BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

IN THE MATTER OF THE APPLICATION OF NAVIGATOR HEARTLAND GREENWAY, LLC FOR A PERMIT UNDER THE SOUTH DAKOTA ENERGY CONVERSION AND TRANSMISSION FACILITIES ACT TO CONSTRUCT THE HEARTLAND GREENWAY PIPELINE IN SOUTH DAKOTA

DOCKET NO. HP22-002

Direct Testimony of Tim Cowman
On Behalf of the Staff of the South Dakota Public Utilities Commission
May 25, 2023

Q: Please state your name and business address.

A: Name: Tim Cowman
Business address: 414 E. Clark St, Akeley-Lawrence Science Center, Vermillion, SD

Q: Describe your educational background.

A: I received a Master of Natural Sciences degree from the University of South Dakota in 1998. I received a Bachelor of Science degree with majors in Earth Science (geology) and Chemistry in 1984 from the University of South Dakota.

Q: By whom are you now employed?

A: I am employed by the Geological Survey Program in the South Dakota Department of Agriculture and Natural Resources. We are also referred to as the South Dakota Geological Survey.

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

A: Supervising staff geologists and hydrologists conducting aquifer mapping and geologic mapping projects across the State;

Assisting cities and rural water systems in developing and maintaining public water supplies;

Conducting hydrogeologic studies on aquifers in eastern South Dakota;

Mapping ground water resources in the eastern portion of the State;

Water quality assessments of ground water and surface water in eastern South Dakota;

Project coordination and management for development of the Big Sioux River Flood Information System.

Q: What Professional Credentials do you hold?

A: I have been investigating and mapping ground water resources in South Dakota for 38 years. I have conducted ground water studies in various parts of eastern South Dakota to determine characteristics of ground water movement, aquifer recharge rates, contaminant transport in ground water, aquifer yield, and aquifer water quality. I am currently the State Geologist and Program Administrator for

the South Dakota Geological Survey. I plan and direct the activities of up to 25 employees to carry out studies and investigations to document, map, and assess the geologic and ground water resources of the State. I provide information to regulators, planners, and engineers at the federal, state, and local level to help them make informed decisions regarding the development and protection of the State's natural resources.

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 Section 6.2 of the Application for the Navigator Heartland Greenway Pipeline (Project)?

A: Yes.

Q: To the best of your knowledge, does Section 6.2 of the Application properly summarize the geologic formations to be crossed by the Project?

A: No. The geologic formations discussed in section 6.2 were derived from geologic maps by the South Dakota Geological Survey and U.S. Geological Survey that portray the bedrock geology. These maps are indicative of the geology at a substantial depth below the glacial sediments that are present at the surface. The geologic processes active in the vicinity of the pipeline route are determined by the surface geology. A surface geology map should have been used to assess the geology crossed by the pipeline route.

Q: Does the Project cross any geologic formations that may pose a risk to the pipeline? Please explain.

A: I am not aware of any geologic formations crossed by the pipeline route that would pose a risk to the pipeline stability. The pipeline route crosses stable glacial sediments and alluvial deposits. There is a small crossing of Sioux Quartzite which I would also consider to be geologically stable.

Q: Have you reviewed Section 6.4 of the Application for the Project?

A: Yes.

Q: To the best of your knowledge, does Section 6.4 of the Application properly summarize the hydrology in the Project area?

A: No. Section 6.4 states the pipeline route crosses the Big Sioux, Dakota, and Sioux Quartzite aquifers. It does cross the Big Sioux aquifer, and a short stretch

of the Sioux Quartzite, but the Dakota aquifer is deeply buried under several impermeable layers. There are a few other surficial aquifers that it crosses that were not mentioned. Although section 6.4 is about the hydrology of the pipeline route, it only addresses ground water hydrology and not surface water hydrology. The surface water resources crossed by the project need to be addressed.

Q: Should the Commission be concerned about any aquifers or shallow aquifers that the Project will cross? Please explain.

A: Yes. The Big Sioux aquifer is a potential concern because it is the source of drinking water for many people in the project area. However, if the pipeline is constructed and operated properly it will minimize the potential risks to the aquifer.

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

A: No.

Q: Does this conclude your testimony?

A: Yes

Tim Cowman

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Education

- Master of Natural Sciences: University of South Dakota, 1998
- Bachelor of Science (Earth Science/Geology and Chemistry): University of South Dakota, 1984

Professional Work Experience

- State Geologist & Program Administrator, SD Geological Survey, SD Department of Agriculture and Natural Resources: 2018 – present

  PRIMARY RESPONSIBILITIES: Direct and administer the activities of the SD Geological Survey to conduct investigations on the geology and ground water resources of the state. Provide information to help make informed decisions regarding the development and protection of the state's natural resources.

  Other responsibilities include:

  - Program project planning, budget planning, and daily operations
  - Supervising staff geologists and hydrologists conducting aquifer mapping and geologic mapping projects across the state
  - Supervising staff geologists and hydrologist conducting special investigations related to geologic and ground water resources in the Black Hills region
  - Managing Program staff to integrate environmental databases into GIS and produce online databases and online GIS maps containing geologic and hydrologic information
  - Assisting local area governments in developing and maintaining water supplies
  - Presenting and testifying to various boards, commissions, and legislative committees to obtain support and funding for Program and Department projects

- Assisting SD Attorney General's Office on Missouri River issues

- Project coordination and management for development of the Big Sioux River Flood Information System

- Natural Resources Administrator & Environmental Scientist Manager II, SD Geological Survey, SD Department of Environment and Natural Resources (DENR): 1998 - 2018

  Responsibilities included:

  - assisting the State Geologist in Program project planning, budget planning, and daily operations

  - supervising staff geologists and hydrologists conducting aquifer mapping and geologic mapping projects across the state

  - supervising staff hydrologist conducting special investigations related to geologic and ground water resources in the Black Hills region

  - managing Program staff to integrate environmental databases into GIS and produce online databases and online GIS maps containing geologic and hydrologic information

  - assisting local area governments in developing and maintaining water supplies

  - presenting and testifying to various boards, commissions, and legislative committees to obtain support and funding for Program and Department projects

  - assisting SD Attorney General's Office on Missouri River issues

  - project coordination and management for development of the Big Sioux River Flood Information System

  - South Dakota project lead for U.S. Environmental Protection Agency's Environmental Information Exchange Network

  - building digital base map coverage of the state

  - building and managing web-based distribution of environmental data for the Program and Department

  - geomorphology research on the Missouri River and tributaries

- Director, Missouri River Institute, University of South Dakota: 2007 – 2014

  Responsibilities included:

- initiating, coordinating, and managing research projects on the Missouri River and tributaries
- competitive grant writing to fund Institute research
- supervising and conducting research on the geology, morphology, and water quality of the Missouri River and tributaries
- developing undergraduate and graduate education in river studies
- enhancing education and awareness of the Missouri River as a natural resource through website building and public outreach

- Senior Hydrologist, SD Geological Survey, SD DENR: 1985 - 1998

  Responsibilities included:

  - supervising and conducting hydrogeologic studies
  - designing and conducting aquifer tests
  - mapping ground water resources
  - water quality sampling and evaluating chemical analyses of ground water and surface water

- Adjunct Instructor, University of South Dakota: 1988 - 2014

  Courses taught:

  - Science, Culture, and History of the Missouri River
  - Introduction to River Studies
  - Introduction to Geographic Information Systems
  - Digital Electronics and Microcomputers
  - Principles of Earth Science Lab

Certifications and Special Training

- Currently in process of obtaining Certified Professional Geologist certification from the American Institute of Professional Geologists
- 40-hour OSHA HAZWOPER training certificate
- ESRI ArcGIS short course

- EPA Sampling for Hazardous Materials short course
- State Emergency Operations Center training
- Ground Water Modeling short course
- Methods in Geophysics workshop

Special Appointments

- Board of Directors, Missouri Sedimentation Action Coalition, 2018 - present
- Board of Directors, Friends of the Missouri National Recreational River, 2015 - 2022
- Co-Chair, Hydrologic and Geologic Framework of the Central Missouri River Corridor session, Geological Society of America – Rocky Mt Section meeting, 2010
- Appointed Member, SD Bureau of Human Resources Engineer and Environmental Scientist Oversight Committee, 2009 – present
- Board of Directors, Spirit Mound Trust, 2008 – 2021
- Core Scientific Team Member, U.S. Army Corps of Engineers Cottonwood Management Plan, 2007 – 2012
- Planning Committee, Missouri River Natural Resources Conference, 2006 & 2008
- Board of Directors, Black Hills Digital Mapping Association, 2005 - 2008
- Chair, SD Department of Environment and Natural Resources Database Management Team, 2002 - 2007
- Technical Committee Member, SD Department of Transportation GIS Implementation Plan Study, 2002
- Chair, SD Department of Environment and Natural Resources GIS Advisory Group, 1997 – 2002
- Chair, SD Department of Environment and Natural Resources Database Task Force, 1994 – 1997

Special Recognitions and Awards

- Engineering Excellence Award: Big Sioux River Flood Information System, American Council of Engineering Companies, 2020

- Preparedness, Technology, and Innovation Award: Big Sioux River Flood Information System, South Dakota Emergency Management Association, 2019

- Outstanding Engineering Achievement Award: Big Sioux River Flood Information System, South Dakota Engineering Society, 2019

- Recognition of Efforts, Friends of the Missouri National Recreational River, 2017

- *First State in the Nation* to build a Toxic Release Inventory data flow on the EPA Environmental Information Exchange Network, U.S. Environmental Protection Agency, 2014

- Recognition of Achievements, U.S. Department of Interior, 2013

- Missouri National Recreational River Outstanding Partner Award, National Park Service, 2013

- Certificate of Appreciation, U.S. Environmental Protection Agency, 2011 & 2012

- Certificate of Appreciation, Black Hills Digital Mapping Association, 2008

- Recognition of Contributions, River Management Society and Missouri River Natural Resources Committee, 2006

- Special Achievement in GIS Award, ESRI International User Conference – San Diego, CA, 2002

- Environmental Achievement Award, U.S. Environmental Protection Agency, 1998

Select Publications *(as author or co-author)*

- *Geologic Map Geodatabase of the Valley Corridor of the 59-mile Reach of the Missouri National Recreational River, South Dakota, Nebraska, and Iowa: Gavins Point Dam to North Sioux City,* U.S. Geological Survey, 2022

- *Contributions of Suspended Load from Missouri River Tributaries, Southeast South Dakota and Northeast Nebraska: Building a Sediment Budget,* River Research and Applications, 2021

- *Sediment Sources of the Lewis and Clark Lake Delta, Missouri River,* Geological Society of America, 2018

- *Eolian and Fluvial Modifications of Missouri River Sandbars Deposited by the 2011 Flood,* Journal of Geomorphology, 2018

- *Effects of a Natural Flood Event on the Riparian Ecosystem of a Regulated Large-River System: The 2011 Flood on the Missouri River, Ecohydrology, 2015*

- *Historical and Future Sediment Accumulation in the Niobrara River Delta and Lewis and Clark Lake Headwaters,* Geological Society of America Abstracts with Programs Vol. 46, No. 4, 2014

- *Impacts of the 2011 Flood on the Missouri River Channel,* SD Association of Rural Water Systems periodical, 2012

- *Historic Changes (1941–2008) in Side Channel and Backwater Habitats on an Unchannelized Reach of the Missouri River*, River Research and Applications, 2011

- *Occurrence and Endocrine Effects of Agrichemicals in a Small Nebraska, USA, Watershed*, Environmental Toxicology and Chemistry, 2011

- *Temporal and Spatial Trends of Various Water Quality Parameters and Chlorophyll Concentrations within the 59-mile Reach of the Missouri National Recreational River***,** Missouri River Natural Resources Conference, 2011

- *Late Pleistocene Glaciation of Eastern South Dakota and Relations to the Geologic Framework of the Central Missouri River,* Geological Society of America, 2010

- *Differentiating Missouri and James River Sediments at their Confluence using Grain Size and Geochemical Methods*, Geological Society of America Annual Meeting, 2009

- *Nature and Timing of the Latest Wisconsin Advance of the James River Lobe, South Dakota: Relations to Geologic Mapping at its Southern Limit,* American Quaternary Association Biennial Meeting, 2008

- *New Geologic Mapping Along the Missouri National Recreational River*, Geological Society of America Abstracts with Programs, Vol 38, No. 7, p. 165, 2006

- *Geologic Map of South Dakota*, GIS in State Government, Vol 1, ESRI, 2005

- *Source Water Assessment and Protection in the Black Hills Region*, Proceedings of the 1999 Conference on the Hydrology of the Black Hills, South Dakota School of Mines and Technology Bulletin No. 20, 2000

- *GIS and Digital Mapping at the South Dakota Geological Survey*, Proceedings of a Workshop on Digital Mapping Techniques, U.S. Geological Survey Open-File Report 97-269, 1997