

DEVELOPING CARBON DIOXIDE INFRASTRUCTURE

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Good morning, everybody. Thank you to Caitlin and her colleagues at the North Dakota Law Review for inviting me here today from Washington D.C. It is my first time in North Dakota, and everybody I've met so far has been very welcoming and warm. It has been a great trip so far. I am honored to be with you all today as part of the Energy Law Symposium. I was talking to my twelve-year-old daughter earlier this week about coming to North Dakota, and she said, "Why are you doing this?" I said, "I'm going to a symposium." She said, "Well, what's that?" I just sort of answered without thinking about it. I said, "Well, it's just a conference." Then I looked up the word "symposium" this morning and it stuck in my head. Does anybody know what the word means—the origin of symposium? Anybody? Any brave souls? It has Latin and Greek roots, and it means drinking party. I do not think you should change "symposium." I think that is a good pick.

Again, my name is Jim Curry. I'm a lawyer at Babst Calland, and I am in our D.C. office. My focus is on energy regulatory law. I am a former federal regulator. My background is primarily in the pipeline sector. The presentations that Kevin Connors and Tade Oyewunmi gave are a nice background to the next step in the process. Now that we have talked a lot about what happens down under the ground, let's talk about how we move it around. I will talk about pipelines today. I started my career at the United States Department of Transportation in an agency called the Pipeline and Hazardous Materials Safety Administration ("PHMSA"). It was a great place to start my legal career. I started there in 2006 and was able to work on all kinds of interesting issues related to pipeline safety. I left PHMSA in 2010, and I have been in private practice since then. I focus on all kinds of pipeline projects. Hopefully I can provide some perspective on issues that the pipeline industry faces and some national perspectives that may be useful here in North Dakota as you consider a variety of carbon capture related pipeline projects.

While most of my practice is still focused on oil and gas pipelines, a fast-growing part of it is on CO₂ pipelines, and also in the hydrogen space as part of the energy transition. Our energy clients in the traditional oil and gas and the coal space have reached out to us and said, "We want to diversify. We

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want to do carbon capture storage (“CCS”). We want to do hydrogen. We want to do renewables.” They want to adapt to new markets and new demands from customers.

I will talk about the critical link in the CCS infrastructure today, and it’s pipelines. We are talking about moving CO₂ from industrial sources. Around here, there is a lot of ethanol production. The exhaust gas stream from an ethanol plant is almost pure CO₂. It is pretty easy to capture. You have these ready-made opportunities to pull CO₂ out of the ethanol production process and other industrial facilities as well. As a result of bipartisan infrastructure legislation and the Inflation Reduction Act passed over the last couple of years, we have a national policy that supports CCS now: 45Q. The tax credit has been around for a while, but it was really never enough on its own at previous levels to jumpstart CCS. CCS is expensive. Now that we do have that policy, it has really come into focus. We have an increase in that tax credit. We have capital support from the Department of Energy and a variety of other policy support that has supercharged this space in the last couple of years. North Dakota recognized this opportunity early. You are leaders in carbon capture and sequestration in terms of being able to permit Class VI wells at state level instead of waiting many years for EPA permits. You have really led on this. It is very impressive.

I want to talk with you about CO₂ pipelines that exist today in the United States. I will start by giving a bit of background on what they are used for, where they are, and their safety record. Safety is really important. A lot of my work is in the safety space, and so I will spend a fair bit of time on that. We will also talk about the other regulatory frameworks that apply. If you want to build a project, you have to get through the regulatory rubicon. So we will talk about economic regulation, siting regulation, to the extent it exists for CO₂ pipelines, at least at a federal level, and pipeline safety. We will also talk more generally about pipeline permitting and environmental reviews. Then we will talk challenges and opportunities. What do these frameworks mean for the CCS and the future of CCS? Is this going to be an easy and smooth road, or will there be bumps along the way? Where there are bumps: what can we be thinking about to smooth out the path ahead? That is the roadmap for today.

Let’s talk about the background of CO₂ pipelines. We have about 5,200 miles of CO₂ pipelines in the ground today in the United States. Most of those have served enhanced oil recovery (“EOR”) purposes. Injecting CO₂ into aging reservoirs improves their productivity. Of course, there are a number of proposed CO₂ pipeline projects in the Midwest, on the Gulf Coast, and in other parts of the country to transport CO₂ not for EOR purposes but for permanent sequestration. For example, some projects include Summit Carbon, Navigator, and Wolf Carbon. Most of these existing and proposed

pipelines move CO₂ in what we call a ‘dense phase’ or ‘supercritical phase.’ CO₂ is an interesting molecule. It behaves differently depending on combinations of temperature and pressure. It can be a solid, a liquid, a gas, or a dense vapor phase. The most economical way to move CO₂ is in that dense phase, or supercritical phase, where you compress it so much that it is not a gas anymore. It is more like a liquid. All of the projects, at least in this neck of the woods, move CO₂ in the dense phase for economic reasons. There are a handful of projects elsewhere in the United States that propose moving CO₂ in the gas phase. There are some interesting projects where operators of existing hydrocarbon infrastructure are looking at repurposing that infrastructure for CO₂ transport in support of CCS and EOR. We will talk a little bit about the phase differences introduced into the mix.

Fortunately, there is a mature regulatory program for the safety of these pipelines. I think that is something that stakeholders who have not dealt with CO₂ pipelines may not be aware of. This is because there are not a tremendous amount of them compared to the three million miles or so of oil and gas pipelines in the United States. There is a robust federal safety program that is not well known, although senior leaders at PHMSA have been promoting it. One of PHMSA’s deputy associate administrators testified on Tuesday this week before the Iowa Legislature to provide more information about the federal program. I think efforts like that are helpful because they give stakeholders confidence that there is a robust safety framework.

We have a good understanding as an industry on how to design, construct, and do operations and maintenance for CO₂ pipelines. There are some differences between CO₂ pipelines and oil and gas pipelines. There are differences in the risks that the pipelines pose, but they are well understood and straightforward. Of the 5,200 miles, several thousand of those miles have been in place for a generation, and they have a great safety record.

Let’s talk about the regulatory framework. So, you want to build a pipeline. What do you have to do? You have to run through the permitting rubicon. Let’s start with economic regulation, and by economic regulation I mean the regulation of common carriers, access, open access, rates, and tariffs. Some of you may be familiar with interstate natural gas pipelines, which have a very robust federal economic regulatory framework around them. There is the Natural Gas Act. Those pipelines need permits, right-of-way permits, and permits from the Federal Energy Regulatory Commission (“FERC”) to actually build the line, which are called Certificates of Public Convenience and Necessity. Natural gas pipelines also need a host of environmental permits. There is eminent domain at the federal level, and regulation of rates and tariffs.

There is no such framework for CO₂ pipelines, at least at the federal level. The only exception to that is if you are building a CO₂ pipeline and

you cross federal lands and need a right-of-way lease from the Bureau of Land Management (“BLM”). That is in the Mineral Leasing Act—a short provision—that requires a pipeline to provide common carrier open access in exchange for a right-of-way lease from the BLM, but that only applies on federal lands. That is really the only federal framework that exists for economic and siting regulation of CO₂ pipelines.

In the late 1970s, during a period of CO₂ pipeline development, the Cortez Pipeline Company was involved in a case at FERC, where the question presented was: is CO₂ a gas subject to the Natural Gas Act? FERC said no. It needs to be a hydrocarbon gas. They disclaimed jurisdiction under the Natural Gas Act in 1979. In 1980, the Surface Transportation Board (“STB”) evaluated that same question. STB has limited jurisdiction over non-energy pipelines under the Interstate Commerce Act, and STB had the same answer. They said CO₂ is not covered. So, if there is no federal overarching framework, where does that leave CO₂ pipelines?

So far, it has worked out okay. Five thousand two hundred miles of CO₂ pipelines have been built in the United States without support from a federal siting and economic regulatory program, but I think there is a diversity of opinions. I should say that all my opinions up here are my own and not necessarily those of my clients. I will say that there is a diversity of opinions on whether there should be a unified federal economic regulatory and siting program for CO₂ lines. I think the jury is still out on this question. On one hand, we have been successful developing projects over many years without that framework. On the other hand, there are real challenges in terms of building a large interstate system and you are dealing with a lot of regulators. As you cross state boundaries, a different set of expectations often comes into play. Will there ever be a federal program? I do not know. I think the notion of getting a siting program through Congress, one that would provide federal level eminent domain, seems hard. Politically, eminent domain is a difficult issue. It is radioactive. But we will see what the future holds.

Where does that leave CO₂ pipelines? Again, it leaves you with a mix of differing state-level requirements. Some states treat CO₂ pipelines under their general public utility statutes. If those pipelines provide common carrier access, the states will provide eminent domain. Some states’ public utility laws do not cover CO₂. There are many states in the middle where it is not all that clear, but the states are probably going to assert jurisdiction if the issue comes up.

Let’s talk about pipeline safety. Safety is serious business for pipelines, and for all stakeholders. Basically, our industry’s license to operate, in the eyes of the public and the court of public opinion, is based on how safe we are. This is something that our operator clients and developers are thinking about every day. Let’s talk about the regulatory framework in place on

pipeline safety. PHMSA administers a national pipeline safety regulatory program under the Pipeline Safety Act. They have a robust enforcement program as well, and they have regulated CO₂ pipelines in this dense or supercritical phase since the early 1990s. They received the authority for CO₂ pipelines in 1988. They do not currently regulate gas phase lines, so if a pipeline operates below that critical pressure—when the CO₂ is in a gas phase and is no longer in a dense vapor phase—PHMSA does not actually have regulations, but they are changing that. PHMSA announced that a rulemaking proceeding will kick off with a proposed rule in 2024, maybe earlier, to bring those gas phase pipelines into regulation. None of the lines, as far as I am aware of, in this region are gas phase lines. All of the proposed greenfield projects in this region are designed to operate in the dense phase and will be fully regulated.

In terms of what the regulations cover, we have a cradle to grave approach: design, construction, and initial strength testing. After you build these assets, you fill them with water and pressure test them to make sure they do not leak, and you test the strength and workmanship of the facility. There is also a program called Integrity Management where operators inspect the pipeline from the inside out using technology that is similar to an MRI machine. They put a magnetic field on the pipe, and they look for defects like dents, corrosion, and cracks. Operators must run those tools at least every five years, and in some cases, less than that. The regulations also cover pipeline inspections like right-of-way patrols, public awareness, and emergency response coordination with local officials. There is a federal program that requires the people who are working on the pipeline facilities to be qualified, via training and documentation. These are the same regulations that are in 49 CFR Part 195 that also apply to oil pipelines and to refined products pipelines. There are a couple of differences in the regulations that account for the different materials, properties, and behaviors of CO₂, but by and large, it is the same regulatory program.

There is an excellent safety record as well. You can go to the data section of PHMSA's website and select CO₂ pipelines, and you can see the full accident history going back to the early 1990s when they started collecting data on CO₂. The safety record is very good. It's not perfect, and there is some risk, but it's a very good safety record that compares favorably to the safety record of oil and gas pipelines.

Let's talk about environmental reviews and permitting for CO₂ pipelines. If you are in the oil and gas space and you want to build an oil or gas pipeline, the permitting regime for CO₂ pipeline is very similar in most places. There are some differences, but you need things like Section 401 Water Quality Certifications under the Clean Water Act, Section 404 Dredge and Fill Permits, and Water Crossing Permits. There are also a host of state

permits that are required, particularly in those areas where EPA has delegated authority to the states for implementation of environmental programs. There are also reviews and approvals under the Endangered Species Act and the National Historic Preservation Act. The Migratory Bird Treaty Act sometimes comes up.

Review under the National Environmental Policy Act (“NEPA”) only kicks in when you have a major federal action like a large federal permit. Otherwise, state-level NEPA processes will kick in. Then, of course, if your state has a pipeline right-of-way permitting framework, environmental review may apply there as well. Again, the big difference between what I just described and, for example, an interstate natural gas pipeline, is that for interstate natural gas pipelines, you have an agency that sits as the leader in terms of authorizing the project: FERC. In the CO₂ pipeline context, you do not have that federal leadership. It is a state-by-state approach. In that sense, it is like permitting an oil pipeline where FERC does have some jurisdiction over common carriage, but it does not do siting for oil pipelines. Siting a CO₂ pipeline, in terms of permitting, is pretty similar to siting an oil pipeline. That is a bit on the environmental route reviews and permitting.

Let’s shift gears and talk about challenges and opportunities. We just talked about permitting and safety. I think one of the key challenges is the narrative on safety, particularly in areas where we have not built a lot of CO₂ infrastructure. You might say, “Oh, this is carbon capture and sequestration. Everybody is going to be okay with this, right?” No. It is just like building any other piece of infrastructure—we have to work hard. Project developers in this area have worked hard to get information out there to stakeholders, local governments, and landowners about the safety and benefits of the project. That effort continues. It has gotten to the point where there is enough interest and there is enough controversy. CO₂ pipelines are now getting national attention. Part of that attention is around landowner issues. Part of that attention includes things like climate change and safety. All these things are wrapped up with each other.

I think it is important for stakeholders to know that there is a federal safety program, that it is robust, and that PHMSA is out there providing education to the states. If there are legislators in North Dakota who would like PHMSA to come out and speak, I think that they would do that. They were in Iowa earlier this week, so they are on something of a road show. What a PHMSA official said earlier this week is that we do have a good safety program. It is robust. We have an excellent safety record. PHMSA also acknowledged that this is not a zero-risk proposition. There are always going to be risks as there are with any other kind of pipeline facility. It is how you communicate that risk to stakeholders and landowners, and how you communicate your mitigation steps for that risk. The stakeholders want to

understand the safety risk and how you are going to mitigate that risk. Again, I think the project developers have been working very hard to get those messages out there.

There is going to be a PHMSA CO₂ pipeline public workshop sometime in June or July. I really hope they hold it in the Midwest because that is where all these projects are, but we do not know where it will be yet. PHMSA will post public notice of it on its website when it gets the details ironed out. Unfortunately, while there is this good safety program, there is also a narrative that has developed with allegations that PHMSA does not have a regulatory program for CO₂ pipelines or that its regulatory program is seriously lacking. Also, some of the environmental groups have even said there should be a moratorium on CO₂ pipelines. I think the facts do not support that. Certainly PHMSA, the federal regulator, does not support that. Look at the data: go on PHMSA's website, pull the data, and understand what the data says about the safety record. Again, that is not to say there is no risk. There is risk in everything we do in modern life, including the CO₂ pipelines. It is about mitigating that risk, understanding it, and meeting it head-on.

What is happening on the regulatory front on safety? PHMSA's regulatory program has been very dynamic in the last several years. They have updated a variety of its regulations that apply to oil and gas lines and CO₂ lines. We had significant updates in the regulations for risk analysis back in 2019. This bumped up what operators need to do to consider and mitigate risk. We have new requirements from last year where firms now require new construction, such as remote-controlled or automatic shutoff valves all up and down the pipeline. Those rules will apply to the new CO₂ development projects that are going on in this region. PHMSA has also announced a new rulemaking specifically on CO₂. We do not know what is going to be in it exactly, but the bulk of it will be to bring those gas phase CO₂ pipelines, under the umbrella with respect to the rest of the projects that are running dense phase and are already fully regulated. PHMSA will probably look back on some of the recent experiences with CO₂ pipelines. There have been releases. There was big release in 2020, in Satartia Mississippi. PHMSA is going to look hard at the lessons from that release. And PHMSA may propose regulations to adjust some of the programs that apply to CO₂ pipelines. The developers are ahead of that already. They have learned from that accident. There really are not that many accidents to learn from. There are some learnings that have baked into various programs and procedures for running risk, doing risk analysis, so on and so forth.

Let's talk about project information and balancing stakeholder interests. Energy is complicated. It is hard. You are never going to get full consensus on projects. There will always be folks who do not want projects. That is just a reality of modern life. There is a balance when it comes to sharing

information, particularly information that has security sensitivities, as part of any state permit proceeding. Agencies are going to request from developers a variety of project information. Most of that is pretty routine, such as maps, plans, and design information, but there is some material that is sensitive, such as consequence modeling. There is always a balance between how much information you should provide so the public is aware of what is happening and whether there is too much that could be used by somebody to harm a facility or people. That is not hypothetical. Perhaps you have heard about a film that is coming out called, “How to Blow Up a Pipeline.” You can see the trailer on YouTube. This is on people’s radar. So, we have to strike the right balance. You want to inform stakeholders, you want to give the public information and they need to understand what you are doing, but not everything can be open. Finding that balance is important. Protecting information that is truly sensitive is important. PHMSA will look at all of that information. It has authority over these projects. It will be looking at modeling information and providing feedback.

Preemption is another issue that comes up on these projects. I think a lot of this has its root in a misunderstanding of PHMSA’s role as a safety regulator. A number of counties throughout the Midwest have begun to adopt ordinances that zone out CO₂ pipeline infrastructure. Sometimes those ordinances are tied to safety concerns with respect to the asset. There is a strong preemption provision in the Pipeline Safety Act that prohibits states and localities from directly regulating an interstate pipeline facility. There are several lawsuits out there on this preemption question. A partial solution is continued education of the role of the federal program. Again, it was great to see that PHMSA is out there speaking at the state and local level on these issues.

Next, I want to talk about permitting and environmental review at a federal level. The thesis here is that if you want to build the infrastructure necessary to support modern life, a prosperous economy, and do low carbon energy, you must do something about federal permitting delays particularly with respect to NEPA. This is not just an oil and gas issue or a CO₂ issue. Projects of all kinds in the energy space—solar, wind, high voltage electric transmission, and oil and gas—are being delayed or canceled due to serial permit delays and litigation on permits and NEPA reviews. Even if you get a permit, the delays can sometimes be so bad that project financing is put at risk.

Stepping back from all of that, as a society we want to give stakeholders a voice, and at the same time we want to build things. Where is the right balance? It is one of the hardest policy questions right now in the energy space, and there are no easy answers. I will say that without reform, it is unlikely that we will actually dispense all of the money and do all the things

that are provided for in those two pieces of legislation: the Inflation Reduction Act and the infrastructure bill. There is just not enough time to spend the money if we have ten-year permit delays. We need solutions to find that balance between interests of stakeholders and the need to build projects. NEPA is one of the challenges here.

The Council on Environmental Quality did an analysis of all the NEPA reviews across all federal agencies and found that the typical Environmental Impact Statement takes four and a half years from start to finish. It is a long time. Water permits are another challenging area, particularly for pipeline assets. Another uncertainty is how different federal agencies implement environmental justice mandates: a series of executive orders from the president mandating that agencies take a variety of steps on environmental justice, their executive orders, and statutory law. I think all the federal agencies are struggling, and this is new for a lot of agencies. They are trying to figure out how to faithfully execute what the President has asked them to do, but they are doing it in different ways. I think that is an area that really calls for consistency and clarity. There are a lot of opportunities there.

Can we fix this? It's up to Congress. There is bipartisan interest in federal permit reform. This is a particular interest in the new House majority. Its first bill, HR 1, is on permitting reform. The bill would include significant streamlining for NEPA and Section 401 certifications. The bill is the start of a negotiation. Even in the Senate, there is bipartisan interest in permitting reform. You must get permits, and they are hard to get in many instances, so this effort in the current Congress picks up on the efforts of Senator Joe Manchin from West Virginia last year. Eventually that bill in some form, in compromise form, will make its way to the Senate for consideration. We will see. There is a lot of interest in this Congress.

I will leave you with a couple of other points. Since permitting is so hard, a lot of folks in the pipeline sector have looked at infrastructure repurposing. It is a lot easier to take a line that's already in the ground and use it for something else if it happens to be underutilized in hydrocarbon service. There are projects out there that have been announced. Tallgrass is one in Colorado, Nebraska, and Wyoming. There are regulations on conversion to service that require testing and integrity assurances before a line can be converted. It appears that the opportunities for CO₂ on infrastructure repurposing are probably a little bit more limited than a new build infrastructure. The pressures that you need to run to keep CO₂ in a dense phase require thicker wall pipe, and a lot of oil and gas pipelines do not have those same pressure demands. It may be hard to do widespread conversions, but it is happening where it is economic. I should say too that heavy wall pipe is another kind of important design feature for CO₂ pipelines. It provides additional protection

from one of the leading causes of pipeline incidents, which is people hitting pipelines with equipment during excavation activities.

If we could get through the permitting challenges and get CO2 pipeline projects built, you can build momentum on CCS. CCS has had fits and starts over the years. There have been other projects that just have not penciled out on the economics. I think with a bump in the tax credit, we are getting tail winds on the economics for CCS. The more we can get built, the more projects we can do, the more economies of scale we can realize, the more carbon we can capture. And these projects provide high paying jobs in rural America, support agriculture, particularly in this region, and continue to contribute to the all-above energy approach. That is what we could do with CO2 pipelines. That's all I have. I appreciate your attention today.