotopes, lithologic description, water levels, and hydraulic gradients to characterize hydrogeologic conditions.
- Directed drilling, well installation, and water sampling activities.
- Produced maps and written scientific reports.
- Reviewed and evaluated consultants' reports on hydrogeologic characterizations of future landfill sites. Assisted consultants in preparing work plans to gather hydrogeologic information necessary for the permitting

process related to solid waste disposal facilities in low-permeability geologic settings.

- Designed and implemented a statewide ground water quality monitoring network for South Dakota that is focused on long-term monitoring of the ambient quality of water in 25 of the state's surface aquifers.
- Provided expert witness testimony regarding the hydrology and geology of potential landfill sites on behalf of the South Dakota Department of Environment and Natural Resources.
- Compiled and evaluated existing hydrologic and geologic information in preparation for the planning of drilling and well installation projects.
- Planned field investigations based on existing information. Investigations were conducted in (1) highly variable glacial sediments (including buried and surficial glacial outwash aquifers), (2) Cretaceous age geologic units of Niobrara Formation, Carlile Shale, Greenhorn Formation, Graneros Shale, Dakota Formation, and Split Rock Creek Formation, and (3) Precambrian age Sioux Quartzite.
- Directed drilling and well installation for ground-water resource investigations wherein the extent, thickness, and water quality of various aquifers were studied. Investigations were performed to locate new or supplemental sources of drinking water for cities and rural water systems. Drilling and well depths ranged from very shallow to greater than 800 feet. The primary drilling method employed was the forward mud rotary method. Auger drilling (solid stem and hollow stem) was also used but to a much lesser extent.
- Planned and directed drilling and well installation activities to characterize the hydrogeology at potential or existing landfill sites.
- Planned and directed the investigation of sites contaminated with petroleum products (gasoline, diesel, fuel oil). Directed test drilling, well installation, and performed sampling of water and contaminants.
- Spent extensive time in the field with drilling projects as the well-site geologist and project director; logged and interpreted drill cuttings.
- Performed and interpreted results of geophysical logging of test holes (single-point resistivity, spontaneous potential, and natural gamma) to define subsurface geology.
- Used isotopic analysis of ground water to interpret paleo-hydrogeologic environment and age of the ground water.
- Interpreted surface and subsurface geology and hydrology in order to construct aquifer maps. The process included reconstruction of geologic history and an evaluation of all available hydrologic parameters.
- Developed wells, commonly using compressed air, and sampled wells for water quality analysis using a variety of methods (air lift, bailer, centrifugal pump, bladder pump).
- Collected water levels and used them to construct water table maps and potentiometric surface maps.
- Prepared maps, cross sections, and written reports for projects lasting a few months to several years.

- Made presentations of project results to city councils, rural water system boards of directors, consultants, other government officials, and the general public.

Additionally, I have experience as a Senior Hydrologist/Project Manager from November 1984-January 1986 with Twin City Testing Corporation, St. Paul, Minnesota, during which time I performed the following functions.

- Designed and directed investigations of sites having petroleum contamination in the subsurface. Field methods employed were drilling of test holes, installation of monitoring wells, collection of sediment and ground-water samples, and collection of water-level data.
- Worked on project sites ranging geographically from West Virginia to California encompassing bedrock, alluvial, and glacial geologic settings.
- Hired and directed subcontractors for project sites remote from the Minneapolis, Minnesota, area.
- Evaluated aquifer test data to assist in the understanding of subsurface hydrologic conditions.
- Used geologic, hydrologic, and contaminant data to interpret subsurface conditions, and to predict future environmental impacts of contamination.
- Designed and implemented remedial action at project sites to mitigate environmental impacts and to protect human health and safety.
- Prepared maps, cross sections, and written reports.

Q: What Professional Credentials do you hold?

A: I am a Certified Professional Geologist (CPG) through the American Institute of Professional Geologists

Q: On whose behalf was this testimony prepared?

A: I prepared this testimony on behalf of the Staff of the South Dakota Public Utilities Commission.

Q: Have you reviewed the Application and its amendments?

A: I have reviewed the portion of the Application that is relevant to my area of expertise.

Q: What methodology did you employ?

A: I looked at the proposed route of the pipeline and compared it to the surface geology that would be crossed. I also looked at maps showing shallow glacially derived aquifers that may be present along the proposed path of the pipeline.

Q: When would your agency have jurisdiction over Dakota Access?

A: The Geological Survey Program, South Dakota Department of Environment and Natural Resources, does not have regulatory authority. The Geological Survey Program would most likely become involved at the request of regulatory Programs in the Department and would provide interpretation of geologic and hydrologic conditions as requested.

Q: Did you provide any recommendations to Dakota Access during route development?

A: No

Q: Does the proposed pipeline route cross any areas where shallow aquifers have been identified?

A: Yes, I will mention them beginning in Campbell County, which contains the northwest end of the proposed route in South Dakota, and progress southeastward to Lincoln County.

- In Campbell County, the pipeline route crosses areas where the Spring Creek aquifer and the Selby aquifer have been mapped. Experience gained since the report that named these aquifers was published in 1970 leads me to suspect that these two aquifers are very likely much smaller than indicated in the report. Nevertheless, there are data from drill holes near the pipeline route that show some shallow sand and gravel to be present.
- In southwestern Spink County, the pipeline route crosses an area where the Tulare aquifer has been mapped. Recent work by the Geological Survey Program corroborates the presence of this shallow sand and gravel aquifer.
- In western Lake County, the pipeline route crosses the East Fork Vermillion River. A sand and gravel aquifer named the Vermillion-East-Fork has been mapped to occur in the river valley but the presence of shallow sand and gravel within the mapped aquifer area is not ubiquitous as demonstrated by maps of surface geology and test-hole data.
- At the southeastern end of the proposed pipeline route in South Dakota, the valley of the Big Sioux River is crossed. A sand and gravel aquifer named the Big Sioux aquifer is mapped in the valley. Although there are no test holes which have been drilled at the exact location of the proposed pipeline crossing, a nearby test hole and the presence of a nearby gravel pit indicate that shallow sand and gravel is likely in the river valley.

Q: Does this conclude your testimony?

A: Yes