

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 21, 2024

The North Dakota Century Code (38-23) establishes a High-Level Radioactive Waste Advisory Council that is to meet at least once per year, review the site suitability of any proposed high-level radioactive waste facility and issue a report to the Legislative Assembly and 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.

**High-Level Radioactive Waste Advisory Council Members**

Senator Jim Roers, District 46; HLRWAC Chairman

Representative Dan Ruby, District 38

Representative Jon Nelson, District 14

Senator Dale Patten, District 39

Jeb Williams, Director of Game and Fish Department

Nizar Wehbi, State Health Officer, Department of Health

Josh Teigen, Commissioner, Department of Commerce

Andrea Travnicek, State Engineer, State Water Commission

David Glatt, Director of the 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 report of the activities of the Advisory Council was presented to the Energy Development and Transmission Committee on July 26, 2022 and to the Industrial Commission on August 22, 2022. Since then, the Advisory Council met on November 22, 2022 and again on November 22, 2023. 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 the video recordings of those meetings.

There are three federal agencies that are involved with high-level radioactive waste: the Nuclear Regulatory Commission (NRC), the Department of Energy (DOE), and the Environmental Protection Agency (EPA). In previous meetings, we had heard from representatives of the NRC and DOE, during this reporting period we heard from a representative of EPA.

The featured speaker for the November 22, 2022 meeting was Dan Schultheisz, the EPA Associate Director for the Center of Waste Management & Regulation. Dan Schultheisz spelled out EPA's roles and responsibilities for high-level radioactive waste and spent nuclear fuel, EPA's statutory authority for high-level waste and spent fuel repositories, the current EPA standards, the process for establishing these protection standards; and what EPA is anticipating Congress will do regarding high-level radioactive waste in the next few years. The current law states that Yucca Mountain is the federal repository and there is no alternative. Contrary to popular belief, the operating permit for Yucca Mountain was not denied. Instead, the permitting process for that facility is on hold. Schultheisz said that spent fuel rods are currently being safely stored adjacent to operating or abandoned nuclear power plants and it is not viewed as an immediate safety concern by the federal government. However, it is not the optimal condition as onsite dry cask storage was not intended to be a permanent solution. There are private efforts to develop interim storage where the fuel can be moved off-site to a centralized location. DOE has also started its consent-based siting process for those interim facilities.

David Stradinger, Division of Waste Management, DEQ, spoke on low-level, and technologically enhanced naturally occurring radioactive material (TENORM). He described high-level, low-level, and TENORM wastes, noted the concerns expressed for high-level waste, presented spent fuel pools and dry cask storage examples, noted the transportation challenges of high-level radioactive waste, the authorities that regulate TENORM, the active low-level waste disposal sites in the nation, TENORM waste examples, the radioactive material licenses required for TENORM waste in the state of North Dakota, as well as the financial assurance requirements and transportation requirements for TENORM.

The featured speakers for the November 22, 2023 meeting were Tim Nesheim (DMR), Chris Bader (DWR), and Damon Grabow (DWR). Their talks demonstrated the geologic and hydrologic databases that both agencies maintain that would form the backbone of a report to either the Legislature or the Industrial Commission should a high-level radioactive waste facility be proposed for North Dakota. Dave Glatt (DEQ) also spoke on carbon capture and a Climate Pollution Reduction Plan.

Tim Nesheim, Head of the Subsurface Section and Acting Core Library Manager, Geological Survey, DMR, spoke on the tectonic framework of North Dakota, the deep test wells drilled across North Dakota that provided the data that has enabled a determination of the stratigraphy at depth in the Williston Basin. Tim also discussed oil and gas production in the state as well as disposal of produced waters, an overview of the core and samples housed in the core and sample library in Grand Forks, and the potential for future production of helium, deep geothermal, potash, lithium, and rare earth elements in North Dakota.

Chris Bader, Director of the Water Appropriation Division, DWR, gave an overview of the department, the extent of North Dakota's water resources-including the bedrock and glacial aquifers, Missouri River hydrology, a delineation of the state's watersheds, the department's surface water monitoring and precipitation data sites, the permitted water intakes, and an explanation of the DWR PRESENS (REmote SENSors) network.

Damon Grabow, Dam Safety Engineer, Regulatory Division, DWR, explained the ND Statewide

Probable Maximum Precipitation (PMP) two-year study. His presentation included the project background, the study area, the PMP storm process, the precipitation events that make up the datasets, a probable maximum precipitation event map, and a snow water equivalent data map.

Dave Glatt, Director of the DEQ, presented on energy transformation, noting that both the federal government and the state governments have established major goals for a carbon-constrained future. He noted that DEQ is currently putting together a Climate Pollution Reduction Plan, mentioning the Project Tundra facility as an alternative. Additionally, he recapped a meeting he recently attended in Kemmerer, Wyoming where they are looking to build a nuclear power plant at a former coal-fired power plant site.

The High-Level Radioactive Waste Advisory Council was established in 2019. The four legislative appointees and the three Governor's appointees all serve four-year terms. Three legislators were reappointed, Representative Mark Owens did not return to the state legislature and was replaced by Representative Jon Nelson. Of the Governor's appointees, the city government representative agreed to serve an additional four-year term, the county government representative retired and was replaced by Jana Hennessy (Mountrail County Engineer), and the agricultural representative declined an additional term and was replaced by Mirek Petrovic (Pierce County). Additionally, a number of the agency directors have come and gone during this time period.

High-Level Radioactive Waste Advisory Council Minutes of the November 22, 2022 Meeting  
Virtual Meeting via Teams

The meeting was called to order by Chairman Roers at 1:41 pm. Chairman Roers welcomed everyone to the meeting. He welcomed and introduced two new Council members, Joshua Teigen (Dept of Commerce Commissioner) and Ron Henke (NDDOT Director). Ed Murphy was asked to assist with the roll call.

Advisory Council attendees:

Representative Dan Ruby, District 38  
Senator Dale Patten, District 39  
Senator Jim Roers, District 46  
David Glatt, Dept. of Environmental Quality  
John Paczkowski, Dept of Water Resources  
Joshua Teigen, Dept of Commerce

Ron Henke, NDDOT Director  
Dr. Nizar Wehbi, ND State Health Officer  
Kenneth Vein, City Government Rep  
Rebecca Leier, Agricultural Community Rep  
Ed Murphy, Geological Survey

Council members not in attendance: Representative Mark Owens, District 17; Jeb Williams, ND Game and Fish; Dean Pearson, County Government Rep. Ed Murphy stated that the Council is looking for a new County Rep, due to the retirement of Dean Pearson. Murphy noted that a quorum was present. Additional people attending the meeting were: Featured Presenter Dan Schultheisz (EPA), Featured Presenter David Stradinger (DEQ), Jay Santillan (EPA), Tom Peake (EPA), Marina Gasser (DMR).

The first order of business was to approve the June 14, 2022 meeting minutes. John Paczkowski made a motion to approve the June 2022 minutes. Josh Teigen seconded the motion. The motion was unanimously carried out to approve the written June 14, 2022 meeting minutes.

The second order of business was a presentation from Featured Speaker, Dan Schultheisz, the EPA Associate Director for the Center of Waste Management & Regulation. The main points of his “EPA Standards for High-Level Waste and Spent Fuel” presentation were: EPA’s roles and responsibilities for high-level waste and spent nuclear fuel; EPA’s statutory authorities for high-level waste and spent fuel repositories; the existing EPA standards; the standard-setting process; the elements of protection standards; additional considerations for future standards; and what EPA is anticipating from Congress in the next few years.

Senator Roers asked when things will become critical, and at what time something will need to be done. Schultheisz stated that there is no formal activity now as the law says that Yucca Mountain is the repository, without another alternative. He said that the EPA has done everything that Congress has asked them to do. Although, they do anticipate that Congress will be asking them to develop new standards in the future. Senator Roers asked when spent nuclear fuel stored onsite at power plants will ever become a critical situation. Schultheisz said that the cells are currently being stored safely and it is not an immediate safety concern, but it is not the optimal condition as onsite dry cask storage was not intended to be a permanent solution. There are private efforts to develop interim storage where the fuel can be moved off-site to a centralized location. DOE has also started its consent-based siting process.

The third order of business was a presentation on high-level, low-level, and technologically enhanced naturally occurring radioactive material (TENORM) waste from David Stradinger, North Dakota Department of Environmental Quality Division of Waste Management. The main points of discussion were: descriptions of high-level, low-level, and TENORM wastes; the process of nuclear fission; a nuclear fuel assembly depiction; concerns of high-level waste; spent fuel pools; dry cask storage examples; transportation challenges of HLRW; transuranic waste; the authorities that regulate TENORM and high and low-level waste; active low-level waste disposal sites; TENORM waste examples; radioactive material licenses required for TENORM waste in the state of North Dakota; financial assurance requirements for TENORM; and transportation requirements of TENORM.

Chairman ROERS stated that the Council has now heard reports from the three federal agencies on high-level radioactive waste: The Nuclear Regulatory Commission, the Department of Energy, and the Environmental Protection Agency, and asked members what they would like to hear and learn more about in the future. Chairman Roers asked if the Council should consider investigating the opportunity of using today’s technology to capture the unutilized energy from the State’s current wastes. Josh Teigen agreed that it would be in North Dakota’s best interest and considered it a valuable option and worth looking into. Chairman Roers asked if anyone had any more discussion or comments regarding the meeting.

Chairman Roers asked for a motion to adjourn the meeting. Senator Dale Patten moved to adjourn the meeting, John Paczkowski moved to second the motion. The motion was unanimously carried.

Chairman Roers adjourned the meeting at 3:09 pm.

High-Level Radioactive Waste Advisory Council Minutes of the November 22, 2023 Meeting

Virtual Meeting via Teams

The meeting was called to order by Chairman Roers at 1:04 pm.  
Chairman Roers welcomed everyone to the meeting.  
He welcomed new Council member, Representative Jon Nelson (District 14)  
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  
Joshua Teigen, Dept of Commerce  
Jeb Williams, ND Game and Fish  
Kenneth Vein, City Government Rep  
Rebecca Leier, Agricultural Community Rep  
Ed Murphy, Geological Survey

Council members not in attendance: Dr. Nizar Wehbi, ND State Health Officer. Murphy noted that a quorum was present.

Murphy pointed out the legislative appointments of the committee and their terms. Murphy stated that the Council has found a new County Rep due to the retirement of Dean Pearson. Jana Hennessy, Mountrail County Engineer, has agreed to serve on the committee and is currently going through the appointment process. Additional people attending the meeting were: Featured Presenter Tim Nesheim (DMR NDGS), Featured Presenter Chris Bader (DWR), Featured Presenter Damon Grabow (DWR), John Paczkowski (DWR), David Stradinger (DEQ), Marina Gasser (DMR), and Abby Ebach.

The first order of business was to approve the November 22, 2022 meeting minutes. Senator Patten made a motion to approve the November 2022 minutes. Jeb Williams seconded the motion. The motion was unanimously carried out to approve the November 22, 2022 meeting minutes as written.

Ed Murphy reviewed the purpose and the duties of the Council as written in NDCC 38-23. He went over the role the Council would play in issuing a site suitability report and the timeline of events if a waste facility site were to be nominated/proposed in North Dakota.

The second order of business was a presentation from Featured Speaker, Tim Nesheim, Head of the Subsurface Section and Acting Core Library Manager for the North Dakota Geological Survey. The main points of his "North Dakota Geology: Geologic History & Resource Review" presentation were: Tectonic Assemblage of North Dakota; mineral test exploration well graphics and maps; Williston Basin stratigraphy and the sedimentary rock layers; helium, geothermal, potash, lithium, and rare earth elements potential; North Dakota oil & gas production and produced water disposal areas; the Surficial geology of North Dakota graphics and maps; coal mining and the coal-fired power plants; and a NDGS Core Library overview. Tim closed his presentation by reiterating that NDGS geologists are always gathering new information and data to improve upon their understanding of North Dakota's history.

Joshua Teigen asked if North Dakota is at the point where the State should be looking for companies to come in and explore for resources such as lithium and potash. Nesheim stated that lithium exploration might be close, and helium is already being produced and the technology is in place, but our lithium and helium resources overlap with oil and gas fields. Chairman Roers asked for more of an update on rare earth elements. Ed Murphy stated that the NDGS has taken over 2,000 coal samples in Western North Dakota. The department has added a portable X-ray fluorescence machine so geologists can get an indication of rare earth concentrations while they are in the field. The team expects to triple the previous concentrations with their newest samples from November. NDGS will be doing a drilling program on trust lands in the Summer of 2024. They have narrowed the search area down to 2, 20-foot-thick zones that could have some potential for mining. Currently, North Dakota and West Virginia are both in the running for a possible \$125m DOE grant towards the construction of a processing plant, to be awarded in the next 2-3 years.

The third order of business was a presentation on North Dakota's water management from Chris Bader, North Dakota Department of Water Resources Water Appropriation Division. The main points of discussion were: an overview of the Department of Water Resources; the extent of North Dakota's water resources; Missouri River specifics; identification of ND's bedrock and glacial drift aquifers; maps of ground water sites/types, private contractor sites, watershed sites, surface water monitoring sites, precipitation data sites, and permitted water intakes; and an explanation of the DWR PRESENS (Pushing REmote SENSors) network, data,

history, future and costs.

The fourth order of business was a presentation from Damon Grabow, Dam Safety Engineer, North Dakota Department of Water Resources Regulatory Division. The main points of his "ND Statewide Probable Maximum Precipitation (PMP)" presentation were: the definition of PMP; its background, updates, and uses; the PMP storm process, and the study area; maps of historical local, general, and cool season storm events that make up the datasets; an example map of probable maximum precipitation; and a snow water equivalent data map.

Ed Murphy expressed his excitement with the work that DWR is doing in their precipitation tracking efforts. He stated that this information would have been useful in NDGS projects during the 70s & 80s. Additionally, he asked if NDAWN (North Dakota Agricultural Weather Network) and PRESENS were connected. Bader said they were not connected, but the data is compatible if someone wants to use both.

Andrea Travnicek, Director of DWR, noted that DWR is trying to make sure that their PRESENS information, NDAWN info, USGS stream gauges, core data, and any National Weather Service data have a centralized location during flood events in the Department of Emergency Services Watch Center. The PRESENS DWR system information is filling in some of the gaps in the NDAWN data across the state.

The fifth order of business was a presentation by David Glatt, Dept. of Environmental Quality. The main topic of his presentation was energy transformation. He noted that federal and state governments have major goals for a carbon-constrained future. DEQ is currently putting together a Climate Pollution Reduction Plan. What are our options in North Dakota for reliable, affordable energy, as a current fossil fuel state? He briefly touched on the Project Tundra facility as an alternative. He recapped a meeting he recently attended in Kemmerer, Wyoming with TerraPower. Wyoming is looking to build a nuclear power plant at a former coal-fired power plant site. What issues would North Dakota face in doing the same, and how it would impact our state?

Chairman Roers moved on to future meetings and topics. He pointed out that the Energy Development Transmission Committee will be meeting on December 18 and will feature Jeff Merrifield, the former Commissioner of the United States Nuclear Regulatory Commission. Merrifield will be speaking about advanced nuclear energy. The presentation will be recorded, and Roers anticipates that portions will be played at the next Council meeting. Chairman Roers asked if anyone on the Board had any topics regarding nuclear challenges that the Council should investigate and report on at the next meeting. Rebecca Leier stated that she would like David Glatt to give another update on the Wyoming plant at the next meeting. She also asked for a glossary of nuclear terms to be shared at the next meeting.

Chairman Roers asked Ed Murphy, Council Secretary, to review the terms of Board appointments in hopes that they are staggered, to maintain a balance of continuity and turnover.

Ed Murphy commended Tim Nesheim, Chris Bader, Damon Grabow, and David Glatt on their presentations. Chairman Roers agreed and thanked Ed Murphy for finding the speakers on such short notice due to unforeseen circumstances surrounding the formerly scheduled presentation.

Chairman Roers asked if anyone had any other discussion or comments regarding the meeting.

Chairman Roers asked for a motion to adjourn the meeting. Senator Dale Patten moved to adjourn the meeting.

Joshua Tiegen moved to second the motion.

The motion was unanimously carried.

Chairman Roers adjourned the meeting at 3:01 pm.