

**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 Sara Thronson  
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: Sara Thronkson, 222 S 9<sup>th</sup> Street, Suite 2900, Minneapolis, Minnesota 55402  
4  
5 **Q: Describe your educational background.**  
6  
7 A: I received my bachelor's degree in 2002 from Northland College in Environmental  
8 Studies, and a master's degree from the University of Minnesota in 2006.  
9  
10 **Q: By whom are you now employed?**  
11  
12 A: I have been employed by Environmental Resources Management, Inc. (previously  
13 Natural Resource Group, LLC) since 2006. I currently hold the position of  
14 Associate Partner.  
15  
16 **Q: What work experience have you had that is relevant to your involvement on  
17 this project?**  
18  
19 A: While working at ERM my responsibilities have included providing clients in the  
20 pipeline and transmission line industries with environmental permitting and  
21 environmental review services. Specific tasks have included assisting in the  
22 preparation of Environmental Impact Statements and Environmental Assessments  
23 under the National Environmental Policy Act and/or applicable state programs. I  
24 have worked on projects across the United States including post construction  
25 restoration monitoring programs.  
26  
27 **Q: What is the purpose of your testimony?**  
28  
29 A: I evaluated the Seismicity and Subsidence, Geological Project Constraints and  
30 Mitigation, and the Soils, Erosion, and Sedimentation sections (Sections 6.2.2,  
31 6.2.4, and 6.3, respectively) of the Navigator Heartland Greenway Pipeline System  
32 South Dakota Public Utilities Commission (SDPUC) Application. The purpose of  
33 my evaluation was to determine whether a sufficient level of detail was provided to  
34 describe the geology and soil characteristics, as well as soil-related limitations and  
35 potential hazards associated with pipeline construction (specifically erosion,  
36 subsidence potential, slope instability, and geologic constraints). I also reviewed  
37 Exhibits A3 (Topographic Maps), A4 (Soil Maps), C (Supplementary Tables), and  
38 E (Environmental Construction Guidance) from the Application and the Applicants  
39 responses to staff data requests (received through 5/25/2023) to further evaluate  
40 the level of detail provided for the proposed route.  
41  
42 **Q: Did you review sections 6.2 and 6.3 of Navigator's Application for the  
43 Heartland Greenway carbon dioxide pipeline ("Project") that address  
44 geological features and soil types along the proposed route?**  
45

46 A: Yes, I reviewed Sections 6.2.2, 6.2.4, and 6.3 of Navigator’s Application for the  
47 Heartland Greenway carbon dioxide pipeline which addressed the geological  
48 features and soil types along the proposed route.  
49

50 **Q: Does the proposed route cross any geological features that have the**  
51 **potential for subsidence or land movement? If so, please explain.**  
52

53 A: Yes, the proposed route crosses soil types and geologic features that have the  
54 potential for subsidence and land movement. The potential for land subsidence is  
55 present in sections of the proposed route due to the abundance of karst terrain.  
56 According to Section 6.2.2 of the application, approximately 15.58 miles of the  
57 Project encounters karst terrain. However, the risk of land subsidence is low due  
58 to the carbonate rock formations (which have the potential for karst topography)  
59 being buried under approximately 50 feet of glacial drift deposits. The only geologic  
60 unit within the Project that is susceptible to land movement is the Pierre Shale  
61 which comprises approximately 8.32 miles of the proposed route from MP 9.08 to  
62 MP 17.41.  
63

64 **Q: In your opinion, does Navigator address the concerns with subsidence or**  
65 **land movement in a manner that is consistent with industry standard**  
66 **practices during pipeline routing?**  
67

68 A: Due to the low-risk potential for subsidence or landslides in the Project area,  
69 Navigator has sufficiently outlined necessary mitigation methods that are  
70 consistent with industry standards. Section 6.2.4 discusses the corrective action  
71 to be taken if shallow bedrock or boulders are encountered during construction.  
72 Navigator also addresses that if blasting is indeed necessary to assist with ditch  
73 excavation, then best management practices (BMPs) will be implemented  
74 appropriately to minimize potential impacts. To ensure that the scope of each  
75 potential geologic hazard is properly assessed, Navigator has coordinated with  
76 Terracon Consultants, Inc. to conduct a Geohazard Assessment Study. Navigator  
77 expects the Geohazard Analysis to be completed by the end of Q1 2023.  
78

79 **Q: Do you have any additional recommendations for Navigator with regards**  
80 **for mitigating risks associated with subsidence or land movement?**  
81

82 A: Yes, I would recommend that Navigator provide a figure set in the Geohazard  
83 Analysis that appropriately addresses the areas where geological hazards may be  
84 encountered by the proposed route. These figures would complement the  
85 preexisting Table 6.2-2, which outlines the milepost ranges of each geological  
86 hazard and their respective risk levels. Navigator expects the Geohazard Analysis  
87 to be completed by the end of Q1 2023. Based on the results of the Geohazard  
88 Analysis additional measures might be recommended.  
89

90 **Q: Should the results of Geohazard Analysis and the associated mitigation**  
91 **measures be reviewed by the SDPUC in order to determine that Navigator**

92 **will implement all appropriate measures to protect the pipeline from**  
93 **subsidence and land movement?**

94  
95 A: Yes, I would recommend that the results of the Geohazard Analysis be reviewed  
96 by the SDPUC prior to determination. Per the Application, the Geohazard Analysis  
97 will include many categories of hazards and will identify the appropriate mitigation  
98 measures to be incorporated into the final design. The SDPUC should review these  
99 measures and make additional recommendations as needed.

100  
101 **Q: Does the proposed route cross any soil types that have the potential for**  
102 **erosion? If so, please explain.**

103  
104 A: Yes, the proposed route crosses soil types that have the potential for erosion.  
105 Section 6.3 estimates that 43.88 miles of the proposed route have water erodibility  
106 potential, as designated by the Natural Resources Conservation Service (NRCS).  
107 Soil parameters that help identify if a soil is highly erodible include, but are not  
108 limited to, the classification of land capability and slope. The land capability class  
109 and subclass designations of the NRCS were determined for the proposed pipeline  
110 route. Section 6.3 states that “Soils with a land capability class and subclass of Ve  
111 through VIIIe are considered to be highly erodible. Soils with a land capability class  
112 and subclass of IIIe through IVe are considered to be moderately erodible”. The  
113 Application does not provide a description or visual that details the land capability  
114 class or subclass of segments of the proposed pipeline route. In Table C-1 (Soils  
115 Characteristics of Soil Map Units Crossed by the Heartland Greenway Pipeline  
116 System Centerlines) of Exhibit C and Section 6.3, the Application states that  
117 “*Steep slopes are defined as soils that have slopes greater than 8 percent*” which  
118 can be a major contributor to the water erosion potential of the soil. Table 6.3-1  
119 (Summary of Major Soil Characteristics Impacted by Project (miles)) approximates  
120 that 13.58 miles of the soils crossed by the proposed route are situated on steep  
121 slopes.

122  
123 **Q: Does Navigator propose any methods for mitigating erosion during**  
124 **construction and/or operation of the pipeline? If so, please explain.**

125  
126 A: Yes, Navigator proposed methods for mitigating erosion during construction and  
127 operation within Section 6.3 and Exhibit E. Within Exhibit E, there were also  
128 references made to a Stormwater Pollution Prevention Plan (SWPPP), an  
129 Agricultural Construction Mitigation Plan, and a Weed Control Plan, all of which  
130 the Applicant has stated are being developed within the guidelines of the NRCS,  
131 South Dakota Department of Agricultural and natural Resources (DANR), and the  
132 county weed managers; however, it is my understanding that these documents  
133 have not yet been submitted to the PUC for review (as of 5/25/2023).

134  
135 **Q: Since the SWPPP is currently under development, do you have any specific**  
136 **recommendations that the Commission should require Navigator provide**  
137 **for review?**

138  
139 A: The Application does not state that final preconstruction design efforts will include  
140 site-specific plans that will identify and locate the type of BMPs proposed for  
141 specific locations with highly erodible soils. I recommend that the SDPUC require  
142 that pre-construction design efforts include BMPs specific to locations with higher  
143 erosion potential including the 13.58 miles of the soils crossed by the proposed  
144 route are situated on steep slopes as described in Table 6.3-1 of the application.  
145

146 **Q: Do you have any additional recommendations for mitigating erosion**  
147 **concerns?**  
148

149 A: I recommend that Navigator provide descriptions for the locations where topsoil  
150 segregation, along with other mitigation measures, will occur along the proposed  
151 pipeline route as mentioned in Section 6.3, "Hydric Soils and Compaction  
152 Potential". Table 6.3-1 references that approximately 11.14 miles crossed by the  
153 proposed pipeline route are hydric soils and 111.13 miles are considered to have  
154 a high soil rutting hazard. To minimize compaction during the construction process,  
155 Navigator has proposed to implement several other erosional mitigation practices  
156 along with topsoil segregation including the use of timber mats, using low ground-  
157 weight bearing equipment, and limiting the amount of construction in wet weather  
158 conditions. It would be advised that references, with specific MP callouts, be made  
159 for extents of the proposed pipeline route that are designated as having a high risk  
160 for soil rutting, compaction, wind and water erodibility, and steep slopes so that the  
161 Environmental Inspectors (EIs) can have the data more readily accessible during  
162 construction and restoration to know where the problem areas are expected to be.  
163

164 Exhibit E states that both topsoil and subsoil may be decompacted per landowner  
165 stipulations or applicable permits. Exhibit E also describes winter construction  
166 techniques that will be implemented to address erosion and control and  
167 stabilization techniques. These techniques are consistent with industry standards  
168 and describe the challenges and mitigation measures for construction,  
169 stabilization, and monitoring during frozen or thawing conditions. The EIs and  
170 Construction Managers will determine when and where these measures will be  
171 implemented as that cannot be determined without knowing the final construction  
172 schedule or the weather conditions.  
173

174 **Q: Does the proposed route cross any soil types that could inhibit future**  
175 **revegetation of ground disturbed during construction activities? If so,**  
176 **please explain.**  
177

178 A: Yes, the proposed route crosses soil types that could inhibit future revegetation of  
179 ground disturbed during construction activities. Section 6.3, "Revegetation" states  
180 the primary factors that influence a soil's ability to regrow vegetation include  
181 whether the soil is classified as being prime farmland or hydric, the soil rutting  
182 hazard, the compaction potential, the steepness of slope, and the soil's potential  
183 for erosion via water or wind. The revegetation potential for each map unit within

184 the proposed pipeline project area, can be found in Table C-1 of Exhibit C. Table  
185 6.3-1 summarizes the major soil characteristics that are impacted by the Project  
186 and approximates that 4.67 miles of the proposed pipeline route crosses soils with  
187 a low revegetation potential. It would be advised that references, with specific MP  
188 callouts, be made for extents of the proposed pipeline route that are designated as  
189 having a low revegetation potential so that the EIs can have the data more readily  
190 accessible during construction and restoration to know where the problem areas  
191 are expected to be.

192  
193 **Q: In your opinion, does Navigator have the proper plans in place to manage**  
194 **these soil types in order to facilitate revegetation after pipeline**  
195 **construction?**

196  
197 A: Navigator outlines plans to promote soil fertility and limit erosion and compaction  
198 through the application of fertilizers and installment of erosional controls such as  
199 erosion control blankets, mulch, and tackifiers. Exhibit E provides details regarding  
200 restoration and revegetation success criteria and record keeping that are  
201 consistent with industry standards.

202  
203 Navigator does not identify if any areas with saline, sodic, and saline-sodic soils  
204 would be crossed by the proposed Project; however, Exhibit E does describe that  
205 a soil salinity map will be prepared. These soil types can be linked to revegetation  
206 issues and loss of agricultural productivity if soils are not handled properly during  
207 construction. I recommend that Navigator include a discussion of saline-sodic soils  
208 in the Agricultural Construction Mitigation Plan, in addition to the statements made  
209 in Exhibit E regarding the soil amendments or topsoil supplementation to ensure  
210 successful revegetation.

211  
212 **Q: Do you have any additional recommendations for Navigator regarding**  
213 **these soil types in order to enhance revegetation after pipeline**  
214 **construction?**

215  
216 A: I would recommend that reference maps, with specific MP callouts, be made for  
217 extents of the proposed pipeline route that are designated as having a low  
218 revegetation potential so that the EIs can have the data more readily accessible  
219 during construction and restoration to know where the problem areas are  
220 anticipated to be.

221  
222 **Q: Does this conclude your testimony?**

223  
224 A: Yes.