BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

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HP 22-002

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,	:	**APPLICANT'S POST-HEARING BRIEF**

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On September 27, 2022, Applicant Navigator Heartland Greenway LLC ("Navigator") filed an application for a siting permit under SDCL Ch. 49-41B to construct and operate the proposed Navigator Heartland Greenway Pipeline ("the Pipeline" or the "Project"). Since then the Commission granted intervention to numerous persons and entities, and the parties have engaged in discovery. A contested-case hearing in this matter was held before the Commission in Pierre beginning on July 25, 2023, and continuing until August 8, 2023.

Navigator had earlier filed a motion under SDCL § 49-41B-28 asking that the Commission preempt zoning ordinances enacted by Minnehaha County and Moody County after Navigator filed its application; Navigator contends that the ordinances are unreasonably restrictive "as applied to the proposed route," which was established and on file with the Commission before the ordinances were passed. The Commission held an additional two days of hearing on August 24-25, 2023, to hear evidence related to Navigator's preemption motion.

At the beginning of the hearing on August 24, Navigator moved to reopen its case for the limited purpose of producing maps related to an aspect of its plume modeling; the mapping had been discussed in testimony and requested by Staff witness Matt Frazell and Commissioner Nelson. Navigator's motion was granted and the mapping was introduced as Exhibit N68. The Commission then heard additional evidence related to the ordinances passed by Minnehaha County and Moody County for purposes of determining Navigator's preemption motion and Navigator's burden of proof with respect to its ability to comply with all laws and the views of local governments.

As directed by the Commission at the conclusion of the hearing on August 8, Navigator submits this post-hearing brief in support of its Application, together with proposed findings of fact and conclusions of law. Navigator will separately brief the preemption issue on September 4, 2023. As explained below, and as supported by Navigator's proposed findings of fact and conclusions of law, Navigator has met its burden of proof and is entitled to a permit under SDCL § 49-41B-22.

1. The project and procedural history.

Navigator has submitted separate, numbered findings of fact and conclusions of law that summarize in detail the parties to the docket, the procedural history of this docket, and details about the Project, which, with specificity to this docket, is a proposed midstream transportation interstate pipeline to transport carbon dioxide captured from ethanol facilities in South Dakota to be sequestered in Illinois. The findings of fact also address demand for the Project. Navigator relies on those proposed findings, paragraphs 1-57, for relevant background.

2. Navigator's burden of proof.

Navigator's burden of proof is established by statute. Navigator must prove:

(1) The proposed facility will comply with all applicable laws and rules;

(2) The facility will not pose a threat of serious injury to the environment nor to the social and economic condition of inhabitants or expected inhabitants in the siting area;

(3) The facility will not substantially impair the health, safety or welfare of the inhabitants; and

(4) The facility will not unduly interfere with the orderly development of the region with due consideration having been given the views of governing bodies of affected local units of government.

SDCL § 49-41B-22. Navigator must meet this burden by a preponderance of the evidence. *Id.* A preponderance is generally defined as "the greater weight of evidence" and is the standard commonly used in civil cases. *See Pieper v. Pieper*, 2013 S.D. 98, ¶ 22, 841 N.W.2d 781, 787. Based on substantial evidence in the record, Navigator has satisfied each of these criteria.

A. The Project will comply with all applicable laws and rules.

Navigator committed in its Application to comply with all applicable laws, rules, and regulations, including the United States Department of Transportation regulations at 49 CFR Part 195, which govern hazardous liquids pipelines. (Ex. N20 at pp. 5, 8.) Navigator's primary regulator at the federal level is the Pipeline Hazardous Materials Safety Administration (PHMSA) of the USDOT. PHMSA currently regulates CO2 pipelines, and has since the 1970's. (FF ¶ 58.) Any pipeline that transports CO2 in a supercritical state, including as a liquid, is within PHMSA's jurisdiction. (*Id.* ¶ 60.) Navigator has consulted with PHMSA about the Project since 2021 and obtained an operator I.D. in February 2022. (*Id.* ¶ 64.) Since then, Navigator has met with PHMSA quarterly, and to date PHMSA has stated no concerns about anything it has reviewed with Navigator. (*Id.*) Steve Lee and Vidal Rosa both testified to Navigator's compliance with 49 CFR Part 195. In addition, Staff witness William Byrd testified that based on his review, Navigator's plans for the design, construction, and operation of the

Pipeline comply with 49 CFR Part 195. (*Id.* at S2, p. 12:20-28.) John Godfrey, who works for DNV, testified that DNV has completed three design verifications to determine Navigator's compliance with DNV-RP-F104, which is an international design standard applicable to CO2 pipelines that meets or exceeds PHMSA requirements. (*Id.* ¶ 82.) Navigator offered in evidence Ex. N22, which was submitted as an exhibit to the Application, and which shows the many ways in which Navigator will not only meet but exceed PHMSA's requirements; the PHMSA exceedance table was unchallenged in the record and is undisputed. (*Id.*)

Navigator must also cooperate with and facilitate federal agency compliance with the National Environmental Policy Act and Section 106 of the National Historic Preservation Act. Dr. Jenna Carlson-Dietmeier, the Interim State Historic Preservation Officer, testified for Staff that Navigator has complied with SDCL § 1-19A-11.1 and with all of her recommendations. (*Id.* ¶ 121.) Navigator's witnesses Brandi Naughton and Monica Howard testified to Navigator's compliance with federal and state environmental permitting statutes and regulations. Howard also testified to Navigator's bi-monthly meetings with the U.S. Army Corps of Engineers to establish Navigator's compliance with federal water quality standards. (*Id.* ¶ 108.) No witness testified to the contrary.

Exhibit N1 includes an updated version of Table 1-8.1, which details state and federal permits that Navigator must obtain to construct and operate the Pipeline. (Ex. N1 at pp. 30-31.) No witness or evidence challenged the table.

Staff retained consultants, subpoenaed State officials, and designated Utility Analyst Jon Thurber as a witness. All of Staff's prefiled testimony was admitted at the hearing. None of Staff's witnesses testified to any law, rule, or regulation, state or federal, with which the proposed pipeline would not comply.

No witness at the hearing suggested that Navigator would not comply with all applicable laws or regulations.

The only exception to this testimony and evidence, as discussed by Monica Howard, is with respect to the zoning ordinances passed by Minnehaha County and Moody County almost nine months after Navigator filed its permit application with the Commission and less than two months before the scheduled hearing. Because the ordinances are unreasonably restrictive as applied to the proposed route, Navigator has separately moved that the Commission preempt the ordinances under SDCL § 49-41B-22 with respect to Navigator's Application.

B. The Project does not pose a threat of serious injury to the environment or to the social and economic condition of inhabitants or expected inhabitants in the siting area.

1. The route does not adversely affect the environment or any inhabitants.

Although the Commission does not have jurisdiction to require that the Project be rerouted, *see* SDCL § 49-41B-36, the suitability of Navigator's route is addressed in Navigator's application as required by regulation (Ex. N20, § 2.0), and the Commission heard evidence about the suitability of Navigator's routing process and the chosen route. The route was developed through an iterative process using Pivvot, a proprietary software program. (Ex. N5, Direct, ¶ 8.) The routing process considered many positive and negative considerations and constraints, with each data set being weighted based on whether it was desirable or should be avoided. (*Id.*) The routing process includes an objective to minimize the overall length of the route, consistent with the goal of minimizing the collective impact of the Pipeline along its route. (FF ¶¶ 69, 71.) These goals are required by the National Environmental Policy Act. (Tr. at 1926:16 to 1927:9.) As part of its routing process, Navigator held voluntary open-houses in early 2022 to provide information and hear comments and questions. (FF ¶ 72.) Navigator considered this information

in its routing efforts. (*Id.*) In addition, Navigator voluntarily incorporated a routing buffer based on its initial plume modeling in the process of microrouting the Pipeline.

Staff witness Alissa Ingham testified that "[b]y selecting a route that is the shortest distance between the beginning and end point while also considering digitally available information (e.g. existing infrastructure, floodplains, or recreational areas), it minimizes risks and maximizes efficiency." (Ex. S12 p. 3:68-71.) Ingham testified that Navigator's routing analysis and optimization were "in line with industry standards and South Dakota Administrative Rule." (*Id.* p. 3:80-84.) She agreed that Navigator's routing process followed the principles of avoidance, minimization, and mitigation. (Tr. at 1926:16 to 1927:9.) Ingham also agreed that Navigator properly analyzed the compatibility of the Pipeline with regard to its effects on rural life and the business of farming. (*Id.* at 1928:9-18.) The dominant land use crossed by the route is agricultural. (FF ¶ 238.) Normal farming practices are consistent with the permanent easement and not prohibited. (FF ¶ 250.)

Based on the route as of May 25, 2023, shown in Ex. N1 at pp. 79-244, the closest the route comes to any municipal borders is 1,050 feet from Aurora, and 1,130 feet from Egan. The nearest school is 6,540 feet from the centerline. (FF ¶¶ 75-76.) With respect to inhabitable structures, there are two within Navigator's initial routing buffer and five within the design and operations buffer for a six-inch pipeline. (FF ¶ 77.) For the eight-inch pipeline, there are four inhabitable structures within Navigator's initial routing buffer and five within the design and operations buffer. (*Id.*) Navigator did an exceptional job locating the route away from occupied structures; mitigation measures will be implemented at the few locations identified above to provide an equivalent level of safety. (*Id.*) In Minnehaha County, the average distance between the pipeline and a residence triggering the application of the 330-foot separation distance under

Minnehaha County's new zoning ordinance is 1,400 feet. (Tr. at 3699:2-11.) In Moody County, the average triggering distance is 1,100 feet. (*Id*. at 4:12-18.) These are well outside Navigator's initial routing and operations and maintenance buffer areas based on Navigator's plume modeling, which, as discussed below, was validated by two non-Navigator witnesses.

There was no testimony that the route negatively affected cemeteries, cultural resources, public or private water wells, any municipal water supplies, or aquifers. Navigator is required by PHMSA regulations to identify High Consequences Areas affected by the Pipeline. HCAs are specific locales and areas where a release could have the most significant adverse consequences. HCAs are defined by PHMSA regulations and include high population areas, sensitive drinking water resources, and ecologically-sensitive resource areas. To ensure protection of these sensitive resources, HCAs are subject to higher levels of regulation under 49 CFR Part 195. HCAs in the Pipeline siting area are shown in Exhibit 33. The locations where the pipeline could affect HCAs are shown in Exhibit 42. As indicated in the exhibit, the percentage of the Pipeline that could affect HCAs is low. (*Id.*) By comparison, Staff witness William Byrd testified that 50% of liquid transmission pipelines throughout the United States could affect HCAs. (Tr. at 1797:4-9.) Navigator is continuing to determine where the Pipeline could affect HCAs as part of its integrity management plan. Byrd testified that the ongoing "could affect" analysis with respect to HCAs should not be a critical variable for the Commission in its permitting decision because "the 'could-affect' analysis is constantly going to be updated as required" under 49 CFR § 195.452. (Tr. at 1853:18 to 1854:5.) Navigator has committed to this process more frequently than is required. (Ex. N22.) "Operators don't do this once. They do it any time the populated areas are – you know, other potentially affected areas change. You know, so they can't just sit on their hands once the pipeline's approved and say we've already figured out what our "could-

affect" segments are, we don't have to go back. So it's going to be an evergreen process." (Tr. at 1853:15 to 1854:5.) With respect to the CFD modeling that Navigator has always planned to do, that modeling will not affect the route, but will inform additional mitigation measures needed for design, construction, maintenance, and operation of the Pipeline. Navigator agreed that it would provide the results of that modeling and additional mapping based on it to the Commission.

No witness challenged Navigator's routing process and substantial evidence establishes that the route based on which Navigator seeks a permit does not adversely affect the environment or the inhabitants of the siting area.

2. The chances of a pipeline leak are small.

Navigator offered evidence that the statistical chance of a leak on the pipeline based on historical PHMSA data is 0.0011 incidents per mile per year. (FF ¶ 132.) The size of the release represented by the probability is 6,799 barrels. (*Id.*) By comparison, the amount of CO2 released in the Satartia incident was approximately 31,000 barrels. (*Id.*) Because this probability is based on historical data that includes pipelines that were constructed decades ago, using inferior design, construction, and leak detection standards, the statistical probability is conservative when applied to Navigator's new Pipeline incorporating new technology that exceeds PHMSA standards. (FF ¶ 132; Tr. at 1080:8 to 1081:17.) This testimony was undisputed and unquestioned by any witness. Combined with evidence that existing carbon dioxide pipelines have a better safety record than hazardous liquids transmission pipelines as a whole (FF ¶ 59: Tr. at 1080:20-23), which is also undisputed evidence, the risk of a leak or spill that would cause injury is extremely low. Carbon dioxide pipelines are proven to be safe, and transportation by pipeline is the safest way to transport hazardous liquids. (FF ¶ 59.) While the

consequences of a leak or spill may vary based on what is being transported through the pipeline, the causal factors of a leak or spill from a carbon dioxide pipeline are no different for CO2 pipelines than other hazardous liquids pipelines. (FF ¶ 99.) As Steve Lee testified, 80% of the factors to consider with respect to all carbon-steel pipelines are consistent and transferable knowledge, while geographical differences related primarily to construction account for 10%, and the product transported through the pipeline is the remaining 10%. (*Id*.) As John Godfrey testified, "steel doesn't care what's in it," and there are no unique threats to a CO2 pipeline that would lead to a greater probability of failure other than internal corrosion due to impurities or the risk of ductile fracture, which are not issues for Navigator's Pipeline because of the exceptionally pure CO2 that comes from ethanol plants and Navigator's use of proven design standards to mitigate the risk of ductile fracture. (*Id*.) The first question is not what happens if there is a leak or spill, which is the subject of emergency response and also requires consideration of the likelihood that a leak or spill will occur in close enough proximity to any persons to affect them, but whether there will be one in the first place. Navigator's goal is zero incidents (FF ¶ 206), and its heightened design standards and leak-detection methods, as discussed in more detail below, make that a reasonable goal. No pipeline can be guaranteed not to leak, so every permitting decision, like many decisions made millions of times each day (e.g., getting on an airplane or driving a car to work) requires a risk-benefit analysis. Here, the risk of a leak is low, the risk of injury is lower, and the economic benefits of the Project are substantial. (FF ¶¶ 59, 99, 132.)

3. Navigator's plume modeling exceeds federal requirements and industry standards, and establishes that the Pipeline is appropriately routed and safe.

The Commission heard extensive evidence about Navigator's plume modeling. For context, no federal or state standard governs plume modeling, including whether it be done, where it be done, when it be done, what model or models should be used, what information should be assumed for purposes of the modeling, for what purpose the modeling should be done, and to whom, if anyone, it should be disclosed. Navigator proactively determined that it would use plume modeling as part of its routing process; it engaged DNV and Integrity Solutions to assist with the modeling; it selected reasonable and appropriate models; it committed long ago to further modeling using different models as part of its analysis of "could affect" HCAs; it used the modeling that has been done in routing the Project; it provided an early overview of its modeling to Staff; it provided extensive additional information to the Commission subject to confidentiality because of the proprietary nature of its work; it explained the modeling at length through testimony and documentary evidence; and it most recently agreed to the public disclosure of mapping based on the modeling.

In response, the Landowners have challenged Navigator's modeling as: (1) unreliable because it was not done with models using computational fluid dynamics ("CFD"); (2) it was not based on a worst-case scenario and the inputs were not reasonable; and (3) it should have been given to counties and emergency responders long ago. As explained in detail below, Navigator's plume modeling has been validated by multiple experts, including Staff's consulting witnesses; its methodology was reasonable; its results are reasonable; and it has been appropriately used.

Navigator selected two models for its analysis. It retained Integrity Solutions to do modeling using ALOHA, which standards for Aereal Locations of Hazardous Atmospheres.

Navigator selected ALOHA because it is widely used by first responders in the field. (FF ¶ 137.) Navigator also retained DNV to do modeling using its proprietary PHAST program. Navigator chose PHAST in part because it was available through DNV and in part because the model had been validated through a real-world experiment in 2015 with empirical data and published research data and testing results. (*Id.*) John Godfrey and Staff witness Matt Frazell both testified that Navigator used appropriate modeling. Frazell testified that both PHAST and ALOHA represent industry best practices and are widely accepted models in the industry for consequence analysis and dispersion modeling. (FF ¶ 138.) Godfrey testified that use of these models was "a prudent approach." (*Id.*) Frazell was familiar with DNV's validation of PHAST through its real-world experiment in 2015 at Spadeadam, the results of which were published and "well-known." (FF ¶ 139.)

The only witness to criticize the models used was the Landowners' expert Dr. John Abraham, who has zero experience using plume dispersion modeling in the routing, design, or construction of a pipeline, and who was not even familiar with DNV's real-world experiment, despite the results having been published. (FF ¶ 143.) Dr. Abraham insisted that CFD modeling is more reliable because it is more detailed and uses inputs for terrain. (FF ¶ 140.) From this, he incorrectly concluded that the results of Navigator's modeling must be unreliable.

Dr. Abraham's testimony was flawed for several reasons. First, he testified that CFD modeling could be done for a representative flatland scenario with minimal terrain changes and that few if any locations on the Project route would require site-specific modeling. (FF ¶ 141.) Godfrey testified that for a representative flatland scenario, PHAST modeling would yield a similar result and accomplish the same thing because the power of CFD modeling comes from being able to model obstructions and terrain effects, so if that were not being done, there would

be no advantage to using CFD modeling. (*Id.*) In fact, Dr. Abraham testified that "you do not need to use CFD everywhere." (FF ¶ 142.) Staff witness William Byrd agreed with this; he testified that CFD modeling is more appropriate for site-specific and overland flow analysis, which is used to inform risk management decisions such as higher integrity pipe or enhanced emergency response and it not normally used to determine a pipeline's route. (FF ¶ 140.) Second, despite testifying that CFD is not expensive or time-consuming and that he could do it with a free model and a desktop computer with information he had received as of the date of his testimony, Dr. Abraham did not run a model for any location on Navigator's route, which would have allowed a direct comparison between his results and those obtained by Navigator. (FF ¶ 144.) Third, while a respectable academic, Dr. Abraham has no real-world experience with plume-dispersion modeling, CFD or otherwise, for a hazardous liquid transmission pipeline. (FF ¶ 143.) He was unfamiliar even with DNV, an international standards body, including the results of DNV's validation of PHAST, and in an effort to question the reliability of PHAST, he relied on outdated studies done before DNV's 2015 real-world experiment that resulted in updates to its modeling program. (FF ¶ 143.) By more than a preponderance of the evidence, Navigator's choice of models was reasonable and appropriate.

The results of Navigator's modeling are discussed in Exhibits N62 and N47A. (FF ¶ 134.) Navigator used a worst-case guillotine rupture of the pipe and maximum operating pressure for the release rate. (FF ¶ 148.) Matt Frazell testified that the release pressure at maximum operating pressure was adequate for the modeling and that the distances yielded by the modeling seemed reasonable. (FF ¶ 149.) As Steve Lee testified, the inputs used for the modeling are subjective, which is part of the reason why Navigator retained consultants to assist with the modeling. (Tr. at 1092:7-25.) As part of its work, DNV verified the reasonableness of

the inputs Navigator used. No evidence in the record establishes that the results of Navigator's modeling are not reasonable or reliable.

Based on the modeling, Navigator selected the most conservative results for a guillotine rupture for each line size and established a baseline design or initial-routing buffer distance for each pipe size that applies to residential structures and gathering places. (FF 148; Ex. N62.) Navigator also established buffers for design and operations, emergency response, and public awareness, although Navigator's emergency response plans and public awareness will be much larger than the buffers originally shown in Exhibit N62. (*Id.*) Again, Frazell testified that these distances seemed reasonable, and no other expert questioned the buffers that Navigator determined based on the modeling results.

Frazell testified that it would be helpful if Navigator produced a map showing the results of the modeling on HCAs. (Tr. at 1980:6 to 1981:7.) Jon Thurber testified that he thought Frazell would use 40,000 ppm to create the mapping buffer to understand the worst-case scenario. (Tr. at 2946:19 to 2947:5.) Commissioner Nelson suggested that a map be prepared showing the buffer distance based on an exposure of 40,000 parts per million, which after 30 minutes of exposure would cause effects immediately dangerous to life or health. (Tr. at 3315:12 to 3316:16.) Based on this testimony and an exchange with Commissioner Nelson, Navigator produced a responsive map, which was admitted as a public document as Exhibit N68. (Tr. at 3413:15 to 3414:10.) The mapping shows the maximum possible distance a plume containing 40,000 ppm of CO2 could travel based on nine different plume models runs that Navigator conducted. This exposure level is referred to as Immediately Dangerous to Life and Health ("IDLH"), but these effects occur only after a 30-minute exposure. The buffer is a greater distance than Navigator's initial routing buffer because potential exposure levels in that buffer

are higher in the event of a rupture. The buffer distance is based on a worst-case scenario. (FF ¶ 148.) The mapping is for demonstrative purposes, and does not show a distance within which structures should not be located. (Ex. N47A.) Navigator shared the mapping with Staff before offering it in evidence to query whether it was responsive to Frazell's request, and Staff advised that it was responsive. (Tr., 8/24 at 35:22 to 36:2.) The document is public, and Navigator has committed to produce additional mapping based on site-specific modeling that yields different results at any location. (FF ¶ 146.)

As part of the emergency response training that has occurred so far, Navigator has discussed its plume modeling and shared the initial routing buffers. (FF ¶ 152.) Navigator intends to make more information available as the process of training emergency responders progresses. Navigator did not share the plume-modeling results with any county officials before the hearing. The record contains no evidence that any county official asked Navigator for the modeling. When pressed repeatedly, Commissioner Joseph Kippley testified that he did not think that Minnehaha County needed to see the modeling because reviewing the sufficiency of that information was a matter for the Commission, not the County. (Tr. at 3662:19 to 3663:19.)

4. Navigator's design and engineering standards are exceptional.

No witness challenged the myriad of ways in which Navigator's design and engineering of the Pipeline have exceeded federal requirements and industry standards. There is no evidence in the record of any deficiency in, and in fact no challenge to, Navigator's design and engineering. Steve Lee was on the witness stand for hours. While he received many questions about plume modeling, he received almost none about the details of Navigator's design and engineering. Thus, the information on these topics that is contained in his prefiled testimony was unchallenged at the hearing.

First, the PHMSA exceedance table documents the ways in which the Pipeline design exceeds federal requirements under 49 C.F.R. Part 195. (Ex. N22.) The Pipeline is designed with increased nominal wall thickness in excess of federal requirements found at 49 C.F.R. § 195.106; while a design factor of 0.72 is compliant with federal law and industry standard, Navigator's design exceeds this. (*Id.*) Navigator also developed an enhanced API 5L-PSL2 line pipe specification that exceeds 49 CFR Part 195.112. (*Id.*) Lee was not asked any questions about these design standards.

Second, Navigator has sought outside design and engineering reviews. Navigator has gone above and beyond by designing the pipeline to be in compliance with DNV-RP-F104, a design standard promulgated by Det Norske Veritas, and asking DNV to verify its compliance with that standard. (FF ¶¶ 80, 82 .) DNV has verified compliance, and John Godfrey testified that the DNV standard is the only international standard for the design and operation of a CO2 pipeline. (Tr. at 1263:13 to 1264:8.) Navigator has also asked PHMSA to conduct a design review, which is a service provided in PHMSA's discretion for larger projects exceeding $2.5 billion in capital investment. (*Id.* ¶ 84.) Navigator has been consulting with PHMSA about the Project since 2021, and currently meets with PHMSA quarterly. (*Id.* ¶ 64.) To date, PHMSA has expressed no concerns about Navigator's design and engineering of the Pipeline. (*Id.*) These are pro-active steps beyond what Navigator must do and demonstrate not only its commitment to the safety of the Pipeline, but also that the Pipeline has been designed and engineered to be safer than required. In addition, Navigator has worked with outside engineering firms other than DNV in the design of the Pipeline, including Integrity Solutions LTD and LJA Engineering Inc., which has performed detailed engineering design of the pipe, mainline valve settings, and the launcher/receiver facilities. (*Id.* ¶ 87.) Navigator has separately retained

Trimeric Corporation to provide additional quality and technical review of LJA's engineering work. (*Id.*)

Third, the Pipeline is regulated by PHMSA. PHMSA's current regulations are adequate, and PHMSA's oversight is rigorous and intrusive. Two outside experts, Mark Hereth and Staff witness William Byrd, both testified that PHMSA has jurisdiction over Navigator's proposed Pipeline and will regulate it. (FF ¶ 66.) The scope of PHMSA's regulation covers design, construction, operation, and emergency preparedness and response. (*Id.* ¶ 61.) The fact of PHMSA's jurisdiction is especially undisputed given PHMSA's ongoing quarterly meetings with Navigator. (*Id.* ¶ 64.) The adequacy of PHMSA's regulation of Navigator's Pipeline is demonstrated by the historical safety record of CO2 pipelines in the United States. (*Id.* ¶ 59.) While PHMSA has undertaken a new rulemaking in response to the incident in Satartia, the fact of the rulemaking is not evidence that PHMSA's current regulation is inadequate, and the new rulemaking is unlikely to impose any design or construction standards that Navigator's proposed design would not meet or exceed. (*Id.* ¶ 66.) The new rulemaking is unlikely to address improvements in design and construction, and more likely will address emergency preparedness and response and public engagement. (*Id.* ¶ 67.) Denbury was cited for failure to follow existing regulations. (*Id.* ¶¶ 158-159.) Both Hereth and Byrd testified that there is no reason for the PUC to wait for the conclusion of the current rulemaking, which could take years, to issue a permit in this docket. (FF ¶ 65; Tr. at 584:8-15; Ex. S2, p.11:41 to 12:7.) As for the rigor of PHMSA's oversight and inspections, Byrd testified that as part of PHMSA's routine auditing program, PHMSA inspectors ask "incredibly detailed questions" and undertake a "pretty rigorous" review. (*Id.* ¶ 62.) PHMSA's integrated inspections and program-by-program audits are "a lot of work for the operator" and "a lot of work for PHMSA." (*Id.*) While the Commission must consider

the safety of the Pipeline as part of its determination whether Navigator has met its burden of proof under SDCL 49-41B-22, the fact that PHMSA is Navigator's primary regulator with respect to safety and that its oversight is rigorous demonstrates that the Pipeline will be safe.

Fourth, CO2 from ethanol plants is especially pure and will meet Navigator's specification of 98% purity, which will be required for transportation on the Pipeline and will be monitored and guaranteed by automated equipment at each compressor facility. (FF 32-33.) There will be no hydrogen sulfide (H2S) in Navigator's pipeline, although H2S was present in Denbury's pipeline in Satartia and its presence distinguishes that event from any possible release from Navigator's pipeline with respect to both how the plume travelled and the toxicity of the release. (FF ¶¶ 161-162.)

Fifth, while fracture propagation is a known issue with CO2 pipelines, Navigator has retained DNV to assist with an extensive fracture propagation and ductility analysis to determine the required metallurgical properties for the proposed Pipeline, and will use crack arrestors, which is a redundant practice recognized as effective in preventing fracture propagation. (FF ¶ 85.) No expert testified that these steps are inadequate or ineffective.

Sixth, the Pipeline will employ cathodic protection to prevent external corrosion and the pipe will be coated with Fusion Bonded Epoxy before installation, which are redundant methods to protect against external corrosion. (FF ¶ 91.) There is no evidence in the record that these methods are not effective in preventing external corrosion.

Seventh, Navigator is committed to the use of materials inspectors during pipe manufacturing and external inspectors during construction, and these inspectors will be in addition to PHMSA inspectors who will be onsite during construction, and any third-party inspectors required by the Commission through a permit condition. (FF ¶¶ 88, 175.)

Eighth, Navigator has committed to using union labor because of the additional training that union workers receive and the skills they offer. (FF ¶ 92.) The qualification and training of the union workforce was demonstrated through the undisputed testimony of three union representatives at the hearing.

Ninth, Navigator worked with union representatives to qualify the welding specifications for the Project, which included third-party observers and laboratory destructive testing to ensure compliance with the specifications. (FF ¶ 92.) Non-destructive testing will be performed on 100% of all field welds, which exceeds PHMSA's requirement of 10%. (*Id.*)

Tenth, the pipeline will be installed with a standard five-foot depth of cover, which exceeds federal requirements and industry standard. (FF ¶ 38.) This not only allows for normal farming practices over the pipeline, but also provides an additional level of safety considering that the most common cause of damage to underground transmission lines is excavation damage. (FF ¶ 94.) This depth also allows Navigator to install warning tape above the pipeline and below the plow line as another layer of safety from excavation damages. (FF ¶ 200.) The landowners' efforts to dispute this, including the ridiculous and apparently perjured tractor photograph, are not a serious response to a serious issue. (Tr. at 2276:13 to 2277:12; Ex. LO134.) The pipeline will be installed at greater depths where it is bored or drilled. (FF ¶ 54.)

Eleventh, no expert testified to any issues with valve spacing, design, and operation. The spacing for the 18 valves in South Dakota is shown on Ex. N42, which also shows HCA impacts. (FF ¶ 96; Ex. N42.) Staff witness William Byrd was the only witness to address this issue and he said that Navigator could probably provide the same level of safety with fewer valves; he testified that the valve spacing in South Dakota "seems to be more than adequate." (FF ¶ 97.)

Twelfth, there are no known geohazards to the Pipeline that cannot be mitigated. Tim Cowman, the State Geologist, testified that there are no geological formations along the right of way that pose a risk to pipeline safety. (FF ¶ 100.) He also testified that he was not aware of any geologic formations that would be a threat to the safety of the Pipeline if the route shifted slightly. (*Id.*) Staff witness Sara Throndson also testified to a low risk of subsidence in the area of the proposed route, and in her opinion Navigator has sufficiently addressed necessary mitigation measures. (FF ¶ 104.) Similarly, the Project is located in an area of low seismic probability with no faults within 100 miles of the Project area, so soil liquefaction, which typically occurs when loose, saturated soil is subject to a seismic event, is an unlikely threat to the Pipeline. (FF ¶ 103.) In addition, Navigator has conducted a Phase I geohazard assessment of the Project route, which confirmed that there are known mitigation methods for any geological hazard that may be identified during the second phase of the geohazard assessment, which will use field verification of the Phase I desktop analysis. (FF ¶ 102.) The additional information garnered from the Phase II assessment will inform construction techniques that may be required at certain locations. (*Id.*) Navigator will provide the results of the Phase II assessment to the Commission upon completion. (FF ¶ 105.)

For all of these reasons, Navigator has proved that the design and engineering of the pipeline, which is the primary driver of safety and first line of defense against leaks or spills, is more than sufficient to meet its burden of proof.

5. Navigator's leak detection systems exceed industry standards and federal regulation.

In addition to design and engineering, Navigator's leak detection systems and integrity management program exceed industry standards and federal regulation. Navigator's integrity management program is governed by 49 CFR Part 195 and is continuous and ongoing.

Navigator will develop an Operations Manual that will be routinely reviewed and updated throughout operation of the Pipeline. (FF ¶ 189.) The integrity management program is overseen by PHMSA, which will require that Navigator must prove that the pipeline is safe. (*Id.* ¶ 190.) The process will involve intrusive inspections, inline inspections, pressure testing, and physical inspections of pipe at certain locations based on anomalies discovered during operations or the pipeline's location with respect to "could affect" HCAs. (*Id.*)

Navigator will install a supervisory Control and Data Acquisition (SCADA) system to efficiently and effectively facilitate safe operation and monitoring of the Pipeline. (*Id.* ¶ 191.) To ensure that the Pipeline's maximum operation pressure ("MOP") is not exceeded during operations, there will be pressure control set points at all capture facilities and launcher receiver sites. Each pipeline segment and facility piping will have independent over-pressure devices that are calibrated to open at a set pressure that is at or below MOP for a controlled release of carbon dioxide to the atmosphere. (*Id.*) The SCADA system and all operation will be monitored 24/7/365 through a redundant and fully functional Operational Control Center ("OCC"), with a back-up OCC located in a different area of the country. (*Id.* ¶ 192.) The OCC will be staffed by at least two dedicated operators at all times. (*Id.*)

The Pipeline includes multiple features that meet or exceed PHMSA requirements and industry standards to prevent or minimize leaks, including: mainline isolation and control valves; internal and external corrosion protection equipment; initial and ongoing integrity validation of the Pipeline; and the installation and use of a state-of-the-art leak detection system that will use both continuous and non-continuous monitoring. (FF ¶ 195.) Non-continuous monitoring includes aerial patrol every 10 days weather permitting, but a minimum of two times per month, and use of an in-line inspection tool to validate pipeline integrity. (*Id.* ¶ 197.) Both

will occur more frequently than required by federal regulation. (*Id.*) Continuous monitoring will consist of a variety of compensated mass balance monitoring, real time transient modeling, negative pressure wave technology, fiber-optic sensing cables, and strategically placed CO2 monitoring devices. (*Id.* ¶¶ 198, 203.) Fiber-optic sensing cables, which uses acoustics to identify third-party activity or the acoustic signature of a CO2 release, will be used; Navigator is still determining the feasibility of installing fiber-optic cable where the Pipeline is drilled or bored. (*Id.* ¶ 203.)

Navigator is working with Penn State University to develop an odorant that can be detected but that does not cause internal corrosion or other issues, including problems at sequestration sites. (FF ¶ 205.) Navigator is optimistic about the prospects for finding a workable odorant. (*Id.*)

Navigator is also working with a third-party, Rave, to develop an emergency alert system, called NAV911, that would notify subscribers by text and email of an emergency. (FF ¶ 199.) Subscribers could be landowners or anyone within or along the Pipeline footprint who wants to be notified. (*Id.*) In addition to the text and email alerts, the system would make a phone call to each subscriber seeking confirmation of receipt of the message. (*Id.*) As part of the development, Navigator is working with counties that have emergency alert systems already in place. (*Id.*) A system like Amber Alert, which is a legislatively approved use of communication towers, is not currently allowed by the FCC.

Warning tape will be installed 24 inches above the pipe where conventionally installed to avoid and minimize the potential for unintentional third-party damage. (FF ¶ 200.) Navigator will participate in the 811 Call Before You Dig program and other public awareness programs designed to prevent unintentional third-party damage. (*Id.* ¶ 201.) Navigator will use a more

targeted and risk-based approach to different types of excavators to make sure that when certain excavators make an 811 call, someone from Navigator is present at the job site in an effort to prevent third-party damage. (*Id.*) Navigator's public-awareness program will extend five miles on both sides of the pipeline. (*Id.*) Navigator will also mark the pipeline as required by federal regulation with signs including owner contact information and an emergency response 800 number. (*Id.* ¶ 202.) As part of operations, Navigator will regularly check and replace signs that have been damaged or removed. (*Id.*)

During normal operations, Navigator will need very limited access to the permanent right of way and will follow common industry practice to provide notice between two weeks and two days before entering a landowner's property. (FF ¶ 207.) Navigator will make a good-faith effort to contact all landowners before entering their property in nonemergency circumstances. (*Id.*) Thus, while Navigator's standard easement allows for 24/7 access to the right of way in the case of an emergency, Navigator's standard practices will provide notice to landowners and endeavor to minimize disruption. (*Id*.)

As provided in Navigator's standard easement, if the Pipeline is decommissioned in the future, Navigator will comply with applicable state or federal regulation at the time. (FF ¶ 208.) Most pipelines are abandoned in place because removal requires that the ground be disturbed. (*Id.* ¶ 209.)

6. Navigator's emergency response and preparedness will meet or exceed all federal standards.

Navigator will comply with the emergency-response requirements of 49 CFR Part 195, Subpart F. (FF ¶ 211.) PHMSA requires that an emergency response plan ("ERP") be complete before pipeline operations begin, but Navigator has committed to exceed that by at least 90-180 days. (*Id*.) Preparing an ERP is a lengthy and collaborative process, which requires that

Navigator consult with local emergency responders, provide them training, agree on what equipment is necessary, determine appropriate response routes to particular locations, obtain contact information for responders and county officials, and otherwise develop and document extensive response-related facts that go into the ERP. (FF ¶ 213.) The completed ERP will likely be 400-500 pages. (Tr. at 1443:14-23.) The Commission has previously conditioned permits in pipeline dockets on filing with the PUC a copy of the ERP when it is complete pursuant to PHMSA's regulations; it has not required that the ERP be completed before a permit can be issued. (Amended Final Decision & Order, HP09-001, June 29, 2010, Condition ¶ 36; Final Decision & Order, HP14-002, Dec. 14, 2015, Condition 36.) Navigator completed the first draft of the ERP at Staff's request before the hearing and it has been filed as a public document, together with a document explaining and outlining Navigator's emergency response protocols and planning processes. (Exs. N45; N43; N6, Supplemental, Ex. A.) An ERP is reviewed in detail during routing PHMSA audits. Staff witness William Byrd testified that PHMSA has professional staff dedicated to reviewing ERPs and that the Commission can reasonably rely on PHMSA's expertise in reviewing the sufficiency of Navigator's ERP. (FF ¶¶ 221-222.) The continued development of Navigator's ERP will be overseen by Vidal Rosa, Navigator's Senior Vice President of Operations, who has 28 years of experience in pipeline operations and previous experience developing an ERP. (FF ¶ 217.)

Navigator has begun and will continue to meet with local emergency responders, county emergency managers, and other first responders. (FF ¶ 214.) Navigator first met with responders and officials in South Dakota in the Summer of 2022 during technical meetings held at the county level. (*Id.*) It conducted first-responder CO2 training in South Dakota, which many first responders from across the Project footprint attended. (*Id.*) The training overview

presented to first responders is in evidence. (FF ¶ 215.) Commissioner Joseph Kippley attended the training on behalf of Minnehaha County and testified that it was informative, frank, responsive to preliminary questions, and he knows that it will be followed by additional training conducted by Navigator. (Tr. at 3667:5 to 3668:14.) Navigator will next meet with emergency responders in South Dakota in October 2023. (FF ¶ 216.)

In determining what equipment local responders need to respond to an emergency, Navigator has deployed an online tool that will allow them to communicate about equipment needs and to request funding from Navigator through a grant program. (FF ¶ 219.) This communication will be ongoing throughout the life of the Project. (*Id*.)

As part of its emergency response work, Navigator will continue to meet regularly with local responders and will annually conduct unannounced drills that will be graded; the drills will include Navigator's own personnel and control-room personnel. (FF ¶ 218.) Navigator will station 80-100 full-time employees for operations across the entire Pipeline, with approximately 10-15 personnel located in South Dakota. (*Id.* ¶ 220.) These South Dakota employees will include a public-awareness employee and a damage-prevention employee. (*Id.*)

7. Navigator's construction and reclamation practices will protect property, persons, and the environment.

Navigator has prepared a detailed document setting forth its Environmental and Construction guidance ("ECG") that describes standards for avoiding minimizing, or mitigating impacts on stream and wetland ecosystems, wildlife habitat, cultural resources, and the human environment. (Ex. N19; FF ¶ 165.) The ECG, which is a standard document governing construction practices for linear-infrastructure projects, addresses the use of environmental inspectors, spill prevention and remediation, dust management, weed management, waste management, noise-impact mitigation, unanticipated discoveries, preconstruction issues, right-

of-way clearing, grading temporary erosion control, trenching, trench dewatering, lowering-in, backfilling, soil decompaction, rock removal, restoration of the preconstruction contours, hydrostatic testing, final grading, and restoration. (FF ¶ 166.) The ECG also addresses special pipeline construction procedures for agricultural areas, wetland crossings, waterbody crossings, trenchless installation, difficult soils, steep terrain, and winter construction. (*Id.*) Staff witness Adam DiAntonio recommended several additions to the ECG to address air quality, and his suggestions were adopted in the ECG submitted in evidence. (FF ¶ 167.) Staff witness Herbert Pirela, who adopted DiAntonio's testimony, reviewed the ECG and found it "robust and complete" and consistent with best practices. (*Id.* ¶ 168.)

Navigator also submitted an Agricultural Protection Plan, which supplements the ECG and addresses ways to avoid, mitigate, or minimize impacts to privately owned agricultural land. The plan addresses the use of agricultural inspectors, the construction sequence, points of contact with Navigator, and an array of mitigation measures, including effects on drain tile, wet-weather construction, and procedures for determining construction-related damages. (FF ¶ 169.) Navigator submitted the Agricultural Protection Plan to the South Dakota Department of Agriculture and Natural Resources, which did not offer any suggested changes to the document. (*Id*.)

With respect to drain tile, two experts testified about this issue and they agreed that drain tile can be successfully repaired when it has been cut during pipeline construction. (FF ¶ 176.) While Richard McKean, the Landowners' expert, testified that he chose not to work repairing drain tile in connection with a pipeline construction project, he agreed that drain tile can be successfully repaired. (*Id.*) Navigator's witness Steve Brandenburg testified that he has worked to repair drain tile that is damaged or severed during pipeline construction. (*Id.*) He explained

that his company has worked on similar projects to Navigator's, and that drain tile can be, and regularly is, repaired successfully following pipeline installation. (*Id.*) Navigator has committed to returning as many times as necessary to repair drain tile that is damaged during construction. (*Id*.)

With respect to wet-weather construction, the Commission questioned who makes the decision not to construct when the weather is too wet and fields may be damaged. This issue is addressed in Section 6.7 and 6.8 of the ECG. (FF ¶174.) Navigator's third-party environmental inspectors will work with the contractor and the landowner to determine when conditions are too wet for construction. (*Id.*) Navigator has committed to having its ECG and Agricultural Protection Plan enforced by the inspectors, including any additional third-party inspectors required by the Commission in permit conditions. (*Id.*)

Navigator will use third-party inspectors during construction, including utility, welding, coating, safety, agricultural, and environmental inspectors. (FF ¶ 175.) No inspector will be affiliated with Navigator, its affiliates, or the contractors. (*Id.*) Navigator has agreed to comply with inspection protocols by the Commission through permit conditions. (*Id*.) These inspectors are in addition to PHMSA inspectors who will be present during construction. (*Id.*)

Navigator has also prepared a Weed Control Plan that was submitted to DANR for review and that incorporated DANR's comments in the final document. (FF ¶ 170.)

Navigator submitted a draft Inadvertent Return Contingency Plan to Staff in discovery and will require its contractor to provide Project-specific plans before construction begins. (FF ¶ 171.)

Both boring and horizontal directional drilling ("HDD"), which are different construction methods, will be used at various locations for various reasons. Where used at road crossing,

railroad crossings, large waterbodies, or in other sensitive areas or areas with cultural resources, the pipeline depth will be at least 10 feet for a bore and typically at least 25-50 feet for an HDD. (FF ¶ 178.) When these measures are used for installation, additional measures will be taken to protect the pipe, including the application of an abrasion-resistant overcoat on top of the fusion-bonded epoxy coating. (*Id.*) No witness questioned the efficacy or any unintended effects of these construction methods.

Navigator will be required to acquire permits authorizing the crossing of county and township roads, which permits typically require that Navigator restore roads to their preconstruction condition. (FF ¶ 179.) If construction causes damage to county or township roads, Navigator will be responsible for the repair of those roads to preconstruction condition. (*Id*.) This issue is governed by statute, since Navigator must post a bond to ensure that any damage beyond normal wear to public roads, highways, bridges, or other related facilities will be adequately compensated. (*Id.*; SDCL § 49-41B-38.) Staff Utility Analyst Jon Thurber testified that Staff and Navigator have agreed that $10 million is an appropriate bond amount. (*Id*.) Thurber also testified that in previous Commission dockets in which a road bond has been required, no claims have been made on the bond. (*Id*.) Previous Commission practice has required that before the bond can be released after construction, all affected counties and townships must confirm their satisfaction with postconstruction road restoration. (*Id*.)

Staff witness Brian Sterner, who testified that he is not a soils scientist (Tr. at 2246:4-5), raised the issue whether the temperature of the pipeline at the injection points may have an impact on soil biology. But he did not know exactly what effects would occur and testified that any impact on productivity could be positive or negative. (FF ¶ 187.) His testimony on this issue is legally insufficient to satisfy the *Daubert* standard and the requirements for expert

testimony in South Dakota. Staff witness Herbert Pirela testified that "changes of soils temperature by pipelines along the right-of-way is not an issue of concern," and that "the overall effect on vegetation and crops associated with heat generated by the operation of pipelines is not significant." (FF ¶ 185.) This testimony is consistent with Exhibit 23 and Steve Lee's testimony that the temperature gradient of soil around the pipeline is affected within the first 12 inches, but there are negligible temperature effects greater than 12 inches above the top of the pipeline. (FF ¶ 186.) The record contains no evidence that normal pipeline operating temperatures will cause productivity issues or damage to crops. (*Id.*)

8. Navigator has complied with state and federal requirements and practices to protect cultural resources.

Navigator has consulted with the State Historic Preservation Office (SHPO) to address cultural resources. Only certain areas of the Project require federal permits under Section 106 of the National Historic Preservation Act, while some sections are subject to SHPO review under SDCL § 1-19A-11.1. (FF ¶ 117.) Navigator has voluntarily performed surveys in areas not subject to regulation in an effort to avoid impacts to cultural resources. Before commencing any survey work, Navigator provided a letter and scope of work to SHPO describing areas of high probability for cultural resources and potential USACE permit areas, to which SHPO has responded with recommendations that Navigator has agreed to. (FF ¶ 118.) Navigator has submitted a Level III Cultural Resources Survey Report as part of its USACE permit; SHPO acknowledge receipt and requested the 2023 survey results. (*Id.* ¶ 119.) Navigator provided a copy of its archaeological survey report, which contains its unanticipated discoveries plan, and Navigator incorporated edits to the plan based on comments from SHPO. (*Id.* ¶ 120.) Dr. Jenna Carlson-Dietmeier, the Interim State Historic Preservation Officer, testified that Navigator has complied with SDCL § 1-19A-11.1, and to date has complied with all of her recommendations.

(FF ¶ 121.) Additional cultural surveys will allow Navigator to decrease the number of areas where resources might be encountered during construction, thus allowing avoidance of those areas in advance of construction. (FF ¶ 122.) Dr. Carlson-Dietmeier agreed that use of an inspection team during construction as outlined in the unanticipated discoveries plan is appropriate. (FF ¶ 123.)

Navigator has implemented a tribal engagement program that includes engaging with interested tribes on cultural resources. (FF ¶ 124.) Participating tribes are meeting monthly with Navigator. (*Id.*) Interested tribes have been invited to accompany Navigator on its cultural surveys and to perform their own surveys. (*Id.*)

No evidence establishes that the Project poses a threat to cultural resources.

9. The Project does not threaten wildlife, biological resources, protected species, or water resources.

The evidence shows by a preponderance that the Project will not pose a serious threat of injury to the environment. Tim Cowman, the State Geologist, testified that the project poses only a minimal threat to the Big Sioux Aquifer. (FF ¶ 101.) Staff witness Brian Sterner testified that he has some concerns about effects on aquatic resources during construction, but agreed that if Navigator receives a permit from the U.S. Army Corps of Engineers, which also includes a water quality certificate from DANR, his concerns would be resolved. (FF ¶ 106.) While Sterner also stated that he thought additional field surveys for wetlands delineation were necessary, he agreed that Navigator must submit a wetlands delineation report to the USACE that if Navigator obtains and complies with such permitting, it would address his concerns about wetlands delineation. (FF ¶ 107.) Navigator is currently meeting with the USACE twice every month and has been meeting with the Corp at least monthly since inception of the Project. (FF ¶ 108.) Based on those meetings, Monica Howard testified that a substantial amount of surveys

have been completed and that formal delineation done on every feature that is crossed is not required by the Corps. (*Id.*) Moreover, the delineation is largely immaterial to the overall impact of the Project because delineation boundaries can change based on seasonal environmental factors and the impacts on wetlands are temporary and a construction-related issue. (*Id.*) Navigator's surveys have not discovered unexpected wetlands. Rather, surveys have shown the opposite, that while some areas hold water sometime during the year, they do not have the hydric conditions to support a wetland, so Navigator's mapping has been overinclusive. (*Id.*)

The Project is not a threat to federal and state-listed protected species. Hilary Morey with the South Dakota Department of Game, Fish, & Parks testified that the Department has consulted with Navigator and provided a siting letter to Navigator, including recommendations to avoid and minimize impacts to wildlife. (FF ¶ 111.) Further consultation yielded a second siting letter in September 2022. (*Id.*) Navigator and the Department have collaborated to outline avoidance and mitigation measures for the Topeka Shiner and agreed that Navigator would use HDD for any stream crossings where Topeka Shiners could be present. (*Id.*) Similarly, Navigator and the Department have agreed to appropriate mitigation measures concerning the Lined Snake, which Morey recommended be memorialized in a permit condition. (FF ¶ 112.) Navigator worked with both SDGF&P and the United States Fish and Wildlife Service ("USFWS") to address acoustic bats, and Navigator is presuming presence of protected bats at unsurveyed locations, as addressed in the Biological Opinion issued by USFWS. (FF ¶ 114.) Morey testified that assuming presence is a common practice and appropriate. (*Id.*)

Although most of the Landowners who intervened in this docket have precluded Navigator from completing some survey work on their property despite the existence of a statute giving Navigator a right to survey access, *see* SDCL § 21-35-33, biological surveys are

approximately 99% complete and cultural surveys are between 80-85% complete. (FF ¶ 125.) With respect to threatened and endangered species, additional surveys are not necessary because Navigator is presuming presence and will proceed accordingly. (FF ¶¶ 114, 128.) With respect to federally protected species, Navigator has completed surveys required by USFWS. (*Id.* ¶ 128.) With respect to wetlands and cultural resources, areas not surveyed can be avoided through installation methods. (*Id.*) Navigator does not object to the permit being conditioned on completion of necessary geological surveys. (FF ¶ 129.) Ultimately, no additional survey work will affect the route, and any results can be accounted for by design, installation methods, or operational controls. (FF ¶ 130.)

Navigator and SDGF&P have worked together to address access to walk-in hunting areas during construction, and Navigator will provide 60-days' notice before construction affecting such areas. (FF ¶ 113.)

With respect to vegetation, cultivated crops account for 98.98 miles out of 112.61 miles of vegetated land in South Dakota. (FF ¶ 116.) Pasture is 7.82 miles, and developed land is 4.05 miles. (*Id.*) The Project affects a minimal area of native grasslands in South Dakota, 0.6 miles, some of which are near the Big Sioux River and Split Rock Creek. (FF ¶ 115.) Navigator will use HDD to install the Pipeline at most of these locations to avoid disturbing native grasslands, which Morey agreed was appropriate. (*Id.*)

C. The Project will not substantially impair the health, safety, and welfare of the inhabitants.

1. The economic benefits of the Project are substantial.

The Project will bring jobs, both temporary and permanent, to South Dakota during construction and operation of the Pipeline. Navigator estimates that approximately 600 to 1,000 workers will be used on the two construction spreads that originate in South Dakota and between

10 and 15 permanent employees will be located in South Dakota. (FF ¶ 227.) Based on these jobs, the payment of ad valorem and state and local sales taxes, and the direct and indirect effects of construction throughout the economy, the Project's economic benefits to South Dakota are substantial. (FF ¶¶ 228-232.) Both Jon Muller and Jared McEntaffer conducted economic analyses using a model developed by Regional Economic Models, Inc. (REMI), which is peer-reviewed, widely used by universities, and generally relied on for public-policy use. (*Id.* ¶¶ 228, 233.) No witness and no evidence challenged the model. In addition to wages and total dynamic economic output based on a capital investment of $142 million in South Dakota (which Navigator has updated to $154 million since Muller's study was done), Muller estimated that ongoing operations and maintenance was expected to be approximately $5.9 million per year. (*Id.* ¶ 230.) Muller did not attempt to estimate the actual ad valorem taxes that Navigator will pay in South Dakota based on the Pipeline being centrally assessed by the South Dakota Department of Revenue, but he used an estimate, which he determined to be reasonable, that the State would receive approximately $3.0 million annually in property taxes, and approximately $3.6 million from sales and gross receipts taxes in 2024. (*Id.* ¶ 231.) He estimated that the sales and gross receipts tax revenue would normalize to $1.4 million annually by 2030. (*Id.*) These amounts are substantial and no other witness challenged them. Muller testified that the positive economic benefits from the Project would be material, resulting in a $142 million injection of capital into the South Dakota economy. (*Id.* ¶ 232.)

Dr. McEntaffer's economic study, which also used the REMI model, was broader in scope, but yielded similar results about the positive economic benefits of the Project. (FF ¶ 234.) Dr. McEntaffer estimated that the combined Navigator and Summit Carbon Solutions projects in South Dakota and Iowa would increase the corn basis by nearly $0.19 after five years based on

an estimated 15% increase in ethanol production, which he determined was a reasonable forecast. (*Id.* ¶ 235.)

The Project has significant support from the ethanol industry. Fifteen out of fifteen ethanol plants in South Dakota have publicly committed to some level of carbon management technology. (Tr. at 273:17-24.) Brian Brinkman, the plant manager at Valero's plant in Aurora, testified about the importance of the Project to his facility and employees. (Ex. N47; Tr. at 346-386.) Valero's commitment to carbon sequestration is part of its board-approved response to its investors' request to provide greenhouse gas emission reduction plans, and Valero anticipates that its commitment to carbon capture will continue after the expiration of the 45Q and 45Z tax credits because of the development of low-carbon markets that will take advantage of low-carbon ethanol. (FF ¶ 50.)

Navigator's burden does not require that the Commission pass judgment on the policies that caused the United States Congress to pass the laws creating the 45Q and 45Z tax credits. The 45Q credit, initially passed during the administration of President George W. Bush, was later increased in value per ton during the Trump and Biden Administrations, respectively. (Tr. at 284:1 to 286:7.) The law is the law, and Navigator offered substantial evidence that the tax credits were intended to incentivize investment in CO2-reduction projects such as Navigator's proposed pipeline. Federal law has in fact incentivized that investment, and the resulting capital investment in South Dakota, which is supported by the ethanol industry, will be good for South Dakota, including South Dakota's farmers.

Staff did not retain a consultant to review the socio-economic consequences of the Project. No other party offered any evidence to contradict the conclusions of Dr. McEntaffer or Mr. Muller.

2. The Project is safe.

Navigator has never argued that the PUC should not or cannot consider whether the Project is safe. Navigator agrees with Commissioner Hanson's statement during the hearing that safety is paramount. While Navigator lodged objections to some of Staff's discovery requests based on federal preemption, its objections, which are not unusual in discovery,[1] did not prevent Navigator from providing Staff with the information it requested. The fact that PHMSA regulates pipeline safety does not negate the Commission's obligation to consider safety in connection with Navigator's burden under SDCL § 49-41B-22, and Navigator has not suggested otherwise.

For all of the reasons explained elsewhere in this brief, the Project is reasonably safe. Staff witness William Byrd, a preeminent expert in pipeline design and operations, testified for Staff, which is a neutral party and represents the public, that the Project should not pose a threat of serious injury to the environment nor to the social and economic condition of inhabitants or expected inhabitants of the siting area. (Ex. S2 at 12:30-34.) He also testified that the Project should not substantially impair the health, safety, or welfare of the inhabitants in the siting area. (*Id.*) His endorsement is significant validation of the Project, and without contrary expert opinion, the Commission should be comfortable based on this record in reaching a conclusion consistent with his opinion.

[1] For comparison purposes, Navigator invites the Commission to consider the objections made by Minnehaha County and Moody County to discovery that Navigator served. (Exhibits N69 and N18.) The fact of an objection is not evidence related to Navigator's burden of proof. *See* SD Pattern Jury Instruction 1-10-40.

3. The Project does not diminish land values.

The starting point in considering whether the Project will adversely affect land values is the current land uses along the Project route and how they will be affected by construction and operation of the Pipeline. The predominant land use, indeed, almost the exclusive land use, along the Project route is agricultural. (FF ¶ 238.) Navigator offered substantial evidence that the Project does not affect normal farming practices or continued agricultural production from the land, or even improvements on agricultural lands (e.g., new drain tile) as the landowner sees fit. (FF ¶ 250.) Consider: (1) where installed conventionally, the pipe will be buried at a depth of five feet, which is more than sufficient for normal farming operations and is one foot deeper than two previous pipelines permitted by the Commission (Dockets HP09-001 and HP14-001); (2) Navigator's construction plans and specifically its Agricultural Protection Plan were validated by Staff's witnesses; (3) other than yields during production for which landowners will be compensated, no Staff witness testified that construction and operation of the Pipeline would negatively affect production agriculture in South Dakota; (4) Staff's witness Herbert Pirela affirmatively testified that Navigator's proposed procedures were sufficient to mitigate against significant crop-yield loss resulting from construction (FF ¶ 184); and (5) the record includes substantial evidence in the form of studies and testimony that crop yields return to normal within a few years of construction. (Tr. at 3197:21 to 3198:14.)

Despite this evidence, a number of landowners testified that they think their property will be worth less if it is crossed by the Pipeline. Their testimony is contradicted by six published studies in the record that the construction of other hazardous liquid or natural gas transmission pipelines has not adversely affected property values. (FF ¶ 254.) While a landowner in an eminent-domain case in South Dakota is always entitled to offer an opinion of value, the

landowner's opinion must be based on the same sort of evidence on which an appraiser's opinion of value must be based. *State v. Henriksen,* 1996 S.D. 62, ¶ 20, 548 N.W.2d 806, 810. Here, no landowner offered more than a conclusory opinion unsupported by any facts. The closest any landowner came was testimony from Karla Lems that she tried to sell at auction a parcel that would be crossed by the Pipeline, and the auction resulted in a no-sale. (Tr. at 134-135; *Id.* at 154:11-12.) Despite offering this testimony as causal evidence, she was unable to offer any details about the auction related to price, including a reserve price or the difference between the highest bid and the reserve price. (*Id.*) Nor did she offer any evidence that the proposed pipeline was known to potential bidders and ultimately impacted their bidding decisions. Her testimony that she did not know those facts is not credible and should be disregarded. Indeed, the entirety of her testimony should be given little weight by the Commission, given her inappropriate ex parte communication with Commissioner Fiegen as reflected in the docket on August 25, 2023.[2]

Moreover, Navigator has voluntarily obtained something more than 30% of the easements that it needs for the Project. (Tr. at 3208:5-9.) It has pledged to work diligently to obtain voluntary easements from the remaining landowners, many of whom have told Navigator that they are waiting to see the outcome in this docket before negotiating further with Navigator. (Tr. at 3261:5-12; *id.* at 3324:10-12.) Ultimately, if Navigator and any landowners are unable to agree on land acquisition, the landowners will have the opportunity to prove in court that the

[2] This communication, which the PUC appropriately filed in the docket, is troubling. Lems is a State legislator and knows better than to directly contact a Commissioner in an active docket to which she is a party, is represented by counsel, and testified as a witness. If there were any doubt about whether she knows better, it is removed by the Commission's administrative rules prohibiting such contact. ARSD 20:10:01:02.01. Lems should have asked her lawyer the questions stated in her text message instead of directly contacting a Commissioner. As a State legislator, she occupies a position of influence and authority that makes her ex parte communication more significant, and troubling, than if it came from someone who is not an elected official.

Project will negatively affect their property values, and if they do so Navigator will be required to compensate them accordingly. Without evidence that the construction and operation of the Pipeline in South Dakota will reduce property values on a county-wide basis, the issue concerns compensation for individual instances of land acquisition and is not within the Commission's jurisdiction.

4. Navigator will indemnify landowners for damage caused by the Pipeline.

As stated in Navigator's standard easement, Navigator is financially responsible and agrees to hold harmless and indemnify landowners for any liability or damage resulting from Navigator's use of the easement. (FF ¶ 223.) Navigator agreed at the hearing to a permit condition that would make it financially responsible for any loss or damage except that caused by a landowner's gross negligence or willful misconduct. (*Id.*) As provided in the easement, Navigator will maintain insurance, including commercial general liability and umbrella liability insurance, and has already talked to its insurance broker about naming landowners as additional insureds on its policies and will consider that upon request. (FF ¶ 224.) Navigator further agreed at the hearing to ask its insurer for a waiver of subrogation against any landowner as part of its policies. (*Id.*) Finally, a landowner is protected by a standard farm liability insurance policy from the landowner's own negligence, so if a landowner negligently caused damage to the pipeline on his or her property, such damage would be covered by the policy. (FF ¶ 226.)

D. The Project will not unduly interfere with the orderly development of the region with due consideration having been given the views of governing bodies of affected local units of government.

1. Only two counties, and no municipalities, actively participated in the docket, and Minnehaha County and Moody County participated on only a limited basis.

Of the counties where the Pipeline would be located, Brookings County intervened in the docket, but did not participate in discovery or the hearing, has not filed any public comment, and has not adopted an ordinance that would regulate the Project. (FF ¶ 266.) Turner County did not intervene in the docket, has not filed any public comment, and has not adopted an ordinance that would regulate the Project. (FF ¶ 267.) Lincoln County intervened in the docket, but did not participate in discovery or the evidentiary hearing, has not filed any public comment, and has not adopted an ordinance that would regulate the Project. (FF ¶ 268.) Minnehaha County filed a letter in the docket about its emergency-response concerns, but did not intervene in the docket until Navigator asked the Commission to preempt under SDCL § 49-41B-28 its ordinance adopted on June 6, 2023. (FF ¶¶ 269-70 .) Minnehaha County obtained leave to intervene for the limited purpose of addressing Navigator's preemption motion. (*Id.*) Notably, Commissioner Kippley testified that the purpose of Minnehaha County's ordinance is not to foreclose hazardous liquids transmission pipelines from routing through the County. (Tr. at 3674:15-22; *id.* at 3685:10-21.) Moody County intervened in the docket but did not participate in the evidentiary hearing other than to respond to Navigator's preemption motion. (FF ¶ 272.)

The City of Sioux Falls did not intervene in the docket, nor did Brandon Valley, Valley Springs, Harrisburg, Flandreau, Brookings, Colman, Egan, or Aurora. The City of Canton intervened, but did not participate in the docket. The record contains public comment from counties not affected by Navigator's proposed route, but no comments from municipalities in the counties through which it will be sited.

Thus, while Minnehaha County and Moody County have passed ordinances, no affected county or municipality is on record opposing the Project. Both Minnehaha County and Moody County have stated that their ordinances are not limited to CO2 pipelines, so their ordinances

need to be considered in the context of Navigator's preemption motion, not as opposition to the Project.

Navigator has engaged in extensive governmental outreach. No local governmental official is on record that Navigator has not been engaged and responsive to local concerns.

2. Navigator considered future growth plans and there is no evidence that the Project will interfere with orderly development.

Navigator has considered future growth plans that are a matter of public record and reached out to counties as part of its initial routing process to find out about any known or anticipated developments in the near future that could conflict with the route. (FF ¶ 239.) Navigator also inquired about respective future growth plans. (*Id*.) With respect to Minnehaha County's future growth plans, Navigator considered the County's Envision 2035 Comprehensive Plan. As shown in Exhibit N70, Navigator's proposed route through Minnehaha County does not intersect with any future growth area identified in the plan. (*Id.*) No evidence in the record establishes that the City of Sioux Falls, the City of Brandon, or the City of Valley Springs intend their municipal limits to encompass the Project route anytime in the reasonably foreseeable future. While it is unknown what future growth may occur in Minnehaha County in 50-60 years, or in perpetuity, Navigator's permit application should be judged based on the County's current future development plans. Based on that standard, there is no conflict. Moody County lacks a future land use plan, although its comprehensive plan identifies agriculture as the most important land use that should be preserved. Kendra Eng testified that she did not see a conflict between the Project and continued use of agricultural land in Moody County. (Tr. at 3895:18-24.) There is no evidence in the record that the Project violates future development plans in Brookings, Turner, or Lincoln Counties.

The record contains substantial evidence that hazardous liquids transmission pipelines do not foreclose future development. Monica Howard testified that she has seen many places where municipal development, including the development of housing, schools, and parks, have abutted existing transmission pipelines. As she testified, in many cases, housing developments located next to a transmission pipeline are higher-end developments because a green space, often used for a park or greenway, is created around the pipeline and homes locate next to the green space and guarantee of no structures. (FF ¶ 240; Tr. at 3170:12 to 3170:13.) The record contains evidence that is true in Sioux Falls, with the development of the Prairie Tree neighborhood on both sides of two refined-products pipelines that serve NuStar's terminal in Sioux Falls, which is across the street from a relatively new Costco. (FF ¶ 240; Tr. at 1557:11 to 1558:6; *id.* at 1558:17 to 1559:1.) The record also includes evidence of schools in Lincoln and Minnehaha Counties that have been built in close proximity to transmission pipelines. (Ex. N72.)

For the Commission to reject this evidence and conclude that a CO2 pipeline will preclude future development, there must be some evidence that CO2 pipelines are incompatible with municipal growth. Such evidence is not only absent in the record, but contradicted by it. Existing CO2 pipelines are located in municipal areas in Houston and Monica Howard testified that municipal development has occurred around pipelines transporting ammonia and hydrogen, which is highly toxic. (Tr. at 3286:1-6.) While the Landowners rely on fear of an unknown because a CO2 pipeline has not previously been routed through South Dakota, their concern is not transferrable to all potential property owners and is therefore not evidence that safe operation of Navigator's Pipeline will preclude future development.

3. The Project will not interfere with the exercise of housing eligibilities in Minnehaha and Lincoln Counties, and if there is evidence that it does, Navigator will compensate affected landowners through the process of acquiring the land.

Housing eligibilities were created in Minnehaha and Lincoln Counties to protect agricultural land uses and to preserve the rural character of the land—their purpose is to limit residential sprawl into the country. (FF ¶ 244.) In Lincoln County, before a building permit may be issued for any new single family residence in the A-1 Agricultural District, a "Right to Farm Covenant" must be filed with the Register of Deeds. (FF ¶ 246.) This purpose of protecting agricultural land use has been turned on its head in this docket as an argument to preclude permitting the Pipeline.

Minnehaha and Lincoln Counties have both created housing eligibilities through their respective zoning ordinances, while Brookings, Moody, and Turner counties do not have housing eligibilities, but other zoning ordinances limiting housing development. (FF ¶ 241.) In Minnehaha County and Lincoln County, which have almost identical ordinance provisions on the subject, one housing eligibility is allowed on a quarter-quarter section (a 40-acre parcel). (FF ¶ 242.) The housing eligibility is floating, meaning that the landowner can locate it anywhere on the 40 acres, although the County must determine that it has appropriate road access. (*Id.*) To locate and use the eligibility, a landowner must obtain a conditional use permit and a building permit from the county. (*Id.*) A housing eligibility may be moved to a contiguous parcel under the same ownership. (*Id.*) If a certain number of housing eligibilities are aggregated, then a landowner must comply with the county's subdivision ordinance, which requires internal roads and utilities. (FF ¶ 247.)

The landowners who testified about housing eligibilities on their properties did not testify that they had specific plans to build a house or had obtained conditional use permits from the

county for certain locations. (FF ¶ 249.) Rather, they offered general testimony that they owned agricultural property with one or more housing eligibilities, and that in their opinion, the location of Navigator's Pipeline anywhere on their property would eliminate the value of their housing eligibilities. (*Id*.) As with their testimony about the effect of the Project on their property value in general, more than this is required. A landowner's opinion of the effect of the Pipeline on the value of a housing eligibility located some distance away from the right of way does not establish the market and is not evidence that a certain proximity to the Pipeline diminishes, or even negates, the value of the housing eligibility. On this record, any such conclusion is pure speculation. This is especially true given Navigator's testimony that it has negotiated with landowners and compensated them for claims that the location of the Pipeline has impaired the value of their land because of the existence of a housing eligibility. (FF ¶ 248.) In other words, if a landowner presents evidence of a permitted housing eligibility or an obvious location for a housing eligibility that would be affected by the Project route, and if Navigator is unable to locate the Pipeline on the property so that it does not directly affect the housing eligibility, then Navigator will compensate the landowner. Ultimately, this issue is not about orderly development, but about compensating landowners in appropriate instances supported by evidence for damages in the form of diminished property value.

While Navigator's easement acquisition status is lowest in Lincoln County, it is at 47% percent in Minnehaha County (Tr. at 3722:9-12), meaning that housing eligibilities are a potential issue on at most half of the parcels located in the county, assuming all remaining parcels have housing eligibility concerns, which is not likely, and it is not an issue in Brookings, Moody, or Turner Counties.

Conclusion

Navigator's Project poses no serious threat to the environment or the inhabitants where it will be sited. While CO2 pipelines are new to South Dakota, they are not a new type of pipeline, and with respect to their design, construction, and operation, they differ very little from other carbon-steel pipelines transporting hazardous liquids. Because Navigator has appropriately accounted for the toxicity of CO2 in the event of a release through careful plume modeling, conservative routing, rigorous operational controls, and well-planned emergency response, the Project will be safe. Because it has met its burden under SDCL § 49-41B-22, Navigator respectfully requests that it be granted a permit.

Dated this 29th day of August, 2023.

WOODS, FULLER, SHULTZ & SMITH P.C.

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