BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF SOUTH DAKOTA

IN THE MATTER OF THE APPLICATION OF SCS CARBON TRANSPORT LLC FOR AN ENERGY FACILITY PERMIT TO CONSTRUCT THE SUMMIT CARBON SOLUTIONS PIPELINE	DOCKET NO. HP22-001

DIRECT TESTIMONY OF
ALEXANDER LANGE

ON BEHALF OF

SUMMIT CARBON TRANSPORT LLC

SUMMIT CARBON TRANSPORT LLC EXHIBIT #

August 1, 2023

Q. Please state your name and business address for the record.

A. My name is Alexander Lange. My business address is 2321 N. Loop Dr., Suite 221, Ames, IA 50010

Q. What is your position with SCS Carbon Transport LLC (Applicant)?

A. I'm the Director of Engineering for Summit Carbon Solutions, LLC ("Summit"), parent company of the Applicant, SCS Carbon Transport LLC, in this proceeding.

Q. Please briefly describe your education and experience.

A. I have a Bachelor of Science in Electrical Engineering, from Michigan State University, in East Lansing, MI. I have had 8 years of experience working for various pipeline operators.

Q. Please describe your duties with SCS Carbon Transport LLC.

A. I confirm technical deliverables for the pipeline and pump stations are completed on schedule and meet quality and performance requirements per the regulations, Design Basis, and engineering design and specifications. As a part of my responsibilities, I manage internal engineers and external engineering/technical contractors.

Q. Which sections of the application are you responsible for?

A. I will be adopting Section 2.2 (Engineering Design), Appendix 2 (Typical Above Ground Facility Layouts) and provided input to Section 1.2 (Project Overview and General Site Description), Appendix 1 (Construction Spread Overview Map) as previously filed by Lynn Meredith as he retired from the Company.

Q. Provide a general description of where the facility is located in South Dakota.

A. The larger Summit Carbon Solutions Midwest Carbon Express Project covers five states; Iowa, Minnesota, Nebraska, North Dakota, and South Dakota. In South Dakota, the pipeline is entirely east of the Missouri River and proceeds from Lincoln County in the southeast to McPherson County in the north central. Additionally, there are laterals from ethanol plants as well. The proposed pipeline consists of approximately 477 miles of buried pipeline, four pump stations, 66 mainline valves ("MLV"), and six launcher-receiver sites. An overview of the Project facilities in South Dakota is provided in Section 2.1.1 and Table 2 of the Application.

Q. Describe all above ground facilities present along the pipeline route.

A. There are three types of above ground facilities and typical drawings of these facilities are provided in Appendix 2 (Typical Above Ground Facility Layouts) of the Application:

Pump Stations: The operating pump stations are planned to be located in the counties listed in Table 2 (Beadle, Minnehaha, Brown, McPherson). Each pump station will be fenced and contain three or more pumps driven by electric motors, and include an electrical and controls building, electrical substation, and parking area for station personnel. Design and construction of the pump stations will meet the requirements of the National Electric Code and Federal regulation 49 CFR Part 195. SCS Carbon Transport LLC will purchase electricity for the pump stations from local providers. The pump stations will be fully designed for remote, unmanned operation via an Operations Control Center (OCC) that will be located in Ames, Iowa.

The pipe entering and exiting the pump station will be located underground; however, some of the piping within the pump station yard (after entering and prior to exiting the pump station facilities) will be above ground.

Mainline Valves (MLV): The intermediate MLVs will be constructed within the 50-foot permanently maintained ROW and be approximately 50-feet-long and 50-feet-wide. These valve sites will be located within an easement obtained from landowners. The spacing intervals between the MLVs along the ROW will be in accordance with *Title 49 Part 195.260 Valves: Location* which includes considerations such as location of pump stations; CO_2 dispersion calculations and modeling; high consequence areas, and certain waterbody crossings. All of these MLVs will be remotely activated valves. In the unlikely event of an emergency, these valves can be remotely activated to isolate sections of the pipeline to minimize potential discharge. The valves will also be designed to allow for local operation.

Launcher and Receivers: All pipeline segments will allow the passage of internal or inline inspection devices called smart pigs, which can detect internal and external anomalies in the pipe such as corrosion, dents, and gouges. Launcher and receivers are designed to launch and receive these internal inspection devices. All launcher and receivers and MLVs will be above-ground fabricated settings which will have a design factor of 0.6 with an appropriate pipe wall thickness.

Q. What is the design and construction standard by which the Project will be built?

A. The Project is being designed to transport supercritical CO_2 according to U.S. Department of Transportation ("DOT") Pipeline and Hazardous Material Safety Administration ("PHMSA") regulations at 49 CFR Part 195, Transportation of Hazardous Liquids by Pipeline; the final design and construction will meet or exceed ASME B31.4, Pipeline Transportation Systems for Liquids and Slurries Standard, as well as other applicable technical standards.

A majority of the pipeline will have a design factor of 0.72. Higher design factors will be used at crossings and above ground facilities. The pipeline system consists of nominal outside diameter pipe varying from 6" up to 24". Pipe material grade will vary from API 5L X-52 up to X-70 and

will meet or exceed API 5L-PSL2. Pipe wall thickness will be adequate to meet the appropriate safety factors used. To protect against corrosion, an external Fusion Bonded Epoxy ("FBE") coating will be applied to the pipeline, as well as special Abrasion Resistant Overcoat ("ARO") for certain crossings, and an impressed cathodic protection system will be used. All material will be manufactured, constructed, and operated in accordance with applicable regulations.

Q. Have you applied or do you intend to apply for any waivers from PHMSA?

A. At this time, Summit does not anticipate applying for any waivers from PHMSA.

Q. As proposed, does the project meet or exceed all federal and state standards?

A. Yes.

Q. What is the design capacity and design pressure?

A. The pipeline has been designed as follows:

- Maximum Operating Pressure ("MOP"): 2,183 pounds per square inch gauge ("psig").
- Maximum Operating Temperature: 120 degrees Fahrenheit.
- Maximum design flow rate: 936 million standard cubic feet ("MMSCF") per day which is approximately equivalent to a capacity of 18 million metric tons per annum ("MMTPA") of CO_2

The design of the pipeline system is based on a maximum 2,160 psig normal discharge pressure at each pump station, with a 2,183 psig MOP of the pipeline. The design of the pipeline is based on a steady state and transient analysis to identify MOP under normal and abnormal operating conditions.

Q. Does the Project include compressor stations?

A. No, as described above, the project will utilize pump stations.

Q. Does the Project include storage facilities?

A. Not in South Dakota.

Q. Does this conclude your testimony?

A. Yes.

Dated this 1st day of August 2023.

/s/ Alex Lange

Alexander Lange