

**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 25<sup>th</sup>, 2023**

1 **Q: Please state your name and business address.**  
2  
3 A: Matthew Frazell, 7700 Windrose Ave., Plano, Texas 75024  
4  
5 **Q: Describe your educational background.**  
6  
7 A: I have a Bachelor of Science in Civil Engineering  
8  
9 **Q: By whom are you now employed?**  
10  
11 A: I have been employed by Environmental Resources Management, Inc. since May  
12 of 2012.  
13  
14 **Q: What work experience have you had that is relevant to your involvement on  
15 this project?**  
16  
17 A: I have had 9 years of full-time experience as a consultant, and 2 years as an intern,  
18 focusing on Regulatory Compliance, Process Safety Management including  
19 Quantitative Risk Assessment. Of the 9 years of full-time experience, I was  
20 seconded for 2 years at a company that operated carbon dioxide (CO2) pipelines.  
21 At this seconded position, I was responsible for reducing the risk of leaks from CO2  
22 pipelines, which included modeling the effects of leaks and managing the  
23 execution of risk based internal inspections of both pipelines and facilities.  
24  
25 **Q: What is the purpose of your testimony?**  
26  
27 A: To provide an honest and unbiased expert opinion as to the quality of any modeling  
28 pertaining to risk assessment and/or consequence analysis for the Application for  
29 the Navigator Heartland Greenway Pipeline System. As part of my testimony, I  
30 reviewed all sections of the application and other supporting documentation.  
31  
32 **Q: Are you familiar with pipeline risk assessments?**  
33  
34 A: Yes. I have experience in Quantitative Risk Assessment, (QRA), Risk Based  
35 inspection techniques, and U.S. Pipeline and Hazardous Materials Safety  
36 Administration (PHMSA) risk assessment and mitigation strategies.  
37  
38 **Q: Are you familiar with dense gas dispersion modeling?**  
39  
40 A: Yes, my experience over the past 9 years includes far-field vapor dispersion  
41 modeling of multiple types of fluids including CO2, and specifically CO2 pipelines.  
42  
43 **Q: Are you familiar with PHMSA's risk assessment/modeling requirements  
44 and PHMSA's guidance on pipeline risk modeling?**  
45

46 A: Yes, I am familiar with PHMSA Risk assessment and modeling methodologies.  
47 Some of these methodologies include PHMSA Part 192 and 195 risk assessment  
48 methodologies. I am also familiar with the PHMSA document titled Pipeline Risk  
49 Modeling Overview of Methods and Tools for Improved Implementation, 2020. This  
50 document discusses many different types of Pipeline risk assessment methods  
51 and tools including consequence analysis.  
52

53 **Q: Why do operators subject to PHMSA’s regulations complete risk modeling?**  
54

55 A: Operators subject to PHMSA conduct risk modeling to ensure that their chosen  
56 pipeline design and location are such that the risks associated with the  
57 construction and operation of these pipelines are properly mitigated to prevent  
58 harm to the public, the operator’s employees, and environment.  
59

60 **Q: Should risk modeling be used to inform pipeline siting decisions?**  
61

62 A: It is imperative to perform various types of risk modeling in order to mitigate risk  
63 associated with the operation of the pipeline installation in relation to the public,  
64 operator’s employees, and the environment. By developing sound models, which  
65 denote where the pipeline has the potential to impact the health and safety of the  
66 public, employees, and the environment; the applicant would be able to adjust the  
67 route of the pipeline to minimize these risks.  
68

69 **Q: How can risk modeling be used to inform pipeline siting decisions?**  
70

71 A: Proper modeling will help pipeline operators identify where the pipeline has the  
72 potential to impact High Consequence and Highly sensitive areas. Risk modeling  
73 can and should be used to determine where potential risks to the public or  
74 environment are elevated due to the population density and proximity of the  
75 proposed location to environmentally sensitive areas.  
76

77 **Q: Did you review the risk and dispersion modeling completed by Navigator?**  
78

79 A: Yes, I reviewed two documents and a figure, which were initially provided with the  
80 application, pertaining to the Navigator Pipeline. I reviewed the document titled  
81 “Heartland Greenway System Plume Modeling and Buffer Overview”, a document  
82 titled “Dispersion Modeling Techniques for Carbon Dioxide Pipelines in Australia”,  
83 and a table file (Effects of CO2\_Concentration over Time.png), which presents the  
84 health effects of varying CO2 concentrations over time.  
85

86 **Q: Please summarize the risk and dispersion modeling completed by  
87 Navigator?**  
88

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

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

120  
121 **Q: Does the modeling completed by Navigator align with PHMSA’s guidance?**

122  
123 A: The document titled “Heartland Greenway System Plume Modeling and Buffer  
124 Overview” does speak to specific PHMSA regulatory citations for a methodology  
125 to calculate buffer distances (PHMSA 49 CFR Part 192 and 195), and the  
126 outcomes of the calculations are shown in the document. The PHMSA Part 192  
127 specific buffer distances seem reasonable based on the information provided in  
128 the table.

129  
130 **Q: Please summarize the findings of the risk and dispersion modeling  
131 completed by Navigator?**

132  
133 A: The document titled “Heartland Greenway System Plume Modeling and Buffer  
134 Overview” references the use of multiple air dispersion and plume modeling  
135 software packages in the Risk Avoidance category of the Methodology and  
136 Mitigation Factors – CO2 Dispersion and Plume Modeling: (High Level) section.  
137 This section goes on to state that (Risk = Probability x Consequence); however,

138 there is no calculated risk examined anywhere within the document. The document  
139 mentions the uses and purposes of the software packages of Area Location of  
140 Hazardous Atmosphere (ALOHA) and DNV PHAST; however, no analysis  
141 documentation of including the use of either software is presented. The document  
142 also makes mention of the fact that Stability Classes D, E, and F were used in  
143 modeling exercises, but the specific details of the analysis was not included.  
144

145 **Q: Does the risk and dispersion modeling completed by Navigator provide an**  
146 **adequate analysis of the potential risks and impacts of the proposed**  
147 **carbon dioxide pipeline? Please explain.**  
148

149 A: Based on the information currently available, it is my opinion that the Applicant has  
150 done a satisfactory job describing what they plan to do, but not what has been  
151 done currently. The documents provided speak at a very high level as to how  
152 PHMSA specific buffers were determined. The Applicant has yet to provide  
153 information pertaining to how the individual software packages were used in  
154 determining the setback and buffer distances, what are the locations of the  
155 potential High Consequence and Highly Sensitive Areas, and what is the  
156 calculated risk of operating the pipeline. More detailed information is required to  
157 make a determination as to the adequacy and accuracy of the risk associated with  
158 the proposed project. It should be noted that a pipeline incident involving the  
159 transport of CO2 had a mechanical failure causing a release from the pipeline, and  
160 a resulting plume that extended for over 1.5 miles. The resulting plume impacted  
161 the residents of a nearby town. No modeling has been provided that denotes the  
162 extent at which communities could be impacted.  
163

164 **Q: Based on your review of the risk and dispersion modeling completed by**  
165 **Navigator, is there adequate information in the record for the Commission**  
166 **to make findings in accordance with SDCL 49-41B-22? Please explain.**  
167

168 A: No, based on the information currently provided, the Applicant has not adequately  
169 provided enough information to prove that the proposed pipeline would not cause  
170 potential harm to the public, employees, or the environment. The Applicant has yet  
171 to provide information pertaining to how the individual software packages were  
172 used in determining the setback and buffer distances, what are the locations of the  
173 potential High Consequence and Highly Sensitive Areas, and what is the  
174 calculated risk of operating the pipeline. More detailed information is required to  
175 make a determination as to the adequacy and accuracy of the risk associated with  
176 the project.  
177

178 **Q: Based on your review of the Navigator’s Application and interrogatories, do**  
179 **you agree with Navigator’s conclusion that the project does not cross any**  
180 **high consequence areas (HCAs)? If not, please explain why you disagree.**  
181

182 A: No, according to the Applicant’s Responses to the Staff’s Fourth Set of Data  
183 Requests, the Applicant provided a document titled “Heartland Greenway System

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

193  
194 **Q: Based on your review of the Application and any related interrogatories, do**  
195 **you believe the project will cross any unusually sensitive areas (USAs)? If**  
196 **so, please explain.**

197  
198 A: Yes, according to the Applicant’s Responses to the Staff’s first Set of Data  
199 Requests, the Applicant provided a document titled “Exhibit A7 Public Facilities  
200 Map Heartland Greenway Pipeline System”. This document overlays the pipeline  
201 route against known Land Use/Ownership and known historic sites, public  
202 gathering locations, and other areas of concern. It can be determined that the  
203 pipeline route crosses near a wetlands, cemeteries, and other places of concern.  
204 It would be useful from a risk assessment perspective to add the buffers shown in  
205 the document titled “Heartland Greenway System Plume Modeling and Buffer  
206 Overview” to the above-mentioned map to better understand how far an impact the  
207 pipeline could have on the surrounding area in the event of a failure or leak. The  
208 map titled “Heartland Greenway System South Dakota HCA Overview” also shows  
209 that the pipeline route passes through and by several National OPA’s (Oil  
210 Protection Act) locations which denote that the lands are unusually sensitive.

211  
212 **Q: If you identified the project will cross any HCAs or USAs, do you believe**  
213 **Navigator has the proper mitigation measures in place? Please explain.**

214  
215 A: No. I believe that the pipeline has the potential to impact HCAs based on the map  
216 titled “Heartland Greenway System South Dakota HCA Overview”. According to  
217 the map, the pipeline route crosses several HCAs in Minnehaha, Moody, and  
218 Brookings Counties. Based on the Map Legend, the pipeline crosses both National  
219 OPAs and National ESAs. The document titled “Heartland Greenway System  
220 Plume Modeling and Buffer Overview” discusses several methodologies that the  
221 applicant would employ to reduce the risk, however, it is still unclear as to what  
222 has actually been implemented from a risk reduction standpoint.

223  
224 **Q: Based on your review of Navigator’s Application and responses to**  
225 **interrogatories, is it your opinion that the pipeline will not pose a threat of**  
226 **serious injury to the environment? Please explain.**

227  
228 A: Based on the information provided at this time, it is not possible to make that  
229 determination at this time. Information regarding the details of all analyses such as

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

233  
234 **Q: Based on your review of Navigator’s Application and responses to**  
235 **interrogatories, is it your opinion that the facility will not substantially**  
236 **impair the health, safety or welfare of the inhabitants? Please explain.**

237  
238 A: Based on the information provided at this time, it is not possible to make that  
239 determination at this time. Information regarding the details of all analyses such as  
240 technical approach, input data, output data, maps, figures, and conclusions should  
241 be provided for all dispersion and risk modeling that was performed by the  
242 Applicant.

243  
244 **Q: Does this conclude your testimony?**

245  
246 A: Yes.