High-Level Radioactive Waste Advisory Council
Minutes of the November 8, 2024 Meeting
Virtual Meeting via Teams

Senator Roers, Chairman, called the meeting to order at 9:01 am.

Chairman Roers welcomed everyone to the meeting.
He welcomed new Council members, Jana Hennessey and Mirek Petrovic.

Ed Murphy was asked to assist with the roll call.

Advisory Council attendees:

Representative Jon Nelson, District 14
Representative Dan Ruby, District 38
Senator Dale Patten, District 39
Senator Jim Roers, District 46
David Glatt, Dept. of Environmental Quality
Andrea Travnicek, Dept. of Water Resources
Ron Henke, NDDOT Director
Dr. Nizar Wehbi, ND State Health Officer
Jana Hennessy, County Government Rep.
Mirek Petrovic, Agricultural Community Rep.
Ed Murphy, Geological Survey

Council members not in attendance: Kenneth Vein, City Government Rep.; Jeb Williams, ND Game and Fish; and Joshua Teigen, Dept of Commerce

Murphy noted that a quorum was present.

Additional people attending the meeting were: Featured Presenter Miriam Juckett (Pacific Northwest National Laboratory), Featured Presenter Jay Thomas (Pacific Northwest National Laboratory), Featured Presenter Rich Garman (ND Dept. of Commerce), David Stradinger (DEQ), and Marina Gasser (DMR).

The first order of business was to approve the November 22, 2023 meeting minutes. Senator Patton made a motion to approve the November 2023 minutes. Representative Nelson seconded the motion. The motion was unanimously carried on a voice vote that the minutes of the November 22, 2023 meeting be approved as written.

Ed Murphy reviewed the purpose and the duties of the Council as written in NDCC 38-23. He stated that the Council must submit a biennial report to the North Dakota Legislative Management Energy Development and Transmission Committee and the North Dakota Industrial Commission regarding its findings, according to Section 38-23-08. Murphy submitted his report to the EDTC and will present to the Industrial Commission on November 26, 2024, as part of his NDGS quarterly report.

The second order of business was a presentation from Featured Speaker, Miriam Juckett, Intergovernmental and External Engagement Advisor for the Nuclear Materials Storage and

Transportation program, at the Pacific Northwest National Laboratory. Jay Thomas, Team Lead with the DOE Office of Nuclear Energy Office of Storage and Transportation, opened with the mission of the Office of Storage and Transportation. It is to prepare to design a license to construct and operate one or more federal consolidated interim storage facilities for spent nuclear fuel sited through the DOE's consent-based process and provide for safe, secure transport and conduct research and development to address spent nuclear fuel and high-level waste storage and transportation operation needs now and in the future. He stated that one of their priorities is the package performance demonstration project where DOE plans to conduct physical demonstrations on a full-size spent nuclear fuel transportation cask. The main points of Juckett's "DOE's Spent Nuclear Fuel Package Performance Demonstration" presentation were: What is Spent Nuclear Fuel?; Spent Nuclear Fuel (SNF) Transportation Basics regulated by the U.S. Department of Transportation (DOT), the U.S. Nuclear Regulatory Committee (NRC) and the U.S. Department of Energy (DOE); DOE Package Performance Demonstrations (PPD) that tests the SNF casks at full-scale; Why DOE is Planning a PPD; Preliminary Plans: free drop, puncture, thermal, and immersion under water tests and realistic scenarios; DOE is seeking input on what potential casks to be used and what demonstrations should be performed; External Engagement Outcomes; Request For Information Categories, responses, increasing outreach and future reports.

Questions and discussion to follow.

Representative Nelson asked what the procedure is for communicating with the states and the communities that are being impacted when the spent nuclear fuel is going through. Juckett stated that the DOE has a communication forum through the National Transportation Stakeholders Forum (NTSF) through which DOE communicates with states and tribes about the transport of radiological materials. NTSF includes state, regional, and tribal groups that meet with DOE regularly to share information. Required, formal notifications to states and tribes along the routes are also in place. Thomas also stated that pre-planning with the state, tribes, and communities must take place.

Chairman Roers talked about local response and the responders' ability to deal with these situations, along with equipment and preparations, and if there will be a response team to accompany the transports. Juckett stated that there are a number of response teams and funds that will be available to help with emergency preparedness. The DOE designed railcars with systems to help avoid incidents and accidents. The train will also be escorted by a rail escort vehicle as a security component.

Murphy thanked Juckett for her presentation and asked if the timeline is still 10-15 years down the road. Juckett agreed that it was a fair timeline, but noted that with a consent-based process, DOE is moving at "the speed of trust" and it is only an estimate until there is willing consent. Murphy also asked what the lifespan of the casks would be. Thomas said the casks are designed and licensed according to the regulations at the time and if regulations do not change the ability of the cask to meet those regulations they can continue to be used and re-licensed. The licenses are normally good for 5 years and then they can be renewed. It is possible to have a cask that has been in service for 35-40 years providing that it has been maintained according to its safety analysis report and continues to function per the certificate.

Murphy also mentioned that Dave Glatt and the Department of Environmental Quality are notified when hazardous waste is being moved and assumed the same for the Department of Transportation. He

figured that this would be the same type of notification process when these materials were coming through the states. Juckett agreed. Thomas also agreed and stated that regulations require layers of notifications for certain materials and most go to the Governors' designee for either NRC Part 73 or Part 37 which is for low-level waste shipments and highway rate ground control quantities.

Chairman Roers moved to the next agenda item by introducing District 39 Senator Patten, a member of the Economic Development and Transmission Committee, to bring the Committee up to speed on the new regulations. Patten stated that when the Interim Committee met at Dakota Gasification they introduced a draft bill that would authorize $500,000.00 in spending by the State to study the opportunities and challenges that relate to developing nuclear energy in North Dakota. After some modifications, the bill draft was approved and will go forward in the next legislative session to be considered for approval. Senator Patten has been to the national laboratory in Idaho where they study nuclear energy. Patten stated that it is one of the biggest nuclear research facilities in the world. There is renewed interest in Alaska and Wyoming to develop their nuclear energy resources. Alaska is looking at small modular reactors (SMR). He doesn't believe there are any in the United States right now, but there are three in the world. He has been told that the SMRs have the ability to use other nuclear waste to further deplete the resource which results in further toxicity of the waste. Wyoming is also looking at SMRs and Patten has heard that they are considering a legislative bill that would authorize disposal of nuclear waste in Wyoming. He did not know how the bill would fare. Patten said that EERC would possibly be the entity to address the storage aspect as well as the transportation. AI and huge data centers have also triggered new relationships because nuclear plants are very reliable with very little downtime. The data centers want continuous power running 24 hours a day with high reliability. There are already a few plants in the United States providing power to data centers. In some cases, data centers would be built onsite or adjacent to the plants with direct delivery. North Dakota would provide huge 30-50% cost savings to the data centers, from a cooling standpoint, due to our weather. North Dakota must realize the value and benefit of nuclear before we can "sell it" to our communities, but it will be a big challenge.

Due to needing a quorum present, the Committee moved up the selection of a new chairman and voting agenda item. Senator Roers has chosen not to run for re-election in the Senate and his term will be ending in December. The Committee must now elect a new chairman. Roers stated that he has enjoyed being the Chairman since the Committee was formed. Chairman Roers opened the meeting up for nominations. Hearing none, Chairman Roers moved to nominate Senator Dale Patten for Chairmanship. He stated that Patten is very knowledgeable and involved in various energy topics in the Senate. Andrea Travnicek seconded the motion. No other nominations were made. Senator Dale Patten was elected to Chairman of the High-Level Radioactive Waste Advisory Council Committee by a unanimous voice vote. Roers thanked Patten for taking on the new role.

Chairman Roers introduced Rich Garman, the Director of Economic Development with the Financial Division of the Department of Commerce, and his potential future energy needs in the State based on the interest expressed by the energy industry and North Dakota's high energy needs presentation. He started with some economic development interests in North Dakota and his recent experiences from Wyoming and Utah. He agreed with Senator Patten and said that the biggest request for power in North Dakota right now is from the data and AI world. Rich has spent 30 years in the energy industry with the

last decade of those years working in economic development in the energy industry. He stated that during that time sub 50 megawatt requests were a big deal. All of the data projects that North Dakota could potentially receive start at 200 megawatts and move significantly higher. Entry-level asks are 200 megawatts and quickly move up to the gigawatt range. Garman said that some of the major data companies are here searching for sites, talking to power producers, and searching for solutions to serve power to data centers. Garman agreed with Patten stating that the biggest reasons the companies want to be here are reliable energy, our climate, and our impressive business environment. The major data companies are here and actively seeking opportunities. This week he and his team spent two full days meeting with a large company looking for gigawatt-sized sites. The first few companies that came to North Dakota wanted to be close to large communities, but they are quickly finding out that that is not where all of the other assets are located. The companies are looking everywhere, from the extreme northwest to the extreme southeast. If the different asks that North Dakota has gotten were roughly calculated, it would be in the 20 gigawatt (20,000 megawatts) range. We don't have that much, so there would have to be other solutions. One of the other major projects looking at North Dakota is an iron ore processing facility. North American Iron would take product from Minnesota, bring it to North Dakota, and process it. Their ask would be approximately 300 megawatts. That project would bring diversity to the economic landscape in North Dakota. There is an extremely large drive to build out sustainable aviation fuel projects right now. The pending acquisition of Red Trail Energy by Gevo hit the news a month ago. Gevo will expand the Red Trail ethanol process to make sustainable aviation fuel. There are three to four other sustainable aviation fuel projects that are looking to come to North Dakota. Carbon capture technology will have a large impact on power in North Dakota. Carbon capture technology retrofitted onto existing lignite-fired plants will take a reasonably large load to run those facilities. The last time Garman checked the numbers, current technology puts the carbon capture load at 30% auxiliary load. Direct air capture technology would use 1-2 megwatts +/- per ton of CO2 removed. The two projects in the state that are actually capturing/sequestering CO2 right now are some of the lower energy opportunities because they don't have to clean the CO2 steam nearly as much as the others. Those are the ethanol SAF plant opportunities. That's about 100 to 200 kilowatts per ton. They are not as significant, but still a load we need to consider when we're talking about total energy requirements for all these projects. There are dozens of other projects that take varying loads, but he tried to hit all of the big projects.

Questions and discussion to follow.

In October, Garman had an opportunity to tour the TerraPower site, the nuclear power site that's being constructed in southwest Wyoming. He got to meet with several people from Idaho National Labs and also spoke on a panel about what our power looks like in North Dakota. His approach for the panel was to convey that North Dakota needs as much power as we can to do the types of Economic Development that we would like to do. There is a consortium right now between Wyoming, Idaho, Utah, and Alaska (and possibly Louisiana) and they would love North Dakota to participate. Garman would like the Council to consider doing so from a learning aspect.

Chairman Roers introduced David Glatt, Director of Dept. of Environmental Quality, and his presentation on his findings from companies with high energy needs and what Glatt envisions in the future. Glatt stated, on the regulatory end, there are a lot of pressures on the existing energy generation fleet that we have in North Dakota as it relates to fossil fuel. They are seeing a lot of regulations come out regarding how we

start constraining CO2 emissions or greenhouse gas emissions from those facilities. Several of the regulations are pointed at single facilities, such as our coal fleet, which makes it tough for them to start making business decisions on the long term. A lot of regulations indicate that coal-fired fleet energy generation have carbon capture implemented by 2032. This might not be feasible as the construction alone takes four years, not to mention the design, permitting, and financing. In addition, this is still a developing technology. Companies may not be able to guarantee a 90% capture rate on a consistent basis, which is part of the rule. Our existing coal fleet has some tough decisions in the future unless the federal regulatory landscape changes. Companies that are looking at major energy needs say they need it now. So, they are looking at natural gas and looking to build their own facilities. Existing natural gas regulations state that you can build a new facility, but you can only use 40% of it. So, companies will have to overdesign/overbuild two and a half times to get the energy that they need to run their facility. Doing so doesn't make it very cost-competitive, but they are looking at this option. Nuclear does come up in discussions. Glatt talked to his counterpart at the regulatory agency in Wyoming and got some insight on what they're doing with nuclear at the Kemmerer facility. The facility is in construction now and they are hoping to have it up and running by 2031, but agreed to shut down their coal plant by 2025. The small community is for nuclear energy and the plant, but there won't be an economic development driver other than the construction workers for about six years. The community is trying to keep the coal facility operating until 2031, but the EPA has been reluctant to do so. Glatt was told that the government-to-government discussions were extremely helpful. The NRC was very easy to work with, very upfront and provided good information. Glatt's counterpart also stated that it's not just federal to state, but it's state to local and federal to local and it was very important to have those communications, along with industry. He also stated that the timelines were tough. It takes a long time to go through the design approval process and construction. It takes ten-plus years to get to completion. He said the power switch, going from coal to nuclear, was a tough balancing act. If you shut down the coal-fired power plant too soon the economic incentive from the community isn't there. His biggest issue was the waste handling. They have to "temporarily permanently" store the waste on-site and had to go through legislative changes to make that happen. Local support has been good, but people outside that community are giving pushback because they don't see the economic impact. Overall, what Glatt has heard is to start the government-to-government discussions and to keep the local communities informed during the process. Trust is the biggest issue for the local communities and how you go about getting people to trust in this. North Dakota has great potential, but might be limited by where we will get the energy. As far as nuclear goes, the waste is still a major issue to be dealt with as a state. There's a lot of groundwork that has to be done at the state level, working with the federal and local entities, to get nuclear moving forward.

Chairman Roers introduced the last presenters, Dave Stradinger and Ed Murphy, to discuss the Midwest Radioactive Material Transportation Committee meeting on October 8, 2024, in Bismarck. Senator Patten, Representative Jon Nelson, Chairman Roers and Dave Glatt also attended the meeting. Murphy began with the presentation by Joe Lynch, who has worked on eight different nuclear power plant decommissionings. He mentioned the decommissioning of the Kewaunee plant in Wisconsin. Lynch pointed out that a number of nuclear power plants have been shutting down in recent years because they can't compete with natural gas unless they had a long-term purchasing agreement in place. However, at the end of his talk Lynch pointed out that nuclear power is going through a "Renaissance" and that several of the facilities are restarting. One of the ones he talked about was Three Mile Island. Unit 1 is planning to restart by 2028 and Microsoft is going to buy all the energy that they can produce for the next twenty years until 2048. Stradinger mentioned that the decommissioning of the facilities takes a long time, and it's a step-by-step process and it is done in phases. Murphy added that if there isn't anything above Class C waste, everything goes to Clive, Utah. The next talk they sat in on was from Will Livingston, a postdoctoral research associate out of the University of Oklahoma. He spoke about consent-based sighting and conducting workshops with different groups of people, in order to gain information, find shared values, the see what the communities' long-term goals are. Based on the workshops they've conducted, people want input on design and also want veto power. Livingston said that the people most willing to participate in the roundtable discussions

on nuclear power tend to be males with a higher education degree and a higher income. Murphy figured that the crowd attending the Pierce County hearing held in Rugby, ND was 75% women and stated that they "had done their homework." Livingston found that people that are really negative as less likely to spend 90 minutes at a meeting twice a month. Codesign between the subject matter experts and the communities which allows the communities to have some input is a big part of consent-based sighting. Stradinger also sat in on presentations by Miriam Juckett, other Department of Energy offices, the National Transportation Stakeholders Forum, the ad hoc working groups, and the Tribal Radioactive Materials Transportation Committee. He also sat in on a roundtable discussion with each of the Midwestern states' representatives committee members regarding what has been going on in their states. Stradinger spoke for North Dakota and talked about the number of Highway route-controlled and non-highway route-controlled shipments that were transported through North Dakota since the last meeting, discussion on how that information is transmitted to the states (and that does go through DEQ as they are the Governor's designee), and the possibility for inspections on these shipments (mostly from Canada) as they come through. The Highway Patrol also gets notified, and they have the opportunity to do their inspections as the shipments are coming into the state. The roundtable also discussed other low-level radioactive waste coming out of the oil and gas industry, the regular meetings that the council has, the house resolutions that are looking into nuclear energy, and a recap of the Tenorm (Technologically Enhanced Naturally Occurring Radioactive Material) transportation and the sites that we currently have in North Dakota. North Dakota currently has one permitted landfill and some permitted injection sites. Stradinger also touched on maritime shipments and the safety aspects and design of those vessels.

Ed Murphy took a moment to say how much he appreciated Chairman Roers' work for the committee and expressed that he would be missed.

Chairman Roers thanked the committee members and stated that he has enjoyed being a part of the committee. He felt that the committee has accomplished what they were charged to do. Chairman Roers is excited to see Senator Patten and the committee take on the challenge of capitalizing on energy of all types, with nuclear being a big part of that conversation. He thanked Senator Patten for accepting the Chairman role. He commended Secretary Murphy for making the meetings so informative and easy to administer. Chairman Roers thanked Murphy and the entire committee for their time. In speaking with Senator Patten beforehand, he feels that the future is bright and that Patten is the right man for the job and wished him luck.

Chairman Roers adjourned the meeting at 10:51 am.