

**BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF SOUTH DAKOTA**

**IN THE MATTER OF THE APPLICATION BY SCS CARBON TRANSPORT LLC FOR  
A PERMIT TO CONSTRUCT A CARBON DIOXIDE TRANSMISSION PIPELINE**

**DOCKET NO. HP22-001**

**Direct Testimony of Sara Thronson  
On Behalf of the Staff of the South Dakota Public Utilities Commission  
June 23, 2023**

1 **Q: Please state your name and business address.**  
2  
3 A: Sara Thronson, 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: To provide an assessment of the Geology (Section 5.1.2), Rock, Sand, Gravel,  
30 and Economic Mineral Deposits (Section 5.1.3), Soils (Section 5.1.4), and Section  
31 5.1.5 (Seismic, Subsidence, and Slope Stability Risks) of the Summit Carbon  
32 Solutions Pipeline South Dakota Public Utilities Commission (SDPUC) Application.  
33 This assessment was completed to determine whether a sufficient level of detail  
34 was provided to document the physical environment of the geology and soil  
35 characteristics, as well as the impacts to the physical environment associated with  
36 pipeline construction (specifically erosion, subsidence potential, slope instability,  
37 and geologic constraints).  
38  
39 I also reviewed Appendix 3 (Environmental Construction Plan) and Appendix 7  
40 (Soil Map Units Crossed by the Project) from the Application and the Applicants  
41 responses to staff data requests (received through 5/30/2023) to further evaluate  
42 the level of detail provided for the proposed route.  
43  
44 **Q: Does the proposed route cross any geological features that have the  
45 potential for subsidence or land movement? If so, please explain.**

46  
47 A: Yes, the proposed route crosses soil types and geologic features that have the  
48 potential for subsidence and land movement. Since there are no identified active  
49 faults within 100 miles of the project area, the probability of a seismic event  
50 occurring is considerably low. Therefore, the risk for ground motion, surface  
51 faulting, or soil liquefaction within the project area remains unlikely. However, the  
52 potential for land subsidence is present in several sections of the proposed route  
53 due to the abundance of karst terrain. From the SDT-209 Trunk Line of the  
54 proposed pipeline route, the terrain was classified as having a high hazard risk for  
55 karst-like conditions and the potential presence of sinkholes. The carbonate rock  
56 in this region is covered by less than 50 feet of glacial till.

57  
58 In terms of slope instability, the proposed route does in fact extend through a region  
59 moderately susceptible to landslides. There are 107.3 acres of permanent impacts  
60 anticipated along SDL-320 Lateral where the terrain is designated as being  
61 moderately susceptible to landslides due to the abundance of shrink-swell clays  
62 and steep grades. However, this region has a low incidence rating for landslides.

63  
64 **Q: In your opinion, does Summit address the concerns with seismic hazards**  
65 **and subsidence or land movement in a manner that is consistent with**  
66 **industry standard practices during pipeline routing?**

67  
68 A: Summit has sufficiently identified the locations of potential geologic hazards  
69 relative to industry standards. The overall potential for ground motion hazard  
70 including seismic activity, subsidence or land movement in the Project Area is low  
71 risk except at SDT-209 Trunk Line where the hazard risk is high for karst and along  
72 SDL-320 Lateral where the landslide risk was identified as Moderate Susceptibility  
73 and Low Incidence. Section 5.1.5 discusses measures to be taken during the  
74 construction process to limit the risk of landslides including the preservation of  
75 surface and subsurface drainage, reducing steep grades, and adding fill to the toe  
76 of slopes. To address the effects of shrink-swell soils on surface structures,  
77 Summit plans to design their permanent above ground facilities in compliance with  
78 Uniform Building Code standards and excavate susceptible soils when necessary.  
79 Section 5.1.5 references Appendix 6B and Appendix 7, which display locations for  
80 clay-rich soil units and analyze the drainage class and presence of clay minerals  
81 with swell potential, respectively.

82  
83 **Q: Do you have any additional recommendations for Summit with regards to a**  
84 **Geohazard Analysis for mitigating risks associated with karst hazards or**  
85 **sinkholes?**

86  
87 A: Yes, Section 5.1.5 states that Summit plans to educate their construction  
88 personnel on how to properly identify karst features whilst excavating and they  
89 may implement realignment or specialized construction techniques. It would be  
90 advised that a Geohazard Analysis be completed at a minimum in the areas  
91 identified with potential for karst and that the construction techniques for mitigating

92 the risk for karst-related hazards be thoroughly outlined in Section 5.1.5 to promote  
93 operational safety and efficiency. The Geohazard Analysis will include many  
94 categories of hazards and will identify the appropriate mitigation measures to be  
95 incorporated into the final design in order to prevent surprises during construction.  
96 The Geohazard Analysis should be provided to the SDPUC for review in order to  
97 understand the mitigation measures to be implemented and make additional  
98 recommendations if needed.

99  
100 **Q: Does the proposed route cross any soil map units that are considered**  
101 **saline or sodic? If so, please explain if Summit has addressed the**  
102 **mitigation measures appropriately.**  
103

104 A: Yes, the proposed route crosses soil map units that are mapped as saline and/or  
105 sodic soils. Section 5.1.4.3 describes that 133 acres of soils crossed by the  
106 proposed route are considered saline and 84 acres that are considered sodic.  
107 Maps of these locations are included in Appendix 6B, and saline and sodic soil  
108 map units are identified in Appendix 7. The impacts of construction and operation  
109 are described briefly; however, mitigation measures are not described in sufficient  
110 detail. I recommend including specific details regarding both chemical and physical  
111 mitigation measures that would be used to minimize impacts to the soil (e.g.,  
112 application of mulch, adding gypsum to the soil, and seeding).  
113

114 **Q: Does the proposed route cross any soil types that have the potential for**  
115 **erosion? If so, please explain.**  
116

117 A: Yes, the proposed route crosses soil types with a potential for erosion. Section  
118 5.1.4.6 estimates that approximately 108 acres of soil adjacent to the proposed  
119 route have a high susceptibility to water erosion. These are soils with an erosion  
120 factor (Kw) value greater than 0.40. This value is determined based on soil  
121 characteristics such as soil texture, organic matter content, overall particle  
122 structure, and the saturated hydraulic conductivity. Table 6 describes regions of  
123 the proposed route with Kw values greater than 0.40 and their respective soil type.  
124 In terms of soils susceptible to wind erosion, only 27 acres of adjacent surrounding  
125 soil was designated as being highly erodible by wind with a Wind Erodibility Group  
126 (WEG) value of 2. Similar to the characterization of Kw values, the WEG value is  
127 determined from the soil texture, organic matter content, mineralogy, calcareous  
128 content, and rock fragment content. Table 7 details the soil map units with WEG  
129 rating less than or equal to 2 and their respective soil types.  
130

131 **Q: Does Summit propose any methods for mitigating erosion during**  
132 **construction and/or operation of the pipeline? If so, please explain.**  
133

134 A: Yes, Summit proposed methods for mitigating erosion during construction and  
135 operation within Section 5.1.4.6 and in the Environmental Construction Plan (ECP)  
136 outlined in Appendix 3. Section 2.8 of Appendix 3 describes the types of temporary  
137 erosion control devices (ECDs) to be implemented to the project area including

138 mulch, sediment barriers, trench plugs, and slope breakers. Section 2.9 of  
139 Appendix 3 continues on to describe the permanent types of ECDs to be used  
140 along the proposed route including trench breakers, mulch, and slope breakers.  
141 Summit states that they will prepare Environmental Plan Sheets that accompany  
142 the state required Stormwater Pollution Prevention Plan (SWPPP). An Agricultural  
143 Construction Mitigation Plan, and a Weed Control Plan are also documents related  
144 to erosion control that Summit has not yet made available for review. These plans  
145 are standard industry practice and are recommended at a later stage of the  
146 construction planning process. While the application outlines counties that have  
147 documented occurrences of Statewide Noxious Weeds and describes some of the  
148 measures that will be used to control weeds, there is a lack of detail for monitoring  
149 the spread of weeds post construction and for mitigation for agricultural damages  
150 post construction.

151

152 **Q: Do you have any additional recommendations for mitigating erosion**  
153 **concerns?**

154  
155 A: To minimize compaction during the construction process, Summit has proposed to  
156 implement erosion mitigation practices along with topsoil segregation including the  
157 use of timber mats, using low ground-weight bearing equipment, and limiting the  
158 amount of construction in wet weather conditions. It would be advised that  
159 references, with specific mile post callouts, be made for extents of the proposed  
160 pipeline route that are designated as having a high risk for soil rutting, compaction,  
161 wind and water erodibility, and steep slopes so that the Environmental Inspectors  
162 (EIs) can have the data more readily accessible during construction and restoration  
163 to know where the problem areas are expected to be.

164

165 **Q: Does this conclude your testimony?**

166  
167 A: Yes.