

Class 2 Permit Modification Request
Removal of Excluded Waste Prohibition
Waste Isolation Pilot Plant
Carlsbad, New Mexico
WIPP Permit Number - NM4890139088-TSDF

March 2013

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Acronyms and Abbreviations

ATWIR	Annual Transuranic Waste Inventory Report
CFR	Code of Federal Regulations
CH	contact-handled
DOE	U.S. Department of Energy
LWA	Land Withdrawal Act
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NRC	Nuclear Regulatory Commission
Permit	Hazardous Waste Facility Permit
PMR	Permit Modification Request
RCRA	Resource Conservation and Recovery Act
RH	remote-handled
SNF	spent nuclear fuel
TRAMPAC	Transuranic Waste Authorized Methods of Payload Control
TRU	transuranic
TRUCON	TRU Waste Content Codes
TRUPACT-II	Transuranic Package Transporter-II
TRUPACT-III	Transuranic Package Transporter-III
TWBIR	Transuranic Waste Baseline Inventory Report
WAC	Transuranic Waste Acceptance Criteria
WIPP	Waste Isolation Pilot Plant

Overview of the Permit Modification Request

This document contains a Class 2 Permit Modification Request (**PMR**) for the Hazardous Waste Facility Permit (**Permit**) at the Waste Isolation Pilot Plant (**WIPP**), Permit Number NM4890139088-TSDF.

This PMR is being submitted by the U.S. Department of Energy (**DOE**), Carlsbad Field Office and Nuclear Waste Partnership LLC, collectively referred to as the Permittees, in accordance with the Permit, Part 1, Section 1.3.1 (20.4.1.900 New Mexico Administrative Code [**NMAC**] (incorporating Title 40 Code of Federal Regulations (**CFR**) §270.42(b))). The modification to the Permit is being requested for the following item:

- Remove the excluded waste prohibition, and associated text pertaining to transuranic (**TRU**) mixed waste that has ever been managed as high-level waste and waste from specified tanks listed in the Permit.

These changes do not reduce the ability of the Permittees to provide continued protection to human health and the environment.

The requested modification to the Permit and related supporting documents are provided in this **PMR**. The proposed modification to the text of the Permit has been identified using red text and a double underline for new text and a ~~strikeout~~ font for deleted information. All direct quotations are indicated by italicized text. The following information specifically addresses how compliance has been achieved with the Permit, Part 1, Section 1.3.1. for submission of this Class 2 PMR.

1. **20.4.1.900 NMAC (incorporating 40 CFR 270.42(b)(1)(i)) requires the applicant to describe the exact change to be made to the Permit conditions and supporting documents referenced by the Permit.**

This modification proposes to revise Permit, Part 2 and Attachments C and C6, to remove the prohibition with respect to excluded waste (i.e., *TRU mixed waste that has ever been managed as high-level waste and waste from tanks specified in Permit Attachment C are not acceptable at WIPP unless specifically approved through a Class 3 permit modification*). The proposed changes pertain to the following part and attachments of the Permit:

- Deleting Part 2, Section 2.3.3.8. and Table 2.3.3.8.
- Revising Attachment C, Waste Analysis Plan, Section C-1c and deleting Table C-8.
- Revising Attachment C6, Audit and Surveillance Program, Table C6-1.

The Table of Changes (Appendix A) describe each change that is being proposed and the Proposed Revised Permit Text (Appendix B) shows the changes to the permit text in redline strikeout.

2. 20.4.1.900 NMAC (incorporating 40 CFR 270.42(b)(1)(ii)), requires the applicant to identify that the modification is a Class 2 modification.

The proposed modification is classified as a Class 2 Modification for the reason indicated below:

20.4.1.900 New Mexico Administrative Code (incorporating 40 CFR §270.42, Appendix I, Item B.) *“General Facility Standards, 1. Changes to waste sampling or analysis methods:...d. Other changes...2”*

A position paper on the classification of the modification is included as Appendix C and provides further information regarding classification as a Class 2 PMR.

3. 20.4.1.900 NMAC (incorporating 40 CFR 270.42(b)(1)(iii)), requires the applicant to explain why the modification is needed.

The WIPP Permit is developed and approved based on requirements specified in the Hazardous Waste Permit Program of the hazardous waste regulations that implement Subtitle C of the Resource Conservation and Recovery Act (**RCRA**). The RCRA regulations apply to all aspects pertaining to management of hazardous waste. The radioactive aspects of the waste are not regulated by the RCRA. The excluded waste prohibition requires that the New Mexico Environment Department (**NMED**) approve the Permittees TRU waste determination through a Class 3 PMR. Because this determination is not RCRA related, the Permittees believe the provisions are inappropriate and should be removed.

In 2004 a Class 2 PMR was approved by the NMED to add the excluded waste prohibition to the Permit. This prohibition was targeted at tank waste and waste that was previously managed as high-level waste. The PMR prohibited acceptance and disposal of such wastes at the WIPP facility unless they are approved for disposal through a subsequent Class 3 PMR.

A concern related to chemical compatibility was raised by the NMED in 2003. This concern led to the excluded waste prohibition because the NMED indicated that since the excluded wastes were not identified as WIPP-bound waste in Revision 2 of the Transuranic Waste Baseline Inventory Report (**TWBIR**), sufficient waste characterization was not available to determine that the waste could meet the WIPP Transuranic Waste Acceptance Criteria (**WAC**). Specifically, the NMED was concerned that the compatibility analysis submitted with the WIPP Facility Permit Application did not demonstrate that the excluded waste is compatible with other waste, the waste containers, the transportation containers, and the backfill material.

Since 2004 the TWBIR has been replaced with the Annual Transuranic Waste Inventory Report (**ATWIR**), which is updated annually. Chemical compatibility is not documented in, nor is it a part of, the annual inventory process. In 2012, an updated chemical compatibility evaluation for existing, projected and approved TRU waste streams was performed using the following data sources:

- 2011 ATWIR
- WIPP Waste Data System
- Contact-Handled (**CH**) TRU Content Codes (**TRUCON**) and Remote-Handled (**RH**) TRUCON chemical lists

- The list of allowed hazardous waste numbers in the WIPP Permit
- Information on WIPP backfill materials and fire suppressant chemicals used in the WIPP underground

The 2011 ATWIR contains current information on the defense TRU waste inventory and does include some tank waste that meets the definition of TRU waste as potential TRU waste. The chemical compatibility report concludes that the results of the evaluation demonstrate chemical compatibility across all existing, projected, and approved TRU waste streams in the 2011 ATWIR, waste packaging materials and containers, backfill material, and fire suppressant materials. The 2012 chemical compatibility evaluation is included as Appendix D.

Section 5.4 of Revision 2 of the TWBIR identifies some possible future WIPP waste. Included were tank wastes at the Hanford Site, CH TRU waste at General Electric Vallecitos Nuclear Center and particulate waste streams from Rocky Flats, among others. Only the tank wastes were specified in the excluded waste prohibition added to the Permit, while the waste from General Electric Vallecitos Nuclear Center and Rocky Flats was subsequently shipped and disposed of at the WIPP facility without special provisions regarding chemical incompatibility. This is because generator/storage sites are required to assess chemical compatibility as part of the waste characterization process prior to them being authorized for transport and disposal at the WIPP facility.

Chemical compatibility is further addressed in the Permit in Part 2.3.3 and Attachment C where it explicitly states that *waste incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other waste are not acceptable at WIPP*. Compliance with this prohibition is achieved as described in Section 3.5.3 of the WIPP WAC (DOE/WIPP-02-3122, Revision 7.3) for CH TRU waste and Section 4.5.3 for RH TRU waste.

As described in the WIPP WAC, evaluation of chemical compatibility of waste to be received at the WIPP facility utilizes the authorized method for chemical compatibility evaluation that has been established for transport of the waste to the WIPP facility, instead of using some separate method. Using this methodology, chemical compatibility (or incompatibility) of wastes no longer provides a basis for maintaining the excluded waste prohibition in the Permit. All waste is evaluated for chemical compatibility through the systems and controls that currently exist and that all TRU waste containers received at the WIPP facility must pass.

The WIPP facility is authorized for the disposal of both CH and RH defense TRU waste as specified in the WIPP Land Withdrawal Act (**LWA**) Amendment (Public Law 104-201). Section 12 of the LWA Amendment specifically bans the emplacement and disposal of high-level radioactive waste and spent nuclear fuel (**SNF**) at the WIPP facility. Definitions for TRU and high-level radioactive waste and for SNF are either provided or referenced in the WIPP LWA Amendment.

To comply with the ban on the emplacement and disposal of high-level radioactive waste and SNF stipulated in the WIPP LWA Amendment, waste being considered for disposal at the WIPP facility must be defense TRU waste. The DOE's assessment and determination for compliance with the LWA is established from generator/storage site historical process and management records for the waste and is based upon documentation regarding the origin of the waste.

For instance, the definition for “high-level radioactive waste” given in the Nuclear Waste Policy Act of 1982¹ consists of two parts as follows:

- A. *The highly radioactive material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations; and*
- B. *Other highly radioactive material that the Commission, consistent with existing law, determines by rule requires permanent isolation.*

The second part of the definition effectively allows the Commission (i.e., the Nuclear Regulatory Commission (**NRC**)) to determine what constitutes high-level radioactive waste. The NRC has stated in 10 CFR 60.2 that high-level radioactive waste means:

- 1. *Irradiated reactor fuel,*
- 2. *Liquid waste resulting from the operation of the first cycle solvent extraction system, or equivalent, and the concentrated waste from subsequent extraction cycles, or equivalent, in a facility for reprocessing irradiated reactor fuel, and*
- 3. *Solids into which such liquid wastes have been converted.*

Based on these definitions for high-level radioactive waste, it is clear that the assessment of a waste (e.g., tank waste) is not based upon specific numerical concentration values, but instead on the source and origin from which the waste is derived. As such, the generator/storage site historical process and management records provide the basis for any high-level radioactive waste assessment. DOE Order 435.1, Radioactive Waste Management, provides specific criteria for determining whether a radioactive waste is SNF, high-level waste, TRU waste, or other radioactive waste as defined by the Nuclear Waste Policy Act and the NRC.

Wastes to be disposed of at the WIPP facility are determined to be defense TRU waste as required by the WIPP WAC. As such, there is no need in the Permit to specifically exclude some waste streams with a provision that requires them to be approved through a Class 3 PMR while allowing other waste streams to be approved without such a provision. The waste analysis requirements for the excluded wastes currently identified in the Permit would be no different from any other waste being considered for disposal at the WIPP facility, and as such, they should be subject to the same waste stream approval process. Furthermore, the prohibition for disposal of high level-radioactive waste at the WIPP facility is specifically addressed in other requirements documents (i.e., the WIPP LWA Amendment) and as such does not need to be further addressed in the WIPP Permit. In addition, the responsibility for nuclear waste generated as the result of atomic energy defense activities is granted to the DOE by the Atomic Energy Act of 1954², as amended. The inclusion of the waste exclusion in the Permit puts the New Mexico Environment Department (**NMED**) in the position of having to make a decision regarding defense nuclear classification that is related to the source of the radioactive waste and not the hazardous waste characteristics. The WIPP Permit is meant to address requirements and prohibitions associated with RCRA hazardous waste regulations, not requirements and prohibitions imposed by other laws or regulations.

¹ 42 U.S.C 10101 et seq.

² 42 U.S.C 2011 et seq.

In summary, this PMR is needed for the following reasons:

- A. Consistency: Make the application of requirements similar and consistent in the Permit without exclusion. Eliminate special exclusions and associated procedures. Focus the Permit only on requirements associated with RCRA hazardous waste regulations.
 - B. Eliminate redundancy: Address only RCRA hazardous waste regulations/requirements in the Permit and allow other, existing documents/procedures to address requirements other than those pertaining to RCRA hazardous waste regulations.
 - C. Efficiency: Remove special exclusions and associated approval requirements to streamline waste stream review and approval without unnecessary delay associated with the approval of a Class 3 PMR.
4. **20.4.1.900 NMAC (incorporating 40 CFR 270.42 (b)(1)(iv)), requires the applicant to provide the applicable information required by 40 CFR 270.13 through 270.21, 270.62 and 270.63.**

The regulatory crosswalk describes those portions of the WIPP Permit that are affected by this PMR. Where applicable, regulatory citations in this modification reference Title 20, Chapter 4, Part 1, NMAC, revised March 9, 2009, incorporating 40 CFR Parts 264 and 270. 40 CFR §§270.16 through 270.21, 270.62, and 270.63 are not applicable at WIPP. Consequently, they are not listed in the regulatory crosswalk table.

5. **20.4.1.900 NMAC (incorporating 40 CFR 270.11(d)(1) and 40 CFR 270.30(k)), requires that any person signing under paragraph a and b must certify the document in accordance with 20.4.1.900 NMAC.**

The transmittal letter for this PMR contains the signed certification statement in accordance with Permit Part 1, Section 1.9.

Regulatory Crosswalk

Regulatory Citation(s) 20.4.1.900 NMAC (incorporating 40 CFR Part 270)	Regulatory Citation(s) 20.4.1.500 NMAC (incorporating 40 CFR Part 264)	Description of Requirement	Added or Clarified Information		
			Section of the WIPP Permit Application	Yes	No
§270.13		Contents of Part A permit application	Attachment B Part A		✓
§270.14(b)(1)		General facility description	Attachment A		✓
§270.14(b)(2)	§264.13(a)	Chemical and physical analyses	Part 2.3.1 Attachment C		✓
§270.14(b)(3)	§264.13(b)	Development and implementation of waste analysis plan	Part 2.3.1.1 Attachment C	✓	
	§264.13(c)	Off-site waste analysis requirements	Part 2.2.1 Attachment C	✓	
§270.14(b)(5)	§264.15(a-d)	General inspection requirements	Part 2.7 Attachment E-1a		✓
	§264.174	Container inspections	Attachment E-1b(1)		✓
§270.23(a)(2)	§264.602	Miscellaneous units inspections	Attachment E-1b Attachment E-1b(1)		✓
§270.14(b)(6)		Request for waiver from preparedness and prevention requirements of Part 264 Subpart C	NA		✓
§270.14(b)(7)	264 Subpart D	Contingency plan requirements	Part 2.12 Attachment D		✓
	§264.51	Contingency plan design and implementation	Part 2.12.1 Attachment D		✓
	§264.52 (a) & (c-f)	Contingency plan content	Attachment D		✓
	§264.53	Contingency plan copies	Part 2.12.2 Attachment D		✓
	§264.54	Contingency plan amendment	Part 2.12.3 Attachment D		✓
	§264.55	Emergency coordinator	Part 2.12.4 Attachment D-4a(1)		✓
	§264.56	Emergency procedures	Attachment D-4		✓
§270.14(b)(8)		Description of procedures, structures or equipment for:	Attachment A Part 2.11		✓
§270.14(b)(8)(i)		Prevention of hazards in unloading operations (e.g., ramps and special forklifts)	Part 2.11		✓
§270.14(b)(8)(ii)		Runoff or flood prevention (e.g., berms, trenches, and dikes)	Attachment A1-1c(1) Part 2.11		✓
§270.14(b)(8)(iii)		Prevention of contamination of water supplies	Part 2.11		✓
§270.14(b)(8)(iv)		Mitigation of effects of equipment failure and power outages	Part 2.11		✓
§270.14(b)(8)(v)		Prevention of undue exposure of personnel (e.g., personal protective equipment)	Part 2.11		✓
§270.14(b)(8)(vi) §270.23(a)(2)	§264.601	Prevention of releases to the atmosphere	Part 2.11 Part 4.4 Attachment D-4e Attachment G-1a		✓
	264 Subpart C	Preparedness and Prevention	Part 2.10		✓
	§264.31	Design and operation of facility	Part 2.1		✓

Regulatory Citation(s) 20.4.1.900 NMAC (incorporating 40 CFR Part 270)	Regulatory Citation(s) 20.4.1.500 NMAC (incorporating 40 CFR Part 264)	Description of Requirement	Added or Clarified Information		
			Section of the WIPP Permit Application	Yes	No
	§264.32	Required equipment	Part 2.10.1 Attachment D		✓
	§264.33	Testing and maintenance of equipment	Part 2.10.2 Attachment E-1a		✓
	§264.34	Access to communication/alarm system	Attachment E-1a Part 2.10.3		✓
	§264.35	Required aisle space	Part 2.10.4		✓
	§264.37	Arrangements with local authorities	Attachment D-4a(3)		✓
§270.14(b)(9)	§264.17(a-c)	Prevention of accidental ignition or reaction of ignitable, reactive, or incompatible wastes	Part 2.9		✓
§270.14(b)(10)		Traffic pattern, volume, and controls, for example: Identification of turn lanes Identification of traffic/stacking lanes, if appropriate Description of access road surface Description of access road load- bearing capacity Identification of traffic controls	Attachment A4		✓
§270.14(b) (11)(i) and (ii)	§264.18(a)	Seismic standard applicability and requirements	Attachment G2-2.2 Renewal App. Sep. 2009, 270.14 Contents of Part B: General Requirements		✓
§270.14(b)(11)(iii-v)	§264.18(b)	100-year floodplain standard	Attachment A1-1c(1) Renewal App. Sep. 2009, 270.14 Contents of Part B: General Requirements		✓
§270.14(b) (12)	§264.16(a-e)	Personnel training program	Part 2.8 Attachment F		✓
§270.14(b)(13)	264 Subpart G	Closure and post-closure plans	Part 6 & 7 Attachment G & H		✓
§270.14(b)(13)	§264.111	Closure performance standard	Attachment G-1a		✓
§270.14(b)(13)	§264.112(a), (b)	Written content of closure plan	Attachment G-1		✓
§270.14(b)(13)	§264.112(c)	Amendment of closure plan	Part 6.3 Attachment G-1d(4)		✓
§270.14(b)(13)	§264.112(d)	Notification of partial and final closure	Attachment G-2a		✓
§270.14(b)(13)	§264.112(e)	Removal of wastes and decontamination/dismantling of equipment	Attachment G-1e(2)		✓
§270.14(b)(13)	§264.113	Time allowed for closure	Part 6.5 Attachment G-1d		✓
§270.14(b)(13)	§264.114	Disposal/decontamination	Part 6.6 Attachment G-1e(2)		✓
§270.14(b)(13)	§264.115	Certification of closure	Part 6.7 Attachment G-2a		✓
§270.14(b)(13)	§264.116	Survey plat	Part 6.8 Attachment G-2b		✓

Regulatory Citation(s) 20.4.1.900 NMAC (incorporating 40 CFR Part 270)	Regulatory Citation(s) 20.4.1.500 NMAC (incorporating 40 CFR Part 264)	Description of Requirement	Added or Clarified Information		
			Section of the WIPP Permit Application	Yes	No
§270.14(b)(13)	§264.117	Post-closure care and use of property	Part 7.3 Attachment H-1a		✓
§270.14(b)(13)	§264.118	Post-closure plan; amendment of plan	Part 7.5 Attachment H-1a (1)		✓
§270.14(b)(13)	§264.178	Closure/containers	Part 6.9 Attachment A1-1h Attachment G-1		✓
§270.14(b)(13)	§264.601	Environmental performance standards-miscellaneous units	Attachment A-4 Attachment D-1 Attachment G-1a		✓
§270.14(b)(13)	§264.603	Post-closure care	Part 7.3 Attachment G-1a(3)		✓
§270.14(b)(14)	§264.119	Post-closure notices	Part 7.4 Attachment H-2		✓
§270.14(b)(15)	§264.142	Closure cost estimate	NA		✓
	§264.143	Financial assurance	NA		✓
§270.14(b)(16)	§264.144	Post-closure cost estimate	NA		✓
	§264.145	Post-closure care financial assurance	NA		✓
§270.14(b)(17)	§264.147	Liability insurance	NA		✓
§270.14(b)(18)	§264.149-150	Proof of financial coverage	NA		✓
§270.14(b)(19)(i), (vi), (vii), and (x)		Topographic map requirements Map scale and date Map orientation Legal boundaries Buildings Treatment, storage, and disposal operations Run-on/run-off control systems Fire control facilities	Attachment B2 Part A Renewal App. Sep. 2009, 270.14 Contents of Part B: General Requirements		✓
§270.14(b)(19)(ii)	§264.18(b)	100-year floodplain	Attachment B2 Part A Renewal App. Sep. 2009, 270.14 Contents of Part B: General Requirements		✓
§270.14(b)(19)(iii)		Surface waters	Attachment B2 Part A Renewal App. Sep. 2009, 270.14 Contents of Part B: General Requirements		✓
§270.14(b)(19)(iv)		Surrounding land use	Attachment B2 Part A Renewal App. Sep. 2009, 270.14 Contents of Part B: General Requirements		✓

Regulatory Citation(s) 20.4.1.900 NMAC (incorporating 40 CFR Part 270)	Regulatory Citation(s) 20.4.1.500 NMAC (incorporating 40 CFR Part 264)	Description of Requirement	Added or Clarified Information		
			Section of the WIPP Permit Application	Yes	No
§270.14(b)(19)(v)		Wind rose	Attachment B2 Part A Renewal App. Sep. 2009, 270.14 Contents of Part B: General Requirements		✓
§270.14(b)(19)(viii)	§264.14(b)	Access controls	Attachment B2 Part A Renewal App. Sep. 2009, 270.14 Contents of Part B: General Requirements		✓
§270.14(b)(19)(ix)		Injection and withdrawal wells	Attachment B2 Part A Renewal App. Sep. 2009, 270.14 Contents of Part B: General Requirements		✓
§270.14(b)(19)(xi)		Drainage on flood control barriers	Attachment B2 Part A Renewal App. Sep. 2009, 270.14 Contents of Part B: General Requirements		✓
§270.14(b)(19)(xii)		Location of operational units	Attachment B2 Part A Renewal App. Sep. 2009, 270.14 Contents of Part B: General Requirements		✓
§270.14(b)(20)		Other federal laws Wild and Scenic Rivers Act National Historic Preservation Act Endangered Species Act Coastal Zone Management Act Fish and Wildlife Coordination Act Executive Orders	Attachment B Renewal App. Sep. 2009, 270.14 Contents of Part B: General Requirements		✓
§270.15	§264 Subpart I	Containers	Part 3 Part 4.3 Attachment A1		✓
	§264.171	Condition of containers	Part 3.3 Attachment A1		✓
	§264.172	Compatibility of waste with containers	Part 3.4 Attachment A1		✓
	§264.173	Management of containers	Part 3.5 Attachment A1		✓
	§264.174	Inspections	Part 3.7 Attachment E-1 Attachment A1-1e		✓

Regulatory Citation(s) 20.4.1.900 NMAC (incorporating 40 CFR Part 270)	Regulatory Citation(s) 20.4.1.500 NMAC (incorporating 40 CFR Part 264)	Description of Requirement	Added or Clarified Information		
			Section of the WIPP Permit Application	Yes	No
§270.15(a)	§264.175	Containment systems	Part 3.6 Attachment A1		✓
§270.15(c)	§264.176	Special requirements for ignitable or reactive waste	Attachment A1-1g Permit Part 2.1		✓
§270.15(d)	§264.177	Special requirements for incompatible wastes	Attachment A1-1g Permit Part 2.3.3.4		✓
	§264.178	Closure	Part 6 Attachment G		✓
§270.15(e)	§264.179	Air emission standards	Part 4.4.2 Attachment N		✓
§270.23	264 Subpart X	Miscellaneous units	Part 1.3.1 Attachment A2-1 Attachment G1.3.1		✓
§270.23(a)	§264.601	Detailed unit description	Part 4 Part 5 Attachment A2 Attachment L		✓
§270.23(b)	§264.601	Hydrologic, geologic, and meteorologic assessments	Part 4 Part 5 Attachment A2 Attachment L		✓
§270.23(c)	§264.601	Potential exposure pathways	Part 4 Part 5 Attachment A2 Attachment N Attachment L		✓
§270.23(d)		Demonstration of treatment effectiveness	Part 4 Attachment A2 Attachment N		✓
	§264.602	Monitoring, analysis, inspection, response, reporting, and corrective action	Part 4 Part 5 Attachment A2 Attachment E-1 Attachment N Attachment L		✓
	§264.603	Post-closure care	Attachment H Attachment H1		✓
	264 Subpart E	Manifest system, record keeping, and reporting	Permit Part 1 Permit Part 2.13 & 2.14 Permit Part 4 Attachment C		✓
§270.30(j)(2)	§264.73(b)	Ground-water records	Part 1		✓
	264 Subpart F	Releases from solid waste management units	Part 5 & 7 Attachment G2 & L		✓
	§264.90	Applicability	Part 5 Attachment L		✓
	§264.91	Required programs	Attachment L		✓
	§264.92	Ground-water protection standard	Attachment L		✓
	§264.93	Hazardous constituents	Attachment L		✓

Regulatory Citation(s) 20.4.1.900 NMAC (incorporating 40 CFR Part 270)	Regulatory Citation(s) 20.4.1.500 NMAC (incorporating 40 CFR Part 264)	Description of Requirement	Added or Clarified Information		
			Section of the WIPP Permit Application	Yes	No
	§264.94	Concentration limits	Part 5 Attachment L		✓
	§264.95	Point of compliance	Part 5 Attachment L		✓
	§264.96	Compliance period	Attachment L		✓
	§264.97	General ground-water monitoring requirements	Part 5 Attachment L		✓
	§264.98	Detection monitoring program	Part 5 Attachment L		✓
	§264.99	Compliance monitoring program	Part 5 Attachment L		✓
	§264.100	Corrective action program	Part 5 Attachment L		✓
	§264.101	Corrective action for solid waste management units	Part 8 Attachment L		✓
	264 Appendix IX	Ground-water Monitoring List	Part 5 Attachment L		✓

Appendix A
Table of Changes

Table of Changes

Affected Permit Section	Explanation of Change
Permit Part 2 Condition 2.3.3.8	Deleted all text and reserved the section.
Permit Part 2, Table 2.3.3.8	Deleted table in its entirety.
Attachment C, Section C-1c	Deleted bullet that states: “waste that has ever been managed as high-level waste and waste from tanks specified in Table C-8, unless specifically approved through a Class 3 permit modification.”
Attachment C. Table C-8	Deleted table in its entirety.
Attachment C6, Table C6-1	Deleted bullet in Item 12a that states: “waste that has ever been managed as high-level waste and waste from tanks specified in Table C-8, unless specifically approved through a Class 3 permit modification.”

Appendix B
Proposed Revised Permit Text

Proposed Revised Permit Text:

2.3.3.8. ~~Excluded Waste~~ **Reserved**

TRU mixed waste that has ever been managed as high-level waste and waste from tanks specified in Permit Attachment C are not acceptable at WIPP unless specifically approved through a Class 3 permit modification. Such wastes are listed in Table 2.3.3.8 below.

Table 2.3.3.8 – Additional Approved Waste Streams	
Date Class 3 Permit Modification Request Approved	Description of Waste Stream

C-1c Waste Prohibited at the WIPP Facility

The following TRU mixed waste are prohibited at the WIPP facility:

- liquid waste is not acceptable at WIPP. Liquid in the quantities delineated below is acceptable:
 - Observable liquid shall be no more than 1 percent by volume of the outermost container at the time of radiography or visual examination
 - Internal containers with more than 60 milliliters or 3 percent by volume observable liquid, whichever is greater, are prohibited
 - Containers with Hazardous Waste Number U134 assigned shall have no observable liquid
 - Overpacking the outermost container that was examined during radiography or visual examination or redistributing untreated liquid within the container shall not be used to meet the liquid volume limits
- non-radionuclide pyrophoric materials, such as elemental potassium
- hazardous wastes not occurring as co-contaminants with TRU mixed wastes (non-mixed hazardous wastes)
- wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes
- wastes containing explosives or compressed gases
- wastes with polychlorinated biphenyls (**PCBs**) not authorized under an EPA PCB waste disposal authorization
- wastes exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003)
- ~~waste that has ever been managed as high-level waste and waste from tanks specified in Table C-8, unless specifically approved through a Class 3 permit modification~~
- any waste container from a waste stream (or waste stream lot) which has not undergone either radiographic or visual examination of a statistically representative subpopulation of the waste stream in each shipment, pursuant to Permit Attachment C7
- any waste container from a waste stream which has not been preceded by an appropriate, certified WSPF (see Section C-1d)

**Table C-8
Waste Tanks Subject to Exclusion**

Hanford Site – 177 Tanks	
A-101 through A-106	C-201 through C-204
AN-101 through AN-107	S-101 through S-112
AP-101 through AP-108	SX-101 through SX-115
AW-101 through AW-106	SY-101 through SY-103
AX-101 through AX-104	T-101 through T-112
AY-101 through AY-102	T-201 through T-204
B-101 through B-112	TX-101 through TX-118
B-201 through B-204	TY-101 through TY-106
BX-101 through BX-112	U-101 through U-112
BY-101 through BY-112	U-201 through U-204
C-101 through C-112	
Savannah River Site – 51 Tanks	
Tank 1 through 51	
Idaho National Engineering and Environmental Laboratory – 15 Tanks	
WM-103 through WM-106	WM-180 through 190

Table C6-1 Waste Analysis Plan (WAP) Checklist

Waste Analysis Plan (WAP) General Checklist for use at DOE'S Generator/Storage Sites

	WAP Requirement ¹	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
Unacceptable Waste						
12	<p>Are procedures in place to ensure that the generator/storage site ensures, through administrative and operational procedures and characterization techniques, that waste containers do not include the following unacceptable waste:</p> <ul style="list-style-type: none"> • liquid waste is not acceptable at WIPP. Liquid in the quantities delineated below is acceptable • Observable liquid shall be no more than 1 percent by volume of the outermost container at the time of radiography or visual examination • Internal containers with more than 60 milliliters or 3 percent by volume observable liquid, whichever is greater, are prohibited • Containers with Hazardous Waste Number U134 assigned shall have no observable liquid • Overpacking the outermost container that was examined during radiography or visual examination or redistributing untreated liquid within the container shall not be used to meet the liquid volume limits • non-radionuclide pyrophoric materials • hazardous wastes not occurring as co-contaminants with TRU wastes (non-mixed hazardous wastes) • wastes incompatible with backfill, seal and panel closures materials, container and packaging materials, shipping container materials, or other wastes • wastes containing explosives or compressed gases (continued below) 					

	WAP Requirement ¹	Procedure Documented		Example of Implementation/ Objective Evidence, as applicable		Comment (e.g., any change in procedure since last audit, etc.)
		Location	Adequate? Y/N (Why?)	Item Reviewed	Adequate? Y/N	
12a	<ul style="list-style-type: none"> wastes with polychlorinated biphenyls (PCBs) not authorized under an EPA PCB waste disposal authorization wastes exhibiting the characteristic of ignitability, corrosivity, or reactivity (EPA Hazardous Waste Numbers of D001, D002, or D003) waste that has ever been managed as high level waste and waste from tanks specified in Table C-8, unless specifically approved through a Class 3 permit modification any waste container from a waste stream (or waste stream lot) which has not undergone either radiographic or visual examination of a statistically representative subpopulation of the wastes stream in each shipment pursuant to Permit Attachment C7 any waste container from a waste stream which has not been preceded by an appropriate, certified Waste Stream Profile Form (see Section C-1d) <p>(Section C-1c)</p>					

Appendix C
Position Paper on the Classification of the Permit Modification Entitled: “Remove Excluded Waste Prohibition”

Position Paper on the Classification of the Permit Modification entitled:
“Remove Excluded Waste Prohibition”

Purpose: The purpose of this paper is to provide justification for the classification of the proposed Waste Isolation Pilot Plant (WIPP) Permit Modification Request (PMR) entitled “Remove Excluded Waste Prohibition.” The Permittees have classified the modification as a Class 2 based on Item B.1.d in Appendix I of Title 40 of the Code of Federal Regulations (CFR), Part 270.42. This item is described as “B. General Facility Standards, 1. changes to waste sampling and analysis methods:, d. other changes.” This paper provides background for the modification then discusses the regulatory framework, agency guidance, and precedent for the use of this classification. This paper also discusses the complexity of changes in terms of determining whether the Class 3 process is needed.

Background: In 1988, the U.S. Environmental Protection Agency (EPA) identified that it would be necessary to modify hazardous waste facility permits.³ The EPA established a hierarchy for permit modifications that has two fundamental features: (1) a three-tiered classification system, and (2) specific procedures for processing modifications of each class. Included with the classification system is Appendix I to 40 CFR 270 that “identifies what types of facility changes [that] constitute Classes 1, 2, and 3 modifications. This classification list generally follows the organization of the facility standards in Part 264 and is designed to be self-explanatory.”⁴ This encourages a plain language reading of the items classified in Appendix I. The EPA further stated, regarding Section B of Appendix I: “The “General Facility Standards” portion of Appendix I encompasses changes that affect the general standards and requirements that apply to all hazardous waste facilities (Subparts B through E of Part 264). These changes primarily involve the various plans that must be maintained by the facility (e.g., contingency plan, training plan) and are self-explanatory.”⁵

Section B.1 specifically applies to 40 CFR 264.13 General Waste Analysis. Of the four items listed under the “B.1” heading, only item “a” or item “d” are likely to apply to the WIPP facility. Therefore, based on the plain reading of the requirements and the list in Appendix I, if the Permittees seek to change any of these items in the WAP, and the change is not the result of a change in the regulations, the general category of “other changes” found in item “B.1.d” would apply.

What the Permittees are proposing: The Permittees are proposing to remove the excluded waste prohibition, and associated text from Permit Part 2 and Permit Attachments C and C6. The excluded waste prohibition pertains to transuranic (**TRU**) mixed waste that has ever been managed as high-level waste and waste from specified tanks listed in the Permit. The Permit part and sections affected by this PMR are related to waste analysis plan (WAP) requirements in 40 CFR 264.13. Permit Part 2, Section 2.3.3. is the treatment, storage and disposal facility

³ 53 FR 37912, Wednesday, September 28, 1988, p. 37913 states: “The Agency believes that permits must be viewed as living documents that can be modified to allow facilities to make technological improvements, comply with new environmental standards, respond to changing waste streams, and generally improve waste management practices. Since permits are usually written for ten years of operation, the facility or the permit writer cannot anticipate all or even most of the administrative, technical, or operational changes required over the permit term for the facility to maintain an up-to-date operation. Therefore, permit modifications are inevitable.”

⁴ 53 FR 37912, Wednesday, September 28, 1988, p. 37923.

⁵ 53 FR 37912, Wednesday, September 28, 1988, p. 37925.

waste acceptance criteria (TSDF-WAC), which is a subsection under the General Waste Analysis requirements. Permit Attachment C, Section C-1c and Table C-8 are included in the WIPP WAP.

In response to 20.4.1.900 New Mexico Administrative Code (NMAC) (incorporating 40 CFR 270.42(b)(1)(ii)), which requires the applicant to identify that the modification is a Class 2 modification, the Permittees propose a Class 2 permit modification for the following reasons:

1. **Application of Appendix I to 40 CFR 270.42, Classification of Permit Modification.** Based on the descriptions provided in Appendix I to 40 CFR 270.42, the proposed modification falls into Item B, *General Facility Standards...1. Changes to waste sampling or analytical methods...d. Other changes.* Specifically, as stated previously, the proposed change affects a requirement within the requirements for General Waste Analysis and the WAP. As such, the change applies to the general facility standards and through a process of elimination is determined to most appropriately relate to the general facility standards pertaining to changes to waste sampling or analysis methods. The most applicable item under the general facility standard for changes to waste sampling or analysis methods is other changes since the PMR does not address changes to agency guidance or regulations, incorporate changes associated with F039 sampling or analysis methods, or incorporate changes associated with underlying hazardous constituents in ignitable or corrosive wastes.
2. **Precedent Established by the Classification of the PMR that Added the Exclusion (July 2, 2004).** The PMR that added the excluded waste prohibition to the Permit being proposed for removal in this PMR was classified as a Class 2 pursuant to Item B.1.d in Appendix I to 40 CFR 270.42. This PMR modified the exact same parts and sections of the Permit that the subject PMR is proposing to delete.
3. **The Proposed PMR Does Not Substantially Alter a Facility or Its Operation.** This PMR is also classified as a Class 2 PMR in accordance with the general principles set forth in the preamble to the U.S. Environmental Protection Agency (EPA) notice promulgating the permit modification procedures codified at 40 CFR § 270.42. EPA's final rule establishes the principle that Class 2 procedures are appropriate for changes that do not substantially alter a facility or its operation. The proposed PMR would not alter the WIPP facility or its operation. No specific procedure changes are anticipated if the proposed PMR is accepted since each waste stream to be disposed of at WIPP would still be required to be evaluated and determined to be TRU waste and not high-level waste, spent nuclear fuel or low-level waste to ensure compliance with the WIPP Land Withdrawal Act.

4. **Precedent Established by the PMR to Revise the Polychlorinated Chlorinated Biphenyl (PCB) Prohibition (May 21, 2003)**. The proposed PMR is similar to the Class 2 PMR related to PCB waste that the Permittees submitted in May 2003. That PMR was approved as a Class 2 modification pursuant to Item B.1.d in Appendix I to 40 CFR 270.42. In the PCB PMR, the Permittees proposed a change to the TSDf-WAC and the WAP listing of waste prohibited at the WIPP facility. Specifically, a prohibition on the disposal of PCB waste in concentrations equal to or greater than 50 parts per million was modified to be a prohibition on PCB waste not authorized under an EPA disposal authorization. The proposed PMR is similar to the PCB PMR as follows:
- The subject PMR is proposing changes to these same portions in the Permit as the PCB PMR
 - A justification for the change in the PCB PMR was because PCBs are regulated under the Toxic Substances Control Act (TSCA) with specific disposal options/requirements and not RCRA. This justification is similar to the justification for the subject PMR since the major justification for the proposed PMR is that the designation of radioactive waste as high-level or TRU is regulated under the WIPP Land Withdrawal Act and the Atomic Energy Act and not RCRA. These laws give the authority for TRU waste determination to the Secretary of Energy.
5. **The Proposed PMR is Not Complex**. The regulations at 20 CFR 270.42(b)(6)(i)(C)(2) state that the Director (Secretary of the NMED) may elevate the Class 2 modification request to a Class 3 if “The complex nature of the change requires the more extensive procedures of Class 3.” This, of course, is aimed at assuring changes are “subject to the same review and public participation procedures as permit applications”⁶ which is the goal of the Class 3 modification process. Worth noting is that this provision is restricted to the complexity of the change and not the complexity of the permit. No complex discussions or formulae are involved in the current modification request. The modification request simply proposes to remove the excluded waste prohibition from the Permit.

⁶ 53 FR 37912, Wednesday, September 28, 1988, p. 37919.

Appendix D
Chemical Compatibility of Transuranic Waste Streams

CHEMICAL COMPATIBILITY OF TRANSURANIC WASTE STREAMS

Revision 0—September 2012

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Acronyms, Abbreviations, and Units

ATWIR	Annual Transuranic Waste Inventory Report
CH	contact-handled
CH-TRAMPAC	Contact-Handled Transuranic Waste Authorized Methods for Payload Control
CH-TRUCON	CH-TRU Waste Content Codes
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
RCRA	Resource Conservation and Recovery Act
RH	remote-handled
RH-TRUCON	RH-TRU Waste Content Codes
TRU	transuranic
WDS	Waste Data System
WIPP	Waste Isolation Pilot Plant

1.0 Introduction

A chemical compatibility analysis was performed on all defense-generated, contact-handled (CH) and remote-handled (RH) transuranic (TRU) waste streams reported in the 2011 Annual Transuranic Waste Inventory Report (ATWIR) (DOE, 2011a) and/or obtained from the Waste Isolation Pilot Plant (WIPP) Waste Data System (WDS) database. This chemical compatibility analysis was performed as an update to the analysis that was performed in 1996 as part of the WIPP Resource Conservation and Recovery Act (RCRA) Part B Permit Application (DOE, 1996, Appendix C1). New or revised information for updating the chemical compatibility analysis is now available from the various U.S. Department of Energy (DOE) generator sites for the TRU waste streams that have either already been disposed of at the WIPP facility or are projected to be disposed of at the WIPP facility in the future. The methodology used in this analysis is described in the U.S. Environmental Protection Agency (EPA) document, "A Method for Determining the Compatibility of Hazardous Wastes" (Hatayama et al., 1980). This method is also the basis for the RCRA Part B Permit analysis performed in 1996 and the chemical compatibility analysis performed for the shipment of CH-TRU and RH-TRU wastes in the TRUPACT-II, TRUPACT-III, HalfPACT, or RH-TRU 72-B shipping packages (Appendix 6.1 of DOE, 2009; and Appendix 4.1 of DOE, 2011b). The following sections of this report present the data sources for existing, projected, and approved TRU waste streams, the methodology used to perform the chemical compatibility analysis, as well as the results and conclusions of the analysis.

2.0 Data Sources

The primary sources of information used in this chemical compatibility analysis for chemicals in the TRU waste streams were the ATWIR (DOE, 2011a), the WIPP WDS database, the CH-TRU Waste Content Codes (CH-TRUCON) chemical lists (DOE, 2012a), and the RH-TRU Waste Content Codes (RH-TRUCON) chemical lists (DOE, 2012b). Additional information associated with other chemicals in the waste underground, not included in the TRU waste streams, was collected from WIPP personnel, the 1996 WIPP RCRA Part B Permit Application (DOE, 1996), and the WIPP Hazardous Waste Permit (DOE, 2012c).

2.1 Annual Transuranic Waste Inventory Report

The ATWIR, Appendices A and B, (DOE, 2011a) lists the existing and projected CH- and RH-TRU waste streams at generator sites destined for permanent disposal at the WIPP facility. All existing and projected waste streams with the potential for disposal at WIPP were included in this chemical compatibility analysis for completeness. It should be noted that only waste streams subjected to the approval process defined by the WIPP Hazardous Waste Facility Permit are

eligible for disposal at the WIPP facility. Appendix A of the ATWIR presents waste profile reports for existing CH- and RH-TRU waste streams potentially destined for WIPP facility disposal. The waste stream identifier and description are listed for each waste stream. Many waste profile reports within Appendix A of the ATWIR also indicate the proposed Content Code that will be applied to the waste stream for shipping; some waste streams, however, do not specify a Content Code. Appendix B of the ATWIR presents waste profile reports for projected CH- and RH-TRU waste streams. Like those in Appendix A of the ATWIR, these waste profile reports provide the waste stream identifier, description, and, in some cases, proposed Content Codes. All existing and projected CH- and RH-TRU waste streams identified in Appendices A and B of the ATWIR were evaluated for chemical compatibility. Waste streams that were identified only in the ATWIR are indicated as “ATWIR” in Appendix A of this report.

2.2 WIPP Waste Data System Database

The WDS database lists the CH- and RH-TRU waste streams that are currently approved for shipping and/or have been shipped to the WIPP facility in the past. A list of approved waste streams and corresponding Content Codes was obtained from the WDS database. This list of approved waste streams was compared to the list of existing and projected waste streams documented in the ATWIR. Many of the waste streams listed in Appendix A of the ATWIR have been approved for shipping and are, therefore, also identified in the WDS database. Waste streams that are only identified in the WDS (i.e., not listed in the ATWIR are identified in Appendix A of this report) typically represent approved waste streams from sites that have completed shipping (e.g., Rocky Flats Environmental Technology Site) or approved waste streams that may have a different identifier in the WDS than in the ATWIR. All approved waste streams identified in the WDS were evaluated for chemical compatibility. Waste streams that were identified in only the WDS are indicated as “WDS” in Appendix A of this report. Waste streams that were identified in both the WDS and the ATWIR are indicated as “Both” in Appendix A of this report.

2.3 CH-TRUCON and RH-TRUCON Chemical Lists

Chemical lists associated with each CH- or RH-TRU Content Code (DOE, 2012a and 2012b), corresponding to waste streams listed in the WDS and/or the ATWIR, were used in determining the potential chemical compounds/materials in the waste streams. During development of the Content Codes, each generator site produces a representative list of chemicals/materials that may be present in the waste. These content code-specific chemical lists are summarized in the CH- and RH-TRUCON documents (DOE, 2012a and 2012b). The chemical components found in each Content Code-specific chemical list were determined by examining the process technology and waste generation and packaging procedures, by chemical analysis, or by process flow analysis. This approach accounts for chemical/material inputs into the system, even though all of the components may not be present in the resulting waste. For example, generator sites might

list both acids and bases in their chemical lists, even though the two groups are required by waste generating/packaging procedures to be neutralized and/or rendered nonreactive prior to placement in a TRU-waste payload container. The Content Code-specific chemical lists cover the materials that may be used in waste packaging (inorganic materials [e.g., metal] and commercial plastics, cellulose, and rubbers are the major constituents in TRU wastes and packaging materials). These chemical lists estimate chemical/material concentration levels as either trace (<1% by weight), minor (1-10%), or dominant (>10%).

2.4 WIPP Hazardous Waste Permit

The approved hazardous waste code chemicals listed in Table 2.3.4 of the WIPP Hazardous Waste Permit (DOE, 2012c) were reviewed and added to the list of potential chemicals for evaluation if the chemicals were not also included in the TRU waste stream chemical lists. The chemical acetonitrile, represented by EPA Reactivity Group 26 (Nitriles), was identified in Hazardous Waste Code U003 and added to the chemical compatibility analysis. All other chemicals and EPA Reactivity Groups listed in the WIPP Hazardous Waste Permit were duplicated by the chemicals in the CH- and RH-TRU chemical lists (DOE, 2012a and 2012b).

2.5 Other Chemical Sources

Other potential chemical sources that were evaluated as part of the chemical compatibility analysis include backfill materials used in the WIPP underground and fire suppressant chemicals.

Unreacted magnesium oxide, which is used in the WIPP underground as backfill material, was added in the chemical compatibility analysis with the EPA Reactivity Group Number 10 (Caustics). However, the hydration of magnesium oxide results in the formation of brucite (Mg[OH]), which buffers the pH of the solution at approximately 8.5. Therefore, caustic conditions are not produced by the use of magnesium oxide backfill.

Compounds in the fire suppressants used at the WIPP facility were added. Compounds listed on the Material Safety Data Sheets for Ansulite 6% AFFF (AFC-3) and FORAY Dry Chemical Extinguishing Agent, which are the two fire suppressants in use at the WIPP facility, were evaluated and the following reactive compounds from the fire suppressants were included in the chemical compatibility analysis:

Compound	EPA Reactivity Group Number
Tertiary butyl alcohol	4 (Alcohols and Glycols)
Hexylene glycol	4 (Alcohols and Glycols)
Diethylene glycol monobutyl ether	14 (Ethers)
Fluorosurfactants	15 (Inorganic Fluorides)
Water	106 (Water and Mixtures Containing Water)

Ansulite 6% AFFF (AFC-3) contains a proprietary mixture of hydrocarbon surfactants, fluorosurfactants, inorganic salts, and water, and the additional ingredients diethylene glycol monobutyl ether, tertiary butyl alcohol, and hexylene glycol. The reactive components are listed with EPA Reactivity Group Number above. The hydrocarbon surfactants are not considered hazardous reactive constituents. The FORAY Dry Chemical Extinguishing Agent contains magnesium aluminum silicate, monoammonium phosphate, ammonium sulfate, calcium carbonate, and methyl hydrogen polysiloxane, which are not hazardous reactive constituents.

3.0 Methodology

The chemical compatibility analysis was performed using the method described in the EPA document, “A Method for Determining the Compatibility of Hazardous Wastes” (Hatayama et al., 1980). This method provides a systematic means of analyzing the chemical compatibility for specific combinations of chemical compounds and materials. It classifies individual chemical compounds into chemical groups and identifies the potential adverse reactions resulting from incompatible combinations of the groups. The EPA method was utilized in the original chemical compatibility analysis of TRU-mixed waste streams (DOE, 1996) and remains the preferred and applicable authority for hazardous waste and chemical compatibility. Copies of the chemical compatibility chart presented as Figure 6 in Hatayama, et al. (1980) are presented, with appropriate reference, on the websites for Princeton University¹, Harvard University², Fresno State University³, and others.

Waste streams were identified from the ATWIR and WDS database (as described in Section 2.0). Where provided, the Content Codes identified for each waste stream listed in the ATWIR or WDS database were used to determine potential chemical compounds/materials in those waste streams. For those waste streams in the ATWIR that did not have a Content Code listed within

¹ <http://web.princeton.edu/sites/ehs/chemwaste/compatability.htm>

² <http://www.uos.harvard.edu/ehs/environmental/EPACChemicalCompatibilityChart.pdf>

³ <http://www.fresnostate.edu/ehsrms/enviromgt/hazwaste/chemical/shtml>

the waste profile report, a representative and conservative Content Code was used for this purpose based on the most inclusive description of the waste form and the generator site.

Once the Content Codes and associated chemical lists were identified for each waste stream, the chemicals and materials in each chemical list, regardless of concentration level (i.e., trace, minor, and dominant), were categorized into the EPA Reactivity Groups based on chemical properties and structure (acids, caustics, metals, etc.) as described in Hatayama et al., (1980). Figure 1 presents the EPA Reactivity Groups, their corresponding number designations, and their potential reactions and consequences. Non-reactive compounds identified in the chemical lists were placed into one of three additional groups – OI (Other Inorganics – other non-reactive inorganic materials); OO (Other Organics – other non-reactive organic materials); and OSMA (Other Solidification Materials and Absorbents – other previously reacted or non-reactive solidification and absorbent materials). This ensures a chemical compatibility evaluation that encompasses the various potential chemical processes that could occur in the TRU waste materials, the packaging materials, and the waste containers themselves. Appendix A presents a table of all CH- and RH-TRU waste streams and corresponding EPA Reactivity Groups within each waste stream.

A compilation of all represented EPA Reactivity Groups from the waste streams (Appendix A), and the other chemical sources discussed in Sections 2.4 and 2.5, is presented in Table 1. The potential reactions between the chemicals/materials within the compilation of all represented EPA Reactivity Groups were then evaluated using the EPA Reactivity Chart presented in Figure 1. EPA Reactivity Groups are classified as “incompatible” if the potential exists for any of the following reactions:

- Heat generation
- Fire
- Innocuous and non-flammable gas generation
- Toxic gas formation
- Flammable gas generation
- Explosion
- Violent polymerization
- Solubilization of toxic substances.

The hazardous waste compatibility chart in Figure 1 summarizes the potential types of reactions possible between each of the EPA Reactivity Groups represented in the lists of allowable chemicals for each waste stream. This chart was used to create a list of potential chemical incompatibilities in the TRU waste streams, which is presented in Appendix B. Each identified incompatibility was then evaluated to determine if the potential reaction is likely or possible to occur within the waste streams. Appendix B presents explanations why the reaction associated

with each of the potential chemical incompatibilities is unlikely or will not occur. For example, a site listing a caustic (Group 10) and an acid (Group 1) in its waste that has only the neutralized/reacted product present in an immobilized form does not present an incompatibility. Further reactions of this type do not occur once the waste is neutralized/rendered nonreactive in its final form as required by generator site waste generating/packaging procedures.

4.0 Results and Conclusions

In summary, the potential chemicals/materials present in all existing, projected, and approved CH- and RH-TRU waste streams identified in the ATWIR and WDS database were evaluated for compatibility across waste streams and with the potential chemicals/materials present in waste packaging materials and containers, WIPP backfill, fire suppressant systems, and allowable hazardous waste codes. The possible chemical constituents comprising the waste streams were conservatively evaluated irrespective of chemical concentrations, including those estimated to be present in trace (<1% by weight) quantities, and expected presence in the final waste form. All potential chemicals/materials were divided into EPA Reactivity Groups and possible chemical incompatibilities between reactivity groups were assessed using the EPA method described in Hatayama et al., (1980). The results of the chemical compatibility analysis are presented as a list of potential chemical incompatibilities in Appendix B along with explanations as to why the associated reaction is unlikely or will not occur. As detailed in Appendix B, the reactions will not occur because the waste is solid or solidified and the chemicals/materials are in an inert form, potential reactions (e.g., neutralization of acids and bases) would have occurred prior to the waste being generated and packaged in its final form, and/or immobilization of the waste ensures incomplete reactions will not occur. The results of the analysis demonstrate chemical compatibility across all existing, projected, and approved TRU waste streams, waste packaging materials and containers, backfill material, and fire suppressant materials. Therefore, chemical compatibility is not anticipated to be an issue for TRU waste to be disposed in the WIPP facility.

5.0 References

Hatayama, H. K., J. J. Chen, E. R. de Vera, R. D. Stephens, and D. L. Storm, 1980, "A Method for Determining the Compatibility of Hazardous Wastes," EPA-600/2-80-076, U.S. Environmental Protection Agency, Cincinnati, Ohio.

U.S. Department of Energy (DOE), 1996, *WIPP RCRA Part B Permit Application*, DOE/WIPP 91-005, Revision 6, U.S. Department of Energy, Carlsbad Area Office.

U.S. Department of Energy (DOE), 2009, *CH-TRU Payload Appendices*, Revision 2, U.S. Department of Energy, Carlsbad Field Office.

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U.S. Department of Energy (DOE), 2012a, *CH-TRU Waste Content Codes (CH-TRUCON)*, Revision 44, U.S. Department of Energy, Carlsbad Field Office.

U.S. Department of Energy (DOE), 2012b, *RH-TRU Waste Content Codes (RH-TRUCON)*, Revision 22, U.S. Department of Energy, Carlsbad Field Office.

U.S. Department of Energy (DOE), 2012c, *Waste Isolation Pilot Plant Hazardous Waste Permit*, U.S. Department of Energy, Carlsbad Field Office.

Figure

EPA's Chemical Compatibility Chart

EPA-600/2-80-076 April 1980

A METHOD FOR DETERMINING THE COMPATIBILITY OF CHEMICAL MIXTURES

Please Note: This chart is intended as an indication of some of the hazards that can be expected on mixing chemical wastes. Because of the differing activities of the thousands of compounds that may be encountered, it is not possible to make any chart definitive and all inclusive. It cannot be assumed to ensure compatibility of wastes because wastes are not classified as hazardous on the chart, nor do any blanks necessarily mean that the mixture cannot result in a hazard occurring. Detailed instructions as to hazards involved in handling and disposing of any given waste should be obtained from the originator of the waste.

#	REACTIVITY GROUP NAME	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	101	102	103	104	105	106	107											
1	Acids, Mineral, Non-oxidizing																																																				
2	Acids, Mineral, Oxidizing																																																				
3	Acids, Organic																																																				
4	Alcohols and Glycols																																																				
5	Aldehydes																																																				
6	Amides																																																				
7	Amines, Aliphatic and Aromatic																																																				
8	Azo Compounds, Diazo Compounds and Hydrazines																																																				
9	Carbamates																																																				
10	Caustics																																																				
11	Cyanides																																																				
12	Dithiocarbamates																																																				
13	Esters																																																				
14	Ethers																																																				
15	Fluorides, Inorganic																																																				
16	Hydrocarbons, Aromatic																																																				
17	Halogenated Organics																																																				
18	Isocyanates																																																				
19	Ketones																																																				
20	Mercaptans and Other Organic Sulfides																																																				
21	Metals, Alkali and Alkaline Earth, Elemental																																																				
22	Metals, Other Elemental & Alloys as Powders, Vapors, or Sponges																																																				
23	Metals, Other Elemental & Alloys as Sheets, Rods, Drums, etc.																																																				
24	Metals and Metal Compounds, Toxic																																																				
25	Nitrates																																																				
26	Nitriles																																																				
27	Nitro Compounds, Organic																																																				
28	Hydrocarbons, Aliphatic, Unsaturated																																																				
29	Hydrocarbons, Aliphatic, Saturated																																																				
30	Peroxides and Hydroperoxides, Organic																																																				
31	Phenols and Cresols																																																				
32	Organophosphates, Phosphonates, Phosphorothionates																																																				
33	Sulfides, Inorganic																																																				
34	Epoxides																																																				
101	Combustible and Flammable Materials, Miscellaneous																																																				
102	Explosives																																																				
103	Polymerizable Compounds																																																				
104	Oxidizing Agents, Strong																																																				
105	Reducing Agents, Strong																																																				
106	Water and Mixtures Containing Water																																																				
107	Water Reactive Substances																																																				

CODE	CONSEQUENCE
H	Heat Generation
F	Fire
G	Innocuous and non-flammable gas generation
GT	Toxic Gas formation
GF	Flammable Gas formation
E	Explosion
P	Violent Polymerization
S	Solubilization of toxic substance
U	May be hazardous, but Unknown

Figure 1
EPA's Chemical Compatibility Chart
(Hatayama, et al., 1980)

Table

Table 1
Compilation of Represented EPA Reactivity Groups

EPA Reactivity Group Number	Reactivity Group Name
1	Acids, Mineral, Non-Oxidizing
2	Acids, Mineral, Oxidizing
3	Acids, Organic
4	Alcohols and Glycols
5	Aldehydes
6	Amides
7	Amines, Aliphatic and Aromatic
8	Azo Compounds, Diazo Compounds, and Hydrazines
10	Caustics
11	Cyanides
13	Esters
14	Ethers
15	Fluorides, Inorganic
16	Hydrocarbons, Aromatic
17	Halogenated Organics
18	Isocyanates
19	Ketones
20	Mercaptans and Other Organic Sulfides
21	Metals, Alkali and Alkaline Earth, Elemental
22	Metals, Other Elemental and Alloys as Powders, Vapors, or Sponges
23	Metals, Other Elemental and Alloys as Sheets, Rods, Drops, Moldings, etc.
24	Metals and Metal Compounds, Toxic
25	Nitrides
26	Nitriles
27	Nitro Compounds
28	Hydrocarbons, Aliphatic, Unsaturated
29	Hydrocarbons, Aliphatic, Saturated
30	Peroxides and Hydroperoxides, Organic
31	Phenols and Creosols
32	Organophosphates, Phosphothioates, Phosphodithioates
33	Sulfides, Inorganic
34	Epoxides
101	Combustible and Flammable Materials, Miscellaneous
102	Explosives
103	Polymerizable Compounds
104	Oxidizing Agents, Strong
105	Reducing Agents, Strong
106	Water and Mixtures Containing Water
107	Water Reactive Substances

Appendix A
CH- and RH-TRU Waste Streams and Associated
EPA Reactivity Group Numbers

CH- and RH-TRU Waste Streams and Associated EPA Reactivity Group Numbers (Continued)

Source	Site	Waste Stream Identifier	TRU Type	EPA Reactivity Group Number																																										
				1	2	3	4	5	6	7	8	10	11	13	14	15	16	17	18	19	20	21	22	23	24	25	27	28	29	30	31	32	33	34	101	102	103	104	105	106	107	OI	OO	OSMA		
ATWIR	IN	IN-LL-M001-S5400	CH												•		•				•		•	•											•							•		•		
ATWIR	IN	IN-W322	CH												•		•						•	•												•							•		•	
ATWIR	IN	IN-W358	CH												•		•						•	•													•							•		•
ATWIR	IN	IN-W337	CH													•	•					•	•														•							•		•
ATWIR	IN	IN-BN090	CH													•	•					•	•														•							•		•
BOTH	IN	IN-BN510	CH													•	•					•	•														•							•		•
BOTH	IN	IN-BN510.1	CH													•	•					•	•														•							•		•
ATWIR	IN	IN-W170	CH													•	•					•	•														•							•		•
ATWIR	IN	IN-W171	CH													•	•					•	•														•							•		•
ATWIR	IN	IN-W259	CH													•	•					•	•														•							•		•
ATWIR	IN	IN-W283	CH													•	•					•	•														•							•		•
ATWIR	IN	IN-W287	CH													•	•					•	•														•							•		•
ATWIR	IN	IN-W323	CH													•	•					•	•														•							•		•
ATWIR	IN	IN-W345	CH													•	•					•	•														•							•		•
ATWIR	IN	IN-BN375	CH		•											•	•					•	•														•							•		•
ATWIR	IN	IN-BN842	CH		•											•	•					•	•														•							•		•
ATWIR	IN	IN-W338	CH		•											•	•					•	•														•							•		•
ATWIR	IN	IN-BN005	CH													•							•	•													•							•		•
ATWIR	IN	IN-BN409	CH													•							•	•													•							•		•
ATWIR	IN	IN-LL-T004-S3141	CH													•							•	•													•							•		•
ATWIR	IN	IN-BN203	CH	•	•											•	•	•	•	•			•	•	•											•							•		•	
ATWIR	IN	IN-ID-RF-S5100-A	CH	•	•											•	•	•	•	•			•	•	•											•							•		•	
ATWIR	IN	IN-ID-RTC-S5000	CH	•	•											•	•	•	•	•			•	•	•											•							•		•	
ATWIR	IN	IN-ID-SA-T001	CH	•	•											•	•	•	•	•			•	•	•											•							•		•	
ATWIR	IN	IN-ID-SNL-HCF-S5400	CH	•	•											•	•	•	•	•			•	•	•											•							•		•	
ATWIR	IN	IN-MFC-S5490	CH	•	•											•	•	•	•	•			•	•	•											•							•		•	
ATWIR	IN	IN-W269	CH	•	•											•	•	•	•	•			•	•	•											•							•		•	
ATWIR	IN	IN-W339	CH	•	•											•	•	•	•	•			•	•	•											•							•		•	
ATWIR	IN	IN-BN430	CH				•									•	•					•	•														•							•		•
ATWIR	IN	IN-BN431	CH				•									•	•					•	•														•							•		•
ATWIR	IN	IN-BN432	CH				•									•	•					•	•														•							•		•
WDS	IN	ID-AECHHM	CH	•	•	•	•								•		•	•	•			•	•	•											•							•		•		
WDS	IN	ID-AECHDM	CH	•	•	•	•								•		•	•	•			•	•	•												•							•		•	
WDS	IN	ID-RF-S3114	CH				•									•	•						•	•													•							•		•
WDS	IN	ID-RF-S3150-A	CH				•									•	•						•	•													•							•		•
WDS	IN	ID-SDA-SLUDGE	CH	•	•	•	•								•		•	•	•			•	•	•												•							•		•	
WDS	IN	ID-RF-S5126	CH																					•													•							•		•
WDS	IN	INW276.001	CH																					•													•							•		•
WDS	IN	INW276.002	CH																					•													•							•		•

CH- and RH-TRU Waste Streams and Associated EPA Reactivity Group Numbers (Continued)

Source	Site	Waste Stream Identifier	TRU Type	EPA Reactivity Group Number																																											
				1	2	3	4	5	6	7	8	10	11	13	14	15	16	17	18	19	20	21	22	23	24	25	27	28	29	30	31	32	33	34	101	102	103	104	105	106	107	OI	OO	OSMA			
ATWIR	LA	LA-TA-03-27	CH	•	•		•	•						•							•		•	•										•					•	•	•		•				
ATWIR	LA	LA-TA-03-40	CH	•	•		•	•						•							•		•	•										•					•	•	•		•				
ATWIR	LA	LA-TA-21-07	CH	•	•		•	•						•							•		•	•										•					•	•	•		•				
ATWIR	LA	LA-TA-50-12	CH	•	•		•	•						•							•		•	•										•					•	•	•		•				
ATWIR	LA	LA-TA-55-21	CH	•	•		•	•						•							•		•	•										•					•	•	•		•				
ATWIR	LA	LA-TA-21-08	CH		•												•						•	•										•							•	•		•			
ATWIR	LA	LA-TA-03-17	CH		•								•											•										•			•					•	•		•		
ATWIR	LA	LA-TA-03-23	CH		•								•											•										•			•					•	•		•		
ATWIR	LA	LA-TA-03-42	CH		•								•											•										•			•					•	•		•		
ATWIR	LA	LA-TA-21-09	CH		•								•											•										•			•					•	•		•		
BOTH	LA	LA-OS-00-01.001	CH										•									•	•	•	•								•				•				•	•	•		•		
BOTH	LA	LA-OS-00-03	CH										•										•	•	•	•								•				•				•	•	•		•	
ATWIR	LA	LA-TA-03-10	CH													•	•		•			•		•	•								•								•	•		•			
ATWIR	LA	LA-TA-03-34	CH		•								•				•	•		•			•	•	•								•			•							•	•		•	
ATWIR	LA	LA-TA-21-12	CH		•								•				•	•		•			•	•	•								•			•							•	•		•	
ATWIR	LA	LA-TA-50-20	CH		•								•				•	•		•			•	•	•								•			•							•	•		•	
ATWIR	LA	LA-LAMIN04S	CH										•											•	•									•								•	•		•		
ATWIR	LA	LA-LANIN03NC	CH										•											•	•									•								•	•		•		
ATWIR	LA	LA-MIN04-S.001	CH										•											•	•									•								•	•		•		
ATWIR	LA	LA-LANHD02238	CH	•	•									•	•	•	•	•		•			•	•	•								•			•						•	•		•		
BOTH	LA	LA-MHD05-ITRI.001	CH	•	•		•	•						•									•		•	•	•							•				•				•	•	•		•	
ATWIR	LA	LA-TA-03-21	CH	•	•									•	•	•	•	•	•				•	•	•	•							•			•							•	•		•	
ATWIR	LA	LA-TA-21-11	CH	•	•									•	•	•	•	•	•				•	•	•	•							•			•							•	•		•	
BOTH	LA	LA-TA-55-19	CH	•	•	•	•	•					•				•	•	•		•		•	•	•	•	•	•					•	•		•			•	•	•	•	•	•	•	•	
BOTH	LA	LA-TA-55-30	CH	•	•	•	•	•					•				•	•	•		•		•	•	•	•	•	•					•	•		•			•	•	•	•	•	•	•	•	
ATWIR	LA	LA-TA-55-32	CH	•	•									•	•	•	•	•	•				•	•	•	•							•			•							•	•		•	
WDS	LA	LA-OS-00-01	CH										•										•	•	•	•								•				•				•	•	•		•	
WDS	LA	LA-TA-55-43.01	CH	•	•		•	•						•									•		•	•								•								•	•	•		•	
WDS	LA	LA-MHD02.001	CH	•	•		•	•						•									•		•	•								•								•	•	•		•	
ATWIR	LB	LB-T001	CH	•	•	•	•						•				•	•	•		•		•	•	•	•		•		•			•	•		•			•	•	•	•	•	•	•	•	
ATWIR	LB	LB-T002	CH	•	•	•	•						•				•	•	•		•		•	•	•	•		•		•			•	•		•			•	•	•	•	•	•	•	•	
ATWIR	LB	LB-T003	CH	•	•	•	•						•				•	•	•		•		•	•	•	•		•		•			•	•		•			•	•	•	•	•	•	•	•	•
ATWIR	LB	LB-T004	CH	•	•	•	•						•				•	•	•		•		•	•	•	•		•		•			•	•		•			•	•	•	•	•	•	•	•	•
ATWIR	LL	LL-W019	CH	•	•	•	•						•				•						•	•	•								•			•						•	•		•		
ATWIR	LL	LL-M001	CH	•	•	•	•						•				•						•	•	•	•		•					•			•						•	•		•		
ATWIR	LL	LL-W018-SS	CH		•								•											•										•				•						•	•		•
ATWIR	LL	LL-T004	CH										•										•		•	•								•			•						•	•		•	
ATWIR	LL	LL-W018-S5100	CH	•	•	•	•						•				•						•	•	•	•		•					•			•						•	•		•		
WDS	LL	LL-M001-S5400	CH	•	•	•	•						•				•						•	•	•	•		•					•			•						•	•		•		

CH- and RH-TRU Waste Streams and Associated EPA Reactivity Group Numbers (Continued)

Source	Site	Waste Stream Identifier	TRU Type	EPA Reactivity Group Number																																																
				1	2	3	4	5	6	7	8	10	11	13	14	15	16	17	18	19	20	21	22	23	24	25	27	28	29	30	31	32	33	34	101	102	103	104	105	106	107	OI	OO	OSMA								
WDS	RF	RF119.01	CH	•	•	•	•			•		•	•		•	•	•		•	•	•	•	•	•			•	•		•	•	•		•			•			•	•	•	•	•	•							
WDS	RF	RF122.04	CH	•	•	•	•			•		•	•		•	•	•		•	•	•	•	•	•			•	•		•	•	•		•			•			•	•	•	•	•	•							
WDS	RF	RF122.05	CH	•	•	•	•			•		•	•	•		•	•	•		•	•	•	•	•			•	•		•	•	•		•			•			•	•	•	•	•	•							
WDS	RF	RF009.01	CH	•	•	•	•					•		•	•	•				•	•	•	•	•																												
WDS	RF	RF010.01	CH	•	•	•	•					•		•	•	•				•	•	•	•	•																												
WDS	RF	RF029.01	CH	•	•	•	•					•		•	•	•				•	•	•	•	•																												
WDS	RF	RF031.01	CH	•	•	•	•					•		•	•	•				•	•	•	•	•																												
WDS	RF	RF033.01	CH	•	•	•	•					•		•	•	•				•	•	•	•	•																												
WDS	RF	RF110.01	CH	•	•	•	•					•		•	•	•				•	•	•	•	•																												
WDS	RF	RF116.01	CH	•	•	•	•					•		•	•	•				•	•	•	•	•																												
WDS	RF	RF118.01	CH	•	•	•	•					•		•	•	•				•	•	•	•	•																												
WDS	RF	RF121.01	CH	•	•	•	•					•		•	•	•				•	•	•	•	•																												
WDS	RF	RF123.01	CH	•	•	•	•					•		•	•	•				•	•	•	•	•																												
WDS	RF	RF123.03	CH	•	•	•	•					•		•	•	•				•	•	•	•	•																												
WDS	RF	RF123.04	CH	•	•	•	•					•		•	•	•				•	•	•	•	•																												
WDS	RF	RF128.01	CH	•	•	•	•					•		•	•	•				•	•	•	•	•																												
WDS	RF	RF140.01	CH	•	•	•	•					•		•	•	•				•	•	•	•	•																												
WDS	RF	RF141.01	CH	•	•	•	•			•		•	•	•	•	•				•	•	•	•	•						•			•																			
WDS	RF	RF141.02	CH	•	•	•	•					•		•	•	•				•	•	•	•	•																												
WDS	RF	RF002.01	CH	•	•	•	•			•		•	•	•	•	•				•	•	•	•	•																												
WDS	RF	RF107.01	CH		•	•	•					•		•	•	•				•	•	•	•	•																												
ATWIR	RL	RL105-03	CH		•		•					•		•							•	•	•	•																												
ATWIR	RL	RL221U-09	CH		•		•					•		•							•	•	•	•																												
ATWIR	RL	RLPFP-04	CH												•	•							•	•																												
ATWIR	RL	RLPFP-03	CH		•							•		•								•	•	•																												
ATWIR	RL	RL201-03	CH									•		•								•	•	•	•																											
ATWIR	RL	RL231Z-03	CH									•		•								•	•	•	•																											
ATWIR	RL	RL233S-03	CH									•		•								•	•	•	•																											
ATWIR	RL	RL300-03	CH									•		•								•	•	•	•																											
ATWIR	RL	RL325-03	CH									•		•								•	•	•	•																											
ATWIR	RL	RLBW-03	CH									•		•								•	•	•	•																											
ATWIR	RL	RLCFF-03	CH									•		•								•	•	•	•																											
ATWIR	RL	RLGEV-03	CH									•		•								•	•	•	•																											
ATWIR	RL	RLWAR-03	CH									•		•								•	•	•	•																											
ATWIR	RL	RL105-01	CH	•	•	•	•			•		•	•	•		•	•	•		•	•	•	•	•																												
ATWIR	RL	RL200-01	CH	•	•	•	•			•		•	•	•		•	•	•		•	•	•	•	•																												
ATWIR	RL	RL200-02	CH	•	•	•	•			•		•	•	•		•	•	•		•	•	•	•	•																												
ATWIR	RL	RL202S-01	CH	•	•	•	•			•		•	•	•		•	•	•		•	•	•	•	•																												
ATWIR	RL	RL209E-01	CH	•	•	•	•			•		•	•	•		•	•	•		•	•	•	•	•																												

CH- and RH-TRU Waste Streams and Associated EPA Reactivity Group Numbers (Continued)

Source	Site	Waste Stream Identifier	TRU Type	EPA Reactivity Group Number																																									
				1	2	3	4	5	6	7	8	10	11	13	14	15	16	17	18	19	20	21	22	23	24	25	27	28	29	30	31	32	33	34	101	102	103	104	105	106	107	OI	OO	OSMA	
ATWIR	RL	RL618-08	RH	•	•	•	•			•		•	•	•		•	•	•		•		•	•	•	•			•	•		•	•			•	•	•	•	•	•	•			•	
ATWIR	RL	RLBART-08	RH	•	•	•	•			•		•	•	•		•	•	•		•		•	•	•	•			•	•		•	•			•	•	•	•	•	•	•	•			•
ATWIR	RL	RLBAT-08	RH	•	•	•	•			•		•	•	•		•	•	•		•		•	•	•	•			•	•		•	•			•	•	•	•	•	•	•	•			•
ATWIR	RL	RLBET-08	RH	•	•	•	•			•		•	•	•		•	•	•		•		•	•	•	•			•	•		•	•			•	•	•	•	•	•	•	•			•
ATWIR	RL	RLBW-08	RH	•	•	•	•			•		•	•	•		•	•	•		•		•	•	•	•			•	•		•	•			•	•	•	•	•	•	•	•			•
ATWIR	RL	RLCH2-08	RH	•	•	•	•			•		•	•	•		•	•	•		•		•	•	•	•			•	•		•	•			•	•	•	•	•	•	•	•			•
ATWIR	RL	RLESG-08	RH	•	•	•	•			•		•	•	•		•	•	•		•		•	•	•	•			•	•		•	•			•	•	•	•	•	•	•	•			•
ATWIR	RL	RLFFTF-08	RH	•	•	•	•			•		•	•	•		•	•	•		•		•	•	•	•			•	•		•	•			•	•	•	•	•	•	•	•			•
ATWIR	RL	RLGEV-08	RH	•	•	•	•			•		•	•	•		•	•	•		•		•	•	•	•			•	•		•	•			•	•	•	•	•	•	•	•			•
ATWIR	RL	RLHAN-08	RH	•	•	•	•			•		•	•	•		•	•	•		•		•	•	•	•			•	•		•	•			•	•	•	•	•	•	•	•			•
ATWIR	RL	RLMLB-08	RH	•	•	•	•			•		•	•	•		•	•	•		•		•	•	•	•			•	•		•	•			•	•	•	•	•	•	•	•			•
ATWIR	RL	RLPFP-08	RH	•	•	•	•			•		•	•	•		•	•	•		•		•	•	•	•			•	•		•	•			•	•	•	•	•	•	•	•			•
ATWIR	RL	RLPURX-08	RH	•	•	•	•			•		•	•	•		•	•	•		•		•	•	•	•			•	•		•	•			•	•	•	•	•	•	•	•			•
ATWIR	RL	RLSWO-08	RH	•	•	•	•			•		•	•	•		•	•	•		•		•	•	•	•			•	•		•	•			•	•	•	•	•	•	•	•			•
ATWIR	RL	RLWTP-08	RH	•	•	•	•			•		•	•	•		•	•	•		•		•	•	•	•			•	•		•	•			•	•	•	•	•	•	•	•			•
ATWIR	SA	SA-W135	RH	•	•	•	•					•		•	•	•		•		•		•	•	•	•			•	•		•	•			•	•	•	•	•	•	•	•			•
WDS	SA	SNL-HCF-S5400-RH	RH	•	•	•	•					•		•	•	•		•		•		•	•	•	•			•	•		•	•			•	•	•	•	•	•	•	•			•
ATWIR	SR	SR-RH-773A.01	RH	•	•	•	•				•		•	•	•		•		•		•	•	•	•			•	•		•	•			•	•	•	•	•	•	•	•			•	
ATWIR	SR	SR-RH-221H.01	RH	•	•	•	•					•		•	•	•		•		•		•	•	•	•			•	•		•	•			•	•	•	•	•	•	•	•			•
ATWIR	SR	SR-RH-221H.02	RH	•	•	•	•					•		•	•	•		•		•		•	•	•	•			•	•		•	•			•	•	•	•	•	•	•	•			•
ATWIR	SR	SR-RH-235F.01	RH	•	•	•	•					•		•	•	•		•		•		•	•	•	•			•	•		•	•			•	•	•	•	•	•	•	•			•
ATWIR	SR	SR-RH-772F.01	RH	•	•	•	•					•		•	•	•		•		•		•	•	•	•			•	•		•	•			•	•	•	•	•	•	•	•			•
ATWIR	SR	SR-RH-FTF.01	RH	•	•	•	•					•		•	•	•		•		•		•	•	•	•			•	•		•	•			•	•	•	•	•	•	•	•			•
ATWIR	SR	SR-RH-MNDPAD1.01	RH	•	•	•	•					•		•	•	•		•		•		•	•	•	•			•	•		•	•			•	•	•	•	•	•	•	•			•
ATWIR	SR	SR-RH-SDD.01	RH	•	•	•	•					•		•	•	•		•		•		•	•	•	•			•	•		•	•			•	•	•	•	•	•	•	•			•
ATWIR	SR	SR-RH-SWD.01	RH	•	•	•	•					•		•	•	•		•		•		•	•	•	•			•	•		•	•			•	•	•	•	•	•	•	•			•
WDS	SR	SR-BCLDP.004.002	RH	•	•	•	•					•		•	•	•		•		•		•	•	•	•			•	•		•	•			•	•	•	•	•	•	•	•			•
WDS	SR	SR-BCLDP.001.002	RH	•	•	•	•					•		•	•	•		•		•		•	•	•	•			•	•		•	•			•	•	•	•	•	•	•	•			•
WDS	SR	SR-BCLDP.004.003	RH	•	•	•	•					•		•	•	•		•		•		•	•	•	•			•	•		•	•			•	•	•	•	•	•	•	•			•
WDS	SR	SR-RL-BCLDP.001	RH	•	•	•	•					•		•	•	•		•		•		•	•	•	•			•	•		•	•			•	•	•	•	•	•	•	•			•
BOTH	SR	SR-RH-FBL.01	RH	•	•	•	•				•		•	•	•		•		•		•	•	•	•			•	•		•	•			•	•	•	•	•	•	•	•	•			•
BOTH	SR	SR-RL-BCLDP.002	RH	•	•	•	•					•		•	•	•		•		•		•	•	•	•			•	•		•	•			•	•	•	•	•	•	•	•			•
WDS	SR	SR-BCLDP.001.001	RH	•	•	•	•					•		•	•	•		•		•		•	•	•	•			•	•		•	•			•	•	•	•	•	•	•	•			•
WDS	SR	SR-BCLDP.002	RH	•	•	•	•					•		•	•	•		•		•		•	•	•	•			•	•		•	•			•	•	•	•	•	•	•	•			•
WDS	SR	SR-BCLDP.003	RH	•	•	•	•					•		•	•	•		•		•		•	•	•	•			•	•		•	•			•	•	•	•	•	•	•	•			•

Appendix B
Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations

Potential Chemical Reactions within CH- and RH-TRU Waste Streams and Reaction Explanations

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
1	4	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	5	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	5	Violent Polymerization	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	6	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	7	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	8	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	8	Innocuous and Non-Flammable Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	10	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping; Bases/caustic materials are neutralized and solidified/immobilized prior to shipping
1	11	Toxic Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	11	Flammable Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	13	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	14	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	15	Toxic Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	17	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	17	Toxic Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	18	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	18	Innocuous and Non-Flammable Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
1	19	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	20	Toxic Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	20	Flammable Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	21	Flammable Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	21	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	21	Fire	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	22	Flammable Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	22	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	22	Fire	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	23	Flammable Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	23	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	23	Fire	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	24	Solubilization of Toxic Substances	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	25	Flammable Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	25	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	25	Fire	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	26	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	26	Toxic Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
1	26	Flammable Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	28	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	30	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	30	Innocuous and Non-Flammable Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	31	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	32	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	32	Toxic Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	33	Toxic Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	33	Flammable Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	34	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	34	Violent Polymerization	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	101	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	101	Innocuous and Non-Flammable Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	102	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping; Explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.
1	102	Explosion	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping; Explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.
1	103	Violent Polymerization	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
1	103	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
1	104	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.
1	104	Toxic Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.
1	105	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped.
1	105	Flammable Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped.
1	106	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping; residual liquid content is limited to less than 1% of waste volume
1	107	Highly Reactive	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping; residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
2	3	Innocuous and Non-Flammable Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	3	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	4	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	4	Fire	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	5	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	5	Fire	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
2	6	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	6	Toxic Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	7	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	7	Toxic Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	8	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	8	Toxic Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	10	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping; Bases/caustic materials are neutralized and solidified/immobilized prior to shipping
2	11	Toxic Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	11	Flammable Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	13	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	13	Fire	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	14	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	14	Fire	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	15	Toxic Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	16	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	16	Fire	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	17	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
2	17	Fire	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	17	Toxic Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	18	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	18	Fire	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	18	Toxic Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	19	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	19	Fire	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	20	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	20	Fire	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	20	Toxic Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	21	Flammable Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	21	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	21	Fire	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	22	Flammable Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	22	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	22	Fire	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	23	Flammable Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	23	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
2	23	Fire	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	24	Solubilization of Toxic Substances	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping.
2	25	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	25	Fire	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	25	Explosion	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	26	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	26	Fire	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	26	Toxic Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	27	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	27	Fire	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	27	Toxic Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	28	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	28	Fire	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	29	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	29	Fire	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	30	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	30	Explosion	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	31	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
2	31	Fire	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	32	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	32	Toxic Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	33	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	33	Fire	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	33	Flammable Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	34	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	34	Violent Polymerization	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	101	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	101	Fire	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	101	Toxic Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	102	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping; Explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.
2	102	Explosion	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping; Explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.
2	103	Violent Polymerization	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	103	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
2	105	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped.

Potential Chemical Reactions within CH- and RH-TRU Waste Streams and Reaction Explanations (Continued)

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
2	105	Fire	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped.
2	105	Toxic Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped.
2	106	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping; residual liquid content is limited to less than 1% of waste volume
2	107	Highly Reactive	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping; residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
3	4	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
3	4	Violent Polymerization	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
3	5	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
3	5	Violent Polymerization	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
3	7	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
3	8	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
3	8	Innocuous and Non-Flammable Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
3	10	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping; Bases/caustic materials are neutralized and solidified/immobilized prior to shipping
3	11	Toxic Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
3	11	Flammable Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
3	15	Toxic Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
3	18	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
3	18	Innocuous and Non-Flammable Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
3	21	Flammable Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
3	21	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
3	21	Fire	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
3	22	Innocuous and Non-Flammable Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
3	22	Fire	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
3	24	Solubilization of Toxic Substances	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
3	25	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
3	25	Flammable Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
3	26	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
3	33	Toxic Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
3	34	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
3	34	Violent Polymerization	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
3	102	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping; Explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.

Potential Chemical Reactions within CH- and RH-TRU Waste Streams and Reaction Explanations (Continued)

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
3	102	Explosion	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping; Explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.
3	103	Violent Polymerization	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
3	103	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping
3	104	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.
3	104	Toxic Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.
3	105	Heat Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped.
3	105	Flammable Gas Generation	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped.
3	107	Highly Reactive	Reaction will not occur – Acids are neutralized and solidified/immobilized prior to shipping; residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
4	8	Heat Generation	Reaction will not occur – Alcohols and Glycols are solidified/immobilized prior to shipping
4	8	Innocuous and Non-Flammable Gas Generation	Reaction will not occur – Alcohols and Glycols are solidified/immobilized prior to shipping
4	18	Heat Generation	Reaction will not occur – Alcohols and Glycols are solidified/immobilized prior to shipping
4	18	Violent Polymerization	Reaction will not occur – Alcohols and Glycols are solidified/immobilized prior to shipping
4	21	Flammable Gas Generation	Reaction will not occur – Alcohols and Glycols are solidified/immobilized prior to shipping

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
4	21	Heat Generation	Reaction will not occur – Alcohols and Glycols are solidified/immobilized prior to shipping
4	21	Fire	Reaction will not occur – Alcohols and Glycols are solidified/immobilized prior to shipping
4	25	Flammable Gas Generation	Reaction will not occur – Alcohols and Glycols are solidified/immobilized prior to shipping
4	25	Heat Generation	Reaction will not occur – Alcohols and Glycols are solidified/immobilized prior to shipping
4	25	Explosion	Reaction will not occur – Alcohols and Glycols are solidified/immobilized prior to shipping
4	30	Heat Generation	Reaction will not occur – Alcohols and Glycols are solidified/immobilized prior to shipping
4	30	Fire	Reaction will not occur – Alcohols and Glycols are solidified/immobilized prior to shipping
4	34	Heat Generation	Reaction will not occur – Alcohols and Glycols are solidified/immobilized prior to shipping
4	34	Violent Polymerization	Reaction will not occur – Alcohols and Glycols are solidified/immobilized prior to shipping
4	104	Heat Generation	Reaction will not occur – Alcohols and Glycols are solidified/immobilized prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.
4	104	Fire	Reaction will not occur – Alcohols and Glycols are solidified/immobilized prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.
4	105	Heat Generation	Reaction will not occur – Alcohols and Glycols are solidified/immobilized prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped.
4	105	Flammable Gas Generation	Reaction will not occur – Alcohols and Glycols are solidified/immobilized prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped.
4	105	Fire	Reaction will not occur – Alcohols and Glycols are solidified/immobilized prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped.

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
4	107	Highly Reactive	Reaction will not occur – Alcohols and Glycols are solidified/immobilized prior to shipping; residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
5	7	Heat Generation	Reaction will not occur – Aldehydes are solidified/immobilized prior to shipping
5	8	Heat Generation	Reaction will not occur – Aldehydes are solidified/immobilized prior to shipping
5	10	Heat Generation	Reaction will not occur – Aldehydes are solidified/immobilized prior to shipping; bases/caustic materials are neutralized and solidified/immobilized prior to shipping
5	21	Flammable Gas Generation	Reaction will not occur – Aldehydes are solidified/immobilized prior to shipping
5	21	Heat Generation	Reaction will not occur – Aldehydes are solidified/immobilized prior to shipping
5	21	Fire	Reaction will not occur – Aldehydes are solidified/immobilized prior to shipping
5	25	Flammable Gas Generation	Reaction will not occur – Aldehydes are solidified/immobilized prior to shipping
5	25	Heat Generation	Reaction will not occur – Aldehydes are solidified/immobilized prior to shipping
5	27	Heat Generation	Reaction will not occur – Aldehydes are solidified/immobilized prior to shipping
5	28	Heat Generation	Reaction will not occur – Aldehydes are solidified/immobilized prior to shipping
5	30	Heat Generation	Reaction will not occur – Aldehydes are solidified/immobilized prior to shipping
5	30	Innocuous and Non-Flammable Gas Generation	Reaction will not occur – Aldehydes are solidified/immobilized prior to shipping
5	33	Heat Generation	Reaction will not occur – Aldehydes are solidified/immobilized prior to shipping

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
5	34	May be Hazardous, But Unknown	Reaction will not occur – Aldehydes are solidified/immobilized prior to shipping
5	104	Heat Generation	Reaction will not occur – Aldehydes are solidified/immobilized prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.
5	104	Fire	Reaction will not occur – Aldehydes are solidified/immobilized prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.
5	105	Flammable Gas Generation	Reaction will not occur – Aldehydes are solidified/immobilized prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped.
5	105	Heat Generation	Reaction will not occur – Aldehydes are solidified/immobilized prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped.
5	105	Fire	Reaction will not occur – Aldehydes are solidified/immobilized prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped.
5	107	Highly Reactive	Reaction will not occur – Aldehydes are solidified/immobilized prior to shipping; residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
6	21	Flammable Gas Generation	Reaction will not occur – Amides are solidified/immobilized prior to shipping
6	21	Heat Generation	Reaction will not occur – Amides are solidified/immobilized prior to shipping
6	24	Solubilization of Toxic Substances	Reaction will not occur – Amides are solidified/immobilized prior to shipping.
6	104	Heat Generation	Reaction will not occur – Amides are solidified/immobilized prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
6	104	Fire	Reaction will not occur – Amides are solidified/immobilized prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.
6	104	Toxic Gas Generation	Reaction will not occur – Amides are solidified/immobilized prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.
6	105	Flammable Gas Generation	Reaction will not occur – Amides are solidified/immobilized prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped.
6	105	Heat Generation	Reaction will not occur – Amides are solidified/immobilized prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped.
6	107	Highly Reactive	Reaction will not occur – Amides are solidified/immobilized prior to shipping; residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
7	17	Heat Generation	Reaction will not occur – Aliphatic and aromatic amines are reacted/solidified/immobilized prior to shipping; Halogenated organics are solidified/immobilized prior to shipping
7	17	Toxic Gas Generation	Reaction will not occur – Aliphatic and aromatic amines are reacted/solidified/immobilized prior to shipping; Halogenated organics are solidified/immobilized prior to shipping
7	18	Heat Generation	Reaction will not occur – Aliphatic and aromatic amines are reacted/solidified/immobilized prior to shipping; Isocyanates are reacted/solidified/immobilized prior to shipping
7	18	Violent Polymerization	Reaction will not occur – Aliphatic and aromatic amines are reacted/solidified/immobilized prior to shipping; Isocyanates are reacted/solidified/immobilized prior to shipping
7	21	Flammable Gas Generation	Reaction will not occur – Aliphatic and aromatic amines are reacted/solidified/immobilized prior to shipping; metals are typically in oxide form

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
7	21	Heat Generation	Reaction will not occur – Aliphatic and aromatic amines are reacted/solidified/immobilized prior to shipping; metals are typically in oxide form
7	24	Solubilization of Toxic Substances	Reaction will not occur – Aliphatic and aromatic amines are reacted/solidified/immobilized prior to shipping
7	30	Heat Generation	Reaction will not occur – Aliphatic and aromatic amines are reacted/solidified/immobilized prior to shipping; Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping
7	30	Toxic Gas Generation	Reaction will not occur – Aliphatic and aromatic amines are reacted/solidified/immobilized prior to shipping; Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping
7	34	Heat Generation	Reaction will not occur – Aliphatic and aromatic amines are reacted/solidified/immobilized prior to shipping; Epoxides are solidified/immobilized prior to shipping
7	34	Violent Polymerization	Reaction will not occur – Aliphatic and aromatic amines are reacted/solidified/immobilized prior to shipping; Epoxides are solidified/immobilized prior to shipping
7	104	Heat Generation	Reaction will not occur – Aliphatic and aromatic amines are reacted/solidified/immobilized prior to shipping; Oxidizing agents are reacted prior to being placed in the waste/shipped.
7	104	Fire	Reaction will not occur – Aliphatic and aromatic amines are reacted/solidified/immobilized prior to shipping; Oxidizing agents are reacted prior to being placed in the waste/shipped.
7	104	Toxic Gas Generation	Reaction will not occur – Aliphatic and aromatic amines are reacted/solidified/immobilized prior to shipping; Oxidizing agents are reacted prior to being placed in the waste/shipped.
7	105	Heat Generation	Reaction will not occur – Aliphatic and aromatic amines are reacted/solidified/immobilized prior to shipping; Reducing agents are reacted prior to being placed in the waste/shipped.

Potential Chemical Reactions within CH- and RH-TRU Waste Streams and Reaction Explanations (Continued)

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
7	105	Innocuous and Non-Flammable Gas Generation	Reaction will not occur – Aliphatic and aromatic amines are reacted/solidified/immobilized prior to shipping; Reducing agents are reacted prior to being placed in the waste/shipped.
7	107	Highly Reactive	Reaction will not occur – Aliphatic and aromatic amines are reacted/solidified/immobilized prior to shipping; residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
8	11	Innocuous and Non-Flammable Gas Generation	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping
8	13	Heat Generation	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping; Esters are solidified/immobilized prior to shipping
8	13	Innocuous and Non-Flammable Gas Generation	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping; Esters are solidified/immobilized prior to shipping
8	17	Heat Generation	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping
8	17	Innocuous and Non-Flammable Gas Generation	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping
8	18	Heat Generation	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping; Isocyanates are reacted/solidified/immobilized prior to shipping
8	18	Innocuous and Non-Flammable Gas Generation	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping; Isocyanates are reacted/solidified/immobilized prior to shipping

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
8	19	Heat Generation	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping; Ketones are solidified/immobilized prior to shipping
8	19	Innocuous and Non-Flammable Gas Generation	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping; Ketones are solidified/immobilized prior to shipping
8	20	Heat Generation	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping; Mercaptans are reacted/solidified/immobilized prior to shipping
8	20	Innocuous and Non-Flammable Gas Generation	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping; Mercaptans are reacted/solidified/immobilized prior to shipping
8	21	Flammable Gas Generation	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping; metals are typically in oxide form
8	21	Heat Generation	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping; metals are typically in oxide form
8	22	Heat Generation	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping
8	22	Fire	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping
8	22	Toxic Gas Generation	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping
8	23	Heat Generation	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping
8	23	Fire	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping
8	23	Innocuous and Non-Flammable Gas Generation	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
8	25	May be Hazardous, But Unknown	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping
8	30	Heat Generation	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping; Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping
8	30	Fire	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping; Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping
8	30	Explosion	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping; Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping
8	31	Heat Generation	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping
8	31	Innocuous and Non-Flammable Gas Generation	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping
8	32	May be Hazardous, But Unknown	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping
8	33	Explosion	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping
8	34	Heat Generation	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping; Epoxides are reacted/solidified/immobilized prior to shipping
8	34	Violent Polymerization	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping; Epoxides are reacted/solidified/immobilized prior to shipping
8	102	Heat Generation	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping; Explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
8	102	Explosion	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping; Explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.
8	103	Violent Polymerization	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping
8	103	Heat Generation	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping
8	104	Heat Generation	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping; Oxidizing agents are reacted prior to being placed in the waste/shipped.
8	104	Explosion	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping; Oxidizing agents are reacted prior to being placed in the waste/shipped.
8	106	Innocuous and Non-Flammable Gas Generation	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping; residual liquid content is limited to less than 1% of waste volume
8	107	Highly Reactive	Reaction will not occur – Azo, Diazo, and Hydrazine compounds are reacted/solidified/immobilized prior to shipping; residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
10	13	Heat Generation	Reaction will not occur – Caustics/bases are neutralized and solidified/immobilized prior to shipping
10	17	Heat Generation	Reaction will not occur – Caustics/bases are neutralized and solidified/immobilized prior to shipping
10	17	Flammable Gas Generation	Reaction will not occur – Caustics/bases are neutralized and solidified/immobilized prior to shipping

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
10	18	Heat Generation	Reaction will not occur – Caustics/bases are neutralized and solidified/immobilized prior to shipping
10	18	Violent Polymerization	Reaction will not occur – Caustics/bases are neutralized and solidified/immobilized prior to shipping
10	18	Innocuous and Non-Flammable Gas Generation	Reaction will not occur – Caustics/bases are neutralized and solidified/immobilized prior to shipping
10	19	Heat Generation	Reaction will not occur – Caustics/bases are neutralized and solidified/immobilized prior to shipping
10	21	Flammable Gas Generation	Reaction will not occur – Caustics/bases are neutralized and solidified/immobilized prior to shipping
10	21	Heat Generation	Reaction will not occur – Caustics/bases are neutralized and solidified/immobilized prior to shipping
10	22	Flammable Gas Generation	Reaction will not occur – Caustics/bases are neutralized and solidified/immobilized prior to shipping
10	22	Heat Generation	Reaction will not occur – Caustics/bases are neutralized and solidified/immobilized prior to shipping
10	24	Solubilization of Toxic Substances	Reaction will not occur – Caustics/bases are neutralized and solidified/immobilized prior to shipping.
10	25	May be Hazardous, But Unknown	Reaction will not occur – Caustics/bases are neutralized and solidified/immobilized prior to shipping
10	26	May be Hazardous, But Unknown	Reaction will not occur – Caustics/bases are neutralized and solidified/immobilized prior to shipping
10	27	Heat Generation	Reaction will not occur – Caustics/bases are neutralized and solidified/immobilized prior to shipping
10	27	Explosion	Reaction will not occur – Caustics/bases are neutralized and solidified/immobilized prior to shipping
10	32	Heat Generation	Reaction will not occur – Caustics/bases are neutralized and solidified/immobilized prior to shipping
10	32	Explosion	Reaction will not occur – Caustics/bases are neutralized and solidified/immobilized prior to shipping
10	34	Heat Generation	Reaction will not occur – Caustics/bases are neutralized and solidified/immobilized prior to shipping
10	34	Violent Polymerization	Reaction will not occur – Caustics/bases are neutralized and solidified/immobilized prior to shipping

Potential Chemical Reactions within CH- and RH-TRU Waste Streams and Reaction Explanations (Continued)

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
10	102	Heat Generation	Reaction will not occur – Caustics/bases are neutralized and solidified/immobilized prior to shipping; Explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.
10	102	Explosion	Reaction will not occur – Caustics/bases are neutralized and solidified/immobilized prior to shipping; Explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.
10	103	Violent Polymerization	Reaction will not occur – Caustics/bases are neutralized and solidified/immobilized prior to shipping
10	103	Heat Generation	Reaction will not occur – Caustics/bases are neutralized and solidified/immobilized prior to shipping
10	107	Highly Reactive	Reaction will not occur – Caustics/bases are neutralized and solidified/immobilized prior to shipping; residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
11	17	Heat Generation	Reaction will not occur – Cyanides are solid/solidified/immobilized prior to shipping
11	18	Heat Generation	Reaction will not occur – Isocyanates are reacted/solidified/immobilized prior to shipping
11	18	Innocuous and Non-Flammable Gas Generation	Reaction will not occur – Isocyanates are reacted/solidified/immobilized prior to shipping
11	19	Heat Generation	Reaction will not occur – Ketones are solidified/immobilized prior to shipping
11	21	Flammable Gas Generation	Reaction will not occur – Cyanides are solid/solidified/immobilized prior to shipping; metals are typically in oxide form
11	21	Heat Generation	Reaction will not occur – Cyanides are solid/solidified/immobilized prior to shipping; metals are typically in oxide form
11	25	Flammable Gas Generation	Reaction will not occur – Cyanides are solid/solidified/immobilized prior to shipping
11	25	Heat Generation	Reaction will not occur – Cyanides are solid/solidified/immobilized prior to shipping

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
11	30	Heat Generation	Reaction will not occur – Cyanides are solid/solidified/immobilized prior to shipping; Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping
11	30	Explosion	Reaction will not occur – Cyanides are solid/solidified/immobilized prior to shipping; Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping
11	30	Toxic Gas Generation	Reaction will not occur – Cyanides are solid/solidified/immobilized prior to shipping; Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping
11	34	Heat Generation	Reaction will not occur – Cyanides are solid/solidified/immobilized prior to shipping; Epoxides are reacted/solidified/immobilized prior to shipping
11	34	Violent Polymerization	Reaction will not occur – Cyanides are solid/solidified/immobilized prior to shipping; Epoxides are reacted/solidified/immobilized prior to shipping
11	103	Violent Polymerization	Reaction will not occur – Cyanides are solid/solidified/immobilized prior to shipping
11	103	Heat Generation	Reaction will not occur – Cyanides are solid/solidified/immobilized prior to shipping
11	104	Heat Generation	Reaction will not occur – Cyanides are solid/solidified/immobilized prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.
11	104	Explosion	Reaction will not occur – Cyanides are solid/solidified/immobilized prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.
11	104	Toxic Gas Generation	Reaction will not occur – Cyanides are solid/solidified/immobilized prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
11	105	Heat Generation	Reaction will not occur – Cyanides are solid/solidified/immobilized prior to shipping; strong reducing agents are reacted prior to being placed in the waste/shipped.
11	105	Toxic Gas Generation	Reaction will not occur – Cyanides are solid/solidified/immobilized prior to shipping; strong reducing agents are reacted prior to being placed in the waste/shipped.
11	107	Highly Reactive	Reaction will not occur – Cyanides are solid/solidified/immobilized prior to shipping; residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
13	21	Flammable Gas Generation	Reaction will not occur – Esters are solidified/immobilized prior to shipping
13	21	Heat Generation	Reaction will not occur – Esters are solidified/immobilized prior to shipping
13	25	Flammable Gas Generation	Reaction will not occur – Esters are solidified/immobilized prior to shipping
13	25	Heat Generation	Reaction will not occur – Esters are solidified/immobilized prior to shipping
13	102	Heat Generation	Reaction will not occur – Esters are solidified/immobilized prior to shipping; Explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.
13	102	Explosion	Reaction will not occur – Esters are solidified/immobilized prior to shipping; Explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.
13	104	Heat Generation	Reaction will not occur – Esters are solidified/immobilized prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.
13	104	Fire	Reaction will not occur – Esters are solidified/immobilized prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
13	107	Highly Reactive	Reaction will not occur – Esters are solidified/immobilized prior to shipping; residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
14	104	Heat Generation	Reaction will not occur – Ethers are solidified / immobilized prior to shipping. Oxidizing agents are reacted prior to being placed in the waste/shipped.
14	104	Fire	Reaction will not occur – Ethers are solidified / immobilized prior to shipping. Oxidizing agents are reacted prior to being placed in the waste/shipped.
14	107	Highly Reactive	Reaction will not occur – Ethers are solidified / immobilized prior to shipping. Residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
15	107	Highly Reactive	Reaction will not occur – Inorganic fluorides are reacted during use and processing; Residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
16	104	Heat Generation	Reaction will not occur – Aromatic hydrocarbons are solidified/immobilized prior to shipping. Oxidizing agents are reacted prior to being placed in the waste/shipped.
16	104	Fire	Reaction will not occur – Aromatic hydrocarbons are solidified/immobilized prior to shipping. Oxidizing agents are reacted prior to being placed in the waste/shipped.

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
16	105	Heat Generation	Reaction will not occur – Aromatic hydrocarbons are solidified/immobilized prior to shipping. Strong reducing agents are reacted prior to being placed in the waste/shipped.
16	105	Fire	Reaction will not occur – Aromatic hydrocarbons are solidified/immobilized prior to shipping. Strong reducing agents are reacted prior to being placed in the waste/shipped.
16	105	Explosion	Reaction will not occur – Aromatic hydrocarbons are solidified/immobilized prior to shipping. Strong reducing agents are reacted prior to being placed in the waste/shipped.
16	107	Highly Reactive	Reaction will not occur – Aromatic hydrocarbons are solidified/immobilized prior to shipping. Residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
17	20	Heat Generation	Reaction will not occur – Halogenated organics are solidified/immobilized prior to shipping
17	21	Heat Generation	Reaction will not occur – Halogenated organics are solidified/immobilized prior to shipping
17	21	Explosion	Reaction will not occur – Halogenated organics are solidified/immobilized prior to shipping
17	22	Heat Generation	Reaction will not occur – Halogenated organics are solidified/immobilized prior to shipping
17	22	Explosion	Reaction will not occur – Halogenated organics are solidified/immobilized prior to shipping
17	23	Heat Generation	Reaction will not occur – Halogenated organics are solidified/immobilized prior to shipping
17	23	Fire	Reaction will not occur – Halogenated organics are solidified/immobilized prior to shipping
17	25	Flammable Gas Generation	Reaction will not occur – Halogenated organics are solidified/immobilized prior to shipping
17	25	Heat Generation	Reaction will not occur – Halogenated organics are solidified/immobilized prior to shipping

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
17	30	Heat Generation	Reaction will not occur – Halogenated organics are solidified/immobilized prior to shipping
17	30	Explosion	Reaction will not occur – Halogenated organics are solidified/immobilized prior to shipping
17	104	Heat Generation	Reaction will not occur – Halogenated organics are solidified/immobilized prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.
17	104	Toxic Gas Generation	Reaction will not occur – Halogenated organics are solidified/immobilized prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.
17	105	Heat Generation	Reaction will not occur – Halogenated organics are solidified/immobilized prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped.
17	105	Explosion	Reaction will not occur – Halogenated organics are solidified/immobilized prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped.
17	107	Highly Reactive	Reaction will not occur – Halogenated organics are solidified/immobilized prior to shipping; residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
18	20	Heat Generation	Reaction will not occur – Isocyanates are reacted/solid/immobilized prior to shipping; Mercaptans are reacted/solidified/immobilized prior to shipping
18	21	Flammable Gas Generation	Reaction will not occur – Isocyanates are reacted/solid /immobilized prior to shipping; metals are typically in oxide form
18	21	Heat Generation	Reaction will not occur – Isocyanates are reacted/solid /immobilized prior to shipping; metals are typically in oxide form
18	22	Flammable Gas Generation	Reaction will not occur – Isocyanates are reacted/solid /immobilized prior to shipping
18	22	Heat Generation	Reaction will not occur – Isocyanates are reacted/solid /immobilized prior to shipping

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
18	25	May be Hazardous, But Unknown	Reaction will not occur – Isocyanates are reacted/solid /immobilized prior to shipping
18	30	Heat Generation	Reaction will not occur – Isocyanates are reacted/solid/immobilized prior to shipping; Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping
18	31	Heat Generation	Reaction will not occur – Isocyanates are reacted/solid /immobilized prior to shipping
18	31	Violent Polymerization	Reaction will not occur – Isocyanates are reacted/solid /immobilized prior to shipping
18	33	Heat Generation	Reaction will not occur – Isocyanates are reacted/solid/immobilized prior to shipping; Inorganic sulfides are reacted/solidified/immobilized prior to shipping
18	104	Heat Generation	Reaction will not occur – Isocyanates are reacted/solid/immobilized prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.
18	104	Fire	Reaction will not occur – Isocyanates are reacted/solid/immobilized prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.
18	104	Toxic Gas Generation	Reaction will not occur – Isocyanates are reacted/solid/immobilized prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.
18	105	Flammable Gas Generation	Reaction will not occur – Isocyanates are reacted/solid/immobilized prior to shipping; Reducing agents are reacted prior to being placed in the waste/shipped.
18	105	Heat Generation	Reaction will not occur – Isocyanates are reacted/solid/immobilized prior to shipping; Reducing agents are reacted prior to being placed in the waste/shipped.
18	106	Heat Generation	Reaction will not occur – Isocyanates are reacted/solid/immobilized prior to shipping; residual liquid content is limited to less than 1% of waste volume
18	106	Innocuous and Non-Flammable Gas Generation	Reaction will not occur – Isocyanates are reacted/solid/immobilized prior to shipping; residual liquid content is limited to less than 1% of waste volume

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
18	107	Highly Reactive	Reaction will not occur – Isocyanates are reacted/solid/immobilized prior to shipping; residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
19	20	Heat Generation	Reaction will not occur – Ketones are solidified/immobilized prior to shipping
19	21	Flammable Gas Generation	Reaction will not occur – Ketones are solidified/immobilized prior to shipping
19	21	Heat Generation	Reaction will not occur – Ketones are solidified/immobilized prior to shipping
19	25	Flammable Gas Generation	Reaction will not occur – Ketones are solidified/immobilized prior to shipping
19	25	Heat Generation	Reaction will not occur – Ketones are solidified/immobilized prior to shipping
19	30	Explosion	Reaction will not occur – Ketones are solidified/immobilized prior to shipping
19	104	Heat Generation	Reaction will not occur –Ketones are solidified/immobilized prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.
19	104	Fire	Reaction will not occur –Ketones are solidified/immobilized prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.
19	105	Flammable Gas Generation	Reaction will not occur –Ketones are solidified/immobilized prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped.
19	105	Heat Generation	Reaction will not occur –Ketones are solidified/immobilized prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped.

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
19	107	Highly Reactive	Reaction will not occur – Ketones are solidified/immobilized prior to shipping; residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
20	21	Flammable Gas Generation	Reaction will not occur – Mercaptans are reacted/solidified/immobilized prior to shipping; metals are typically in oxide form
20	21	Heat Generation	Reaction will not occur – Mercaptans are reacted/solidified/immobilized prior to shipping; metals are typically in oxide form
20	22	Heat Generation	Reaction will not occur – Mercaptans are reacted/solidified/immobilized prior to shipping
20	22	Flammable Gas Generation	Reaction will not occur – Mercaptans are reacted/solidified/immobilized prior to shipping
20	22	Fire	Reaction will not occur – Mercaptans are reacted/solidified/immobilized prior to shipping
20	25	Flammable Gas Generation	Reaction will not occur – Mercaptans are reacted/solidified/immobilized prior to shipping
20	25	Heat Generation	Reaction will not occur – Mercaptans are reacted/solidified/immobilized prior to shipping
20	30	Heat Generation	Reaction will not occur – Mercaptans are reacted/solidified/immobilized prior to shipping; Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping
20	30	Fire	Reaction will not occur – Mercaptans are reacted/solidified/immobilized prior to shipping; Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping
20	30	Toxic Gas Generation	Reaction will not occur – Mercaptans are reacted/solidified/immobilized prior to shipping; Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping
20	34	Heat Generation	Reaction will not occur – Mercaptans are reacted/solidified/immobilized prior to shipping; Epoxides are reacted/solidified/immobilized prior to shipping

Potential Chemical Reactions within CH- and RH-TRU Waste Streams and Reaction Explanations (Continued)

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
20	34	Violent Polymerization	Reaction will not occur – Mercaptans are reacted/solidified/immobilized prior to shipping; Epoxides are reacted/solidified/immobilized prior to shipping
20	104	Heat Generation	Reaction will not occur – Mercaptans are reacted/solidified/immobilized prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.
20	104	Fire	Reaction will not occur – Mercaptans are reacted/solidified/immobilized prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.
20	104	Toxic Gas Generation	Reaction will not occur – Mercaptans are reacted/solidified/immobilized prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.
20	105	Flammable Gas Generation	Reaction will not occur – Mercaptans are reacted/solidified/immobilized prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped.
20	105	Heat Generation	Reaction will not occur – Mercaptans are reacted/solidified/immobilized prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped.
20	107	Highly Reactive	Reaction will not occur – Mercaptans are reacted/solidified/immobilized prior to shipping; residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
21	25	Explosion	Reaction will not occur – Nitrides are reacted prior to shipping; metals are typically in oxide form
21	26	Heat Generation	Reaction will not occur – Nitriles are reacted prior to shipping; metals are typically in oxide form
21	26	Violent Polymerization	Reaction will not occur – Nitriles are reacted prior to shipping; metals are typically in oxide form
21	27	Heat Generation	Reaction will not occur – Nitro compounds are reacted prior to shipping; metals are typically in oxide form

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
21	27	Flammable Gas Generation	Reaction will not occur – Nitro compounds are reacted prior to shipping; metals are typically in oxide form
21	27	Explosion	Reaction will not occur – Nitro compounds are reacted prior to shipping; metals are typically in oxide form
21	30	Heat Generation	Reaction will not occur – Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping; metals are typically in oxide form
21	30	Explosion	Reaction will not occur – Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping; metals are typically in oxide form
21	31	Flammable Gas Generation	Reaction will not occur – Phenols and Creosols are solidified/immobilized prior to shipping; metals are typically in oxide form
21	31	Heat Generation	Reaction will not occur – Phenols and Creosols are solidified/immobilized prior to shipping; metals are typically in oxide form
21	32	Heat Generation	Reaction will not occur – Organophosphates are solidified/immobilized prior to shipping; metals are typically in oxide form
21	34	Heat Generation	Reaction will not occur – Epoxides are reacted/solidified/immobilized prior to shipping; metals are typically in oxide form
21	34	Violent Polymerization	Reaction will not occur – Epoxides are reacted/solidified/immobilized prior to shipping; metals are typically in oxide form
21	101	Heat Generation	Reaction will not occur – Combustible materials are dry; residual liquid content is limited to less than 1% of waste volume; metals are typically in oxide form
21	101	Innocuous and Non-Flammable Gas Generation	Reaction will not occur – Combustible materials are dry; residual liquid content is limited to less than 1% of waste volume; metals are typically in oxide form
21	101	Fire	Reaction will not occur – Combustible materials are dry; residual liquid content is limited to less than 1% of waste volume; metals are typically in oxide form

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
21	102	Heat Generation	Reaction will not occur – explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.
21	102	Explosion	Reaction will not occur – explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.
21	103	Violent Polymerization	Reaction will not occur – Polymerizable compounds are reacted or immobilized/solidified prior to shipping; metals are typically in oxide form
21	103	Heat Generation	Reaction will not occur – Polymerizable compounds are reacted or immobilized/solidified prior to shipping; metals are typically in oxide form
21	104	Heat Generation	Reaction will not occur –Oxidizing agents are reacted prior to being placed in the waste/shipped; metals are typically in oxide form
21	104	Fire	Reaction will not occur –Oxidizing agents are reacted prior to being placed in the waste/shipped; metals are typically in oxide form
21	104	Explosion	Reaction will not occur –Oxidizing agents are reacted prior to being placed in the waste/shipped; metals are typically in oxide form
21	106	Flammable Gas Generation	Reaction will not occur – Residual liquids are limited to less than 1% of waste volume; metals are typically in oxide form.
21	106	Heat Generation	Reaction will not occur – Residual liquids are limited to less than 1% of waste volume; metals are typically in oxide form.
21	107	Highly Reactive	Reaction will not occur – Metals are typically in oxide form; residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
22	28	Heat Generation	Reaction will not occur – Unsaturated aliphatic hydrocarbons are solidified/immobilized prior to shipping

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
22	28	Explosion	Reaction will not occur – Unsaturated aliphatic hydrocarbons are solidified/immobilized prior to shipping
22	30	Heat Generation	Reaction will not occur – Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping.
22	30	Innocuous and Non-Flammable Gas Generation	Reaction will not occur – Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping.
22	34	Heat Generation	Reaction will not occur – Epoxides are reacted/solidified/immobilized prior to shipping.
22	34	Violent Polymerization	Reaction will not occur – Epoxides are reacted/solidified/immobilized prior to shipping.
22	102	Heat Generation	Reaction will not occur – explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.
22	102	Explosion	Reaction will not occur – explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.
22	103	Violent Polymerization	Reaction will not occur – Polymerizable compounds are reacted or immobilized/solidified prior to shipping
22	103	Heat Generation	Reaction will not occur – Polymerizable compounds are reacted or immobilized/solidified prior to shipping
22	104	Heat Generation	Reaction will not occur – Oxidizing agents are reacted prior to being placed in the waste/shipped
22	104	Fire	Reaction will not occur – Oxidizing agents are reacted prior to being placed in the waste/shipped
22	104	Explosion	Reaction will not occur – Oxidizing agents are reacted prior to being placed in the waste/shipped
22	106	Flammable Gas Generation	Reaction will not occur – Residual liquids are limited to less than 1% of waste volume; water reactive metals are reacted prior to shipping
22	106	Heat Generation	Reaction will not occur – Residual liquids are limited to less than 1% of waste volume; water reactive metals are reacted prior to shipping

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
22	107	Highly Reactive	Reaction will not occur – Residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
23	102	Heat Generation	Reaction will not occur – explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.
23	102	Explosion	Reaction will not occur – explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.
23	103	Violent Polymerization	Reaction will not occur – Polymerizable compounds are reacted or immobilized/solidified prior to shipping
23	103	Heat Generation	Reaction will not occur – Polymerizable compounds are reacted or immobilized/solidified prior to shipping
23	104	Heat Generation	Reaction will not occur – Oxidizing agents are reacted prior to being placed in the waste/shipped
23	104	Fire	Reaction will not occur – Oxidizing agents are reacted prior to being placed in the waste/shipped
23	107	Highly Reactive	Reaction will not occur – Residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
24	26	Solubilization of Toxic Substances	Reaction will not occur – Nitriles are reacted/solidified/immobilized prior to shipping.
24	30	Heat Generation	Reaction will not occur – Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping.
24	30	Innocuous and Non-Flammable Gas Generation	Reaction will not occur – Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping.
24	34	Heat Generation	Reaction will not occur – Epoxides are solidified/immobilized prior to shipping.

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
24	34	Violent Polymerization	Reaction will not occur – Epoxides are solidified/immobilized prior to shipping.
24	102	Explosion	Reaction will not occur – explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.
24	103	Violent Polymerization	Reaction will not occur – Polymerizable compounds are reacted or immobilized/solidified prior to shipping
24	103	Heat Generation	Reaction will not occur – Polymerizable compounds are reacted or immobilized/solidified prior to shipping
24	106	Solubilization of Toxic Substances	Reaction is unlikely – Residual liquid content is limited to less than 1% of waste volume.
24	107	Highly Reactive	Reaction will not occur – Residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
25	26	Flammable Gas Generation	Reaction will not occur – Nitrides are reacted prior to shipping
25	26	Heat Generation	Reaction will not occur – Nitrides are reacted prior to shipping
25	27	Heat Generation	Reaction will not occur – Nitrides are reacted prior to shipping; Nitro compounds are reacted prior to shipping.
25	27	Flammable Gas Generation	Reaction will not occur – Nitrides are reacted prior to shipping; Nitro compounds are reacted prior to shipping.
25	27	Explosion	Reaction will not occur – Nitrides are reacted prior to shipping; Nitro compounds are reacted prior to shipping.
25	30	Heat Generation	Reaction will not occur – Nitrides are reacted prior to shipping; Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping.
25	30	Flammable Gas Generation	Reaction will not occur – Nitrides are reacted prior to shipping; Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping.

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
25	30	Explosion	Reaction will not occur – Nitrides are reacted prior to shipping; Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping.
25	31	Flammable Gas Generation	Reaction will not occur – Nitrides are reacted prior to shipping; Phenols and creosols are solidified/immobilized prior to shipping.
25	31	Heat Generation	Reaction will not occur – Nitrides are reacted prior to shipping; Phenols and creosols are solidified/immobilized prior to shipping.
25	34	Heat Generation	Reaction will not occur – Nitrides are reacted prior to shipping; Epoxides are solidified/immobilized prior to shipping.
25	34	Violent Polymerization	Reaction will not occur – Nitrides are reacted prior to shipping; Epoxides are solidified/immobilized prior to shipping.
25	101	Heat Generation	Reaction will not occur – Nitrides are reacted prior to shipping; Combustible materials are dry; residual liquid content is limited to less than 1% of waste volume
25	101	Flammable Gas Generation	Reaction will not occur – Nitrides are reacted prior to shipping; Combustible materials are dry; residual liquid content is limited to less than 1% of waste volume
25	101	Fire	Reaction will not occur – Nitrides are reacted prior to shipping; Combustible materials are dry; residual liquid content is limited to less than 1% of waste volume
25	102	Explosion	Reaction will not occur – explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.
25	103	Violent Polymerization	Reaction will not occur – Nitrides are reacted prior to shipping
25	103	Heat Generation	Reaction will not occur – Nitrides are reacted prior to shipping
25	104	Heat Generation	Reaction will not occur – oxidizing agents are reacted prior to being placed in the waste/shipped.
25	104	Fire	Reaction will not occur – oxidizing agents are reacted prior to being placed in the waste/shipped.
25	104	Explosion	Reaction will not occur – oxidizing agents are reacted prior to being placed in the waste/shipped.

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
25	106	Flammable Gas Generation	Reaction will not occur – Nitriles are reacted prior to shipping; Residual liquids are limited to less than 1% of waste volume
25	106	Heat Generation	Reaction will not occur – Nitriles are reacted prior to shipping; Residual liquids are limited to less than 1% of waste volume
25	107	Highly Reactive	Reaction will not occur – Residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
26	30	Heat Generation	Reaction will not occur – Nitriles are reacted prior to shipping; Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping.
26	30	Violent Polymerization	Reaction will not occur – Nitriles are reacted prior to shipping; Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping.
26	30	Toxic Gas Generation	Reaction will not occur – Nitriles are reacted prior to shipping; Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping.
26	104	Heat Generation	Reaction will not occur – Nitriles are reacted prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.
26	104	Fire	Reaction will not occur – Nitriles are reacted prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.
26	104	Toxic Gas Generation	Reaction will not occur – Nitriles are reacted prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.
26	105	Heat Generation	Reaction will not occur – Nitriles are reacted prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped.
26	105	Flammable Gas Generation	Reaction will not occur – Nitriles are reacted prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped.

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
26	107	Highly Reactive	Reaction will not occur – Residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
27	104	Heat Generation	Reaction will not occur – Nitro compounds are reacted/solidified/immobilized prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.
27	104	Explosion	Reaction will not occur – Nitro compounds are reacted/solidified/immobilized prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.
27	105	Heat Generation	Reaction will not occur – Nitro compounds are reacted/solidified/immobilized prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped.
27	105	Explosion	Reaction will not occur – Nitro compounds are reacted/solidified/immobilized prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped.
27	107	Highly Reactive	Reaction will not occur – Nitro compounds are reacted/solidified/immobilized prior to shipping; Residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
28	30	Heat Generation	Reaction will not occur – Unsaturated aliphatic hydrocarbons are immobilized/solidified prior to shipping; peroxides and hydroperoxides are reacted/immobilized prior to shipping
28	30	Violent Polymerization	Reaction will not occur – Unsaturated aliphatic hydrocarbons are immobilized/solidified prior to shipping; peroxides and hydroperoxides are reacted/immobilized prior to shipping

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
28	104	Heat Generation	Reaction will not occur – Unsaturated aliphatic hydrocarbons are immobilized/solidified prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped
28	104	Fire	Reaction will not occur – Unsaturated aliphatic hydrocarbons are immobilized/solidified prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped
28	107	Highly Reactive	Reaction will not occur – Unsaturated aliphatic hydrocarbons are immobilized/solidified prior to shipping; residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
29	104	Heat Generation	Reaction will not occur – Saturated aliphatic hydrocarbons are immobilized/solidified prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped
29	104	Fire	Reaction will not occur – Saturated aliphatic hydrocarbons are immobilized/solidified prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped
29	107	Highly Reactive	Reaction will not occur – Saturated aliphatic hydrocarbons are immobilized/solidified prior to shipping; residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
30	31	Heat Generation	Reaction will not occur – Phenols and creosols are immobilized/solidified prior to shipping; Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping.

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
30	32	May be Hazardous, But Unknown	Reaction will not occur – Organophosphates are immobilized/solidified prior to shipping; Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping.
30	33	Heat Generation	Reaction will not occur – Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping.
30	33	Toxic Gas Generation	Reaction will not occur – Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping.
30	34	Heat Generation	Reaction will not occur – Epoxides are reacted/solidified/immobilized prior to shipping; Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping.
30	34	Violent Polymerization	Reaction will not occur – Epoxides are reacted/solidified/immobilized prior to shipping; Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping.
30	101	Heat Generation	Reaction will not occur – Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping; Combustible materials are dry; residual liquid content is limited to less than 1% of waste volume
30	101	Fire	Reaction will not occur – Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping; Combustible materials are dry; residual liquid content is limited to less than 1% of waste volume
30	101	Toxic Gas Generation	Reaction will not occur – Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping; Combustible materials are dry; residual liquid content is limited to less than 1% of waste volume
30	102	Heat Generation	Reaction will not occur – explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.
30	102	Explosion	Reaction will not occur – explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.
30	103	Violent Polymerization	Reaction will not occur – Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping.
30	103	Heat Generation	Reaction will not occur – Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping.

Potential Chemical Reactions within CH- and RH-TRU Waste Streams and Reaction Explanations (Continued)

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
30	104	Heat Generation	Reaction will not occur – Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.
30	104	Innocuous and Non-Flammable Gas Generation	Reaction will not occur – Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.
30	105	Heat Generation	Reaction will not occur – Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped.
30	105	Explosion	Reaction will not occur – Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped.
30	107	Highly Reactive	Reaction will not occur – Peroxides and Hydroperoxides are reacted/solidified/immobilized prior to shipping; Residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
31	34	Heat Generation	Reaction will not occur – Phenols and creosols are immobilized/solidified prior to shipping; Epoxides are reacted/solidified/immobilized prior to shipping
31	34	Violent Polymerization	Reaction will not occur – Phenols and creosols are immobilized/solidified prior to shipping; Epoxides are reacted/solidified/immobilized prior to shipping
31	102	Heat Generation	Reaction will not occur – explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.
31	102	Explosion	Reaction will not occur – explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
31	103	Violent Polymerization	Reaction will not occur – Polymerizable compounds are reacted or immobilized/solidified prior to shipping; phenols and creosols are immobilized/solidified prior to shipping
31	103	Heat Generation	Reaction will not occur – Polymerizable compounds are reacted or immobilized/solidified prior to shipping; phenols and creosols are immobilized/solidified prior to shipping
31	104	Heat Generation	Reaction will not occur – Phenols and creosols are immobilized/solidified prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped
31	104	Fire	Reaction will not occur – Phenols and creosols are immobilized/solidified prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped
31	105	Flammable Gas Generation	Reaction will not occur – Phenols and creosols are immobilized/solidified prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped
31	105	Heat Generation	Reaction will not occur – Phenols and creosols are immobilized/solidified prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped
31	107	Highly Reactive	Reaction will not occur – Phenols and creosols are immobilized/solidified prior to shipping; residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
32	34	May be Hazardous, But Unknown	Reaction will not occur – Organophosphates are immobilized/solidified prior to shipping; Epoxides are reacted/solidified/immobilized prior to shipping
32	104	Heat Generation	Reaction will not occur – Organophosphates are immobilized/solidified prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped
32	104	Fire	Reaction will not occur – Organophosphates are immobilized/solidified prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
32	104	Toxic Gas Generation	Reaction will not occur – Organophosphates are immobilized/solidified prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped
32	105	Toxic Gas Generation	Reaction will not occur – Organophosphates are immobilized/solidified prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped
32	105	Flammable Gas Generation	Reaction will not occur – Organophosphates are immobilized/solidified prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped
32	105	Heat Generation	Reaction will not occur – Organophosphates are immobilized/solidified prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped
32	107	Highly Reactive	Reaction will not occur – Organophosphates are immobilized/solidified prior to shipping; residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
33	34	Heat Generation	Reaction will not occur – Epoxides are reacted/solidified/immobilized prior to shipping
33	34	Violent Polymerization	Reaction will not occur – Epoxides are reacted/solidified/immobilized prior to shipping
33	102	Heat Generation	Reaction will not occur – explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.
33	102	Explosion	Reaction will not occur – explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.
33	103	Violent Polymerization	Reaction will not occur – Polymerizable compounds are reacted or immobilized/solidified prior to shipping
33	103	Heat Generation	Reaction will not occur – Polymerizable compounds are reacted or immobilized/solidified prior to shipping
33	104	Heat Generation	Reaction will not occur – oxidizing agents are reacted prior to being placed in the waste/shipped.
33	104	Fire	Reaction will not occur – oxidizing agents are reacted prior to being placed in the waste/shipped.

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
33	104	Toxic Gas Generation	Reaction will not occur – oxidizing agents are reacted prior to being placed in the waste/shipped.
33	106	Toxic Gas Generation	Reaction is unlikely – Residual liquids are limited to less than 1% of waste volume
33	106	Flammable Gas Generation	Reaction is unlikely – Residual liquids are limited to less than 1% of waste volume
33	107	Highly Reactive	Reaction is unlikely – residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
34	102	Heat Generation	Reaction will not occur – explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.
34	102	Explosion	Reaction will not occur – explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.
34	104	Heat Generation	Reaction will not occur – Epoxides are reacted/solidified/immobilized prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.
34	104	Fire	Reaction will not occur – Epoxides are reacted/solidified/immobilized prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.
34	104	Innocuous and Non-Flammable Gas Generation	Reaction will not occur – Epoxides are reacted/solidified/immobilized prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped.
34	105	Heat Generation	Reaction will not occur – Epoxides are reacted/solidified/immobilized prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped.

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
34	107	Highly Reactive	Reaction will not occur – Epoxides are reacted/solidified/immobilized prior to shipping; Residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
101	102	Heat Generation	Reaction will not occur – explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.
101	102	Explosion	Reaction will not occur – explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.
101	104	Heat Generation	Reaction will not occur – Combustible materials are dry; oxidizing agents are reacted prior to being placed in the waste/shipped
101	104	Fire	Reaction will not occur – Combustible materials are dry; oxidizing agents are reacted prior to being placed in the waste/shipped
101	104	Innocuous and Non-Flammable Gas Generation	Reaction will not occur – Combustible materials are dry; oxidizing agents are reacted prior to being placed in the waste/shipped
101	105	Flammable Gas Generation	Reaction will not occur – Combustible materials are dry; reducing agents are reacted prior to being placed in the waste/shipped
101	105	Heat Generation	Reaction will not occur – Combustible materials are dry; reducing agents are reacted prior to being placed in the waste/shipped

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
101	107	Highly Reactive	Reaction will not occur – Combustible materials are dry; residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
102	103	Heat Generation	Reaction will not occur – explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.
102	103	Explosion	Reaction will not occur – explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.
102	104	Heat Generation	Reaction will not occur – explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.
102	104	Explosion	Reaction will not occur – explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.
102	105	Heat Generation	Reaction will not occur – explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.
102	105	Explosion	Reaction will not occur – explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.
102	107	Highly Reactive	Reaction will not occur – explosives are not allowed, explosive compounds will be reacted prior to being placed in the waste/shipped.
103	104	Heat Generation	Reaction will not occur – Polymerizable compounds are reacted or immobilized/solidified prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped
103	104	Fire	Reaction will not occur – Polymerizable compounds are reacted or immobilized/solidified prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
103	104	Toxic Gas Generation	Reaction will not occur – Polymerizable compounds are reacted or immobilized/solidified prior to shipping; oxidizing agents are reacted prior to being placed in the waste/shipped
103	105	Heat Generation	Reaction will not occur – Polymerizable compounds are reacted or immobilized/solidified prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped
103	105	Violent Polymerization	Reaction will not occur – Polymerizable compounds are reacted or immobilized/solidified prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped
103	105	Flammable Gas Generation	Reaction will not occur – Polymerizable compounds are reacted or immobilized/solidified prior to shipping; reducing agents are reacted prior to being placed in the waste/shipped
103	107	Highly Reactive	Reaction will not occur – Polymerizable compounds are reacted or immobilized/solidified prior to shipping; residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
104	105	Heat Generation	Reaction will not occur – Oxidizing agents are reacted prior to being placed in the waste/shipped; reducing agents are reacted prior to being placed in the waste/shipped
104	105	Fire	Reaction will not occur – Oxidizing agents are reacted prior to being placed in the waste/shipped; reducing agents are reacted prior to being placed in the waste/shipped
104	105	Explosion	Reaction will not occur – Oxidizing agents are reacted prior to being placed in the waste/shipped; reducing agents are reacted prior to being placed in the waste/shipped

**Potential Chemical Reactions within CH- and
RH-TRU Waste Streams and Reaction Explanations (Continued)**

Combination of EPA Reactivity Groups		Reaction Result (A x B)	Explanation of Potential Incompatibility
Group A	Group B		
104	107	Highly Reactive	Reaction will not occur – Oxidizing agents are reacted prior to being placed in the waste/shipped; residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
105	106	Flammable Gas Generation	Reaction will not occur – Reducing agents are reacted prior to being placed in the waste/shipped; residual liquid content is limited to less than 1% of waste volume
105	106	Toxic Gas Generation	Reaction will not occur – Reducing agents are reacted prior to being placed in the waste/shipped; residual liquid content is limited to less than 1% of waste volume
105	107	Highly Reactive	Reaction will not occur – Reducing agents are reacted prior to being placed in the waste/shipped; residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.
106	107	Highly Reactive	Reaction will not occur – Residual liquid content is limited to less than 1% of waste volume; water reactive substances are reacted prior to being placed in the waste/shipped. Lime in Portland cement is most common water reactive substance expected in the waste. Portland cement is used as an absorbent and solidification agent for the wastes.

EPA = U.S. Environmental Protection Agency.