

**Waste Stream Name**

Solid Waste Stream #1 - Concrete and Masonry from Limited Area

**Waste Stream Description**

Concrete from the aprons and foundations and masonry material from explosive production buildings

**Process/Building Generating Waste**

Removal of concrete during construction or demolition

**Description of Process Generating Waste**

When production buildings are demolished or modernized, the existing concrete is sometimes removed or replaced.

**Composition:**

The composition of this waste stream is basically just concrete. Since this concrete is coming from an explosives production building, there is a high(er) likelihood that the concrete has been exposed to explosives.

**Physical State**

- Solid
- Liquid
- Semi-solid
- Dust/powder
- Debris
- Sludge
- Gas/Aerosol

**Odor**

- None
- Mild
- Strong

Describe \_\_\_\_\_

**Flashpoint** N/A

**pH** N/A

**Btu Range** N/A

**Specific Gravity** N/A

**Layers?** N/A

**Color** White, brown

**Wastewater/non-Wastewater** Non-Wastewater

**Characteristic?**

D001, Ignitable (Flash point < 140F)

D002, Corrosive (pH <2.0 or > 12.5)

D003, Reactive

Water Reactive

Shock Sensitive

Oxidizer

Pyrophoric  
Explosive  
Sulfides  
Cyanides  
Other

**(re: reactivity---See additional documentation at end of document for generator knowledge for D003)**

\_\_\_\_\_ D004-D043, Toxic (fail TCLP for specific compounds; if yes are there any UHCs?)  
*D030 (2,4-dinitrotoluene has the potential to be present if TNT or Composition B which contains TNT.)*

No Hazardous Characteristic/Non Hazardous

**Listed?**

\_\_\_\_\_ F (spent solvents)

\_\_\_\_\_ K (generated by specific processes)

\_\_\_\_\_ P (unused commercial chemicals, toxic)

\_\_\_\_\_ U (unused commercial chemicals, acutely toxic)

N/A. Not listed

**Underlying Hazardous Constituents**

(Anything painted will be tested for lead and PCBs if no generator knowledge exists to rule out PCBs or lead.) Also, any PCB suspect materials such as caulking, etc. will be tested to rule out PCBs or any other suspected UHC.

**Source of information**

Generator Knowledge

**Disposal Method**

Due to safety concerns and Army regulations, being classified similar to a Division 1.4 (or lesser—not a 1.1, 1.2, or 1.3) explosive material, it is still classified via Army regulations as Material Determined to have an Explosive Hazard (MDEH). This material, when not evaluated by Safety to be MDAS (material determined as safe), must be thermally decontaminated via permitted Title V covered activity of open burning since no other safe alternatives for disposal exist. HSAAP's current thermal decontamination method is open burning until a new technology is identified and implemented.

D003 Characterization and Documentation

**Generator Knowledge Documentation**

The foundation of our determination for **Waste Stream #1** is based on our answers (in red) for the 7 properties of reactivity defined at 40 CFR 261.23(a):

(a) A solid waste exhibits the characteristic of reactivity if a representative sample of the waste has any of the following properties.

- (1) It is normally unstable and readily undergoes violent change without detonating.  
*Solid Waste Stream 1 being sent to the cage or pile are stable and does not readily undergo violent change without detonating.*
- (2) It reacts violently with water.  
*Solid Waste Stream 1 does not react violently with water. They are open to rainfall 365 days a year.*
- (3) It forms potentially explosive mixtures with water.  
*Solid Waste Stream 1 does not form potentially explosive mixtures with water. They are open to rainfall 365 days a year.*
- (4) When mixed with water, it generates toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.  
*Solid Waste Stream 1 does not generate toxic gases, vapors, or fumes when mixed with water.*
- (5) It is a cyanide or sulfide bearing waste which, when exposed to pH conditions between 2 and 12.5 can generate toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.  
*Solid Waste Stream 1 is not cyanide or sulfide bearing wastes.*
- (6) It is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement.  
*Current screening procedures eliminate the allowance of grossly explosives contaminated materials from being added to the cages or piles. Solid Waste Stream 1 is similarly described as Division 1.4 hazard class—substances and articles which present only a small hazard in the event of ignition or initiation. An external fire shall not cause virtually instantaneous explosion of almost the entire contents of the package [article] (49 CFR 173.50 and 173.53).*  
  
*In this regard, Solid Waste Stream 1 is not capable of detonation or explosive reaction if it is being subjected to a strong initiating source or heated under confinement.*
- (7) It is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.  
*Solid Waste Stream 1 is not readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.*
- (8) It is a forbidden explosive as defined in 49 CFR 173.54, or is a Division 1.1, 1.2 or 1.3 explosive as defined in 49 CFR 173.50 and 173.53.  
*Solid Waste Stream 1 does not meet the definition of forbidden explosive as defined in 49 CFR 173.54 or the class definition of Division 1.1, 1.2, or 1.3 explosives as defined in 49 CFR 173.50 and 173.53.*

**EPA Regulatory memos relevant to this characterization are also attached below.**

9443.1988(10)

REACTIVE WASTE - EXPLOSIVITY

MEMORANDUM

DATE: September 8, 1988

SUBJECT: Definition of Reactive Waste - Explosivity

FROM: David Friedman, Chief  
Methods Section, (OS-331)

TO: Sonya Stelmack,  
Assistance Branch, (OS-343)

As you requested, I have reviewed the testing protocols and classification criteria used by the Department of Defense in evaluating the explosivity of material (Army TB 700-2, Navy NAVSEAINST 8020.8, Air Force To 11A-1-47, DLA DLAR 8220.1).

It is my judgement that the only materials that would exhibit the reactivity characteristic (40 CFR 261.23), due to their potential explosivity, are those that fall into Department of Defense Hazard Classes 1.1, 1.2, and 1.3. Materials rated as Class 1.4 would, therefore, not be an explosive within the meaning of the reactivity characteristic.

cc: Suzanne Rudzinski  
Reva Rubenstein  
Robert Dellinger

RO 13223

9443.1995(01)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

February 24, 1995

MEMORANDUM

SUBJECT: Debris and Soil Contaminated with Explosive Residues

FROM: James F. Michael, Chief  
Disposal Technology Section (5303W)  
Office of Solid Waste

TO: Lawrence A. Wapensky, Chief  
Utah/North Dakota Section  
Region VIII

This responds to your January 20, 1995 memorandum requesting assistance in answering questions raised by the State of Utah concerning regulatory issues pertaining to wastes contaminated with explosive residues.

The first question raises concern with the reference at 40 CFR 261.23(a)(8) to certain Department of Transportation (DOT) regulations concerning explosive classifications, that are cited as criteria for determining the characteristic of reactivity. The DOT regulations cited at 261.23(a)(8) have recently been changed and expanded to conform with Department of Defense hazard classes, therefore, presenting difficulties in implementing the Federal regulatory definition of reactivity under RCRA. Until such time that 261.23(a)(8) is updated, those referenced DOT regulations can not be used for determining reactivity. Reactivity determinations should be made using the remaining criteria at 261.23(a)(1) - (7).

The second question asks whether and when liquid, solid, or debris mixed with explosives would be considered reactive. Wastes, whether themselves explosives, or media contaminated with explosives could be considered reactive by meeting the definition of reactivity as described in 261.23(a)(1)-(7). Wastes that do not meet the criteria in 261.23(a)(1)-(7) would not be considered reactive.

The third question regards other Federal criteria for explosivity. If agencies such as the Bureau of Alcohol, Tobacco, and Firearms (BATF) have regulations, or protocols, for determining whether or not a substance is explosive, those regulations or protocols would not be enforceable under EPA regulations, unless they became incorporated into our rules. Specific methods used by agencies such as BATF to determine if a substance is an explosive could however, be applied to determine whether a waste is reactive according to 261.23(a)(6) or (7).

Thank you for the opportunity to address questions related to the reactivity characteristic as it relates to explosives. If you have any questions, please call Jeff Gaines at (703) 308-8655.

cc: Frank McAlister, AB, PSPD, OSW  
Jeff Gaines, AB, PSPD, OSW

**Waste Stream Name**

Solid Waste Stream #2 - Fiber drums and Cardboard from the limited area

**Waste Stream Description**

Empty fiber drums that were used to store raw materials including explosives and cardboard used in explosives buildings

**Process/Building Generating Waste**

Explosives manufacturing

**Description of Process Generating Waste**

Explosives production receives many types of raw materials, including explosives, in fiber drums and cardboard boxes. If the fiber drums or boxes cannot be reused, the plant will dispose of it.

**Composition:**

The fiber drums are primarily made up of cardboard with metal rings at the top and bottom. Cardboard boxes are just made from cardboard. Since the fiber drums and cardboard were used in explosives production and might have contained explosives, the fiber drums and cardboard have the potential to contain residual explosives.

**Physical State**

- Solid
- Liquid
- Semi-solid
- Dust/powder
- Debris
- Sludge
- Gas/Aerosol

**Odor**

- None
- Mild
- Strong

Describe \_\_\_\_\_

**Flashpoint** N/A

**pH** N/A

**Btu Range** N/A

**Specific Gravity** N/A

**Layers?** N/A

**Color** Brown, metal

**Wastewater/non-Wastewater** Non-Wastewater

**Characteristic?**

D001, Ignitable (Flash point < 140F)

D002, Corrosive (pH <2.0 or > 12.5)

D003, Reactive

Water Reactive

- Shock Sensitive
- Oxidizer
- Pyrophoric
- Explosive
- Sulfides
- Cyanides
- Other

**(re: reactivity---See additional documentation at end of document for generator knowledge for D003)**

- D004-D043, Toxic (fail TCLP for specific compounds; if yes are there any UHCs?)  
*D030 (2,4-dinitrotoluene has the potential to be present if TNT or Composition B which contains TNT.)*
- No Hazardous Characteristic/Non Hazardous

**Listed?**

- F (spent solvents)
- K (generated by specific processes)
- P (unused commercial chemicals, toxic)
- U (unused commercial chemicals, acutely toxic)
- N/A. Not listed

**Underlying Hazardous Constituents** (Anything painted will be tested for lead and PCBs if no generator knowledge exists to rule out PCBs or lead.) **Note: This stream typically never involves painted items.**

**Source of information**

Generator Knowledge

**Disposal Method**

Due to safety concerns and Army regulations, being classified similar to a Division 1.4 (or lesser—**not** a 1.1, 1.2, or 1.3) explosive material, it is still classified via Army regulations as Material Determined to have an Explosive Hazard (MDEH). This material, when not evaluated by Safety to be MDAS (material determined as safe), must be thermally decontaminated via permitted Title V covered activity of open burning since no other safe alternatives for disposal exist. HSAAP's current thermal decontamination method is open burning until a new technology is identified and implemented.



D003 Characterization and Documentation**Generator Knowledge Documentation**

The foundation of our determination for **Waste Stream #1** is based on our answers (in red) for the 7 properties of reactivity defined at 40 CFR 261.23(a):

(a) A solid waste exhibits the characteristic of reactivity if a representative sample of the waste has any of the following properties.

- (1) It is normally unstable and readily undergoes violent change without detonating.  
Solid Waste Stream 2 being sent to the cage or pile are stable and does not readily undergo violent change without detonating.
- (2) It reacts violently with water.  
Solid Waste Stream 2 does not react violently with water. They are open to rainfall 365 days a year.
- (3) It forms potentially explosive mixtures with water.  
Solid Waste Stream 2 does not form potentially explosive mixtures with water. They are open to rainfall 365 days a year.
- (4) When mixed with water, it generates toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.  
Solid Waste Stream 2 does not generate toxic gases, vapors, or fumes when mixed with water.
- (5) It is a cyanide or sulfide bearing waste which, when exposed to pH conditions between 2 and 12.5 can generate toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.  
Solid Waste Stream 2 is not cyanide or sulfide bearing wastes.
- (6) It is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement.  
Current screening procedures eliminate the allowance of grossly explosives contaminated materials from being added to the cages or piles. Solid Waste Stream 2 is similarly described as Division 1.4 hazard class—substances and articles which present only a small hazard in the event of ignition or initiation. An external fire shall not cause virtually instantaneous explosion of almost the entire contents of the package [article] (49 CFR 173.50 and 173.53).  
  
In this regard, Solid Waste Stream 2 is not capable of detonation or explosive reaction if it is being subjected to a strong initiating source or heated under confinement.
- (7) It is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.  
Solid Waste Stream 2 is not readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.
- (8) It is a forbidden explosive as defined in 49 CFR 173.54, or is a Division 1.1, 1.2 or 1.3 explosive as defined in 49 CFR 173.50 and 173.53.  
Solid Waste Stream 1 does not meet the definition of forbidden explosive as defined in 49 CFR 173.54 or the class definition of Division 1.1, 1.2, or 1.3 explosives as defined in 49 CFR 173.50 and 173.53.

**EPA Regulatory memos relevant to this characterization are also attached below.**

9443.1988(10)

REACTIVE WASTE - EXPLOSIVITY

MEMORANDUM

DATE: September 8, 1988

SUBJECT: Definition of Reactive Waste - Explosivity

FROM: David Friedman, Chief  
Methods Section, (OS-331)

TO: Sonya Stelmack,  
Assistance Branch, (OS-343)

As you requested, I have reviewed the testing protocols and classification criteria used by the Department of Defense in evaluating the explosivity of material (Army TB 700-2, Navy NAVSEAINST 8020.8, Air Force To 11A-1-47, DLA DLAR 8220.1).

It is my judgement that the only materials that would exhibit the reactivity characteristic (40 CFR 261.23), due to their potential explosivity, are those that fall into Department of Defense Hazard Classes 1.1, 1.2, and 1.3. Materials rated as Class 1.4 would, therefore, not be an explosive within the meaning of the reactivity characteristic.

cc: Suzanne Rudzinski  
Reva Rubenstein  
Robert Dellinger

9443.1995(01)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

February 24, 1995

MEMORANDUM

SUBJECT: Debris and Soil Contaminated with Explosive Residues

FROM: James F. Michael, Chief  
Disposal Technology Section (5303W)  
Office of Solid Waste

TO: Lawrence A. Wapensky, Chief  
Utah/North Dakota Section  
Region VIII

This responds to your January 20, 1995 memorandum requesting assistance in answering questions raised by the State of Utah concerning regulatory issues pertaining to wastes contaminated with explosive residues.

The first question raises concern with the reference at 40 CFR 261.23(a)(8) to certain Department of Transportation (DOT) regulations concerning explosive classifications, that are cited as criteria for determining the characteristic of reactivity. The DOT regulations cited at 261.23(a)(8) have recently been changed and expanded to conform with Department of Defense hazard classes, therefore, presenting difficulties in implementing the Federal regulatory definition of reactivity under RCRA. Until such time that 261.23(a)(8) is updated, those referenced DOT regulations can not be used for determining reactivity. Reactivity determinations should be made using the remaining criteria at 261.23(a)(1) - (7).

The second question asks whether and when liquid, solid, or debris mixed with explosives would be considered reactive. Wastes, whether themselves explosives, or media contaminated with explosives could be considered reactive by meeting the definition of reactivity as described in 261.23(a)(1)-(7). Wastes that do not meet the criteria in 261.23(a)(1)-(7) would not be considered reactive.

The third question regards other Federal criteria for explosivity. If agencies such as the Bureau of Alcohol, Tobacco, and Firearms (BATF) have regulations, or protocols, for determining whether or not a substance is explosive, those regulations or protocols would not be enforceable under EPA regulations, unless they became incorporated into our rules. Specific methods used by agencies such as BATF to determine if a substance is an explosive could however, be applied to determine whether a waste is reactive according to 261.23(a)(6) or (7).

Thank you for the opportunity to address questions related to the reactivity characteristic as it relates to explosives. If you have any questions, please call Jeff Gaines at (703) 308-8655.

cc: Frank McAlister, AB, PSPD, OSW  
Jeff Gaines, AB, PSPD, OSW

**Waste Stream Name**Solid Waste Stream #3 - Metal from the Limited Area**Waste Stream Description**Can include any metal used in an explosives production building. This includes process piping, conduit, motors, pumps, wire, vessels, etc.**Process/Building Generating Waste**Explosives manufacturing**Description of Process Generating Waste**When explosives production buildings are modernized or demolished, metal waste is produced. Metal waste is also produced when new piping, wiring, parts or etc. is replaced or repaired in an explosives building.**Composition:**Steel, iron, brass, copper, etc. Since the metal was in service in an explosives production building, there is a high likelihood that the metal has been exposed to explosives.**Physical State**

- Solid  
 Liquid  
 Semi-solid  
 Dust/powder  
 Debris  
 Sludge  
 Gas/Aerosol

**Odor**

- None  
 Mild  
 Strong

Describe \_\_\_\_\_

**Flashpoint** N/A**pH** N/A**Btu Range** N/A**Specific Gravity** N/A**Layers?** N/A**Color** Various metals**Wastewater/non-Wastewater** Non-Wastewater**Characteristic?** D001, Ignitable (Flash point < 140F) D002, Corrosive (pH <2.0 or > 12.5) D003, Reactive

Water Reactive

Shock Sensitive  
Oxidizer  
Pyrophoric  
Explosive  
Sulfides  
Cyanides  
Other

**(re: reactivity---See additional documentation at end of document for generator knowledge for D003)**

\_\_\_\_\_ D004-D043, Toxic (fail TCLP for specific compounds; if yes are there any UHCs?)  
\_\_\_\_\_ D030 (2,4-dinitrotoluene has the potential to be present if TNT or Composition B which contains TNT.)  
 \_\_\_\_\_ No Hazardous Characteristic/Non Hazardous

**Listed?**

\_\_\_\_\_ F (spent solvents)  
\_\_\_\_\_ K (generated by specific processes)  
\_\_\_\_\_ P (unused commercial chemicals, toxic)  
\_\_\_\_\_ U (unused commercial chemicals, acutely toxic)  
 \_\_\_\_\_ N/A. Not listed

**Underlying Hazardous Constituents**

(Anything painted will be tested for lead and PCBs if no generator knowledge exists to rule out PCBs or lead.) Also, any PCB suspect materials such as certain types of motors or caulking, etc. will be tested to rule out PCBs or any other suspected UHC.

**Source of information**

Generator Knowledge

**Disposal Method**

Due to safety concerns and Army regulations, being classified similar to a Division 1.4 (or lesser—**not** a 1.1, 1.2, or 1.3) explosive material, it is still classified via Army regulations as Material Determined to have an Explosive Hazard (MDEH). This material, when not evaluated by Safety to be MDAS (material determined as safe), must be thermally decontaminated via permitted Title V covered activity of open burning since no other safe alternatives for disposal exist. HSAAP's current thermal decontamination method is open burning until a new technology is identified and implemented.

D003 Characterization and Documentation**Generator Knowledge Documentation**

The foundation of our determination for **Waste Stream #3** is based on our answers (in red) for the 7 properties of reactivity defined at 40 CFR 261.23(a):

(a) A solid waste exhibits the characteristic of reactivity if a representative sample of the waste has any of the following properties.

- (1) It is normally unstable and readily undergoes violent change without detonating.  
Solid Waste Stream 3 being sent to the cage or pile are stable and does not readily undergo violent change without detonating.
- (2) It reacts violently with water.  
Solid Waste Stream 3 does not react violently with water. They are open to rainfall 365 days a year.
- (3) It forms potentially explosive mixtures with water.  
Solid Waste Stream 3 does not form potentially explosive mixtures with water. They are open to rainfall 365 days a year.
- (4) When mixed with water, it generates toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.  
Solid Waste Stream 3 does not generate toxic gases, vapors, or fumes when mixed with water.
- (5) It is a cyanide or sulfide bearing waste which, when exposed to pH conditions between 2 and 12.5 can generate toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.  
Solid Waste Stream 3 is not cyanide or sulfide bearing wastes.
- (6) It is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement.  
Current screening procedures eliminate the allowance of grossly explosives contaminated materials from being added to the cages or piles. Solid Waste Stream 3 is similarly described as Division 1.4 hazard class—substances and articles which present only a small hazard in the event of ignition or initiation. An external fire shall not cause virtually instantaneous explosion of almost the entire contents of the package [article] (49 CFR 173.50 and 173.53).  
  
In this regard, Solid Waste Stream 3 is not capable of detonation or explosive reaction if it is being subjected to a strong initiating source or heated under confinement.
- (7) It is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.  
Solid Waste Stream 3 is not readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.
- (8) It is a forbidden explosive as defined in 49 CFR 173.54, or is a Division 1.1, 1.2 or 1.3 explosive as defined in 49 CFR 173.50 and 173.53.  
Solid Waste Stream 1 does not meet the definition of forbidden explosive as defined in 49 CFR 173.54 or the class definition of Division 1.1, 1.2, or 1.3 explosives as defined in 49 CFR 173.50 and 173.53.

**EPA Regulatory memos relevant to this characterization are also attached below.**

9443.1988(10)

REACTIVE WASTE - EXPLOSIVITY

MEMORANDUM

DATE: September 8, 1988

SUBJECT: Definition of Reactive Waste - Explosivity

FROM: David Friedman, Chief  
Methods Section, (OS-331)

TO: Sonya Stelmack,  
Assistance Branch, (OS-343)

As you requested, I have reviewed the testing protocols and classification criteria used by the Department of Defense in evaluating the explosivity of material (Army TB 700-2, Navy NAVSEAINST 8020.8, Air Force To 11A-1-47, DLA DLAR 8220.1).

It is my judgement that the only materials that would exhibit the reactivity characteristic (40 CFR 261.23), due to their potential explosivity, are those that fall into Department of Defense Hazard Classes 1.1, 1.2, and 1.3. Materials rated as Class 1.4 would, therefore, not be an explosive within the meaning of the reactivity characteristic.

cc: Suzanne Rudzinski  
Reva Rubenstein  
Robert Dellinger



9443.1995(01)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

February 24, 1995

MEMORANDUM

SUBJECT: Debris and Soil Contaminated with Explosive Residues

FROM: James F. Michael, Chief  
Disposal Technology Section (5303W)  
Office of Solid Waste

TO: Lawrence A. Wapensky, Chief  
Utah/North Dakota Section  
Region VIII

This responds to your January 20, 1995 memorandum requesting assistance in answering questions raised by the State of Utah concerning regulatory issues pertaining to wastes contaminated with explosive residues.

The first question raises concern with the reference at 40 CFR 261.23(a)(8) to certain Department of Transportation (DOT) regulations concerning explosive classifications, that are cited as criteria for determining the characteristic of reactivity. The DOT regulations cited at 261.23(a)(8) have recently been changed and expanded to conform with Department of Defense hazard classes, therefore, presenting difficulties in implementing the Federal regulatory definition of reactivity under RCRA. Until such time that 261.23(a)(8) is updated, those referenced DOT regulations can not be used for determining reactivity. Reactivity determinations should be made using the remaining criteria at 261.23(a)(1) - (7).

The second question asks whether and when liquid, solid, or debris mixed with explosives would be considered reactive. Wastes, whether themselves explosives, or media contaminated with explosives could be considered reactive by meeting the definition of reactivity as described in 261.23(a)(1)-(7). Wastes that do not meet the criteria in 261.23(a)(1)-(7) would not be considered reactive.

The third question regards other Federal criteria for explosivity. If agencies such as the Bureau of Alcohol, Tobacco, and Firearms (BATF) have regulations, or protocols, for determining whether or not a substance is explosive, those regulations or protocols would not be enforceable under EPA regulations, unless they became incorporated into our rules. Specific methods used by agencies such as BATF to determine if a substance is an explosive could however, be applied to determine whether a waste is reactive according to 261.23(a)(6) or (7).

Thank you for the opportunity to address questions related to the reactivity characteristic as it relates to explosives. If you have any questions, please call Jeff Gaines at (703) 308-8655.

cc: Frank McAlister, AB, PSPD, OSW  
Jeff Gaines, AB, PSPD, OSW

**Waste Stream Name**Solid Waste Stream #4 - Personal Protective Equipment (PPE) from Limited Area**Waste Stream Description**Respirators, gloves, Tyvek suits, hats, safety glasses, boots, coveralls**Process/Building Generating Waste**Explosives manufacturing**Description of Process Generating Waste**Employees that work in explosives production buildings are required to wear PPE. As this PPE gets worn out, or is required to be changed out due to manufacturer's recommendations it is disposed of onsite.**Composition:**Plastic, metal, Tyvek, leather, rubber, cotton. Due to direct contact with explosives material, there is a high likelihood that the PPE used in the explosives production buildings has been exposed to explosives.**Physical State**

Solid  
 Liquid  
 Semi-solid  
 Dust/powder  
 Debris  
 Sludge  
 Gas/Aerosol

**Odor**

None  
 Mild  
 Strong

Describe \_\_\_\_\_

**Flashpoint** N/A**pH** N/A**Btu Range** N/A**Specific Gravity** N/A**Layers?** N/A**Color** Various**Wastewater/non-Wastewater** Non-Wastewater**Characteristic?** D001, Ignitable (Flash point < 140F) D002, Corrosive (pH < 2.0 or > 12.5) D003, Reactive

Water Reactive

Shock Sensitive

Oxidizer

Pyrophoric

Explosive  
Sulfides  
Cyanides  
Other

**(re: reactivity---See additional documentation at end of document for generator knowledge for D003)**

\_\_\_\_\_ D004-D043, Toxic (fail TCLP for specific compounds; if yes are there any UHCs?)  
\_\_\_\_\_ D030 (2,4-dinitrotoluene has the potential to be present if TNT or Composition B which contains TNT.)  
\_\_\_\_\_  No Hazardous Characteristic/Non Hazardous

**Listed?**

\_\_\_\_\_ F (spent solvents)  
\_\_\_\_\_ K (generated by specific processes)  
\_\_\_\_\_ P (unused commercial chemicals, toxic)  
\_\_\_\_\_ U (unused commercial chemicals, acutely toxic)  
\_\_\_\_\_  N/A. Not listed

**Underlying Hazardous Constituents**

(Anything painted will be tested for lead and PCBs if no generator knowledge exists to rule out PCBs or lead.) However, painted and/or lead/PCB containing materials is typically never a suspect UHC for this stream. If any other UHC is suspected, it will be tested to rule out suspect UHC.

**Source of information**

Generator Knowledge

**Disposal Method**

Due to safety concerns and Army regulations, being classified similar to a Division 1.4 (or lesser—not a 1.1, 1.2, or 1.3) explosive material, it is still classified via Army regulations as Material Determined to have an Explosive Hazard (MDEH). This material, when not evaluated by Safety to be MDAS (material determined as safe), must be thermally decontaminated via permitted Title V covered activity of open burning since no other safe alternatives for disposal exist. HSAAP’s current thermal decontamination method is open burning until a new technology is identified and implemented.

D003 Characterization and Documentation**Generator Knowledge Documentation**

The foundation of our determination for **Waste Stream #4** is based on our answers (in red) for the 7 properties of reactivity defined at 40 CFR 261.23(a):

(a) A solid waste exhibits the characteristic of reactivity if a representative sample of the waste has any of the following properties.

- (1) It is normally unstable and readily undergoes violent change without detonating.  
Solid Waste Stream 4 being sent to the cage or pile are stable and does not readily undergo violent change without detonating.
- (2) It reacts violently with water.  
Solid Waste Stream 4 does not react violently with water. They are open to rainfall 365 days a year.
- (3) It forms potentially explosive mixtures with water.  
Solid Waste Stream 4 does not form potentially explosive mixtures with water. They are open to rainfall 365 days a year.
- (4) When mixed with water, it generates toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.  
Solid Waste Stream 4 does not generate toxic gases, vapors, or fumes when mixed with water.
- (5) It is a cyanide or sulfide bearing waste which, when exposed to pH conditions between 2 and 12.5 can generate toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.  
Solid Waste Stream 4 is not cyanide or sulfide bearing wastes.
- (6) It is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement.  
Current screening procedures eliminate the allowance of grossly explosives contaminated materials from being added to the cages or piles. Solid Waste Stream 4 is similarly described as Division 1.4 hazard class—substances and articles which present only a small hazard in the event of ignition or initiation. An external fire shall not cause virtually instantaneous explosion of almost the entire contents of the package [article] (49 CFR 173.50 and 173.53).  
  
In this regard, Solid Waste Stream 4 is not capable of detonation or explosive reaction if it is being subjected to a strong initiating source or heated under confinement.
- (7) It is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.  
Solid Waste Stream 4 is not readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.
- (8) It is a forbidden explosive as defined in 49 CFR 173.54, or is a Division 1.1, 1.2 or 1.3 explosive as defined in 49 CFR 173.50 and 173.53.  
Solid Waste Stream 1 does not meet the definition of forbidden explosive as defined in 49 CFR 173.54 or the class definition of Division 1.1, 1.2, or 1.3 explosives as defined in 49 CFR 173.50 and 173.53.

**EPA Regulatory memos relevant to this characterization are also attached below.**

9443.1988(10)

REACTIVE WASTE - EXPLOSIVITY

MEMORANDUM

DATE: September 8, 1988

SUBJECT: Definition of Reactive Waste - Explosivity

FROM: David Friedman, Chief  
Methods Section, (OS-331)

TO: Sonya Stelmack,  
Assistance Branch, (OS-343)

As you requested, I have reviewed the testing protocols and classification criteria used by the Department of Defense in evaluating the explosivity of material (Army TB 700-2, Navy NAVSEAINST 8020.8, Air Force To 11A-1-47, DLA DLAR 8220.1).

It is my judgement that the only materials that would exhibit the reactivity characteristic (40 CFR 261.23), due to their potential explosivity, are those that fall into Department of Defense Hazard Classes 1.1, 1.2, and 1.3. Materials rated as Class 1.4 would, therefore, not be an explosive within the meaning of the reactivity characteristic.

cc: Suzanne Rudzinski  
Reva Rubenstein  
Robert Dellinger

RO 13223

9443.1995(01)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

February 24, 1995

MEMORANDUM

SUBJECT: Debris and Soil Contaminated with Explosive Residues

FROM: James F. Michael, Chief  
Disposal Technology Section (5303W)  
Office of Solid Waste

TO: Lawrence A. Wapensky, Chief  
Utah/North Dakota Section  
Region VIII

This responds to your January 20, 1995 memorandum requesting assistance in answering questions raised by the State of Utah concerning regulatory issues pertaining to wastes contaminated with explosive residues.

The first question raises concern with the reference at 40 CFR 261.23(a)(8) to certain Department of Transportation (DOT) regulations concerning explosive classifications, that are cited as criteria for determining the characteristic of reactivity. The DOT regulations cited at 261.23(a)(8) have recently been changed and expanded to conform with Department of Defense hazard classes, therefore, presenting difficulties in implementing the Federal regulatory definition of reactivity under RCRA. Until such time that 261.23(a)(8) is updated, those referenced DOT regulations can not be used for determining reactivity. Reactivity determinations should be made using the remaining criteria at 261.23(a)(1) - (7).

The second question asks whether and when liquid, solid, or debris mixed with explosives would be considered reactive. Wastes, whether themselves explosives, or media contaminated with explosives could be considered reactive by meeting the definition of reactivity as described in 261.23(a)(1)-(7). Wastes that do not meet the criteria in 261.23(a)(1)-(7) would not be considered reactive.

The third question regards other Federal criteria for explosivity. If agencies such as the Bureau of Alcohol, Tobacco, and Firearms (BATF) have regulations, or protocols, for determining whether or not a substance is explosive, those regulations or protocols would not be enforceable under EPA regulations, unless they became incorporated into our rules. Specific methods used by agencies such as BATF to determine if a substance is an explosive could however, be applied to determine whether a waste is reactive according to 261.23(a)(6) or (7).

Thank you for the opportunity to address questions related to the reactivity characteristic as it relates to explosives. If you have any questions, please call Jeff Gaines at (703) 308-8655.

cc: Frank McAlister, AB, PSPD, OSW  
Jeff Gaines, AB, PSPD, OSW



**Waste Stream Name**

Solid Waste Stream #5 - Wood \_\_\_\_\_

**Waste Stream Description**Pallets, building material, non-chemical treated wood**Process/Building Generating Waste**Materials handling, demolition, explosives production**Description of Process Generating Waste**

Wood is generated when product and raw materials are delivered into explosives buildings on pallets and come into contact with explosives. Wooden buildings materials are generated when production buildings are demolished or modernized; the existing wood in these buildings is sometimes removed or replaced. Due to direct contact with explosives material, there is a high likelihood that wood used in the explosives production buildings has been exposed to explosives. In order to maintain the temperature required to meet the Army regulation for thermal decontamination, clean wood is sometimes added to the open burn pile.

**Composition:**Wood**Physical State**

- Solid  
 Liquid  
 Semi-solid  
 Dust/powder  
 Debris  
 Sludge  
 Gas/Aerosol

**Odor**

- None  
 Mild  
 Strong

Describe \_\_\_\_\_

**Flashpoint** N/A**pH** N/A**Btu Range** N/A**Specific Gravity** N/A**Layers?** N/A**Color** Various**Wastewater/non-Wastewater** Non-Wastewater**Characteristic?** D001, Ignitable (Flash point < 140F) D002, Corrosive (pH < 2.0 or > 12.5) D003, Reactive

Water Reactive  
Shock Sensitive  
Oxidizer  
Pyrophoric  
Explosive  
Sulfides  
Cyanides  
Other

**(re: reactivity---See additional documentation at end of document for generator knowledge for D003)**

\_\_\_\_\_ D004-D043, Toxic (fail TCLP for specific compounds; if yes are there any UHCs?)  
*D030 (2,4-dinitrotoluene has the potential to be present if TNT or Composition B which contains TNT.)*  
 No Hazardous Characteristic/Non Hazardous

**Listed?**

\_\_\_\_\_ F (spent solvents)  
\_\_\_\_\_ K (generated by specific processes)  
\_\_\_\_\_ P (unused commercial chemicals, toxic)  
\_\_\_\_\_ U (unused commercial chemicals, acutely toxic)  
 N/A. Not listed

**Underlying Hazardous Constituents** (Anything painted will be tested for lead and PCBs if no generator knowledge exists to rule out PCBs or lead.) Any other suspect lead/PCB/or other UHC containing materials will be tested to rule out any suspect UHC.

**Source of information**

Generator Knowledge

**Disposal Method**

Due to safety concerns and Army regulations, being classified similar to a Division 1.4 (or lesser—**not** a 1.1, 1.2, or 1.3) explosive material, it is still classified via Army regulations as Material Determined to have an Explosive Hazard (MDEH). This material, when not evaluated by Safety to be MDAS (material determined as safe), must be thermally decontaminated via permitted Title V covered activity of open burning since no other safe alternatives for disposal exist. HSAAP's current thermal decontamination method is open burning until a new technology is identified and implemented.

D003 Characterization and Documentation**Generator Knowledge Documentation**

The foundation of our determination for **Waste Stream #5** is based on our answers (in red) for the 7 properties of reactivity defined at 40 CFR 261.23(a):

(a) A solid waste exhibits the characteristic of reactivity if a representative sample of the waste has any of the following properties.

- (1) It is normally unstable and readily undergoes violent change without detonating.  
Solid Waste Stream 5 being sent to the cage or pile are stable and does not readily undergo violent change without detonating.
- (2) It reacts violently with water.  
Solid Waste Stream 5 does not react violently with water. They are open to rainfall 365 days a year.
- (3) It forms potentially explosive mixtures with water.  
Solid Waste Stream 5 does not form potentially explosive mixtures with water. They are open to rainfall 365 days a year.
- (4) When mixed with water, it generates toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.  
Solid Waste Stream 5 does not generate toxic gases, vapors, or fumes when mixed with water.
- (5) It is a cyanide or sulfide bearing waste which, when exposed to pH conditions between 2 and 12.5 can generate toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.  
Solid Waste Stream 5 is not cyanide or sulfide bearing wastes.
- (6) It is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement.  
Current screening procedures eliminate the allowance of grossly explosives contaminated materials from being added to the cages or piles. Solid Waste Stream 4 is similarly described as Division 1.4 hazard class—substances and articles which present only a small hazard in the event of ignition or initiation. An external fire shall not cause virtually instantaneous explosion of almost the entire contents of the package [article] (49 CFR 173.50 and 173.53).  
  
In this regard, Solid Waste Stream 5 is not capable of detonation or explosive reaction if it is being subjected to a strong initiating source or heated under confinement.
- (7) It is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.  
Solid Waste Stream 5 is not readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.
- (8) It is a forbidden explosive as defined in 49 CFR 173.54, or is a Division 1.1, 1.2 or 1.3 explosive as defined in 49 CFR 173.50 and 173.53.  
Solid Waste Stream 1 does not meet the definition of forbidden explosive as defined in 49 CFR 173.54 or the class definition of Division 1.1, 1.2, or 1.3 explosives as defined in 49 CFR 173.50 and 173.53.

**EPA Regulatory memos relevant to this characterization are also attached below.**

9443.1988(10)

REACTIVE WASTE - EXPLOSIVITY

MEMORANDUM

DATE: September 8, 1988

SUBJECT: Definition of Reactive Waste - Explosivity

FROM: David Friedman, Chief  
Methods Section, (OS-331)

TO: Sonya Stelmack,  
Assistance Branch, (OS-343)

As you requested, I have reviewed the testing protocols and classification criteria used by the Department of Defense in evaluating the explosivity of material (Army TB 700-2, Navy NAVSEAINST 8020.8, Air Force To 11A-1-47, DLA DLAR 8220.1).

It is my judgement that the only materials that would exhibit the reactivity characteristic (40 CFR 261.23), due to their potential explosivity, are those that fall into Department of Defense Hazard Classes 1.1, 1.2, and 1.3. Materials rated as Class 1.4 would, therefore, not be an explosive within the meaning of the reactivity characteristic.

cc: Suzanne Rudzinski  
Reva Rubenstein  
Robert Dellinger

9443.1995(01)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

February 24, 1995

MEMORANDUM

SUBJECT: Debris and Soil Contaminated with Explosive Residues

FROM: James F. Michael, Chief  
Disposal Technology Section (5303W)  
Office of Solid Waste

TO: Lawrence A. Wapensky, Chief  
Utah/North Dakota Section  
Region VIII

This responds to your January 20, 1995 memorandum requesting assistance in answering questions raised by the State of Utah concerning regulatory issues pertaining to wastes contaminated with explosive residues.

The first question raises concern with the reference at 40 CFR 261.23(a)(8) to certain Department of Transportation (DOT) regulations concerning explosive classifications, that are cited as criteria for determining the characteristic of reactivity. The DOT regulations cited at 261.23(a)(8) have recently been changed and expanded to conform with Department of Defense hazard classes, therefore, presenting difficulties in implementing the Federal regulatory definition of reactivity under RCRA. Until such time that 261.23(a)(8) is updated, those referenced DOT regulations can not be used for determining reactivity. Reactivity determinations should be made using the remaining criteria at 261.23(a)(1) - (7).

The second question asks whether and when liquid, solid, or debris mixed with explosives would be considered reactive. Wastes, whether themselves explosives, or media contaminated with explosives could be considered reactive by meeting the definition of reactivity as described in 261.23(a)(1)-(7). Wastes that do not meet the criteria in 261.23(a)(1)-(7) would not be considered reactive.

The third question regards other Federal criteria for explosivity. If agencies such as the Bureau of Alcohol, Tobacco, and Firearms (BATF) have regulations, or protocols, for determining whether or not a substance is explosive, those regulations or protocols would not be enforceable under EPA regulations, unless they became incorporated into our rules. Specific methods used by agencies such as BATF to determine if a substance is an explosive could however, be applied to determine whether a waste is reactive according to 261.23(a)(6) or (7).

Thank you for the opportunity to address questions related to the reactivity characteristic as it relates to explosives. If you have any questions, please call Jeff Gaines at (703) 308-8655.

cc: Frank McAlister, AB, PSPD, OSW  
Jeff Gaines, AB, PSPD, OSW

**Waste Stream Name**Solid Waste Stream #6 - Soil**Waste Stream Description**Soil from the limited area**Process/Building Generating Waste**Accidental (explosives) discharges, demolition activities, excavation activities and etc.**Description of Process Generating Waste**Soil that must be removed and is contaminated with explosives, from historic activities or accidental discharges must be disposed**Composition:**Soil, rock, plant matter**Physical State**

Solid  
 Liquid  
 Semi-solid  
 Dust/powder  
 Debris  
 Sludge  
 Gas/Aerosol

**Odor**

None  
 Mild  
 Strong

Describe \_\_\_\_\_

Flashpoint N/ApH N/ABtu Range N/ASpecific Gravity N/ALayers? N/AColor VariousWastewater/non-Wastewater Non-Wastewater**Characteristic?** D001, Ignitable (Flash point < 140F) D002, Corrosive (pH < 2.0 or > 12.5) D003, Reactive

Water Reactive

Shock Sensitive

Oxidizer

Pyrophoric

Explosive

Sulfides  
Cyanides  
Other

**(re: reactivity---See additional documentation at end of document for generator knowledge for D003)**

\_\_\_\_\_ D004-D043, Toxic (fail TCLP for specific compounds; if yes are there any UHCs?)  
*D030 (2,4-dinitrotoluene has the potential to be present if TNT or Composition B which contains TNT.)*

No Hazardous Characteristic/Non Hazardous

**Listed?**

\_\_\_\_\_ F (spent solvents)  
\_\_\_\_\_ K (generated by specific processes)  
\_\_\_\_\_ P (unused commercial chemicals, toxic)  
\_\_\_\_\_ U (unused commercial chemicals, acutely toxic)  
 N/A. Not listed

**Underlying Hazardous Constituents**

Any soil suspect for any UHCs will be tested to rule out any suspect for any other hazardous constituents.

**Source of information**

Generator Knowledge

**Disposal Method**

Due to safety concerns and Army regulations, being classified similar to a Division 1.4 (or lesser—**not** a 1.1, 1.2, or 1.3) explosive material, it is still classified via Army regulations as Material Determined to have an Explosive Hazard (MDEH). This material, when not evaluated by Safety to be MDAS (material determined as safe), must be thermally decontaminated via permitted Title V covered activity of open burning since no other safe alternatives for disposal exist. HSAAP's current thermal decontamination method is open burning until a new technology is identified and implemented.



D003 Characterization and Documentation**Generator Knowledge Documentation**

The foundation of our determination for **Waste Stream #6** is based on our answers (in red) for the 7 properties of reactivity defined at 40 CFR 261.23(a):

(a) A solid waste exhibits the characteristic of reactivity if a representative sample of the waste has any of the following properties.

- (1) It is normally unstable and readily undergoes violent change without detonating.  
Solid Waste Stream 6 being sent to the cage or pile are stable and does not readily undergo violent change without detonating.
- (2) It reacts violently with water.  
Solid Waste Stream 6 does not react violently with water. They are open to rainfall 365 days a year.
- (3) It forms potentially explosive mixtures with water.  
Solid Waste Stream 6 does not form potentially explosive mixtures with water. They are open to rainfall 365 days a year.
- (4) When mixed with water, it generates toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.  
Solid Waste Stream 6 does not generate toxic gases, vapors, or fumes when mixed with water.
- (5) It is a cyanide or sulfide bearing waste which, when exposed to pH conditions between 2 and 12.5 can generate toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.  
Solid Waste Stream 6 is not cyanide or sulfide bearing wastes.
- (6) It is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement.  
Current screening procedures eliminate the allowance of grossly explosives contaminated materials from being added to the cages or piles. Solid Waste Stream 6 is similarly described as Division 1.4 hazard class—substances and articles which present only a small hazard in the event of ignition or initiation. An external fire shall not cause virtually instantaneous explosion of almost the entire contents of the package [article] (49 CFR 173.50 and 173.53).  
  
In this regard, Solid Waste Stream 6 is not capable of detonation or explosive reaction if it is being subjected to a strong initiating source or heated under confinement.
- (7) It is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.  
Solid Waste Stream 6 is not readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.
- (8) It is a forbidden explosive as defined in 49 CFR 173.54, or is a Division 1.1, 1.2 or 1.3 explosive as defined in 49 CFR 173.50 and 173.53.  
Solid Waste Stream 1 does not meet the definition of forbidden explosive as defined in 49 CFR 173.54 or the class definition of Division 1.1, 1.2, or 1.3 explosives as defined in 49 CFR 173.50 and 173.53.

**EPA Regulatory memos relevant to this characterization are also attached below.**

9443.1988(10)

REACTIVE WASTE - EXPLOSIVITY

MEMORANDUM

DATE: September 8, 1988

SUBJECT: Definition of Reactive Waste - Explosivity

FROM: David Friedman, Chief  
Methods Section, (OS-331)

TO: Sonya Stelmack,  
Assistance Branch, (OS-343)

As you requested, I have reviewed the testing protocols and classification criteria used by the Department of Defense in evaluating the explosivity of material (Army TB 700-2, Navy NAVSEAINST 8020.8, Air Force To 11A-1-47, DLA DLAR 8220.1).

It is my judgement that the only materials that would exhibit the reactivity characteristic (40 CFR 261.23), due to their potential explosivity, are those that fall into Department of Defense Hazard Classes 1.1, 1.2, and 1.3. Materials rated as Class 1.4 would, therefore, not be an explosive within the meaning of the reactivity characteristic.

cc: Suzanne Rudzinski  
Reva Rubenstein  
Robert Dellinger

9443.1995(01)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

February 24, 1995

MEMORANDUM

SUBJECT: Debris and Soil Contaminated with Explosive Residues

FROM: James F. Michael, Chief  
Disposal Technology Section (5303W)  
Office of Solid Waste

TO: Lawrence A. Wapensky, Chief  
Utah/North Dakota Section  
Region VIII

This responds to your January 20, 1995 memorandum requesting assistance in answering questions raised by the State of Utah concerning regulatory issues pertaining to wastes contaminated with explosive residues.

The first question raises concern with the reference at 40 CFR 261.23(a)(8) to certain Department of Transportation (DOT) regulations concerning explosive classifications, that are cited as criteria for determining the characteristic of reactivity. The DOT regulations cited at 261.23(a)(8) have recently been changed and expanded to conform with Department of Defense hazard classes, therefore, presenting difficulties in implementing the Federal regulatory definition of reactivity under RCRA. Until such time that 261.23(a)(8) is updated, those referenced DOT regulations can not be used for determining reactivity. Reactivity determinations should be made using the remaining criteria at 261.23(a)(1) - (7).

The second question asks whether and when liquid, solid, or debris mixed with explosives would be considered reactive. Wastes, whether themselves explosives, or media contaminated with explosives could be considered reactive by meeting the definition of reactivity as described in 261.23(a)(1)-(7). Wastes that do not meet the criteria in 261.23(a)(1)-(7) would not be considered reactive.

The third question regards other Federal criteria for explosivity. If agencies such as the Bureau of Alcohol, Tobacco, and Firearms (BATF) have regulations, or protocols, for determining whether or not a substance is explosive, those regulations or protocols would not be enforceable under EPA regulations, unless they became incorporated into our rules. Specific methods used by agencies such as BATF to determine if a substance is an explosive could however, be applied to determine whether a waste is reactive according to 261.23(a)(6) or (7).

Thank you for the opportunity to address questions related to the reactivity characteristic as it relates to explosives. If you have any questions, please call Jeff Gaines at (703) 308-8655.

cc: Frank McAlister, AB, PSPD, OSW  
Jeff Gaines, AB, PSPD, OSW

**Waste Stream Name**Plastic**Waste Stream Description**Drum liners, nutsche cover liners, etc.**Process/Building Generating Waste**Explosives manufacturing**Description of Process Generating Waste**Explosives production receives many types of raw materials, including explosives, in fiber drums and cardboard boxes that have plastic liners.**Composition:**The drum liners and nutsche liners are made from plastic materials. Since drum liners and nutsche liners were used in explosives production and might have directly contacted explosives, the plastic drum liners and nutsche liners have the potential to contain residual explosives.**Physical State**

Solid  
 Liquid  
 Semi-solid  
 Dust/powder  
 Debris  
 Sludge  
 Gas/Aerosol

**Odor**

None  
 Mild  
 Strong

Describe \_\_\_\_\_

**Flashpoint** N/A**pH** N/A**Btu Range** N/A**Specific Gravity** N/A**Layers?** N/A**Color** Clear, white**Wastewater/non-Wastewater** Non-Wastewater**Characteristic?** D001, Ignitable (Flash point < 140F) D002, Corrosive (pH <2.0 or > 12.5) D003, Reactive

Water Reactive

Shock Sensitive

Oxidizer

Pyrophoric  
Explosive  
Sulfides  
Cyanides  
Other

**(re: reactivity---See additional documentation at end of document for generator knowledge for D003)**

\_\_\_\_\_ D004-D043, Toxic (fail TCLP for specific compounds; if yes are there any UHCs?)  
*D030 (2,4-dinitrotoluene has the potential to be present if TNT or Composition B which contains TNT.)*

\_\_\_\_\_ No Hazardous Characteristic/Non Hazardous

**Listed?**

\_\_\_\_\_ F (spent solvents)  
\_\_\_\_\_ K (generated by specific processes)  
\_\_\_\_\_ P (unused commercial chemicals, toxic)  
\_\_\_\_\_ U (unused commercial chemicals, acutely toxic)  
 \_\_\_\_\_ N/A. Not listed

**Underlying Hazardous Constituents**

(Anything painted will be tested for lead and PCBs if no generator knowledge exists to rule out PCBs or lead.) Any other suspect lead/PCB/or other UHC containing materials will be tested to rule out any suspect UHC. This stream typically never has painted items or items suspect for any other UHC.

**Source of information**

Generator Knowledge

**Disposal Method**

Due to safety concerns and Army regulations, being classified similar to a Division 1.4 (or lesser—not a 1.1, 1.2, or 1.3) explosive material, it is still classified via Army regulations as Material Determined to have an Explosive Hazard (MDEH). This material, when not evaluated by Safety to be MDAS (material determined as safe), must be thermally decontaminated via permitted Title V covered activity of open burning since no other safe alternatives for disposal exist. HSAAP's current thermal decontamination method is open burning until a new technology is identified and implemented.

D003 Characterization and Documentation**Generator Knowledge Documentation**

The foundation of our determination for **Waste Stream #7** is based on our answers (in red) for the 7 properties of reactivity defined at 40 CFR 261.23(a):

(a) A solid waste exhibits the characteristic of reactivity if a representative sample of the waste has any of the following properties.

- (1) It is normally unstable and readily undergoes violent change without detonating.  
Solid Waste Stream 7 being sent to the cage or pile are stable and does not readily undergo violent change without detonating.
- (2) It reacts violently with water.  
Solid Waste Stream 7 does not react violently with water. They are open to rainfall 365 days a year.
- (3) It forms potentially explosive mixtures with water.  
Solid Waste Stream 7 does not form potentially explosive mixtures with water. They are open to rainfall 365 days a year.
- (4) When mixed with water, it generates toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.  
Solid Waste Stream 7 does not generate toxic gases, vapors, or fumes when mixed with water.
- (5) It is a cyanide or sulfide bearing waste which, when exposed to pH conditions between 2 and 12.5 can generate toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.  
Solid Waste Stream 7 is not cyanide or sulfide bearing wastes.
- (6) It is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement.  
Current screening procedures eliminate the allowance of grossly explosives contaminated materials from being added to the cages or piles. Solid Waste Stream 7 is similarly described as Division 1.4 hazard class—substances and articles which present only a small hazard in the event of ignition or initiation. An external fire shall not cause virtually instantaneous explosion of almost the entire contents of the package [article] (49 CFR 173.50 and 173.53).  
  
In this regard, Solid Waste Stream 7 is not capable of detonation or explosive reaction if it is being subjected to a strong initiating source or heated under confinement.
- (7) It is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.  
Solid Waste Stream 7 is not readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.
- (8) It is a forbidden explosive as defined in 49 CFR 173.54, or is a Division 1.1, 1.2 or 1.3 explosive as defined in 49 CFR 173.50 and 173.53.  
Solid Waste Stream 1 does not meet the definition of forbidden explosive as defined in 49 CFR 173.54 or the class definition of Division 1.1, 1.2, or 1.3 explosives as defined in 49 CFR 173.50 and 173.53.

**EPA Regulatory memos relevant to this characterization are also attached below.**

9443.1988(10)

REACTIVE WASTE - EXPLOSIVITY

MEMORANDUM

DATE: September 8, 1988

SUBJECT: Definition of Reactive Waste - Explosivity

FROM: David Friedman, Chief  
Methods Section, (OS-331)

TO: Sonya Stelmack,  
Assistance Branch, (OS-343)

As you requested, I have reviewed the testing protocols and classification criteria used by the Department of Defense in evaluating the explosivity of material (Army TB 700-2, Navy NAVSEAINST 8020.8, Air Force To 11A-1-47, DLA DLAR 8220.1).

It is my judgement that the only materials that would exhibit the reactivity characteristic (40 CFR 261.23), due to their potential explosivity, are those that fall into Department of Defense Hazard Classes 1.1, 1.2, and 1.3. Materials rated as Class 1.4 would, therefore, not be an explosive within the meaning of the reactivity characteristic.

cc: Suzanne Rudzinski  
Reva Rubenstein  
Robert Dellinger



9443.1995(01)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

February 24, 1995

MEMORANDUM

SUBJECT: Debris and Soil Contaminated with Explosive Residues

FROM: James F. Michael, Chief  
Disposal Technology Section (5303W)  
Office of Solid Waste

TO: Lawrence A. Wapensky, Chief  
Utah/North Dakota Section  
Region VIII

This responds to your January 20, 1995 memorandum requesting assistance in answering questions raised by the State of Utah concerning regulatory issues pertaining to wastes contaminated with explosive residues.

The first question raises concern with the reference at 40 CFR 261.23(a)(8) to certain Department of Transportation (DOT) regulations concerning explosive classifications, that are cited as criteria for determining the characteristic of reactivity. The DOT regulations cited at 261.23(a)(8) have recently been changed and expanded to conform with Department of Defense hazard classes, therefore, presenting difficulties in implementing the Federal regulatory definition of reactivity under RCRA. Until such time that 261.23(a)(8) is updated, those referenced DOT regulations can not be used for determining reactivity. Reactivity determinations should be made using the remaining criteria at 261.23(a)(1) - (7).

The second question asks whether and when liquid, solid, or debris mixed with explosives would be considered reactive. Wastes, whether themselves explosives, or media contaminated with explosives could be considered reactive by meeting the definition of reactivity as described in 261.23(a)(1)-(7). Wastes that do not meet the criteria in 261.23(a)(1)-(7) would not be considered reactive.

The third question regards other Federal criteria for explosivity. If agencies such as the Bureau of Alcohol, Tobacco, and Firearms (BATF) have regulations, or protocols, for determining whether or not a substance is explosive, those regulations or protocols would not be enforceable under EPA regulations, unless they became incorporated into our rules. Specific methods used by agencies such as BATF to determine if a substance is an explosive could however, be applied to determine whether a waste is reactive according to 261.23(a)(6) or (7).

Thank you for the opportunity to address questions related to the reactivity characteristic as it relates to explosives. If you have any questions, please call Jeff Gaines at (703) 308-8655.

cc: Frank McAlister, AB, PSPD, OSW  
Jeff Gaines, AB, PSPD, OSW

**Waste Stream Name**Explosives Contaminated Oil**Waste Stream Description**Oil removed from machinery, pumps, motors, elevators used in explosives production buildings.**Process/Building Generating Waste**Explosives production**Description of Process Generating Waste**When maintenance removes the oil from equipment located in explosives production buildings, the oil is collected and disposed.**Composition:**

The composition of this waste stream is various types of industrial oil. Since this oil is coming from an explosives production building, there is a high likelihood that the oil has been exposed to explosives. Prior to thermal decontamination, all oil is tested for TCLP Metals, TCLP organics, and PCBs. Oil from transformers or other electrical equipment is not included in this waste stream so this waste stream is not contaminated with PCBs—however analytical testing for PCBs will always be conducted.

**Physical State**

Solid  
 Liquid  
 Semi-solid  
 Dust/powder  
 Debris  
 Sludge  
 Gas/Aerosol

**Odor**

None  
 Mild  
 Strong

Describe \_\_\_\_\_

**Flashpoint** >140F**pH** Neutral**Btu Range** 5000-10000**Specific Gravity** 8**Layers?** N/A**Color** Brown, clear, yellow**Wastewater/non-Wastewater** Non-Wastewater**Characteristic?** D001, Ignitable (Flash point < 140F) D002, Corrosive (pH < 2.0 or > 12.5) D003, Reactive

Water Reactive  
Shock Sensitive  
Oxidizer  
Pyrophoric  
Explosive  
Sulfides  
Cyanides  
Other

(re: reactivity---See additional documentation at end of document for generator knowledge for D003)

\_\_\_\_\_ D004-D043, Toxic (fail TCLP for specific compounds; if yes are there any UHCs?)  
*D030 (2,4-dinitrotoluene has the potential to be present if TNT or Composition B which contains TNT.)*  
 No Hazardous Characteristic/Non Hazardous

**Listed?**

\_\_\_\_\_ F (spent solvents)  
\_\_\_\_\_ K (generated by specific processes)  
\_\_\_\_\_ P (unused commercial chemicals, toxic)  
\_\_\_\_\_ U (unused commercial chemicals, acutely toxic)  
 N/A. Not listed

**Underlying Hazardous Constituents**

Prior to thermal decontamination, all oil is tested for TCLP Metals, TCLP organics, and PCBs.

**Source of information**

Generator Knowledge and analytical testing

**Disposal Method**

Due to safety concerns and Army regulations, being classified similar to a Division 1.4 (or lesser—not a 1.1, 1.2, or 1.3) explosive material, it is still classified via Army regulations as Material Determined to have an Explosive Hazard (MDEH). This material, when not evaluated by Safety to be MDAS (material determined as safe), must be thermally decontaminated via permitted Title V covered activity of open burning since no other safe alternatives for disposal exist. HSAAP's current thermal decontamination method is open burning until a new technology is identified and implemented.

D003 Characterization and Documentation**Generator Knowledge Documentation**

The foundation of our determination for **Waste Stream #8** is based on our answers (in red) for the 7 properties of reactivity defined at 40 CFR 261.23(a):

(a) A solid waste exhibits the characteristic of reactivity if a representative sample of the waste has any of the following properties.

- (1) It is normally unstable and readily undergoes violent change without detonating.  
Solid Waste Stream 8 being sent to the cage or pile are stable and does not readily undergo violent change without detonating.
- (2) It reacts violently with water.  
Solid Waste Stream 8 does not react violently with water. They are open to rainfall 365 days a year.
- (3) It forms potentially explosive mixtures with water.  
Solid Waste Stream 8 does not form potentially explosive mixtures with water. They are open to rainfall 365 days a year.
- (4) When mixed with water, it generates toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.  
Solid Waste Stream 8 does not generate toxic gases, vapors, or fumes when mixed with water.
- (5) It is a cyanide or sulfide bearing waste which, when exposed to pH conditions between 2 and 12.5 can generate toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.  
Solid Waste Stream 8 is not cyanide or sulfide bearing wastes.
- (6) It is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement.  
Current screening procedures eliminate the allowance of grossly explosives contaminated materials from being added to the cages or piles. Solid Waste Stream 8 is similarly described as Division 1.4 hazard class—substances and articles which present only a small hazard in the event of ignition or initiation. An external fire shall not cause virtually instantaneous explosion of almost the entire contents of the package [article] (49 CFR 173.50 and 173.53).  
  
In this regard, Solid Waste Stream 8 is not capable of detonation or explosive reaction if it is being subjected to a strong initiating source or heated under confinement.
- (7) It is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.  
Solid Waste Stream 8 is not readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.
- (8) It is a forbidden explosive as defined in 49 CFR 173.54, or is a Division 1.1, 1.2 or 1.3 explosive as defined in 49 CFR 173.50 and 173.53.  
Solid Waste Stream 1 does not meet the definition of forbidden explosive as defined in 49 CFR 173.54 or the class definition of Division 1.1, 1.2, or 1.3 explosives as defined in 49 CFR 173.50 and 173.53.

**EPA Regulatory memos relevant to this characterization are also attached below.**

9443.1988(10)

REACTIVE WASTE - EXPLOSIVITY

MEMORANDUM

DATE: September 8, 1988

SUBJECT: Definition of Reactive Waste - Explosivity

FROM: David Friedman, Chief  
Methods Section, (OS-331)

TO: Sonya Stelmack,  
Assistance Branch, (OS-343)

As you requested, I have reviewed the testing protocols and classification criteria used by the Department of Defense in evaluating the explosivity of material (Army TB 700-2, Navy NAVSEAINST 8020.8, Air Force To 11A-1-47, DLA DLAR 8220.1).

It is my judgement that the only materials that would exhibit the reactivity characteristic (40 CFR 261.23), due to their potential explosivity, are those that fall into Department of Defense Hazard Classes 1.1, 1.2, and 1.3. Materials rated as Class 1.4 would, therefore, not be an explosive within the meaning of the reactivity characteristic.

cc: Suzanne Rudzinski  
Reva Rubenstein  
Robert Dellinger

9443.1995(01)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

February 24, 1995

MEMORANDUM

SUBJECT: Debris and Soil Contaminated with Explosive Residues

FROM: James F. Michael, Chief  
Disposal Technology Section (5303W)  
Office of Solid Waste

TO: Lawrence A. Wapensky, Chief  
Utah/North Dakota Section  
Region VIII

This responds to your January 20, 1995 memorandum requesting assistance in answering questions raised by the State of Utah concerning regulatory issues pertaining to wastes contaminated with explosive residues.

The first question raises concern with the reference at 40 CFR 261.23(a)(8) to certain Department of Transportation (DOT) regulations concerning explosive classifications, that are cited as criteria for determining the characteristic of reactivity. The DOT regulations cited at 261.23(a)(8) have recently been changed and expanded to conform with Department of Defense hazard classes, therefore, presenting difficulties in implementing the Federal regulatory definition of reactivity under RCRA. Until such time that 261.23(a)(8) is updated, those referenced DOT regulations can not be used for determining reactivity. Reactivity determinations should be made using the remaining criteria at 261.23(a)(1) - (7).

The second question asks whether and when liquid, solid, or debris mixed with explosives would be considered reactive. Wastes, whether themselves explosives, or media contaminated with explosives could be considered reactive by meeting the definition of reactivity as described in 261.23(a)(1)-(7). Wastes that do not meet the criteria in 261.23(a)(1)-(7) would not be considered reactive.

The third question regards other Federal criteria for explosivity. If agencies such as the Bureau of Alcohol, Tobacco, and Firearms (BATF) have regulations, or protocols, for determining whether or not a substance is explosive, those regulations or protocols would not be enforceable under EPA regulations, unless they became incorporated into our rules. Specific methods used by agencies such as BATF to determine if a substance is an explosive could however, be applied to determine whether a waste is reactive according to 261.23(a)(6) or (7).

Thank you for the opportunity to address questions related to the reactivity characteristic as it relates to explosives. If you have any questions, please call Jeff Gaines at (703) 308-8655.

cc: Frank McAlister, AB, PSPD, OSW  
Jeff Gaines, AB, PSPD, OSW



**Waste Stream Name**General Explosives Manufacturing Waste**Waste Stream Description**Filters, probe socks, cloth nutsche covers and etc.**Process/Building Generating Waste**Explosives manufacturing**Description of Process Generating Waste**Explosives production uses various filters throughout the production process. Probe socks are used in water removal from explosives production. Nutsche covers are used to cover containers of product awaiting further processing**Composition:**Filters are composed of cotton, plastic, metal, and various filter media. Probe socks and nutsche covers are made of cotton. Since these materials were used in explosives production and have contained explosives, these materials contain residual explosives.**Physical State**

Solid  
 Liquid  
 Semi-solid  
 Dust/powder  
 Debris  
 Sludge  
 Gas/Aerosol

**Odor**

None  
 Mild  
 Strong

Describe \_\_\_\_\_

Flashpoint N/ApH N/ABtu Range N/ASpecific Gravity N/ALayers? N/AColor Clear, whiteWastewater/non-Wastewater Non-Wastewater**Characteristic?** D001, Ignitable (Flash point < 140F) D002, Corrosive (pH <2.0 or > 12.5) D003, Reactive

Water Reactive

Shock Sensitive

Oxidizer  
Pyrophoric  
Explosive  
Sulfides  
Cyanides  
Other

**(re: reactivity---See additional documentation at end of document for generator knowledge for D003)**

\_\_\_\_\_ D004-D043, Toxic (fail TCLP for specific compounds; if yes are there any UHCs?)  
*D030 (2,4-dinitrotoluene has the potential to be present if TNT or Composition B which contains TNT.)*

No Hazardous Characteristic/Non Hazardous

**Listed?**

\_\_\_\_\_ F (spent solvents)  
\_\_\_\_\_ K (generated by specific processes)  
\_\_\_\_\_ P (unused commercial chemicals, toxic)  
\_\_\_\_\_ U (unused commercial chemicals, acutely toxic)  
 N/A. Not listed

**Underlying Hazardous Constituents**

(Anything painted will be tested for lead and PCBs if no generator knowledge exists to rule out PCBs or lead.) Any other suspected UHC will be tested to rule out any hazardous constituent. This stream typically never includes painted or other suspect UHC items.

**Source of information**

Generator Knowledge

**Disposal Method**

Due to safety concerns and Army regulations, being classified similar to a Division 1.4 (or lesser—**not** a 1.1, 1.2, or 1.3) explosive material, it is still classified via Army regulations as Material Determined to have an Explosive Hazard (MDEH). This material, when not evaluated by Safety to be MDAS (material determined as safe), must be thermally decontaminated via permitted Title V covered activity of open burning since no other safe alternatives for disposal exist. HSAAP's current thermal decontamination method is open burning until a new technology is identified and implemented.

D003 Characterization and Documentation

**Generator Knowledge Documentation**

The foundation of our determination for **Waste Stream #9** is based on our answers (in red) for the 7 properties of reactivity defined at 40 CFR 261.23(a):

(a) A solid waste exhibits the characteristic of reactivity if a representative sample of the waste has any of the following properties.

- (1) It is normally unstable and readily undergoes violent change without detonating.  
*Solid Waste Stream 9 being sent to the cage or pile are stable and does not readily undergo violent change without detonating.*
- (2) It reacts violently with water.  
*Solid Waste Stream 9 does not react violently with water. They are open to rainfall 365 days a year.*
- (3) It forms potentially explosive mixtures with water.  
*Solid Waste Stream 9 does not form potentially explosive mixtures with water. They are open to rainfall 365 days a year.*
- (4) When mixed with water, it generates toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.  
*Solid Waste Stream 9 does not generate toxic gases, vapors, or fumes when mixed with water.*
- (5) It is a cyanide or sulfide bearing waste which, when exposed to pH conditions between 2 and 12.5 can generate toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.  
*Solid Waste Stream 9 is not cyanide or sulfide bearing wastes.*
- (6) It is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement.  
*Current screening procedures eliminate the allowance of grossly explosives contaminated materials from being added to the cages or piles. Solid Waste Stream 9 is similarly described as Division 1.4 hazard class—substances and articles which present only a small hazard in the event of ignition or initiation. An external fire shall not cause virtually instantaneous explosion of almost the entire contents of the package [article] (49 CFR 173.50 and 173.53).*  
  
*In this regard, Solid Waste Stream 9 is not capable of detonation or explosive reaction if it is being subjected to a strong initiating source or heated under confinement.*
- (7) It is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.  
*Solid Waste Stream 9 is not readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.*
- (8) It is a forbidden explosive as defined in 49 CFR 173.54, or is a Division 1.1, 1.2 or 1.3 explosive as defined in 49 CFR 173.50 and 173.53.  
*Solid Waste Stream 1 does not meet the definition of forbidden explosive as defined in 49 CFR 173.54 or the class definition of Division 1.1, 1.2, or 1.3 explosives as defined in 49 CFR 173.50 and 173.53.*

**EPA Regulatory memos relevant to this characterization are also attached below.**

9443.1988(10)

REACTIVE WASTE - EXPLOSIVITY

MEMORANDUM

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TO: Sonya Stelmack,  
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cc: Suzanne Rudzinski  
Reva Rubenstein  
Robert Dellinger

9443.1995(01)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

February 24, 1995

MEMORANDUM

SUBJECT: Debris and Soil Contaminated with Explosive Residues

FROM: James F. Michael, Chief  
Disposal Technology Section (5303W)  
Office of Solid Waste

TO: Lawrence A. Wapensky, Chief  
Utah/North Dakota Section  
Region VIII

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The first question raises concern with the reference at 40 CFR 261.23(a)(8) to certain Department of Transportation (DOT) regulations concerning explosive classifications, that are cited as criteria for determining the characteristic of reactivity. The DOT regulations cited at 261.23(a)(8) have recently been changed and expanded to conform with Department of Defense hazard classes, therefore, presenting difficulties in implementing the Federal regulatory definition of reactivity under RCRA. Until such time that 261.23(a)(8) is updated, those referenced DOT regulations can not be used for determining reactivity. Reactivity determinations should be made using the remaining criteria at 261.23(a)(1) - (7).

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