

# North Dakota Geological Survey



Edward C. Murphy - State Geologist

Department of Mineral Resources

Lynn D. Helms - Director

North Dakota Industrial Commission

[www.state.nd.us/ndgs](http://www.state.nd.us/ndgs)

December 21, 2018

Mr. James W. Dawson  
 SWCA Environmental Consultants  
 116 North 4<sup>th</sup> Street, Suite 200  
 Bismarck, ND 58505-0840

Re: Denbury Green CO<sub>2</sub> Pipeline Corridor Review Comments

The North Dakota Geological Survey appreciates the notification and opportunity to review and provide comment on the proposed oil and gas energy infrastructure development project. Your comment solicitation letter of November 30, 2018 was reviewed by our office on December 18, 2018. We dropped in the North Dakota portion of the alignment of the proposed pipeline route on our landslide base maps from the GIS layer provided to us and compared it to the locations of landslides that have been identified by detailed mapping work previously completed by our office (Moxness, 2018, Murphy, 2016). Additionally, the entire North Dakota portion of the proposed pipeline route was evaluated by reviewing historical aerial photography from July, 1957, LiDAR elevation data collected between the fall of 2015 and spring of 2016 and National Agriculture Imagery Program (NAIP) aerial imagery from 2014 for the identification of any more recent landslide areas.

We noted that the proposed pipeline route generally passes along areas that are generally topographically flat with little relief and consequently are generally free of landslides. However, a few areas of concern were noted at the locations of stream crossings and where topographic conditions suggest additional engineering review should be considered (Figure 1, Attached). The approximate locations of these areas are listed below in Table 1:

Table 1. Location of Areas of Concern along Proposed Pipeline Route

No.	County	Description	Longitude	Latitude
1	Slope	West Facing Slope with Collapse Topography	-104.037021	46.291616
2	Bowman	West Facing Slope at Little Beaver Creek Meander	-103.975638	46.271727
3	Bowman	North Facing Slope Adjacent to Slough	-103.949745	46.245374
4	Bowman	Erosional\Slide Areas along West and East Pipeline Corridor	-103.939319	46.224228

Landslide maps and data, along with LiDAR elevation data sets and mapping products for the project area are available on our website at: <https://www.dmr.nd.gov/ndgs/SurfaceMap/SurfaceMap.asp?source=landslide24k>

Careful examination of actual pipeline routes and evaluation of applicable construction practices throughout the proposed pipeline corridor should be continued. You may also contact our offices directly, with any additional questions or comments, at (701) 328-8000.

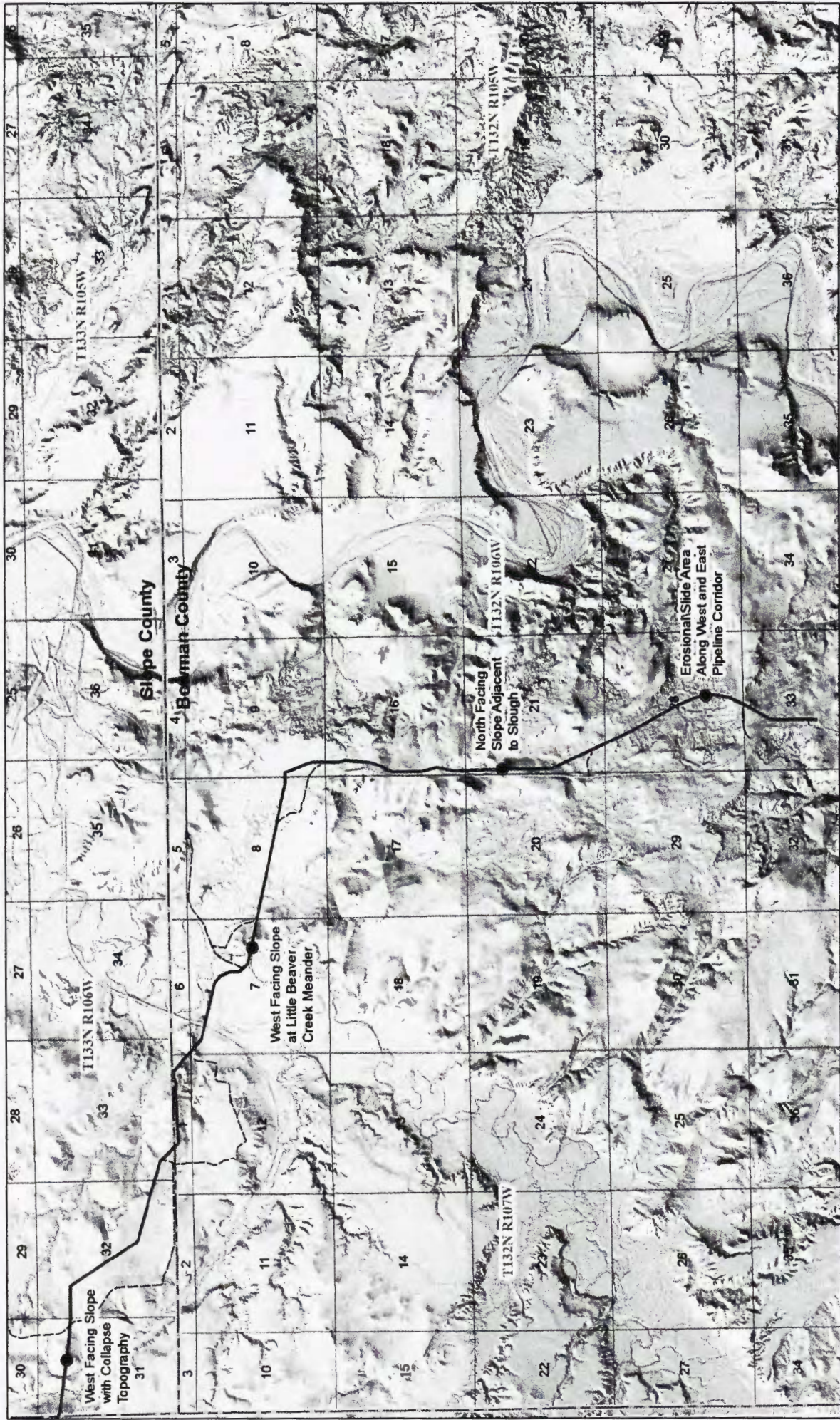
Sincerely,

North Dakota Geological Survey:

Fred Anderson  
 Geologist  
[fjanderson@nd.gov](mailto:fjanderson@nd.gov)

FJA\Attachment

# Proposed Denbury Green CO<sub>2</sub> Pipeline Route - Location Map



- Areas of Concern
- Pipeline Centerline

Figure 1: Denbury Green CO<sub>2</sub> Proposed Pipeline Route Areas of Concern - Location Map