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 Matthew Frazell
On Behalf of the Staff of the South Dakota Public Utilities Commission
May 25th, 2023

Q: Please state your name and business address.

A: Matthew Frazell, 7700 Windrose Ave., Plano, Texas 75024

Q: Describe your educational background.

A: I have a Bachelor of Science in Civil Engineering

Q: By whom are you now employed?

A: I have been employed by Environmental Resources Management, Inc. since May of 2012.

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

A: I have had 9 years of full-time experience as a consultant, and 2 years as an intern, focusing on Regulatory Compliance, Process Safety Management including Quantitative Risk Assessment. Of the 9 years of full-time experience, I was seconded for 2 years at a company that operated carbon dioxide (CO2) pipelines. At this seconded position, I was responsible for reducing the risk of leaks from CO2 pipelines, which included modeling the effects of leaks and managing the execution of risk based internal inspections of both pipelines and facilities.

Q: What is the purpose of your testimony?

A: To provide an honest and unbiased expert opinion as to the quality of any modeling pertaining to risk assessment and/or consequence analysis for the Application for the Navigator Heartland Greenway Pipeline System. As part of my testimony, I reviewed all sections of the application and other supporting documentation.

Q: Are you familiar with pipeline risk assessments?

A: Yes. I have experience in Quantitative Risk Assessment, (QRA), Risk Based inspection techniques, and U.S. Pipeline and Hazardous Materials Safety Administration (PHMSA) risk assessment and mitigation strategies.

Q: Are you familiar with dense gas dispersion modeling?

A: Yes, my experience over the past 9 years includes far-field vapor dispersion modeling of multiple types of fluids including CO2, and specifically CO2 pipelines.

Q: Are you familiar with PHMSA's risk assessment/modeling requirements and PHMSA's guidance on pipeline risk modeling?

A: Yes, I am familiar with PHMSA Risk assessment and modeling methodologies. Some of these methodologies include PHMSA Part 192 and 195 risk assessment methodologies. I am also familiar with the PHMSA document titled Pipeline Risk Modeling Overview of Methods and Tools for Improved Implementation, 2020. This document discusses many different types of Pipeline risk assessment methods and tools including consequence analysis.

Q: Why do operators subject to PHMSA's regulations complete risk modeling?

A: Operators subject to PHMSA conduct risk modeling to ensure that their chosen pipeline design and location are such that the risks associated with the construction and operation of these pipelines are properly mitigated to prevent harm to the public, the operator's employees, and environment.

Q: Should risk modeling be used to inform pipeline siting decisions?

A: It is imperative to perform various types of risk modeling in order to mitigate risk associated with the operation of the pipeline installation in relation to the public, operator's employees, and the environment. By developing sound models, which denote where the pipeline has the potential to impact the health and safety of the public, employees, and the environment; the applicant would be able to adjust the route of the pipeline to minimize these risks.

Q: How can risk modeling be used to inform pipeline siting decisions?

A: Proper modeling will help pipeline operators identify where the pipeline has the potential to impact High Consequence and Highly sensitive areas. Risk modeling can and should be used to determine where potential risks to the public or environment are elevated due to the population density and proximity of the proposed location to environmentally sensitive areas.

Q: Did you review the risk and dispersion modeling completed by Navigator?

A: Yes, I reviewed two documents and a figure, which were initially provided with the application, pertaining to the Navigator Pipeline. I reviewed the document titled "Heartland Greenway System Plume Modeling and Buffer Overview", a document titled "Dispersion Modeling Techniques for Carbon Dioxide Pipelines in Australia", and a table file (Effects of CO2_Concentration over Time.png), which presents the health effects of varying CO2 concentrations over time.

Q: Please summarize the risk and dispersion modeling completed by Navigator?

A: Section 2.2 – Route Selection and Alternatives of the Application references buffer zones and setbacks that were determined using plume modeling techniques. However, no further details as to how the buffers and setbacks were determined

was included in the Application. Several other documents were included with the Application pertaining to CO2 dispersion. The document titled "Heartland Greenway System Plume Modeling and Buffer Overview" describes in summary the planned methodology and mitigation factors to be used in the development of the pipeline. The document focuses on three different methodologies or mitigation factors. Those methodologies are Risk Avoidance, Risk Management, and Event Response. All three methodologies and mitigation factors mainly speak at a high level to what they will do, but not to what has been done currently. In the Applicant's Responses to Staff's First Round of Data Requests, the South Dakota Public Utilities Commission (PUC) Staff asked the Applicant to provide a summary on the plume modeling completed and the results of such modeling that are referenced on page 11 of the Direct Testimony of Stephen Lee and in Section 2.2 of the Application. The applicant responded to the request stating "Objection. This request seeks information that is confidential and proprietary because it has commercial value and disclosure to any competitor would cause damage to Navigator. It also seeks information that may be outside the jurisdiction of the PUC based on federal preemption and to that extent is not relevant to the scope of this proceeding. Without waiving the objection, a table containing responsive information will be provided subject to entry of a protective order by the PUC." Based on the information currently provided, the Applicant has not been able to provide the details associated with the way in which they determined most of the setback distances and buffer zones. These details are needed to understand the accuracy of the buffer and setback distances from High Consequence and Highly Sensitive Areas. Also, the standards with which the completed modeling is based is unclear, especially with the inclusion of the document titled "Dispersion Modeling Techniques for Carbon Dioxide Pipelines in Australia" as this standard is not widely accepted in the United States as Regularly and Generally Accepted Good Engineering Practice (REGAGEP).

Q: Does the modeling completed by Navigator align with PHMSA's guidance?

A: The document titled "Heartland Greenway System Plume Modeling and Buffer Overview" does speak to specific PHMSA regulatory citations for a methodology to calculate buffer distances (PHMSA 49 CFR Part 192 and 195), and the outcomes of the calculations are shown in the document. The PHMSA Part 192 specific buffer distances seem reasonable based on the information provided in the table.

Q: Please summarize the findings of the risk and dispersion modeling completed by Navigator?

A: The document titled "Heartland Greenway System Plume Modeling and Buffer Overview" references the use of multiple air dispersion and plume modeling software packages in the Risk Avoidance category of the Methodology and Mitigation Factors – CO2 Dispersion and Plume Modeling: (High Level) section. This section goes on to state that (Risk = Probability x Consequence); however,

there is no calculated risk examined anywhere within the document. The document mentions the uses and purposes of the software packages of Area Location of Hazardous Atmosphere (ALOHA) and DNV PHAST; however, no analysis documentation of including the use of either software is presented. The document also makes mention of the fact that Stability Classes D, E, and F were used in modeling exercises, but the specific details of the analysis was not included.

Q: Does the risk and dispersion modeling completed by Navigator provide an adequate analysis of the potential risks and impacts of the proposed carbon dioxide pipeline? Please explain.

A: Based on the information currently available, it is my opinion that the Applicant has done a satisfactory job describing what they plan to do, but not what has been done currently. The documents provided speak at a very high level as to how PHMSA specific buffers were determined. The Applicant has yet to provide information pertaining to how the individual software packages were used in determining the setback and buffer distances, what are the locations of the potential High Consequence and Highly Sensitive Areas, and what is the calculated risk of operating the pipeline. More detailed information is required to make a determination as to the adequacy and accuracy of the risk associated with the proposed project. It should be noted that a pipeline incident involving the transport of CO2 had a mechanical failure causing a release from the pipeline, and a resulting plume that extended for over 1.5 miles. The resulting plume impacted the residents of a nearby town. No modeling has been provided that denotes the extent at which communities could be impacted.

Q: Based on your review of the risk and dispersion modeling completed by Navigator, is there adequate information in the record for the Commission to make findings in accordance with SDCL 49-41B-22? Please explain.

A: No, based on the information currently provided, the Applicant has not adequately provided enough information to prove that the proposed pipeline would not cause potential harm to the public, employees, or the environment. The Applicant has yet to provide information pertaining to how the individual software packages were used in determining the setback and buffer distances, what are the locations of the potential High Consequence and Highly Sensitive Areas, and what is the calculated risk of operating the pipeline. More detailed information is required to make a determination as to the adequacy and accuracy of the risk associated with the project.

Q: Based on your review of the Navigator's Application and interrogatories, do you agree with Navigator's conclusion that the project does not cross any high consequence areas (HCAs)? If not, please explain why you disagree.

A: No, according to the Applicant's Responses to the Staff's Fourth Set of Data Requests, the Applicant provided a document titled "Heartland Greenway System

South Dakota HCA Overview". This document overlays the pipeline route against known Land Use/Ownership and known HCAs. Though the map is quite large and is grainy when zooming in to examine the content, it can be determined that the pipeline route crosses several HCAs in Minnehaha, Moody, and Brookings Counties. The map only shows the pipeline centerline in relation to HCA location but does not include the buffers or setbacks used in determining the pipeline route. Further, it would be useful to include the buffers in the HCA map to determine if the potential exists for the pipeline to impact the HCAs in the event of a pipeline leak of rupture.

Q: Based on your review of the Application and any related interrogatories, do you believe the project will cross any unusually sensitive areas (USAs)? If so, please explain.

A: Yes, according to the Applicant's Responses to the Staff's first Set of Data Requests, the Applicant provided a document titled "Exhibit A7 Public Facilities Map Heartland Greenway Pipeline System". This document overlays the pipeline route against known Land Use/Ownership and known historic sites, public gathering locations, and other areas of concern. It can be determined that the pipeline route crosses near a wetlands, cemeteries, and other places of concern. It would be useful from a risk assessment perspective to add the buffers shown in the document titled "Heartland Greenway System Plume Modeling and Buffer Overview" to the above-mentioned map to better understand how far an impact the pipeline could have on the surrounding area in the event of a failure or leak. The map titled "Heartland Greenway System South Dakota HCA Overview" also shows that the pipeline route passes through and by several National OPA's (Oil Protection Act) locations which denote that the lands are unusually sensitive.

Q: If you identified the project will cross any HCAs or USAs, do you believe Navigator has the proper mitigation measures in place? Please explain.

A: No. I believe that the pipeline has the potential to impact HCAs based on the map titled "Heartland Greenway System South Dakota HCA Overview". According to the map, the pipeline route crosses several HCAs in Minnehaha, Moody, and Brookings Counties. Based on the Map Legend, the pipeline crosses both National OPAs and National ESAs. The document titled "Heartland Greenway System Plume Modeling and Buffer Overview" discusses several methodologies that the applicant would employ to reduce the risk, however, it is still unclear as to what has actually been implemented from a risk reduction standpoint.

Q: Based on your review of Navigator's Application and responses to interrogatories, is it your opinion that the pipeline will not pose a threat of serious injury to the environment? Please explain.

A: Based on the information provided at this time, it is not possible to make that determination at this time. Information regarding the details of all analyses such as

technical approach, input data, output data, maps, figures, and conclusions should be provided for all dispersion and risk modeling that was performed by the Applicant.

Q: Based on your review of Navigator's Application and responses to interrogatories, is it your opinion that the facility will not substantially impair the health, safety or welfare of the inhabitants? Please explain.

A: Based on the information provided at this time, it is not possible to make that determination at this time. Information regarding the details of all analyses such as technical approach, input data, output data, maps, figures, and conclusions should be provided for all dispersion and risk modeling that was performed by the Applicant.

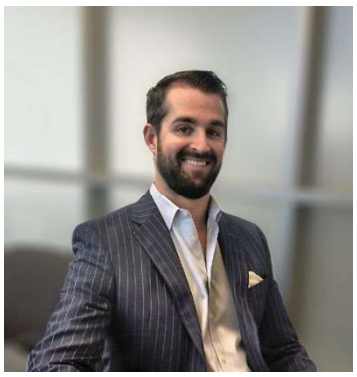
Q: Does this conclude your testimony?

A: Yes.

Matthew Frazell, EIT, ASP

Principal Consultant

Matthew is a graduate engineer, who holds a B.S. in Civil Engineering from Texas Tech University and has over ten years of Engineering, Process Safety, and Regulatory consulting experience. His work experience at ERM includes Facility and pipeline consequence analysis, PSM program development and auditing for midstream and downstream facilities, production and processing facility engineering design, equipment design, well site design/layout, flare studies and PSV sizing calculations, Greenhouse Gas reporting and SPCC plan generation. He also participated in over 150 PHAs as a Facilitator and Scribe. He is proficient with AutoCAD and ProMax. He has completed the AIChE certificate training program for HAZOP and LOPA. Matthew holds an Associate Safety Professional credential, and is an Engineer-In-Training with the Texas Board of Professional Engineers.



Experience: Ten years' experience in oil and gas, Energy, and Petrochem sectors

Email: Matt.Frazell@erm.com

LinkedIn: https://www.linkedin.com/in/matthew-frazell-eit-asp-9447621a/

Education

- BS, Civil Engineering, Texas Tech University

Professional Affiliations and Registrations

- Engineer-in-Training (EIT) in the State of Texas
- Associate Safety Professional (ASP), Board of Certified Safety Professionals
- Eagle Scout, Boy Scouts of America (BSA)
- Society of Petroleum Engineers
- Independent Petroleum Association of America

Languages

- English, native speaker
- Spanish, limited working proficiency

Fields of Competence

- DOT / PHMSA Compliance
- Consequence Analysis
- Mechanical Integrity
- Facility Design
- Relief Valve Design & Sizing

Key Industry Sectors

- E&P Upstream
- Alternative Energy
- Gas Processing Midstream
- Petrochem Downstream

Publications

- Safety in the Red Zone: Hydraulic Fracturing – Theory to Practice

Key Projects

New Fortress Energy – FLNG EIS
Assisted United States Coast Guard (USCG) in developing an Environmental Impact Statement (EIS). Project tasks included analyzing the consequences of a Loss of Containment of Liquefied Natural Gas (LNG) and Diesel Fuel in the Gulf of Mexico including fire thermal radiation isopleth development and vapor dispersion analysis.

Energy Transfer – Blue Marlin EIS
Assisted United States Coast Guard (USCG) in developing an Environmental Impact Statement (EIS). Project tasks included analyzing the consequences of a Loss of Containment of Crude Oil in the Gulf of Mexico including fire thermal radiation isopleth development and vapor dispersion analysis.

Enterprise – SPOT EIS
Assisted United States Coast Guard (USCG) in developing an Environmental Impact Statement (EIS). Project tasks included analyzing the consequences of a Loss of Containment of Crude Oil in the Gulf of Mexico including fire thermal radiation isopleth development and vapor dispersion analysis.

Energy Transfer – DAPL EIS
Assisted United States Army Corps of Engineers (USCG) in developing an Environmental Impact Statement (EIS). Project tasks included analyzing the consequences of a Loss of Containment of Crude Oil pipeline in North Dakota including fire thermal radiation isopleth development and vapor dispersion analysis.

ExxonMobil – Gas to Energy Guyana EIS
Assisted ExxonMobil and Guyana Environmental Protection Agency (EPA) in developing an Environmental Impact Statement (EIS). Project tasks included analyzing the consequences of a Loss of Containment of Crude Oil and Natural Gas in waters off the coast of Guyana including fire thermal radiation isopleth development and vapor dispersion analysis.

Calumet Pipeline Holdings – PHMSA Support
Assisted current owner of Alligator Alley Pipeline with ensuring pipeline was abandoned properly according to DOT/PHMSA regulations. Tasks included developing an abandonment strategy, engaging with stakeholders and PHMSA regulators, and developing the Annual Report.

MarkWest – Pipeline Integrity
Worked with MarkWest Operations and Engineering to alleviate material stress issues due to subsidence from long wall coal mining directly beneath the pipeline.

Conoco Phillips – PHMSA Support
Managed PHMSA compliance requirements including the annual records review of Control Room Management Procedures, Integrity Management System, Public Awareness Program, Line Classification and operational requirements interpretations, FERC Filings, and Operator Qualification program.

Devon – Facility Siting Study
Conducted a Facility Siting Study using the Consequence Analysis (API 752/753) method to address the Facility Siting portion of OSHA PSM.

Lucid - PSM Support
Lead 18+ person team that produced redlined drawings, conducted a facility siting study, RMP updates, developed operating and maintenance procedures, and developed heat and material balance for multiple Cryogenic Gas Processing Facilities.

Denbury – Mechanical Integrity Program
Developed corporate management system for Mechanical/Asset integrity, and implemented inspection program field wide to address DOT/PHMSA requirements.

SM Energy – PHMSA Support
Aided upstream producer in understanding Line classification of newly laid pipeline, and developed Control Room Management Procedures.

Pardus – Produced Water System Management
Optimized Produced Water management system, and replaced 150 miles of produced water pipeline network over varying terrain.

Newell – Wood Wick – Containment & Piping Design
Designed new secondary containment and piping for candle making facility.

Entergy – Electrical Area Classification Drawings Development
Developed Electrical Area Classification drawings for Natural Gas powered steam turbine electric generation facility.

Conoco Phillips – Production Facility Process Simulation
Developed process simulation of new facility for use in optimizing air permit for central production facility.

Performance food Group – PSM Program Audit
Managed onsite effort in trouble shooting issues with Lithium Grease manufacturing process. Aided Onsite team in replacing faulty components.

Indorama - PSM Support
Facilitated PHA and helped team develop/refine process safety information

BP - North American Gas Facility Design
Developed production facility design for locations in Wyoming equipped with associated cold weather design conditions.

Pardus - Water Flood Design & Implementation
Aided upstream producer in developing water flood strategy, designed injection facility, and managed construction of said facility.

Atlas – Salt Water Disposal Design
Designed Produced Water injection facility with pipeline and truck loading options

Enlink – Flare System Design
Sized 90+ Pressure relief valves, and modeled flare header piping network.