



**DEPARTMENT OF THE ARMY**  
**OFFICE OF THE ASSISTANT SECRETARY OF THE ARMY**  
**INSTALLATIONS, ENERGY AND ENVIRONMENT**  
**110 ARMY PENTAGON**  
**WASHINGTON DC 20310-0110**

18 April 2013

MG Glenn H. Curtis  
The Adjutant General  
Louisiana National Guard  
6400 St. Claude Avenue  
Jackson Barracks  
New Orleans, LA 70117

Dear General Curtis:

Enclosed is the report from the technical assistance visit you requested in your letter of March 12, 2013 regarding the potential short- and long-term hazards associated with the M6 propellant that Explo Systems, Inc. (Explo) stores and processes for recycling and commercial sale at the Louisiana National Guard's (LANG) Camp Minden. The attached report provides recommendations LANG and the Louisiana State Police (LASP) may consider to improve the explosives safety posture at Camp Minden.

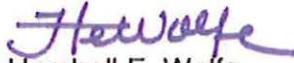
The Army's technical assistance team, which conducted its review on 2 and 3 April 2012, focused on Explo's storage and processing of M6 propellant. The team did not review Explo's personnel qualifications, operating procedures, and/or its procedures for security or accountability of explosives. LANG may want to consider evaluating these matters.

The team was informed there may be other commercial entities performing operations involving explosives at Camp Minden, and that LANG may also be leasing facilities to other commercial entities for non-munitions-related work. LANG did not request the team evaluate these areas or operations, nor did it make them available for the team's evaluation. Because operations of this nature may be cause for concern, LANG is encouraged to evaluate all operations at Camp Minden to help ensure the safety of personnel working on Camp Minden, the security of LANG's operations, and the safety of the public. I recommend LANG contact the National Guard Bureau's Quality Assurance Specialist (Ammunition Surveillance), Mr. Clark Holmes, to request any assistance it may need to address these and other explosives safety-related matters.

The team that visited Camp Minden remains available to LANG to provide further advice on the Explo materials at Camp Minden. Additionally, the US Army Technical Center for Explosives Safety is a valuable resource for all Army and National Guard activities.

I understand Explo continues to reduce the quantity of propellant it stores at Camp Minden and is moving remaining propellant into storage. As such, the explosive hazards posed on Camp Minden and to nearby communities are substantially reduced. This is good news for Camp Minden's neighboring communities and for state officials who are providing oversight of the situation. My point of contact for this matter is Mr. J. C. King, Director for Munitions and Chemical Matters, and the Army's Department of Defense Explosives Safety Board Voting Member, at (703) 697-5564; james.c.king4.civ@mail.mil.

Sincerely,



Hershell E. Wolfe

Acting Deputy Assistant Secretary of the Army  
(Environment, Safety and Occupational Health)

Enclosure

# **FOR OFFICIAL USE ONLY**

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# **FOR OFFICIAL USE ONLY**

**Department of Army**

**Report**

**of**

**Explosives Safety Assistance Visit**

**to**

**Louisiana Army National Guard's**

**Camp Minden**

**April 18, 2013**

## Final Report of Explosives Safety Assistance Visit to Camp Minden

### 1. Background.

a. On 12 March 2013, The Adjutant General (TAG), Louisiana National Guard (LANG) requested (Enclosure) the Army provide a technical assistance team to assess stored propellant at the State-owned Camp Minden, Louisiana (LA), and make recommendations for potential mitigation measures. TAG specifically, requested the team conduct an assessment of the potential short- and long-term hazards associated with M6 propellant being processed and stored on Camp Minden by Explo Systems, Inc. (Explo), a commercial firm. Explo has a lease from the State for certain property on Camp Minden, which it uses for the purpose of conducting demilitarization operations under Contract W52P1J-10-C-0025 for the demilitarization of D533 Charges, Propellant, 155mm, M119A2, and Explo's subsequent commercial recycling operations of the demilitarized propellant.

b. On 2 and 3 April, a team, under the leadership of COL Leo Bradley, Army Military Representative to the Department of Defense Explosives Safety Board (DDESB), conducted the requested technical assistance visit (TAV). The team consisted of:

- COL Leo Bradley, DDESB
- Mr. James Young, Quality Assurance Specialist (Ammunition Surveillance), Department of the Army, G4
- Mr. Paul Cummins, Mr. Greg Heles, and Ms. Libzent Odom, US Army Technical Center for Explosives Safety (USATCES)
- Mr. James Lane, Defense Ammunition Center.

c. COL Bradley provided COL Ronnie D. Stuckey, Commander, Camp Minden, an initial report of the team's assessment. This is the final report of that visit.

2. Executive Summary. COL Stuckey, and Officer John Porter, Deputy Command Technician, and Shelly Hopkins, Criminal Investigator, LA State Police's (LASP) Hazardous Material and Explosives Control Unit, provided the team a thorough in-briefing. After touring the portion of the facility leased and used by Explo and gaining access to installation facility maps, the team conducted an explosives safety quantity distance (ESQD) analysis. This analysis detailed the original situation in Explo's area of operations (Figure 1) in November 2012, as the LASP described; the situation on 2 and 3 April (the current situation) (Figure 2); and a proposed solution (Figure 3) that would provide improved public safety by making changes to Explo's explosives-related operations and propellant storage locations. During the TAV, the team observed several deviations from standard Department of Defense (DoD) explosives safety practices as identified in DoD 6055.09-M (Volumes 1 to 8), DoD Ammunition and Explosives Safety Standards. Based on its assessment, the team recommends LANG initiate the following actions as quickly as possible:

- Consider all areas within the S-Line (an Explo facility) as an explosives storage site, and prohibit explosives operations within the area, including Explo's current repacking operation and its proposed aluminum reclamation operation.

- Reduce the quantity of propellant in building 1607 to 591,805 lbs of M6 propellant. Reduce the amount of M6 propellant in other buildings to the quantities provided in Figure 3.
- Identify the location of all M6 propellant from Lot IND82E-070170, segregate, and dispose of it as soon as possible. The team's review of the DoD lot numbers shipped to Camp Minden revealed that this Lot has been classified with stability category "C."
- Move the LASP's administrative offices outside of the "marginal" arc of Figure 3.

3. Way Ahead. Since November 2012, when LASP discovered the potential explosive hazards posed by M6 propellant at Camp Minden, LANG and LASP have taken effective action to protect the public. Implementation of the above recommendations will further increase public safety; however, their implementation will not bring the S-Line into conformity with DoD 6055.09-M. The team strongly recommends LANG and the Commander, Camp Minden, consult with explosives safety experts at the National Guard Bureau and, if required, seek further advice from the technical assistance team as the situation at the Explo's area of operations at Camp Minden improves.

### Explosives Safety Quantity Distance (ESQD) Analysis

In its ESQD analysis, the team applied the below universal assumptions:

- The TNT equivalency of M6 propellant is 0.65 (65 percent (%)).
- The responsible authority accepts the hazards and risks to the rail yard, rail cars, and any other facilities within ESQD arcs.
- The explosives limits shown on the drawing are not exceeded.

#### S-Line ESQD Analysis:

##### Original Situation November 2012 (Figure 1)

Figure 1 shows the situation on the S-Line in November 2012. The ESQD situation depicted is for 6.5M lbs of TNT, which is the TNT equivalency of 10M lbs of M6 propellant. The team calculated the TNT equivalency by simply adding all the explosives material present on the S-Line at that time.

In its ESQD analysis of the S-Line's original situation, the team assumed that all 10M lbs of M6 propellant on the line in November 2012 would react with a prompt propagation as a Hazard Division (HD) 1.1 – a reaction of 6.5M lbs net explosives weight (NEW).

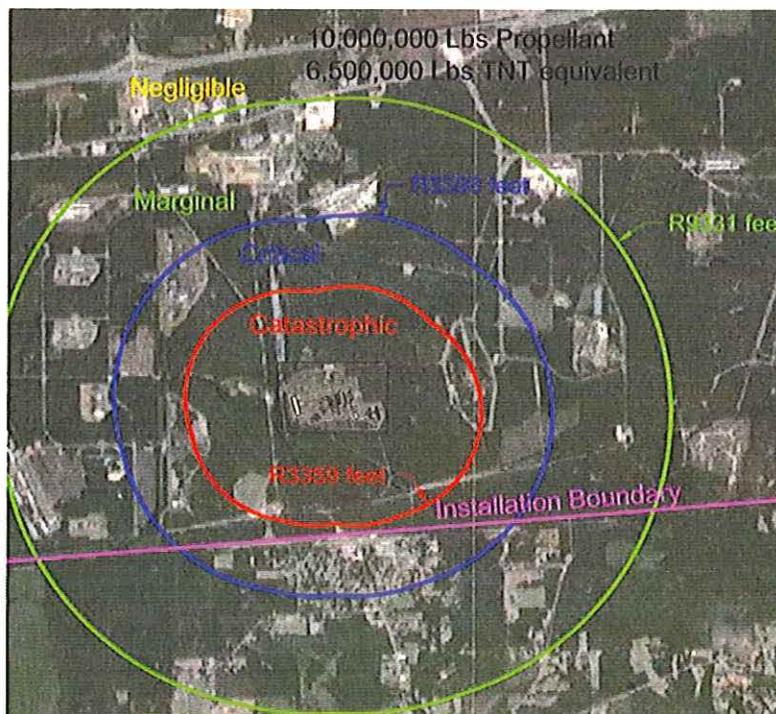


Figure 1 – Original Situation (November 2012)

**Current Situation April 2013 (Figure 2)**

Figure 2 shows the current situation. The ESQD situation depicts the team's "best estimate" of the NEW of M6 propellant on the S-Line as of April 2013.

In its ESQD analysis of the current situation, the team assumed:

- The S-Line is only an explosives storage site. Only operations directly related to the storage of explosives would be allowed to be performed within the S-Line. Therefore, the repackaging operations currently performed at the S-Line would be discontinued. Additionally, among other non-storage related activities, the shipping and receiving office would be moved, and aluminum recovery operations as well as demilitarization-related operations would not be allowed to be performed within the S-Line.
- There are three inter-magazine distance (IMD) violations on S-line.
  - The first is from building 1607 to building 1645. Considering both buildings only contain M6 propellant, it is not anticipated that propagation will occur between these buildings. Therefore, the IMD violation will be discounted.
  - The second is from building 1607 to building 1610. Considering both buildings only contain M6 propellant, it is not anticipated that propagation will occur between these buildings. Therefore, the IMD violation will be discounted.
  - The third is between buildings 1610 and 1650. Therefore, for the "Current Situation" analysis, buildings 1610 and 1650 will be referred to as the "group of 2," with the explosives totaled and treated as one explosives storage location. IMD is maintained between the "group of 2" and all other explosives storage buildings.
- The small wing on building 1607 that extends east towards building 1610 does not contain any explosives materials. Non-explosives materials are allowed.

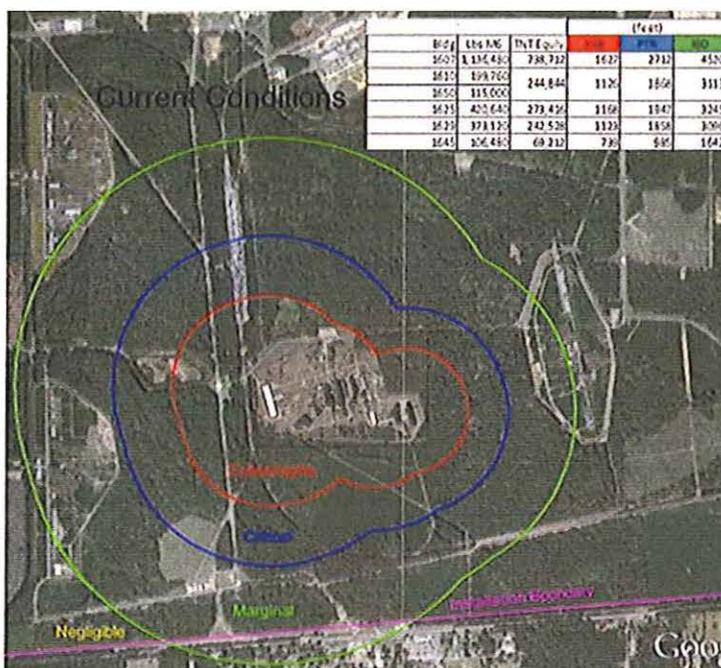


Figure 2 – Current Situation (Apr 13)

### Proposed Solution (Figure 3)

Figure 3 shows the proposed solution. The proposed solution is a “future state” that will meet DoD 6055.09-M’s criteria and reduce the threat to the public to a “negligible” level.

In its ESQD analysis for the proposed solution, the team assumed:

- S-Line is only an explosives storage site. Only operations directly related to the storage of explosives should be allowed to be performed within the S-Line. Therefore, the repackaging operations currently performed at the S-Line would be discontinued. Additionally, among other non-storage related activities, the shipping and receiving office would be moved, and aluminum recovery operations as well as demilitarization-related operation would not be allowed to be preformed within the S-Line.
- For the proposed solution, buildings 1610, 1617, 1619, and 1650 will be referred to as the “group of 4,” with the explosives totaled and treated as one explosives storage location. IMD is maintained between the “group of 4” and all other explosives storage facilities. Grouping these four buildings as one explosives location maximizes the allowable explosives storage within S-line.
- The proposed solution meets DoD 6055.09-M’s criteria, with respect to IMD, and provides an acceptable level of protection for the public.

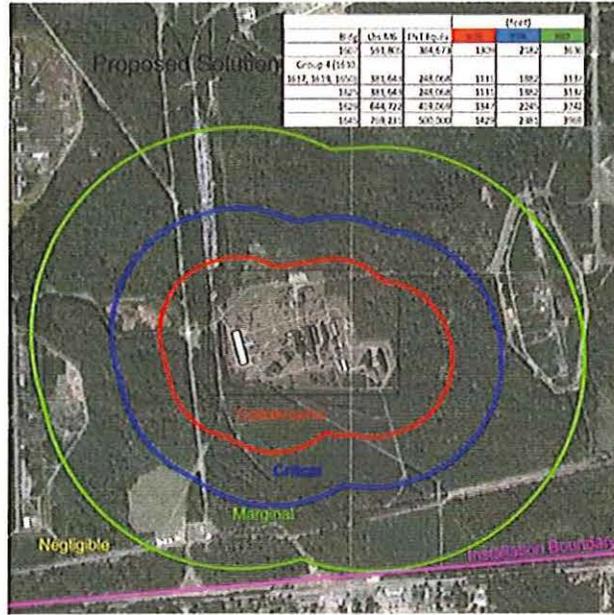


Figure 3 – Proposed Solution

## Hazard Zone Definitions

The below provide a broad definition of the different types of consequences expected within the ESQD hazard zones depicted in Figures 1 through 3.

- **Catastrophic:** Delayed propagation of an explosion may occur from fire brands or equipment failure at the exposed sites. Personnel in the open will likely be killed by direct action of blast, by being struck by fragments and building debris, or by physically being thrown against a hard surface. Personnel in buildings may be injured or killed by destruction/collapse of the building. Damage to un-strengthened buildings will be serious and approximate 50 percent or more of the total replacement cost (minimum). Transport vehicles will incur extensive, but not severe, body and glass damage consisting mainly of dishing of body panels and cracks in shatter-resistant window glass.
- **Critical:** Personnel in the open are likely to be injured or killed by fragments and debris, depending largely upon the structure housing the explosives, the amount of explosives, and its fragmentation characteristics. Injuries are principally caused by broken glass and internal building debris. Un-strengthened buildings are likely to sustain damage approximating 20 to 50 percent of the replacement cost depending on building type and distance. Vehicles on the road should suffer little damage unless hit by a fragment or unless the blast wave causes momentary loss of control.
- **Marginal:** Personnel in structures are provided a high degree of protection from death or serious injury, with likely injuries principally being caused by broken glass and building debris. Personnel in the open are not expected to be injured seriously directly by the blast but these personnel may receive injuries and possible death from fragments and debris, depending largely upon the structure and the amount of explosives and its fragmentation characteristics. Facility structure and fragmentation characteristics will determine the probability of marginal .vs. negligible consequences. Un-strengthened buildings are likely to sustain damage from 5 to 20 percent of the replacement cost depending on distance. Exposed equipment and material may be damaged by fragments and become unusable.
- **Negligible:** Personnel beyond the green arc are not likely to be injured or killed by fragments. Fragments can occur at these distances, but the probability of hitting a person is unlikely. On DoD installations, DoD accepts this level of risk through policy and regulation. Un-strengthened buildings are likely to sustain only minor damage, 5 percent maximum, primarily from fragments and glass breakage.

### Additional Observations and Recommendations

- **Observation:** Building 1607 is used as a storage location for approximately 1M lbs of M6 propellant. In addition, Explo conducts operations involving the receipt, repackaging, and shipment of M6 propellant this site.

**Recommendation:** Prohibit Explo from repackaging propellant in building 1607 and move the repackaging operation to another location that complies with DoD 6055.09-M. Limit building 1607's use to storage of M6 propellant.

**Reference:** DA Pam 385-64, Ammunition and Explosives Safety Standards, paragraph 2-5, Personnel and Explosives Limits.

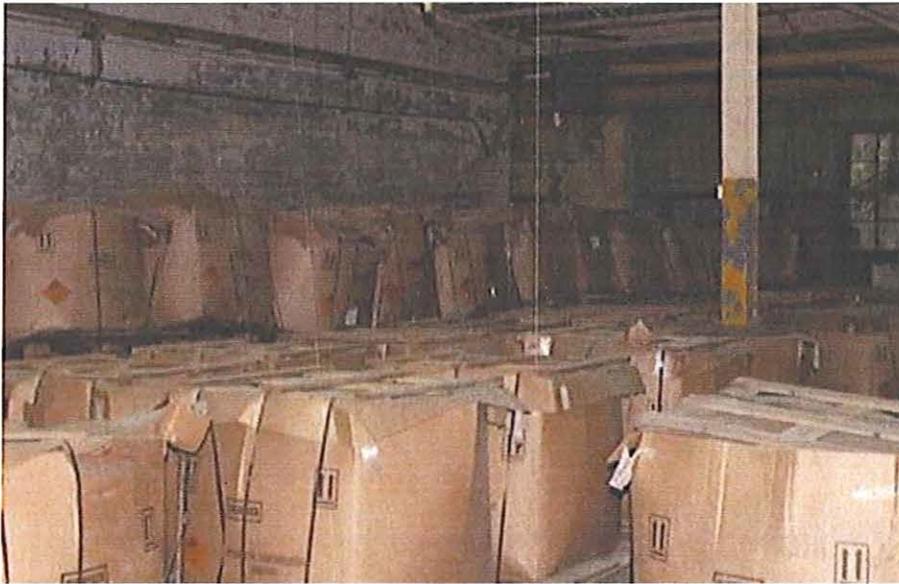


Propellant repackaging operations in building 1607

- **Observation:** The amount of propellant in storage in building 1607 creates ESQD violations.

**Recommendation:** Reduce the propellant in storage in building 1607 to no more than 591K lbs. Limit building 1607's use to storage of M6 propellant. Prohibit the storage of hazardous materials, other than M6 propellant.

**Reference:** DA Pam 385-64, Chapter 8, Explosives Safety Separation Distance (Quantity-Distance).



M6 Propellant in 880 lb bulk pack, Bldg 1610 (typical)

- **Observation:** The explosives in S-Line violate DoD 6055.09-M's explosives safety compatibility rules - if IMD is not met, all explosives must be treated as being at one location. M6 propellant, Tritonal, hazardous waste (pink water) and explosives residue (i.e., tar mixed with TNT) from a previous TNT/Tritonal melt-out operation, and Explosive D (ammonium picrate) are all stored within the S-Line (in buildings 1619 and 1617).

**Recommendation:** Remove, segregate and store explosives per DoD 6055.09-M's explosives safety compatibility and mixing rules. Comply with DoD 6055.09-M's criteria for storage of waste military munitions. Prohibit the storage of hazardous waste with explosives.

**References:**

- DoD 6055.09-M, V1, Table 7-2, Storage Compatibility Group (SCG) Mixing Chart for Storage.
- DoD 6055.09-M, V7, Enclosure 5, Special Storage Procedures for Waste Military Munitions.

DA Pam 385-64, paragraph 2-7.a.(4) – *At a minimum, hazardous waste material will be removed from AE and other operating facilities and taken to an approved disposal area or temporary collection point at the end of each shift. (b) Hazardous waste material should not be "stored" in the disposal area, but disposed of as soon as possible after arrival.*



**Tritonal Flaking Belt – Building 1619**



**Tritonal scraps located in Building 1619 generated from Tritonal flaking operation**



TNT Contaminated Water (red water/pink water)

- **Observation:** There was no static-electrical grounding or bonding on metal conveyers or hoppers (bonded and/or grounded conductive work surfaces). Personal protective equipment (PPE) (e.g., conductive shoes, wrist-stats, cotton garments) is not being used to prevent buildup of static electrical charges.

**Recommendation:** Prohibit the use of this equipment until it is grounded and/or bonded per DA PAM 385-64. Provide operators appropriate PPE.

**References:**

- DA Pam 385-64, Section II, Static Electricity, paragraph 17-10. *General requirements – All machinery and equipment such as mixers for pyrotechnic, propellant, and explosive compositions, screening and sifting devices, assembly and disassembly machines, elevators, defusing machines, presses, hoppers, and all associated equipment involved in loading or processing explosives or explosives materials will be bonded to the earth electrode subsystem.*
  - DA Pam 385-64, Chapter 2, General Safety
  - 29 CFR 1910, Subpart 1 - personal protective equipment.
- **Observation:** The electric scale used to weigh propellant drums is connected to a standard 110 volt outlet (spark hazard). The outlet is located directly above open containers of bulk propellant. Several pallets of loaded drums are stored within 5 feet of the scale and download operation. Loose propellant observed wedged between the base of the scale and the platform.

**Recommendation:** Discontinue this operation until the above are addressed. Determine the requirement for explosion proof electrical connections and install where required. Perform a comprehensive cleanup of the area to remove loose and/or visible propellant and other explosive residues. Develop spill cleanup procedures and implement them.

**Reference:** DoD Manual 6055.09-M, V2, Enclosure 3, Electrical Standards; NFPA 70.

- **Observation:** Equipment used at propellant repack operations have electric motors, but explosive proof electrical outlets are not installed.

**Recommendation:** Determine if this operation is a Class II hazardous location. Determine if the proper equipment and electrical connections are being used. If not, install and use.

**Reference:** DA Pam 385-64, paragraph 17-6, Electrical Motors for Hazardous Locations: *Electrical motors should not be installed in a room or building which is a Class I or II hazardous location. They should have no connection to the building except through glands or apertures adequately sealed against entrance of hazardous materials either into the location or into the motor itself.*

- **Observation:** Deluge systems are not in place at the propellant download operation.

**Recommendation:** Apply the "best practice" for operations involving exposed propellant by installing required deluge systems.

**References:**

- DoD Manual 6055.09-M, V, Enclosure 9, Personnel Protection, V1.E9.3.2.4. *Personnel protection may be achieved by: using fire detection and extinguishing systems (e.g., infrared actuated deluge system) in those areas where exposed, thermally energetic materials that have a high probability of ignition and a large thermal output are handled.*
- DA Pam 385-64, paragraph 6-19, Deluge Systems for Explosives Operations.

- **Observation:** Exposed electrical wires and motors are on equipment used to crush metal containers.

**Recommendation:** Discontinue use of this equipment until it meets electrical safety standards and is in proper working order.

**Reference:** DA Pam 385-64, Chapter 17, Electrical Hazards and Protection.

- **Observation:** Tools used in the repack operations are not the non-sparking variety normally required for explosive operations.

**Recommendation:** Ensure the proper hand tools be used for explosive operations.

**Reference:** DA Pam 385-64, paragraph 2-6 h. – *Only authorized and properly maintained tools, including hand tools, that are approved for use in locations having hazardous concentrations of flammable dusts, gases, vapors, or exposed explosives will be used. Safety hand tools will be constructed of non-sparking and /or spark-resistant materials (wood, brass, titanium) that under normal conditions of use will not produce sparks.*

- **Observation:** Cleaning supplies and flammable chemicals (sweeping compound, cleaners, solvents, paints, anti freeze, hydraulic fluid, and acetone) are stored and scattered throughout the S-Line. A considerable amount of scrap wood, trash, and paper debris, litters the building as well.

**Recommendation:** Remove cleaning supplies and/or flammable chemicals from the operations and storage areas of the S-Line. Store this type material in a secure location, separate from explosives storage or operating area. Perform general housekeeping by removing scrap wood, trash, and combustible packing materials.

**Reference:** DA Pam 385-64, paragraph 2-7: *Ammunition AE storage, handling and operating facilities and area (AE facilities) will be maintained free of debris and rubbish, particularly the accumulation of oily rags or other material subject to spontaneous ignition. Paragraph 17-10 (3) (C) Solvents.*

- **Observation:** Diesel powered forklifts are being used in operational areas where M6 propellant is present. The team observed sparks emitting from an engine compartment of one forklift.

**Recommendation:** Discontinue use of diesel forklifts in buildings and storage magazines containing explosives. Use electric forklifts and pallet jacks in operational areas.

**Reference:** DA Pam 385-64, paragraph 2-17 (6) – *When necessary for efficient operation, battery-powered MHE is permitted to be used in buildings or magazines containing AE or other hazardous materials.*

- **Observation:** Lightning protection appeared to be deficient or in disrepair. Building 1607 had been an inert warehouse. As such, lightning protection for this building may have been omitted or designed to a lesser standard.

**Recommendation:** Implement procedures to warn of an approaching electrical storm, discontinue explosive operations, and leave the explosive area during such storms. Upgrade the lightning protection of all explosives storage locations to comply with NFPA 780, DOD 6055.09-M and DA Pam 385-64.

**Reference:** As stated.

- **Observation:** Inadequate grounds keeping at S-Line increases the likelihood of a fire reaching the stored explosives within the S-Line.

**Recommendation:** Maintain a 50-foot fire break around the S-Line. Remove large accumulations of combustible materials (grasses, trees, pine needles, inert storage, etc.) within the S-Line.

**Reference:** DA Pam 385-64, paragraph 6-8, Fire Prevention Requirements

- **Observation:** Explosive operators were wearing gloves, but no other PPE, such as coveralls and eye protection was observed.

**Recommendation:** Ensure personnel wear the proper PPE.

**References:**

- DA Pam 385-64, Chapter 2, General Safety
- 29 CFR 1910 subpart 1- personal protective equipment.

- **Observation:** Emergency destruction of 2.5M pounds of propellant may be required at some point.

**Recommendation:** Ensure the proper equipment, facilities, explosive weights, and separation distances are used in burning of propellant.

**Reference:** DoD 5055.09-M, V5, Enclosure 3, Areas Used for Intentional Burns and Detonations.

- **Observation:** M6 Propellant Lot IND82E-070170 is stability category "C," indicating it is approaching a potentially hazardous stability condition. (See the below explanation for the Stability Category Codes.)

**Recommendation:** Any lot found with Lot Index Number 070170 should be segregated and disposed of as soon as possible per Army Notices of Ammunition Reclassifications (NAR) 11-0967.

**Reference:** Propellant management Guide, December 2003 (see table below).

Table 2-1 Stability Category Codes

STABILITY CATEGORY	PERCENT STABILIZER	EFFECTIVE
A	0.30 or MORE	
C	0.29 - 0.20	
D	LESS THAN 0.20	

**A** – Acceptable stabilizer loss. Lot is safe for storage until next required retest date.

**C** – Significant stabilizer loss. Lot does not represent an immediate hazard, but is approaching a potentially hazardous stability condition. This level of stabilizer loss does not adversely affect functioning in a finished round configuration.

**D** – Unacceptable stabilizer loss. The lot presents a potential safety hazard and is an unacceptable risk for continued storage as bulk propellant, bulk-packed components, or as separate loading propelling charges. The risk of autoignition of propellant in SC-D increases with time. Demilitarization must be completed within 60 days of notification for bulk propellant, bulk-packed components, and separate loading propelling charges.

- **Observation:** Some M6 propellant storage boxes were not labeled with the manufacturer's propellant lot number and/or the lot number was not readable. Propellants with lost manufacturer lot identity represent a potential safety hazard.

**Recommendation:** Develop a local numbering system for any propellant that is not clearly labeled with the manufacturer's lot number. Immediately test this propellant for stabilizer content. Dispose of propellant that is not stable as a first priority, and propellant without a known manufacturer lot number as a second priority. DoD guidance requires disposal within 60 days.

**Reference:** Supply Bulletin 742-1, Ammunition Surveillance Procedures, paragraph 13-14, "Lost Lot Identity".

- **Observation:** None of the M6 propellant observed was in its original propellant charge cans.

**Recommendation:** Do not download M6 propellant from propellant charge cans into other containers unless final disposition of the material within a year is guaranteed.

- **Observation:** Although the team did not fully investigate the propellant surveillance program being used to monitor the remaining effective stabilizer in the M6 propellant being stored or processed, it appeared that only Ammunition Peculiar Equipment 1995 Near-Infrared Spectroscopy data is being used.

**Recommendation:** Develop a propellant surveillance program for the M6 propellants that incorporates recommendations made by Mr. Lewis Kansas, Energetics Materials Analysis Branch, ARDEC, Picatinny Arsenal, in his 20 December 2012 trip report.

**Reference:** As stated.

- **Observation:** The preponderance of evidence indicates that the probability of an explosives event directly related to the long-term storage of M6 propellant at Minden is likely. That is: (a) anecdotal evidence indicates that the “kicker boxes” of propellant may contain multiple Lots, instead of the single Lot number indicated on the “blue” labels; (b) due to the unknown storage conditions for M6 propellant after its removal from the propellant charge cans, the propellant’s stability cannot be guaranteed; and (c) the bulk packaging (white bag, fiber drum or cardboard box) is not a standard packaging method for long-term storage of M6 propellant. The use of such bulk packaging may (a) not prevent the loss of stabilizer; (b) allow moisture intrusion; and (c) increase nitro-cellulose decomposition rates. These factors, combined with nitro-cellulose’s ability to auto ignite, increase the probability of a detonation within a storage structure at Camp Minden within 10 years.

**Recommendation:** Aggressively pursue methods to reduce the quantities of the downloaded M6 propellant at Minden to include the use of both controlled open burning and sale. Develop a working group to study unique solutions for the disposal of large quantities of M6 propellant.

**Reference:** Supply Bulletin 742-1, Ammunition Surveillance Procedures, paragraph 13-14, “Lost Lot Identity.”

Enclosure

12 March 2013

The Adjutant General and Louisiana National Guard Request for Technical  
Assistance



## DEPARTMENTS OF THE ARMY AND AIR FORCE

JOINT FORCE HEADQUARTERS-LOUISIANA  
OFFICE OF THE ADJUTANT GENERAL  
JACKSON BARRACKS  
NEW ORLEANS, LOUISIANA 70117

NGLA-TAG

12 March 2013

MEMORANDUM FOR Assistant Secretary of the Army for Environment, ATTN: DASA-ESOH, Mr. James C. King

SUBJECT: Request for Army Technical Assessment Team

1. Request a Department of the Army Technical Assessment Team to assess stored explosives at Camp Minden, LA. Specifically, request the team conduct an assessment of the potential short and long term hazards associated with the M6 propellant and make recommendations for potential mitigation measures.
2. The M6 propellant is a hazardous material derived from the demilitarization of the M119A2 Propelling Charge by Explo Systems, Inc. ("Explo"), a tenant of the Louisiana Military Department at Camp Minden. The propellant was used in connection with an activity of the DoD as provided in 10 U.S.C. 2692 (b)(1). The excess propellant was produced by Explo under the terms and conditions of its contract with DoD (contract no. W52P1J-10-C-0025). While performing work for the DoD under its contract, Explo illegally and improperly stored large amounts of M6 propellant on the premises of Camp Minden without the knowledge or consent of the State of Louisiana. Explo's actions in this regard violate state and federal law. Explo's illegal activities were discovered by the Louisiana State Police during a routine inspection of their operations. The State of Louisiana has requested assistance from the Department of Defense for the transportation and storage of the excess M6 propellant and is currently awaiting a determination.
3. Point of contact is the undersigned at (318) 613-5313 or email [glenn.h.curtis.mil@mail.mil](mailto:glenn.h.curtis.mil@mail.mil).

GLENN H. CURTIS  
MG, LAARNG  
The Adjutant General





**DEPARTMENT OF THE ARMY**  
**OFFICE OF THE ASSISTANT SECRETARY OF THE ARMY**  
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20 JUN 2013

MG Glenn H. Curtis  
The Adjutant General  
Louisiana National Guard  
6400 St. Claude Avenue  
Jackson Barracks  
New Orleans, LA 70117

Dear General Curtis:

Enclosed is the report from the technical assistance visit (TAV) the Army provided 7 - 9 May 2013 at the Louisiana National Guard's (LANG) Camp Minden. The Army provided this TAV as a follow-up to a TAV it had provided on 2 and 3 April 2012 in response to your request of 12 March 2013. The Commander, Camp Minden and Louisiana State Police (LASP) requested this follow-up on 1 May 2013 to assess the potential hazards associated with approximately 130,000 pounds (lbs) of Tritonal that Explo Systems, Inc. (Explo) had stored in Building 1650, and other explosives Explo has in storage at Camp Minden. The attached report provides recommendations LANG and the Louisiana State Police (LASP) may consider to improve the explosives safety posture at Camp Minden.

As requested, the Army's technical assistance team focused its assessment on the hazards associated with the handling and storage of Tritonal in Building 1650 and other explosives Explo stored at Camp Minden. The TAV team did not review Explo's personnel qualifications, operating procedures, and/or its procedures for security or accountability of explosives. LANG may want to consider evaluating these matters.

During this TAV, the TAV team:

- a. Assessed the hazards associated with the handling and storage of Tritonal in Building 1650, offered to LANG a demilitarization plan for propellant and explosives generated by Explo, and recommended an approach for establishing a propellant stability program for approximately 15M lbs of M6 propellant remaining at Camp Minden for which lot identity has been lost, pending the final disposition of the M6.
- b. Identified some explosives the condition of which posed a serious explosive hazard. As a result, the TAV team recommended LASP, in coordination with LANG, request follow-on technical assistance from an Army Explosive Ordnance Disposal unit. Subsequently, LASP has requested EOD's assistance in assessing the

condition of these explosives and recommending to LASP courses of action for LASP to dispose of it safely.

The team that visited Camp Minden remains available to LANG to provide further advice on the Explo materials at Camp Minden. Additionally, the US Army Technical Center for Explosives Safety is a valuable resource for all Army and National Guard activities.

Explosive safety oversight of explosive operations of the nature Explo performed at Camp Minden requires expertise in explosives safety management. Should LANG continue to lease Camp Minden's facilities for operations such as those Explo conducted, I strongly recommend it consider developing this expertise within the Camp Minden staff through attendance at explosive safety training programs the Defense Ammunition Center (DAC) offers. Although some training may require attendance at the DAC, which is located on McAlester Army Ammunition Depot, McAlester, OK, DAC offers many of its course as self-paced, distance-learning courses (see <http://ammo.okstate.edu>). Additionally, I recommend LANG contact the National Guard Bureau's Senior Quality Assurance Specialist (Ammunition Surveillance), Mr. Clark Combs, to request any assistance it may need to address explosives safety-related matters.

My point of contact for this matter is Mr. J. C. King, Director for Munitions and Chemical Matters, and the Army's Department of Defense Explosives Safety Board Voting Member, at (703) 697-5564; james.c.king4.civ@mail.mil.

Sincerely,



Hershell E. Wolfe

Deputy Assistant Secretary of the Army  
(Environment, Safety and Occupational Health)

Enclosure

**Department of Army**

**Report**

**of**

**Explosives Safety Assistance Visit  
(7 to 9 May 2013)**

**to**

**Louisiana National Guard's  
Camp Minden**

**June 13, 2013**

# **Final Report of Explosives Safety Assistance Visit to Camp Minden (7 to 9 May 2013)**

## **1. Background.**

a. On 1 May 2013, COL Ronnie D. Stuckey, Commander, Camp Minden, Louisiana National Guard (LANG) and Lieutenant John Porter, Deputy Command Technician, LA State Police (LASP) requested the Army provide an additional technical assistance visit (TAV) to assess the potential hazards associated with approximately 130,000 pounds (lbs) of Tritonal (80 percent (%) TNT and 20% aluminum powder) stored by Explo Systems, Inc. (Explo) in building 1650 at Camp Minden, LA. LASP and LANG believed these explosives posed a potential explosive hazard to an on-post public traffic route. LASP and LANG requested the TAV also assess other explosives that Explo has in storage at Camp Minden. This was a follow-up to a TAV provided by the Army on 2 and 3 April 2013. The Army provided the report of that visit dated 18 April 2013, to The Adjutant General of the Louisiana National Guard.

b. During 7 to 9 May 2013, a team, under the direction of Mr. James Young, Headquarters, Department of the Army, G-4, conducted the requested TAV. The team consisted of:

- Mr. James Young, Quality Assurance Specialist (Ammunition Surveillance), Department of the Army, G-4
- Mr. James Lane, Defense Ammunition Center (DAC)
- Mr. Russel Ingle, DAC
- Mr. Terry Trivitt, US Army Technical Center for Explosives Safety (USATCES)
- Mr. Paul Cummins, USATCES

## **2. Executive Summary.**

a. As requested, this TAV team assessed the hazards associated with the handling and storage of Tritonal in building 1650, offered to the LANG a demilitarization plan for propellant and explosives generated by Explo, and recommended an approach for establishing a propellant stability program for approximately 15M lbs of M6 propellant remaining at Camp Minden for which lot identity has been lost, pending the final disposition of the M6.

b. The TAV team observed additional explosives that Explo had in storage beyond the M6 propellant addressed by the initial TAV, which was conducted 2 and 3 April 2013, and the Tritonal in building 1650. The Tritonal in building 1650 was the primary subject of this TAV. Recommendations to address the potential explosive hazards associated with these additional observations are made below. The total quantity of Explo explosive material the TAV team observed at Camp Minden included:

- 128 lbs of Black Powder
- 200 lbs of Composition H6

- 4 50-gallon drums of Ammonium perchlorate
- 2 50-gallon drums and 150-lb boxes Explosive D (ammonium picrate)
- 109,000 lbs of M30 Propellant
- 320,000 lbs of Clean Burning Incendiary (CBI)
- 661,000 lbs of Nitrocellulose
- 1.817M lbs of Tritonal, mixed with tar
- 15M lbs of M6 propellant

c. The recommendations from both the initial TAV (conducted 2 and 3 April 2013), which focused on the explosive safety hazards posed by approximately 18M lbs of M6 propellant, and this TAV were offered to LASP and LANG for consideration for reducing the potential explosive hazards posed to the public by Explo's operations. On 20 May 2013, the Commander, Camp Minden informed the Army that effective 1200 hrs, on 20 May 2013, Explo-related public safety issues had been resolved, and LASP had revoked Explo's explosive license pending resolution of criminal charges.

## Observations and Recommendations

### Building 1650

**Observation:** The only building on Camp Minden's S-line that continues to store Explo's explosives is building 1650. This is a metal structure containing approximately 130,000 lbs of Tritonal (80% TNT and 20% aluminum powder, with some tar contamination). The Tritonal in this building is contained in palletized, cardboard boxes. The explosives safety quantity distance arcs from this building extend over 3<sup>rd</sup> Avenue, which is an on-post road that is used as a local school bus route; therefore, it is considered a public traffic route. LASP and LANG consider this a public safety issue. The TAV team agreed this public exposure poses a potential catastrophic risk that should be addressed.

**Recommendation:** The TAV team believes, based on its observations and the condition of this Tritonal, that this Tritonal is safe to handle, transport, and store in its current configuration on post. However, some boxes may need to be re-palletized. The TAV surveyed 20 earth-covered magazines during the course of its review and identified storage space appropriate for the Tritonal currently in building 1650. The TAV team recommends the Tritonal be re-warehoused to the earth-covered magazines identified, as soon as possible. Once this is accomplished, the potential explosives safety hazards on the S-Line in building 1650, which are of concern to the LASP and LANG, will be eliminated. This will be a significant accomplishment to reduce public risk.

### Disposition of M6 Propellant and other Explosives

**Observation:** The TAV team surveyed an area for burning explosives (potential burning ground), primarily the M6 propellant. This area, which is next to Camp Minden's E-Line, could be used for open burning (treatment) of propellants (Hazard Classification {HC} 1.3) and potentially for explosives (e.g., Tritonal), which are HC 1.1, and explosive-contaminated material (e.g., red water). (See Figure 1.)

**Recommendation:** The TAV team recommends (a) vegetation be cleared in and around the potential burning grounds; (b) access to areas to be used for burn pans, staging and explosives handling, and to the storage area for support material and equipment be improved; (c) crushed rock be added throughout the burning grounds; and (d) a personnel operating structure be sited outside of K-24 for the crew's use during burns. The TAV team also recommends consideration be given to installing barrier material to minimize potential environmental contamination due to residues from treatment of propellant and other materials. Applicable environmental requirements under federal, state and local laws pertaining to waste storage, treatment, and disposal operations involving burning, including permitting, which are not otherwise discussed in this report, should be

addressed by the LANG. The burning grounds may be sited to accommodate 10 burn pans, each capable of holding up to 4,000 pounds of propellant per burn. Assuming LANG could conduct 2 burns of up to 80,000 lbs per day, the remaining M6 propellant (approximately 15M pounds) might be destroyed in less than a year.

## **Propellant Burning Operations**

**Observation:** Open burning of propellant and other explosives is an extremely hazardous operation that requires a comprehensive explosives safety management program (ESMP).

**Recommendation:** If LANG decides to conduct these burning operations, the TAV team recommends LANG or LASP begin planning for the equipment and support needed for this operation. To assist in planning, the TAV recommends LANG and/or LASP consider the actions listed below prior to conducting burning operations.

- Determine the ownership of the materials to be disposed, and LANG's or LASP's authority to dispose of these materials.
- Seek the assistance needed, if any, to carry out the recommended actions.
- Coordinate with environmental regulators and obtain environmental permits, if any, required by applicable federal, state, or local laws or regulations.
- Develop:
  - Burning ground site safety plan.
  - Standing Operating Procedures.
  - Qualifications and responsibilities or tasks for the personnel involved (e.g., supervisor, technical support, surveillance personnel).
  - Procedures for physical security and access control that are required to ensure worker and public safety.
  - Spill response plan.
- Fabricate burn pans and equipment required to load propellants into the burn pans.
- Clear vegetation, conduct surface improvements and any required construction.
- Establish and site an operating building for the crew's use during burning operations.
- Determine the:
  - Type of firefighting equipment needed on site, and coordinate with local medical and fire departments for contingency support.
  - Tools, Material Handling Equipment, and personnel protective equipment (PPE) required for the conduct of operations.
  - Electrical support, including grounding systems, required for safe operations.
  - Federal, state, or local regulatory requirements that may apply to closure of the burning grounds after these operations are complete.

- Plan and implement solid and hazardous waste (e.g., ash) collection, sampling and disposal procedures.

## **M6 Propellant Stability**

**Observation:** Low stability content can result in auto-ignition of propellant in storage, causing a detonation. At Camp Minden, Explo's operations appear to have resulted in the loss of lot identity for the M6 propellant that Explo has in storage. Explo's packaging configurations (e.g., incorrect lot markings on containers and outer-packs, multiple markings); storage procedures, which exposed some of the packaged propellant to the environment; and packaging process, which may have mixed lots led the TAV team to conclude that lot identity was, at a minimum, questionable. Explo did not have a propellant stability monitoring program in place. Although the transfer of M6 propellant to earth-covered storage has reduced the risk to public safety, an explosive event (i.e., a detonation) from auto-ignition is very possible without a propellant stability monitoring program in place to track the propellant's stabilizer content and address potentially unstable propellant.

**Recommendation:** The TAV team recommends a plan for establishing a propellant stability monitoring program at Camp Minden be developed. The potential risks associated with the continued storage of propellant should be conveyed to all concerned, including commercial contractors located on Camp Minden. The TAV team also recommends LANG seek the assistance it needs, if any, to develop this plan.

## **Other Matters:**

- **Observation:** The TAV team surveyed 20 earth-covered magazines, operating buildings, and the Super Critical Water Oxidation (SCWO) operating building. Explo reportedly was developing the SCWO under a sub-contract with General Atomics. In addition to the M6 propellant and Tritanol, Explo had in storage: Explosive D (ammonium picrate); Composition H6; black powder; M30 propellant; nitrocellulose in water (marked ATK-Radford AAA), and clean burning incendiary (CBI). Explo stored M6 propellant in 3 configurations: 880 lb sacks, 110 lb drums, and 32 lb cardboard boxes. These materials are discussed in other observations below and quantities are summarized here.

**Recommendation:** Based on the condition and known hazards associated with the above mentioned explosives, the TAV team recommends disposal of this material in the order of priority indicated below. The recommended method of treatment is also provided.

- Explosive D in drums, which may have crystallized, making it more sensitive, should be disposed of as soon as practical. (LASP has requested Army Explosive Ordnance Disposal (EOD) assistance in assessing the condition of

these explosives and recommending to LASP courses of action for LASP to dispose of it safely.) Quantity: 2 50-gal drums (1 metal, 1 plastic) and 3 50-lb boxes.

- Ammonium perchlorate, which may have crystallized, making it more sensitive, should be disposed. Quantity: 4 50-gal drums (plastic).
  - SCWO influent, unknown quantity or composition. Quantity: several 16 oz bottles and a large tank.
  - Black powder, nitrocellulose, in water and CBI – destroy by burning. (Quantity: 128 lbs of black powder, 661,000 lbs of nitrocellulose, and 320,000 lbs of CBI).
  - M30 Propellant – destroy by burning. Quantity: 109K lbs.
  - Composition M6 Propellant – commercial sales or, if necessary, destroy by burning. Quantity: 15M lbs.
  - Tritonal – destroy by burning or open detonation. Quantity: 1.817M lbs.
  - Composition H6 – destroy by burning or open detonation. Quantity: 200 lbs.
- **Observation:** Building 1619 contains equipment for demilitarizing 750 lb bombs including equipment for melting out explosives and flaking Composition H6. This equipment and material, which is heavily contaminated with explosives residues, includes: autoclaves, kettles, re-melter, flaker belts, pumps, piping, rails, and platforms. In addition, the building that housed this operation is heavily contaminated. Among other contamination, the TAV team observed explosive-contaminated fixtures, sprinkler systems, walls, floors, and ceilings.

**Recommendation:** The TAV team recommends LANG explore the feasibility of decontaminating; disassembling, with additional decontamination, as required; and disposal of explosive-contaminated material that cannot be decontaminated. The TAV team also recommended LANG seek the assistance it needs, if any, to develop a plan for decontaminating this explosive-contaminated material.

- **Observation:** Approximately 200 lbs of Composition H6 is in building 1619 near the Composition H6 flaking operation.

**Recommendation:** The TAV team recommends LANG prepare a plan for collecting and packaging the explosives left in this building and moving it to earth-covered storage.

- **Observation:** Inside building 1619 (between the 750 lb bomb demilitarization operation and Composition H6 flaker belts) is a hazardous waste storage area holding with 3, 50-pound boxes of Explosive D.

**Recommendation:** These explosives are recommended to be disposed as waste in coordination with the appropriate regulatory agency. (LASP has requested Army EOD assistance in assessing the condition of these explosives and recommending to LASP courses of action for LASP to dispose of it safely.)

- **Observation:** The SCWO is not operational, but four drums of ammonium perchlorate mixed with water and two drums of ammonium picrate (Explosive D) mixed with water, which were used as feedstock for the SCWO, remain.

**Recommendation:** These drums are recommended to be disposed as waste, in coordination with the appropriate regulatory agency. (LASP has requested Army EOD assistance in assessing the condition of these explosives and recommending to LASP courses of action for LASP to dispose of it safely.)

- **Observation:** There are two large effluent tanks in the SCWO building that contain unknown material. According to Explo personnel, these tanks only contain iron oxide in water, and were reportedly tested by Toxicity Characteristics Leaching Procedure (TCLP) analysis.

**Recommendation:** Ownership and responsibility for SCWO-related materials should be determined by the LANG. LANG may coordinate with the owner to arrange for suitable chemical analysis and seek the material's proper disposal in compliance with applicable federal and state laws.

- **Observation:** A refrigerator in the SCWO building contains several 16oz plastic containers of test influent that was intended as input for the SCWO.

**Recommendation:** LANG may coordinate with the material's owner to arrange for suitable chemical analysis and then seek the materials proper disposal in compliance with applicable federal and state laws. (LASP has requested Army EOD assistance in assessing the condition of these explosives and recommending to LASP courses of action for LASP to dispose of it safely.)

- **Observation:** A large stainless steel tank in the SCWO building contains an unknown chemical influent intended as input for the SCWO. This container potentially contains Explosive D and/or ammonium perchlorate.

**Recommendation:** This container should not be moved, handled, or its contents removed until its contents are analyzed and identified, and proper disposition is determined. LANG may coordinate with the material's owner to arrange for suitable chemical analysis and proper disposal in compliance with applicable federal and state laws.

- **Observation:** The TAV team recommends that safety clearance zones near the E-line be established for the potential burning grounds.

**Recommendation:** Figure 1 (below) depicts the safety clearance zones the TAV team recommends for the burning grounds. With the recommended safety clearance, the burning grounds should be able to accommodate safely 10 burn pans, each one capable of holding up to 4,000 pounds of propellant.



Figure 1