ATTACHMENT 11

M-136 and M-225 Thermal Treatment Operations

11.0 PROCESS INFORMATION

All reactive waste management operations at the facility are conducted and are under the management of ATK. The reactive waste management process is described in the following text.

11.1 Facility Description

The ATK Promontory facility is located in a remote area of west Box Elder County, Utah, approximately 30 miles northwest of Brigham City, and approximately 11 miles north of the Great Salt Lake. The facility was purchased by Thiokol in 1956, with the exception of a 1,500-acre tract that was sold to the U.S. Air Force in 1958 and then repurchased in 1995. The facility has been held in its entirety since purchase.

ATK Launch Systems conducts thermal treatment of reactive hazardous wastes at two treatment units: (1) the main facility, M-136, located centrally to the two main manufacturing sites; and (2) M-225 located in a remote development location called Plant III.

M-136 is the primary treatment area for conducting open burning at the Promontory facility. Open detonation is also conducted at M-136 which is a secured fenced facility within the main facility fence.

The M-225 treatment area receives small amounts of the reactive hazardous waste materials from the Plant III propellant development area. The M-225 treatment unit is surrounded with an 8-foot high chain link fence. The waste materials are treated via open burning or open detonation.

The M-136 and M-225 treatment areas are fenced and are located within a controlled and fenced facility that is patrolled and maintained by a security department. The treatment areas have warning signs posted around the perimeter. The vegetation is controlled within the treatment areas through application of herbicide and putting in place loads of gravel and road base. Surrounding both treatment areas are a large system of fire breaks that are constructed using large equipment to till and cultivate a large strip of land removing any vegetation. The system of fire breaks are designed to contain a fire within its boundaries.

Contained within the boundaries of the M-136 treatment area are twelve former surface impoundments called Liquid Thermal Treatment Areas (LTTAs). These impoundments were used for the disposal of hazardous waste and wastewater and then capped and closed. The units are currently under post closure care and managed through a Post Closure Permit which includes requirements for groundwater monitoring and corrective action. The Post-Closure groundwater monitoring program includes all wells around the M-136 and M-225 treatment areas as part of the groundwater monitoring system. These wells are routinely monitored thorough the permit requirements which includes the Sampling and Analysis and Quality Assurance Plans.

The Promontory facility is located in the Blue Spring Valley which is bounded on the east by the Blue Spring Hills and on the west by Engineer Mountain and the Promontory Mountain ranges. Within the Blue Spring Valley, the terrain is characterized by topography that slopes down from the mountain crest at an elevation of approximately 6,050 feet above mean sea level (AMSL) toward the center of the Blue Creek Valley at an elevation of 4,250 feet AMSL. As a result, the surrounding environment extending out to 6.2 miles (10 kilometers) from both treatment units can be characterized as complex terrain.

GEOLOGY

The ATK facility is located in the Southern Blue Creek Valley, northwest of the Salt Lake Valley, which is the eastern most structural valley of the Basin and Range physiographic province, which includes parts of Utah, Idaho, Nevada, Arizona, and New Mexico. The Basin and Range province consists of a number of north-south aligned mountain ranges and valleys bounded by high-angle normal faults. The Blue Creek Valley, in which ATK is located, is bounded on the east and west by the Blue Springs Hills and the Engineer and Promontory Mountain ranges, respectively. Movement along the faults has displaced the mountains upward relative to the adjacent valley. Likewise, the mountains immediately west of ATK are bounded on their eastern margin by one or more faults which are partly buried by recent deposits.

Bedrock, composed of Middle Paleozoic shale, sandstone, and limestone, is exposed in the ranges adjacent to the site. The bedrock is highly fractured with some folding.

During the Mississippian and Permian Periods, marine sediments consisting of sand, clay, and calcareous detritus were deposited in shallow marine environments. In the late Cretaceous Period, compressional forces from the west resulted in folding and thrust faulting in conjunction with uplift of the region into mountain ranges. Extensive jointing and fracturing of the bedrock were caused by this folding and faulting episode. Tensional stresses in the early to middle Tertiary Period resulted in north south trending normal faults that formed a series of high linear mountain ranges with intervening basins which received sediment from adjacent highlands. This activity was associated with volcanism and ancient lake deposition.

In the late Tertiary Period, a series of geologic units tentatively identified as the Salt Lake Group were formed from deposition of sediments in large lakes which developed within the valleys. These lake deposits are composed primarily of silts and clays with minor amounts of sand and gravel and are characterized by low to moderate permeabilities; extensive deposits of volcanic ash are also present in the Salt Lake Group. The alluvial fan deposits were overlapped by more recent lake sediments of Pleistocene Lake Bonneville, the predecessor to the present Great Salt Lake. Lake Bonneville covered much of western Utah and parts of Idaho and Nevada between about 23,000 and 12,000 years ago. Deposits associated with the lake consist of lakebed and alluvial materials reworked by lake bottom and shoreline processes. Lake Bonneville sediments thicken southward.

The most recent sedimentary deposits consist of stream alluvium and mud and debris flows. The stream alluvium consists primarily of silty and clayey sand and gravel. The mud and debris flow deposits are characterized by a broad gradation of sediments from clay-size fines to boulders as large as 3 feet in diameter.

HYDROGEOLOGY

Ground water in Blue Creek Valley occurs under unconfined and confined conditions. These two conditions exist in fractured and faulted bedrock, lake clays and gravels, unconsolidated alluvium, gravel, and sandy deposits. Precipitation, surface water infiltration, and plant discharges that infiltrate into sediments may migrate slowly, vertically, and horizontally to form perched water tables above the 50- 150-foot depth of the regional water zone. The perched ground water may eventually migrate to the deeper regional system. The regional system ranges from 50- 600 feet in depth depending on the topographical location. Blue Creek may recharge shallow aquifers in the center of the Blue Creek Valley. The direction of movement within the faulted and fractured bedrock will be controlled by the connection of faults and fractures. Regionally, the ground water flow trend is from north to south. Depth to groundwater at the M-136 treatment units is an average 300 feet. Depth to groundwater at the M-225 treatment unit is 600 feet.

The ground water quality in Blue Creek Valley is generally poor due to naturally occurring chlorides and total dissolved solids. Levels of dissolved solids range from 400 to over 12,000 mg/l. The quality of ground water depends upon the sediments, which it has contacted. Quality is quite good in local, up gradient areas of water recharge, but degrades rapidly as it moves from mountain to the valley axis. High levels of total dissolved solids in lowland areas are probably due to slow migration through Tertiary sediments. Down gradient from the ATK sites, quality deteriorates rapidly as it enters the mudflats of the Great Salt Lake.

CLIMATE

ATK has a 10-meter meteorological tower and instruments to measure and record air temperature, barometric pressure, relative humidity, solar radiation, precipitation, vertical and horizontal wind speed, and direction.

The ATK plant site is classified as semiarid, with an average annual total precipitation of 14.88 inches at the ATK meteorology station. During the winter months, the average total snowfall amounts to 24 inches. Precipitation typically occurs on 95 days out of the year (includes trace precipitation). During the year, it would be expected that 35 percent of the days would be clear, 30 percent of the days would be partly cloudy, 34 percent would be cloudy, and fog would be expected to occur about 1 percent of the time. According to interpreted weather data for the ATK facility, the 25-year storm with 24-hour duration would result in 2.4 inches of precipitation.

Evaporation rates are high throughout the year, with the Great Salt Lake averaging 66 in. a year. The average area evapotranspiration rate is 46.6 inches. The consistently low precipitation and high evaporation allow little if any percolation into subsurface soils.

The average annual temperature in the ATK Promontory area is in the 45 to 50 degree range, with generally hot, dry summers. Relative humidity averages between 20 and 30 percent during summer afternoons. Nights are usually cool, but daytime maximums occasionally exceed 100 degrees F. On clear nights, cold air usually drains from the slopes of the adjacent ranges and accumulates on the valley floor, while the foothills and bench areas, such as at ATK, remain relatively warm. The average daily temperature ranges from about 11 to 32 degrees F in January and from about 54 to 91 degrees F in July.

On an annual basis, the winds for the valley tend to prevail from the north during the earlier morning hours and south to southeast, averaging about 10 mph, during the afternoon.

Blue Creek is the only perennial stream in the valley drainage basin and is the closest water body to the M-136 treatment unit. Blue Creek originates some 15 miles north of the Promontory facility from a warm saline spring, which flows along the western boundary of the facility.

The Promontory area is characterized as a very sparsely populated rural region, with primarily dry farms and ranching activities. Low growing perennial grasses and shrubs characterize the vegetation in the area. The ecological habitat found at the Promontory facility includes many head of mule deer and large populations of various birds, rabbit, and predator species.

11.2 WASTE CHARACTERIZATION

Wastes will be characterized to identify hazardous properties to ensure they are properly managed. The Waste Analysis Plan (see Attachment 1) will be used to characterize and classify reactive wastes.

11.3 REACTIVE WASTE DESCRIPTION

The primary products produced at the facility include solid rocket motors, military and aviation flares, and high explosive/high energy compounds. Solid rocket motors are typically cast with composite propellants. Composite propellants are classified as a DOT 1.3 material, and typically contain a non-explosive liquid binder mixed with aluminum powder and ammonium perchlorate. Flares are generally classified as a DOT 1.3 material, and typically contain an inert binder, a metal powder, and an oxidizer. High explosive compounds are generally classified as DOT 1.1 material and are generally nitramine compounds developed for specific military requirements. Reactive wastes are produced from the manufacturing process include, but are not limited to the following: cured and uncured propellants; rocket motors; small initiating devices; explosives articles, propellant scrap; and explosive ingredients such as HMX, RDX, CL-20, explosive contaminated metal powders such as aluminum and magnesium and oxidizers such as ammonium perchlorate and potassium perchlorate. The facility also contains both quality assurance and research and development laboratories. The quality assurance laboratories generate wastes similar to manufacturing wastes. The Research and Development laboratories generate a small quantity, but a wide variety of both explosive compounds and precursors to explosive compounds.

Reactive wastes are characteristic hazardous wastes for reactivity (D003). Nearly all of the reactive wastes are reactive due to the presence of propellants and explosives. Some reactive wastes, such as those from laboratory operations, may contain solvents which would also be a listed waste defined by R315-261-1 of the UAC. Wastewater treatment sludge generated from the processing of explosives is a K044 listed hazardous waste. Reactive wastes also include materials such as rags, gloves, other personal protective equipment, plastics, rubber and paper contaminated with explosive materials during the manufacturing process.

Reactive wastes may also be received from off-site sources. With one exception, off-site wastes are rocket motors, propellants or explosives with similar formulations and ingredients to those generated on site.

11.4 REACTIVE WASTE GENERATION AND COLLECTION

ATK uses a variety of containers to store reactive wastes at the Facility. The standard containers used at the Facility are described in this section. However, due to the nature of our business, new types of containers may be required in the future, and can't be described in this application. To ensure that all containers are safe to use, containers will be selected using the DOD Contractor's Safety Manual for Ammunition and Explosives (DOD 4145.26-M). All containers for reactive waste that are currently used, or will be used in the future, will meet the DOD 4145.26-M requirements.

Operating buildings generating reactive wastes use a variety of collection containers as described below:

- **Conductive Containers** –Electrically conductive containers are typically bags made of opaque, volume-conductive carbon-impregnated polyolefin or polypropylene. They can be grounded to prevent the build-up of static electricity. The bags are available in a variety of sizes from small containers to large than one cubic yard. They are typically used to line other containers, but can be used without an outside container. Typical conductive containers include Velostat® bags, Velostat® sheet material, and conductive sling bag and Super Sack® containers.

- **Static Dissipative Containers –**Static dissipative containers are typically bags made of a polyethylene material. The material prevents the build-up of static electricity by continually dissipating the charge. These bags are typically used to line other containers, but may be used without an outside container. Typical static dissipative containers include pink poly bags, pink poly sheet material and static dissipative Cromhmiq™ sack containers.

- **Fiberboard drums –** Wastes may be collected directly into commercially available 30-gallon fiberboard drums. These drums have a removable lid that can be sealed in place with a locking chime after the drum is filled. Fiberboard drums selected for this application are approved by DOT for highway transportation of hazardous materials and can be used to ship these wastes off-site for treatment and disposal.

- **Sumps**- Explosive contaminated wastewater is collected in sumps at the point of generation. When appropriate, propellant "chips" and other suspended solids are filtered out before the wastewater reaches the tank, and when the wastewater is pumped out of the tanks. The wastewater is pumped into tanker trucks where it is treated at M-705 and discharged under a UPDES permit. Filters containing "chips and other suspended solids are accumulated , and treated and disposed of in accordance with the applicable hazardous waste management rules.

- **Other Containers –** Large blocks of cured propellant are containerized by wrapping the waste in plastic and placing it on wood pallets. Ammunition cans are used to hold initiating and ordnance items. Waste rocket motors are generally large enough to be their own container. Plastic buckets are used to hold conductive and static dissipative bags. The buckets are reused and become contaminated with reactive material. The buckets are cleaned by removing the contaminated material using a rag. The contaminated rag is then collected for disposal and managed as directed in UAC R315-262. If a bucket cannot be cleaned, it is managed as a hazardous waste and treated by open burning. Laboratory waste may come in a variety of sizes and types of containers such as plastic, metal or glass. DOT containers for Class 1.1 and 1.3 reactive materials may also be used. A plastic cover secured to a tray may be used as a container for unburned residue or containers of off-site waste stored in a tray prior to thermal treatment.

Operating personnel accumulate reactive waste in these containers as it is generated. When a reactive waste container is full or at the end of an operating shift, it is closed or sealed as applicable for the container. A hazardous waste label is filled out and attached to the container. Operators at the buildings that generated the waste enter pertinent information into the electronic waste tracking system described in Section 11.5.

Most operating buildings that generate reactive waste have an explosive waste collection area located approximately 50 feet from the operating building. Except as described below, waste containers are placed in the collection area to facilitate removal of waste propellant, explosive and reactive wastes from the operating buildings. The collection sheds are constructed of wood or corrugated metal and are secured to a concrete floor.

When managing reactive wastes, ATK building operators use the temporary collection sheds as 90-day or satellite accumulation stations. Reactive wastes are placed in the collection area either as they are generated or at the end of each operating shift. Waste containers that are not full at the end of a shift are sealed, a hazardous waste label is attached to the container and they are moved to the temporary collection area.

Containerized explosive wastes are picked up from the collection location using a vehicle approved for the transport of explosive wastes. Extreme care is used when handling all explosive wastes. Wastes are transported directly to either M-629, S-633 for storage, or to the M-136 or M-225 burning ground.

Propellant and explosive operating buildings at the facility, including explosive waste 90-day storage and satellite accumulation areas, are designed and constructed in accordance with strict federal standards. These standards identify the criteria that must be used to construct buildings where reactive material will be used and/or stored. These standards also require that explosive buildings to be separated by sufficient distance, or a quantity-distance relationship, to prevent an explosive event in one building from propagating to another building. Quantity-distance rules also control the location of propellant and explosive operating buildings with regard to public property (highways, parks, etc,) and private property. All buildings used for temporary storage of waste explosives, including the temporary storage sheds, are correctly sited with respect to the applicable quantity-distance rules.

11.5 QUANTITY DISTANCE DETERMINATION

The facility uses the Department of Defense (DOD) guidance to calculate quantity distance relationships. The evaluation was conducted according to NAVSEA OP5, Volume 1, Revision 4, Paragraph 11-3.2. The method used to determine safe quantity distance relationships for both Class 1.1 and 1.3 propellants is provided below.

The quantity distance relationship for Class 1.3 propellant is determined by the following formula: $\mathbf{D = 5W^{1/3}}$. Where W is the weight of Class 1.3 propellant and D is the safe distance. The formula applies to Class 1.3 propellant and Class 1.3 propellant ingredients. The safe distance is defined as the interline protection for mass fire for Class 1.3 propellant.

The quantity distance relationship for Class 1.1 propellant is determined by the following formula: $\mathbf{D = 18W^{1/3}}$. Where W is the weight of a Class 1.1 explosive and D is the safe distance. The formula applies to Class 1.1 propellant and Class 1.1 propellant ingredients. The safe distance is defined as the unbarricaded interline protection for Class 1.1 propellant.

11.6 WASTE TRACKING

ATK maintains an electronic waste tracking record to collect and manage information about reactive wastes generated at the facility. This tracking system uses a combination of paper records and an electronic database.

Wastes being accumulated in containers at operating areas within the facility are labeled and managed in accordance with R315-262 of the UAC for either a satellite accumulation or less than 90-day hazardous waste storage area. The electronic tracking system maintains the following information to monitor cradle to grave waste handling practices:

- ID# - container identification number
- Date – accumulation date
- Building # - identifies where the waste was generated;
- RWDI# - identifies the reactive waste disposal instruction
- Profile # - identifies the profile
- Quantity of PEP – quantity of propellant, explosive or pyrotechnic material ;
- Quantity of Contaminated waste - Explosive and total weight of the container;
- Material Description – description of the material
- Propellant name – describes the propellant by type, program other identifier
- Log Date – date logged into the system

The electronic tracking system maintains information on all containers of reactive waste in 90- day storage at M-136 and M-225. It also tracks the total weight of waste placed on each burn tray, and the total weight of waste burned on any given day.

In the event reactive waste is shipped off-site for treatment, the system maintains the following information: the manifest number, transporters, manifest ship date, and manifest return date.

In the event the electronic tracking system is not operable, the information will be tracked using paper copies until the electronic system is operable. In the event this occurs, ATK will transfer all information to the electronic system within 3 business days of the system becoming operational again.

11.7 REACTIVE WASTE STORAGE

ATK may store hazardous wastes prior to disposal. Solid reactive wastes are stored in designated facilities as described in this section, and are segregated according to compatibility requirements.

- **M-629** - This building can be used to store any of the explosive wastes listed in Section 11.3. All containers of waste in storage will be closed except when waste is being added to or removed from the container. Adequate aisle space must be provided to permit proper container inspection. All containers will be labeled and managed in accordance with R315-262. This building is equipped with a fire sprinkler system, which is checked annually. Employees are not permitted to fight fires inside an explosive storage building. This building is totally enclosed, so there are no precipitation run-on or run-off concerns.

- **M136**- trays at M-136 can be used to store waste containers prior to treatment subject to the terms of the Permit. In addition, waste rocket motors may be stored on the ground at Burn Station 14 prior to treatment subject to the terms of this Permit. All containers of waste must be closed, labeled and managed in accordance with R315-262.

- **S-633**- This storage pad can be used to store any of the explosive wastes listed in Section 11.3. All containers of waste in storage will be closed except when waste is being added to or removed from the container. Adequate aisle space must be provided to permit proper container inspection. S-633 is approximately 100’ x 100’ in size. It is secured by a perimeter fence, a vehicle access gate that can be locked, and has the appropriate warning signs for a storage area. It has a road base surface, and has lighting protection. All waste containers will be labeled, and managed in accordance with R315-262. This area does not have water immediately available, and relies on the Fire Department for any emergency action. Employees are not permitted to fight fires inside a reactive waste storage area. Precipitation run-on or run-off is prevented by a combination of diversion ditches, collection ditches and trenches.

11.8 TREATMENT OF REACTIVE WASTE

The facility utilizes thermal treatment methods to safely dispose reactive hazardous wastes. Thermal treatment methods include both open burning and open detonation. Reactive hazard wastes may also be shipped off-site and treated at other permitted treatment storage and disposal facilities.

11.8.1 OFF-SITE TREATMENT OF REACTIVE WASTE

All hazardous reactive wastes treated off-site will comply with all applicable local, State and Federal regulations.

11.8.2 ON-SITE TREATMENT

The M-136 and M-225 facilities are thermal treatment units designed to treat reactive hazardous wastes using open burning or open detonation. Treatment by open burning at M-136 is limited to a maximum of 125,000, 122,000, or 1,200 pounds per day depending on the treatment scenario. Thermal treatment scenarios are limited to those shown in Table 1 below. Treatment by open detonation will be conducted at burn stations 13 and 14 only, and is limited to 600 pounds per burn station. Figure 11-2 shows the security fence, control bunker, and vehicle access points for M-136.

Treatment by open burning at M-225 is limited to a maximum of 4,500 pounds per day. Each burn station 1-4 may burn all or a portion of the 4,500 pound limit. Treatment by open detonation is limited to the 600 pounds per day in the M-225 open detonation area. Figure 11-2 shows the security fence and vehicle access points for M-225.

The process flow for open burning at both treatment areas is identified below:

1. Pre-planned Activities
2. Placement of Waste in Treatment Units, Wiring and Ignition
3. Post-burn Inspection and Cleanup

The following precautions are used to ensure operator safety while working at the M-136 and M-225 burn grounds:

1. Emergency egress routes are always maintained while employees are working in the treatment areas.
2. The firing systems are disabled using an interlock to prevent accidental ignition.
3. Weather conditions are monitored to assure operators are not exposed to risks from lightning strikes.

TABLE 1 - ATK Promontory OB/OD Treatment Limit Scenarios Appendix A, June 2016 HHRA Report

Treatment Scenario	Treatment Scenario Description	Annual Emissions Rates – Chronic Exposure Max. lbs/year	Annual Emissions Rates – Chronic Exposure Max. lbs/day	One-Hour Emission Rate – Acute Exposure Max. lbs/event (or hour or day)	Annual Max ÷ One-Hour Emission Rate lbs/event (or hr)
M-136 A1	OB in 6 Stations – 1,4,7,8,10 and 11	6,720,000 (1,120,000X6)	18,408 (3,068X6)	96,000 (16,000X6)	70
M-136 A2	OB in Station 13	840,000	2,301	10,000	84
M-136 A3	OB in Station 14	840,000	2,301	16,000	52.5
M-136 B	OB of large rocket motors in Station 14	1,500,000	4,110	125,000	12
M-136 C13	OD in Station 13	50,000	137	600	83.333
M-136 C14	OD in Station 14	50,000	137	600	83.333
M-225 A	OB in Stations 1 through 4	55,000	151	4500	12.222
M-225 B	OD in Station 1	10,000	27	600	16.666

The Permittee shall not operate more than one treatment scenario at M-136 or M-225 in a calendar day. One treatment scenario can occur at M-136 and M-225 on the same calendar day.

11.8.2.1 PRE- PLACEMENT ACTIVITIES

OBOD operations at the facility are a continuous process. Wastes are transported from the generation areas and brought into the treatment areas on a daily basis. Wastes are off-loaded and placed in trays and managed under 90-day rules at M-225 and as a permitted storage area at M-136 until treatment occurs. When treatment is completed, the trays are cleaned, inspected and the loading process begins again. Pre-placement inspections occur during the post-burn inspection and clean-up phase of the treatment process.

Prior to placing reactive waste for treatment at the OBOD facilities, operators visually verify the following tasks were completed during post-burn inspection and cleanup activity:

1. Any untreated waste and/or unburned residue has been identified, collected and is being properly managed;
2. Storm water accumulated in the trays has been removed.
3. Trays which do not meet the inspection criteria have been removed from service.

11.8.2.2 PLACEMENT OF WASTE IN TREATMENT UNITS

Reactive hazardous waste is transported to the OBOD facilities using a vehicle which meets explosive safety requirements. Reactive hazardous waste may be offloaded by hand or mechanical means including a knuckle boom, forklift, crane, or other appropriate equipment. Reactive hazardous waste is not collected, transported, or unloaded during a lighting warning, which is defined as lightning within 30 miles of the facility. If collection, transportation, or unloading operation has started, the operation is brought to a safe halt.

Treatment units used to treat and contain waste are listed below but are not limited to, the following:

- **Burn Trays** – Metal trays constructed in several different sizes including, 4’X10’, 5’X16’, 8’X8’, and 8’X20’. Typical construction is out of steel plate A36 grade steel ranging thicknesses of ¼”, 3/8”, ½”, ¾”, and 1 inch.

- **Clamshell Disposal Trays**– Used for the disposal of items that have the potential to be propulsive. Typical construction is a square welded box 1-inch thick, A36 steel plate with a vented lid that enables treatment of potentially propulsive items, while safely containing the propulsive energy.

- **Restraining Trays are t**ypically constructed of 1-inch thick A36 steel plate welded into a square box that is filled with sand. There are several different designs for restraining trays which include: (1) steel tubes sitting on end in the sand are used to hold potentially propulsive items which are secured to the tube allowing the exhaust to vent out of the open end of the steel tubes, and (2) used without steel tubes where propulsive items are secured at the base for items where the exhaust will vent from the side of the item.

- **Small Motor Disposal Vaults**– Constructed from a concrete 10x10 foot sump filled with sand. Small rocket motors such are placed into the sand with the aft end exposed perpendicular to the ground. Motors are treated with the propulsive force directed into the concrete sump and the sand.

The vehicle containing hazardous waste is to be parked near the receiving tray with any side rails lowered to facilitate offloading of the waste. Containers are transferred directly from the truck and carefully placed into the burn tray. Items to be open detonated are offloaded from the vehicle by hand, knuckle boom, or by forklift and then placed on the ground for treatment

Items that have the potential to be propulsive are off-loaded into the clamshell, sandbox, or small motor disposal vault by hand, knuckle boom, or by forklift. After offloading, items are restrained using engineered restraints allowing for safe treatment. Potentially propulsive items (e.g. rocket motors) may also be off-loaded into station 14 using the knuckle boom, forklift, or crane. The case may be placed on the ground, sand/dirt mounds, chocks, or other support media for treatment.

PEP waste which generates ash or residue which is listed or characteristic is segregated from PEP waste which generates non-regulated ash. Ash and residue are managed as described in 11.8.2.5.

11.8.2.3 WIRING AND IGNITION

After waste has been placed on a tray, the next step is to complete a resistance check on the ignition system. As a safety precaution, a physical interlock (e.g. key) is used to prevent the firing panel from being accidently engaged during the resistance check. The key remains in under the control of the operators during the resistance check and all subsequent operations until the operators return to the control bunker to complete treatment. Each firing stanchion must have 10 ohms or less. A firing stanchion that has a resistance of 10 ohms or greater must be tagged out until repairs are made.

Once the resistance check is completed igniter installation is performed. The igniter is attached to the firing system by connecting the lead wire from the initiating device to the firing stanchion. Igniter installation operations are performed by a minimum of two operators. The types of igniters commonly used are listed below:

1. Burn Grounds Igniter –Propellant with a hot wire
2. Bag Igniters – Propellant, explosive, pyrotechnic with electric match or other electric initiation device.
3. Blasting Caps – Small amount of primary explosive
4. Electric Matches – wire attached to small explosive device
5. Fuse – a tube, cord, or the like, filled or saturated with combustible matter
6. EBW – Exploding Bridge Wire, a wire that contacts explosives fired by a high voltage electricity source
7. TBI – Through Bulkhead Initiator, shock initiation of an energetic material provided through an integral barrier

Linear shaped charge may also be used to facilitate thermal treatment of potentially propulsive wastes and items contaminated with reactive hazardous wastes.

Reactive hazardous wastes may be desensitized by adding one of the liquids listed below. The addition of these liquids modifies the reactive nature of the waste making it safer to store, handle and transport. It also slows the burning rate of the material during treatment.

1. Oils
2. Water
3. Alcohol
4. Triacetin
5. Physical Media (e.g. Conductive and static dissipative packaging)

When necessary, additional burn enhancers may be used to promote a more complete burn. Additives include, but are not limited to, the following:

1. Diesel Fuel
2. Alcohol
3. Wood (e.g. Pallets)
4. Propellant

The burning ground operators verify the treatment area has been evacuated of all personnel before proceeding with ignition. The burning ground operators retreat to the control bunker and close the door. The lockout key is inserted into the control system which allows power to the firing panel. Circuit continuity is checked at the firing panel which verifies that igniters were properly installed. A flashing red light is activated once the firing system is operational to alert personnel inside the area that a treatment operation is about to begin. The appropriate stanchion is chosen and the igniter fired by pressing the ignition buttons. Two operators are required for this operation.

In the event of a misfire, operators must wait a minimum period before reentering the treatment area to correct the problem. If a misfire occurs on the first tray, being burned the process stops, and personnel are required to stay in the bunker for at least 30 minutes. After 30 minutes, the igniter which failed is uninstalled. This process requires two employees and is done by: (1) the two employees performing the task remove the physical interlock and keep it in their possession, (2) the igniter wires are removed from the stanchion where the misfire occurred then twisted together to short the circuit. The igniter is not physically removed from its position. A new igniter is installed, and the operators return to the control bunker and repeat the process.

If a misfire occurs and it is not the first tray in the burn sequence, the operators return after 16 hours and repeat the process described above.

The Box Elder County Dispatch is notified prior to each treatment. This notification can be made by telephone, fax or email, and may be made immediately prior to ignition or an undefined number of hours prior to igniting the waste. Notification must be made the same day as the waste is treated.

11.8.2.4 POST-BURN INSPECTION AND CLEANUP

Following a treatment event, the area where the burn or detonation occurred cannot be re-entered for at least 16 hours after completion of the event without specific approval from ATK management. A preliminary inspection is performed before the cleanup begins. This inspection includes checking for hot spots and checking for unburned reactive hazardous waste. Hot spots include visual indications of hot material (flame, smoke, high temperature). If these conditions exist, post-burn clean is postponed until the hot spots are gone.

All residues remaining on the burn trays are visually inspected to determine if there is any unburned reactive material. Unburned reactive material will be reburned. Depending on the nature of the material that did not burn, donor material or burn enhancers such as diesel or wood may be used to ensure the material will completely burn. Unburned waste ejected from the tray will be collected and placed on a burn tray, and treated in the same manner.

Small amounts of untreated residue will be considered as newly generated waste and will be tracked as such in the tracking system. A small amount is defined as less than or equal to 5% of the total volume placed on the tray or treatment area. The primary option for managing this waste is to burn it by 6pm the following calendar day. If untreated residue cannot be treated by 6pm the following calendar day then it will be managed in accordance with R315-262.

Unburned waste that results from a misfire or an interrupted ignition can remain on a burn tray. An interrupted ignition occurs when anything greater than 5% of the waste on the tray fails to ignite. In this situation, the waste is considered unreacted waste instead of newly generated residue. ATK will attempt to reburn the waste by 6 pm of the following calendar day. If unforeseen circumstances prevent the burn from occurring by 6pm of the following day, the waste will be covered and the burn tray will be labeled and managed as a 90-day storage area in accordance with the requirements of R315-262. The cumulative storage time for the waste both in storage prior to burning and on the burn tray may not exceed 90-days. If it is necessary to storage this waste for greater than 90-days, an emergency permit would be requested.

Typically, the post-burn and cleanup activities described in this section will be conducted the next calendar day following treatment. The clean process begins after the preliminary inspection is completed. Cleaning is accomplished using a variety of tools and equipment such as rakes, shovels, a forklift and a tractor. Ash is classified for disposal as described in 11.8.2.5. The majority of the waste treated is classified as EPA waste number D003 reactive only. The ash resulting from treating D003 reactive waste is collected, and transported to the on-site landfill where it is disposed.

Ash classified as hazardous is collected and managed in accordance with the requirements of R315-262. Ash resulting from the treatment of K044 is collected and disposed in the on-site landfill. After the tray is cleaned, it is inspected for holes, weld cracks, and 6 inches of wall height. If a tray fails the inspection criteria, it is removed from service. These inspections are maintained onsite in the operating record. In the event a tray is not going to be used for an extended period, it is stored in a manner to prevent stormwater accumulation (e.g. stored upside down or with a lid). If accumulated liquid is present in a burn tray it is removed and delivered for treatment at a UPDES permitted facility.

11.8.2.5 Ash Classification

A waste assessment is conducted prior to receiving waste for treatment. The waste assessment is made using generator knowledge of the production process, the raw materials used to produce the material, and the chemical composition of the materials. If the assessment identifies that, at the point of generation, the waste meets any of the following three criteria, all ash from the initial treatment is collected, and the ash is sampled and analyzed using the protocol described in Attachment 1.

1. It could potentially contain R315-261-31 listed constituents.
2. It could potentially contain toxicity characteristic constituents above the R315-261-24 regulatory level.
3. It could potentially contain underlying hazardous constituents above the R315-268-48 treatment standards.

Based on the analytical results, the ash is managed using the logic in Attachment 1 Figure 3-2. All ash classified as hazardous based on the above criteria is managed in accordance with the requirements of R315-262.

As stated above, the majority of the waste treated at the burn grounds is classified as EPA waste number D003 reactive only. The ash resulting from treating D003 reactive waste is collected, and transported to the on-site landfill where it is disposed.

To ensure that significant concentrations of perchlorate are not disposed of in the on-site, solid waste landfill, a representative sample of burn ground ash resulting from the typical treatment of D003 reactive waste shall be analyzed for perchlorate on a semiannual basis.

The analytical results of the burn ground ash shall be included with the Promontory Thermal Treatment Areas Annual Report as required by Condition II.G.3.f.

11.9 RECEIVING HAZARDOUS WASTE FROM OFF-SITE

ATK periodically receives reactive hazardous waste from off-site sources. All hazardous waste received from an off-site source will be managed at one of the permitted storage units. All off-site generated hazardous waste will be reviewed and approved prior to being accepted using the following criteria:

- EPA hazardous waste number(s);
- Physical description;
- Chemical description;
- Source of the waste;
- Sampling frequency;
- Parameter for analysis;
- Handling code;
- Tracking system number;
- DOT shipping description; and
- Safe handling instructions

Upon receipt, all off-site generated hazardous waste will be visually inspected to ensure that it meets the acceptance criteria, the manifest is correct, and the containers are labeled, closed, in good condition and compatible with the waste. All deficiencies will be resolved with the generator before the waste is received. After the waste has been accepted, it will be managed using the tracking systems described in Sections 11.6.

11.10 ENVIRONMENTAL PERFORMANCE STANDARDS

R315-264-600 contains requirements for treatment, storage and disposal facilities to meet environmental performance standards to ensure operations are conducted in a manner that ensures protection of human health and the environment. The follow areas of concern have been or are in the process of being addressed to ensure compliance with the performance standard requirements.

Prevention of Releases Due to Migration of Waste Constituents in the Ground Water or the Subsurface Environment - this standard requires actions to prevent releases that may have adverse effects on human health or the environment due to migration of waste constituents in the ground water or subsurface environment. Topics that must be considered are:

- The volume and physical and chemical characteristics of the waste in the unit, including its potential for migration through soil, liners, or other containing structures;
- The hydrologic and geologic characteristics of the unit and the surrounding area;
- The existing quality of ground water, including other sources of contamination and their cumulative impact on the ground water;
- The quantity and direction of ground-water flow;
- The proximity to and withdrawal rates of current and potential ground-water users;
- The patterns of land use in the region;
- The potential for deposition or migration of waste constituents into subsurface physical structures, and into the root zone of food-chain crops and other vegetation;
- The potential for health risks caused by human exposure to waste constituents; and
- The potential for damage to domestic animals, wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents;

Prevention of Releases Due to Migration of Waste Constituents in Surface Water, Wetlands or on the Soil Surface -This standard requires actions to prevent releases that may have adverse effects on human health or the environment due to migration of waste constituents in surface water, or wetlands or on the soil surface. Topics that must be considered are:

- The volume and physical and chemical characteristics of the waste in the unit;
- The effectiveness and reliability of containing, confining, and collecting systems and structures in preventing migration;
- The hydrologic characteristics of the unit and the surrounding area, including the topography of the land around the unit;
- The patterns of precipitation in the region;
- The quantity, quality, and direction of ground-water flow;
- The proximity of the unit to surface waters;
- The current and potential uses of nearby surface waters and any water quality standards established for those surface waters;
- The existing quality of surface waters and surface soils, including other sources of contamination and their cumulative impact on surface waters and surface soils;
- The patterns of land use in the region;
- The potential for health risks caused by human exposure to waste constituents; and
- The potential for damage to domestic animals, wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents.

Prevention of Releases Due to Migration of Waste Constituents in the Air - this standard requires actions to prevent releases that may have adverse effects on human health or the environment due to migration of waste constituents in the air. Topics that must be considered are:

- The volume and physical and chemical characteristics of the waste in the unit, including its potential for the emission and dispersal of gases, aerosols and particulates;
- The effectiveness and reliability of systems and structures to reduce or prevent emissions of hazardous constituents to the air;
- The operating characteristics of the unit;
- The atmospheric, meteorologic, and topographic characteristics of the unit and the surrounding area;
- The existing quality of the air, including other sources of contamination and their cumulative impact on the air;
- The potential for health risks caused by human exposure to waste constituents; and
- The potential for damage to domestic animals, wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents.

11.10.1 Compliance With Environmental Performance Standard Requirements

All of these factors have been and will continue to be evaluated until closure of the facility to ensure waste treatment methods are conservative and will not adversely affect human health or the environment. Control measures include, but are not limited to the following:

Human Health Risk Assessment - A Human Health Risk Assessment (HHRA) has been conducted to evaluate the risk to the public from open burning and open detonation operations at the facility. Tasks associated with the HHRA included developing an air dispersion model, evaluating sources, source parameters, and waste materials, and characterizing emissions. The HHRA addresses the following environmental performance related concerns:

- The volume and physical and chemical characteristics of the waste in the unit, including its potential for the emission and dispersal of gases, aerosols and particulates;
- The effectiveness and reliability of systems and structures to reduce or prevent emissions of hazardous constituents to the air;
- The operating characteristics of the unit;
- The atmospheric, meterologic, and topographic characteristics of the unit and the surrounding area; and
- The potential for health risks caused by human exposure to waste constituents.

The methods used in the HHRA are based on United States Environmental Protection Agency (U.S. EPA) risk assessment guidance documents, and to the extent possible, the dispersion modeling methodology within the Human Health Risk Assessment Protocol (HHRAP) for Hazardous Waste Combustion Facilities (U.S. EPA, September 2005). The completed HHRA Protocol and Report has been reviewed and approved by the Utah Division of Waste Management and Radiation Control. Limits on OBOD operations have been based on this assessment.

Ecological Risk assessment – The need to conduct an Ecological Risk Assessment (ERA) has been evaluated and a waiver was granted by DWMRC. The ERA waiver was justified because, the ecological receptors will not be affected by the treatment operations, Volatile Organic Compounds (VOCs) do not accumulate in the ecological system, modeled soil concentrations for metals, semi-volatile organic compounds (SVOCs) and other contaminants are below background levels, below measurable existing laboratory methods and several orders of magnitude below available environmental screening levels. Impacts of the thermal treatment unit operations will be evaluated using the soil monitoring plan.

Soil Monitoring Plan – a Soil Monitoring Plan (SMP) has been developed to verify the air dispersion and deposition models that were developed for the HHRA. The SMP will be used to evaluate the existing quality of surface soils, and to determine what impact continued operations at the thermal treatment areas has on surface soil. Risks to human health and the environment will be evaluated using the data collected during implementation of the SMP.

Groundwater Monitoring Plan – a groundwater monitoring program has been in place at the facility since 1986 to monitor contaminants that were released from past disposal practices. The sampling methods, constituents of concern, sampling frequency, sampling results and analytical methods are closely reviewed and monitored by the DWMRC.

The groundwater monitoring program addresses the following concerns:

- The hydrologic and geologic characteristics of the unit and the surrounding area
- The existing quality of groundwater, including other sources of contamination and their cumulative impact on the groundwater;
- The quantity and direction of groundwater flow; and
- The proximity to and withdrawal rates of current and potential groundwater users.

A Groundwater Monitoring Plan has been developed to evaluate the impact of thermal treatment operations on groundwater down gradient of the M-136 and M-225 Thermal Treatment Areas. The plan identifies additional statistical studies, any additional groundwater modeling needed and groundwater monitoring frequency and reporting.

Annual Review of Limits – Permit Condition II.G.3.g. requires ATK to review the emission factors established by the HHRA to determine whether the factors are still representative of the wastes treated. In addition, Permit Condition II.G.3.h. requires ATK to review the HHRA to evaluate changes to dose-response factors for the three classes of detected COPCs: chromium (total and hexavalent), 2,3,7,8-TCDD TE, and detected potentially carcinogenic PAHs (benzo(a)anthracene, benzo(k)fluoranthene, chrysene and indeno(1,2,3-cd)pyrene)., A review of the potential human health risk scenarios evaluated in the HHRA is also required to assure that the scenarios have not changed. These reviews are conducted annually and are included with the Promontory Thermal Treatment Areas Annual Report that is submitted to the Director by March 1st of each calendar year. The annual Report requirements are listed under Condition II.G.3

Stormwater Management – Stormwater run-on and run-off is controlled by a combination of soil grading and drainage ditches. The terrain around M-136 and M-225 has been graded and drainage ditches surround the areas in order to minimize stormwater run-on and run-off. The topography is shown in Attachment 6, Figures F-1 and I-1. Stormwater collection and drainage is shown in Attachment 11 Figure 11-1 and Figure

11-2. The combination of controlling run-on and run-off, containing waste in water-tight burn trays, lack of precipitation, high evaporation rate and depth to groundwater prevents waste constituents from being released to the groundwater and or subsurface environment. Ongoing soil and groundwater monitoring are used to verify these controls are effective in preventing adverse effects to human health and the environment.

Actions to Prevent Releases to the Environment – all spills of hazardous materials are promptly cleaned up. Internal procedures require that chemicals be properly containerized, labeled, stored, used and disposed. The workplace is routinely audited to ensure compliance with procedures. When spills do occur, the released material is promptly cleaned up and the reporting requirements of R315 and Condition I.T.3. are followed.

Open Burning is Conducted in Steel Containers – Open burning is conducted in containers which minimizes the potential for waste constituents to migrate to the ground water, surface water or related environments. The Operating Permit requires routine inspections to ensure the containers are properly maintained. Containers requiring repair are removed from service until repairs are completed.

Ash Management – ash and residue from OBOD operations are promptly collected and disposed. Ash is managed and classified as described in sections 8.2.4, and 8.2.5 of this attachment.

Storage and Inspections – All PEP and residues from OBOD treatment are stored in accordance with Section 4 of this attachment and R315-262 Hazardous Waste Generator Requirements. Storage and treatment areas are inspected as required by Attachment 2 and are operated in accordance with Attachment 9 of this permit.

Regulatory Oversight- the facility is subject to strict regulatory oversight by the Utah Division of Waste Management and Radiation Control. All aspects of hazardous waste management described in this Attachment are subject to their review. When necessary, deficiencies are identified and corrective action is taken by the permittee.