Report of the
HIGH-LEVEL RADIOACTIVE WASTE ADVISORY COUNCIL
to the
ENERGY DEVELOPMENT AND TRANSMISSION COMMITTEE

Edward C. Murphy
Executive Secretary of the High-Level Radioactive Waste Advisory Council

October 16, 2026

This report was presented to the Industrial Commission on May 12, 2026.

The High-Level Radioactive Waste Advisory Council was established in 2019 (North Dakota Century Code (38-23). The Council is to meet at least once per year and report its findings biennially to the Industrial Commission and to Legislative Management. The Council is also to review the site suitability of any proposed high-level radioactive waste facility and issue a report to either the Legislative Assembly (if in session) or the Industrial Commission, review high-level radioactive waste rules and standards and make recommendations to the Industrial Commission, consider any other matters related to high-level radioactive waste that the council deems as appropriate, and make recommendations to the Industrial Commission regarding the administration of the program.

The four legislative appointees and the three Governor's appointees all serve four-year terms on the Council. Chairman Jim Roers chose not to run for re-election in 2024 and the Council voted Senator Dale Patten in as Chair at the close of the November 8, 2024 meeting. In 2025, Senator Jeff Barta was appointed to replace Senator Roers and several new agency directors joined the council: Sherry Adams (Health Dept.), Christopher Schilken (Commerce), and Reice Haase, (Water Resources).

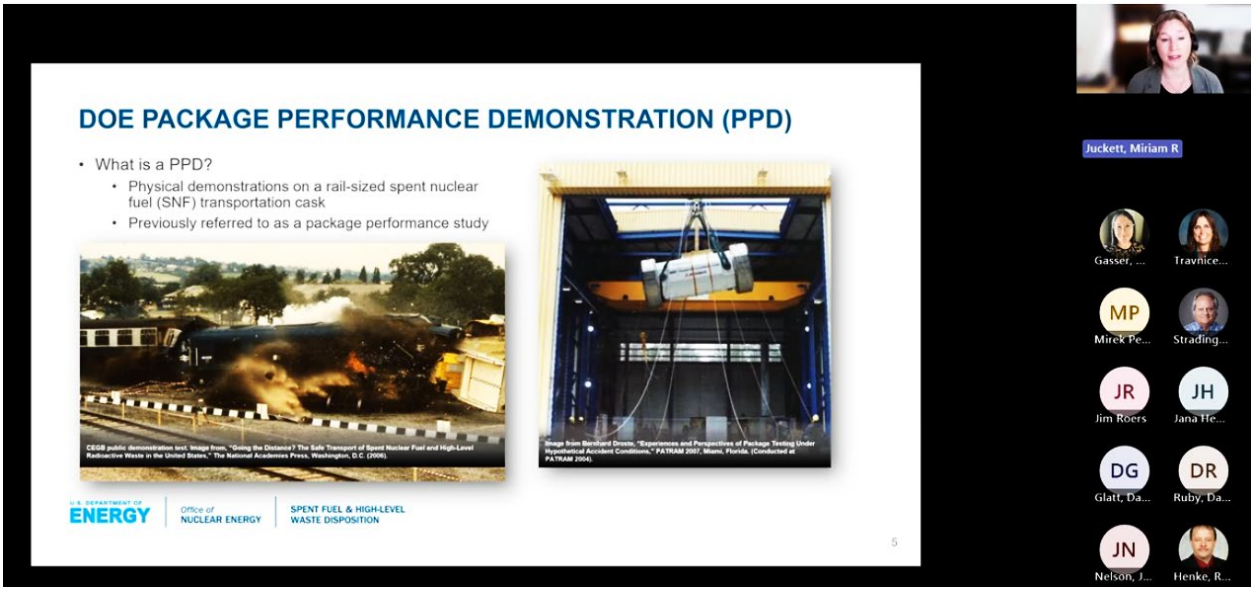
The current membership of the High-Level Radioactive Waste Advisory Council Members
Senator Dale Patten, District 26; HLRWAC Chairman
Representative Dan Ruby, District 38
Representative Jon Nelson, District 14
Senator Jeff Barta, District 43
Jeb Williams, Director, Game and Fish Department
Sherry Adams, State Health Officer, Department of Health
Christopher Schilken, Commissioner, Department of Commerce
Reice Haase, Director, Department of Water Resources
David Glatt, Director, Department of Environmental Quality
Ron Henke, Director, Department of Transportation
Kenneth Vein, City Government Representative
Jana Hennessy, County Government Representative
Mirek Petrovic, Agriculture Representative
Ed Murphy, State Geologist, Dept of Mineral Resources - Geological Survey; HLRWAC Executive Secretary

The last Advisory Council report was presented to the Energy Development and Transmission Committee on October 21, 2024 and I included that report in my quarterly report to the Industrial Commission on November 26, 2024. Since the last report, the Advisory Council met on November 8, 2024, July 8, 2025, and October 22, 2025. The minutes to those meetings are attached to this report and links to those minutes are posted on the DMR – Geological Survey website along with links to the video recordings of those meetings.

November 8, 2024 Meeting

Jay Thomas, Team Lead with the U.S. Department of Energy's (DOE) Office of Nuclear Energy -- Storage and Transportation, stated that the mission of the Office of Storage and Transportation is to design a license to construct and operate one or more federal consolidated interim storage facilities for spent nuclear fuel sited under DOE's consent-based process. His office is also charged with the safe, secure transport of these materials and are to conduct research and development to address spent nuclear fuel and high-level waste storage and transportation operation needs both now and in the future. He stated that one of their priorities is the package performance demonstration project.

Miriam Juckett, Intergovernmental and External Engagement Advisor for the Nuclear Materials Storage and Transportation program, at DOE's Pacific Northwest National Laboratory, presented the basics for spent nuclear fuel transportation (regulated by DOE, U.S. Department of Transportation and U.S. Nuclear Regulatory Committee). Miriam expanded on what Jay Thomas had said regarding the DOE package performance demonstrations. Pointing out that full-scale nuclear fuel casks would be subjected to free drop, puncture, thermal and water immersion.



A screen capture of Miriam Juckett's (DOE) presentation on the testing of spent fuel transportation casks at the November 8, 2024 meeting of the HLRWAC.

State Senator Dale Patten (District 39), a member of the Energy Development and Transmission Committee, brought the Council up to speed on proposed legislation for the 69th Legislative Session. Patten stated that the Interim Committee 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. Senator Patten noted there is renewed interest in Alaska and Wyoming to develop their nuclear energy resources. Rich Garman, the Director of Economic Development with the Financial Division of the Department of Commerce, spoke on the potential future energy needs in the State based on the interest expressed by the energy industry. He started that, right now, the biggest request for power in North Dakota is from the data and AI world. Over the last 30 years, 50 megawatt requests were a big deal, enquiries lately start at 200 megawatts and move significantly higher. He then discussed a number of proposed projects that would have large energy needs.

David Glatt, Director of the ND Dept. of Environmental Quality, spoke on proposed federal regulations relating to fossil fuels, constraining CO_2 emissions or greenhouse gas emissions from those facilities. Glatt talked to his counterpart in Wyoming about the plans to build a nuclear power plant near the Kemmerer coal-fired power plant that is in the process of shutting down.



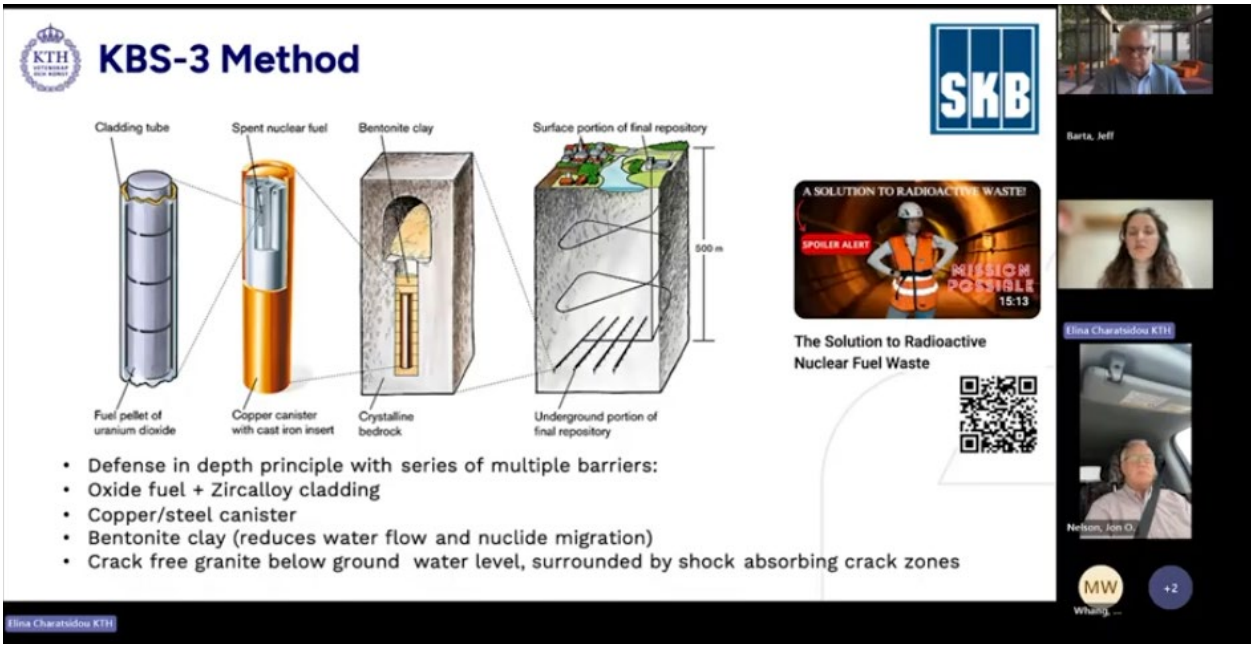
A screen capture of Sean Schaub's (Wyoming Energy Authority) presentation on the that entity, the TerraPower facility being built near Kemmerer, and the plans for multiple nuclear power microreactors (illustrated above) to power trona and soda ash production near Green River.

Dave Stradinger (DEQ) and Ed Murphy (NDGS) gave a brief synopsis of the talks that were presented at the Midwest Radioactive Material Transportation Committee that met in Bismarck on October 8, 2024. Chairman Roers along with Council members Senator Dale Patten, Representative Jon Nelson, Dave Glatt, and Ed Murphy formed an impromptu panel and discussed North Dakota's radioactive waste rules and regulations and energy needs in the state.

July 8, 2025 Meeting

Sean Schaub, the Nuclear Industry Coordinator for the Wyoming Energy Authority, pointed out that the mission of the Authority is to advocate, facilitate and advance Wyoming's energy economy. The Authority was formed in 2020 by combining the Wyoming Infrastructure Authority, Pipeline Authority, and State Energy Office. It is non-regulatory and is the point of contact for all energy related activities in the state. Wyoming has had a long history of uranium production. TerraPower, a nuclear innovation company founded by Bill Gates, is building the nuclear power plant near Kemmerer.

Dakota Kochie, Director of Government and External Relations for the Nuclear Waste Management Organization (NWMO), presented on the NWMO's federal role in Canada and its responsibility for the development of long-term management plans for nuclear waste. The NWMO was created in 2002, reports through their Minister of Natural Resources, and annually reports to Canada's Parliament. The NWMO works with the U.S. Department of Energy, sharing best



A screen capture from the presentation given by Elina Charatsidou (KTH Royal Institute of Technology) regarding the three-tiered barrier system (copper canister, bentonite clay, in granite) that Sweden is going to use in the nuclear waste repository they are currently constructing.

practices for radioactive waste. Canada's plan for safe, long-term management of used nuclear fuel is to store it underground in a deep geological repository, at depths to 2,300 feet. Construction is slated to begin in 2033.

Rich Garmin, the Director of Economic Development with the Financial Division of the Department of Commerce, lead a group discussion regarding interest in North Dakota expressed by industries with high energy needs. The energy and reliability needs of crypto currency and data centers as well as their budget scales are very different from typical projects. Garmin noted that they have talked with smaller entities that are into edge computing (e.g., small processing facilities that might process agricultural data or hospital data). Instead of having edge computing data go to a major data center, smaller processing centers could handle those needs locally.

October 22, 2025

Elina Charatsidou, a PhD student in Physics and Nuclear Engineering, KTH Royal Institute of Technology, Stockholm, Sweden, gave a presentation on nuclear waste management. Charatsidou talked about the different types of canisters and repositories for high level waste and the type of repository Sweden is currently constructing. She also spoke about the future of nuclear power and the need to conduct outreach.



A screen capture from Rod McCullum's presentation pointing out that U.S. companies are designing advanced nuclear reactors that would be able to recycle spent nuclear fuel.

Rod McCullum, Senior Director of Decommissioning and Used Fuel with the Nuclear Energy Institute, discussed the management, interim storage, transportation, and long-term disposal of radioactive waste as well as trends in spent fuel recycling. He also spoke about advanced reactors being planned and developed in the United States.

Dave Stradinger, Radiation Control Program Manager at the North Dakota Department of Environmental Quality gave an overview of high-level radioactive waste, transuranic waste, low-level radioactive waste, and technologically enhanced naturally occurring radioactive material (TENORM). He spoke on the regulatory authority for radioactive waste in the North Dakota, including federal authority and regional authority by the Southwestern Low-level Radioactive Waste Commission.

Chairman Patten provided a summary of the Advanced Nuclear Energy Interim Committee meeting held on September 3, 2025. He chairs the committee which is comprised of 17 members (12 legislators, 3 agency representatives, and 2 industry representatives). Chairman Patten said the committee has identified several areas of interest in terms of presentations (cost, technology, fuel source, state and federal permitting regulation, waste storage, ownership, and liability). A private Canadian development company, Nucleon, was chosen to conduct a study outlined in House Bill 1025 (69th Legislative Assembly). Based upon the more expansive work the Advanced Nuclear Energy Committee is doing, Chairman Patten anticipated the High-Level Radioactive Waste Advisory Council will not need to meet again until the fall of 2026.

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 through the 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.

High-Level Radioactive Waste Advisory Council
Minutes of the July 8, 2025 Meeting
In-Person at the Department of Mineral Resources in Bismarck and via Teams

Senator Dale Patten, Chairman, called the meeting to order at 10:04 a.m.

Chairman Patten welcomed everyone to the meeting.
Ed Murphy was asked to take the roll call.

Advisory Council attendees:

Representative Jon Nelson, District 14
Representative Dan Ruby, District 38
Senator Dale Patten, District 26
Senator Jeff Barta, District 43
Reice Haase, Dept. of Water Resources
Dave Glatt, Dept of Environmental Quality
Ron Henke, NDDOT Director
Jana Hennessy, County Government Rep.
Mirek Petrovic, Agricultural Community Rep.
Chris Schilken, Dept. of Commerce
Ed Murphy, Geological Survey

Council members not in attendance: Josh Teigen (Commerce), Jeb Williams (Game and Fish), State Health Officer (seat vacant), Kenneth Vein (City Government Representative).

Additional people attending the meeting were: Featured Presenter Sean Schaub (Nuclear Industry Coordinator, Wyoming Energy Authority), Featured Presenter Dakota Kochie (Director of Government and External Relations, Nuclear Waste Management Organization), Bruce Kreft (Game and Fish) , Rich Garman (Director of Economic Development and Finance), David Stradinger (DEQ), Marina Gasser (DMR), and Michael Whang (DMR).

Following the roll call, Chairman Patten noted that a quorum was present. There was a brief introduction by each attendee acknowledging the new members on the Advisory Council.

The first order of business was to approve the November 8, 2024, meeting minutes. Chairman Patten asked for a motion to approve the November 2024 minutes. Representative Nelson made the motion, it was seconded by Ron Henke, and unanimously carried on a voice vote as written.

The second order of business was a presentation from Featured Speaker Sean Schaub, Nuclear Industry Coordinator, Wyoming Energy Authority (WEA). Sean Schaub opened with the mission of the WEA—to advocate, facilitate and advance Wyoming's energy economy. The WEA began in 2020 by combining three existing offices together—infrastructure authority, pipeline authority, and state energy office—and is non-regulatory and also the point of contact for all energy related activities in the state. Several key points about Wyoming's nuclear history are it is rooted in uranium production. Wyoming is the domestic leader in the production of uranium, mining over 250 million pounds to date. Wyoming has never had a commercial nuclear power reactor. However, today's nuclear industry momentum is driven by firm, emissions-free baseload generation, increased electricity demands led by artificial intelligence and data center growth, and new forms of capital showing interest (e.g. major banks, World Bank, venture capitalists). Two projects were shared to illustrate how WEA viewed industry momentum: TerraPower's natrium (sodium) project catalyzed nuclear interest in Wyoming, and BWX Technologies for small modular

or micro nuclear reactors for trona (sodium carbonate, or baking soda) mines. TerraPower is a nuclear innovation company founded by Bill Gates. BWX Technologies Inc. is a company that supplies nuclear components and fuel internationally.

Chairman Patten thanked Sean Schaub for the presentation. Questions and comments followed.

The third order of business was a group discussion regarding recent legislation relating to an advanced nuclear power study, specifically HB 1025 Feasibility of Advanced Nuclear Power and SB 2159 relating to projects the State Energy Research Center (EERC) is permitted to pursue. SB 2159 essentially reauthorizes the EERC to conduct exploratory, transformational, and innovative research that advances future energy opportunities and benefits the state's economy and environment, lifting restrictions on researching nuclear energy applications. Mirek Petrovic voiced concerns over notification of any research the EERC conducts as well as temporary and long-term storage issues. Waste storage issues were also a concern of Representatives Dan Ruby and Jon Nelson. Chairman Patten reminded the Council that item four of SB 2159 requires approval by the Industrial Commission along with consultation with the High-Level Radioactive Waste Advisory Council and other groups noting there will be public engagement throughout the entire process. Ed Murphy commented that may require this council to meet more frequently.

The fourth order of business was a presentation by Dakota Kochie, Director of Government and External Relations, Nuclear Waste Management Organization (NWMO). The focus of Dakota Kochie's presentation was the NWMO's federal role and responsibility in Canada for the development of long-term management plans of its use of nuclear fuel. The NWMO was created in 2002 and annually reports to Canada's Parliament. The NWMO reports through their Minister of Natural Resources and the NWMO works with the U.S. Department of Energy, sharing best practices of radioactive waste. The situation in Canada differs from the U.S. in that the NWMO's primary job is to manage existing and future radioactive waste. Also in Canada, if you create the waste, you pay for the waste. According to Dakota Kochie, this differs from the U.S. where liability is placed on U.S. taxpayers (rate payers) and not the actual companies. Canada has benefitted from nuclear power for 70 years. Over those 70 years, Canada has accumulated approximately 3.5 million bundles of used fuel, enough used fuel bundles to fill nine hockey rinks from the surface of the ice to the top of the boards. Canada's plan for safe, long-term management of used nuclear fuel is to utilize a deep geological repository (DGR), where you would have a surface facility and three underground facilities (services area, placement rooms, and an excavated rock management area) that would span from 5 to 700 meters (16 to 2,296 feet). All the used fuel will be housed underground. The U.S. does have versions of repositories (e.g. The Waste Isolation Pilot Plant (WIPP) in Carlsbad, New Mexico). Kochie stated that Finland is in the lead of DGR pursuits and has a DGR already built and is awaiting regulatory approval to place the used fuel. Switzerland, France, and Canada are in second place in the pursuit of a DGR. In Canada, uranium is mined in Saskatchewan and processed in Ontario. The regulatory process for Canada's DGR project begins this year and is not expected to end before 2033 when construction is slated to begin. DGR operations are slated to begin in mid-2040s.

Chairman Patten thanked Dakota Kotchie for the presentation and asked Dakota a question about the proximity of communities within the DGR site. Dakota said that the site is in a remote part of Ontario and is not in a very populated area, but it is close to the well-traveled Trans-Canada Highway. Patten also asked if Canada distinguished between low-level, smaller reactor on-site waste and high-level waste.

Dakota said the NWMO is responsible for intermediate and high-level waste and any other waste that results in the processing or production of radioactive waste. There is no reprocessing or recycling in Canada but any type of fuels that would come out of that would be the responsibility of the NMWO. Low-level waste (mop handles, papers that are in a reactor and in a nuclear facility, etc.) is the responsibility of the individual waste owners. Dakota said low-level waste can either be incinerated or stored for a number of years.

The next agenda item was a group discussion of interest expressed by industries with high energy needs. Rich Garmin (Commerce) noted the energy and reliability needs of crypto currency and data centers as well as their budget scales are very different. Garmin said they are getting five to eight calls per month on major data projects, and noted they are not the only ones getting those calls. Garmin said a lot of data companies are going directly to utility companies and larger communities like Grand Forks, Fargo, and Minot. Garmin also mentioned that the state can effectively produce energy, whether it's through natural gas, oil, or coal, and data centers are a big user of that energy, so we should collect energy here, convert it into electricity, and add value to the state instead of shipping the energy (e.g., natural gas, oil, coal) out. If there are plans to build new coal or nuclear plants, they would be long-term plans; however, the fastest energy to market is combined cycle. Other opportunities Garmin said there are smaller entities that they have talked to that are into edge computing (e.g., small processing facilities that might process agricultural data like drone data or crop data or hospital data). Instead of having edge computing data go to a major data center, can smaller processing centers handle those locally. From a geographical and climate standpoint, North Dakota provides a cool climate, reliable energy, and is business friendly. However, if we can't put all these things together, the big data companies are going to go with the next best thing because these big companies must build now. The biggest holdup for the state is providing those mega- and gigawatt resources that these big companies need right now. North Dakota has a lot of energy but data centers need electricity, so there is a recognized need to make electricity and lots of it. Garmin also mentioned the partnership of Talon Metals with Westmoreland Coal to process nickel and copper ore in Beulah and other opportunities for processing iron ore.

Chairman Patten led a discussion on future meeting dates and topics. October 22, 2025, was chosen as the next meeting date. Topics to include a refresher on radioactivity. Presentations to be solicited from the Nuclear Regulatory Commission as well as Ian Gilley, a nuclear engineer on a Commerce Fellowship and living in Sheyenne, ND.

Chairman Patten adjourned the meeting at 1:10 p.m.

High-Level Radioactive Waste Advisory Council
DRAFT Minutes of the October 22, 2025 Meeting
In-Person at the Fort Union Conference Room, State Capitol and via Teams

Senator Dale Patten, Chairman, called the meeting to order at 10:01 a.m.

Advisory Council attendees:

Senator Dale Patten, District 26
House Representative Jon Nelson, District 14
Reice Haase, Dept. of Water Resources
Jana Hennessy, County Government Rep.
Sherry Adams, State Health Officer
Senator Jeff Barta, District 43
Dave Glatt, Dept. of Environmental Quality
Mirek Petrovic, Agricultural Community Rep.
Ed Murphy, State Geologist, Geological Survey

Council members not in attendance: Dan Ruby (House Representative, District 38), Chris Schilken (Dept. of Commerce), Jeb Williams (Dept. of Game and Fish), Ron Henke (Dept. of Transportation), Ken Vein (City Government Representative).

Additional people attending the meeting were: Featured Presenter Elina Caratsidou (PhD student in Physics and Nuclear Engineering, KTH Royal Institute of Technology, Stockholm, Sweden), Featured Presenter Rod McCullum (Senior Director of Decommissioning and Used Fuel, Nuclear Energy Institute, Washington D.C.), Featured Presenter Dave Stradinger (Radiation Control Program Manager, North Dakota Dept. of Environmental Quality), Bruce Kreft (Dept. of Game and Fish) , Rich Garman (Director of Economic Development and Finance), Ian Gilley (Energy Innovator Fellowship, Dept. of Commerce), and Michael Whang (Dept. of Mineral Resources).

Following roll call, Chairman Patten noted that a quorum was present.

The first order of business was to approve the July 8, 2025, meeting minutes. Chairman Patten asked for a motion to approve the November 2024 minutes. Representative Nelson made the motion; it was seconded by Jeff Barta and unanimously carried on a voice vote as written.

The second order of business was a presentation from Featured Presenter Elina Charatsidou, PhD student in Physics and Nuclear Engineering, Sunrise Project, KTH Royal Institute of Technology, Stockholm, Sweden. Charatsidou's presentation was titled *Nuclear Waste Management – From Laboratory to Public Dialogue*, and she spoke about types of nuclear waste: high level (95% radioactivity), intermediate level (4%), low level (1%)), spent fuel composition, radiotoxicity, different types of canisters and repositories for high level waste, the type of repository Sweden is currently projected to build, and outreach for the future of nuclear power.

Chairman Patten thanked Elina Charatsidou for the presentation. Questions and comments followed. Representative Jon Nelson asked what the public's acceptance level was to Sweden's repository plan. Charatsidou discussed SKB's open and transparent innovative way it handled the information campaign, e.g., using graphic signage on public transportation, sharing of scientific information with the public using technology, to reverse public opinion about the repository. SKB is the nuclear waste management company responsible for building and managing the repository. Representative Jeff Barta asked about cost. Charatsidou said the company, SKB, from the start collected money per kilowatt sold for nuclear energy

waste and set this money aside for handling nuclear waste. It was not taxpayer money but money from fees. Secretary Ed Murphy thanked Charatsidou for her presentation and asked a question regarding the composition of spent fuel after cooling (slide 5), whether plutonium was 89%, a result from a breeder reactor, or was it reprocessed fuel to have that high of a percentage. Charatsidou clarified light water reactor percentage means of the transuranic elements and does not refer to the whole spent fuel, but of the percentage of the transuranic elements, which contains something like 5%, if not mistaken, 98% of that is plutonium. Charatsidou said that is what that value means.

The third order of business was a presentation from Featured Presenter Rod McCullum, Senior Director of Decommissioning and Used Fuel, Nuclear Energy Institute. Rod McCullum presentation was titled *Used Nuclear Fuel*, and he spoke about categories of radioactive waste and -management, storage, transportation, and interim and long-term disposal as well as trends in recycling and advanced reactors in the United States.

Chairman Patten thanked Rod McCullum for the presentation. Questions and comments followed. Ian Gilley asked what the organization receiving appropriations would look like. McCullum replied the organization would be a private entity—a private corporation—accountable to the government, have a board of directors that would include the utilities that would pay or pay into the waste fund in the future, include the state and local governments, and affected tribes similar to the nuclear energy waste organization in Ontario, Canada, which is a non-government entity, has four shareholders (the three Canadian power nuclear companies and the Canadian National Nuclear Laboratory), and it operates as a private corporation authorized by the Canadian government; it's decision to move forward with its repository had to be approved by the Canadian government and its processes, and has access to the waste fund without having to rely on a government appropriations structure. Government appropriations are not a system you can rely on for any long-term project.

The fourth order of business was a presentation from Featured Presenter Dave Stradinger, Radiation Control Program Manager, North Dakota Department of Environmental Quality. Dave Stradinger presentation was titled *Advanced Waste*, and he discussed two classes of radioactive waste (high and low level), including transuranic waste (clothing, tools, and equipment exposed to radiation) and TENORM waste (produced water, scale, sludge, etc.) as well as disposal sites and regulation in the United States.

Chairman Patten thanked Dave Stradinger for the presentation. Dave Stradinger gave an overview of high-level radioactive, transuranic, low-level radioactive waste, TENORM (Technologically Enhanced Naturally Occurring Radioactive Waste (TENORM) as well as regulatory authority in the state of North Dakota, including federal and regional authority by the Southwestern Low-level Radioactive Waste Commission.

Chairman Patten thanked Dave Stradinger for the presentation. Questions and comments followed. Dave Glatt commented on the general heightened interest in small modular reactors, and along with it, an increase in sources of waste as well as the inability of the federal government to police the waste. Glatt asked Stradinger for his thoughts on how he saw the state's programs evolving with this. Glatt said they are continuing education of new processes and new types of reactors by staying informed of industry trends, e.g., mobile micro-reactors and their ability to move in and out of state. Collaborating with others (scientists, geologists, etc.) and other programs will be key in moving forward.

Chairman Patten led a discussion on future meeting dates and topics. Chairman Patten provided a summary of the Advanced Nuclear Energy Committee meeting held on September 3, 2025. The committee is comprised of 17 members (12 legislators, 3 agency representatives, and 2 industry representatives). Chairman Patten is also the chair of the Advanced Nuclear Energy Committee. Patten discussed his involvement with the state's Advanced Nuclear Energy Committee and how it will affect how the High-Level Radioactive Waste Advisory Council operates. Chairman Patten said the committee has identified several areas of interest in terms of presentations (cost, technology, fuel source, state and federal permitting regulation, waste storage, ownership, and liability). A private Canadian development company, Nucleon, will conduct a study, and Nucleon scheduled four tentative meeting dates to present findings (Dec. 15, March 24, June 16, and Aug. 11). Nucleon will be identifying criteria for general information, for example, regarding siting location information and gauging public opinion. The next Advanced Nuclear Energy Committee meeting will be December 15, 2025, at 10:00 a.m., State Capitol. Based upon the more expansive work the Advanced Nuclear Energy Committee is doing, Chairman Patten anticipated the High-Level Radioactive Waste Advisory Council will not need to meet until next year or next fall.

Chairman Patten adjourned the meeting at 2:00 p.m.