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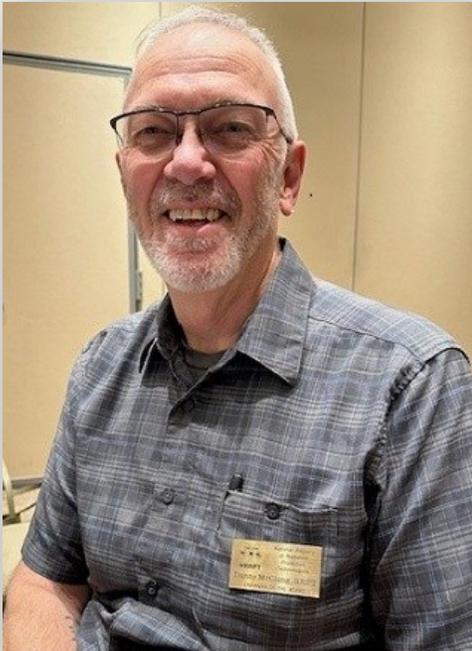
# NRRPT NEWS

OFFICIAL NEWSLETTER of the *National Registry of Radiation Protection Technologists*

June 2025

Incorporated April 12, 1976

## Chairman's Message



Chairman Danny McClung

### Greetings fellow RRPTs!

*Summer is upon us!*

Fellow RRPTs, welcome to the late spring edition of **your** NRRPT newsletter. In a couple of weeks, it will officially be summer. I hope your plans include joining us in Madison, WI, for the next meeting of NRRPT, July 12<sup>th</sup> through 15<sup>th</sup>. We are meeting in conjunction with the 70<sup>th</sup> annual meeting of the Health Physics Society. Here is the link if you want to check it out: <https://www.xcdsystem.com/hps/program/Eo5tJeK/index.cfm>. If you are so inclined, some squeaky cheese curds, and maybe even a cold Wisconsin beer are on the daily menu!

The US exam was held on February 22, 2025. We now have 24 new RRPTs, which brings us to a total of 6067 registrants. Congratulations to all of you who put in the time to study and pass a very rigorous exam!

Featured in this edition is a technical article about low activity waste by Ryan Murdock and a "rad" movie review by Robert Stueve. Thanks to these outstanding professionals for their continued service to NRRPT.

I attended a webinar sponsored by the Health Physics Society (HPS), the National Council on Radiation Protection and Measurements (NCRP), the American Association of Physicists in Medicine (AAPM), and the Conference of Radiation Control Program Directors (CRCPD) concerning the recently promulgated Executive Orders (EO) aimed at the nuclear industry. There are several focus areas: easing the regulatory burden; re-evaluation of the Linear No-Threshold theory (LNT) as the basis for dose limits; re-evaluation of the As Low As Reasonably Achievable concept (with heavy emphasis on the letter "R"); and continued independence of the Nuclear Regulatory Commission. Many organizations that support the nuclear industry are engaged in discussions that concern the implementation of these EOs, as they undergo

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both legal and professional scrutiny. **NRRPT does not comment officially on politics.** Any opinions each of us has remain our own. I am following the situation as it is prudent to be involved in anything that could impact our profession. I will try to keep you informed as the situation develops.

### **A Primer on Artificial Intelligence**

Artificial intelligence (AI) is revolutionizing the way we function in society. AI offers innovative solutions across various industries. Despite its benefits, there are arguments suggesting that the use of AI should be approached with caution or limited. One of the primary concerns is ethical implications. AI systems often operate as “black boxes”, which can be complex and difficult to understand. When AI systems make decisions that affect human lives, as in healthcare, autonomous vehicle driving, and even the NRRPT exam bank, there is often no straightforward way to trace the reasoning behind these decisions, leading to challenges in ensuring fairness and accountability.

As AI systems are integrated with increased data, they require large amounts of information, much of which can be personal or sensitive. Maintaining privacy in processes, like those performed by the NRRPT Exam Panel, is paramount in protecting the integrity of the exam. The use of AI increases the risk of unauthorized access to data. Besides these risks, AI systems can be vulnerable to cyberattacks, and malicious entities can exploit their capabilities to infiltrate privacy settings and propagate misinformation. These risks amplify the need for robust security measures and regulation, which often are not keeping pace with rapid technological advances.

In conclusion, while AI has the potential to drive progress, it is crucial to recognize and address the ethical, privacy, security, and other challenges that can impact an institution's integrity. Implementing AI systems without careful consideration of these issues could lead to unintended consequences that might outweigh the benefits. NRRPT's Panel of Examiners and Board of Directors will continue to evaluate the use of AI in preparing and selecting examination questions, while maintaining the security of the exam bank that we and so many before us have spent countless hours creating. **(A big thank you to Michelle Kovach for doing this research on AI.)**

I will update you on the Chairman's agenda and the result of the upcoming American Council on Education (ACE) credit evaluation review in the next newsletter.

Hope to see you all in Wisconsin soon!

Danny McClung, RRPT, FHPS  
Chairman of the Board of Directors  
**NRRPT**

## **Welcome New NRRPT Members**

Congratulations to the following individuals who successfully passed the USA

**NRRPT Examination on February 22, 2025:**

Kyler Albertson	Gbenga Elegbede	Andrew Owens
Molly Ballinger	Ryan Fabian	Trevor Powers
Spencer Brooks	Brandon Fulton	Albert Rice
Tristin Chapman	Braden Leaf	Carl Robison
David Cinquegrani	Aaron Lewis-Sandy	Gregory Rovenger
Matthew Cole	Kimberly Maldonado	Ashley Sorcic
Meghan Dieffenthaler	Clifford McWilliams	Jose Trevino
Jack Dorian	Alan Nix	Connor Williams

# Overview of the WCS Exemption Process for Disposal of Low-Activity Waste

by Ryan Murdock

In this overview, the term “exempt waste” refers to low-activity radioactive waste (LAW) that is exempted from requirements that would otherwise apply to disposal of low-level radioactive waste (LLW) under Radioactive Materials License R04100 License Condition 192 herein referred to as LC-192. WCS’s Licensed Exemption (LC-192) process occurs in a RCRA permitted landfill that is fully covered by Financial Assurances. As explained herein, exempt waste is still subject to regulation and licensing, and the process WCS uses to determine whether particular waste is exempt waste is a process thoroughly vetted and approved by the Texas Commission on Environmental Quality (TCEQ), under the oversight of the U.S. Nuclear Regulatory Commission (NRC).

## Exemptions Generally

In absence of an agreement with a state that provides otherwise, the NRC regulates LLW disposal. The general requirements for land disposal of LLW are contained in Part 61 of NRC’s rules.<sup>1</sup> LLW is classified for near surface disposal as Class A, Class B, or Class C waste. Different disposal requirements may be applied depending on the class. For LAW, NRC’s rules provide mechanisms that may be used to exempt LAW disposal from the general requirements of Part 61.<sup>2</sup> For example, Section 20.2002 of NRC’s rules<sup>3</sup> provides that an NRC licensee may apply to NRC for “approval of proposed procedures, not otherwise authorized in the regulations in this chapter, to dispose of licensed material generated in the licensee’s activities.” Because it is an “Agreement State,” Texas has the authority to authorize similar activities for licensees in Texas, such as WCS.

NRC has provided for alternative disposal procedures since the beginning of its regulation of LLW disposal. To date, millions of pounds and cubic yards of LLW have been disposed in hazardous waste and municipal waste landfills pursuant to approved alternative procedures. Examples of the approved alternative procedures include the Bulk Survey for Release process administered by the State of Tennessee, the procedures used by the US Ecology Facility in Idaho, and the WCS process discussed in this overview.

## Texas’s “Agreement State” Authority

Pursuant to Section 274b of the Atomic Energy Act of 1954, the State of Texas and NRC entered into an agreement whereby NRC relinquished portions of its regulatory authority over radioactive materials. Thus, Texas is known as an “Agreement State.” Under the agreement, Texas regulates disposal of LLW within Texas’s boundaries. TCEQ issued the radioactive material license (RML R04100) that authorizes WCS’s operation of LLW disposal facilities.

NRC continuously reviews Agreement State programs and ensures that the programs are consistent with federal law. NRC’s review process is primarily performance based. The process is known as the Integrated Materials Performance

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<sup>1</sup> 10 C.F.R. pt. 61.

<sup>2</sup> The term “low-activity waste” or “low-activity radioactive waste” is not defined in statute or rule. The term usually refers to LLW that can be safely disposed of in hazardous or municipal solid waste landfills because the waste contains such a small fraction of the Class A limits specified in Part 61 that extensive Part 61 controls are not needed to ensure protection of public health and safety and the environment.

<sup>3</sup> 10 C.F.R. § 20.2002.

Evaluation Program (IMPEP). Agreement State programs are routinely reviewed at least every four years. Under IMPEP, NRC has audited and upheld TCEQ's approval of WCS's exempt process for determining whether waste is exempted as Tier 3, Tier 2, Tier 1, & Tier 1a waste. Texas's agreement with NRC requires that the exemption process approved by TCEQ is at least as protective as the federal exemptions authorized under NRC's rules.

## The WCS Exemption Process

Pursuant to Section 336.5 of TCEQ's rules,<sup>4</sup> adopted under statutory authority granted by Section 401.106 of the Texas Radiation Control Act,<sup>5</sup> TCEQ approved WCS's exemption process, which uses curie concentration limits of particular radionuclides to determine whether waste contains such very low levels of radioactivity that the waste is exempt from disposal requirements that would otherwise apply to LLW. Exempt waste must be disposed of in WCS's Resource Conservation and Recovery Act (RCRA) Subtitle C landfill (also known as a hazardous waste landfill), operated under RCRA Permit 50358.

The curie concentration limits serve as an easily verifiable surrogate for the radiation dose that could result to a hypothetical individual member of the public from disposal of the exempt waste at WCS's hazardous waste landfill. In approving WCS's exemption process, TCEQ focused on the radiation dose to ensure protection of public health and safety and the environment. TCEQ used a very protective dose limit that is more restrictive than the dose limit NRC would typically use in approving an exemption process. For example, under Section 20.2002 of NRC's rules, NRC may authorize disposal of LAW in landfills if radiation doses to members of the public are limited to "a few millirems per year" over a period of 1,000 years after site closure.<sup>6</sup> However, TCEQ approved the curie concentration limits used in WCS's exemption process on the basis of a radiation dose limit of just one millirem (mrem) per year per license condition 192 (LC-192). Furthermore, TCEQ required an additional evaluation period, beyond 1,000 years, for radionuclides with half-lives greater than 300 years. The one millirem per year dose limit is considered an inherently safe level of radiation by the International Atomic Energy Agency and the National Council of Radiation Protection and Measurements. Exempt waste under WCS's process has only about 10 percent of the activity of the high-end limit of Class A LLW.

WCS's approved process for waste exemption is governed by LC-192.<sup>7</sup> This is where TCEQ set forth the minimum regulatory threshold and procedures that WCS must follow to determine whether waste is LAW that presents a sufficiently low hazard to be safely disposed of in the WCS hazardous waste landfill. Under WCS's process, all LAW is subject to strict characterization requirements to determine whether the waste qualifies for exemption. Generators must submit a detailed waste profile to WCS for approval before shipping any quantity of potentially exempt LAW. The waste profile must include representative radioactive characterization samples. When shipped to WCS, all LAW must be accompanied by a standard NRC 540/541 form that documents the waste's properties (e.g., radioactivity, packaging, and quantities). The waste is initially received and handled at WCS's radioactive waste storage and processing facility as non-exempt waste in accordance with the NRC definition of Class A waste. Upon receipt at WCS's facility, 100 percent of the potentially exempt waste is subject to physical and radiological verification including ensuring all waste meets the WCS administrative dose rate limit of less than one-hundred mrem per hour at thirty centimeters. WCS checks that the waste was accurately

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<sup>4</sup> 30 Tex. Admin. Code § 336.5 (*Exemptions*).

<sup>5</sup> Tex. Health & Safety Code § 401.106 (*Exemption from Licensing or Registration Requirements or from Application of Rule*).

<sup>6</sup> See U.S. Nuclear Regulatory Commission, *Low-Level Waste Disposal Under 10 CFR 20.2002*, available at <http://www.nrc.gov/waste/llw-disposal/10cfr20-2002-info.html> (last accessed March 20, 2019).

<sup>7</sup> LC-192 is reproduced in Appendix A, attached to this overview.

described by the generator and that the waste meets the requirements for disposal in the hazardous waste landfill. As part of LC-192, WCS submits an updated performance assessment that demonstrates that the facility will remain compliant for the 1,000-year period of compliance peak dose of 1 mrem per year and evaluates peak doses beyond 1,000 years to ensure the LAW process remains protective of human health and the environment. Once the waste has been exempted and disposed of in the hazardous waste landfill, title and responsibility for the waste transfers to WCS. WCS's RCRA Permit 50358 provides for safe closure and long-term stewardship of the hazardous waste landfill and includes provisions specific to LAW for additional environmental monitoring and reporting over and above the requirements of LC-192. Beyond the license controls of LC- 192 and RCRA Permit 50358, WCS maintains Financial Assurance that, in the event of a facility closure, the Financial Assurance is in place to ensure the long-term care of WCS permitted subtitle C landfill and the long-term protection of human health and safety and the environment. With WCS's superior geology and long-term protection and care that far exceeds WCS's competitors—even in LLW licensed facilities— WCS's customers can be assured of any disposal in WCS's Subtitle C Landfill under the LAW exemption process.

WCS has safely and compliantly disposed of several million cubic feet of exempt waste for nearly all sectors of the nuclear industry that generate LAW, including general licensees, nuclear power plant operators (e.g., Vermont Yankee, Southern California Edison, Diablo Canyon, Palo Verde, Susquehanna, Exelon Byron Station, TVA, Ameren, and Humboldt Bay), industrial producers, radioactive waste processors, and the U.S. Department of Energy (DOE). WCS is routinely audited for compliance by Texas and other federal and commercial entities, including the Nuclear Procurement Issues Corporation (NUPIC), DOE and most customers.

#### ***WCS Exemption Process Users***

- ***Nuclear Power Plants***
- ***DOE***
- ***DOD***
- ***Radioactive Waste Processors***
- ***Industrial Generators***
- ***NORM and Oil and Gas Generators***
- ***Decommissioning Sites***

### **Navy's Stamp of Approval**

In addition to being vetted and approved by the TCEQ under the oversight of NRC, the Naval Reactors Laboratory Field Office, at the request of the Naval Reactors Sites, has reviewed WCS's Licenses, Permits, and Processes, including the LAW disposal process. As a result, the Naval Nuclear Laboratory has designated WCS as authorized destination for low level and mixed low-level radioactive waste from Naval Reactor Program Facilities.

### **DOE's Stamp of Approval**

In addition to being vetted and approved by the TCEQ under the oversight of NRC, the Navy and DOE have reviewed WCS's LAW disposal process. DOE's Office of Environmental Management has approved the use of the WCS process by DOE generators. As a result of its review, performed in accordance with DOE Order 458.1, change 3, DOE has a contract with WCS so that DOE generators can easily dispose of LAW in the WCS hazardous waste landfill. DOE does not impose any additional controls or limits on the exemption process. DOE waste has and continues to be disposed of as exempted waste under WCS's exemption process.

### **Comparing the WCS Exemption Process to LAW Disposal Elsewhere**

There are several commercial disposal companies that might be considered to have capabilities that compare to the WCS exemption process. It is WCS's understanding that EnergySolutions, OMEGA, Toxco, EDI, and Babcock all offer Bulk

Survey for Release (BSFR) services, and US Ecology Idaho offers disposal of waste that has already been exempted by the generator through the NRC or other licensing authority.

EnergySolutions offers a LAW disposal process known as BSFR. The process (also offered by OMEGA, Toxco, EDI, and Babcock) is regulated by the State of Tennessee and allows for disposal of LAW in municipal landfills, subject to annual mass-based allowances. The BSFR process involves shipping licensed material to a licensed processor for exemption. The BSFR process is Agreement-State licensed, and is therefore subject to the NRC monitoring through IMPEP. However, unlike WCS's hazardous waste landfill, the municipal landfills used are not suitable for RCRA hazardous wastes. Because hazardous waste landfills are usually built with more robust protective measures than municipal landfills, the limits on radioactive hazardous materials that may be disposed of in municipal landfills are usually comparatively very low.

US Ecology Idaho does not have a radioactive material license. Its landfill operates under a standard RCRA landfill permit issued by the State of Idaho. US Ecology accepts waste for disposal that has been determined to be exempt by the original generator using an exemption process approved under Section 20.2002 of NRC's rules. Thus, technically, US Ecology does not have its own exemption process. It merely operates a landfill with an expressed willingness to accept already-exempted LAW for disposal. The waste generator must apply to NRC for the exemption approval, and the generator must do all the physical waste screening and radiological monitoring to ensure compliance. NRC exemptions may require six to twelve months to obtain. Contrast that waiting period to the maximum period of 21 days that may be required to determine whether LAW is exempt waste under WCS's exemption process.

## **Conclusion**

WCS's exempt waste program has been extensively reviewed directly or indirectly by Federal and State regulatory agencies, as well as multiple commercial entities to include but not limited to the State of Texas, the NRC, the Navy, and DOE. In all cases, review of WCS's licensed exempt waste program has resulted in the approval and the authorization to ship LAW to WCS under that program to WCS's RCRA permitted landfill covered by all the necessary Financial Assurance. WCS's exempt waste program offers a less expensive alternative to disposal of LAW as compared to competitors and other processes while also providing superior performance and compliance.



**If you'd like to join the Panel of Examiners please contact one of the following:**

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**Executive Secretary—DeeDee McNeill—[nrrpt@nrrpt.org](mailto:nrrpt@nrrpt.org)**



## Brief Overview of Cesium-137 (Cs-137)

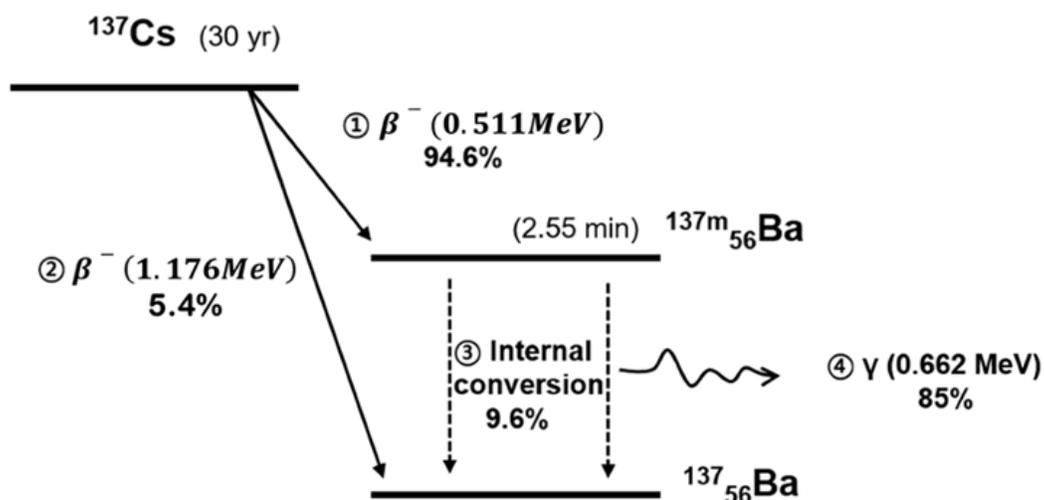
by Michelle Kovach

Cs-137 is a radionuclide that is found in the environment as a result of nuclear activities like reactor accidents and weapon tests. It is detected using gamma spectroscopy with high-purity germanium detectors, which identify its unique gamma emissions at 662 keV. This detection method is used for environmental samples (soil, water, vegetation) and in air .

As a byproduct of nuclear fission, Cs-137 has a half-life of about 30 years. It decays through beta emission into Barium-137m (Ba-137m), which releases gamma radiation. Its water solubility allows for widespread dispersion through atmospheric deposition and runoff. Cs-137's persistence presents health risks due to its accumulation in soft tissues when inhaled or ingested, necessitating strict regulatory and monitoring criteria to minimize impact on health and the environment.

Though radioactive, Cs-137 offers value through its gamma-ray emissions. In medicine, it is used for cancer treatment by targeting and destroying cancer cells with gamma radiation. In industrial settings, Cs-137 is used to measure thickness, density, and moisture content, benefiting sectors like manufacturing and agriculture through consistent gamma emissions. It also serves as a tracer in environmental studies of soil erosion and sedimentation, providing insights into land use changes and remediation effectiveness.

Cesium-137 is a significant radioactive isotope requiring careful regulation and detection. Its distinct properties and practical applications highlight the need to understand its environmental and health impacts.



# Game with a Prize

## What is This?

**How to Play:**

Be the **first NRRPT member** to correctly identify the object shown in the close-up image below

**How to Enter:**

Email your guess to: [nrrpt@nrrpt.org](mailto:nrrpt@nrrpt.org)

**Prize:**

Win an NRRPT logo t-shirt

**Eligibility:**

Open to NRRPT members only

*Note: Board of Directors and Exam Panel members are NOT eligible to participate*

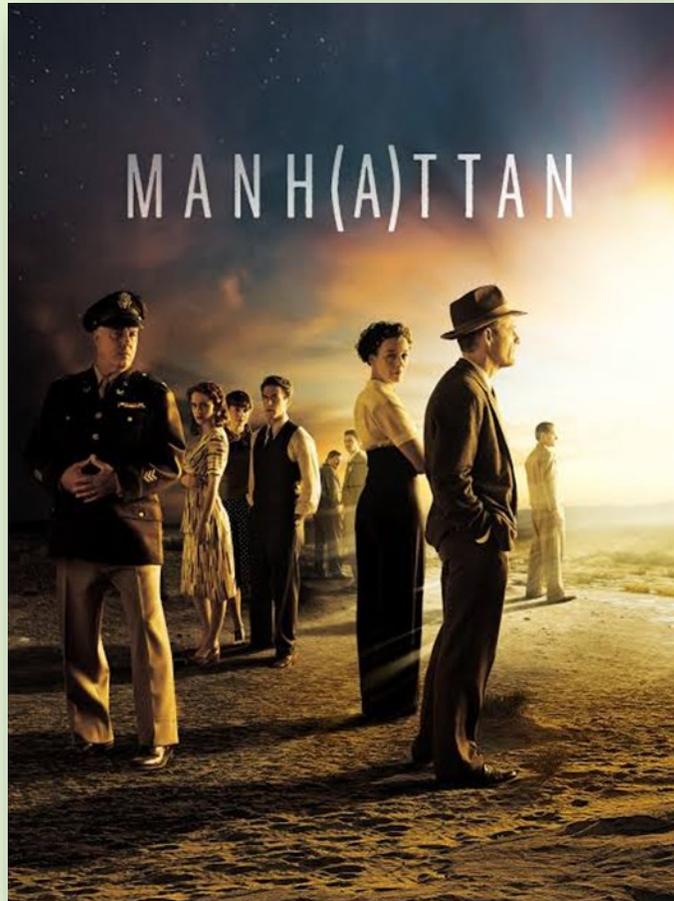
**Hint:**

The NRRPT News issues hold valuable information

**Good luck and happy guessing!**



# RAD MOVIE REVIEW!



## Rad Movie Review—Revisiting Manhattan: A Decade Later, the Atomic Drama Still Resonates

By Robert Stueve

Ten years after its final episode aired, *Manhattan*, the gripping television drama that brought the secretive world of the atomic bomb's creation to life, remains a haunting and underappreciated gem. Created by Sam Shaw and aired on WGN America from 2014 to 2015, the two-season series offered a fictionalized yet deeply human look at the scientists, soldiers, and families behind the Manhattan Project, the clandestine effort during World War II to develop the weapon that would change history forever.

Set in the dusty, isolated town of Los Alamos, New Mexico, *Manhattan* didn't just focus on the science of splitting the atom. It dove into the moral dilemmas, personal sacrifices, and psychological tolls borne by those who lived in the shadow of their own creation. The show starred John Benjamin Hickey as Frank Winter, a brilliant but tormented physicist, and Olivia Williams as his wife Liza, a botanist grappling with the absurdity of their secretive existence. Alongside them, a talented ensemble, including Ashley Zukerman as the ambitious Charlie Isaacs and Rachel Brosnahan as the sharp-witted Abby, brought depth to a world teetering between discovery and destruction.

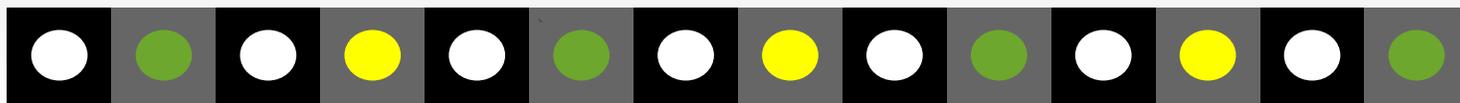
What set *Manhattan* apart from other historical dramas was its refusal to romanticize its subject. The show didn't shy away from the ethical dilemmas of building a weapon capable of annihilating millions. Scenes of scientific breakthroughs were undercut by moments of quiet dread—wives knitting in the dark about their husbands' work, soldiers enforcing silence with cold authority, and scientists wrestling with the knowledge that their genius might end the war or end the world. As Frank

Winter once mused in the series, “We’re not just building a bomb; we’re building a future we can’t see.”

Critics praised *Manhattan* for its meticulous period detail and taut storytelling. The show’s dusty vistas and 1940s aesthetics were paired with a modern sensibility, making it feel both timeless and urgent. Yet despite its quality, it struggled to find a wide audience, perhaps overshadowed by flashier contemporaries like *Breaking Bad* or *Game of Thrones*. After two seasons and 23 episodes, WGN America canceled the series in 2016, leaving fans with an unresolved cliffhanger and a lingering sense of what might have been.

A decade later, *Manhattan* feels more relevant than ever. In an era of renewed nuclear tensions and debates over scientific responsibility, think AI ethics or climate tech, the show’s questions about progress and its costs hit harder. Streaming platforms like Hulu, where the series remains available, have seen a modest resurgence of interest, with online forums buzzing about its prescience. “It’s a slow burn that sticks with you,” one X user posted recently. “You watch it and wonder: what are we building today that we’ll regret tomorrow?”

For those who missed it the first time, *Manhattan* is worth revisiting. It’s not just a history lesson—it’s a mirror. As we mark 80 years since the real Manhattan Project’s culmination in 1945, the show reminds us that the line between innovation and catastrophe is thinner than we’d like to admit. And in 2025, that’s a story we can’t afford to forget.



# NRRPT Logo Merchandise Available!

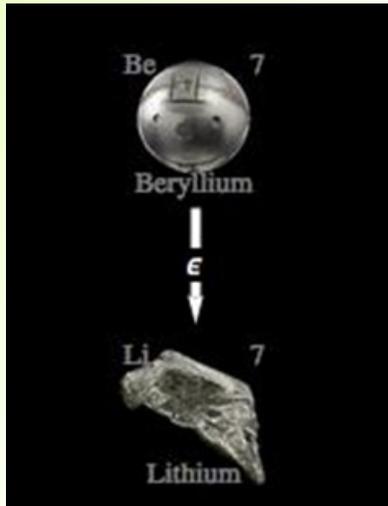
Dear NRRPT Members,

We’re excited to announce that NRRPT logo merchandise is now available through Bonfire! Whether you're looking for a tank top, t-shirt, hoodie, hats, mugs or duffel bags, Bonfire makes it quick and easy to order.

Shop now: <https://www.bonfire.com/store/nrrpt-logo-merchandise/>

You can also find the link on the NRRPT website home page.

We hope you enjoy the new products and show off your NRRPT pride!



## Brief Overview of Beryllium-7 (Be-7) by Michelle Kovach

Beryllium-7 (Be-7) is a radioactive isotope of beryllium that is naturally produced in the atmosphere through cosmic ray spallation — interactions of cosmic rays with the nuclei of atmospheric gases. Be-7 is a naturally occurring radionuclide formed when cosmic rays interact with Earth's atmosphere. It's created through nuclear spallation, where high-energy cosmic rays hit nitrogen and oxygen nuclei, causing them to break apart and form isotopes like Be-7. Be-7 can also be produced artificially using accelerators. Accelerators generate particle beams, such as protons, which are directed at target materials to induce nuclear reactions, including spallation that results in the formation of Be-7 (target bombardment).

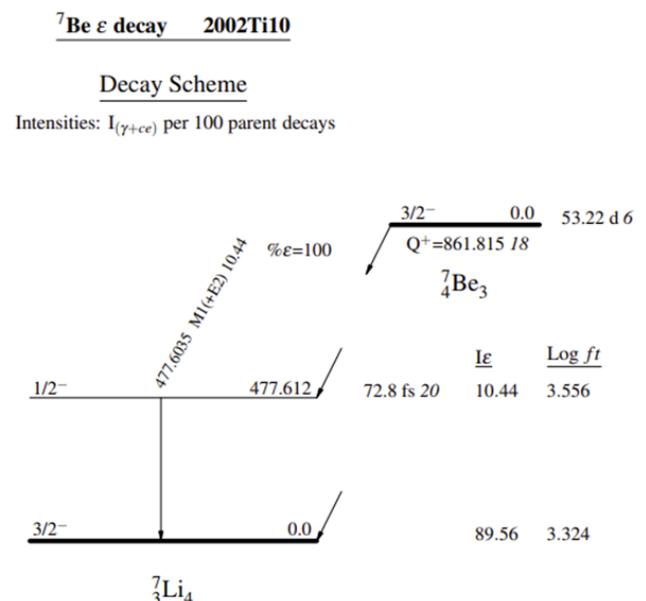
Detecting Be-7 typically involves collecting samples from various environmental media, such as air, precipitation, and soil. The detection process requires gamma spectroscopy due to the isotope's gamma-ray emission at an energy level of 477.6 keV. Be-7 emits this gamma photon 10.44% of the time. This method allows for the identification and quantification of Be-7 in samples, providing essential data for environmental and scientific research.

Be-7 has a half-life of approximately 53.22 days and decays via electron capture, transforming into lithium-7 (Li-7). Despite being radioactive, Be-7 is a relatively rare isotope compared to stable forms like Beryllium-9 (Be-9). In the environment, Be-7 can attach to aerosol particles and can be deposited onto the earth's surface through precipitation, which makes its presence an excellent tracer for studying atmospheric processes and transport.

Be-7 enables various applications, particularly in the fields of atmospheric science and environmental studies. It serves as a natural tracer for understanding atmospheric transport and deposition processes. By analyzing the distribution of Be-7, researchers can gain insights into weather patterns, air mass movement, and vertical atmospheric mixing.

Additionally, Be-7 has applications in studying the dynamics of aquatic systems. By examining its deposition in water bodies such as lakes and oceans, scientists can investigate sedimentation rates and water exchange processes, which are pivotal for environmental monitoring and the management of aquatic ecosystems.

In conclusion, Be-7 offers valuable insights into atmospheric, environmental, and aquatic studies through its detection and analytical application. Its unique characteristics and behaviors make it a useful tool in scientific endeavors aimed at determining these natural processes.



## 25 Years + as an RRPT

The following members were registered 1996 & 1997

### 1996

ALSTON, MICHAEL K.	CLARK, DAVID E.	GRANAAS, RANDALL S.	KLINGAMAN, MIKE A.
ARMKNECHT, GARY A.	COCHRAN, THOMAS E.	GRANTHAM, RICKY D.	KLINGLER, SCOTT B.
ASHMUN, DANIAL A.	COLBERT, EMMETT M.	GRAY, KEITH W.	KOSTOFF, BOYD D.
ASHTON, MARGARET E.	COLEMAN, NEIL	GRAY, MARTIN E.	KOVACIC, JOSEPH
ATWOOD, DUANE L.	COREY, LAWRENCE H.	GREIF, ANDREW A.	KRUPP, BRADLEY A.
BANASZYNSKI, JUDY	COX, ROBERT J.	HAAN, THOMAS P.	LANDES, CLAUDE W.
BARBER, SCOTT C.	CRAIG, DONALD M.	HAASE, MICHAEL D.	LANE, GREGORY W.
BARNES, DAVID A.	CRAIG, DOUGLAS W.	HACKWORTH, MICHAEL F.	LAYNE, ROBERT L.
BARTOLOMEY, EDWIN	DARGAY-WOLF, LORI ANN E.	HALE, J. M	LEDGERWOOD, KELLY D.
BAUMAN, RODNEY L.	DAVIS, KENNETH F.	HALLAM, CHRISTOPHER M.	LEMONS, RICHARD C.
BEDINGFIELD, CHAD A.	DAVIS, MACE W.	HAMPSHIRE, G. JOHN	LESTER, MICHAEL M.
BEILKE, ROBERT L.	DE SHAZO, ROBERT E.	HANSEN, ROBERT W.	LINDSEY, MELVIN C.
BENFIELD, EDWIN M.	DEMLOW, JAMES E.	HARMON, DAVID J.	LONGER, JOHN P.
BERTOSSI, BENJY P.	DENNIS, THOMAS W.	HARTLEY, MARK P.	MAC LEANE, JR., JOHANNES
BICE, LORI A.	DIEHL, JOHN A.	HAUGER, GREGORY S.	MACMINN, JOHN S.
BIELBY, MICHAEL E.	DIETRICH, WAYNE W.	HAYNES, ELLA J.	MADDEN, CLAY R.
BINGHAM, II, THOMAS E.	DIXON, JOSEPH A.	HAYS, JR., DAVID C.	MARCHAND, ALAN R.
BLACK, VON W.	DONOHUE, J. TERRY	HEYDE, JR., HARVEY P.	MARIANO, ROBERT A.
BLANKENSHIP, DAREN D.	DOOLEY, H. MICHAEL	HIGBEE, MARK D.	MARQUEZ, CHARLENE M.
BLIMKIE, RICK D.	DOUGHTY, JERRY A.	HILL, DENNIS L.	MARTENS, THOMAS C.
BOURNE, MATTHEW R.	DOWNEY, SHEILA SMITH	HINKLE, THOMAS D.	MARTIN, CHRISTOPHER R.
BRACAMONTES, DAMON J.	DUFFY, PATRICK R.	HITT, STEPHEN R.	MARTINEZ, ANTHONY R.
(SONNY)	DUMAS, STEPHEN W.	HOGAN, JEAN T. R.	MARTINSON, TIMOTHY I.
BROACH, DAVID M.	DUNLAP, LYNETTE S.	HOLYOAK, RYAN G.	MATTHEISS, MARK B.
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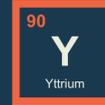
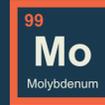
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