



## The Secretary of Energy

Washington, DC 20585

February 1, 2022

The Honorable Joyce Connery  
Chair  
Defense Nuclear Facilities Safety Board  
625 Indiana NW, Suite 700  
Washington, DC 20004

Dear Chair Connery:

Thank you for your September 8, 2021, letter expressing concern over conclusions in the May 1, 2019, Carlsbad Field Office (CBFO) direction letter on management of transuranic wastes containing mixtures of Nitric Acid or Nitrate Salts with Polysaccharides.

Pursuant to 42 United States Code § 2286b(d), your letter requested, that the Department of Energy (DOE) provide a report and briefing within 90 days that describes its plan for safely managing these waste materials across the complex. Thank you also for your December 2, 2021, letter that extends the due date for the written response to January 31, 2022.

In response, the Office of Environmental Management briefed the Board on November 17, 2021, and the report addressing the Defense Nuclear Facilities Safety Board's (DNFSB) concerns and detailing CBFO's plan to safely manage these waste materials within the DOE defense nuclear complex is enclosed. Based on feedback from the DNFSB technical staff, CBFO addressed technical concerns which enhance program safety across the defense nuclear complex by providing a revised letter of direction, enclosed. Notably, the new direction letter clarified the following:

- Removed references to technical documents and conclusions in question;
- Provided a statement on risk acceptance;
- Removed reference to wheat-based sorbents; and
- Established a sunset clause for the direction.

The report details how the revised direction letter addresses the Board's concerns. The Department appreciates continued interaction with your staff to enhance safety while effectively managing these waste materials within the certified programs across the defense nuclear complex.

If you have any questions, please contact me or Mr. William I. White, Senior Advisor for Environmental Management, at (202) 586-8214.

Sincerely,

A handwritten signature in black ink, appearing to read 'J. Granholm', written in a cursive style.

Jennifer Granholm

Enclosure (2)

- 1) CBFO Report: Plan to Manage Transuranic Waste Containing Nitric Acid or Nitrate Salts with Polysaccharides. [DOE/CBFO-22-RPT01. Revision 0]
- 2) CBFO Direction Letter: Revised CBFO Direction for Nitric Acid and Metal Nitrate Salts with Polyol Organic Chemicals and Polysaccharide Sorbing Materials for Chemical Compatibility and Basis of Knowledge Criteria Evaluations. December 21, 2021.

# Plan to Manage Transuranic Waste Containing Nitric Acid or Nitrate Salts with Polysaccharides



U.S. Department of Energy  
Carlsbad Field Office

DOE/CBFO-22-RPT01  
Revision 0

Effective Date: January 13, 2022

**TABLE OF CONTENTS**

<b>1.0</b>	<b>ACRONYMS and ABBREVIATIONS</b> .....	<b>3</b>
<b>2.0</b>	<b>EXECUTIVE SUMMARY</b> .....	<b>3</b>
<b>3.0</b>	<b>BACKGROUND</b> .....	<b>4</b>
<b>3.1</b>	<b>Guidance Issued on April 16, 2018</b> .....	<b>4</b>
<b>3.2</b>	<b>Guidance Issued on May 1, 2019</b> .....	<b>6</b>
<b>4.0</b>	<b>DISCUSSION</b> .....	<b>7</b>
<b>4.1</b>	<b>DNFSB Technical Concerns Summary</b> .....	<b>7</b>
<b>4.2</b>	<b>DNFSB Technical Concerns Discussion</b> .....	<b>7</b>
<b>5.0</b>	<b>APPLICATION</b> .....	<b>8</b>
<b>5.1</b>	<b>Changes to CBFO Direction on Nitric Acid or Nitrate Salts with Polysaccharides</b> .....	<b>8</b>
<b>5.2</b>	<b>Nitric Acid or Nitrate Salts with Polysaccharides Waste Management</b> .....	<b>9</b>
<b>6.0</b>	<b>CONCLUSION</b> .....	<b>10</b>
<b>7.0</b>	<b>REFERENCES</b> .....	<b>10</b>

## 1.0 ACRONYMS and ABBREVIATIONS

BOK	basis of knowledge
C	Centigrade
CBFO	Carlsbad Field Office
CCE	Chemical Compatibility Evaluation
DNFSB	Defense Nuclear Facility Safety Board
DOE	U.S. Department of Energy
EM	DOE Office of Environmental Management
F	Fahrenheit
LANL	Los Alamos National Laboratory
RNS	remediated nitrate salts
TRU	transuranic
WIPP	Waste Isolation Pilot Plant

## 2.0 EXECUTIVE SUMMARY

In a letter dated October 25, 2017, the U.S. Department of Energy (DOE) Carlsbad Field Office (CBFO) provided direction to the Waste Isolation Pilot Plant (WIPP) certified programs regarding nitric acid and nitrate salts with polyol-based material for the purpose of chemical compatibility and basis-of-knowledge (BOK) criteria evaluations [Ref 1]. The letter of direction allowed the certified program to process problematic waste originating from the Los Alamos National Laboratory (LANL) where chemical compatibility evaluation (CCE) criteria were considered met through aging and temperature requirements for the waste. The narrow population of containers was cleared to proceed through container-by-container BOK evaluations to ensure no oxidizers were present and that the containers were compliant to ship to the WIPP for permanent disposal.

The CBFO revised the letter of direction on April 16, 2018, and again on May 1, 2019 [Refs 2 and 3]. The revisions increased the body of knowledge on remediated nitrate salts (RNS) waste and the potential for runaway autocatalytic reactions. The research conducted by LANL resulted in the establishment of a basis by which nitric acid and nitrate salts with polyol-based material could be evaluated for certification. Most notably, only qualified certification program experts can utilize the basis to provide reasonable assurance the actual storage times and temperature requirements for the specific waste have been met to reduce the risk of a future adverse reaction.

The CBFO direction provided in the letters applied to a narrow subset of transuranic (TRU) waste within the complex. Associated reports [Refs 4 and 5] supporting the direction were limited in their application to other TRU waste within the complex.

DOE issued a memorandum from the Office of Environmental Management (EM) acting Deputy Assistant Secretary for Safety, Security, and Quality Assurance to all EM field managers stating:

The analysis and conclusions documented in these reports were not intended to be broadly applied to other waste stored across the EM complex. Any future use of these reports needs to be cleared with the Office of Safety, Security and Quality Assurance (EM-3.1), or the Office of Field Operations and Oversight (EM 3.11), before utilizing them as a basis/reference in Safety Basis documents. [Ref 10].

The Defense Nuclear Facilities Safety Board (DNFSB) issued a letter on September 8, 2021, to the Secretary of Energy [Ref 7] expressing specific concerns with the CBFO direction letter dated May 1, 2019. That CBFO direction letter referenced scientific papers utilized to justify reductions in time and temperature requirements for TRU waste containing nitric acid or nitrate salts with polysaccharides. Respectively, age criteria reduced from 365 to 200 days non-consecutive, and from 60 to 50 degrees Fahrenheit (F) for minimum storage temperature for waste containing cellulosic-based material [Ref 3].

On November 17, 2021, DOE briefed the DNFSB. This briefing covered elements of aging and temperature criteria, technical reviews of scientific papers used to justify criteria, and the usage of the current CBFO direction letter within certified programs. The DOE did not have any additional technical information to submit to the DNFSB during the briefing beyond the analysis of the scientific papers in question.

Following the briefing to the DNFSB, the CBFO federal staff met with DNFSB technical staff. The CBFO incorporated DNFSB technical staff feedback to develop a revised direction letter. This revised direction letter became effective on December 21, 2021 [Ref 8], and applies to waste specifically containing cellulosic material generated up to May 31, 2022, at which time the direction letter expires. The letter narrows the scope of applicability while giving waste generator sites time to make changes to programs and processes that might be affected by expiration of the direction letter in May 2022.

### **3.0 BACKGROUND**

#### **3.1 Guidance Issued on April 16, 2018**

In response to the nature of the 2014 WIPP event involving Drum 68660, enhanced acceptable knowledge criteria guidelines were issued for all waste streams at certified program generator sites. One of these guidelines was the BOK criteria for evaluating oxidizers present in waste streams.

Analyzing limited historical data from the Savannah River Site, the data suggested the likelihood of a runaway reaction occurring after a few months was very low [Ref 9]. One important factor to consider in this data is the ambient temperature in extreme conditions, like those observed during the fall, winter, and early spring months at Idaho National Laboratory. To ensure that all RNS waste was subjected to an appropriate aging time, decreasing the likelihood of a runaway reaction, a storage time of 1 year was determined to be reasonable to minimize the risk of a runaway reaction in a drum prior to emplacement at the WIPP. In addition, studies from LANL demonstrated that mixtures of metal nitrate salts begin to undergo runaway autocatalytic reactions beginning at temperatures of 140° F (60° C). The data from these LANL studies were compiled to provide the following guidance issued by the CBFO in April 2018:

- Nitrate Salt or Nitric Acid mixtures with polyols shall be identified as compatible using a CBFO directed ambient temperature of 140° F (60° C) and ambient pressure in the chemical compatibility evaluation documentation when it is known the waste has been packaged for more than 1 year.
- Nitric acid or nitrate salt mixtures with polyols shall be identified as incompatible using an ambient temperature of 140°F (60°C) and ambient pressure in the chemical compatibility evaluation documentation when the waste has been packaged for 1 year or less.
- Nitric acid or nitrate salt mixtures with polyols shall be deemed indeterminate for compliance with the BOK criteria by the Certified program, regardless of the length of time since the waste was packaged until specific evaluation criteria are identified and included in the BOK documents for evaluating such mixtures. The WIPP certified program will provide containers identified as being indeterminate for compliance with this BOK criterion to CBFO in a formal letter.
- Headspace gas sampling and analysis will be performed as directed by the CBFO on each waste container deemed indeterminate for compliance to the BOK criteria due to nitric acid or nitrate salt mixtures with polyols to determine if significant nitrate-induced oxidation reactions are occurring. The determination that an observed reaction is significant or insignificant will be made by the CBFO after reviewing the data obtained from analysis of headspace gas sampling and the determination results will be communicated to the WIPP certified program. Should the determination conclude the potential for significant nitrate-induced oxidation reactions, CBFO will communicate that the waste container is noncompliant with the BOK criteria and that it be appropriately dispositioned in accordance with the WIPP certified program.

### 3.2 Guidance Issued on May 1, 2019

Recognizing the limited historical data used in creating the guidance issued in April 2018, a summary of historic exothermic drum events was compiled. These events were limited to those determined to be caused by reactions between polysaccharides and nitric acid or nitrate salts. This summary included a total of more than 60 events that were used in creating more specific guidance [Refs 4 and 5]. From these data, the longest times observed were 20 days and 73 days before an exothermic event occurred involving cellulose-based and starch-based polysaccharides, respectively. A safety factor of ten-fold was conservatively applied to each aging period to create the recommended aging time of 200 days and 730 days for RNS waste containing cellulose-based and starch-based polysaccharides, respectively. A temperature of 140°F (60°C) for chemical compatibility evaluation based on the highest temperature the waste could experience during compliant operations was used. This temperature was based on the center of a top payload assembly within a shipping container stored for up to 60 days experiencing normal decay heat. [Refs 4 and 5].

The CBFO issued revised guidance based on the research summarized in DWT-RPT-005 and DWT-RPT-006 [Refs 4 and 5]. The CBFO letter 19-0024 contained new guidance to the certified programs based on the research outlined above:

- Nitric acid or nitrate salt mixtures with non-sorbing polyol chemicals (e.g., poly vinyl alcohol, glycerol, excluding polysaccharides) shall be evaluated for compatibility using a CBFO-directed evaluation temperature of 140°F (60°C). With the exception of polysaccharides, non-sorbing chemical polyols shall be evaluated as miscellaneous organic materials using the criteria specified for Ion Exchange Resins in BOK section 4.5.3.
- Nitric acid or nitrate salt mixtures with cellulose sorbents, rags, wipes, sorbent pads, or pillows shall be identified as compatible in the chemical compatibility evaluation after the waste has aged a total of 200 days since the last closure date of the waste container at an average daily temperature of 50° F or higher (does not have to be consecutive days).
- Nitric acid or nitrate salt mixtures with Wheat Scoop shall be identified as compatible in the chemical compatibility evaluation after the waste has aged a total of 730 days since the last closure date of the waste container at an average daily temperature of 50° F or higher (does not have to be consecutive days).

The generator sites are responsible for ensuring that all nuclear materials are stored, handled, and managed in a safe and compliant manner.

In order to ensure that generator sites did not inappropriately apply this WIPP certified program-specific guidance as a technical basis for safe on-site storage, DOE issued a memorandum from the EM acting Deputy Assistant Secretary for Safety, Security, and Quality Assurance to all EM field managers stating:

The analysis and conclusions documented in these reports were not intended to be broadly applied to other waste stored across the EM complex. Any future use of these reports needs to be cleared with the Office of Safety, Security and Quality Assurance (EM-3.1), or the Office of Field Operations and Oversight (EM 3.11), before utilizing them as a basis/reference in Safety Basis documents.

[Ref 6].

## **4.0 DISCUSSION**

### **4.1 DNFSB Technical Concerns Summary**

In a letter dated September 8, 2021, the DNFSB outlined three significant technical concerns regarding the guidance issued in 2019 to WIPP certified programs. The three significant concerns are summarized below:

- The change in the aging period for drums containing RNS waste to be considered chemically compatible for acceptance at WIPP.
- The basis for the temperature at which the drums must be stored to count toward the aging time.
- The peer review process used in reviewing DWT-RPT-005 and DWT-RPT-006. These documents were the main basis from which the new direction issued to WCP in 2019.

### **4.2 DNFSB Technical Concerns Discussion**

#### **4.2.1 Peer Review Process**

The DNFSB's letter dated September 8, 2021, states "...the staff team has concerns with the scope and rigor of the peer review process and whether concerns were adequately resolved." DWT-RPT-005 and DWT-RPT-006 were removed in the revised direction letter that became effective on December 21, 2021.

#### 4.2.2 Aging Period

The DNFSB's concern regarding the aging period is that the period relies on single data points as the basis for each aging time provided. Although a set of single data points was selected to establish the final values provided in the May 1, 2019, guidance, the data points were the most conservative selected from each population of cellulose and starch-based polysaccharide incidents. Statistical analysis of all data points within the data sets would yield a much lower aging time. The two incidents that had the longest aging time prior to deflagration revealed significantly longer times than the other aging times. To ensure that the CBFO was providing the most conservative guidance to the certified programs, the statistical outliers of the observed events were used instead of an average of the populations.

#### 4.2.3 Storage Temperature

The final concern addressed by the Board is the guidance issued related to the storage temperature being above 50° F (10° C) to count toward the aging period of a drum containing RNS waste. The CBFO derived this value from a report issued by LANL [Ref 9]. The reduced storage temperatures were removed in the revised direction letter that became effective on December 21, 2021.

## 5.0 APPLICATION

### 5.1 **Changes to CBFO Direction on Nitric Acid or Nitrate Salts with Polysaccharides**

The CBFO issued revised direction to the certified programs on December 21, 2021 [Ref 8]. The revised direction included:

- a limiting clause stating the direction will only pertain to waste generated up to May 31, 2022;
- removal of wheat-based sorbents from the direction letter;
- return to the previous 365-day aging and 60-degree Fahrenheit temperature criteria instituted in the CBFO direction letter issued April 16, 2018;
- removal of scientific research references and associated conclusions stated in the May 1, 2019, direction letter; and
- clear statement of risk acceptance with applicability and limitations.

The new direction letter is not applicable to waste generated after May 31, 2022. The time period up to the date allows individual DOE sites actively generating waste to review their processes and procedures related to the referenced waste

forms. This gives the certified programs adequate time to update enhanced acceptable knowledge and chemical compatibility evaluations, as necessary. These changes are in accordance with applicable waste acceptance criteria and in line with the evaluation and characterization of other waste forms within the National TRU Program.

The new direction letter removes all reference to wheat-based sorbents for age and temperature requirements related to chemical compatibility. Prior direction letters included wheat-based sorbents and had limited application to a specific waste population. This application is no longer necessary.

The CBFO elected to remove reference to the reports, DWT-RPT-005 and DWT-RPT-006, and revert to requirements stated in the direction letter dated April 16, 2018. These criteria will uniformly be used for applicable waste generated up to May 31, 2022. The decision to revert to previous, more restrictive, criteria is in response to the DNFSB's concerns and discussions with DNFSB technical staff. The previous criteria represent a greater margin of safety and a reduction in risk. This approach is prudent based on the merit of presented safety concerns and associated technical discussions.

The CBFO is only able to determine and direct risk acceptance for the WIPP. Any such risk acceptance does not imply acceptance of risk to a generating site retrieving, characterizing, or storing TRU waste. The newly revised direction letter states the CBFO is making a risk-informed decision with acceptance of that risk as it relates to a narrow subset of TRU waste for compatibility for disposal at the WIPP site. Furthermore, the letter clearly states there is no applicability related to the direction for hazard determination and facility safety for a given waste generator site. Waste management and facility safety are the responsibility of the cognizant field office and contracted entities. The CBFO is responsible for the delivery of safe, compliant waste to the WIPP repository.

The latest direction represents three core changes within the National TRU Program as it relates to the management of TRU waste containing nitric acid or nitrate salts with polysaccharides. First, is removal of applicability to Starch-based RNS waste. The second change is the return to previous aging and temperature criteria for waste containing cellulosic material. The last is the phasing out of the direction in a controlled manner.

## **5.2 Nitric Acid or Nitrate Salts with Polysaccharides Waste Management**

The CBFO is working with waste generating sites and certified programs to determine the path forward related to nitric acid or nitrate salts with

polysaccharides. Potential changes will be evaluated through the updated enhanced acceptable knowledge documents and BOK reviews as they occur.

This narrow subset of the TRU waste population will continue to follow all WIPP waste acceptance criteria and other related program documents during applicable periods of the CBFO direction letter and afterwards. The DOE will engage DNFSB technical staff in discussions related to waste containing nitric acid or nitrate salts with polysaccharides as they occur.

## **6.0 CONCLUSION**

The CBFO reviewed the concerns presented by the DNFSB and conducted follow-up discussions with DNFSB technical staff. The outcome of these discussions, along with historical review of the direction letters and supporting documentation, resulted in the CBFO's determination to revise previous guidance documents to limit the scope and direction to expire on May 31, 2022. The primary driver for limiting the scope of the direction is the reduced need for the direction within the DOE complex as it relates to a subpopulation of TRU waste. Additionally, the CBFO determined that many of the technical concerns presented by the DNFSB provided valuable perspective on the interpretation and application of research completed by a national laboratory as it relates to this subpopulation of TRU waste.

DOE will continue to confer with DNFSB technical staff as management strategies for waste containing nitric acid or nitrate salts with polysaccharides mature. This professional dialogue represents not only a mutual commitment to safety, but also a robust process by which new technical and scientific information may be evaluated for use across the complex.

## **7.0 REFERENCES**

[1] Letter CBFO:OOM:KW:RS:17-0053:UFC 5822.00 dated October 25, 2017, from Todd Shrader, CBFO Manager, to Mr. Bruce Covert, NWP, and Mr. John C. McCoy, Manager, RH/CH TRU Program, Fluor Idaho; Subject: CBFO Direction for Nitric Acid and Nitrate Salts with Polyol-Based Material Chemical Compatibility and Basis of Knowledge Criteria Evaluations

[2] Letter CBFO:ONTP:KEP:RMS:18-0621:UFC 5822.00 dated April 16, 2018, from Todd Shrader, CBFO Manager, to Mr. Bruce Covert, NWP, and Mr. John C. McCoy, Manager, RH/CH TRU Program, Fluor Idaho; Subject: Transmittal of the Revised CBFO Direction for Nitric Acid and Nitrate Salts with Polyol-Based Material Chemical Compatibility and Basis of Knowledge Criteria Evaluations

[3] Letter CBFO:OOM:KW:LM: 19-0024:UFC 5822.00 dated May 1, 2019, from Todd Shrader, CBFO Manager, to Mr. Bruce Covert, NWP, and Mr. John C. McCoy, Manager, RH/CH TRU Program, Fluor Idaho; Subject: Revised CBFO Direction for Nitric Acid and Metal Nitrate Salts with Polyol Organic Chemicals and Polysaccharide Sorbing Materials for Chemical Compatibility and Basis of Knowledge Criteria Evaluations

[4] Los Alamos National Laboratory Document, LA-UR-18-27835, issued July 15, 2020; Titled: DWT-RPT-005, Revision 2, Safety Evaluation of Nitric Acid Reactions with Polysaccharides

[5] Los Alamos National Laboratory Document, LA-UR-19-23350, issued July 15, 2020; Titled: DWT-RPT-006, Revision 1, Safety Evaluation of Remediated Nitrate Salt Waste

[6] Memo dated June 9, 2020, from Michael Mikolanis, acting Deputy Assistant Secretary for Safety, Security, and Quality Assurance, to Office of Environmental Management Field Managers; Subject: Use of Reports Safety Evaluation of Nitric Acid Reactions with Polysaccharides (DWT-RPT-005) and Safety Evaluation of Remediated Nitrate Salt Waste (DWT-RPT-006)

[7] Letter dated September 8, 2021, from Joyce Connery, DNFSB Chair, to the Honorable Jennifer Granholm, Secretary of Energy, Defense Nuclear Facilities Safety Board (Board), technical evaluation regarding the May 1, 2019, Carlsbad Field Office (CBFO) letter on evaluating waste containing mixtures of nitric acid or nitrate salts with polysaccharides

[8] Letter CBFO:ONTP-WCD:KEP:VV:21-1081:UFC 5822.00 dated December 21, 2021, from Reinhard Knerr, CBFO Manager, to Mr. Sean Dunagan, NWP, and Mr. Ed Gulbransen, Fluor-Idaho; Subject: Revised CBFO Direction for Nitric Acid and Metal Nitrate Salts with Polyol Organic Chemicals and Polysaccharide Sorbing Materials for Chemical Compatibility and Basis of Knowledge Criteria Evaluations

[9] Savannah River Site Document, WSRC-TR-91-22, issued June 1991; Revision 1, Adverse Experiences with HNO<sub>3</sub> at Savannah River Site

[10] Los Alamos National Laboratory Document, LA-UR-15-22393, issued April 2, 2015; Titled: Chemical Reactivity and Recommended Remediation Strategy for LANL Remediated Nitrate Salt (RNS) Waste



**Department of Energy**  
Carlsbad Field Office  
P. O. Box 3090  
Carlsbad, New Mexico 88221  
December 21, 2021

Mr. Sean Dunagan  
President & Project Manager  
Nuclear Waste Partnership LLC  
P.O. Box 2078  
Carlsbad, NM 88221

Mr. Ed Gulbransen, Manager  
Waste Management Programs  
Fluor Idaho  
1580 Sawtelle St.  
Idaho Falls, ID 83402

Subject: Revised CBFO Direction for Nitric Acid and Metal Nitrate Salts with Polyol Organic Chemicals and Polysaccharide Sorbing Materials for Chemical Compatibility and Basis of Knowledge Criteria Evaluations

- Reference: 1) CBFO letter CBFO:ONTP:KEP:RMS:18-0621 from Todd Shrader, Manager, to Bruce Cover, President and Project Manager, and John C. McCoy, RH/CH TRU Program Manager; Subject: Transmittal of the Revised CBFO Direction for Nitric Acid and Nitrate Salts with Polyol-Based Material Chemical Compatibility and Basis of Knowledge Criteria Evaluations, dated April 16, 2018
- 2) Department of Energy Carlsbad Field Office, *Basis of Knowledge for Evaluating Oxidizing Chemicals in TRU Waste*, DOE/WIPP-17-3589, Revision 1, December 2018
- 3) CBFO letter CBFO:OOM:KW:LM:19-0024 from Todd Shrader, Manager, to Bruce Covert, President and Project Manager, and John C. McCoy, RH/CH TRU Program Manager; Subject: Revised CBFO Direction for Nitric Acid and Metal Nitrate Salts with Polyol Organic Chemicals and Polysaccharide Sorbing Materials for Chemical Compatibility and Basis of Knowledge Criteria Evaluations, dated May 1, 2019

Dear Mr. Dunagan and Mr. Gulbransen:

The guidance below pertains to any transuranic (TRU) waste generated on or before May 31, 2022. Any waste generated after that date will defer to the established Waste Acceptance Criteria and Waste Analysis Plan for the Waste Isolation Pilot Plant (WIPP). The guidance below represents Department of Energy Carlsbad Field Office (CBFO) risk acceptance for TRU waste compatibility as related to the certified programs and WIPP. This guidance does not impact individual generator site hazard determinations or responses to include acceptable risk determinations which are defaulted to the host site cognizant office.

Chapter 18 of the WIPP Documented Safety Analysis and WIPP Waste Acceptance Criteria Appendix H require WIPP Certified Programs to perform enhanced chemical compatibility evaluations and evaluation of waste with oxidizing chemicals according to the CBFO issued "Basis of Knowledge" (BoK) criteria. This correspondence supersedes the CBFO letter dated May 1, 2019 regarding the Revised CBFO Direction for Nitric Acid and Metal Nitrate Salts with Polyol Organic Chemicals and Polysaccharide Sorbing Materials for Chemical Compatibility and Basis of Knowledge Criteria Evaluations (Reference 3).

The nitric acid or nitrate salt mixtures with polysaccharides, other than starch-based sorbing materials, are not expected to undergo autocatalytic runaway reactions after one year when stored at an average daily temperature of 50 degrees Fahrenheit (°F) or higher (Reference 1). Therefore, CBFO is issuing revised direction to be followed by WIPP Certified Programs when performing chemical compatibility evaluations of waste containing nitric acid or metal nitrate salt mixtures with non-sorbing polyol chemicals and polysaccharide sorbing materials. This direction also specifies how such waste must be evaluated to the BoK criteria.

- Nitric acid or nitrate salt mixtures with non-sorbing chemicals containing multiple hydroxide groups (e.g., poly vinyl alcohol, glycerol) shall be evaluated for compatibility using a CBFO-directed evaluation temperature of 140°F (60°Centigrade). Non-sorbing chemicals with multiple hydroxide groups shall be evaluated as miscellaneous organic materials using the criteria specified for Ion Exchange Resins in BoK section 4.5.3.
- Nitric acid or nitrate salt mixtures with cellulose sorbents (such as cheese cloth), rags, wipes, sorbent pads, or pillows shall be identified as compatible in the chemical compatibility evaluation after the waste has been stored for a total of 365 days since the last closure date of the waste container at an average daily temperature of 50°F or higher (does not have to be consecutive days).

The cellulose sorbents (such as cheese cloth), rags, wipes, sorbent pads, or pillows are evaluated by the TRU waste generator sites and are handled separately in the BoK in sections 4.5 and 4.5.2. (Reference 2) Cellulose specifically does not have an allowable concentration limit listed for disposal in the WIPP. These polysaccharides require treatment, testing, or technical justification showing compliance for shipment to the WIPP.

When TRU waste has cellulose sorbents (such as cheese cloth), rags, wipes, sorbent pads, or pillows contaminated with nitric acid or metal nitrate salts or other oxidizing salts (such as permanganate), the WIPP Certified Program shall determine if the waste exhibits the characteristic of ignitability as specified in Title 40 Code of Federal Regulations section 261.21 (a)(4) or the state equivalent regulation. When a WIPP Certified Program determines that the waste exhibits the characteristic of ignitability due to the inclusion of nitric acid or metal nitrate salt contaminated polysaccharide components with other waste, the components of concern must be treated per section 5.0 or tested and treated when necessary per section 2.0 c) of the BoK.

If you have any questions, please contact Mr. Kenneth Princen, Assistant Manager of the National TRU Program, at (575) 234-7053.

Sincerely,

REINHARD

KNERR

Reinhard Knerr

Manager

Carlsbad Field Office

Digitally signed by REINHARD  
KNERR  
Date: 2021.12.21 09:55:47 -07'00'

cc:

J. Marble, EM-4.1	*ED	G. Byram, ICP	ED
M. Bollinger, CBFO	ED	G. Tedford, ICP	ED
M. Hall, CBFO	ED	D. Weaver, LANL-CO	ED
K. Princen, CBFO	ED	B. Crawford, LANL-CO	ED
K. Watson, CBFO	ED	P. Duval, LANL-CO	ED
A. Walker, CBFO	ED	L. Watson, LANL-CO	ED
D. Foreman, CBFO	ED	B. Lemons, LANL-CO	ED
M. Brown, CBFO	ED	M. Percy, NWP	ED
H. Cruickshank, CBFO	ED	R. Lee, NWP	ED
T. Carver, CBFO	ED	M. Ramirez, NWP	ED
M. Toothman, CBFO	ED	M. Devarakonda, NWP	ED
D. Smith, CBFO	ED	C. Hatch, NWP	ED
D. Bamber, CBFO	ED	D. Wade, NWP	ED
W. Iqbal, CBFO	ED	T. Greenwood, TechSpecs	ED
D. Standiford, CBFO	ED	Site Docs	ED
D. Pruitt, DOE-ID	ED	CBFO M&RC	ED
T. Jenkins, DOE-ID	ED		

\*ED denotes electronic distribution