Maryland Department of the Environment

Hazardous Waste Program

Controlled Hazardous Substances Permit

CHS PERMIT A-052
EPA ID No. MDD003067121

Permittee: ATK Elkton LLC
55 Thiokol Road
Elkton, Maryland 21921-0241

Effective August 23, 2005

MARYLAND DEPARTMENT OF THE ENVIRONMENT
Hazardous Waste Program

Controlled Hazardous Substances Permit
Number A-052

ATK Elkton LLC (ATK)
55 Thiokol Road
Elkton, MD 21921-0241

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MARYLAND DEPARTMENT OF THE ENVIRONMENT
Hazardous Waste Program
Controlled Hazardous Substances Permit Number A-052

OVERVIEW

This permit is a renewal, with minor modifications, of a CHS permit that was previously issued to Thiokol Corporation, Elkton Division, on September 22, 1997. Due to transfer of ownership, the permit was later transferred to the new owner/operator, ATK Elkton, LLC. The facility, located at 55 Thiokol Road, Elkton, Maryland 21921-0241, is permitted to conduct the following hazardous waste operations in accordance with the requirements of Code of Maryland Regulations Title 26, Subtitle 13:

- Storage of hazardous wastes in containers within the confines of designated buildings.

- Destruction of unstable wastes, classified as hazardous only because of their explosive nature, by open burning / open detonation (OB/OD).

- Post-closure care, including maintenance, remediation and monitoring of the site of a closed incinerator feed surface impoundment

The major portion of the waste stored and treated (OB/OD) by the facility is generated on-site. However, the permit contains provisions for ATK to receive limited amounts of the same type of wastes from off site, essentially from ATK customers.

ATK has provided, in two separate buildings, for storage of 14,080 gallons of hazardous waste in 256 55-gallon drums and 568 gallons of laboratory wastes in small containers at any one time. Permit allows ATK to dispose of wastes not to exceed 111 tons per year by open burning/open detonation. ATK has presented acceptable plans for personnel training, contingency and emergency procedures, closure and post-closure care of the facility, together with financial assurance and liability insurance documents.

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CONTROLLED HAZARDOUS SUBSTANCES FACILITY PERMIT

Permit Number: **A-052**

EPA ID Number: **MDD003067121**

Effective Date: **August 22, 2005**

Expiration Date: **August 21, 2015**

Pursuant to the Provisions of Environment Article, Section 7-232, Annotated Code of Maryland and regulations promulgated thereunder, the Maryland Department of the Environment, Waste Management Administration, hereinafter referred to as "WAS", hereby authorizes

ATK Elkton LLC (ATK)
55 Thiokol Road
Elkton, MD 21921-0241

to operate a controlled hazardous substances (CHS) facility located at the above address in Cecil County, Maryland, consisting of the following units:

Containers Storage Units
Building H-22 at 39°37'22"N, 75°51'55"W
Building A-26 (Lab Pack Area) at 39°36'37.5"N, 75°51'47.7"W

Waste Explosive Storage
Magazine D-2 at 39°37'32"N, 75°51'46"W

Waste Propellant Open Burn Facility
at 39°37'16.3"N, 75°52'10.2"W

Closed Incinerator Feed Surface Impoundment Area
at 39°37'14.8"N, 75°52'1.3"W

in accordance with the following standard, general and special conditions of this permit, including the attachments made part hereof, and the provisions of COMAR 26.13.

This permit is based on the assumption that the information contained in the permit application and its amendments submitted by ATK on March 20, 2002, April 4, 2003, June 6, 2003, August 6, 2003, July 22, 2004, May 15, 16, and 25, 2005 (hereafter referred to as the application[1]) is accurate and that the facility will be operated as specified in the application. Any inaccuracies found in this information may be grounds for the modification or termination of this permit (as provided by COMAR 26.13.07.11 and .12) and potential enforcement action. ATK shall inform the WAS of any deviation from or changes in the information in the application which would affect ATK's ability to comply with the applicable regulations or permit conditions.

The name, address, and telephone number of the contact person for environmental affairs at the facility are included in Permit Attachment 7, Section B, Facility Description (4), on page B-4.

[1] ATK has had several name changes in recent years. Therefore, in the permit application material attached herewith, whenever Thiokol, or ATK Tactical Systems LLC, is mentioned, ATK Elkton LLC (ATK) is intended.

PART I
STANDARD CONDITIONS

I.A. EFFECT OF PERMIT

ATK is allowed to manage hazardous waste in accordance with the conditions of this permit. Any management of hazardous waste not authorized in this permit is prohibited unless otherwise authorized by COMAR 26.13. Issuance of this permit does not convey property rights of any sort or any exclusive privilege; nor does it authorize any injury to persons or property, any invasion of other private rights, or any infringement of State or local laws or regulations. Compliance with the terms of this permit does not constitute a defense to any action brought under Section 7003 of RCRA (42 USC §6973), Section 106(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 USC §9606(a), commonly known as CERCLA), or any other law governing protection of public health or the environment.

I.B. PERMIT ACTIONS

This permit may be modified, revoked and reissued, or terminated for cause as specified in COMAR 26.13.07.11 and 12. The filing of a request for a permit modification, revocation and re-issuance, or termination or the notification of planned changes or anticipated noncompliance on the part of ATK does not stay the applicability or enforceability of any permit conditions.

I.C. SEVERABILITY

The provisions of this permit are severable; and if any provision of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby.

I.D. DEFINITIONS

For the purpose of this permit, terms used herein shall have the same meaning as those in COMAR 26.13 unless this permit specifically states otherwise; where terms are not otherwise defined, the meaning associated with such terms shall be as defined by a standard dictionary reference or the generally accepted scientific or industrial meaning of the term.

I.E. SIGNATORY REQUIREMENTS

All reports or other information requested by the WAS shall be signed and certified as required by COMAR 26.13.07.03B.

I.F. DOCUMENTS TO BE MAINTAINED AT THE FACILITY SITE

ATK shall maintain at the facility, for the period required by regulations, the following documents and amendments, revisions, and modifications to these documents:

I.F.1. Waste analysis plan required by COMAR 26.13.05.02D and this permit.

I.F.2. Inspection schedules and logs required by COMAR 26.13.05.02F(2) and (4) and this permit.

I.F.3. Personnel training documents and records required by COMAR 26.13.05.02G (4) and (5) and this permit.

I.F.4. Contingency Plan required by COMAR 26.13.05.04 and this permit.

I.F.5. Operating record required by COMAR 26.13.05.05D and this permit.

I.F.6. Closure Plan required by COMAR 26.13.05.07 and this permit.

I.F.7. A copy of this permit and its attachments.

I.F.8. A copy of COMAR 26.13 and its updates.

I.F.9. All other documents required by subsequent parts of this permit.

I.G. DUTIES AND REQUIREMENTS

I.G.1. Duty to Comply. ATK shall comply with all conditions of this permit, except to the extent and for the duration such noncompliance is authorized by an emergency permit. Any other permit noncompliance constitutes a violation of COMAR and gives grounds for enforcement action, permit termination, revocation and re-issuance, modifications, or denial of a permit renewal application.

I.G.2. Duty to Reapply. If ATK wishes to continue an activity regulated by this permit after the expiration date of the permit, ATK shall submit a complete application for a new permit at least 180 days before this permit expires, in accordance with COMAR 26.13.07.04C.

I.G.3. Permit Expiration. This permit and all conditions therein will remain in effect beyond the permit's expiration date if ATK has submitted a timely, complete application and through no fault of ATK, the WAS has not issued a new permit (State Government Article, §10 - 226(b)).

I.G.4. Need to Halt or Reduce Activity Not a Defense. It shall not be a defense for ATK in an enforcement action to argue that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

I.G.5. Duty to Mitigate. ATK shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from non-compliance with this permit.

I.G.6. Proper Operation and Maintenance. ATK shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by ATK to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems to maintain compliance with the conditions of this permit. (COMAR 26.13.07.04F)

I.G.7. Duty to Provide Information. ATK shall furnish to the WAS, within a reasonable time, any relevant information which the Secretary may request to determine whether cause exists for modifying, revoking and reissuing, or terminating of this permit, or to determine compliance with this permit. ATK shall also furnish to the WAS, upon request, copies of records required to be kept by this permit. (COMAR 26.13.07.04I)

I.G.8. Inspection and Entry. ATK shall allow the WAS, or an authorized representative, upon the presentation of credentials and other documents as may be required by law to:

I.G.8.a. enter at reasonable times upon the ATK's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

I.G.8.b. have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

I.G.8.c. inspect at reasonable times any facility, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

I.G.8.d. sample or monitor substances or parameters at any location, at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the Environment Article and COMAR 26.13 (Disposal of Hazardous Substances).

I.G.9. Monitoring and Records.

I.G.9.a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. The method used to obtain a representative sample of the waste to be analyzed must be the appropriate method and approved by the WAS. Laboratory methods must be those specified in Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846) and its updates as incorporated by reference in COMAR 26.13.01.05A(4), Standard Methods for the Examination of Water and Wastewater (20th Edition, 1999) or an equivalent method as specified in the attached Waste Analysis Plan.

I.G.9.b. ATK shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports and records required by this permit, and records of all data used to complete the application for this permit for a period of at least three (3) years from the date of the sample, measurement, report, and record. These periods may be extended by request of the WAS at any time and are automatically extended during the course of any unresolved enforcement action regarding this facility.

I.G.9.c. Records of monitoring information shall specify:

1. the dates, exact place, and times of sampling or measurements;
2. the individuals who performed the sampling or measurements;
3. the dates analyses were performed;
4. the individuals who performed the analyses;
5. the analytical techniques or methods used; and
6. the results of such analyses.

I.G.10. Reporting Planned Changes. ATK shall give notice to the WAS, as soon as possible, of any planned physical alterations or additions to the permitted facility or any planned alterations to the permitted activity. This notice must include a description of all incidents of noncompliance reasonably expected to result from the proposed changes.

I.G.11. Transfer of Permits. This permit may be transferred to a new owner or operator only if the permit has been modified or revoked and reissued pursuant to COMAR 26.13.07.11, or a minor modification made to identify the new permittee and incorporate such other requirements as may be necessary (COMAR 26.13.07.10). Before transferring ownership or operation of the facility, ATK shall notify the new owner or operator in writing of the requirements of COMAR 26.13 and provide the new owner with a copy of this permit.

I.G.12. Notification.

I.G.12.a. ATK shall report to the WAS any noncompliance, which may endanger health or the environment, orally within 24 hours and in writing within 5 days from the time ATK becomes aware of the circumstances (COMAR 26.13.07.04 M(6)).

I.G.12.b. Oral and written reports required by Permit Condition I.G.12.a above shall include the following:

1) Information concerning release of any hazardous waste that may endanger a public drinking water supply source;

2) Any information of a release or discharge of hazardous waste, or of a fire or explosion at the facility which could threaten human health or the environment outside the facility, with the description of the occurrence and its cause including:

i) The name, address, and telephone number of the owner or operator;

ii) The name, address, and telephone number of facility;

iii) The date, time, and type of incident (for example, a release or fire);

iv) The names and quantities of material(s) involved;

v) The extent of injuries, if any;

vi) The assessment of actual or potential hazard to the environment and human health outside the facility, where this is applicable; and

vi) The estimated quantity and disposition of recovered material that resulted from the incident. (COMAR 26.13.07.15D).

I.G.12.c. In addition to the information required by Permit Condition I.G.12.b above, ATK shall include in the written report of noncompliance:

1) A description of the noncompliance and its cause;

2) The period of noncompliance, including exact dates and times, and if the noncompliance has been corrected or the anticipated time it is expected to continue; and

3) Steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance. (COMAR 26.13.07.04 M(6)).

I.G.12.d. ATK may submit the written report required by Permit Condition I.G.12.a within 15 days of becoming aware of the circumstances requiring notification, if the WAS approves the later deadline. (COMAR 26.13.07.15D(2)(g)).

I.G.12.e. If ATK determines that the facility has had a release, fire or explosion that could threaten human health, or the environment, outside the facility, or, if the release exceeds the Reportable Quantities set forth in COMAR 26.13.05.04G(4), ATK shall immediately notify:

1) the government official designated as the on-scene coordinator for the geographical area, if any;

2) the National Response Center at the 24-hour toll-free number (800) 424-8802;

3) the WAS Hazardous Waste Enforcement Division at (410) 537-3400, during working hours;

4) the MDE Emergency Response Division at (866) 633-4686;

5) Cecil County Emergency Management by dialing 911 or calling (410) 398-1350

6) Other appropriate local authorities, if the facility's Emergency Coordinator determines that evacuation of local areas may be advisable. (COMAR 26.13.05.04G(4))

I.G.12.f. In the oral notification report required by Permit Condition I.G.12.e above, ATK shall include:

1) Name and telephone number of reporter;

2) Name and address of the facility;

3) Time and type of incident (release, fire or explosion);

4) Name and quantity of materials involved, to the extent known;

5) The extent of injuries, if any; and

6) The possible hazards to human health, or the environment, outside the facility. (COMAR 26.13.05.04G(4)(b)

I.G.12.g. If an incident occurs which requires ATK to implement the Emergency Plan / Contingency Plan of Permit Attachment 4, ATK shall make a written submission to the WAS within 15 days of the incident (COMAR 26.13.05.04G(10)). This submission shall include the information items (i) through (iv) listed under Permit Condition I.G.12.b (2) above.

I.G.13. Other Noncompliance. ATK shall report other instances of noncompliance that are not otherwise required to be reported above at the time monitoring reports are submitted. The reports shall contain the information listed in Permit Condition I.G.12.

I.G.14. Other Information. Whenever ATK becomes aware that ATK failed to submit any relevant facts in the permit application, or submitted incorrect information in a permit application or in any report to the WAS, ATK shall promptly submit such facts or information to the WAS and state the reason for the omission or inaccuracy.

I.H. CERTIFICATION OF CONSTRUCTION OR MODIFICATION

ATK may not manage hazardous waste at a new hazardous waste management unit or a modified portion of the facility until:

I.H.1. ATK has submitted to the WAS, by certified mail or hand delivery, a letter signed by ATK and an independent registered professional engineer stating that the facility has been constructed or modified in compliance with the permit; and

I.H.2. Either

I.H.2.a. The WAS has inspected the modified or newly constructed facility and found it is in compliance with the conditions of this permit; or

I.H.2.b. Within fifteen (15) days of the date of the submission of the letter required by Permit Condition I.H.1, ATK has not received notice from the WAS of the WAS' intent to conduct the inspection described in Permit Condition I.H.2.a.

I.I. PERMIT FEE

Payment of the permit fee for this facility is a prerequisite to issuing this permit. Failure to pay the permit fee in a timely manner constitutes grounds for permit revocation. As specified in COMAR 26.13.07.21 the permit fee is based on the size of the facility, nature and quantity of CHS, and the anticipated costs of regulatory activities such as permit preparation, inspections, monitoring, and program development. During the existence of this permit, the permit fee is $34,035.49 per year, in addition to the cost of public notices. An application fee, submitted with the permit application, will be credited towards the first year's annual permit fee.

I.J. COMPLIANCE SCHEDULES

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than fourteen (14) days following each schedule date.

PART II
GENERAL FACILITY CONDITIONS

II.A. DESIGN AND OPERATION OF FACILITY

ATK shall maintain and operate the facility to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste constituents to air, soil, surface water or groundwater which could threaten human health or the environment.

II.B. GENERAL WASTE ANALYSIS

ATK shall follow the procedures described in the attached Waste Characteristics, Attachment 1. ATK shall verify its waste analysis as part of its quality assurance program, in accordance with current EPA practices (Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, and its updates as incorporated by reference in COMAR 26.13.01.05A(4)) or equivalent methods approved by the WAS; and at a minimum, maintain proper functional instruments, use approved sampling and analytical methods, verify the validity of sampling and analytical procedures, and perform correct calculations.

II.C. GENERAL INSPECTION REQUIREMENTS

ATK shall follow the inspection schedules in Attachment 2. ATK shall remedy any deterioration or malfunction discovered by an inspection as required by COMAR 26.13.05.02F (3). Records of inspections shall be kept as required by COMAR 26.13.05.02F (4).

II.D. PERSONNEL TRAINING

ATK shall conduct personnel training as required by COMAR 26.13.05.02G. The training program shall follow the Training Plan, Attachment 3. ATK shall maintain documents and records as required by COMAR 26.13.05.02G (4) and (5).

II.E. PREPAREDNESS AND PREVENTION

II.E.1. Required Equipment. At a minimum, ATK shall equip the facility with the equipment set forth in the Contingency Plan, Attachment 4, as required by COMAR 26.13.05.03C.

II.E.2. Testing and Maintenance of Equipment. ATK shall test and maintain the equipment specified in the previous permit condition and in Attachment 4, as necessary, to assure its proper operation in time of emergency.

II.E.3. Access to Communications or Alarm System. ATK shall maintain access to the communications or alarm system as required by COMAR 26.13.05.03E.

II.E.4. Required Aisle Space. At a minimum, ATK shall maintain aisle space as required by COMAR 26.13.05.02I.

II.E.5. Arrangements with Local Authorities. ATK shall maintain arrangements with local authorities as required by COMAR 26.13.05.03H. If local officials refuse to enter into or renew existing preparedness and prevention arrangements with ATK, ATK shall document this refusal in the operating record and immediately notify the WAS in writing of the refusal.

II.F. CONTINGENCY PLAN

II.F.1. Implementation of Plan. ATK shall immediately carry out the provisions of the Contingency Plan, Attachment 4, and follow the emergency procedures described by COMAR 26.13.05.04G whenever there is an imminent or actual fire, explosion, or release of hazardous waste or constituents that threatens or could threaten human health or the environment.

II.F.2. Amendments to Plan. ATK shall review and immediately amend the Contingency Plan, if necessary, as required by COMAR 26.13.05.04E.

II.F.3. Copies of Plan. ATK shall comply with the requirements of COMAR 26.13.05.04D.

II.F.4. Emergency Coordinator. ATK shall comply with requirements of COMAR 26.13.05.04F.

II.F.5. Emergency Procedures. ATK shall comply with the requirements of COMAR 26.13.05.04G.

II.G. RECORD KEEPING AND REPORTING

II.G.1. Operating Record. ATK shall maintain a written operating record at the facility in accordance with COMAR 26.13.05.05D.

II.G.2. Biennial Report. ATK shall comply with all applicable biennial report requirements of COMAR 26.13.05.05F.

II.G.3. Availability, Retention, and Disposition of Records. ATK shall retain the required records and make them available in accordance with COMAR 26.13.05.05E.

II.G.4. Additional Reports. ATK shall submit any applicable additional reports in accordance with COMAR 26.13.05.05H.

II.G.5. Unmanifested Waste Report. ATK shall comply with the requirements of COMAR 26.13.05.05G concerning any hazardous waste received from off-site.

II.H. GENERAL CLOSURE REQUIREMENTS

II.H.1. Performance Standard. ATK shall close the facility as required by COMAR 26.13.05.07, and in accordance with the Closure Plan, Attachment 6.

II.H.2. Amendment to Closure Plan. ATK shall amend the Closure Plan in accordance with COMAR 26.13.05.07C, whenever necessary.

II.H.3. Notification of Closure. ATK shall notify the WAS at least 45 days prior to the date ATK expects to begin closure.

II.H.4. Time Allowed for Closure. After receiving the final volume of hazardous waste, ATK shall treat or remove from the site all hazardous waste and shall complete closure activities in accordance with the schedules specified in the Closure Plan, Attachment 6.

II.H.5. Disposal or Decontamination of Equipment. ATK shall decontaminate and/or dispose of all facility equipment as required by COMAR 26.13.05.07E and the Closure Plan, Attachment 6.

II.H.6. Certification of Closure. ATK shall certify that the facility has been closed in accordance with the specifications in the Closure Plan and required by COMAR 26.13.05.07F. The certification shall be signed by ATK, and an independent registered professional engineer.

II.I. COST ESTIMATES FOR FACILITY CLOSURE/POST-CLOSURE

II.I.1. Annual Adjustment. During the active life of the facility, ATK shall adjust the closure and post-closure cost estimates included in Attachment 6, approved by the WAS, for inflation, within 60 days prior to each anniversary date of the establishment of the financial instrument used to comply with COMAR 26.13.05.08 and 40 CFR 264.142 (b), which has been incorporated by reference.

II.I.2. Adjustment for Changed Conditions. ATK shall revise the closure and post-closure cost estimates whenever there is a change in the facility's Closure Plan as required by 40 CFR §264.142 (c).

II.I.3. Availability. ATK shall keep at the facility the latest closure and post-closure cost estimates as required by 40 CFR §264.142 (d).

II.J. INCAPACITY OF OWNER/OPERATOR, GUARANTORS, OR FINANCIAL INSTITUTIONS

ATK shall comply with 40 CFR §264.148 whenever necessary.

II.K. GENERAL REQUIREMENTS FOR IGNITABLE, REACTIVE, OR INCOMPATIBLE WASTES

ATK shall comply with the requirements of COMAR 26.13.05.02H.

II.L. FINANCIAL REQUIREMENTS

II.L.1. Financial Assurance for Facility Closure and Post-Closure. ATK shall maintain compliance with COMAR 26.13.05.08 by providing financial assurance, as required by 40 CFR §264.143, by means other than the financial test or corporate guarantee, in at least the amount of the closure and post-closure cost estimates required by Permit Condition II.I.1 and Permit Attachment 6. Changes in financial assurance mechanisms must be approved by the WAS.

II.L.2. Liability Requirements. ATK shall comply with the requirements of COMAR 26.13.05.08 and the documentation requirements of 40 CFR §264.147, including the requirements to have and maintain liability coverage for sudden and non-sudden accidental occurrences in the amount of at least $4 million per occurrence with an annual aggregate of at least $8 million, exclusive of legal defense costs.

II.M. SECURITY

ATK shall comply with the security requirements of COMAR 26.13.05.02E.

II.N. MANIFEST SYSTEM

ATK shall comply with the manifest requirements of COMAR 26.13.05.05B, C, and G.

II.O. FLOODPLAIN STANDARD

II.O.1. ATK shall comply with the requirements of COMAR 26.13.05.02-1B, and COMAR 26.13.07.02D(26) and (27).

II.O.2. Specifically for the part of the facility located in a 100-year flood plain, ATK shall:

II.O.2.a. Within 45 days of the effective date of this permit, submit a plan for the WAS' review and approval to bring the facility into compliance with the requirements of COMAR 26.13.05.02-1B(2); and

II.O.2.b. In the interim, if a 100-year or greater magnitude storm is imminent, take precautions by removing all hazardous waste from the 100-year flood zone to a safe area.

II.P. WASTE MINIMIZATION/SOURCE REDUCTION

II.P.1. ATK shall develop and conduct a Waste Minimization / Source Reduction Program, in accordance with the Environment Article §7-205 and COMAR 26.13.05.05F(4)(j) and (k). ATK as a generator shall make a reasonable effort not to dispose of a controlled hazardous substance unless ATK demonstrates to the satisfaction of the Department that:

II.P.1.a. Recovery possibilities have been considered; and

II.P.1.b. The controlled hazardous substance cannot be reasonably treated further to reduce the volume of or the hazard that the controlled hazardous substance poses to the environment.

II.P.2. By March 1 of each even-numbered year, ATK shall submit a report to the WAS that:

II.P.2.a. Describes the efforts undertaken during the preceding year to reduce the volume and toxicity of the waste generated; and

II.P.2.b. Describes the changes in volume and toxicity of waste actually achieved during the preceding year in comparison to previous years.

II.Q. NOTICE TO GENERATORS

When ATK plans to receive hazardous waste from an off-site source in accordance with Permit Condition III.B.1(b), ATK shall inform the generator in writing that ATK (Elkton Division) has the appropriate permits for, and will accept, the waste the generator is shipping. ATK shall keep a copy of this written notice as part of the operating record required by Permit Condition II.G.1. (COMAR 26.13.05.02C(3)

PART III
SPECIAL CONDITIONS FOR STORAGE IN CONTAINERS

III.A. GENERAL PROVISIONS

ATK may store hazardous wastes in containers in three areas:

III.A.1. The container storage area located in Building H-22, which is used for CHS stored in 55-gallon drums. The container storage area consists of a 59.66 x 26 ft. reinforced concrete pad, which is 1/2 ft. in thickness, with a 4-inch high curb. This secondary containment area holds 26% of the maximum volume of waste stored in containers. This facility can store 256 55-gallon drums in two 8 drum x 8 drum sections, stacked 2 drums high. The primary aisle dividing the two groupings is 12 feet wide and the secondary aisles are 5 ft. wide. The total area of this storage area is 1551.16 square feet. Further details of this storage area are included on Pages D-4 and D-5 of the Permit Application (included in Permit Attachment 5), and Drawings E36656 – E36658, E37522, E38508 and E38520, on file with the ATK Permit Application documents at the WAS' offices.

III.A.2. The lab-pack storage area located in Building A-26. This area is used for storage of small containers of a pint to five gallons capacity. The lab pack storage building A-26 is a 13-ft x 13-ft totally enclosed single-floor corrugated metal building. The floor of the building consists of a 13-ft x 13-ft concrete slab totally surrounded by a 6-inch high x 4-inch thick monolithically poured curb. The curb area is capable of containing 568 gallons of waste. The building is further described on Page D-6 of the Permit Application (included in Permit Attachment 5). The building details are shown in Drawing E8935A on file with the ATK Permit Application documents at the WAS' offices.

III.A.3. The explosive waste storage Magazine D-2, designated for waste explosives received from off-site. The wastes consist only of solid detonators or spin motors, and contain no free liquids. Magazine D-2 is a pre-cast concrete unit, 10 x 12 feet in area and 8 feet high. The maximum explosive capacity of this magazine allowed under this permit of class 1.1 explosives (as defined in US Department of Transportation Regulations, 49 CFR §173.50) is 200 pounds. The corresponding maximum allowed of class 1.3 explosives is 30,000 pounds. The magazine is located 325 feet from the property line. Additional description of Magazine D-2 is included on Page D-6 of the Permit Application (included in Permit Attachment 5). Construction details of the magazine are shown in a set of 13 Drawings, numbered 11624, on file with the ATK Permit Application documents at the WAS' offices.

III.B. PERMITTED AND PROHIBITED WASTE IDENTIFICATION

III.B.1. ATK may store, in Building H-22, a maximum of 14,080 gallons of hazardous waste in 256 55-gallon drums at any one time. ATK may also store up to 568 gallons of laboratory wastes in small containers at any one time in Building A-26. The wastes, other than two streams, are generated on-site. ATK may store explosive wastes only in Magazine D-2. The types and annual quantities are as follows:

III.B.1.a. Wastes Generated On-Site

Waste Type[1]	Waste Code(s)	Maximum Annual Amount (ton)
Waste & Off-Specification Oxidizers	D001, D003	10
Scrap Propellant	D003	100
Photographic Waste Water	D006, D011	10
Spent Halogenated Solvents	F001, U226	10
Spent Nonhalogenated Solvents	F005	1
Discarded Tetrachloroethylene	U210	1
Discarded Toluene Diisocyanate	U223	1
Flammable/Toxic Liquid Waste	D001, F001, F003, F005, U002, U044, U154, U196, U220, U210, U041	5
Lab-Pack Waste	D001, D002, D003, D005, D006, D007, D008, D009, D011, D018, D035, D038, DO39, U002, U009, U012, U041, U044, U053, U056, U061, U113, U151, U154, U159, U188, U196, U205, U210, U213, U220, U223, U226, U239, P002, P015, P054, M001	5

Waste Type[1]	Waste Code(s)	Maximum Annual Amount (ton)
Discarded MEK	U159	1
Beryllium Dust[2]	P015	1
III.B.1.b. Wastes Generated Off-Site		
Waste Vintage MC3502 Rocket Motors[3]	D003	0.5
III.B.1.c. Wastes Generated On- or Off-Site		
Waste High-Explosive Detonators	D003	50 lbs

[1] Further details and chemical components of the wastes are included in Permit Attachment 1, pages C-1 through C-8, and Permit Attachment 5, pages D-1 through D-3.

[2] ATK may not manage unpasted beryllium dust at the storage facility. Handling of such waste shall be limited to ATK Building C-58 provided with specialized control devices and by the staff in personal protective equipment, as described in Permit Attachment 5, Page D-2a.

[3] This waste consists of old rocket motors identified as MC 3502, containing waste propellant. They are received from U.S. Department of Energy as explained on page C-5 of Permit Attachment 1. ATK may only store these motors in Explosive Magazine D-2, for temporary holding prior to being disassembled and thermally destroyed in accordance with Part IV of this permit.

III.B.2. ATK is prohibited from storing for more than 90 days any hazardous waste generated on-site which is not identified in Permit Condition III.B.1.a unless ATK requests and obtains a modification to this permit.

III.B.3 ATK is prohibited from receiving any wastes from off-site other than those identified in Permit Conditions III.B.1.b or c.

III.C. CONDITION OF CONTAINERS

If a container holding hazardous waste is not in good condition (e.g., severe rusting, apparent structural defects) or if it begins to leak, ATK shall transfer the hazardous waste from such container to a container that is in good condition or otherwise manage the waste in compliance with the conditions of this Permit.

III.D. COMPATIBILITY OF WASTE WITH CONTAINERS

ATK shall assure that the ability of the container to contain the waste is not impaired, as required by COMAR 26.13.05.09C.

III.E. MANAGEMENT OF CONTAINERS

ATK shall keep all containers closed during storage, except when it is necessary to add or remove waste, and shall not open, handle, or store containers in a manner that may rupture the container or cause it to leak.

III.F. CONTAINMENT SYSTEMS

ATK shall maintain the containment system as required by COMAR 26.13.05.09H and in accordance with the attached plans and specifications, contained in Permit Attachment 7.

III.G. INSPECTION SCHEDULES AND PROCEDURES

ATK shall inspect the container area weekly, in accordance with the Inspection Schedule, Permit Attachment 2, to detect leaking containers and deterioration of containers and the containment system caused by corrosion and other factors. (COMAR 26.13.05.09E)

III.H. RECORD KEEPING

ATK shall place the results of all waste analyses and trial tests and any other documentation showing compliance with the requirements of Permit Conditions III.K.1 and III.K.2 and COMAR 26.13.05.02H and 26.13.05.09G in the facility operating record. (COMAR 26.13.05.05D)

III.I. SPECIAL CONTAINER PROVISIONS FOR IGNITABLE OR REACTIVE WASTE

III.I.1. ATK shall not locate containers holding ignitable or reactive waste within 15 meters (50 feet) of the facility's property line. (COMAR 26.13.05.09F).

III.I.2. ATK shall take precautions to prevent accidental ignition or reaction of ignitable or reactive waste and follow the procedures specified in Permit Attachment 2, pages F-11 and F-12. (COMAR 26.13.05.02H and H(3)).

III.J. SPECIAL CONTAINER PROVISIONS FOR INCOMPATIBLE WASTE

III.J.1. ATK shall not place incompatible wastes, or incompatible wastes and materials, in the same container.

III.J.2. ATK shall not place hazardous waste in an unwashed container that previously held an incompatible waste or material. (COMAR 26.13.05.09G(2)).

III.J.3. ATK shall separate containers of incompatible wastes. (COMAR 26.13.05.09 G(3)).

III.K. CLOSURE

III.K.1. At closure, ATK shall remove all hazardous waste and hazardous waste residues from the storage areas, and close the facility in accordance with COMAR 26.13.05.07 and an approved detailed closure plan. Permit Attachment 6 is a general closure plan showing the minimum topics to be included in the detailed closure plan.

III.K.2. At least 90 days prior to the intended beginning of closure, ATK shall submit a detailed closure plan including a sampling and analysis plan to the WAS for review and approval.

III.K.3. The detailed closure plan required by Permit Condition III.K.2, above, shall include at least the following elements:

III.K.3.a. The steps necessary to perform partial and/or final closure of the facility at any point during its active life,

III.K.3.b. A description of how each container storage unit will be closed,

III.K.3.c. A description of how final closure of the facility will be conducted, identifying the maximum extent of operations during the active life of the facility,

III.K.3.d. An estimate of the maximum inventory of hazardous wastes ever onsite over the active live of the facility and a description of the methods used to remove, transport, treat, store, or dispose of all hazardous wastes,

III.K.3.e. A detailed description of the steps needed to remove or decontaminate all hazardous waste residues and contaminated containment system components, equipment, structures, and soils,

III.K.3.f. A description of methods employed to decontaminate structures and equipment that will remain on site after closure,

III.K.3.g. Identification of decontamination agents to be used, including chemical and physical specifications of the agents,

III.K.3.h. Specific safety measures to be taken to control spread of contamination during the closure activity and to protect human health and the environment,

III.K.3.i. A detailed description of other activities necessary during the closure period,

III.K.3.j. A schedule for closure of each storage unit and for the final closure of the facility meeting the requirements of COMAR 26.13.05.07D, and

III.K.3.k. A description of how all hazardous waste and hazardous waste residues will be removed from the containment systems to achieve the closure performance standards of COMAR 26.13.05.07B.

III.K.4. The sampling and analysis plan, required by Permit Condition III.K.2, above, shall, at a minimum, include the following components to verify the effectiveness of decontamination activities:

III.K.4.a. A listing and justification of sampling and analytical methods employed. ATK shall select and propose these methods in accordance with the Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846, latest edition), as appropriate for the constituent in question, or equivalent methods acceptable to the WAS,

III.K.4.b. A description of quality assurance and quality control procedures associated with the selected sampling and analysis methods,

III.K.4.c. A definition and justification of a Target Compound List (TCL) for which the verification samples will be analyzed,

III.K.4.d. Identification and justification of a threshold level for each compound on the TCL list that determines a "clean" or "contaminated" condition, and

III.K.4.e. Number, location, media or substances to be sampled.

III.K.5. ATK shall decontaminate the storage areas, including the loading/ unloading and staging areas and the equipment that is to remain onsite after closure, in accordance with the detailed closure plan submitted by ATK and approved by the WAS in accordance with Permit Conditions III.K.2 through III.K.4, above.

III.K.6. Within 60 days of the completion of the closure activities, ATK shall submit a:

III.K.6.a. Closure report containing results of the activities conducted in compliance with each component of the approved closure plan, including, but not limited to, the verification results demonstrating a clean closure of the storage areas, and a certification of closure as required by COMAR 26.13.05.07F, or

III.K.6.b. Written request to extend the 60-day deadline including the reason for the request and a proposed timeline for completion.

III.K.7. If ATK is unable to demonstrate a clean closure in accordance with Permit Condition III.K.6, above, ATK shall inform the WAS within 60 days of the completion of the closure activities, and propose measures to achieve closure performance standards, such as submission of a post-closure care plan for the WAS' review and approval.

PART IV
SPECIAL CONDITIONS FOR OPEN BURNING/OPEN DETONATION (OB/OD)

IV.A. GENERAL PROVISIONS

IV.A.1. This part of the permit is issued under the authority of COMAR 26.13.05.16-1, Miscellaneous Units.

IV.A.2. ATK may conduct open burning and open detonation only of reactive hazardous wastes in compliance with the following conditions.

IV.B. PERMITTED AND PROHIBITED WASTES

IV.B.1. ATK may only treat the following wastes by open burning. The maximum amount of waste per burn shall not exceed 100 pounds of Class 1.1 or 900 pounds of Class 1.3 explosives:

Waste Type[1]	Waste Code(s)
Solid Fuel Rocket Propellant Waste	D003
Spent Cleaning Solvents Contaminated with Propellant	D003, D001, F001, F003
Waste or Off-Specification Oxidizer	D001, D003
Waste Powdered Aluminum	D003
Waste Vintage MC3502 Rocket Motors	D003

IV.B.2. ATK may only treat the following wastes by open detonation. The maximum net explosive weight per detonation cycle shall not exceed two grams (0.07 ounce), and it shall not exceed a total of one pound per day:

Waste Detonators	D003

[1]Further details and chemical components of the wastes are included in Permit Attachment 1, pages C-1 to C-5 (Hazardous wastes disposed of by thermal treatment open burning), and Permit Attachment 5, pages D-1 and D-3

IV.B.3. ATK may thermally destruct a maximum of 50 pounds per year of waste high-explosive detonators. Specifications and chemical components of the waste are included on Page C-4 of Permit Attachment 1.

IV.B.4. Open burning or open detonation of any other wastes not included in Permit Conditions IV.B.1 and 2 are prohibited.

IV.C. DESIGN AND CONSTRUCTION

IV.C.1. Open Burn (OB) Unit.

IV.C.1.a. The OB unit consists of four treatment units:

- three open pans that are provided with covers to minimize the accumulation of precipitation in the pans between treatment events, and
- the "clamshell", a pan with a moveable cover that is deployed in a closed position during treatment operations and that is designed to contain burns involving potentially ejectable material.

Design features of the OB unit at ATK are outlined in Permit Attachment 5, Page D-8. Technical specifications of the pans are shown in Drawing Set E41780 (three drawings), and specifications of the clamshell are shown in Drawing F7004873. These drawings are on file as part of the ATK Permit Application at the offices of the Maryland Department of the Environment.

IV.C.1.b. ATK shall maintain all structural components of the OB unit in proper order to function for the intended purpose.

IV.C.1.c. Existing dikes shall effectively control run-on and run-off generated to and from the unit by a 500-year flood event.

IV.C.1.d. The burn-pan covers shall sufficiently protect the pans from precipitation water coming in contact with the waste.

IV.C.1.e. The sumps provided for the pans shall have sufficient capacity to capture any precipitation water entering the pans and seeping through the sand content that fills the pans.

IV.C.1.f. Existing one up-gradient and three down-gradient wells shall sufficiently monitor the trend in the area groundwater quality.

IV.C.2. Open Detonation.

Open detonation operations at ATK are limited to using a mobile Waste Detonator Disposal Unit. The unit components and operational characteristics are explained on pages D-9 and D-10 of the Permit Application, included in Permit Attachment 5.

Technical specifications of the unit are shown on Drawing Set E46286 (three drawings) included in the ATK Permit Application on file at the offices of the Maryland Department of the Environment (the "Department"). The trailer-mounted unit is hauled and stationed for operation at a specific space, shown on Drawing E46286, Sheet 1, within the open burning area described under Permit Condition IV.C.1, above. The unit is towed out of the OB area and stored under cover when not in use.

IV.D. OPERATING CONDITIONS

IV.D.1. ATK shall conduct open burning (OB) operations in accordance with the Standing Operating Procedures, SOP-P-50(Rev M, included in Permit Attachment 5, Process Information.

IV.D.2. ATK shall conduct open detonation (OD) operations in accordance with the Standing Operating Procedures, SOP-P-524 (Rev E), included in Permit Attachment 5, Process Information.

[CONTINUED ON PAGE 25]

IV.D.3. ATK may only treat by OB/OD the type of wastes listed in Permit Condition IV.B, not exceeding the maximum permitted amounts.

IV.D.4. ATK shall conduct open burning in accordance with COMAR 26.13.05.16-1.

IV.D.5. ATK shall keep the open burning area trimmed or otherwise clear of dead or dying vegetation and any other debris that may present a fire hazard within 500-foot radius of the burn pans and clamshell.

IV.D.6. ATK shall maintain a distance of 1200 feet between the open burning area and ATK property boundary.

IV.D.7. Within 24 hours following a burn, or once safe condition prevail, ATK shall conduct a visual search to collect any ejected material.

IV.D.8. ATK shall remove any material that may accumulate in the open burning unit, including contaminated water, sand or ash, at least once per month to avoid spillage or wind dispersal. ATK shall have this material analyzed for hazardous constituents for proper disposal. ATK shall never discharge collected precipitation or liquids in sumps of the pans into the ground.

IV.D.9. ATK shall perform OB/OD operations only during daylight hours of one hour after sunrise to one hour before sunset.

IV.D.10. ATK shall perform OB/OD operations only when winds speeds are less than 15 miles per hour.

IV.D.11. ATK shall not perform OB/OD operations when electrical storms are within three miles of the area

IV.D.12. ATK shall not perform OB/OD operations during precipitation, inclement weather or weather inversion.

IV.D.13. ATK shall not plan OB/OD operations of storms are forecast within a 4-hour period or if a weather inversion is forecast.

IV.D.14. ATK shall manage the waste energetics in a manner in which they are only placed in the OB/OD unit if treatment is planned within 4 hours.

IV.D.15. ATK shall not use the same pan, including the clamshell, for two consecutive burns unless the operations are at least 24 hours apart to allow the burn pan to cool.

IV.D.16. ATK shall not load and burn more than one pan at a time.

IV.D.17. ATK shall ensure that no beryllium containing waste is ever subjected to treatment in OB/OD units.

IV.D.18. ATK shall ensure that no emissions of any TCLP metals from OB/OD units exceed the limits mandated by the Maryland Department of the Environment Air and Radiation Management Administration.

IV.D.19. If a waste with the potential to eject from an open pan during a burn event is to be treated at the OB unit, that waste may only be treated in the clamshell, subject to the requirements of Permit Condition IV.D.20

IV.D.20. The clamshell may only be used to treat a given hazardous waste if the material intended to be treated is found to be acceptable for treatment under the procedure specified beginning on page 10 of SOP-P-050 (Rev M) (included in Permit Attachment 5). This procedure includes plotting a data point defined by the material's maximum burning surface area and the material's burning rate against an acceptance curve, and determining if the plotted point falls within the area beneath the acceptance curve designated as "acceptable for burn".

IV.E. INSPECTION AND MAINTENANCE

IV.E.1. ATK shall ensure the integrity of each OB/OD unit prior to each use through specific close inspections as required by the following Permit Conditions (IV.E.2 – IV.E.5).

IV.E.2. ATK shall comply with inspection requirements of COMAR 26.13.05.16-1C, .02F, and the inspection schedule included in Permit Attachment 2, pages F-5 and F-7, using the form included in Permit Attachment 2, and the forms on pages 13-19 of SOP-P-050 (Rev M), and Page 7 of SOP-P-524 (Rev E), included in Permit Attachment 5.

IV.E.3. ATK shall have the liquids collected in the sumps analyzed in order to determine appropriate procedure for their disposal.

IV.E.4. ATK shall maintain the grounds around and beneath the pans and clamshell clear in order to facilitate recovery of any ejected treatment residue and to prevent fire hazards.

IV.E.5. After each OB/OD event, ATK shall clean the containment devices of any residue and manage it as hazardous waste unless determined otherwise based on a laboratory analysis.

IV.F. MONITORING

IV.F.1. ATK shall monitor groundwater flow and quality in and around the OB/OD area in accordance with Permit Condition V.M of Part V of this permit.

IV.F.2. ATK shall monitor run-on and run-off controls. ATK shall develop an inspection plan to log the condition of the run-on/run-off control system and insure its proper operation.

IV.F.3. ATK shall clean and maintain drains and ditches to allow free drainage of storm water.

IV.F.4. ATK shall protect high-rate run-off areas by appropriate methods such as coarse stone or grassed waterways to minimize erosion.

[CONTINUED ON PAGE 27]

IV.G. RECORD KEEPING AND REPORTING

ATK shall follow COMAR 26.13.05.05, Manifest System, Record Keeping, and Reporting based on applicable instructions included in COMAR 26.13.05.20, including but not limited to the following:

IV.G.1. ATK shall follow all applicable manifest regulations of COMAR 26.13.05.05B and C.

IV.G.2. ATK shall maintain records of all wastes received from off-site including the sources, common names, chemical names, codes, physical state, amount, dates received, and final treatment.

IV.G.3. ATK shall maintain records of each burning and detonation including dates, times, weather conditions, types, codes, amounts of treated wastes, post-treatment inspection results and the fate of any remaining waste at the site and after each treatment.

IV.G.4. ATK shall retain records required by Permit Condition IV.G.2 and .3 above in accordance with permit Condition I.G.9 on file with the facility Operating Record specified in Permit Condition II.G.1.

IV.G.5. ATK shall submit notification and reports as required by Permit Conditions I.G.10 and I.G.12.

IV.H. CLOSURE AND POST-CLOSURE

IV.H.1. At closure, ATK shall remove all hazardous waste and residues from open burning area and equipment, and close the facility in accordance with COMAR 26.13.05.07 and an approved detailed closure plan. Permit Attachment 6, pages I-4 through I-6 is a general closure plan showing the minimum topics to be included in the detailed closure plan.

IV.H.2. At least 90 days prior to the intended beginning of closure, ATK shall submit a detailed closure plan including a sampling and analysis plan to the Department for review and approval.

IV.H.3. The detailed closure plan requirement by Permit Condition IV.H.2, above, shall include at least the following elements:

IV.H.3.a. The steps necessary to perform partial and/or final closure of the facility at any point during its active life;

IV.H.3.b. A description of how each of OB and OD units will be closed;

IV.H.3.c. A description of how final closure of the facility will be conducted, identifying the maximum extent of operations during the active life of the facility;

IV.H.3.d. Identification of all waste material and disposable items onsite at the closure of the facility, and a description of the methods used to remove, transport, treat, store, or dispose of them;

IV.H.3.e. A detailed description of the steps needed to remove or decontaminate all hazardous waste residues and contaminated reusable equipment, components, structures and soils;

IV.H.3.f. A description of methods employed to decontaminate structures and equipment that will remain on site after closure;

IV.H.3.g. Identification of decontamination agents to be used, including chemical and physical specifications of the agents;

IV.H.3.h. Specific safety measures to be taken to control spread of contamination during the closure activity and to protect human health and the environment;

IV.H.3.i. A detailed description of other activities necessary during the closure of the facility meeting the requirements of COMAR 26.13.05.07D; and

IV.H.3.k. A description of how effectiveness of decontamination will be verified by sampling and analysis to achieve the closure performance standards of COMAR 26.13.05.07B.

IV.H.4. The sampling and analysis plan, required by Permit Condition IV.H.2, above, shall, at a minimum, include the following components to verify the effectiveness of decontamination activities:

IV.H.4.a. A listing and justification of sampling and analytical methods employed. ATK shall select and propose these methods in accordance with the Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods (SW-846, latest edition), incorporated by reference in COMAR 26.13.01.05A(4), as appropriate for the constituent in question, or equivalent methods acceptable to the Department. ATK shall use the Toxicity Characteristic Leaching Procedure (TCLP), Test Method 1311, in SW-846, for demonstration of the toxicity characteristic;

IV.H.4.b. A description of quality assurance and quality control procedures associated with the selected sampling and analysis methods;

IV.H.4.c. A definition and justification of a Target Compound List (TCL) for which the verification samples will be analyzed;

IV.H.4.d. Identification and justification of a threshold level for each compound on the TCL list that determines a "clean or "contaminated" condition; and

IV.H.4.e. Number, location, media or substances to be sampled.

IV.H.5. ATK shall decontaminate the OB/OD site, including all loading and staging areas and the equipment that is to remain onsite after closure, in accordance with the detailed closure plan submitted by ATK and approved by the Department in accordance with Permit Condition IV.H.2 through IV.H.4, above.

IV.H.6. Within 60 days of the completion of the closure activities, ATK shall submit a:

IV.H.6.a. Closure report containing results of the activities conducted in compliance with each component of the approved closure plan, including, but not limited to, the verification results demonstrating a clean closure of the OB/OD units, and a certification of closures as required by COMAR 26.13.05.07F; or

IV.H.6.b. Written request to extend 60-day deadline including the reason for the request and a proposed timeline for completion.

IV.H.7. If ATK is unable to demonstrate a clean closure in accordance with Permit Condition IV.H.6, above, ATK shall inform the Department within 60 days of the completion of the closure activities, and propose measures to achieve closure performance standards, such as submission of a post-closure care plan for the Department's review and approval.

PART V

SPECIAL CONDITIONS FOR POST-CLOSURE CARE OF CLOSED INCINERATOR FEED SURFACE IMPOUNDMENT AND ABANDONED OPEN BURNING/OPEN DETONATION UNIT

V.A. BACKGROUND

The Incinerator Feed Surface Impoundment (IFSI) was decommissioned and closed in the spring of 1988. The former Open Burning/Open Detonation (OB/OD) unit was abandoned in 1992. Twenty-nine monitoring wells have been installed in and around the area, located at the northwestern portion of ATK property (C Area). An infiltration gallery and an interceptor drain have also been constructed. Through several years of groundwater monitoring, sampling and analysis, it has been established that there is a general groundwater flow direction southwest towards Elk Creek in the shallow aquifer. Several volatile organic compounds (VOC) have been detected in the shallow aquifer higher than the respective Maximum Contaminant Levels (MCL). Benzene has been found at 26 micrograms per liter (µg/l) in the deep aquifer which is also above the respective MCL.

V.B. UNIT IDENTIFICATION

ATK shall provide post-closure care for the closed IFSI and the former OB/OD site, subject to the terms and conditions of this permit. The original IFSI covered an area of approximately 900 square feet. The area affected by IFSI and the former OB/OD unit is approximately 100 acres, shown on Page B-17, Permit Attachment 7, Facility Description.

V.C. POST-CLOSURE PROCEDURES AND USE OF PROPERTY

V.C.1. ATK shall conduct post-closure care of the units for 30 years. The 30 year post closure care period may be shortened upon application and demonstration by ATK, and approved by the WAS, that the units are secure, or may be extended if the WAS finds this is necessary to protect human health and the environment.

V.C.2. ATK shall comply with the requirements for surface impoundments as follows: (COMAR 26.13.05.11G(2)(a), (c) and (d))

V.C.2.a. Maintain the integrity and effectiveness of the final cover, including making repairs to the cap, as necessary, to correct the effects of settling, subsidence, erosion, and other events;

V.C.2.b. Maintain and monitor the ground water monitoring system and comply with all applicable requirements of COMAR 26.13.05.06 through 06-7 during the post-closure period. (COMAR 26.13.05.07G(1))

V.C.2.c. Prevent run-on and run-off from eroding or otherwise causing damage to the final cover.

V.C.3. ATK shall not allow any use of the area designated in Permit Condition V.B. which will disturb the integrity of any components or the function of the facility's monitoring systems during the post-closure care period.

V.D. INSPECTIONS

ATK shall inspect the components, structures, and equipment at the site in accordance with the Inspection Schedule, in Permit Attachment 2. (COMAR 26.13.05.07G(1)(b))

V.E. NOTICES AND CERTIFICATION

Within 60 days of the effective date of this permit ATK shall submit to the WAS a certification, signed by the owner or operator, that ATK has recorded the notation specified in COMAR 26.13.05.07I(2)(a) including a copy of the document in which the notation has been placed. (COMAR 26.13.05.07I(2)(b))

V.F. FINANCIAL ASSURANCE

ATK shall maintain financial assurance during the post-closure period and comply with all applicable requirements of 40 CFR Part 264 Subpart H, incorporated by reference in COMAR 26.13.05.08.

V.G. POST-CLOSURE PERMIT MODIFICATIONS

ATK shall comply with the requirements of COMAR 26.13.05.07H(4) whenever a change in the approved post-closure plan is required.

V.H. CORRECTIVE ACTION PROGRAM

V.H.1. ATK shall continue operations using the interceptor trench to withdraw and treat contaminated groundwater.

V.H.2. Within 60 days of the effective date of this permit ATK shall submit to the WAS:

V.H.2.a. An evaluation, and quantification, of the effectiveness of the interceptor trench operation in removing volatile organic compounds and perchlorate from groundwater.

V.H.2.b. An evaluation, and quantification, of the effectiveness of the current phytoremediation activity by willow trees in removing volatile organic compounds and perchlorate from groundwater.

V.H.2.c. The results, findings and recommendations derived from the implementation of the Edible Oil Bioremediation treatment demonstration project.

V.H.2.d. A report on measures taken in response to Data Gaps No. 3 and 4, listed in the Corrective Action Plan, dated December 21, 1997, prepared by Geraghty and Miller, Inc. concerning groundwater flow velocity and monitoring well locations, respectively.

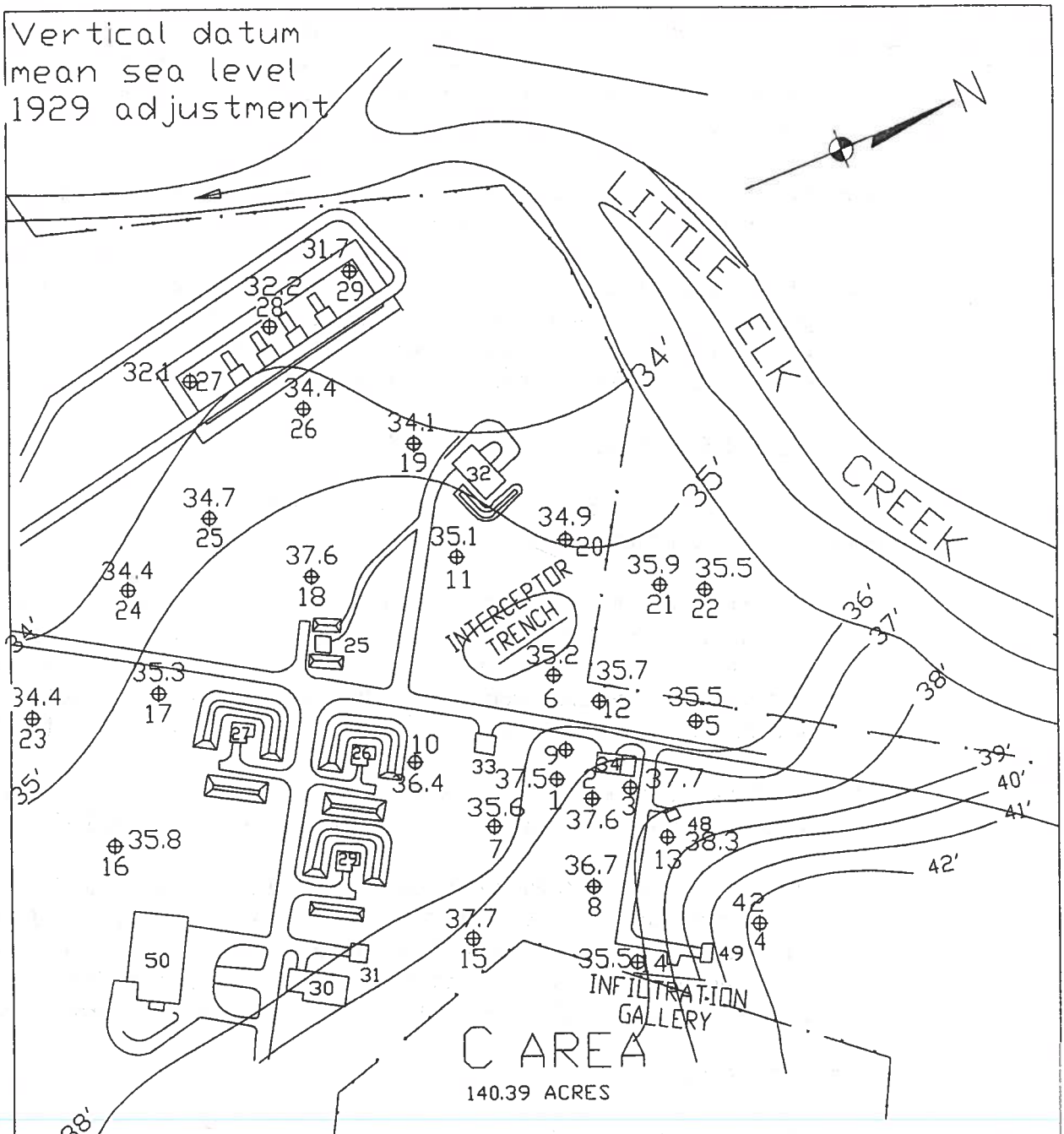
V.H.2.e. A comparative evaluation of all applicable alternative in- and ex-situ technologies to determine the best approach at the site to expedite stabilization and final remediation of the VOC contaminated plume.

V.I. GROUNDWATER PROTECTION STANDARD

V.I.1. ATK shall continue to implement a corrective action program to address groundwater contamination at the site affected by IFSI and the abandoned OB/OD unit at least as long as any of the concentration limits listed in Permit Condition V.I.2 and V.I.3 are exceeded at the compliance point (Well No.2 as shown on Figure 1) and all points downgradient of the compliance point to ATK's property boundary (COMAR 26.13.05.06-1D).

V.I.2. The following table lists hazardous constituents and corresponding concentration limits that are part of the groundwater protection standard under Permit Condition V.I.1:

Constituent	Concentration limit (ppb)
Benzene	5
Chlorobenzene	100
Chloroform	80
Carbon tetrachloride	5
1,2 Dichloroethane	5
1,1 Dichloroethene	7
Methylene chloride	5
Tetrachloroethene (PCE)	5
1,1,1 Trichloroethane	200
1,1,2 Trichloroethane	5
Trichloroethene (TCE)	5
Vinyl Chloride	2



Quarterly average C-68 air stripper feed rate = 6 gpm. Average shallow aquifer depth = 10.19 ft.
Approximate shallow groundwater gradient (dh/dl) = 8ft/1000ft = 0.008 ft/ft
Calculated shallow groundwater velocity = (k/n dh/dl) = 4.3 feet/year. (n = .25 = effective porosity)
Aquifer transmissivity, T = kb = 3.8 sqft/day = 28.2 gal/day/ft
Shallow aquifer hydraulic conductivity (k) = 0.37ft/day (1.3x10-6m/s), (GTI slug test 3/15/90)

	INIT	DATE	MONITORING WELLS		INIT	DATE
DRAWN BY	W.E.L.	3/22/03	POTENTIOMETRIC SURFACE	SAFETY		
CHECKED BY			Dec. 3, & 4, 2003	ENVIRONMENT		
ENGINEER			ATK Elkton LLC	SCALE:	1"=200'	
APPROVED				LD-GWE403	REV.	

Figure 1

These constituents have been detected above their respective MCL at least once. This list shall be revised by adding any other constituents that are detected above their MCLs during groundwater monitoring conducted in accordance with Permit Condition V.M.

V.I.3. For the purpose of Permit Condition V.I.1, the concentration limit for perchlorates in groundwater is 4.0 parts per billion.

V.I.4. The compliance period, as per COMAR 26.13.05.06-1E, shall be equivalent to the post-closure care period under COMAR 26.13.05.07G(1). ATK shall maintain compliance for thirty years following the closure date of each unit, unless COMAR 26.13.05.07G(2)(a) or (b) is invoked.

V.J. SAMPLING AND ANALYSIS PROCEDURES

ATK shall use the following techniques and procedures for obtaining and analyzing samples from groundwater monitoring wells:

V.J.1. ATK shall submit copies of the Standard Operating Procedures and Quality Assurance/ Quality Control Methods of the laboratory that will be used for sampling and analysis work to the WAS for review. The laboratory must use the methods and procedures documented in the latest edition of the EPA Publication Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846.

V.J.2. ATK shall assure that all groundwater extracted from purging the monitoring wells and all discarded samples are contained, tested and disposed of properly.

V.J.3. ATK shall follow procedures described in the Environmental Protection Agency 1986 publication OSWER-9950.1 "RCRA Ground-Water Monitoring Technical Enforcement Guidance Document" or other procedures acceptable to the WAS in obtaining, preserving, shipping, analyzing and tracking samples from groundwater monitoring wells and for quality assurance and control of results.

V.J.4. ATK shall:

V.J.4.a. Employ procedures for sample collection, preservation, shipment and analysis and for tracking and control of samples and data that provide reliable indication of the quality of groundwater below the units, and

V.J.4.b. Assure that such procedures are compatible with the statistical analysis method required in Permit Condition V.L.

V.K. GROUNDWATER SURFACE ELEVATION

V.K.1. ATK shall determine the groundwater surface elevation at each well each time groundwater is sampled.

V.K.2. ATK shall install additional monitoring wells or piezometers, as required, based on plans and specifications to be submitted by ATK and approved by WAS, to allow a clear understanding of groundwater gradients as they evolve as a result of the corrective action measures. ATK shall report to the WAS all well construction data for each new monitoring well. ATK shall also provide the driller's log for each well.

V.L. STATISTICAL PROCEDURES

ATK shall use a statistical method from those listed under COMAR 26.13.05.06-3B for evaluating groundwater monitoring data, and to determine the effect of corrective action measures. ATK shall use a procedure that:

V.L.1. is appropriate for the distribution of hazardous constituents; and

V.L.2. complies with other performance standards of COMAR 26.13.05.06-3C.

V.M. MONITORING PROGRAM AND DATA EVALUATION

V.M.1. ATK shall continue to implement a semi-annual Groundwater Monitoring Plan as described in Attachment 8 of this permit, as part of the Corrective Action Program required under Permit Condition V.H, and report its findings to the WAS. The report shall:

V.M.1.a. Include sampling results of the 29 wells shown on Figure1, and the analysis, data evaluation, and discussion.

V.M.1.b. Meet the requirements of Permit Condition V.J, Sampling and Analysis Procedures, including Standard Operating Procedures and Quality Assurance/ Quality Control Methods.

V.M.1.c. Meet the requirements of Permit Condition V.K, Groundwater Surface Elevation.

V.M.1.d. Meet the requirements of Permit Condition V.L, Statistical Procedures.

V.M.1.e. Evaluate the effectiveness of the corrective action program.

V.M.2. ATK shall determine groundwater quality as follows:

V.M.2.a. ATK shall collect, preserve and analyze samples in accordance with Permit Condition V.J.2.

V.M.2.b. ATK shall determine the concentration of the hazardous constituents specified in Permit Condition V.I.1 throughout the post-closure care

period in groundwater at each monitoring well at the compliance point and within the property boundary semi-annually in accordance with the groundwater monitoring plan.

V.M.3. ATK shall determine, and report to the WAS, the groundwater flow rate and direction in the uppermost aquifer at least annually. ATK shall submit to the WAS maps of groundwater contours and flow directions.

V.M.4. ATK shall statistically compare the measured concentration of each monitored hazardous constituent with its concentration limit in the groundwater protection standard each time groundwater quality is determined in accordance with Permit Condition V.M.2. ATK shall compare the groundwater quality measured at each monitoring well at the point of compliance and all other points specified in Permit Condition V.I.3 in accordance with procedures specified in Permit Condition V.L.

V.N. RECORD KEEPING AND REPORTING

V.N.1. ATK shall enter all monitoring, testing and analytical data obtained, according to Permit Condition V.M, in the operating record. The record must include all computations, calculated means, variances and results of statistical tests obtained in complying with this permit.

V.N.2. ATK shall submit the analytical results required by Permit Conditions V.M.2.b and V.M.5 in accordance with the following schedule:

Samples Collected During:	**Results Due to WAS by:**
March	June 30
September	November 30

V.N.3. ATK shall submit the reports required by Permit Condition V.M.3 on March 31 of each year for the previous calendar year.

V.N.4. ATK shall report to the WAS at least annually on the effectiveness of the corrective action program. ATK shall include this report with the report required under Permit Condition V.N.3 above.

V.O. REQUEST FOR PERMIT MODIFICATION

If ATK or the WAS determines that the corrective action program established by this Permit no longer satisfies the regulatory requirements, then ATK must submit an application for a permit modification within 90 days to make any appropriate changes to the program. ATK may alter or replace its methods of remediation, provided that ATK can demonstrate to the satisfaction of the WAS that such action is necessary to improve the effectiveness of the corrective action program.

ATTACHMENTS

The following attachments are an enforceable part of this permit. These permit attachments consist of Sections of the permit application, and its subsequent amendments, submitted by ATK. Permit Attachments are intended to provide further details of Permit Conditions. However, if there is a discrepancy between a Permit Condition and the contents of a Permit Attachment, the Permit Condition shall prevail.

Permit Attachment No.	Application Section and Title	Number of Pages
1	Section C, Waste Characteristics and Analysis Plan	15
2	Section F, Procedures to Prevent Hazards	41
3	Section G, Personnel Training	13
4	Section H, Contingency Plan	(Not attached[1])
5	Section D, Process Information	31
6	Section I, Closure and Post-Closure Plans	15
7	Section B, Facility Description	32
8	Section E, Groundwater Monitoring	31
9	Part A Permit Application	8

[1] ATK Contingency Plan, over 100 pages long, is not attached here. It is maintained with ATK application documents at the WAS offices.

Horacio Tablada, Director
Waste Management Administration

8/23/05
Date

Permit No. A-052

ATK Elkton LLC

ATTACHMENT 1
Section C
of the Permit Application
Waste Characteristics & Analysis Plan
(15 pages)

Section C - Waste Characteristics and Analysis

COMAR 26.13.07.02 D (16) Chemical and physical analyses of the hazardous wastes to be handled at the facility. At a minimum, these analyses shall contain all the information that must be known to treat, store, or dispose of the wastes in accordance with COMA 26.13.05.

The chemical and physical analyses of the CHS handled at this facility are described below, including an explanation of why the wastes are hazardous and how they should be stored, treated, and disposed.

Hazardous wastes disposed of by thermal treatment open burning.

Solid Fuel Rocket Propellant Waste
EPA Hazardous Waste Code D003 (Reactive)

Solid fuel rocket propellant wastes consist of unsuitable propellant batches, contaminated paper, clothing and disposable tools, propellant turnings, tailings, and residues. The propellants are manufactured at this location according to exacting ATK or Department of Defense specifications. The specific formulations are proprietary and in some cases classified information. Generally, propellants consist of 60-90% oxidizer (commonly ammonium perchlorate), 0-24% powdered aluminum, and 9-30% binder. The binders used are polymeric compounds. Some of the most commonly used polymers are polybutadienes, polyurethanes, and polyesters. A Material Safety Data Sheet for a generic class 1.3 propellant is included at the end of this section. These wastes are explosive and safety is the primary concern. These propellant wastes are treated and destroyed on site at the waste propellant open burning facility.

Less than 1% (total propellant produced basis) may also contain one or more of the following molecular explosives as additives:

Cyclotrimethylenetrinitramine (RDX)
Cyclotetramethylenetetranitramine (HMX)
Trinitrotoluene (TNT)
Pentaerythritoltetranitrate (PETN)
1,2,4-butanetriol trinitrate (TMETN)
Triethyleneglycol dinitrate (TEGDN)
(Poly)glycidyl nitrate (PGN)
Glycidyl azide polymer (GAP)
N butyl 2nitrato ethyl nitomine (BuNENA)
National Security Classified Explosives

Less than 5% (total propellant produced basis) may use one or more of the following oxidizers:

Ammonium nitrate (AN)
Hydroxylammonium nitrate (HAN)
Hydroxylammonium perchlorate (HAP)
Dihydroxyglyoxime (DHG)
The ammonium salt of DHG (ADHG)
Triethanolammonium nitrate (TEAN)
Sodium azide

The polymer rubber binder systems used are derived from polymers such as:

Hydroxyterminated polybutadiene (HTPB)
Carboxyterminated polybutadiene (CTPB)
Hydroxyterminated polyether (HTPE)
Carboxyterminated polyester (CTPE)
Tetrahydro furan polyethylene glycol (TPEG)

and reacted with isocyanates or epoxides to form cured-rubber systems such as hydrocarbon, polyesters, or polyurethanes.

Extensive quality control measures (testing and documentation) are taken for all propellant made. The exact formulation of every propellant batch made is kept in our records for at least 3 years.

Propellants are hazardous because, when ignited, they burn so vigorously and persistently that they pose a hazard, EPA hazard code D003 (reactive). Once a propellant starts burning, it is virtually impossible to extinguish. When burned under confinement, propellants can exhibit explosive properties. These wastes have the potential to detonate, which means their burning rate exceeds the speed of sound. Solid propellants are not corrosive when dry and can be stored in any commonly available container.

When propellant is mixed in water, it can more easily be handled because its chances of initiation are decreased. Some of the oxidizer will go into solution and form a mildly corrosive solution of pH 5.0 - 6.5. Plastics, rubbers, and stainless steels are the recommended material for storage of aqueous solutions.

Spent Cleaning Solvents Contaminated With Propellant
EPA Hazardous Waste Number D003, D001, F001, F003

Uncured waste solid rocket propellant (D003) must be cleaned from the tooling (mixer blades, mix bowls, casting cans, etc). We predominantly (over 99% of the time) use water based cleaner, which is not a hazardous waste. Sometimes these water-based cleaners will not effectively clean the tools and some cleaners that are also EPA hazardous wastes, must be used. These cleaners are; waste Oxsol 325 (F001), waste acetone (F003), and the waste ignitable solvent cleaners (D003) that include isopropanol and MEK. Less than 1 gallon of these cleaners that also contain waste rocket propellant is generated and open burned per burn.

Waste or Off-Specification Oxidizer
EPA Hazardous Waste Number D001 (Ignitable) and D003 (Reactive)

The oxidizers used at the facility include ammonium perchlorate (AP), ammonium nitrate (AN), dihydroxyglyoxime (DHG), hydroxyl ammonium nitrate (HAN), hydroxyl amine (HA), triethanolaminenitrate (TEAN), liquid gun propellant (LGP), hydroxyl ammonium perchlorate (HAP), glycidyl nitrate (GN), and polyglycidyl nitrate (PGN). AP is by far the most widely used oxidizer, over 95%. These oxidizers, when discarded, exhibit the hazardous waste characteristic of "reactivity" (waste code "D003"), as defined in COMAR 26.13.02.13, and do not exhibit any other hazardous waste characteristic.

Dry ammonium perchlorate is purchased from a vendor in accordance with ATK Tactical Systems Company, Elkton Operations specification document ESRM-17 (attached). Page 3 of ESRM-17 lists the chemical properties of the purchased material. Our Quality Laboratory tests each lot purchased to assure that the specification is followed. As the sheet shows, this material is more than 98% NH_4ClO_4. Our current supplier is the Western Electrochemical Company, and their Material Safety Data Sheet is shown in this section.

The dry raw material purchased is an oxidizer, and, if discarded in this form, it is a D001 (ignitable) hazardous waste. When ammonium perchlorate is ground to less than 15-micron particle size, it is classified as a class 1.1 explosive and a D003 (reactive) CHS. Dry ammonium perchlorate should be stored in non-sparking containers. Ammonium perchlorate is very soluble in water: 10.9 parts per 100 parts at 0°C, and 46.9 parts per 100 parts at 100°C. When mixed in water, it loses its explosive properties. The pH of a water solution is between 4.5 and 6.5. Fiberglass, rubber, and stainless steel are acceptable materials for aqueous solution storage.

Ammonium perchlorate is the predominant oxidizer used to formulate solid propellant. On very rare occasions, ammonium nitrate is purchased and used. Annual usage is under 10,000 pounds. AN has the same hazardous properties as AP-D001 (ignitable) and D003 (reactive). The solubility of AN in water is 68 wt%. The Material Safety Data Sheet for AN is on file at this facility.

Dihydroxygloxime, hydroxyl ammonium perchlorate, hydroxyl ammonium nitrate, triethanolamine nitrate, hydroxyl amine, and glycidyl nitrate are the oxidizers formulated by Elkton Operations. These materials are generally not wasted but reformulated. Hazardous properties are also D001 and D003.

Waste Powdered Aluminum
EPA Hazardous Waste Number D003 Reactive

Powdered aluminum is a purchased raw material that is used in some solid rocket propellants. On occasion the material becomes off specification and it becomes a waste. Powdered aluminum will react with water and generate flammable hydrogen gas. To safely dispose of it, it is open burned with other waste propellant.

Waste Detonators
EPA Hazardous Waste Number D003 (Reactive)

Waste detonators are explosive devices that include blasting caps, initiators, primers, squibs, igniters, and detonating cord. They generally consist of a metallic capsule containing a primary Class 1.1 explosive charge. The amount of charge per unit varies from a few milligrams to 1 gram. Detonators can be ignited by a flame of a safety fuse, electrically, high temperatures, friction, or impact. The explosive charges may include the following Class 1.1 explosives:

Common Name	Gross Formula	Chemical Name
TSPP	$TiH_{.65}KCLO_4$	Titanium subhydride/potassium perchlorate
PETN	$C_5H_8N_4O_{12}$	Pentaerythritra tetranitrate
Lead azide	$Pb(N_3)_2$	Lead azide
RDX	$C_3H_6N_6O_6$	Cyclo-1,3,5-trimethylene-2,4,6-trinitramine
HMX	$C_4H_8N_8O_8$	Cyclotetramethylene tetranitramine
$BKNO_3$	$BKNO_3$	Boron potassium nitrate
Lead styphnate	$C_6H_3N_3O_9Pb$	Lead trinitroresorcinate
DDNP	$C_6H_2N_4O_5$	Diazodinitrophenol
Tetryl	$C_7H_5N_5O_8$	Trinitro-2,4,6-phenylmethyl-nitramine
Various	Various	Metallic/oxidant pyrotechnics
Tetracene	$C_2H_8N_{10}O$	Tetrazolyl guanyltetrazene hydrate
HNS	$C_{14}H_6N_6O_{12}$	Hexanitrostilbene
DIPAM	$C_{12}H_4N_6O_{12}$	Diaminohexanitrobiphenyl
Tacot	$C_{12}H_4N_8O_8$	Tetranitrodibenzotetrazapentolene

Each of the above is an initiating or primary explosive. All are classified by US DOT as Class 1.1 explosives. Their solubilities and other properties vary from compound to compound. They all have the same products of combustion. The carbons combust to mostly carbon dioxide (CO_2) with some small amounts of carbon monoxide (CO). The nitrogens combust primarily to nitrogen dioxide (NO_2) with some smaller amounts of other nitrogen oxides (NO_x). The hydrogen combusts to water. The metals combust to either the pure metal or the metal oxide. The inorganics combust to inorganic salts.

All storage handling and disposal of waste detonators will not only be conducted in accordance with all applicable EPA and MDE regulations but also those of the DOT, MVA, DoD, Bureau of Alcohol, Tobacco and Firearms (BATF), and the Maryland Fire Marshal.

New detonators may be purchased from others and manufactured on site. The waste detonators have the same origins. We also accept waste detonators of the same waste characteristics from others and we dispose of them at our thermal treatment open burning facility.

Waste Vintage MC3502 Rocket Motors
EPA Hazardous Waste Number D003 (Reactive)

These rocket motors are owned by the US Department of Energy and are being removed from the US Weapons Arsenal. Each motor contains less than 10 lbs of propellant. The propellant formulation is essentially identical to the propellants currently manufactured by the Elkton Division and emits the same combustion products. We have been asked by our customer to dispose of these motors as a service because we are now manufacturing their replacements.

These vintage motors will be received from off-site, dismantled and disposed of by open burning at our thermal treatment waste propellant open-burning facility.

Containerized hazardous wastes stored in hazardous waste container storage Building H-22 or A-26.

Spent Photographic Developer/Fixer Solution
EPA Hazardous Waste Number D006 and D011

This is the solution of spent photographic developer and spent photographic fixer that is produced by our x-ray and photographic equipment. This solution is hazardous because of its toxic silver and/or cadmium content. The pH is 6.5, and normal construction materials are suitable for its storage containers. The typical composition of this waste is:

pH	5.4
Arsenic	< 0.002 mg/l
Barium	< 0.2 mg/l
Cadmium	< 2 - 4 mg/l
Chromium	< 0.05 mg/l
Lead	< 0.1 mg/l
Mercury	< 0.005 mg/l
Selenium	< 0.003 mg/l
Silver	70 - 120 mg/l
Iron	0.1 mg/l

This wastewater is accumulated and stored in 250 gallon containers or 55 gallon drums in hazardous waste storage building H-22 before it is transported offsite for disposal.

Aqueous Spent Cleaning Solutions That Contain Cadmium
EPA Hazardous Waste Number D006

Some empty rocket motor cases that have a cadmium coating are degreased in an aqueous water washer. The spent water from this operation contains cadmium and is a D006 hazardous waste. The water is accumulated and stored in 250 gallon containers or 55 gallon drums in hazardous waste storage building H-22 before it is transported offsite for disposal.

Spent Oxsol 325 and Other Cleaning Solvents
EPA Hazardous Waste Number F001, D001

Oxsol 325 is a cleaning solvent used in hand wipe applications to clean critical bond surfaces. Oxsol 325 is composed of 30% parachlorobenzotrifluoride (PCBTF), 20% monochlorotoluene (MCT) and 50% perchlorothelene (PCE). PCE is identified as EPA hazardous waste U210 or F001 spent halogenated cleaning solvent. The PCBTF and MCT are not hazardous wastes. Oxsol 325 cleaning solvent is hazardous because of its toxicity. Other spent cleaning solvents such as isopropanol, acetone, MEK, toluene and some water based cleaners are also consolidated and accumulated in 55 gallon steel drums and in hazardous waste storage building H-22 before being transported offsite for disposal. The spent Oxsol 325 is hazardous because of its toxicity and some of the other cleaning solvents are hazardous because of their ignitability.

Waste Aqua Ammonia
EPA Hazardous Waste Number D002

Aqua ammonia is a raw material that is purchased and used to manufacture Dihydroxyglyoxime (DHG) in batches. At the end of a run any aqua ammonia left over is put into 55 gallon drums and stored in building H-22 until it is transported off-site for disposal.

Mixture of Flammable Toxic Waste Liquids
EPA Hazardous Waste Numbers D001, F001, and F005

Flammable and/or toxic liquids are purchased and used in our solid fuel rocket propellant manufacturing operations to clean parts and equipment, paint parts, and formulate adhesives, and as reagents in our laboratories. These liquids are used in small batch quantities, generally smaller than 1 gallon. The used or spent liquids are composited and stored in 55-gallon drums, which are kept at the manufacturing building until they are full. When the drum is full of the waste liquids, it is picked up and stored in building H-22 until it is finally picked up by a licensed hazardous-waste transporter and taken to a licensed hazardous-waste treatment or disposal facility. The preferred disposal method for this waste is recycling. If it is uneconomical due to low solvent content, this waste is incinerated.

Hazardous Wiping Rags and Similar Debris
EPA Hazardous Waste Numbers D001, F001, and F005

Used rags wetted with the solvents and raw materials described above are collected in sealed plastic bags from the manufacturing areas. Paint brushes, Q-tips, sponges, filters, paper also wetted with these materials are put in the plastic bags. The articles in this waste stream are predominantly (95%) solid materials and no more than 5% liquid. The plastic bags are then collected and put into fiber drums and stored in hazardous waste storage building H-22 before being transported offsite for disposal.

Paint Related Wastes
EPA Hazardous Waste Number D001, D007, D035

Paint can heals, out of date or out of specification paint related wastes are picked up from through out the plant and consolidated in 55 gallon steel drums in hazardous waste container storage building H-22 being transported offsite for disposal. This includes puncturing aerosol cans with a special tool that is fitted to the drum. The drum is connected to a carbon filter when it is being filled.

Waste Oxidizers and Powdered Aluminum
EPA Hazardous Waste Number D001, D003

On occasion the oxidizers and powdered aluminum that are the raw materials used to manufacture solid rocket propellant become unusable. When this occurs these wastes may be stored in building H-22 before they are disposed of.

Discarded Methyl Ethyl Ketone
EPA Hazardous Waste Number U159
Discarded Toluene Diisocyanate
EPA Hazardous Waste Number U223

These chemicals are purchased for use in our manufacturing operations. The amount wasted is the residue left behind when the container is emptied. The composition of these materials is the same as the purchased material and is identified on the Material Safety Data Sheets presented at the end of this section.

Lab-Pack Waste

Lab-pack waste is small containers of various raw materials both liquid, solid and gaseous that are stored in lab-pack storage building A-26 before being repackaged for transport and disposal offsite. Most lab-packs generated at Elkton have RCRA U and D codes and several have the acute P codes: The following is a summary of RCRA codes for the lab-pack generated and disposed of in the past.

D001, D002, D003, D005, D006, D007, D008, D009, D011, D018, D035, D038, U002, U009, U012, U041, U044, U053, U056, U061, U113, U151, U154, U159, U188, U196, U205, U210, U213, U220, U223, U226, U239, P002, P015, P054

An example of the small batch operations performed in the manufacture of a solid propellant rocket motor that generates a small quantity of this waste follows.

Prior to bonding the rubber insulation liner to the inside of a metal rocket motor case with an adhesive, the inside of the case is pretreated. The operator mixes a 1-pint can of Chemlok primer with 1 pint of methyl ethyl ketone, both of which are purchased industrial products. The mixture is applied to the inside of the rocket motor case, and usually some of the mixture is left over. Our quality control procedures prevent this mixture from being reused, so it is discarded as a waste. The mix is poured into a 55-gallon steel drum kept at the manufacturing building until the drum is full. This same drum is used for accumulating waste from other small batch operations generated in a similar manner but involving different chemicals.

Because spent halogenated solvents used in degreasing as listed in 40CFR261.31 are a part of the mixture, the waste is classified as EPA number F001.

Because spent non-halogenated solvents as listed in 40CFR261.31 are a part of the mixture, the mixture is also classified as EPA number F005.

Because waste ethyl, isopropyl, and isobutyl alcohols are also a part of the mixture and these alcohols are not included in the list of F005 solvents but have a flash point below 140°F, the mixture is also classified as EPA waste number D001, ignitable.

This waste is not corrosive and steel drums are acceptable. Material Safety Data Sheets for these materials are on file at the facility.

The following Material Safety Data Sheets can be found at the end of this section:

Solid Rocket Propellant, Generic Class 1.3
AP - Ammonium Perchlorate
DHG - Dihydroxyglyoxime
Zyglo Dye Penetrant (non-hazardous waste)
Jon Cool 800 Coolant Oil (non-hazardous waste)

Lab Pack waste is packaged according to the procedures explained on pages C-13 and F-13 to assure incompatible wastes are not packaged together.

Non-Hazardous, non-regulated wastes stored in containers or tanks in Hazardous Waste storage building H-22.

The following non-hazardous waste is also generated. Although they are not regulated they are discussed here so that they are not confused with hazardous waste. Periodically, ATK, Elkton generates certain aqueous solutions containing one or more of the previously described oxidizers. These aqueous solutions, as described below, are classified as non-hazardous waste streams.

Wash Waters Containing Oxidizers

ATK Elkton washes down equipment with water. The wash waters contain residual traces of waste oxidizer(s) (less than 1 percent). On a less frequent basis we also use high pressure water to remove cured solid propellant from it's rocket motor case. This water is referred to as hydromining waste water and at the most may contain 20% AP. The facility historically has classified and managed these wash waters as hazardous wastes because of the presence of these dissolved waste oxidizer(s), and because they may have contained trace amounts of 1,1,1 trichloroethane cleaning solvent which is now banned from use by EPA and is no longer used by ATK Elkton. The wash waters do not come into contact with any other material that would meet the definition of a hazardous waste, when discarded.

Waste Waters Containing Oxidizers

The facility also generates waste waters from the production of DHG, HAN, HAP, TEAN, LGP, GN, and PGN. These waste waters contain small amounts (again, less than 5 percent) of oxidizer(s). ATK Elkton has managed these waste waters as hazardous wastes because they contain trace amounts of waste oxidizer(s). Similar to the wash waters, these waste waters do not come in contact with any other material that would meet the definition of a hazardous waste, when discarded.

Solutions Containing Oxidizers

Finally, the facility generates solutions of various oxidizers and water. For example, water is added to off-specification oxidizer to facilitate safe storage. These solutions contain small amounts of (typically less than 5%) of oxidizer(s) and have historically been managed as hazardous wastes due to the presence of the oxidizer(s). As with the other aqueous solutions, these solutions do not come in contact with any other material that would meet the definition of a hazardous waste.

Regulatory Classification of ATK Elkton's Aqueous Solutions Containing Oxidizers

Upon further reflection, ATK Elkton petitioned MDE to more appropriately classify the aqueous solutions as non-hazardous wastes. MDE's regulations, COMAR 26.13.02.03, specify five alternative "criteria" that may be used to classify solid wastes as hazardous wastes. The aqueous solutions containing residual traces of oxidizer(s) (e.g., ammonium perchlorate, DHG, HAN, HA, TEAN, LGP, HAP, GN, and PGN) do not meet any of these criteria.

First, the solutions in question do not exhibit a hazardous waste characteristic. Under MDE's regulations, a material is a hazardous waste if it exhibits any of four hazardous waste "characteristics." COMAR 26.13.02.03(A)(2)(a). These four characteristics of hazardous waste are: (1) ignitability (COMAR 26.13.02.11); (2) corrosivity (COMAR 26.13.02.12); (3) reactivity (COMAR 26.13.02.13); and (4) toxicity (COMAR 26.13.02.14).

Based on process knowledge[1] and testing, ATK Elkton concludes that the aqueous solutions are not characteristically hazardous. The only residual material contained on the process equipment that exhibits a hazardous waste characteristic is the oxidizer(s), which is considered hazardous solely due to reactivity. ATK has tested the aqueous solutions, as generated, and as required by our Part B CHS permit and found that the solutions do not satisfy the characteristics of ignitability, corrosivity, or toxicity.

Further, based on process knowledge, ATK Elkton has concluded that the aqueous solutions containing residual amounts of oxidizer(s) are not hazardous due to reactivity. Although residual amounts of the reactive oxidizer(s) are contained in the solutions, they are such a small portion that the reactivity characteristic is not imparted to the aqueous solutions.

Dry ammonium perchlorate is listed in the US Dept. of Transportation (DOT) Table of Hazardous Materials (49CFR 172.101) as either a class 1.1 explosive or a class 5.1 oxidizer depending on the particle size of the dry AP.

The Hazardous Materials Table does not contain a listing for aqueous solutions of AP. Therefore it is up to the shipper to properly classify the material.

49CFR173.127(a)(2) states: A liquid material is classed as a Division 5.1 material if, when tested in accordance with the UN Manual of Tests and Criteria, it spontaneously ignites or its mean time for a pressure rise from 690 kPa to 2070 kPa gauge is less than the time of a 1:1 nitric acid (65%)/cellulose mixture.

Alliant and ATK have a great deal of experience using AP and we are very familiar with its properties and characteristics. Aqueous solutions of AP do not fall in the category of oxidizers described above. The perchlorate ion is configured as a tetrahedron and is very stable. It does not readily release its oxygen. Heat is usually required for it to oxidize. It is less of an oxidizer than the 65% nitric acid that DOT uses as the benchmark for a liquid to be classed as a DOT 5.1 oxidizer.

Because the aqueous AP solutions are not DOT oxidizers they are therefore not a RCRA ignitable hazardous waste.

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[1] ATK notes that MDE, similar to EPA, permits a person generating a solid waste to determine via process knowledge whether or not the solid waste exhibits a hazardous waste characteristic. COMAR 26.13.03.02.

Second, the aqueous solutions are not specifically "listed" as hazardous wastes. COMAR 26.13.02.03(A)(2)(b). MDE's regulations identify four lists of hazardous wastes (COMAR 26.13.02.15-.19) and none of the oxidizers in question (ammonium perchlorate, DHG, HAN, HA, TEAN, LGP, HAP, GN, and PGN) nor the aqueous solutions containing the oxidizers are identified on any of the lists. Thus, the aqueous solutions in question are not "listed" hazardous wastes.

Third and fourth, the aqueous solutions in question are not hazardous wastes as a result of the "mixture" rule. COMAR 26.13.02.03(A)(2)(c), (d). The mixture rule applies to a mixture of a listed hazardous waste and a solid waste. In the present instance, neither the oxidizers in question nor the aqueous solutions containing the oxidizers are identified as listed hazardous wastes. Thus, the solutions containing residual oxidizer(s) would not be considered hazardous via the mixture rule.

Fifth, the aqueous solutions are not used oil and, therefore, the hazardous waste criteria applicable to used oil would not be applicable. COMAR 26.13.02.03(A)(2)(e).

In sum, ATK believes that the aqueous solutions containing residual amounts of oxidizers generated during clean-up operations and the manufacturing process are not hazardous wastes.

In a letter dated 10/17/01 the MDE Hazardous Waste Program confirmed that they agree that the aqueous solutions described above are not hazardous waste.

Waste Dye Penetrant and Water
Non-Regulated Waste

Metal parts are inspected using an emulsifiable fluorescent penetrant. The penetrant is purchased from the Magnaflux Corporation and is not hazardous. The material is put on the metal part and then it is examined under a black light to see if there are any cracks. The material is then washed off the part with water and the water is put into 250 gallon containers. The MSDS for the dye penetrant is included in the back of this section. This wastewater is accumulated and stored in 250 gallon containers or 55 gallon drums or in tanks in hazardous waste storage building H-22 before it is transported offsite for disposal.

Waste Coolant and Cutting Oil and Water
Non-Regulated Waste

Metal parts are machined in our machine shop. As mentioned previously on page B-26 they do not machine cadmium or cadmium-coated parts. The shop uses water soluable cooling oil to keep the cutting tools cool and to assist in the machining process. Both of these purchased materials are non-hazardous. The MSDS's for this product is included in the back of this section. We do not machine any metals that would cause this waste to become contaminated with soluable heavy toxic metals. This wastewater is accumulated and stored in 250 gallon containers or 55 gallon drums or in tanks in hazardous waste storage building H-22 before it is transported offsite for disposal.

DHG Waste Water
Non-Regulated Waste

Dihydroxyglyoxime (DHG) is a special rocket fuel ingredient made at this location about once a year. Its chemical formula is $C_2H_4N_2O_4$, and it is manufactured from diethyl oxalate, hydroxylamine sulfate, ammonium hydroxide, and sulfuric acid. DHG has ignitable properties similar to the propellant described. The manufacturing process produced a waste water with a composition of 2.5% ethanol, 6% ammonium sulfate, and 0.2% DHG by weight. The following materials may also be present in amounts under 0.1 wt%: sulfuric acid, the ammonium salt of DHG, oxalic acid oxamide, ammonium hydroxide (possibly other amines or amides), residual hydroxyl amine sulfate, diethyleneoxylate, and iron compounds. No Appendix VIII compounds are present.

COMAR 26.13.07.02 D (17) A copy of the waste analysis plan required by COMAR 26.13.05.

The detailed waste analysis plan for this facility is detailed on the following page. The Elkton procedures listed on the plan are available on request. If for any reason we believe that our operations or processes that could generate a waste have changed, we will analyze the waste as soon as it can be sampled and test it for the applicable parameters.

A test will also be conducted to ensure that the new waste is compatible with our other wastes. This test will be performed under a laboratory hood by mixing 5 grams of the new waste with 5 grams of each of our existing wastes. All the wastes at this facility are compatible with each other. The only exception is the small quantities of waste laboratory chemicals that are handled by lab-packs. Lab-packs are handled according to the procedures defined in 40CFR265.316, "Disposal of Lab-Packs."

ATK will only accept the following waste from off-site:

Description	EPA Waste Number
Waste MC3502 Rocket Motors	D003
Waste Detonators	D003

Before any waste is received, we will require that the generator supply a detailed chemical and physical analysis of the representative wastes.

All waste received from offsite will be inspected prior to being disposed. Waste MC3502 rocket motors and detonators can be identified by their physical appearance.

CHS	Hazardous Parameters	Rationale	Analysis	Test Method	Sampling Method	Frequency	Comments
Waste ground oxidizer, D003, D001	Perchlorate as NH_4ClO_3% (ignitability)	Perchlorate is the portion of the compound that yields oxygen readily to stimulate the combustion of organic matter	Perchlorate	Elkton procedure ESRM-17E 4.410, page 18.03	Elkton procedure ECP-218A, page 18.05	Each lot of raw material purchased	Purchased lot can be traced back to waste material
Waste rocket propellant, D003	Oxidizer as % (reactivity)	The oxidizer is the portion of the propellant that causes it to burn persistently	Test burned	Elkton procedure ECP 216A, page 18.12	Elkton procedure ECP 216A, page 18.12	Each batch produced	The composition of the manufactured propellant is rigidly controlled and documented
Spent photographic fixer/developer, D011, D006	% Silver (toxicity) % Cadmium (toxicity)	The silver and cadmium content of this waste causes it to be toxic	% Silver % Cadmium	Method 7760, atomic absorption direct aspiration	"Coliwasa"	Only if the photographic or x-ray process changes	Over 10 years of test results have shown no appreciable variation
Spent halogenated solvent, F001; spent non-halogenated solvent, F005; ignitable liquid, D001	Ignitability and toxicity	A mixture of commercially purchased toxic and flammable liquids is composited	N/A				Composition of this material is determined from the manufacturer's material safety data sheet
Discarded toluene diisocyanate drums, U223	Toluene diisocyanate (toxicity)	The toluene diisocyanate content of this waste causes it to be toxic	N/A				Composition of this material is determined from the manufacturer's material safety data sheet
Discarded MEK drums, U159	Methyl ethyl ketone (toxicity)	The MEK content of this waste causes it to be toxic	N/A				Composition of this material is determined from the manufacturer's material safety data sheet
Discarded Oxsol 325 cleaning solvent drums, U226	Tetrachlorothylene (toxicity)	The tetrachloroethylene content of this waste causes it to be toxic	N/A				Composition of this material is determined form the manufacturer's material safety data sheet

CHS	Hazardous Parameters	Rationale	Analysis	Test Method	Sampling Method	Frequency	Comments
Beryllium dust contaminated articles	Beryllium	Beryllium dust is a hazardous air pollutant	Beryllium wt %	Method 7090, atomic absorption	Random grab	Annually	
Lab-Pack wastes Including universal waste batteries, fluorescent lamps, mercury switches and used oil.	Ignitability Corrosivity Reactivity Toxicity	These are small containers of various raw materials, both liquid, solid and gaseous generated from all areas of this facility, labs, operations, maintenance, offices etc.	Visual inspection of label and MSDS	NA	Each container is identified.	Each time a container is stored in A-26 or packaged for transportation to the offsite disposal facility.	Container are segregated by chemical compatibility groups and hazard class. Packaged and labeled according to DOT regulations.
Waste detonators and MC3502 rocket motors received from off-site	Reactivity	These are waste items that were manufactured specifically for their reactive properties	Physical inspection	Verify that these items are the same as on the original manufacturing specifications	Grab	Each lot received	Each waste detonator will be visually inspected. If the visual inspection is abnormal this detonator will not handled until a temporary operating procedure (TOP) is written and approved. Abnormal looking detonator may be unstable.
Aqueous spent cleaning solutions	Cadmium	If cadmium plated parts are cleaned, the waste water may contain cadmium and causes it to be toxic	Cd	7190	Grab	Annually	

Permit No. A-052

ATK Elkton LLC

ATTACHMENT 2
Section F
of the Permit Application
Procedures to Prevent Hazards
(41 pages)

Section F - Procedures to Prevent Hazards

COMAR 26.13.07.02 D (18) A description of the security procedures and equipment required by COMAR 26.13.05.02E

Because much of the work performed at this facility is done under Department of Defense contract, ATK Tactical Systems Company, Elkton Operations, is a party to a security agreement with the Department of Defense in which we pledge to maintain comprehensive security measures.

Security at the Elkton Operations is maintained by a trained security force, which controls entry and exit from the facility and provides patrol, escort, and other activities within the plant.

A barrier surrounds the entire parameter of the facility. A steep cliff and chain link fence protect our northern boundary, as can be seen on the topographic map in Section B. A 7-foot chain link fence topped with strands of barbed wire protects all the rest of the facility. There are no public roads through this facility. All gates in the fence are kept closed and locked. Whenever a gate is opened, it is patrolled by a security officer. The main gate to the facility is manned 24 hours a day every day by a minimum of one security officer. Four security officers work the first 8-hour shift and three work the second and third shifts.

A "Danger - Unauthorized Personnel Keep Out" sign is posted at the main entrance to the facility. In addition, these signs are also posted on the door of building A-26, where lab pack chemicals are stored, at each approach to the burn field, incinerator, and container storage area and A-19, where universal fluorescent lights are stored. These signs are legible from a distance of at least 25 feet. Main entrances are provided with ample lighting. All employees entering must show their identification badges and wear them in plain sight throughout the day. All contractors and visitors must wear special identification badges. An employee must escort temporary contractors, vendors, and visitors wherever they go in the plant.

Our security force is also equipped with hand-held two-way radios and a base station.

COMAR 26.13.07.02 D (19) A copy of the general inspection schedule required by COMAR 26.13.05.02F

The inspection schedule and rationale followed for this facility can be found in this section. All hazardous-waste monitoring equipment, safety and emergency equipment, security devices, and operating and structural equipment that are important to preventing, detecting, or responding to environmental hazards are inspected for malfunction and deterioration, operator errors, and discharges.

Records of these inspections are kept for at least 3 years. Copies of the forms used to inspect the hazardous waste areas are included in this section:

Weekly Hazardous Waste Container Storage Area Inspection Log

Building A-26 Lab Pack Storage Weekly Inspection Log

Monthly Safety and Emergency Materials/Equipment Inspection

Waste Propellant Pickup Pad Inspection Form

Chemical Waste and Solvent Rag Pickup Report

Waste Propellant Open-Burning Facility Inspection Form

Hazardous Waste Container Operating Log Sheet for A-26

Monthly IFSI CAP Inspection Form

Groundwater Monitoring Wells

Magazine D-2

Waste Detonator Disposal Unit

ATK Elkton LLC
CHS Facility Inspection Schedule

Area/ Equipment	Specific Item	Types of Problems	Frequency of Inspection
Safety and emergency materials	Standard industrial absorbents (oil-dry)	Out of stock	Monthly/as needed
	Absorbent pads	Out of stock	Monthly/as needed
	Face shields and extra protective glasses	Broken or dirty equipment	Monthly
	First aid equipment and supplies	Out of stock, operability	As used
	Protective clothing (fire-retardant coats, gloves)	Holes, normal wear and tear, not being flame-retarded after washing	As used
	Chemical cartridge respirators	Spent cartridges, seals	Monthly/as used
	Self-contained breathing apparatus	Air quantity in reserve	Monthly/as used
Safety and emergency equipment	Portable tank trailer (1000 gal)	Operability, leaks	Monthly/as used
	Fire truck	Operability	Monthly/as used
	Portable pumps (2)	Operability	Monthly/as used
	Fire hydrant and water lines	Operability, leaks, condition	Yearly
	Fire hoses	Leaks, condition	Yearly
	Fire extinguishers	Discharged, condition, tampering	Monthly
	Fire alarms	Power failure	Monthly
Security devices	Facility fence	Corrosion, damage to chain link or barbed wire	Daily
	Gate 1 (main entrance)	Corrosion, damage to chain link or barbed wire	Daily
	Other gates	Open, unlocked, damage to chain link or barbed wire	Daily
	Two-way radios	Transmitter or receiver	Daily
	Lights	Not operating, burned-out bulbs	Daily
	Warning signs	Damaged, missing	Weekly

Area/ Equipment	Specific Item	Types of Problems	Frequency of Inspection
Building H-22 Container storage area	Container placement and stacking	Aisle space, height of stacks	Weekly
	Sealing of containers	Open lids	Weekly
	Labeling of containers	Improper identification, date missing, label weathered	Weekly
	Containers	Corrosion, leakage, dents	Weekly
	Dike valve	In closed position	Weekly
	Concrete base	Cracks, spalling	Weekly
	Concrete curbing	Cracks, spalling	Weekly
	Debris and refuse	Clogged drain, aesthetics	Weekly
	Warning signs	Damaged, missing	Weekly
Building A-26 Lab pack storage area	Segregation of incompatible wastes	Storage of incompatible waste on the same shelf area	Weekly
	Labeling of shelves	Label missing, shelf not big enough	Weekly
	Labeling of containers	Labels missing	Weekly
	Condition of building	Windows and door closed, roof leaking	Weekly
	Warning sign	Damaged or missing	Weekly
	Log sheets	Missing, not completely filled out	Weekly
Closed Incinerator Feed Surface Impoundment (IFSI) Cap	Debris and Refuse	Trash, material, extraneous items onsite.	Monthly
	Site stabilization	Needs mowing, dead or dry grass.	Monthly
	Clay cap	Cracks, erosion, wet spots, damage to structure, subsidence.	Monthly
	Vegetation	Presence of plants with deeply penetrating roots.	Monthly
	Holes	Animal burrows, human activities, vehicle ruts, subsidence.	Monthly
	Area drainage	Standing water, ponding, drainage swales clogged, not properly maintained, eroded, ruts	Monthly

Area/ Equipment	Specific Item	Types of Problems	Frequency of Inspection
Ground water monitoring wells	Standpipe	Damaged, cap missing, tampering, cracks	Weekly
	Ground water quality	Contamination	Quarterly
	Identification tag	Missing, damaged	Quarterly
	Lock	Missing, damaged	Quarterly
Reactive waste thermal treatment open burning pad	Pan bottom	Corrosion, discoloration, cracks, buckles, wet spots, hot spots	Weekly
	Pan sides	Corrosion, bulges, hot spots, sprung seams	Weekly
	Sand lining	Correct amount, even distribution, water	Weekly
	Sump	Water, valve in open position, leaks, wet spots	Weekly
	Anchor bolts	Corrosion, distortion	Weekly
	Foundation	Cracks, spalling, uneven settlement, erosion	Weekly
	Structural supports	Cracks, corrosion, buckles, damage	Weekly
	Ground clips	Corrosion, missing, broken	Weekly
	Area surrounding area	Debris, dead vegetation, poor drainage. Possible unburned explosives	Weekly
	Protective berm	Cracks, deterioration, erosion, ground hog holes, dry vegetation. Possible unburned explosives.	Weekly
	Interior of dike	In closed position.	Weekly
	Valves	Leaks, corrosion	Weekly
	Warning signs	Damaged, missing	Weekly
	Fire protection	Alarm sign missing, not in prominent location	Weekly
	Covers	Operability, corrosion, distortion	Weekly
	Roads	Pot holes, cracks	Weekly
	Open burning area	Erosion, debris, smoldering material, unusual discoloration	Each operating day
	Safety chains	Damaged, missing	Each operating day
	Surrounding area	Burned vegetation, dead vegetation, unusual discoloration	Each operating day
	Firing cable and station	Defects	Each operating day

Area/ Equipment	Specific Item	Types of Problems	Frequency of Inspection
Waste propellant pickup pads	Concrete base	Cracks, spalling, uneven settlement, wet spots, corrosion, leaks, spills	Weekly
	Concrete curb	Cracks, spalling, damaged, corrosion	Weekly
	Foundation	Eroded stones, deterioration, vegetation, uneven settlement, vehicle ruts	Weekly
	Sump area	Cracks, deterioration, damaged coating, wet spots	Weekly
	Roof	Corrosion, rust, wind damage, bulges, holes, sprung seams	Weekly Weekly
	Roof supports	Damage, rust, dents, sprung seams, bulges, distortion	Weekly
	Anchor bolts	Rust, corrosion, discoloration, distortion	Weekly Weekly
	Warning and ID signs	Missing, damage, faded	
	Lightning protection	Disconnected wires, loose fittings, ground rod damage, excessive corrosion	Weekly
	Debris and refuse	Clogged sump, trash, nonpropellant material	Weekly
	Surrounding area	Trash, buckets, lids, erosion, wet spots, dry vegetation	Each operating day
	Container placement and stacking	Height of stacks, 1-ft parameter aisle space	Each operating day
	Sealing of containers	Missing lids, torn bags, open lids, propellant not covered with water	Each operating day
	Labeling of containers	Improper identification, no labels, date missing, propellant type missing	Each operating day
	Containers	Corrosion, discolorations, cracks, damage, overfilling	

Area/ Equipment	Specific Item	Types of Problems	Frequency of Inspection
Building D-2 Magazine	Segregation of incompatible wastes	Storage of incompatible waste on the same shelf area	Weekly when waste is stored in building
	Labeling of shelves	Label missing, shelf not big enough	Weekly when waste is stored in building.
	Labeling of containers	Labels missing	Weekly when waste is stored in building.
	Condition of building	Door closed, roof leaking, cracks in concrete walls, roof or floor.	Weekly when waste is stored in building.
	Warning sign	Damaged or missing.	Weekly when waste is stored in building.
	Log sheets	Missing, not completely filled out	Weekly when waste is stored in building.
(Det-Popper) Waste Detonator Disposal Unit	Structural Integrity	Rust, corrosion	Each operating day
	Tires	Flat, need air, worn	Each operating day
	Levers	Not operable	Each operating day
	Gauges	Not operable	Each operating day
	Propane tank	Empty, missing	Each operating day
	Grating	Rust, corrosion, loose	Each operating day
	Grounding cables	Accessible, broken	Each operating day
	Batteries	Not in place, need replacement	Each operating day
	PPE - gloves, hearing protection	Missing, worn out	Each operating day

COMAR 26.13.07.02 D (20) A justification of any request for a waiver or waivers of the preparedness and prevention requirements of COMAR 26.13.05.03.

A waiver of the preparedness and prevention requirement is not being requested.

COMAR 26.13.07.02 D (22) A description of procedures, structures, or equipment used at the facility to:

- **(a) Prevent hazardous discharge in unloading operations (for example, ramps, special forklifts).**
- **(b) Prevent runoff from hazardous waste handling areas to other areas of the facility or environment, or to prevent flooding (for example, berms, dikes, trenches).**
- **(c) Prevent contamination of water supplies.**
- **(d) Mitigate effects of equipment failure and power outages.**
- **(e) Prevent undue exposure of personnel to hazardous waste (for example, protective clothing).**

Hazardous wastes generated in the process areas are transported to the CHS storage and treatment areas in the following ways:

1. Waste propellants, which are solid in form, are placed in nonsparking, 5-gallon plastic pails that are lined with a conductive pink poly liner. The propellant is then covered with water to guard against ignition and temporarily stored on a concrete pad. The wastes are transported from this pad to the thermal treatment open burn area using a specially designed trailer. The construction of the trailer is wood and aluminum. It is labeled with large "explosive" signs and, when it is moving, the headlights, emergency flashers, and red flashing beacon light of the tow vehicle are turned on. The propellants are loaded by hand onto the trailer. At each pick-up point, the driver puts the transmission in park, shuts off the motor, sets the emergency brake, acts as a safety observer, and will assist the operator when necessary. These procedures are documented in Elkton Safety Directive 1..

2. Drummed wastes, solvents, surplus raw materials, or photographic wastewater are transported to the H-22 drum storage using a flatbed, lift gate, or pickup truck. The truck may be loaded or unloaded using a forklift truck but transporting a drum over roads is forbidden due to the danger of a spill. Organization Operating Instruction No. SA-E-700-001 describes the procedure used to transport drums and the precautions taken to prevent an accident. The procedure can be found at the end of this section.

    a. All forklift truck operators must have a license. The forklift operator-training program is 4 hours in length, which involves classroom instruction with confirmation of knowledge through a written exam. An actual driving test must be passed as well as medical requirements. All operators receive a certificate of training and forklift card.
    b. All truck drivers must also have an ATK driver's license for the correct weight class of the vehicle being used. An ATK driver's license is issued only after the operator has watched the "Driving Safety" video and passed a written exam. They must have a valid drivers license. Employees who transport explosives must pass road test driving for the class of vehicle for which he is licensed.

Spills are unlikely during the loading and unloading operations because the quantity of waste handled is small. The size of the special trailer used to transport the solid waste propellants was deliberately kept small so that the likelihood of a spill or accident would be

diminished. Elkton standard operating procedure SOP-P-050, which details propellant burn field operation, directs that no more than 900 pounds of waste will be loaded on the trailer at any one time. If a spill should occur, the material would be immediately contained and picked up. Solid propellants, which do not flow, do not need containment. Liquid waste spills would be contained with absorbent. The material would be picked by hand, shovel, pump, or absorbent material. The spilled materials would then be disposed of either at the thermal treatment open burn field or in the incinerator if they contained only propellant or oxidizers. Other materials would be put in new or used UN specification UN1A1 closed head or a UN1A2 open head 55 gallon or 30-gallon steel drums, or UN specification UN1GY fiber drums and stored at our container storage facility until arrangements could be made for final disposal in a permitted disposal site.

The truck loading and unloading area in building H-22 consists of a 10-in. thick reinforced concrete pad. The pad is sloped to a center floor drain, which drains by gravity into Tank No. 1 in H-22. This tank will contain a 3,000-gallon spill.

Runoff from this facility is by means of surface drainage sewers, concrete drainage swales, or sod-covered drainage ditches. All temporary storage pads and sumps are graded to prevent run-on. The entire facility has been graded to adequately and safely remove rainwater from roads and away from building, processing, and hazardous-waste management areas. The incinerator area is diked to contain spills and to divert run-on.

There is no contaminated runoff from the drum and tank storage areas in building H-22, because these facilities are all enclosed inside a 70-ft x 60-ft x 16-ft-high metal butler building. The drainage from the building gutters and downspouts flows away from the building via grass covered swales and drainpipes.

The top of the building H-22 foundation is 1 ft 10 in. above the surrounding grade elevation, thus, preventing run-on into the building. The area surrounding the area is sodded, sloped, and swaled to remove run-on and keep the surrounding area dry.

Wastes placed in the impervious concrete sumps and pads and plastic pails protect the ground and subsequently the groundwater from contamination. The Little Elk Creek is protected from contamination by using suitable approved impervious containers and our operating procedures.

Contamination of drinking water supplies is highly unlikely. The three on-site drinking water supply wells are all located in A-area, which has the highest elevation of all our property and therefore precludes spills from flowing toward a well. The wells are totally enclosed and solidly piped to our water system. The immediate area of the wells is completely surrounded by concrete, grouted, and curbed. Two of the wells are enclosed in a building and one is covered.

Although a power failure will have little or no effect on our CHS facilities, we have installed backup facilities to protect our process and thereby prevent accidental CHS generation.

The main transformer and switchgear are provided with a 100% standby unit. An emergency 4000-volt line is installed as a backup to our regular 33,600-volt line.

Emergency electric generators are installed at four critical process facilities. Critical boilers are equipped with oil and gas firing systems.

Personnel handling waste propellants and oxidizers must wear flame-retardant lab coat/coveralls, safety glasses, and safety shoes. Gloves, goggles, safety glasses, rain suits, and face shields are on site and available to personnel.

Only certified specially trained operators ~~our~~ are permitted to operate the waste propellant open burn area. Their training is re-certified every year. When the operators bring waste propellant to the open burnfield and lay it out on the burn pans they put a barrier up across the road leading to the burn area. The barrier remains up until the burn is complete and the area is inspected and founds to be safe to enter. All employees and contractors are instructed to never pass any barriers in this plant.

Beryllium powder is stored in locked chemical storage areas or in locked laboratories. Only operators or laboratory technicians trained in the safe handling of beryllium are allowed to work with powdered beryllium.

COMAR 26.13.07.02 D (24) A description of precautions to prevent accidental ignition or reaction of ignitable, reactive, or incompatible wastes as required to demonstrate compliance with COMAR 26.13.05.02H, including documentation demonstrating compliance with COMAR 26.13.05.02H(3).

The only incompatible wastes at this facility are the small quantities (generally less than 1 pint each) generated by our Quality and Research Laboratories. These wastes are stored in building A-26 until a sufficient quantity is built up prior to being overpacked in drums and disposed of by a U.S. EPA- and MDE-licensed disposal and transportation contractor. These wastes, while being stored in building A-26, are classified into 15 compatibility groups. The groups are listed on the following page. They are stored on labeled shelves according to these compatibility groups. Each time a waste is put into this building, it is logged in on the log sheet. A copy of the form can be found at the end of this section.

Building A-26 is located more than 400 feet from our nearest property line. The building's sheet metal walls and roof prevent the contained wastes from contacting other wastes. Powdered aluminum is a raw material used in solid fuel rocket propellants. When powdered-aluminum waste is generated, it is disposed of at the thermal treatment open-burn field. Care is taken not to mix powdered aluminum with water as this would generate flammable hydrogen gas and possibly ignite and explode. When handled, this waste material is covered with No. 2 oil. Care is also taken when handling ground ammonium perchlorate waste not to mix it with oil or other organics as this increases its sensitivity. Ammonium perchlorate, DHG wastewater, and propellant wash water are compatible with each other and may be mixed together. No other waste is ever mixed with these oxidizers.

All work that is done in building H-22 is detailed in a Plant Engineering procedure. Each procedure specifies that all emptied containers, or tanks, or tank wagons will be triple-rinsed. The procedures detail how this is to be accomplished and require that the operator initial a checklist stating that he did perform the triple rinsing. The procedures that require triple-rinsing are: PE-32 disposal of waste oxidizer by incineration (non-hazardous); PE-34 disposal of waste cooling/cutting fluid (non-hazardous); PE-36 disposal of DHG waste water (non-hazardous); and PE-37 disposal of waste casting can cleaning water, propellant wash-up water, and hydromining wastewater (non-hazardous).

Procedure SA-E-700-001, which governs the use of drums for hazardous waste, requires that only clean new or used UN specification UN1A1 closed head or a UN1A2 open head 55 gallon or 30-gallon steel drums, or UN specification UN1GY fiber drums used to store hazardous waste.

Because the saleable products produced by this facility (solid fuel rocket motors) are, by their design, ignitable and reactive, extensive preventive measures are in place. This facility employs a full-time safety manager and staff who develop policy and procedures for ignitable and reactive products and waste handling in accordance with Department of Defense, OSHA, and industry recommendations. This department oversees operations and assists in training.

Smoking is not permitted in any of our facilities. Smoking is only permitted inside employee's personal vehicles that are parked in designated parking areas. In addition, each person entering these sections of the facility is stopped by the security officer and required to surrender

any matches or lighters to the officer. Only vehicles equipped with flame arrestors are driven in hazardous areas. Safety shoes, flame-retardant coveralls/lab coats, and safety glasses with side shields are worn when working with these materials where required.
Whenever any work is to be performed in the areas where ignitable or reactive wastes are present, a Plant Engineering work order must be issued and approved. The purpose of these work orders is to outline the requirements to complete the work in a manner that will protect against personnel injury and ignition of the waste.

Building H-22 hazardous-waste container and bulk liquid storage was designed and constructed with the following measures that protect against accidental ignition or reaction.

- All electrical equipment is explosion-proof
- All equipment is grounded
- Ignitable wastes in the container storage area are connected to a grounding bar with grounding ribbons
- All tanks are constructed of nonsparking fiberglass
- The grating over Tank 1 is nonsparking fiberglass
- The building is equipped with fire extinguishers and a 100-ft, 1-1/2-in. firewater hose reel.
- The building is insulated and equipped with two exhaust fans to prevent the drums and tanks from overheating in the summer.
- The building is insulated and heated to prevent the drums and tanks from freezing.
- There are no flame-producing or hot surfaces over 120°F in the building.
- The building is heated by a circulating hot-water system. The hot-water piping cannot contact any waste. The hot-water furnace is located in a completely separate room.

COMPATIBILITY GROUPS

A	Strong inorganic acids Acid solutions Anhydrides
B	Strong inorganic bases Basic solutions
C	Flammable liquids Organic acids, liquid
D	Flammable liquids Organic bases, liquid
E	Combustible liquids Combustible solids
F	Flammable solids, organic Flammable solids, inorganic Flammable solids, metallic
G	Inorganic oxidizers, solid Nonflammable metals and metal compounds
H	Inorganic oxidizers, liquid Inorganic oxidizers, liquid, corrosive
I	Solid poisons Toxic organic solids
J	Liquid poisons Toxic organic liquids
K	Liquids Pesticides, liquid
L	Solids Pesticides, solid
M	Liquid or solid Inorganic salts
N	Solids Fibrous materials
O	Liquid or solid Hazardous waste, n.o.s.

A chart specific to ATK/Elkton Operations waste chemicals can be found at the end of this section.

Before storing a waste in A-26, the waste must be labeled with chemical description (name) and compatibility group, if known. The Hazardous Waste Container Operating Log Sheet must be filled out and the waste placed on the shelf labeled with its compatibility group. The log sheet can be found at the end of this section.

Owners and operators of facilities located in the 100-year flood plane shall provide the following information:

(a) Engineering analysis to indicate the various hydrodynamic and hydrostatic forces expected to result at the site as a consequence of a 100-year flood.

(b) Structural or other engineering studies showing the design of operational units (for example, tanks, incinerators) and flood production devices (for example, floodwalls, dikes) at the facility, and how these will prevent washout.

(c) If applicable, and instead of D(27)(a) and (b) above, a detailed description of procedures to be followed to remove hazardous waste to safety before the facility is flooded, including: the timing of movement relative to flood levels, including estimated time to move the waste, to show that such movement can be completed before floodwaters reach the facility; a description of the location or locations to which the waste will be moved and demonstration that those facilities will be eligible to receive hazardous waste in accordance with COMAR 26.13.01-26.13.09; the planned procedures, equipment, and personnel to be used and the means to ensure that such resources will be available in time for use; and the potential for accidental discharges of the waste during movement.

As can be seen from the map found in Section B, the thermal treatment burn field is located within the 100-year flood plane.

The thermal treatment open-burning facility is protected from 100-year floodwater with an earthen berm that completely surrounds the facility. The berm is 2 1/2 ft higher than the 100-year flood plane and ½ foot above the 500-year flood plane. When there is danger of a flood, the Elkton Safety Dept. monitors the NOAA weather web site and sends out email flood warning to the entire plant. The Safety Dept. specifically notifies the Vice President of Operations and the manager of Plant Engineering who then decide to activate our pre-flood checklists. When the pre-flood checklist is operated all waste propellant is moved out of the flood prone areas as well as other explosives, chemicals, material and equipment that could be washed away.

If any waste is present in these areas, it will be picked up using the reactive waste trailer, which is large enough to take all the waste in one load. If the trailer cannot be used, a flatbed or pickup truck will be used. The entire removal can be accomplished in 1 hour.

The manager of Manufacturing will dispose of the wastes by thermal treatment or temporarily store them in an approved area out of the flood plane.

Appendix D of the ATK Elkton EMERGENCY PLAN (located in Section H of this permit application details the Flood Preparation and Recovery Plan.

ATK ALLIANT TECHSYSTEMS	ATK TACTICAL SYSTEMS COMPANY – ELKTON ORGANIZATION OPERATING INSTRUCTION		
Title:	OPERATING PROCEDURE FOR STORING DRUMS OR CONTAINERS IN THE BUILDING H-22 CONTAINER STORAGE AREA		
No. SA-E-700-001	Issue 00	Page 1 of 2	Effective: - - DRAFT - -

REFERENCE

Forms

F02006 Building H-22 Container Storage Area Log

A. PURPOSE

1. This document establishes a procedure for storing drum or containers in the H-22 Container Storage Area.

B. PROCEDURE

1. When a department has a container of waste material to be disposed of the department will issue a work order to the Plant Engineering Section to pick up and dispose of the container. The department generating the waste must make sure that the container is closed, clean, structurally sound, safe for transporting within the plant and labeled with the proper hazardous communication label as distributed by the Safety Department.

2. The Plant Engineering Section will route the work order through the Manager, Plant Engineering, the Environmental Engineer, and the Supervisor, Grounds Group.

3. The Environmental Engineer will determine if the waste is hazardous or non-hazardous, and where it should be stored. He will note this information on the work order and forward it to the Supervisor, Grounds Group.

4. The Supervisor, Grounds Group, will schedule and supervise the pickup.

5. At the pickup site, the group, taking proper safety precautions and wearing proper safety equipment, will inspect the container to ensure it is clean, structurally sound, and safe for handling, and transport. Closed top drums will be sealed by screwing in both plugs. Open top drums will be sealed by means of a bolted, gasketed, ring.

6. The drum will then be labeled to identify its contents, the location from where it was picked up, and the date it was picked up. The labeling will be done by writing on the drum with a marking pen. An example of a properly labeled drum is: "A-66, 7/8/85".

7. The container will be loaded on the transport vehicle by use of a forklift truck, hand drum truck, or by hand rolling. Care will be taken to ensure the container is not damaged or spilled while being loaded, transported, handled, and unloaded.

8. The vehicle transporting the waste will be driven directly into the Building H-22, Loading/Unloading area. The drum will be unloaded and positioned in the container storage area at the position indicated on the work order.

9. The drums will not be stored on pallets unless otherwise indicated on the work order.

10. The drums will never be stacked more than two high and a minimum 5-foot wide aisle will be kept open around the perimeter of the drum storage pad.

11. If the work order indicates that the container to be picked up is to be transferred into a different container, this will be conducted in the H-22 Loading/Unloading area and in such a manner as to prevent spillage. The waste will only be transferred into containers that are clean, new or used, UN specification UN1A1 closed head or a UN1A2 open head 55 gallon or 30-gallon steel drums, or UN specification UN1GY fiber drums.

12. The person bringing the container to Building H-22 will then log the container in by filling in a log sheet (form F02006 or equivalent). The log sheets are kept in the H-22 desk and are available on the ElktonWeb.

13. The transport vehicle is then driven out of the building. The Loading/Unloading area, and the Container Storage area, are then swept, mopped, or hosed down as required, making sure all areas are thoroughly clean.

14. The thermostats are then checked to be sure they are set at 55°F, the overhead doors closed and locked, the lights turned off, and the pedestrian door locked.

Approved:
Manager, Safety, Health, and Environmental

H-22 WEEKLY HAZARDOUS WASTE CONTAINER STORAGE AREA INSPECTION LOG

Item	Types of Problems	Acceptable		Observations
		Yes	No	
Aisle space	Less than 5-ft aisle around perimeter Less than 2-ft aisle between rows of drums Aisle obstructed			
Sealed containers	Open lids, bungs not screwed in			
Drum filling funnel (with the cover in closed position)	No visible cracks, holes, gaps, or other open spaces			
Labeling of containers	Waste not identified, missing date, missing building number where waste originated			
Container stacking	More than 2 drums high, unstable stacks			
Condition of container	Corrosion, rust dents, leakage, spillage			
Grounding container	Not grounded, cable corroded, missing, broken			
Concrete base	Cracks, spalling, uneven settlement, erosion, wet spots, poor drainage, deteriorated paint			
Concrete curb	Cracks, spalling, gaps			
Dike valve	In open position			
Record keeping	Logbook missing, not properly filled out; inspection log missing, not properly filled out			
Warning sign	Damaged, missing			
Fire protection	Fire extinguishers: missing or discharged, fire hydrant obstructed; fire water hose: inoperable, hose damaged, missing, nozzle damaged, or low water pressure			
Alarm	Telephone inoperative, emergency number not prominently displayed			

Hazardous Waste Inventory:

____	Spent Photographic Waste	____	Spent Halogenated Solvent	____	Mixed Lab Chemicals		
____	Beryllium	____	Solvent Wiping Rags	____	Acidic Waste Water	____	Coolant
____	Dye Penetrant	____	G-20 Waste Water	____	Waste Paint	____	Used Oil
		____	Waste Resin	____	Asbestos	____	Ammonia

Total _____

Inspector's Name/Title _____ Date: _____ Time: _____

F99009 (275) 4/05

BUILDING A-26
LAB PACK STORAGE
WEEKLY INSPECTION LOG

PROTECT OUR ENVIRONMENT

Date	Are Incompatible Wastes Stored on the Same Shelf?	Are Shelves Labeled?	Are Containers Labeled?	Any Leaks?	Conditions of Building						Remarks
					Windows	Doors	Roof	Floor	Warning Sign	Log Sheets	

D-2 MAGAZINE
WEEKLY INSPECTION LOG

Date	Are Incompatible Wastes Stored on the Same Shelf?	Are Shelves Labeled?	Are Containers Labeled?	Any Leaks?	Conditions of Building						Remarks	Name of Inspector
					Windows	Doors	Roof	Floor	Warning Sign	Log Sheets		

WASTE PROPELLANT OPEN-BURNING FACILITY INSPECTION FORM

X = NOT ACCEPTABLE
√ = ACCEPTABLE

Specific Item	Types of Problems	Pad No. 1	Pad No. 2	Pad No. 3	Comments
Area surrounding pans	Debris, dead vegetation poor drainage, possible unburned explosives				
Protective berm	Cracks, deterioration, erosion, groundhog holes, dry vegetation, possible unburned explosives				
Interior of dike	Poor drainage, uneven settlement, dry vegetation, possible unburned explosives				
Dike valve	In open position				
Valves	Leaks, corrosion				
Warning sign	Damaged, missing				
Fire protection	Alarm sign missing, not in prominent location				
Covers	Operability, corrosion, distortion				
Roads	Potholes, cracks				
Pan bottom	Corrosion, discoloration, cracks, buckles, bulges, wet spots, hot spots				
Pan sides	Corrosion, bulges, hot spots, sprung seams				
Sand lining	Correct amount, even distribution, water				
Sump	Water, valve open, leaks, wet spots				
Anchor bolts	Corrosion, distortion				
Foundation	Cracks, spalling, uneven settlement, erosion				
Structural supports	Cracks, corrosion, buckles, damage				
Ground clips	Corrosion, missing, broken				
Time of inspection:					

Name of Inspector	Title of Inspector	Date

MONTHLY SAFETY AND EMERGENCY MATERIALS/EQUIPMENT

PROTECT OUR ENVIRONMENT

Location	Item	Types of Problems	Acceptable		Observations
			Yes	No	
A-61, HazMat van, H-22	Oil dry (absorbent)	Out of stock			
H-22, HazMat van, A-61	Absorbent pads	Out of stock			
A-61	Oil boom	Damaged, missing			
H-22	Portable hand pump	No hose, failed diaphragm, missing handle			
H-22	Portable electric pump	No hose, 2-cycle fuel can missing, inoperable			
A-61, HazMat van	Empty recovery drums	Missing, full, punctured			
A-5	Face shields, safety glasses	Broken or dirty equipment, missing			
A-63, Safety van	First aid equipment/supplies	Out of stock, operability			
A-5	Fire-retardant coats/gloves	Holes, wear and tear, not flame-retardant, missing			
A-5	Chemical cartridge respirators	Spent cartridges, seals, missing			
Safety van, HazMat van	Self-contained breathing equipment	Air quantity in reserve			
1000-gal tank wagon	Operability	Leaks, pump failure, frame damage			
Fire truck	Operability				
HazMat van	Operability				

Date _____ Inspector's Signature _____

THIS INSPECTION FORM IS TO BE COMPLETED MONTHLY AND KEPT FOR AT LEAST 3 YEARS.
RETURN THIS COMPLETED RECORD TO ENVIRONMENTAL ENGINEER.

WASTE PROPELLANT PICKUP PAD INSPECTION FORM

ITEM	TYPE OF PROBLEM	A AREA				C AREA									
		68	42	46	65	58	14	6	70	32	33	49	27	50	
Concrete base	Cracks, spalling, uneven settlement, wet spots, corrosion, leaks, spills														
Concrete curb	Cracks, spalling, damaged, corrosion														
Foundation	Eroded stones, deterioration, vegetation, uneven settlement, vehicle ruts														
Sump area	Cracks, deterioration, damaged coating, wet spots														
Roof	Corrosion, rust, wind damage, bulges, holes, sprung seams														
Roof supports	Damage, rust, dents, sprung seams, bulges, distortion														
Anchor bolts	Rust, corrosion, discoloration, distortion														
Warning and ID signs	Missing, damage, faded														
Lightning protection	Disconnected wires, loose fittings, ground rod damage, excessive corrosion														
Debris and refuse	Clogged sump, trash, nonpropellant material														
Surrounding area	Trash, buckets, lids, erosion, wet spots, dry vegetation														
Container placement and stacking	Height of stacks														
Sealing of containers	Missing lids, torn bags, open lids, propellant not covered with water														
Labeling of containers	Improper identification, no labels, date missing, propellant type missing														
Containers	Corrosion, discolorations, cracks, damage, overfilling														
	PAD INVENTORY														
	No. of full pails														
	No. of full bags														
	No. of empty pails														
	No. of lids														
	Liquid level in sump														
	Time														

Comments and corrective actions required:

NAME OF INSPECTOR	TITLE OF INSPECTOR	DATE

SOP-P-524 (Rev. E)
Destroying Reject, Overage or Undesirable Squibs, Delay Columns, Detonators and Boosters

COPY

Det-Popper
Pre-Inspection Checklist

Description	Acceptable	Non-Acceptable	Corrective Action
Structural Integrity (rust, corrosion)			
Tires (flat, need air, need replacement)			
Input Lever (Operable)			
Discharge Lever (Operable)			
Gauges (4) (Operable)			
Propane Tank (Empty, missing, needs replacement)			
Grating (Intact, needs replacement, corrosion, rust)			
Grounding Cables (Accessible, operational)			
Batteries (In place, need to be replaced)			
Personal Protective Equipment (Hearing protection, gloves)			
Tools			

Comments: _____

_____

_____

Operators Signature: _____ Date: _____

F410001/1 [2/05]

ATK Tactical Systems Company/Elkton Operations
Hazardous Waste Compatibility Chart

Waste	EPA No.	Reactivity Group Name and Number	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
A Ammonium perchlorate	D001, D003	Explosives - 102																				
B Ammonium nitrate	D001, D003	Explosives - 102																				
C Solid rocket propellant	D003	Explosives - 102																				
D Powdered aluminum	D003	Metal Powders - 22	HE	HE	HE																	
E Polymeric rubber binders		Combustible material - 101	HE	HE	HE	HE																
F B-1 waste water	D003	Explosive, water - 102, 106				HE	HE															
G Isocyanates		Isocyanates - 18				GFH		HG	G													
H Photographic waste water	D006, D011	Acids organic, metals, water - 3, 24, 106	HE	HE	HE	GFH		HE	GEH	H												
I 111 Trichloroethane	F001, U223	Halogenated organics - 17				HE					I											
J Acetone	U002	Ketone - 19										J										
K Chloroform	U044	Halogenated organics - 17											K									
L Methanol	U154	Alcohol - 4							HG					L								
M Pyridine	U199	Aromatic hydrocarbons - 16													M							
N Toluene	U220	Aromatic hydrocarbons - 16														N						
O Ethanol	D001	Alcohol - 4							HG								O					
P Isopropyl alcohol	D001	Alcohol - 4							HG									P				
Q Isobutyl alchol	D001	Alcohol - 4							HG										Q			
R Waste oil		Combustible material - 101	HE	HE	HE	HE		HE												R		
S Cutting/cooling fluid		Combustible material, water - 101, 106	HE	HE	HE	HE		HE	HG												S	
T Methylethyl ketone	U159	Ketone - 19																				T

H = Heat generation
E = Explosion
G = Gas Generation
GF = Flammable Gas Generation

Note: B-1 waste water includes all waste waters from the manufacture of the following oxidizers: DHG, TEAN, HAN, LGP, HAP, GN, and PGN, as well as these manufactured products. Waste detonators are in the same compatibility group as waste solid rocket propellant.

ELKTON OPERATIONS

SAFETY DIRECTIVE

Directive Number: 31

Issued: April 15, 1993

Effective: January 23, 2002

TITLE

HAZARDOUS PROCESS SAFETY MANAGEMENT

1.0 SCOPE

1.1 The process safety management (PSM) directive is designed to provide a system to identify, evaluate, and correct potential weaknesses in the design of processes that could lead to catastrophic events. This system will prevent or minimize the consequences of mishaps involving toxic, reactive, flammable, or explosive chemicals. The elements of this system are:

a. Communication/team involvement
b. Information/data gathering
c. Analysis
d. Training
e. Tracking

1.2 Overview of PSM Elements

1.2.1 Team Involvement. The effective management of safety in any hazardous process requires the participation of those involved with the process; therefore, team methods will be employed to accomplish many of the elements of this directive. Team participation may reasonably extend to our vendors and even our customers as information is exchanged about planned activities involving others from outside the organization.

1.2.2 Information/Data Requirements. The need for accurate information in managing the safety of a hazardous process is crucial. Information about materials, process chemistry, equipment, process controls, tolerance limits for process variables, emergency procedures, and other information must be correct and available to operators and others involved. Evaluation of process safety can only be done accurately if this information is current and correct. The information must thoroughly document the process so that no unforeseen hazardous conditions can develop.

1.2.3 Hazards Analysis and Assessment. Analysis or evaluation of safety information cannot precede the collection of that safety information; therefore, the development of safety information packages must occur before a reasonable assessment of the hazards of a process begins. A collective team review of the safety information following the formats in Safety Directive 28 will provide direction throughout the design and implementation of a process by identifying potential hazards, evaluating current control measures, and recommending changes as required to provide a safe work environment.

1.2.4 Training. To safely control a hazardous process, all those involved with the process including supervisors, engineers, operators, and plant maintenance must have a thorough understanding of the process. Training, therefore, is an important aspect of process control. Formal training will be the primary administrative control for operator error.

1.2.5 Tracking. To be sure that the system functions properly over time, it is necessary to provide metrics for system performance. Various aspects of the PSM system will be audited, tracked, or otherwise documented to ensure its continued performance and to verify its improvement.

2.0 APPLICATION

2.1 This directive applies to all live operations (those operations that involve explosives or explosive devices), operations that utilize 10,000 pounds or more of flammable liquids or gases, and operations that are associated with chemicals listed in Appendix A above the threshold quantities listed. No new hazardous processes will be implemented without complying with this directive.

2.2 Exclusions

Under certain circumstances, processes or facilities may be excluded from the requirements of this directive if:

a. A facility is operated, maintained, or serviced by employees who visit the facility only periodically to check its operation and to perform necessary operating or maintenance tasks

b. No employees are permanently stationed at the facility

c. The facility is not contiguous with, and is geographically remote from, all other buildings, processes, or persons. (See DoD 4145.26m for specific minimum separation requirements for explosives.)

3.0 DEFINITIONS AND ACRONYMS

3.1 ACGIH – American Conference of Governmental Industrial Hygienists

3.2 ASHRAE – American Society of Heating, Refrigerating and Air Conditioning Engineers

3.3 ASME – American Society of Mechanical Engineers

3.4 Catastrophic Event

A major uncontrolled emission, fire, or explosion, including one or more highly hazardous chemicals, that presents serious danger to employees in the workplace.

3.5 Contractor

An outside vendor hired to perform maintenance, repair, major renovation, or specialty work on or adjacent to a covered process.

3.6 DoD – Department of Defense

3.7 HAZOP – Hazard and Operability Study

3.8 Hazardous Process

Any activity involving a highly hazardous chemical including any use, storage, manufacturing, handling, or the on-site movement of chemicals, or combination of these activities. Any group of vessels that are interconnected and separate vessels that are located so that a highly hazardous chemical could be involved in a potential release must be considered a single hazardous process.

3.9 ISA – Instrumentation, Systems, and Automation Society R

3.10 Management of Change

A formal process to coordinate requested changes.

3.11 MSDS – Material Safety Data Sheets

3.12 NFPA – National Fire Protection Association

3.13 Normally Unoccupied Remote Facility

A facility that is operated, maintained, or serviced by employees who visit the facility only periodically to check its operation and to perform necessary operating or maintenance tasks. No employees are permanently stationed at the facility. Facilities meeting this definition are not contiguous with, and must be geographically remote from, all other buildings, processes, or persons.

3.14 OSHA – Occupational Safety and Health Administration

3.15 P&ID – Piping and Instrument Diagram

3.16 Process Safety Information

All data gathered related to a covered process, which includes hazards, technology, and equipment.

3.17 PSM (Process Safety Management)

OSHA law to help reduce the probability of a catastrophic event.

3.18 Replacement in Kind

A replacement that satisfies the approved design specification.

3.19 SAR – Safety Action Request

3.20 SMS – Safety Management System

4.0 REQUIREMENTS

4.1 Employee Participation Requirements

Elkton team members will be involved in the development and implementation of its Process Safety Management program. Ongoing communications through SMS and safety meetings/huddles and participation in analyses provide the necessary involvement for all applicable team members in the development and assessment of process hazards analyses and other PSM activities. R

4.2 Information Requirements

4.2.1 Process Safety Information/Data. Written process safety information/data must be compiled for each hazardous process. This information must be compiled before conducting any process hazard analysis. This written process safety information enables all involved with the process to identify and understand the hazards posed by it. Process safety information shall include:

a. Information about the hazards of the highly hazardous chemicals in the process. This information shall be developed consistent with Safety Directive 24, "Hazard Communication Program," and include at least the following:

b. Toxicity information

c. Permissible exposure limits

d. Physical data

e. Reactivity data

f. Corrosivity data

g. Thermal and chemical stability data

h. Hazardous effects of inadvertent mixing of different materials that could foreseeably occur

4.2.2 Information About the Technology of the Hazardous Process

a. Process technology information shall include at least the following:

1. A block flow diagram or simplified process flow diagram

2. Process chemistry

3. Maximum intended inventory

4. Safe upper and lower limits for critical process variables such as temperatures, pressures, flows, or compositions

5. An evaluation of the consequences of deviations, including those affecting the safety and health of employees

b. Where the original technical information is not available, this information may be developed concurrently with the process hazard analysis to support the analysis

4.2.3 Information About the Equipment Used in the Hazardous Process

a. The following documentation pertaining to the equipment, systems, and facilities used in the hazardous process must be complete and available:

1. Materials of construction shall be acceptable for the application and in accordance with the requirements of Federal, state, and local laws as well as:

a) Safety Directive No. 10 for propellants and safe propellant ingredients

b) National practice and appropriate standards for materials of construction for corrosive service

c) Piping and Instrument Diagrams (P&IDs) shall be complete with all process and control devices in accordance with the recommended practices of ISA standards

d) Electrical Area Classification shall be defined and documented in accordance with NFPA 70 (National Electric Code), DoD 6055.9 (Ammunition and Explosives Safety Standards), and DoD 4145.26M (Contractors Safety Manual for Ammunition and Explosives)

e) Pressure Relief System design shall be in accordance with ASME-recommended practices and the relief devices shall comply with ASME code

f) The ventilation system requirements and design shall be in accordance with the latest edition of the ASHRAE manual and the ACGIH Industrial Ventilation manual of recommended practices

g) The Equipment Design Specification shall be complete with pressure ratings, materials of construction, pressure testing requirements, electrical classification, duty cycle, real requirements, etc., all in accordance with good engineering practice

h) Material and Energy Balance analysis shall be completed containing calculation and methodology used as appropriate

i) Safety Systems requirements and analyses shall be complete and in accordance with good engineering practice as noted below:

1) Safety interlocks
2) Controls fault tolerances and redundancy requirements
3) Emergency stop requirements (ATK standard)
4) Electrical lockout procedures
5) Stored energy lockout procedures
6) Hazard detection systems (NFPA)
7) Hazard suppression systems

R

4.3 Operating Procedure Requirements

4.3.1 Written operating procedures shall be prepared to provide clear instructions for safely conducting a process. These procedures shall be consistent with process safety information and shall address steps for each operating phase, operating limits, safety and health considerations, and safety systems and their functions.

4.3.2 Each operating phase shall be documented within the appropriate standard operating procedure (SOP) or Manufacturing and Inspection Record (M&IR), as applicable. The operating phases include initial start-up, normal and temporary operations, emergency shutdown and operations, normal shutdown, and start-up following a turnaround or emergency shutdown.

4.3.3 Operating procedures shall address operating parameters such as pressure limits, temperature ranges, or flow rates and instructions on how to avoid and handle an upset condition.

4.3.4 All safety and health considerations of the chemicals used shall be documented by a hazardous material note or MSDS. These will define all safety and health considerations, including chemical properties and hazards, exposure prevention, and action to be taken if contact or exposure occurs. The hazardous material note or MSDS shall be referred to within the operating procedures for each hazardous chemical used.

4.3.5 Changes required to an M&IR as a result of a process hazard analysis shall be requested on an SAR by the Process Hazard Analysis team. The changes shall be documented on a Manufacturing and Inspection Change Order (MICO). The MICO will be reviewed and approved by the CCB, a member of the PHA team or Safety department, and representatives of other disciplines, as required. All MICOs shall be reviewed by the manufacturing supervisor and the operators informed of the changes. Changes to other types of documentation shall be made in accordance with the applicable Department Instructions (DIs).

4.3.6 All operating procedures shall be readily accessible to employees performing a process. (SOPs shall be posted near the appropriate piece of equipment.) M&IRs, ROs, PDPs, and TOPs are issued to the employees before a process begins.

4.3.7 An M&IR not revised in more than 12 months shall be reviewed by the Process Documentation group before it is issued. The technical writer reviews the M&IR for safety requirements, drawing revisions, and the last time that the M&IR was used. If necessary, a MICO will be prepared to update the M&IR. The technical writer may also recommend a more thorough review by manufacturing, CCB,

Safety, etc., depending on the operation, age of the M&IR, and the last time it was used. The documentation shall be revised for any changes to the process, chemicals, technology, equipment, or facilities.

4.3.8 SOPs are reviewed annually by the responsible supervisor. Any required changes are made. The updated SOP is then reviewed and approved by the responsible supervisor, Safety manager, Manufacturing manager, and Operations director.

4.3.9 Performing special one-time operations or process development shall be documented by a rework/repair order (R.O.), temporary operating procedure (TOP), or development manufacturing procedure (DMP). They shall be prepared and revised to meet the requirements of this safety directive and in accordance with the applicable department instruction. R

4.3.10 Work orders **shall not** be used to direct hazardous operations covered by this directive except when work orders call out properly the specific document that directs a work process. Example of an acceptable work order call-out:

Clean casting can per SOP-P-xxx (as long as SOP-P-xxx includes proper information as described above for the entire cleaning process).

4.3.11 Written procedures for preventive maintenance and mechanical integrity shall be established and implemented as detailed below to maintain the ongoing integrity of the following process equipment used in hazardous processes:

a. Pressure vessels and storage tanks
b. Piping systems and all associated piping system components (valves, gauges, etc.)
c. Pumps
d. Relief and vent systems and devices
e. Emergency shutdown systems
f. Control and monitoring devices, sensors, alarms, and interlocks

4.4 Process Hazard Analysis Requirements

Process Hazard Analysis must be used throughout the product and the manufacturing process design and implementation and throughout the process life cycle. Process Hazards Analysis shall be performed in accordance with Safety Directive No. 28.

4.4.1 The SAR system will be used to track action items and recommendations from the Process Hazard Analysis reports. Results of Process Hazard Analyses will be communicated to involved team members through safety huddles and/or safety meetings. Communication of PHA results to team members will be documented in the Elkton training tracking system. R

4.5 Training Requirements

4.5.1 All personnel shall be trained in an overview of Process Safety Management. Personnel directly involved in hazardous operation shall be trained in operating procedures that include emphasis on specific safety and health hazards, emergency operations, shutdown, and safe work practices applicable to the employee's job tasks.

4.5.2 Cost center managers shall provide verifiable certification that team members in their respective cost centers have the required knowledge, skills, and abilities to safely carry out duties and responsibilities as specified in operating procedure. Verification shall be made through accessing the Elkton training tracking system. R

4.5.3 All personnel shall have refresher training at least every 3 years. Team members directly involved in the operating process shall have the appropriate frequency of refresher training as determined by the cost center manager and Safety manager.

4.5.4 The Elkton training tracking system will contain the identity of the team member, date of training, and the means used to verify that the employee understood the training. R

4.5.5 Team members directly involved in the hazardous operating process shall be required to complete the five-phase training program, which includes orientation, observation, documentation, controlled hands-on experience, and qualification.

4.5.6 Each employee involved in maintaining the integrity of hazardous process equipment shall be trained in the following areas.

a. Overview of the operating process and the maintenance process
b. Process hazards of both operating and maintenance processes
c. Procedures necessary and applicable to ensure safe performance of job tasks

4.5.7 There shall be a safety review by a PSM team and appropriate pre-start-up training before any change to a process is implemented.

4.6 Inspection and Testing Requirements

4.6.1 Hazardous process equipment shall be inspected and tested periodically to ensure continued mechanical integrity.

Inspection and testing procedures shall:

a. Follow recognized and generally accepted good engineering practices

b. Specify frequency and nature of inspections and tests
   1. Per equipment manufacturers' recommendations
   2. Per good engineering practices
   3. Adjust frequency based on experience

c. Provide documentation record of:
   1. Serial number or other equipment identified
   2. Description of inspection or test performed
   3. Results of inspection or test
   4. Name of inspector
   5. Date of inspection or test

4.7 Operational Safety and Readiness Inspection Requirements

4.7.1 Before the operation of any new or modified hazardous process equipment, an ORSI must be performed in accordance with Safety Directive No. 30.

4.8 Contractor Requirements

4.8.1 Contracted work can represent special hazards. A significant cause of hazards when working with contractors is poor communication. At Elkton, there are two principal contractor types: R

a. Contractors who are given access to and work in active or live hazardous areas

b. Contractors who are only allowed to work in those areas where activities have been stopped and cleared of hazardous materials

4.8.2 All contractors will receive a Safety briefing that addresses the operations' safety rules to which they must adhere as a condition of their contract.

4.8.3 The plant safety video discussing the need for safe work practices and expectations will be shown to first-time contractors and those who have not received this orientation within 12 months.

4.8.4 Contractors that access active or live areas will be trained in accordance with employee training policies and training documentation will be maintained with the Elkton training tracking system per management procedure SA-E-0011. R

4.8.5 Contractors' previous records for training will be requested and these documents will be held on file for determining contractor suitability.

4.9 Management of Change Requirements

4.9.1 Most changes to a hazardous process require conformance to the below section. Changes that are replacement in-kind, as defined in Section 3.17, and are not described below, will not be required to comply.

4.9.2 All changes to technology that affect a hazardous process shall conform to the following Department Instructions:

4.9.3 Plant Engineering changes to facility drawings that include buildings, mechanical, electrical, equipment layout, and process piping and instrumentation shall be accomplished in accordance with Procedure PE-48.

4.9.4 Changes to engineering drawings that are not prepared in the Plant Engineering department shall be accomplished in accordance with procedure EN-E-0001.

4.9.5 Changes to the process documentation (MICOs) shall be accomplished in accordance with procedure OP-E-410-029. R

4.9.6 Changes to SOPs shall be accomplished in accordance with procedure OP-E-410-002. No other forms of documentation shall be used to describe changes to new or existing equipment, facilities, or the process documentation for a covered process. R

4.9.7 Changes that affect the process safety information will also be documented through the appropriate changes to the hazards analysis and process safety documentation.

4.10 Incident Investigation Requirements

4.10.1 Incidents, near misses, and other potentially dangerous events will be investigated per Safety Directive No. 7, DoD 4145.26M, and other appropriate standards for such an investigation. R

4.10.2 The SAR system will be used to address and track resolution of incident report recommendations.

4.10.3 Investigation reports will be used as a discussion topic for safety huddles to provide information to operators about the investigation's findings and to review changes required by its findings.

4.11 Compliance Audit Requirements

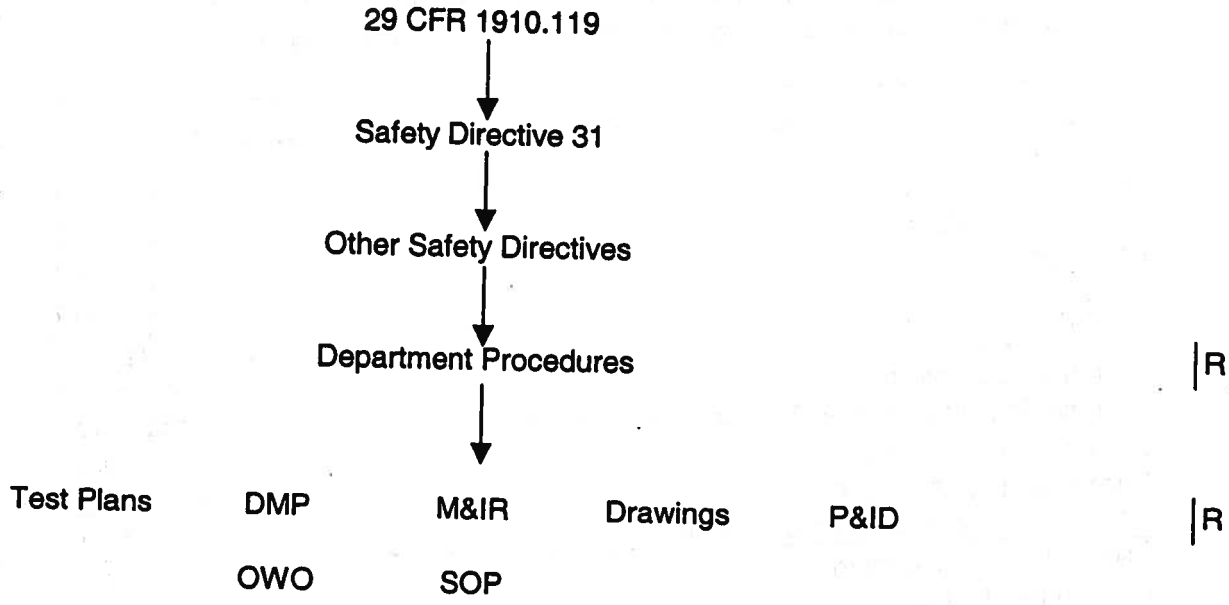
This directive shall be audited annually by the Safety Department. Program- and process-based hazards analysis audits will be conducted at least every 3 years. Operator and contractor training audits will be conducted every 2 years.

These audits shall address:

1. Compliance to respective Elkton policy
2. Implementation effectiveness
3. Policy adequacy

5.0 PRECEDENCE

To resolve conflicts that may develop in complying with current policies and procedures, the following flowchart is provided. If a conflict should arise, the Safety, Health, and Environmental Department must be contacted to evaluate the conflict and proposed resolution. R



R

R

6.0 RESPONSIBILITY

Compliance with this directive lies primarily with the program team. Where significant similarities exist with processes over several programs, the Safety Department will consider requests to combine the programs' efforts to provide a process task team. The process task team will then support the data collection and analysis efforts.

L. K. Hartwell

Laura K. Hartwell

APPENDIX A

List of Highly Hazardous Chemicals, Toxics, and Reactives (Mandatory)

This Appendix contains a listing of toxic and reactive highly hazardous chemicals, which present a potential for a catastrophic event at or above the threshold quantity.

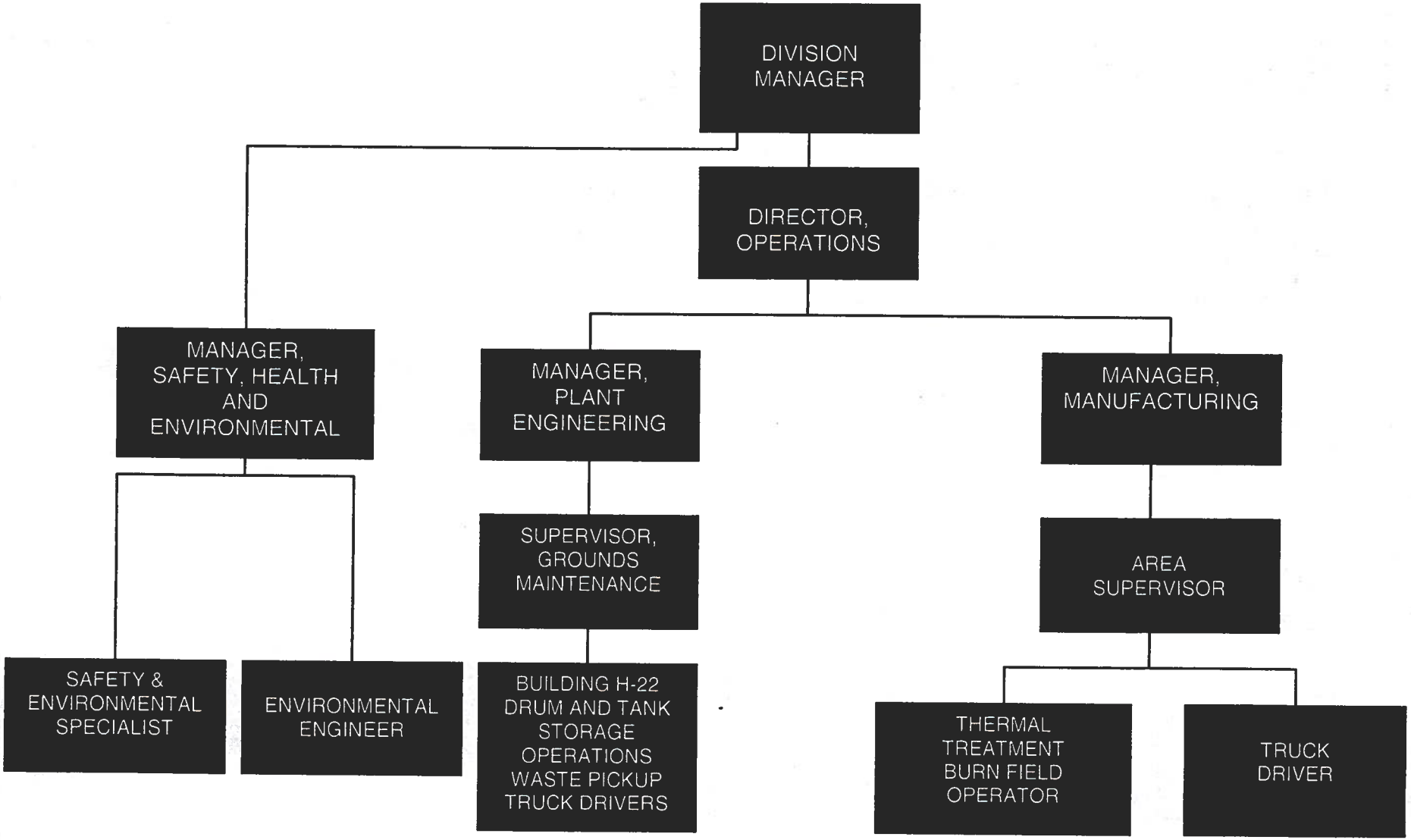
Chemical Name	*CAS No.	**TQ, lb
Acetaldehyde	75-07-0	2500
Acrolein (2-propenal)	107-02-8	150
Acrylyl chloride	814-68-6	250
Allyl chloride	107-05-1	1000
Allylamine	107-11-9	1000
Alkylaluminums	Varies	5000
Ammonia, anhydrous	7664-41-7	10000
Ammonia solutions (> 44% ammonia by weight)	7664-41-7	15000
Ammonium perchlorate	7790-98-9	7500
Ammonium permanganate	7787-36-2	7500
Arsine (also called arsenic hydride)	7784-42-1	100
Bis(chloromethyl) ether	542-88-1	100
Boron trichloride	10294-34-5	2500
Boron trifluoride	7637-07-2	250
Bromine	7726-95-6	1500
Bromine chloride	13863-41-7	1500
Bromine pentafluoride	7789-30-2	2500
Bromine trifluoride	7787-71-5	15000
3-bromopropyne (also called propargyl bromide)	106-96-7	100
Butyl hydroperoxide (tertiary)	75-91-2	5000
Butyl perbenzoate (tertiary)	614-45-9	7500
Carbonyl chloride (see phosgene)	75-44-5	100
Carbonyl fluoride	353-50-4	2500
Cellulose nitrate (concentration > 12.6% nitrogen)	9004-70-0	2500
Chlorine	7782-50-5	1500
Chlorine dioxide	10049-04-4	1000
Chlorine pentrafluoride	13637-63-3	1000
Chlorine trifluoride	7790-91-2	1000
Chlorodiethylaluminum (also called diethylaluminum chloride)	96-10-6	5000
1-chloro-2,4-dinitrobenzene	97-00-7	5000
Chloromethyl methyl ether	107-30-2	500
Chloropicrin	76-06-2	500
Chloropicrin and methyl bromide mixture	None	1500

Chemical Name	*CAS No.	**TQ, lb
Chloropicrin and methyl chloride mixture	None	1500
Cumene hydroperoxide	80-15-9	5000
Cyanogen	460-19-5	2500
Cyanogen chloride	506-77-4	500
Cyanuric fluoride	675-14-9	100
Diacetyl peroxide (concentration > 70%)	110-22-5	5000
Diazomethane	334-88-3	500
Dibenzoyl peroxide	94-36-0	7500
Diborane	19287-45-7	100
Dibutyl peroxide (tertiary)	110-05-4	5000
Dichloro acetylene	7572-29-4	250
Dichlorosilane	4109-96-0	2500
Diethylzinc	557-20-0	10000
Diisopropyl peroxydicarbonate	105-64-6	7500
Dilauroyl peroxide	105-74-8	7500
Dimethyldichlorosilane	75-78-5	1000
Dimethylhydrazine, 1,1-	57-14-7	1000
Dimethylamine, anhydrous	124-40-3	2500
2,4-dinitroaniline	97-02-9	5000
Ethyl methyl ketone peroxide (also methyl ethyl ketone peroxide; concentration > 60%)	1338-23-4	5000
Ethyl nitrite	109-95-5	5000
Ethylamine	75-04-7	7500
Ethylene fluorohydrin	371-62-0	100
Ethylene oxide	75-21-8	5000
Ethyleneimine	151-56-4	1000
Fluorine	7782-41-4	1000
Formaldehyde (formalin)	50-00-0	1000
Furan	110-00-9	500
Hexafluoroacetone	684-16-2	5000
Hydrochloric acid, anhydrous	7647-01-0	5000
Hydrofluoric acid, anhydrous	7664-39-3	1000
Hydrogen bromide	10035-10-6	5000
Hydrogen chloride	7647-01-0	5000
Hydrogen cyanide, anhydrous	74-90-8	1000
Hydrogen fluoride	7664-39-3	1000
Hydrogen peroxide (52% by weight or greater)	7722-84-1	500
Hydrogen selenide	7783-07-5	150
Hydrogen sulfide	7783-06-4	1500
Hydroxylamine	7803-49-8	2500
Iron, pentacarbonyl	13463-40-6	250

Chemical Name	*CAS No.	**TQ, lb
Isopropylamine	75-31-0	5000
Ketene	463-51-4	100
Methacrylaldehyde	78-85-3	1000
Methacryloyl chloride	920-46-7	150
Methacryloyloxyethyl isocyanate	30674-80-7	100
Methyl acrylonitrile	126-98-7	250
Methylamine, anhydrous	74-89-5	1000
Methyl bromide	74-83-9	2500
Methyl chloride	74-87-3	15000
Methyl chloroformate	79-22-1	500
Methyl ethyl ketone peroxide (concentration > 60%)	1338-23-4	5000
Methyl fluoroacetate	453-18-9	100
Methyl fluorosulfate	421-20-5	100
Methyl hydrazine	60-34-4	100
Methyl iodide	74-88-4	7500
Methyl isocyanate	624-83-9	250
Methyl mercaptan	74-93-1	5000
Methyl vinyl ketone	79-84-4	100
Methyltrichlorosilan	75-79-6	500
Nickel carbonly (nickel tetracarbonyl)	13463-39-3	150
Nitric acid (94.5% by weight or greater)	7697-37-2	500
Nitric oxide	10102-43-9	250
Nitroaniline (para nitroaniline)	100-01-6	5000
Nitromethane	75-52-5	2500
Nitrogen dioxide	10102-44-0	250
Nitrogen oxides (NO; NO_2; N_2O_4;N_2O_3)	10102-44-0	250
Nitrogen tetroxide (also called nitrogen peroxide)	10544-72-6	50
Nitrogen trifluoride	7783-54-2	5000
Nitrogen trioxide	10544-73-7	250
Oleum (65% to 80% by weight; also called fuming sulfuric acid)	8014-94-7	1000
Osmium tetroxide	20816-12-0	100
Oxygen difluoride (fluorine monoxide)	7783-41-7	100
Ozone	10028-15-6	100
Pentaborane	19624-22-7	100
Peracetic acid (concentration > 60% acetic acid; also called peroxyacetic acid)	79-21-0	1000
Perchloric acid (concentration > 60% by weight)	7601-90-3	5000
Perchloromethyl mercaptan	594-42-3	150
Perchloryl fluoride	7616-94-6	5000
Peroxyacetic acid (concentration > 60% acetic acid; also called peracetic acid)	79-21-0	1000

Chemical Name	*CAS No.	**TQ, lb
Phosgene (also called carbonyl chloride)	75-44-5	100
Phosphine (hydrogen phosphide)	7803-51-2	100
Phosphorus oxychloride (also called phosphoryl chloride)	10025-87-3	1000
Phosphorus trichloride	7719-12-2	1000
Phosphoryl chloride (also called phosphorus oxychloride	10025-87-3	1000
Propargyl bromide	106-96-7	100
Propyl nitrate	627-3-42	500
Sarin	107-44-8	100
Selenium hexafluoride	7783-79-1	1000
Stibine (antimony hydride)	7803-52-3	500
Sulfur dioxide (liquid)	7446-09-5	1000
Sulfur pentafluoride	5714-22-7	250
Sulfur tetrafluoride	7783-60-0	250
Sulfur trioxide (also called sulfuric anhydride)	7446-11-9	1000
Sulfuric anhydride (also called sulfur trioxide)	7446-11-9	1000
Tellurium hexafluoride	7783-80-4	250
Tetrafluoroethylene	116-14-3	5000
Tetrafluorohydrazine	10036-47-2	5000
Tetramethyl lead	75-74-1	1000
Thionyl chloride	7719-09-7	250
Trichloro (chloromethyl) silane	1558-25-4	100
Trichloro (dichlorophenyl) silane	27137-85-5	2500
Trichlorosilane	10025-78-2	5000
Trifluorochloroethylene	79-38-9	10000
Trimethyoxysilane	2487-90-3	1500

*Chemical Abstract Service Number
**Threshold quantity in pounds (amount necessary to be covered by this standard)



ATK TACTICAL SYSTEMS COMPANY/ELKTON OPERATIONS
PERSONNEL RESPONSIBLE FOR HAZARDOUS WASTE STORAGE AND DISPOSAL FACILITIES

Permit No. A-052

ATK Elkton LLC

ATTACHMENT 3
Section G
of the Permit Application
Personnel Training
(13 pages)

Section G – Personnel Training

An outline of both the introductory and continuing training programs by owners or operators to prepare persons to operate or maintain the HWM facility in a safe manner as required to demonstrate compliance with COMAR 26.13.05.02G. A brief description of how training will be designed to meet actual job tasks in accordance with requirements in COMAR 26.13.05.02G(1)(C).

Training at the Elkton Operations begins the first day a new employee reports for work. This training takes place in the classroom and is conducted by the Elkton Operations Safety, Health, and Environmental Department. Some of the topics covered are:

1. Control and access to hazardous areas
2. Regulations for movement of hazardous materials
3. Emergency signals and communications
4. Response to fires and explosions
5. Familiarization with hazard and safety regulations including personal protective equipment
6. Propellant safety
7. Causes and types of ignition
8. Precautions for preventing ignition
9. Evacuation plans
10. Chemical and physical properties of propellants
11. Review of the booklets Accident Prevention Through a Safe Workstyle, Handle Hazardous Material with Care, and Safety, Health, and Environmental Handbook

Elkton Operations Management Procedure HR-E-0003 Education and Training Program and Safety Directive No. 31 Hazardous Process Safety Management outlines the overall training program and can be found at the end of this section. Also included is the new employee safety orientation checklist which also can be found at the end of this section.

A flowchart has been included to show the organization of personnel at the Elkton Operations who are involved with storage and disposal hazardous waste facilities. Other personnel are involved with the generation of hazardous waste, but they do not have any direct storage or disposal responsibilities.

The personnel training program for hazardous waste management is coordinated by William E. Lucas, the Elkton Operation's environmental engineer. Mr. Lucas has more than 30 years' experience in environmental engineering and environmental compliance. He has a Bachelor of Science degree in chemical engineering and is a Registered Professional Engineer and a Certified Hazardous Materials Manager. He has been trained in all aspects of hazardous waste management regulations relative to the Resource Conservation and Recovery Act. He attends annual environmental/update courses and has also attended many industry, government, and civic organization environmental programs.

Mr. Lucas is responsible for formulating the various procedures utilized in the management of hazardous waste, including conducting the training of supervisors and overseeing operator-training programs.

The training program on the operator level is formulated to provide information that is relevant to their assigned position. Actual hands-on procedures are emphasized. Supervisors and management are trained on the impact of the regulations and procedures to ensure integrity of the paperwork, including manifests and log sheets, and on how to respond to an emergency. Many areas of emergency response are addressed under various procedures developed at the Elkton Operations prior to the promulgation of the hazardous-waste regulation and are adaptable to similar situations involving hazardous waste.

All Operations directorate employees are trained in emergency response and in the precautions required when handling reactive and ignitable materials and wastes, because they all handle or may handle these materials. These measures are a part of the ongoing monthly training conducted by each department at the Elkton Operations.

Attendance at these monthly meetings is mandatory. Attendance is recorded on sign in sheets and entered into the training database.

All employees assigned to a hazardous-waste facility will complete specific training within 6 months of assignment. Employees are required to be trained annually for review and update of the training program. Records documenting the job description and title for each position and the names of employees completing the training programs will be kept by the environmental engineer until closure of the facility for current employees and for 3 years from the date last assigned to a hazardous-waste facility for transferred, promoted, or terminated employees.

All employees assigned to the thermal treatment propellant open burning operations must receive the initial 24-hour hazardous waste operations training in accordance with 29 CFR 1910.120. They must be trained by the Supervisor of the Manufacturing Department prior to engaging in hazardous waste disposal. Employees are required to be training annually for review and update of the training program. Records documenting the job description and title of each position and names of the employees completing the training programs will be kept by the environmental engineer until closure of the facility for current employees and for 3 years from the date last assigned to a hazardous-waste facility for transferred, promoted, or terminated employees.

The personnel training record forms are shown in this section.

The content of the training program is designed to ensure that Elkton Operations personnel who handle and work with CHS do so in a safe and environmentally correct manner. Procedures for using, inspecting, repairing, and replacing emergency and monitoring equipment are reviewed. The program also encompasses waste feed cutoff systems, communication and alarm systems, response to fires, response to groundwater contamination incidents, and shutdowns. This program is conducted every year.

All employees who operate our hazardous-waste storage and treatment facilities are also trained in accordance with the OSHA Hazardous Waste Worker Training Standards specified in 29 CFR 1910.120. This training is conducted by a certified trainer. The following topics are reviewed:

a. Applicable laws and regulations
   1) OSH ACT
   2) CERCLA
   3) SARA
   4) RCRA
   5) Other regulations

b. Chemical and physical properties of materials
   1) States of matter
   2) Hazard recognition
   3) Reading an MSDS
   4) Reading a label
   5) Sources of information

c. Toxicology
   1) Definition
   2) What information is developed
   3) How information is used
   4) Terminology and definitions

Certain other Elkton Operations employees also receive an additional 40 hours of training that qualifies them as members of our Hazardous Material (HAZ-MAT) Emergency Response Team. This additional training covers:

a) Personal protective equipment
b) Air monitoring
c) Medical surveillance
d) Decontamination
e) Site control
f) Emergency response
g) Confined space entry
h) Self-contained breathing apparatus
i) Spill incident exercises

All hazardous-waste workers also receive a minimum of 8 hours annual refresher training.

ATK TACTICAL SYSTEMS COMPANY/ELKTON OPERATIONS
HAZARDOUS WASTE TRAINING RECORD

Hazardous Waste Facility Assignment: **Transportation of Waste, Operation of Building H-22**

Job Title _____

Name of Person Receiving Training: _____

Date of Training Session: _____

The subjects covered in this instruction were as follows:

1.0 INTRODUCTION

1.1 The Federal Resource Conservation and Recovery Act (RCRA)
1.2 The State Regulations for Disposal of Controlled Hazardous Substances (CHS)
1.3 Mandated Requirements
1.4 Penalties

2.0 BUILDING H-22

2.1 Description of Wastes to be Managed
- 2.1.1 Waste Analysis
- 2.1.2 Wastes Permitted
- 2.1.3 Wastes Not Permitted
- 2.1.4 Description of Equipment

3.0 PLANT ENGINEERING OPERATING PROCEDURE

3.1 PE-33 Storing Drums and Containers

4.0 EMERGENCY

4.1 Who and How to Notify
4.2 Cleanup Procedure
4.3 Cleanup Equipment
4.4 Safety Equipment

Trainer Signature: _____ Employee Signature: _____

Date: _____ Date: _____

ATK TACTICAL SYSTEMS COMPANY/ELKTON OPERATIONS
HAZARDOUS WASTE TRAINING RECORD

Hazardous Waste Facility Assignment: **Waste Propellant Open Burning Operators**

Job Title _____

Name of Person Receiving Training: _____

Date of Training Session: _____

The subjects covered in this instruction were as follows:

1.0 INTRODUCTION

1.1 The Federal Resource Conservation and Recovery Act (RCRA)
1.2 The State Regulations for Disposal of Controlled Hazardous Substances (CHS)
1.3 Mandated Requirements
1.4 Penalties

2.0 OPEN BURNING FACILITY

2.1 Description of Wastes to be Managed
  2.1.1 Waste Analysis
  2.1.2 Wastes Permitted
  2.1.3 Wastes Not Permitted
2.2 Normal/Routine Operation
2.3 Recordkeeping and Reporting Requirements
2.4 Inspection Requirements
2.5 Preparation for Flood

3.0 PROCEDURE – SOP-P-050

3.1 Burnfield design
3.2 Normal/Routine Operation
3.3 Wastes Permitted/Not Permitted
3.4 Inspection and Recordkeeping

4.0 EMERGENCY

4.1 Who and How to Notify
4.2 Cleanup Procedure
4.3 Cleanup Equipment
4.4 Safety Equipment

Trainer Signature: _____ Employee Signature: _____

Date: _____ Date: _____

NEW EMPLOYEE SAFETY ORIENTATION CHECKLIST

The following safety procedures, rules and equipment have been reviewed:

☐ Personal Protective Equipment (Attachment 1)

*Safety shoes
*Safety glasses - eye protection
*Lab coats and coveralls - flame treated
    Lab coats and coveralls will be laundered once a week for production operators and as needed for administrative personnel
*Respirators, when required
    Medical requirements - pulmonary function test (PFT)
    Usage and when to wear respirators, cartridges vs airlines

☐ Safety equipment is to be used when hazard building symbols are on facility and signs indicates "Personal Protective Equipment Required Beyond This Point"

☐ Fire Prevention

*Dial 1200 to report a Fire, or HazMat Spill, or Medical Emergencies
*Hazardous building symbols (Attachment 2)
*Emergency evacuation plans
    Emergency exits
    Blow out panels
    Exits
    Meeting points
*Class of fires (A, B, C and D) (Attachment 3)
*Use of fire extinguishers

☐ S.M.S. - Safety Management System

*S.M.S. Handout (Attachment 4)
*Training requirements
    Safety is an inherent responsibility of everyone
    Safety is a primary responsibility of line management.
    Safety is equal to all other business considerations - nothing is more important than the safety of our people, products and facilities
*Safety Management System components
    Planning and procedure reviews
    Job safety analysis, training and observation
    Safety inspection and meetings
    Incident/accident investigation

☐ The Elkton Division is committed to produce quality products safely, on time, and within budget

☐ Hazard Communication Program

*Your Right to Know (handout article 89 MOSHA) (Attachment 5)
*Hazard Communication Program - Safety Directive 24 (Attachment 6)
*Material Safety Data Sheet (MSDS)
*Location of MSDSs (A-63, A-64, A-65 and C-18)
*Hazard communication (handout booklet on chemicals) (Attachment 7)
*Labeling of chemicals (show examples)

☐ Report of Incidents and Injuries
*Injuries, no matter how small, must be reported to your supervisor and the plant nurse
*Proper documentation and medical attention must be performed on any injury at the scene or in the dispensary by the plant nurse
*Major medical emergencies - dial 1200 immediately

☐ Building Entry Procedure

*Explain red and amber light system
*Supervisor of building (notification procedure)
*Explain remote operations
*Explain attended operations
*Permission entry sequence

☐ Propellant Carrying Vehicles (Attachment 8)

*Vehicles signed, red rotating lights, four-way flashers.
*Vehicle speed limit - 15 mph
*Vehicle has right-of-way at all times
*Travel distance behind vehicle is 50 feet, minimum
*Upon approach of vehicle, you must pull to right side of road and stop (motor may remain on)

☐ Seat Belt Policy

*When driving within plant, seat belts are required at all times

☐ Housekeeping

*Housekeeping in an explosive manufacturing facility is a must and is expected to be of the highest level. Good housekeeping will help in the overall safety of all work areas at the division.

☐ Horseplay

*Horseplay will not be permissible at any level or time

☐ Machine Guarding

*Machines are to be equipped with proper guarding per OSHA requirements. If you would find a machine that is not properly guarded - DO NOT USE MACHINE, REPORT TO YOUR SUPERVISOR AND THE SAFETY DEPARTMENT AT ONCE. REMOVAL OF FIXED MACHINE GUARDS IS PROHIBITED WITHOUT APPROVAL FROM SAFETY AND YOUR SUPERVISOR.

☐ Electric Static Discharge (ESD)

*Explain the cause and concerns of ESD in the manufacturing of rocket motors and the handling of explosives. Explain the methods that are used for control of electric static discharge.

☐ Safety Meetings

*Safety meetings are held quarterly and you are required to attend them. A variety of safety subjects are presented by fellow employees.

☐ Lockout/Tagout Requirements

*OSHA Standard
*Reasons for requirements
*Electrical, mechanical, hydraulic, gravitational, etc.

☐ Safe Lifting Techniques

*Total weight lifted vs your capacity/capability
*Portable equipment and fixed equipment for lifting
*Ask for help when needed before attempting by yourself

☐ Future Review Work

*Review Safety Directives and Emergency Disaster Plan
Please ask you supervisor for the Safety Directive book and the Emergency Plan, so that you may review both.

☐ Take Safety With You (booklet) (Attachment 9)

Explosive classifications and definitions chart is attached to this document for review during this presentation.

Most important - if you are not absolutely sure of the safe way to do a job, or if you need clarification, ask you supervisor. Do not tackle anything yourself if you have not been trained to do so, unless you are being given constant supervision. A job can be very dangerous if you don't know what you're doing.

Detach for filing purposes

New Employee Orientation Sign-off Sheet

Name: _____ Badge: _____ Dept: _____ Bldg: _____

Date Hired: _____ Date of Orientation: _____

Job Title: _____

Did you view the "Propellant Safety Is In Your Hands" video? Yes No

<u>The following may be subject to Supervisor approval:</u>

Will you be driving a company vehicle? Yes No

Will you be required to operate a forklift? Yes No

Do you require safety shoes? Yes No

Do you require prescription safety glasses? Yes No

Acknowledgement of Safety Directive 8 – Personal Protective Equipment and Safety Attire

I have read and understand Safety Directive No. 8 titled "Personal Protective Equipment and Safety Attire." I understand PPE will be provided to me according to these guidelines. I also understand if I should leave the company or if I lose/destroy my PPE through carelessness or unreasonable abuse within 10 months of receipt, I will be responsible for reimbursing the company according to the schedule listed below and outlines in Safety Directive No. 8 (Attached).

In Possession	Cost to Employee
1 month	100% of Company cost
2 months	90% of Company cost
3 months	80% of Company cost
4 months	70% of Company cost
5 months	60% of Company cost
6 months	50% of Company cost
7 months	40% of Company cost
8 months	30% of Company cost
9 months	20% of Company cost
10 months	10% of Company cost

My signature below verifies that I have received my safety orientation and have been made aware of the guidelines outlined in Safety Directive #8.

Signature _____ Date _____

ATK ALLIANT TECHSYSTEMS	ATK TACTICAL SYSTEMS COMPANY – ELKTON MANAGEMENT PROCEDURE		
Title:	EDUCATION AND TRAINING PROGRAM		
No. HR-E-0003	Issue 01	Page 1 of 4	Effective: 3/1/99

REFERENCE

Documents

AD-E-0003	Management Review of Quality System
HR-0029	Educational Assistance

Forms

F93042	Education and Training Cost/Benefit Calculation Worksheet

A. POLICY

Education and training initiatives will be established to support the Strategic Plan of Elkton DLV Operations while providing for the short- and long-term development of employees at all levels. No employee will be expected to perform any tasks for which he/she has not been adequately trained. Training is defined as the process by which an effective instructional method is utilized to elicit a measurable and observable change in behavior of the trainee. Education is defined in accordance with the guidelines outlined in the Educational Assistance Program (Management Procedure HR-E-0033).

B. PRACTICES

1. The Human Resources development representative will be responsible for coordinating the Education and Training Program. All training initiatives will be reviewed to ensure that federal, state, local, corporate, and Thiokol Propulsion and Elkton Operations regulations and requirements are met. Management is responsible for determining the need for training and satisfying that need by adopting the methods in Sections 1-6, below. New Hire Orientation is outlined in section 7; Educational Assistance is addressed in HR-E-0033.

2. Training records which teach skills used for the sole purpose of hardware fabrication and hardware inspection (i.e. soldering, welding) shall be maintained by the responsible department. Management is responsible for determining the need for training and satisfying that need by adopting the methods in Sections 1 - 4, below.

3. .Assessment

   The assessment of team member's skills, abilities, and future potential will play a major role in educational and training initiatives undertaken at Elkton Operations. All training will include an assessment by the immediate supervisor and the department manager to determine team members' current skills and abilities prior to training. The assessment will be conducted for both employees new to EDLV and for transfers within EDLV, and will specifically address the skills and system knowledge required to perform the quality-

related parts of the their jobs. After training, the team member will again be assessed to ascertain that instructional objectives have been attained. The Human Resources development representative will provide assistance in the assessment process.

4. Benefit Analysis

The following key elements should be assessed:

4.1. Proposed cost of training (indicate labor, equipment, materials, trainer fees, etc.; refer to Form F93042).

4.2. A demonstrated need that can be documented.

4.3. Clearly stated training objectives, including details about the program's expected results and how the results will be demonstrated, measured, and evaluated.

5. Internal Training Development

Training programs will be developed within Elkton DLV Operations on a documented-need basis only. The need should be based on evidence that employees lack sufficient skill or knowledge to perform correctly, including fulfilling federal, state, local, corporate, and Elkton DLV Operations regulatory requirements, or on evidence that a process requires more than written directions.

The developmental phase should be a rigorous process that includes the following steps:

5.1. Conduct a task analysis

5.2. Define learning objectives

5.3. Choose appropriate media (including job aids, purchased materials, and vendor-supplied training), develop applicable videos and exercises/simulations, and tests

5.4. Test pilot materials before general use when appropriate

5.5. Involve subject matter experts (SME)

5.6. Require subject matter experts to write the training material whenever possible

5.7. Develop training

a. General knowledge/skills

b. Specific skills (using a hands-on approach)

5.8. Develop assessment methodology

6. External Resources

The use of external resources is recommended for training purposes when those resources are better suited or more cost-effective than in-house resources.

Elkton DLV Operations will pursue the establishment of links with local educational institutions and state/local agencies to assist in the acquisition of training resources and the investigation of alternative funding sources for job-related training.

7. Training Delivery

The Human Resources Department will provide training and trainer instructions and on-going assistance to assure that training initiatives are delivered properly when appropriate.

Wherever possible, training will be conducted and delivered by team members. Training will be delivered in a "performance-based" approach with the emphasis targeted toward actual practice of learned skills in each session of training. To assure that the retention of knowledge and skills is maximized, the training will be delivered at the time the learned skills are needed (just-in-time training).

8. Employee Training Reporting System

The Employee Training Reporting System (ETRS), is used to track the following items:

8.1. Employee qualification and expiration by skill/course

8.2. Length/cost and source of training received

8.3. Required/future training

8.4. Licenses and certifications

History of employee training

Required training shall be identified and entered into the system. Each cost center will be responsible for entering, maintaining, and modifying all training data within that cost center. Form 93001 Exhibit A is available for this purpose. The cost center manager will select a designated data entry operator within the cost center to enter the training data in the ETRS. Required versus actual training shall be reported quarterly at the Quality Management Review per AD-E-0003.

9. New-Hire Orientation

Each new employee shall receive an orientation. This orientation shall include but is not necessarily limited to:

9.1. Introduction to the Corporation, its business units, and products.

9.2. Introduction to Elkton DLV Operations administrative and personnel structure.

9.3. Orientations at each organizational level within Elkton DLV Operations.

9.4. Safety training orientation, including an overview of the Process Safety Management (ref. Safety Directive No. 31), HAZCOM, HAZWOPER, SMS, and Ergonomic programs, a videotape presentation of "Propellant in Your Hands," and a security briefing.

9.5. Quality System training including review of policies, procedures, OOIs, and other documents governing the responsibilities, scope, and performance of the employee's duties. Minimum quality system training requirements will be maintained by the ISO Management Representative.

9.6. Comprehensive introduction to the new team member's work area and job description. Team members directly involved in hazardous operations will be trained in operating procedures that emphasize specific safety and health hazards, emergency operations, shutdown, and safe work practices applicable to the employee's job tasks (ref. Safety Directive No. 31).

Approved: /s/ W. L. McMillan
Vice President

Permit No. A-052

ATK Elkton LLC

ATTACHMENT 4
Section H
of the Permit Application
Contingency Plan
(ATK Contingency Plan, over 100 pages long, is not attached here. It is maintained with the permit application documents at the WAS offices, and at the facility)

Permit No. A-052

ATK Elkton LLC

ATTACHMENT 5
Section D
of the Permit Application
Process Information
(40 Pages)

Orbital ATK

STANDARD OPERATING PROCEDURE
MANUFACTURING DEPARTMENT

EXPIRES: 06/30/2016

SOP-P-050 REV M

Title:	**Hazardous Waste Disposal at the Thermal Treatment Propellant Open Burning Facility**
Building:	C-Area
Propellant Limits:	900 lb.
Fabrication Technicians:	4
Transients:	2
Originator:	Charlie Morgan
Date:	May 21, 1953

APPROVALS

Department Manager	Walt Becker	Date	06/16/2015
Supervisor	Earl Mitchell	Date	06/18/2015
Manufacturing Engineer	R. Cichosz (VSET-2)/J. Keeton (Tooling)/T. Korb	Date	06/22/2015
Safety and Environmental	Richard Zambito	Date	06/22/2015

REVISIONS

REV M	Revised by	Justin Keeton/Kim Stanley	Effective Date	06/22/2015

ANNUAL REVIEWS

The Supervisor, Manufacturing Engineering and Safety and Environmental have reviewed this SOP.

Supervisor	Earl Mitchell	Date	06/18/2015
Manufacturing Engineering	Todd Korb	Date	06/22/2015
Safety and Environmental	Richard Zambito	Date	06/22/2015

SAFETY REQUIREMENTS

NOTE: IF AT ANY TIME DURING THIS OPERATION THERE SHOULD BE AN UNUSUAL OCCURRENCE OF A NATURE WHICH WOULD AFFECT THE SAFETY OF THE OPERATION OR THE QUALITY OR COST OF THE PRODUCT, THEN THIS OPERATION SHALL BE BROUGHT TO A SAFE AND ORDERLY STOP AND SUPERVISION NOTIFIED.

No more than 900 lb. of Class 1.3 - OR - 100 lb. of Class 1.1 propellant is permitted for disposal in a single burn.

BLASTING CAPS, DETONATORS OR OTHER SIMILAR DEVICES SHALL NOT BE BURNED OVER ON PANS WHICH HAVE BEEN USED TO DESTROY 1.1 MATERIALS SUCH AS HMX, RDX, AND ETC.

NEVER BURN PROPELLANT FINES IN DRY STATE

No live motors or propellant are permitted outside of C-67 during ignition of the burnfield.

Per AHOPS 1-3, 5.2.24, personnel shall not enter the burning grounds for a period of 16 hours after a burn event has started unless responding to an unusual event as directed by supervision.

Personnel shall never work alone during propellant waste disposal. All warning signs and barriers must be in place to restrict access. One person should observe the operation from a safe distance to be ready in the instance of an emergency.

WARNING: Burnfield Supervisor or authorized designee shall not use the same pan for two consecutive burns for 24 hours to allow pan to cool down.

All personnel involved in burnfield operations shall wear safety glasses with side shields, safety shoes, and flame-retardant coveralls or lab coats properly secured and sleeves rolled down.

Wear appropriate gloves when handling propellants.

Disposal operations are permitted on the burn pans or clamshell only. If a bucket of propellant spills on the ground, report event immediately to the SH&E Department.

In case of emergency, contact the in-plant emergency phone # 1200 to initiate the applicable provisions of the Plant Emergency Plan.

Should smoldering occur during the clean-up or loading operation STOP and advise Burnfield Supervisor. Do not re-enter the burnfield for a minimum of 24 hours.

Hazardous Material List

The following hazardous materials are used in the operations within this document. Read the hazardous material safety note for each material before doing any work.

None

In case of a fire, medical emergency or hazardous material spill, dial #1200 to activate Elkton's Emergency Plan for the appropriate response.

Wear safety glasses with side shields, safety shoes, and flame-retardant coveralls or lab coats properly secured with sleeves rolled down.

Transient personnel must wear appropriate safety attire as required.

Maintain good housekeeping at all times.

Clean up chemical spills immediately.

All pockets above the waist shall be empty.

All persons shall be grounded when handling LIVE components, whenever possible.

Only authorized personnel may operate ATK equipment.

Employees should wear clothing that has a higher blend of cotton than synthetic fiber. All cotton material is preferred for undergarments.

Wear appropriate gloves when handling cleaning agents, hot items, solvents, or items that may cause cuts, scrapes, etc.

OUT OF PLACE PROPELLANT PREVENTION

Maintain good housekeeping at all times. Keep a "Clean as You Go" attitude.

Clean up spills immediately.

Exercise extreme care when handling propellant or propellant contaminated items.

PURPOSE

This SOP is written to comply with all applicable ATK Hazardous Operation Standards AHOPS 1-3, "Handling and Disposal of Explosives and Other Hazardous Waste – Revision 5." Disposal of waste propellant, propellant ingredients, or propellant contaminated materials only. These materials are wastes generated from propellant machining, excess propellant from mixes, cleanup waste, cut back/trimming waste, scrap grains, and excess propellant ingredients. The only wastes that can be disposed of at the propellant burnfield are those containing propellant or oxidizer or very combustible powdered metals that cannot safely be disposed of through other modes of treatment. **This SOP is not for the disposal of inert propellant, motors (with nozzles), or pyrotechnic devices,. No non-propellant containing trash, solvents, or other hazardous or non-hazardous waste can be disposed of at the open burning facility.**

PERSONNEL QUALIFICATIONS

The waste disposal technicians shall be trained by the Manufacturing Department and only those who have been trained by the Manufacturing Department will be permitted to engage in hazardous waste disposal operations. Additionally, all crewmembers shall be 29 CFR 1910.120 certified. Personnel training records are maintained by the Safety Department.

BURNFIELD PRACTICES

Each burning will normally be initiated between 07:00 hours and 15:00 hours of the day. The time will be determined based on weather forecasts/wind factors. Burning shall not take place when weather conditions make burning hazardous or unhealthful. Such conditions would be strong wind (wind conditions of 15 MPH or greater exist if the FAA rated 15 MPH windsock is inflated and in a horizontal position) or adverse winds, dry vegetation and atmospheric inversions.

The open burning area shall be kept trimmed or otherwise cleared of dead or dying vegetation and any other debris which may present a fire hazard within a 500-ft radius of the burn pans or clamshell.

All burning shall be monitored by a Burnfield Supervisor or authorized designee and Safety Representative.

Propellant waste shall not be burned when propellant operations are in progress in C-26, C-32, C-67 and C-70. Personnel shall be evacuated from C-25, C-32, C-67 and C-70 prior to burnfield initiation. Non-ATK personnel (Ex. contractors) shall evacuate the area to at least the distance to C-18 until burnfield operations have been completed and the "All Clear" is given.

Every attempt shall be made to close the pan cover on the day of the burn in order to minimize precipitation accumulation into the pan. Rain Water: The Burnfield Supervisor or authorized designee will close the pan cover on the day of the burn. If pans become water logged, contact the Safety Department for water removal by Plant Engineering. DO NOT DRAIN PANS ON GROUND.

Hydromine material shall be burned over several times to minimize the quantity of material and to ensure no unburned propellant is shipped offsite.

Firefighting shall be directed by the Burnfield Supervisor or authorized designee. After ignition has occurred, the fire truck will remain on site until released by the Burnfield Supervisor or authorized designee.

Items authorized for routine disposal are as follows:

- Propellant waste, cured or uncured, that is collected from casting, mixing, trimming, and cleanup operations.
- Machining chips from large motor cutback (C-49) or small grain machining (C-14).
- Small grains (typically less than, but not limited to 25 pounds each) can be incorporated into the burn plan. The Burnfield Supervisor or authorized designee will detail specific treatments for these grains on the burn plan. Normally, grains in tubes will be pushed into the sand and grains, like MK48, may be laid on top of the sand. Make sure the exposed end of buried tube has no restrictions.
- Lab generated waste materials follow the same guidelines as manufacturing waste.
- Items approved by CRC (Clamshell Review Committee) for disposal in clamshell.

NOTE: **Non-Routine disposal items shall require specific disposal procedures (Temporary Operating Procedure or equivalent) and additional approval (PPCB)**

BURNFIELD PAN COVER CONTROL

1. "Pan cover" control panel is located at the entrance to burn field. Place panel disconnect switch to "ON", insert key into control lock of pan scheduled to be used, turn key to "ON" and push "OPEN" green button to activate cover mover. It will take 4 to 5 minutes for the cover to reach the "OPEN" position and the green light on the "OPEN" button will activate. If travel of the cover must be stopped before operation is complete push the "STOP" button located between the "OPEN" and "CLOSE" buttons.
2. After cover has reached "OPEN", turn key switch "OFF", remove key from panel disconnect to "OFF".

CLAMSHELL LID REMOVAL

1. **Disconnect shackles from lid in four places. Using forklift, lift lid from clamshell and place on ground beside clamshell.**

PAN AND CLAMSHELL CLEAN-UP

WARNING: Should smoldering occur during the clean-up, or loading operation STOP, leave burnfield and advise Burnfield Supervisor. Do not re-enter the burnfield for a minimum of 24 hours.

1. Inspect and clean pan or clamshell used for previous burn. Survey area and complete **Pre-Burn Burnfield Inspection Record** (ref. Burnfield Inspection Record contained within this SOP). Note any anomalies and submit findings to Burnfield Supervisor. Contact Plant Engineering (Grounds crew) for cubic yard boxes, liner, and pallet. Place ash material in cubic yard box with liner for disposal. Large pieces of unburned propellant, rags, perchlorate, or other shall be separated from the ash and consolidated on the pan to burn over during the next propellant burn.

NOTE: Contact Plant Engineering (Grounds crew) when the boxes are full.

2. Inspect pan or clamshell to be used for current day's burning. Make sure pan or clamshell is clean and ready for re-use, tracks are free of contamination, cable is not tangled, junction boxes are in good shape, stairs and deck are satisfactory and pan does not contain excessive quantity of water.

3. Inspect the firing cable for defects and replace as necessary. Plug firing cable into outlet for pan scheduled to be used.

NOTE: Notify Burnfield Supervisor or authorized designee of any defects noted during inspections above.

WASTE PICKUP, TRANSPORT AND LAYOUT

Guidelines:

Do not throw, slide or drop waste containers.

Explosive transport shall comply with all in-plant vehicle regulations and explosive handling instructions dictated in Safety Directive No. 1

Prior to initiating pickup operations, the Burnfield Supervisor or authorized designee shall complete a Propellant Burnfield Plan to provide pickup and layout instructions for the Burnfield Technicians.

NOTE: **The Propellant Burnfield Plan** or **Clamshell Burn Plan** (ref. Propellant Burnfield Plan or Clamshell Burn Plan contained within this SOP) shall be maintained by the Burnfield Supervisor or authorized designee that designates the pan to be used.

The standard waste container is designated as a 5 gallon plastic bucket with a lid. The containers should not contain more than 40 lb. of propellant per container. Follow sound ergonomic practices when transporting or lifting bucket. Lay buckets gently on burn pad; remove the anti-static bag containing the propellant from the 5 gallon plastic bucket.

NOTE: Only buckets free of propellant may be used.

Store reusable buckets on trailer for dispensing to the various hazardous waste pick-up pads during subsequent pick-ups. (Pull-off labels should be removed during layout.)

Anti-static bags that line the inside of each waste propellant 5 gallon pail shall be taped closed prior to pickup to prevent water spillage.

Propellant cuttings, chips, and sawdust shall be wetted with water or other liquid just enough to cover. Use fuel oil, diesel fuel, or Kerosene for PK HGG or similar cuttings or magnesium containing propellants

A list of waste pads to be serviced by the production pick-up team shall be maintained by the Burnfield Supervisor or authorized designee.

If the transport trailer becomes contaminated with propellant residue, the bed of the trailer can be washed in any building that is equipped with wash-down collection. Examples of the appropriate facilities are C-32, C-70, and H-22. All of the wash water shall be collected for storage in H-22 prior to final disposal.

Minimize the number of Technicians to handle waste loading and unloading but no fewer than two Technicians. Add a watch outside the burnfield during layout on the pan. The Burnfield Supervisor or authorized designee will coordinate pick up and lay out of burn pans

Survey the waste pickup pads and list the identity and approximate quantity of waste to be picked up. If waste is not identified (labeled), it will not be picked up. Notify the environmental engineer. The waste pickup sheets shall be kept with the Propellant Burnfield Plan or Clamshell Burn Plan and retained by the Safety Department. All waste contributors are to assist by supplying this information.

Hydromine material may be transported to the burning field by forklift.

Exercise caution when ascending and descending stairs.

Avoid spillage on stairs and decks.

Frozen buckets must be thawed before layout on pans. This will be accomplished by placing frozen buckets in an area designated by the Manufacturing Supervisor the day before scheduled layout.

NOTE: Include pre-ignition photographs for all out-of-family disposal items. Photographs shall be taken to document the orientation and position of items on the burn pan prior to ignition.

Practices:

1. The Supervisor or authorized designee shall provide a Propellant Burnfield Plan or Clamshell Burn Plan showing the pickup locations and the burning pan layout arrangement with quantities of the items to be burned. When using the clamshell, the CRC will help determine the layout arrangement.

WARNING: The quantity shall be limited to 900 pounds of 1.3 – OR – 100 pounds of 1.1 propellant waste.

2. Hook up hazardous waste trailer. Make sure hitch is secured properly and safety chains are attached.

3. Pick up hazardous waste in accordance with the Propellant Burnfield Plan or Clamshell Burn Plan.

4. Display orange flag with chain at the entrance to burn field.

NOTE: Only persons engaged in burning operations shall pass flag. No loaded motors or propellant are to be outside of C-67 when waste is burning.

5. Transport waste to burn field and pull trailer to forward edge of designated pan or clamshell.

6. Transport containers from trailer to pan or clamshell by either carrying up the stairs or bucket brigading from trailer to pan.

7. Lay out waste on designated pan per the Propellant Burnfield Plan. Loading should be done so that the far end of the pan is loaded first. Normally, white plastic 5 gallon buckets with anti-static liners will be used. The contents will be removed and positioned on their sides on the pan to minimize the height. The exception will be buckets containing propellant contaminated solvent or buckets wetted down with #2 fuel oil, diesel fuel, or kerosene. These shall be placed out in a single layer, in straight rows, and with the spaces between the contents equal to their diameter. The height should not exceed 12 inches.

8. When using clamshell, lay out waste per the Clamshell Burn Plan. Small items may be placed by hand. Larger items shall be loaded using fork lift and fork mounted boom.

9. Inspect trailer carefully. Make sure all waste has been removed and the trailer bed is clean.

10. When leaving the burning area put up chains blocking the road.

11. Park trailer at designated spot on hard surface to facilitate attachment to vehicle for next propellant pick up run.

BURNFIELD INITIATION

Guidelines:

Initiation devices shall be fabricated in H-4 per SOP-P-626 Fabrication of Burnfield Initiators. All initiation devices shall be equipped with 12 feet (minimum) leg wires.

Electrical hookup of the ignition train and initiation of the propellant burns shall be completed by the responsible Burnfield Supervisor (or authorized designee) and monitored by a Safety Department representative.

Request Plant Maintenance fire truck to stand by for waste burning.

WARNING: Notify Maintenance Department to have fire truck on site before initiation of the burnfield. If the fire truck is not available, DO NOT burn.

Practices:

1. The firing box, permanently attached to the pan cover control panel, shall be opened only by the Burnfield Supervisor or authorized designee conducting the burn. Place the key in the igniter switch when ready to conduct the burn.

2. Make sure the firing cable is locked out in shorted position at the firing station. The Burnfield Supervisor or authorized designee shall be accompanied by Safety personnel while hooking up the initiator. Keep the initiator a safe distance from the train while connecting leads. The initiator shall be placed in the "squib box" while hooking up wires, to protect personnel from accidental ignition prior to wiring to the firing cable. Initiator is furnished with minimum 12-foot leg wires. The leg wires shall be straightened out by hand and shall not be thrown; waved through the air, or snapped as a whip to loosen the wire coils. The short shall not be removed from the leg wires until the moment of connecting them to the firing cable.

3. Prepare ignition point using propellant designated in the burn plan by creating a pocket for initiator and placing initiator in this pocket such that it does not pull out. Secure with tape.

NOTE: An alternate is to use a few grams of boron pellets in a Velostat bag with the initiator. Tape this "bag" at the designated position in the burn plan.

4. Return to the firing station.

5. Check area visually to verify area is clear and safe for burning. Check to verify no one is at C-32, C-70 or C-67 by looking inside and outside each building.

6. Using the firing box, test the firing circuit continuity. When ready, place key switch into "fire" position and fire the igniter to ignite waste.

   WARNING: If squib fails to fire or waste fails to ignite, DO NOT approach pad for 30 minutes minimum. Burnfield Supervisor shall be on site during new hook up.

7. Do not enter the burnfield for a minimum of 16 hours.. If a brush fire or an unusual event should occur, personnel may enter the burn area (if authorized by the Burnfield Supervisor or authorized designee).

PAN COVER CLOSURE

Within 24 hours, following a burn, but no sooner than a minimum of 16 hours after a burn, technicians shall enter the burnfield and inspect the burn site using the Post-Burn Burnfield Inspection Record (ref. Post-Burn Burnfield Inspection Record contained within this SOP) for:

- Contamination on the tracks – remove debris with dry cloths. Cloths should then be stored at the site for a future burn.
- Integrity of cable on electric motor and untangle any crimps.
- Integrity of limit switches.
- Visually search the burning area for propellant and other debris and material ejected from the pan. Collect and place the ejected material on the pan for disposal during next burn.

To complete Post-Burn Inspection Record after clamshell use, remove small cover on lid and use flashlight to make observations.

The burn field pans shall be cleared of ash and debris at least every 30 days. Large pieces of unburned propellant, rags, perchlorate, or other material shall be separated from the ash and consolidated on the pan to be burned during the next burn.

USE AND OPERATION OF THE CLAMSHELL DEVICE

- The Clamshell device will be used to burn materials that have a potential to move or "jump" as a result of burning.

- Materials to be burned in the Clamshell device will be specifically and individually approved by the Burnfield Supervisor and review committee, Clamshell Review Committee, composed of the following individuals: Safety Representative, Manufacturing Engineering Representative, Chemist, and Burnfield Crew Member.

- Evaluation of materials to be burned in the Clamshell device will be conducted for each burn performed in the Clamshell. The evaluation will be conducted using the following steps:

  1. Calculate the propellant surface area and ambient pressure burn rate.

  2. Record the propellant surface area and ambient pressure burn rate on the Clamshell Burn Plan attached to his procedure.

  3. Plot the area/burn rate on the Clamshell surface area/burn rate graph (Clamshell Acceptance Curve) shown on the graph included on the Clamshell Burn Plan.

  4. Only items falling below the Clamshell Acceptance Curve Are acceptable for disposal in the Clamshell.

  5. The Clamshell Review Committee will determine the proper layout, orientation, and ignition train best suited for the items to be burned.

  6. The Clamshell Review Committee will consider evaluating the Burning Rate at higher pressure to determine the choke point of the motor. The choke point pressure is the maximum pressure inside the motor and is used to calculate the flow rate of gas exiting the motor into the clamshell. That flow rate is converted to determine the maximum pressure expected in the clamshell and will be compared to the clamshell design pressure. If the maximum expected pressure exceeds the design pressure, the motor cannot be burned in the clamshell. (If there are several motors then the flow rates from each motor are summed.)

DISPOSAL OF SPECIAL MATERIALS

- Scrapped (dumped) propellant batches (mixes) shall be picked up by Burnfield Technicians as soon as possible. Mixing and/or Casting crews can aid in loading the transport trailer if additional help is needed.

- Scrapped propellant batch disposal shall be supervised by Burnfield Supervisor or authorized designee. Scrapped batches in excess of 30 gallons shall be laid out and burned separately or on top of hydromined propellant as directed by the Burnfield Supervisor or authorized designee.

- Slurries shall be picked up and poured out by qualified waste disposal technicians and burned separately under the supervision of the Burnfield Supervisor or authorized designee. The waste trailer may be used for transport.

- Unconfined scrap igniter/pyrotechnic material shall be disposed of by or under the direction of the Burnfield Supervisor or authorized designee with the approval of the Safety Department.

NOTE: Only contaminated cloths and miscellaneous unassembled pyrogens/grains can be included in the burn plan.

- Control samples shall be transported to the burn field and placed on a clean pan by qualified personnel supervised by the Burnfield Supervisor or authorized designee. The burnfield technician shall lay out the samples for burning with regular hazardous waste.

- Aluminum powder shall be picked up and transported to the burn field by the burnfield technicians. Aluminum powder shall be mixed in fuel oil and burned separately under the supervision of the Burnfield Supervisor or authorized designee.

EXCEPTION: Up to 10 pounds of aluminum powder may be picked up by the burn field technicians and burned with normal propellant waste. **(Keep aluminum powder separate from oxidizer.)**

- Class 1.1 high explosives and propellant and high-energy oxidizers (such as less than 15-micron size AP) shall be disposed of in accordance with DOD 4145.26M and under the supervision of the Burnfield Supervisor and with approval from the Safety department. No more than 100 lb. of Class 1.1 material, spread out in a single layer is permitted for disposal in a single burn.

  Loaded cases (without nozzles) and grains in excess of 25 pounds each can be disposed of separately. These items shall be reviewed by the CRC for disposal in the clamshell.
- 2" and 5" CP's – unobstructed at both ends – may be burned out during the day in a series or train arrangement. This operation does not require the presence of a safety monitor or the fire truck, but does require the preliminary inspection and set up procedures identified previously.

- Any other items not specifically addressed by this SOP shall not be burned at the burnfield without PPCB approval and a Temporary Operating Procedure (TOP) that is also approved by the Environment Engineer.

Post-Burn Burnfield Inspection Record

(Mandatory: To be conducted within 24 hours, after previous burn per 40 CFR 264.15(d))

Signature of person who performed the inspection:	Date:

OBSERVATIONS	Please Circle One	
1) Any evidence of unburned propellant?	YES	NO
If YES, please explain:		
2) Any evidence of residual smoke or smoldering materials?	YES	NO
If YES, please explain:		
3) Any evidence of projectiles, stray propellant, or ejected material?	YES	NO
If YES, please explain:		
4) Burn pan covers in place and working properly?	YES	NO

Repairs and Other Remedial Actions:

(All ejected material, projectiles, and stray propellant must be cleaned up within 24 hours of a burn):

PROPELLANT WASTE DISPOSAL INVENTORY

PROPELLANT WASTE PAD	LIVE MATERIAL		DATE: _____
	BUCKET	BAGS	NOTES
C-32			
C-33/34			
C-26/27/29			
C-50			
C-49			
C-70			
C-72			
H-4			

SHEETS NEEDED FOR BUCKET PICKED UP			NOTES
A-46			
A-68			
A-42/64			
A-65			
A-7			

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uilding: _____ **PROPELLANT WASTE**

Disposal Period: _____ **through** _____ **FOR BURNFIELD PICKUP**

Propellant	Propellant Status* (See info below)	Quantity, lbs

*** Propellant Status:**
A - Uncured Propellant
B - Cured Chunks
C - Cured Shavings
D - Dust
E - Contains copper chromite

Propellant Burnfield Plan

1	2	3

Date: _____

Approved By: _____

Material to be burned: _____

Amount of propellant burned: _____ lbs

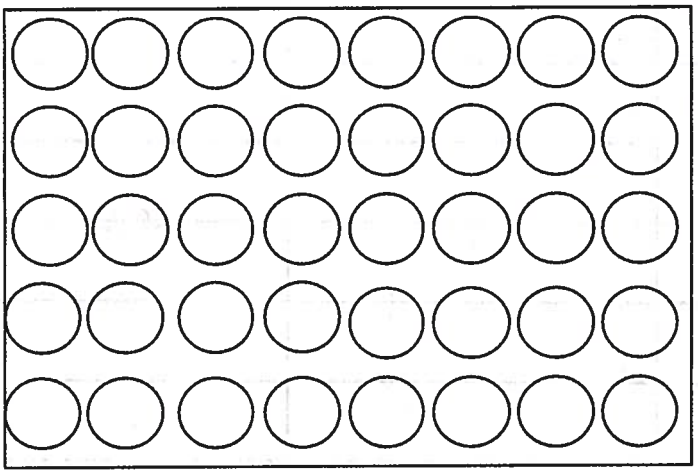
Contains copper chromite: ☐

1. Perform pad inspection and complete Pre-Burn Burnfield Inspection Record (Reverse).
2. Inspect and clean Cover Mover rails and retract burn pan cover.
3. Clean propellant residue and debris from pan and discard in cubic yard box. *Exception: Hydromined propellant may be burnt over several times.*
4. Layout buckets into rows per sketch below. Empty contents of buckets on sand.
5. Open and inspect all bags, then place bags between rows.

1. **Do not allow AP contaminated water to spill over edge of pan onto ground.**
2. **Keep piles of material on sand approximately 6" high or less, when possible.**
3. **Note: Bucket containing solvent or fuel oil should be left undumped until immediately prior to ignition.**
4. **Remove lids from enclosed containers (jars, cans, etc.) prior to ignition.**

PAN LAYOUT

PAN #



WARNING!

Maryland Regulations limit propellant quantity to 900 lbs during a single pan burn.

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Clamshell Burn Plan

Clamshell

Date: _____

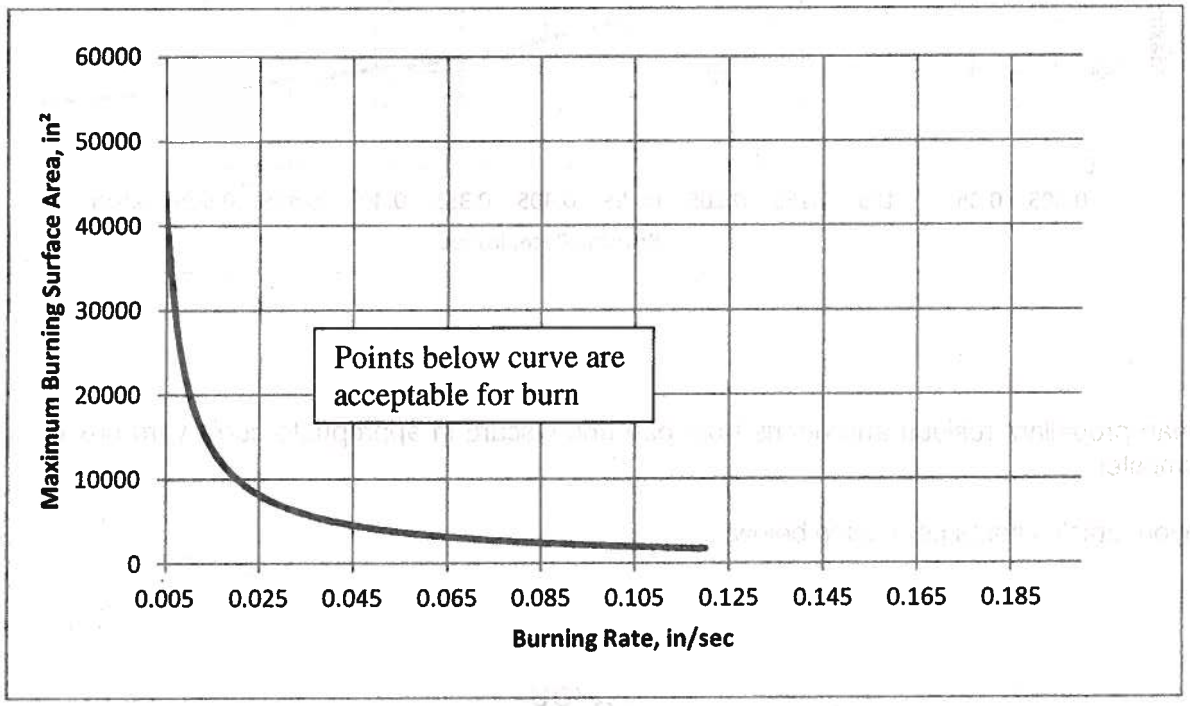
Approved By: _____

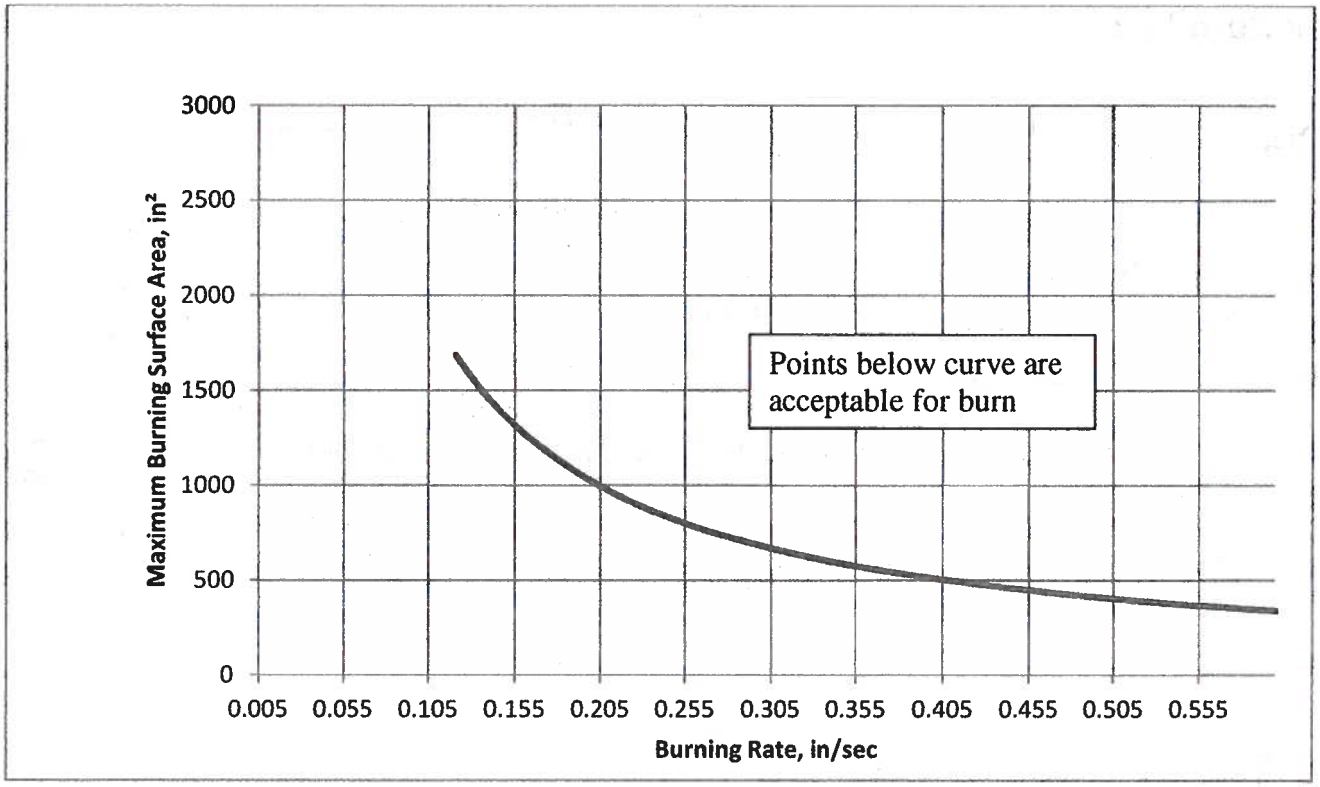
Material to be burned: _____

Surface Area: _____ in^2 Burning Rate: _____ in/sec

Contains copper chromite: ☐

Plot characteristics of material to be burned on the graphs below.

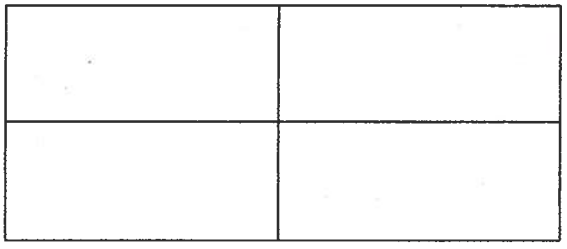




1. Clean propellant residue and debris from pan and discard in appropriate cubic yard box or scrap metal dumpster.

2. Layout articles/items per sketch below.

LAYOUT



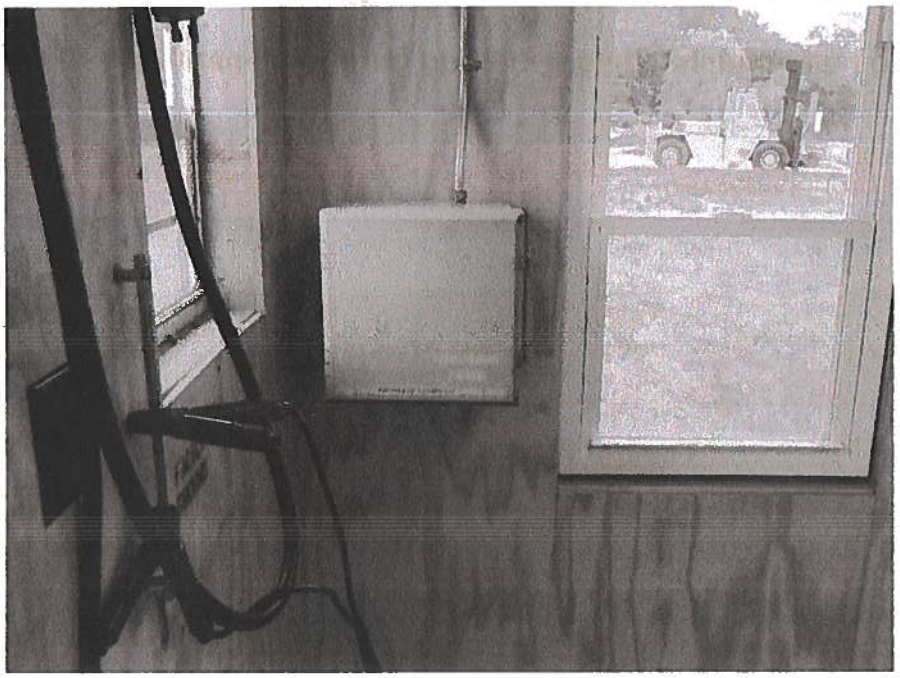
Pre-Burn Burnfield Inspection Record

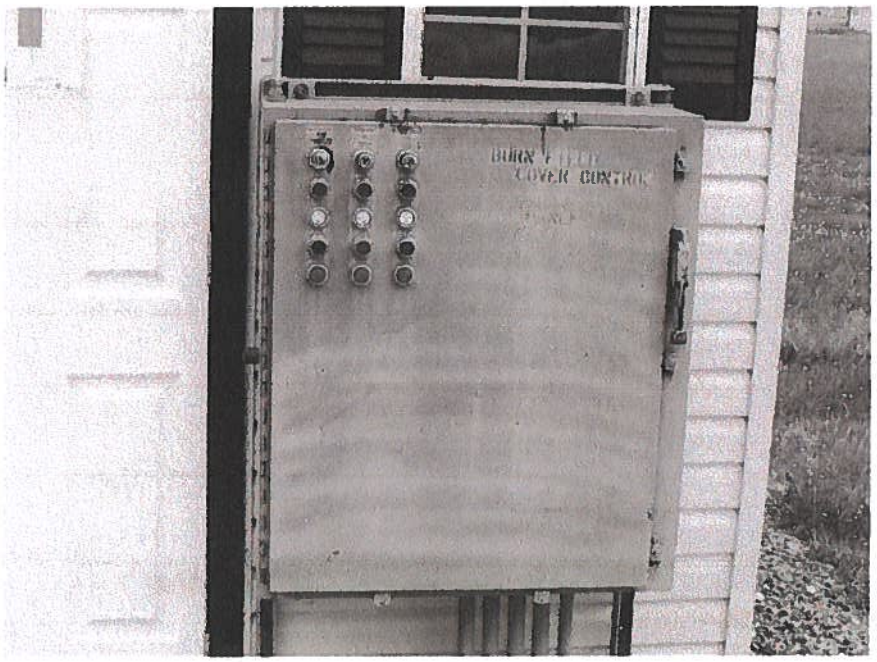
(Mandatory: To be conducted before starting burnfield operations 40 CFR 264.15(d))

Date of previous propellant burn:	Time of burn:

Inspection			
Specific Items	**Type of Problem**	**Acceptable**	**Unacceptable**
Open burning area	Erosion, debris, smoldering material, unusual discoloration		
Safety chains	Damaged, missing		
Surrounding area	Burned vegetation, dead vegetation, unusual discoloration		
Firing cable and station	Defects		

Signature of person who performed the inspection:	Date:





Firing Box

This SOP has been reviewed by the following:

NAME	BADGE	DATE
Jim Barnes	40265	
Tony Beavers	40111	
Marlin Biggers	23939	
Kevin McGroerty	24958	
Tobe McKeown	50920	
Bruce Payne	23608	
Don Raser	24019	
Brian Seyler	39467	
Mark Thompson	23575	
Frank Wiggins	24709	

Upon completion of signatures, forward to G. Mayo, A-29 for entry into the Elkton Training Documentation Database.

ATK TACTICAL SYSTEMS

STANDARD OPERATING PROCEDURE
MANUFACTURING DEPARTMENT

SOP-P-524 REV E

Title:	**Destroying Reject, Overage or Undesirable Squibs, Delay Columns, Detonators and Boosters.**
Building:	**C-Area Bumfield**
Propellant Limits:	**(See Note in Safety Requirements)**
Fabrication Technicians:	2
Transients:	1
Originator:	John Mallick
Date:	April 17, 1990

APPROVAL

Manager of Manufacturing:	Stephen A. Slagle	Date: 2/3/05
Manager of Safety:	Dale A. Johnson	Date: 2/3/05
Vice President of Operations:	Terrance Melton for KWP	Date: 2/3/05

REVISIONS

REV E Revised by: Earl. W. Mitchell Effective Date: 02/03/2005

ANNUAL REVIEW

The Supervisor, Manufacturing Engineering and Safety and Environmental have reviewed this SOP and have determined that no changes are needed at this time.

Supervisor	Gary Simpers	Date	06/11/2013
Manufacturing Engineering	Richard Cichosz	Date	06/10/2013
Safety and Environmental	Laura Hartwell	Date	06/10/2013

SOP-P-524 (Rev. E)
Destroying Reject, Overage or Undesirable Squibs, Delay Columns, Detonators and Boosters

SAFETY REQUIREMENTS

NOTE: IF AT ANY TIME DURING THIS OPERATION THERE SHOULD BE AN UNUSUAL OCCURRENCE OF A NATURE WHICH WOULD AFFECT THE SAFETY OF THE OPERATION, THEN THIS OPERATION SHALL BE BROUGHT TO A SAFE AND ORDERLY STOP AND SUPERVISION NOTIFIED.

NOTE: Propellant Limits - A maximum of 2.0 grams net explosive weight may be disposed of per disposal cycle. No more than 1.0 lb. of net explosive weight may be disposed of per day.

Wear safety glasses with side shields, safety shoes, and flame retardant coveralls or lab coats properly secured and sleeves rolled down.

Wear clothing that has a higher blend of cotton than synthetic fiber. All-cotton material is preferred for undergarments.

A minimum of two Technicians are required to be in attendance for disposal operations.

Adhere to posted FOD requirements.

The destruction of waste detonators is classified as hazardous waste disposal and is fully regulated by the Maryland Department of the Environment and the U.S. Environmental Protection Agency.

Hearing protecting must be worn when disposing of fuse caps or blasting caps.

EQUIPMENT

1. Waste detonator destruction device (ref. Drawing E46286).
2. Laboratory tongs.
3. Propane Tanks

SOP-P-524 (Rev. E)
Destroying Reject, Overage or Undesirable Squibs, Delay Columns, Detonators and Boosters

OPERATIONS

1. Read through this complete S.O.P. prior to taking any action.

2. Operation must be accomplished only in the waste propellant open burning area. Check with the burn field area supervisor to assure area is clear. Assure that the waste detonator destruction device is grounded and the area is cordoned off with warning signs posted.

3. Perform Det Popper Pre-Inspection Checklist and record results on attached form.

4. Obtain all materials for disposal from appropriate storage magazine or area. Transport materials to disposal area in appropriate safe manner. Store materials at disposal area in grounded safety container on the safe side of detonator destructor.

5. Starting:
   a) **WARNING:** Before lighting pilot, close main burner valve by rotating it clockwise (90° to valve body).

   b) Fully open valve on both propane bottles and wait 15 seconds.

   c) Depress red button on safety pilot valve to admit gas to the pilot. If air is in the gas line allow a few minutes for gas to reach the pilot; then light pilot with a long nose butane barbeque lighter while holding in the red safety pilot valve. Repeat until pilot is lit. Continue to hold safety pilot valve for approximately 30 seconds, then release.

   d) If pilot goes out, wait 5 minutes before repeating lighting procedure.

   e) When the pilot remains lit, open the main burner valve by rotating it counter clockwise (in line with valve body) to light main burner. Partially close valve to regulate heat output.

NOTE: 1. Adjusting burn rate too low can cause soot. Watch for and avoid a yellow smoky flame.
2. Fill propane tanks frequently, especially in cold weather. Never allow propane to fall below one-third of the tank capacity.

   f) Attach Thermocouple batteries. Chamber Thermocouple should be 500°F or higher before proceeding with disposals.

6. Close the lower feed tube valve and open the upper feed tube valve.

7. Select individual item to be destroyed from safety container and with use of laboratory tongs insert item into flame pot entrance of feed tube. The purpose of the laboratory tongs is to permit insertion of the item to be destroyed into the flame pot entrance tube from behind the personnel shield without any part of the body coming in line of sight with the feed tube. Close the upper feed tube valve and open the lower valve. The item will fall by gravity into the combustion chamber.

SOP-P-524 (Rev. E)
Destroying Reject, Overage or Undesirable Squibs, Delay Columns, Detonators and Boosters

8. After the item has been expended, as evidenced by a pop, smoke or flame from the exhaust stack, insert a second item and continue until all items scheduled for destruction that day have been expended. Record on the data sheet the quantity of items destroyed and the approximate time from insertion into the tube until unit has popped. If evidence of destruction does not occur, wait at least two (2) minutes before introduction of the next item. Make a record on the data sheet of the lack of response for that item. If two (2) like items do not respond, discontinue introduction of that type of item and make notation on the data sheet.

9. Continue operations for the remainder of materials on the approved destruction list. If an item inserted into the entrance tube is suspected of hanging-up in the tube, a wooden rod should be used to vibrate the tube in an attempt to dislodge the stuck item. AT NO TIME SHOULD ANY ROD BE INSERTED INTO THE TUBE FOR THAT PURPOSE. Wait two (2) minutes for response before continuing operations.

10. Shut Down
    a) Close valve on propane cylinder.
    b) Turn main burner valve off by rotating it clockwise (90° to valve body).
    c) Detach battery power.
    d) Remove propane tanks and store appropriately.

11. If suspected difficulties arise, shut off the gas supply and allow detonator destructor to cool overnight.

12. Retain a copy of the destroyed units. A record of the expended material shall be given to the area supervisor. At the end of the destruction period, shut off the gas, let unit cool overnight. Detonator destructor to be stored in an approved storage area when not in use.

13. Empty the unit the next day to determine that all units have been expended. If any detonators are intact contact the Safety Department or recycle them through the unit. Remove the inert metal shrapnel from the unit and place it in a metal 1-gallon pail. Label the pail "metal shrapnel from expended detonators". Contact the environmental engineer for disposition of material.

14. Units acceptable for destruction are:

    SCB Squibs
    TBI's
    Rotor Leads
    Blasting Cap
    Fuse Cap
    Propellex 4.5 sec. PN3193436
    Holex 3763-2
    J-2
    EA50 delay

- Any small initiator such as Holex 3763-2 (or 1196) which will fit into flame pot entrance tube.
- Any squib or initiator in 207 or 209 class.

SOP-P-524 (Rev. E)
Destroying Reject, Overage or Undesirable Squibs, Delay Columns, Detonators and Boosters

- Any initiator similar to above units. If unit has not been approved for destruction, obtain permission from any of the signers of this S.O.P. or their designee and destroy one or two units. If unit is destroyed without any undue violence as is evident from the intensity of popping noise, continue with destruction of items.

PART NUMBER	DESCRIPTION	QUANTITY	DETONATION TIME

SOP-P-524 (Rev. E) Destroying Reject, Overage or Undesirable Squibs, Delay Columns, Detonators and Boosters			

SOP-P-524 (Rev. E)
Destroying Reject, Overage or Undesirable Squibs, Delay Columns, Detonators and Boosters

Det-Popper
Pre-Inspection Checklist

Description	Acceptable	Non-Acceptable	Corrective Action
Structural Integrity (rust, corrosion)			
Tires (flat, need air, need replacement)			
Input Lever (Operable)			
Discharge Lever (Operable)			
Gauges (4) (Operable)			
Propane Tank (Empty, missing, needs replacement)			
Grating (Intact, needs replacement, corrosion, rust)			
Grounding Cables (Accessible, operational)			
Batteries (In place, need to be replaced)			
Personal Protective Equipment (Hearing protection, gloves)			
Tools			

Comments: _____

_____

_____

Technicians Signature: _____ Date: _____

F410001/2 [2/05]

SOP-P-524 (Rev. E)
Destroying Reject, Overage or Undesirable Squibs, Delay Columns, Detonators and Boosters

This SOP has been reviewed by the following:

NAME	BADGE	DATE

Upon completion of signatures, forward to G. Mayo, A-29. The names will be entered into the Training Documentation Datacase and filed with the original SOP.

Permit No. A-052

ATK Elkton LLC

ATTACHMENT 6
Section I
of the Permit Application
Closure and Post-Closure Plans
(15 pages)

Section I - Closure, Post Closure and Financial Assurance

COMAR 26.13.07.02(29) A copy of the closure plan and, when applicable, the post-closure plan required by COMAR 26.13.05.07C and H. An owner or operator shall include, when applicable, as part of the plan, specific requirements in COMAR 26.13.05.09I, .10-7, .11G, .12I, .13K, .14J, .16L, and .16-1B and D.

This closure plan identifies all steps that will be necessary to partially close the ATK Elkton LLC facility at any point during its intended operating life. The plan also addresses the conditions and reasons under which partial closure will occur. A post-closure plan is not required for all hazardous waste units because the Elkton facility is a storage facility and operates a thermal treatment open-burn facility, and all wastes will be removed at closure. The only units that are now anticipated to require post-closure is the closed incinerator feed surface impoundment and the closed C area waste propellant open burning facility. Both of these closed units were previously permitted by MDE.

ATK Elkton will maintain an on-site copy in the environmental engineer's office of the approved closure plan and all revisions to the plan until the certification of closure completeness has been submitted and accepted by MDE. ATK will notify the Secretary at least 180 days prior to the date it is expected that final closure will begin. The date of closure of the entire facility is estimated for 2105. Upon completion of closure, ATK Elkton LLC's owner will submit to the Secretary a certification by both the owner and a local independent registered professional engineer that the facility has been closed in accordance with the specification in the approved closure plan.

Closure Performance Standard

This closure plan was designed to ensure that the ATK Elkton LLC facility will not require further maintenance and controls, minimizes or eliminates threats to human health and the environment, and avoids escape of CHS, CHS constituents, leachate, contaminated rainfall, or waste-decomposition products to the ground or surface waters or to the atmosphere. If there is evidence of any spills or leaks, samples will be taken and analyzed to determine the extent of contamination in the soil and, if necessary, in ground water. Any contaminated ground water will be remedied. If necessary, the site will be regraded subsequent to closure to prevent erosion. The following sections discuss in detail efforts to be made at the Elkton facility to satisfy the closure performance standard.

Partial and Final Closure Activities

This facility has completed partial closure of four hazardous-waste-management units. Two are the H-area container-storage areas. A report on the final closure of these two areas was sent to MDE on May 24, 1988. These two areas have been clean-closed. No hazardous-waste residues are present in excess of allowable concentrations.

Partial closure activities are currently under way for the no-longer-used incinerator feed-holding surface impoundment. A report on the soil sampling and liner decontamination and removal was sent to MDE in January 1989. A report of the preremediation groundwater study and plume-characterization study was sent to MDE on April 16, 1990. Based on this report, a groundwater-stabilization system was designed.

MDE approved the design in May 1992. The stabilization system consists of a 100-foot-long interceptor trench, an air stripper and an infiltration gallery. It was constructed and started operation in September 1993, and has been in continuous operation since. Quarterly groundwater monitoring is ongoing. These results are analyzed statistically and reported to MDE annually in a groundwater monitoring report submitted to the Department by April first of each year. The results have shown a steady decline in the contaminants.

In order to speed the clean up, we initiated in April 2003 (with the prior approval of MDE) a demonstration project using an Emulsified Edible Oil Substrate (EOS) injected into the contaminated soils. After over a year of monitoring this technology has proven to be effective in removing the contamination. We will propose to MDE a work plan to expand the use of EOS and treat the most highly contaminated portions of the site.

The most current progress report on the EOS pilot study was dated December 7, 2004 and was presented to MDE by our contractor Solutions IES.

The last unit that is undergoing closure is the closed C-area waste propellant open-burning area. This is an area that was used to burn waste propellant on the ground surface. The unit was closed and replaced with a new unit consisting of three aboveground burning pans in January 1992. A soil and groundwater-sampling investigation was performed and reported to MDE on July 14, 1993. A small plume consisting of 1000 ppb volatile organic solvent was found. Quarterly groundwater monitoring is continuing to map the size and location of the plume. The EOS technology used for the closed IFSI may also be applicable for use on this unit.

Partial closure of the remaining active facilities (A-26, lab pack container storage building; H-22, hazardous-waste container-storage area; D-2 waste detonator storage magazine. However, in the event that future circumstances result in a discontinuance of the activities, their final closure activities are included in this plan. If a major change in the plant's CHS facilities' equipment structures, instruments, or procedures occurs, this plan will be revised accordingly.

It is expected that the maximum CHS operation during the life of this facility will consist of the storage of 300 drums, and one thermal treatment open-burning facility.

Maximum Waste Inventory

The following table shows the maximum inventory of CHS at any given time during the life of Elkton Operations:

Waste	Estimated Maximum Amount, gal	Location of Inventory
Photographic waste water Spent halogenated cleaning solvents Spent nonhalogenated solvents Spent aqueous cleaner with cadmium Discarded toluene diisocyanate Beryllium dust Lab packs	D006,D011) F001) F005) D006) 16,500 U223) (300 drums) P015) —)	Containers in H-22 & A-26

General Final Closure Plan for Entire Facility

This plan identifies the steps that will be taken to close all the hazardous-waste units located within ATK Elkton LLC, facility. The plan is based on closing the facility at its maximum extent of operation, which is defined as the entire facility being at maximum hazardous-waste inventory, which is detailed above. Under maximum-waste inventory the partial closure plans have been broken down in sufficient detail so that they are understandable, so the closure schedules can be prepared, and so that cost of closure can be estimated. Costs are estimated using third-party labor and supervision. For planning purposes only, closure is anticipated for the year 2105. The cost-estimate schedule is presented in this section.

Whenever applicable changes in our plans occur, this closure plan will be amended no later than 60 days prior to a proposed change in facility design or operation or not later than 60 days after an unexpected event. If an unexpected event occurs during a partial closure, the plan will be amended within 30 days.

As the schedule shows, all waste is treated or removed from site within 90 days after the approval of the closure plan and total closure is completed within 180 days.

Within 60 days of completion of closure of the entire facility, a certification will be submitted to the MDE that we have closed in accordance with this plan. This signed certification will be sent by registered mail and also signed by an independent registered professional engineer. The engineer will maintain the appropriate supporting documentation to show that the closure was properly carried out. When each unit is closed, but no later than submission of the closure certification for each unit, a survey plat prepared by a certified land surveyor will be submitted to the Cecil County, Maryland, zoning authority. The plat will indicate the dimensions of the closed unit in relation to permanently surveyed benchmarks. The plat will contain a note prominently displayed stating the obligation not to disturb the unit.

Closure of A-26 and H-22 Containing Storage Areas

Prior to closure, all containerized waste will be transported off-site by an outside licensed hazardous-waste transporter and taken to a licensed hazardous-waste disposal facility capable of accepting the containerized waste. Incineration is the preferred disposal method.

Both of the areas have concrete bases. The A-26 lab pack building also has shelving. The shelving and the bases will be inspected for residues. If residue is present, the floors and shelves will be cleaned using steam and a strong industrial detergent. The most difficult residue to remove that may be present is residue from thick gooey hydrocarbon polymers. Steam-cleaning is effecting in removing this type of residue. The entire concrete bases, shelving, and all walls will be steam-cleaned. Brushes, brooms and scrapers will be used to remove residues. Following the cleaning of the bases, the brushes, brooms, and scrapers used will be steam-cleaned to decontaminate them. This equipment will then be reused.

The contaminated steam-cleaning water will be pumped from the base and transported off-site by a licensed hazardous-waste transporter and disposed of as a hazardous waste. The E.I. duPont waste-water treatment facility in Deepwater, New Jersey, will be used to dispose of this waste water if possible.

In order to judge the success of the cleaning and decontamination efforts, wipe test or sampling will be conducted. Five random areas will be wiped at H-22 and two areas at A-26, one from the base and the other from the shelving.

Each wipe will be tested for the 229 priority pollutants. This testing is appropriate due to the lab packs that were stored in each area. The SW-846 analytical method will be used to test for each parameter. The cleaning will be judged a success if no single parameter exceeds 50 ppm.

Closure of Thermal Treatment Open-Burn Facility

The thermal treatment open-burn area will be kept in operation until all the inventory of waste solid rocket propellant has been destroyed.

This closure plan was designed to ensure that the thermal treatment open-burn area will not require further maintenance and controls, minimizes or eliminates threats to human health and the environment, and avoids escape of hazardous constituents, leachate, contaminated rainfall, or waste-decomposition products to the ground or surface waters or to the atmosphere. If there is evidence of any spills or leaks, samples will be taken and analyzed to determine the extent of contamination in the soil and, if necessary, in ground water. Any contaminated soil will be excavated, removed, and disposed of at a proper permitted disposal facility. Any contaminated ground water will be remedied. If necessary, the site will be regraded subsequent to closure to prevent erosion. The following sections discuss in detail efforts to be made at ATK Elkton LLC to satisfy the closure performance standard.

Clean closure will be attempted. This should be possible because it is unlikely that there will be any remaining reactive or ignitable waste residues. There is the possibility that hazardous constituents may be remaining in the soil and/or groundwater. Testing will have to be performed to determine this.

The following is the step by step closure plan for this unit:

1. Open burn all remaining waste propellant and destruct all waste detonators and MC3502 motors.

2. For the sand in each burning pan, take four 2-ft.-long core samples from each pan.

3. For quality control, take one blind duplicate sample for every ten samples taken. Take one field blank of clean commercially purchased sand. Use chain-of-custody procedures. Analyze all samples within the correct holding period using an EPA-certified lab. Decontaminate all sampling equipment after sampling by scrubbing with a stiff brush and water three times.

4. Analyze samples for the parameters shown on the sample schedule.

5. Sample the soil surrounding the open-burning pads or pans at the surface and at a depth of 1 foot. Take a set of samples on a 30-ft. grid pattern extending 100 ft. out from the burn pans or pads.

6. Follow same quality-control procedures as in 3 above.

7. Analyze samples as shown on sample schedule.

8. Take groundwater samples from four monitor wells around open-burn area. Follow the same MDE approved sampling procedure used for the quarterly sampling of the IFSI wells.

9. Analyze sample taken in step 8 above as shown on the sample schedule.

10. Take background soil samples at two different locations at least 300 ft. away from the open-burning pads or pans. The exact location will be chosen by an independent professional engineer. At each location take a surface-soil sample and a 1-ft-deep sample.

11. Analyze the background samples as shown on the sample schedule using an EPA-certified lab and chain-of-custody procedure.

12. All metal parts of open-burn pans and detonator-disposal system will be flashed using a propane torch and exposing all metal surfaces to the flame.

13. All the above steps will be witnessed by an independent professional registered engineer and a report describing the closure will be prepared and sealed for accuracy by the independent engineer.

14. Upon receipt of analytical results, the sand from the burning pads or pans will be judged hazardous if any of the analytical results exceed the current criteria for determining if a waste is a hazardous waste, and nonhazardous if the results are below the current criteria.

15. If the sand is a hazardous waste, it will be disposed of at an EPA-permitted hazardous-waste disposal facility permitted to accept this type of waste and will be transported to the facility by a permitted hazardous-waste transporter. If the waste is hazardous due to reactivity, it may be burned over at the Elkton burn area.

16. If the sand is nonhazardous, it will be disposed of at any landfill not restricted from accepting it.

17. The flashed metal parts will be judged nonhazardous and will be recycled using a scrap-metal recycling facility.

18. If the soil-sample results are less than the current criteria for determining if the waste is hazardous, then the soil will be judged as clean. All areas of the disturbed soil will then be seeded with Kentucky Fescue No. 23.

19. If the soil sample results are above the current criteria for determining if a waste is hazardous and the current health-based criteria, then the post-closure contingency plan will be implemented.

20. If the groundwater testing results are equal to or less than the background groundwater test results, the site will be judged as closed.

21. If the groundwater testing results are above the background testing results, the post-closure contingency plan will be implemented.

Sample Schedule				
Sample	Sample Method	Sample Analysis	SW-846 Method	Container
Sand from burning pans	2-ft core at 4 locations/pads. Use stainless steel auger	TCLP toxicity		Wide-mouth amber pint
		As	7060	
		Ba	7080	
		Cd	7130	
		Cr	7190	
		Pb	7420	
		Hg	7470	
		Se	7740	
		Ag	7760	
		Halogenated and nonhalogenated volatile organics	8010 8015	Large VOA bottle with Teflon septum
		Ignitability	1010	Wide-mouth pint
Soil surrounding burning pans	Surface and 1 ft. 30-ft grid 100 ft from burning area	TCLP toxicity		Wide-mouth amber pint
		As	7060	
		Ba	7080	
		Cd	7130	
		Cr	7190	
		Pb	7420	
		Hg	7470	
		Se	7740	
		Ag	7760	
		Halogenated and nonhalogenated volatile organics	8010 8015	Large VOA bottle with Teflon septum
		Ignitability	1010	Wide-mouth pint
Groundwater	Same MDE approved method as used for quarterly sampling the closed IFSI wells.	As	7060	Amber pint fixed with nitric acid
		Ba	7080	
		Cd	7130	
		Cr	7190	
		Pb	7420	
		Hg	7470	
		Se	7740	
		Ag	7760	
		Halogenated and nonhalogenated volatile organics	8010 8015	Large VOA bottle with Teflon septum

Closure of Surface Impoundment and Past Site of Incinerator

As previously mentioned, this site is still undergoing partial closure. ATK will continue to implement activities until the groundwater contaminated by the incinerator feed surface impoundment has been cleaned to MDE standards.

The compliance point for this unit is monitoring well No. 2. The maximum constituent concentration limits are:

Constituent	Limit ug/1, ppb
1,2 Dichloroethane	5
1,1 Dichloroethene	7
1,1,1 Trichloroethane	200
Vinyl Chloride	2
*Trihalomethanes, Total	100
*Chloroform, bromoform, bromodichloromethane, dibromochloromethane	

The clay cap over the IFSI is inspected monthly to assure that its physical integrity is maintained. Records of these inspections are kept in the office of the ATK Elkton LLC environmental engineer.

COMAR 26.13..07.02D(30) For hazardous waste disposal units that have been closed, documentation that notices required under COMAR 26.13.05.07I have been filed.

The only existing facility that has been closed is the closed incinerator feed surface impoundment. Notification of this closing was made to the Cecil County Planning and Zoning Department on February 20, 1992. A copy of the notification letter is on the following page.

When any additional existing unit completes closure, similar notices will be filed.

COMAR 26.13..07.02D (31) The most recent closure cost estimate for the facility prepared in accordance with 40 CFR §264.142, as incorporated by reference in COMAR 26.13.05.08, and a copy of the documentation required to demonstrate financial assurance under 40 CFR §264.143, as incorporated by reference in COMAR 26.13.05.08. For a new facility, a copy of the required documentation may be submitted 60 days before the initial receipt of hazardous wastes, if that is later than the submission of the permit application.

ATK Elkton LLC
January 2005
Final Closure Cost Estimate

Line #	Task	Cost
1	Remove and transport 300 drums of waste to off-site licensed deposal facility for incineration	$136,000.00
2	Operate burnfield for disposal of residuals (24 hrs n-ex + 4 hrs ex)	$980.00
3	Steam clean (80 hr n-ex + 8hrs ex)	$3,016.00
4	Water wash (40 hours non-exempt + 8 hours exempt)	$1,696.00
5	1 load (5,500gal) of hazardous waste water to Dupont	$2,500.00
6	test 5 wipe samples from H-22 and 2 wipe samples from A-26 for 229 priority pollutants	$1,625.00
7	Test 88 soil and burn pan sand soil samples for TCLP metals, and Volatiles plus ignitability. Test 4 GW samples for metals and volatiles	$19,000.00
8	Labor to collect soil and wipe samples (env tech 80 hrs)	$ 5,440.00
9	Possible removal of soil from contaminated area (25 drums)	$8,125.00
10	Plow and seed burn area(40 hours excavating contractor)	$8,000.00
11	Prepare survey plat (8 cont engr + 4 hr cont drafter + 4 hr attorney)	$2,396.00
12	Certification by independent professional engineer (100 hours)	$17,500.00
Subtotal		$205,278.00
10 % contingency		$20,527.80
Total final Closure Cost Estimate		$225,805.80

COMAR 26.13..07.02D (32) If applicable, the most recent post-closure cost estimate for the facility prepared in accordance with 40 CFR §264.144, as incorporated by reference in COMAR 26.13.05.08, plus a copy of the documentation required to demonstrate financial assurance under 40 CFR §264.145, as incorporated by reference in COMAR 26.13.05.08. For a new facility, a copy of the required documentation may be submitted 60 days before the initial receipt of hazardous wastes, if that is later than the submission of the permit application

Post Closure Cost Estimate
January 2005
INCINERATOR FEED SURFACE IMPOUNDMENT (C-68 Air Stripper)
POST CLOSURE COST ESTIMATE

ANNUAL OPERATING COST IN-HOUSE LABOR

	Task	Exempt Hours	Non-Exempt Hours
1.	Maintain and adjust pump and treat system (2 hrs/wk) (12 wks/yr) - Maintenance Mechanic	24	24
2.	Purge and sample 29 groundwater monitoring wells, Dispose of purge water using C-68 (24 hrs/qtr) (4 qtrs/yr) - Environmental Tech. & Environmental Engineer	96	96
3.	Sample pump and treat system for performance, Inspect IFSI cap - (0.5 hr/mo) (12 mos/yr)	1	6
4.	Prepare quarterly groundwater monitoring and Pump and treat system performance reports (8 hrs/rep)(4 reps/yr) - Environmental Tech. (16 hrs/rep)(4 reps/yr) - Environmental Engr. (6 hrs/rep) (4 reps/yr) - Drafter & Secretary	64	56
	Total hours	185	182
	Costs	$8,695/yr	$6,006/yr
	Total in-house labor costs	$14,701/yr	

MATERIAL/UTILITY COSTS

	Task	Cost
1.	Electrical power for air stripper blower and pumps (10HP) (1KWH/HP) (24 hrs/d) (365 dys/yr) ($0.065/KWH)	$ 5,694
2.	Analyze groundwater-monitoring wells (29 wells) (1 EPA 624/well) (4 samples/yr) ($70/test)	$ 8,120
3.	Analyze pump and treat system for performance (2 samples/mo) (12 mos/yr) (1 EPA 624/sample)	$ 1,680
4.	Miscellaneous spare parts replacement	$ 1,000
	Total annual material/utility costs	$16,494

SUMMARY OF ANNUAL COSTS

Labor Costs	$14,701/yr
Material & Utility Costs	$16,494/yr
Total annual costs	**$31,195/yr**

IFSI Groundwater Remediation System		**Present Worth @ 3%***
1.	Operate C-68, maintain, monitor and report on system performance for NEXT 24 years until 2029 $31,195 annually	$528,304
	Total Post Closure Cost Estimate	**$528,304**

* as of 3/31/05. The ATK environmental reserve uses the 20 year Treasury Note rate less a percentage for inflation

Present Worth Calculator for Interest Bearing FAMs

Directions: Input the following data in the designated cells: interest rate - (A9)
number of years - (B9), annual O&M costs - (C9) and annual Trustee fee - (D9)

The required deposit is displayed in cell (D12) along with a calculation of the principal over time

Interest rate	number of periods	annual O&M costs	annual Trustee fee	annual payout	present worth factor
3.00%	24		$0.00	$31,195.00	16.93554212

required deposit
$528,304.24

Value of Escrow/Trust as a Function of Time

year	principal at start of year	interest rate	principal + interest	annual payout	year end principal
1	$528,304.24	3.00%	$544,153.36	$31,195.00	$512,958.36
2	$512,958.36	3.00%	$528,347.11	$31,195.00	$497,152.11
3	$497,152.11	3.00%	$512,066.68	$31,195.00	$480,871.68
4	$480,871.68	3.00%	$495,297.83	$31,195.00	$464,102.83
5	$464,102.83	3.00%	$478,025.91	$31,195.00	$446,830.91
6	$446,830.91	3.00%	$460,235.84	$31,195.00	$429,040.84
7	$429,040.84	3.00%	$441,912.07	$31,195.00	$410,717.07
8	$410,717.07	3.00%	$423,038.58	$31,195.00	$391,843.58
9	$391,843.58	3.00%	$403,598.89	$31,195.00	$372,403.89
10	$372,403.89	3.00%	$383,576.00	$31,195.00	$352,381.00
11	$352,381.	3.00%	$362,952.43	$31,195.00	$331,757.43
12	$331,757.43	3.00%	$341,710.15	$31,195.00	$310,515.15
13	$310,515.15	3.00%	$319,830.61	$31,195.00	$288,635.61
14	$288,635.61	3.00%	$297,294.68	$31,195.00	$266,099.68
15	$266,099.68	3.00%	$274,082.67	$31,195.00	$242,887.67
16	$242,887.67	3.00%	$250,174.30	$31,195.00	$218,979.30
17	$218,979.3	3.00%	$225,548.68	$31,195.00	$194,353.68
18	$194,353.68	3.00%	$200,184.29	$31,195.00	$168,989.29
19	$168,989.29	3.00%	$174,058.97	$31,195.00	$142,863.97
20	$142,863.97	3.00%	$147,149.88	$31,195.00	$115,954.88
21	$115,954.88	3.00%	$119,433.53	$31,195.00	$88,238.53
22	$88,238.53	3.00%	$90,885.69	$31,195.00	$59,690.69
23	$59,690.69	3.00%	$61,491.41	$31,195.00	$30,296.41
24	$30,296.41	3.00%	$31,195.00	$31,195.00	($0.00)
25	$.	3.00%	($0.00)	$31,195.00	($31,195.00)

ATK ELKTON LLC
January 2005
Final Closure and Post Closure Cost Estimate

Closure **$225,806** **(see closure cost work sheet for calculation)**

Post Closure **$528,304** **(see post closure work sheet for calculation)**

Total **$754,110**

ATK Elkton LLC

UNIT COST costs for Closure and Post Closure

January 2005 LABOR COSTS

In-House Staff	
Exempt Personnel Managers, Engineers, Scientists, Safety Professionals, Operations and Maintenance Supervisors, Industrial Hygienists, Administrative Professionals	$ 47.00/hr.
Non-Exempt Personnel Environmental Technicians, Maintenance Mechanics, Equipment Operators, Laborers, Hazardous Waste Workers, Security Personnel, Clerical Staff, Drafters	$ 33.00/hr.
Contractors	
Independent Professional Engineer for certification	$ 175.00/hr.
Attorney for deed notices	$ 250.00/hr.
Well drilling contractor (includes drill rig and two drillers)	$1,500.00/day
Excavating contractor (includes backhoe, dump truck and two operators)	$ 200.00/hr.
Environmental Consultants	
Senior Scientist or Engineer	$ 142.00/hr.
Field Technician	$ 68.00/hr.
Drafter	$ 56.00/hr.
Clerical	$ 44.00/hr.

SERVICE/UTILITY COSTS

Contaminated soil disposal in hazardous waste landfill (transportation and loading included)	$ 325.00/drum
Contaminated soil disposal by incineration (transportation and loading included)	$ 450.00/drum
Electrical power	$ 0.65/KWH
Analyze groundwater samples for volatile organics according to EPA Test Method #624	$ 70.00/sample
Analyze groundwater samples for metals	$ 60.00/sample
Analyze soil or wipe samples for TCLP metals & volitiles	$ 199.50/sample
Analyze soil or wipe samples for ignitablilty	$ 10.50/sample
Analyze wipe sample for 229 priority pollutants	$1,095.00/sample
Transportation & disposal of tanker load (5,500 gal) at DuPont Deepwater, NJ	$2,500.00/load

COMAR 26.13..07.02D (33) When applicable, a copy of the insurance policy or other documentation which comprises compliance with the requirements of 40 CFR §264.147. For a new facility, documentation showing the amount of insurance meeting the specification of 40 CFR §264.147(a) and, if applicable, 40 CFR §264.147(b), that the owner or operator plans to have in effect before initial receipt of hazardous waste for treatment, storage, or disposal. A request for a variance in the amount of required coverage, for a new or existing facility, may be submitted as specified in 40 CFR §264.147(c).

Attached is the letter sent to MDE that contains our Hazardous waste facility Certificate of Liability Insurance and the Standby Trust Agreement for the closure/post closure Letter of Credit.[1]

The Hazardous Waste Facility Certificate of Liability Insurance was issued by the American International Specialty Lines Insurance Company of 401 Plaza Three, Jersey City, NJ 07311.

The limits of the liability are covering bodily injury and property damage are $1,000,000 per occurrence and $2,000,000 annual aggregate exclusive of legal defense costs.

[1] ATK financial assurance documents are on file at the WAS offices.

COMAR26.13.05.08 Financial Requirements.

A. Except as provided in §B of this regulation, the Department adopts as its regulations the federal regulations at 40 CFR §§264.140-264.148 and 264.151, which are incorporated by reference in COMAR 26.13.01.05B(1)(a).

B. For purposes of this regulation:

(1) Substitute "Secretary" for "Regional Administrator";
(2) Substitute "Department" for "Environmental Protection Agency" or "Agency";
(3) In establishing the financial assurance for closure required by 40 CFR §264.143, a person may not use the financial test or corporate guarantee described in 40 CFR §264.143(f);
(4) In establishing the financial assurance for post-closure care required by 40 CFR §264.145, a person may not use the financial test or corporate guarantee described in 40 CFR §264.145(f) which is incorporated by reference;
(5) 40 CFR §264.140(b)(4) is not incorporated by reference; and
(6) In 40 CFR §264.142(a), the reference to §264.1102 is not applicable.

The Irrevocable standby letter of Credit number SLCMMSP01815 from the US Bank Trust National Association is attached to the document that was referenced on page I-14.

Permit No. A-052

ATK Elkton LLC

ATTACHMENT 7
Section B
of the Permit Application
Facility Description
(32 pages)

Section B - Facility Description

This section addresses the requirements of COMAR 26.13.07.02 D (Sub-paragraphs 1 through 13, 15, 23, 25, 26, 35 and 37)

(1) The activities conducted by the applicant which require it to obtain a permit.

This facility stores hazardous wastes, also referred to as controlled hazardous substances (CHS), in containers.

Waste explosives (waste that have the potential to detonate and bulk military propellants) are disposed of by thermal treatment open burning.

(2) Name, mailing address, and location of the facility for which the application is submitted.

ATK Elkton LLC, is located 1 mile west of the city limits of Elkton, Maryland.

The street address is:

ATK Elkton LLC
55 Thiokol Road
Elkton, Maryland 21921

The mailing address is:

ATK Elkton LLC
P.O. Box 241
Elkton, Maryland 21922-0241

(3) Up to four SIC codes which best reflect the principle products or services provided by the facility.

The SIC code is: 3764 - Guided Missile and Space Vehicle Propulsion Units.

(4) The operator's name, address, telephone number, ownership status, and as federal, state, private, public or other entity.

The operator of this facility is the ATK Elkton LLC, which is a subsidiary of Alliant Techsystems, Inc., 5050 Lincoln Drive, Edina, MN 55436, a Delaware corporation.

The contact for environmental affairs at the Elkton facility is:

William E. Lucas, P.E.
Environmental Engineer
ATK Elkton LLC
P.O. Box 241
Elkton, Maryland 21922-0241
Telephone: 410-392-1626
Email: William.Lucas@atk.com

(5) A listing of all permits or construction approvals received or applied for under any of the following programs:

(a) Hazardous Waste Management Program under the Resource Conservation and Recovery Act;
(b) Underground Injection Control program under the Safe Drinking Water Act;
(c) NPDES program under the Clean Water Act;
(d) Prevention of Significant Deterioration (PSD) program under the Clean Air Act;
(e) Nonattainment program under the Clean Air Act;
(f) National Emission Standards for Hazardous Pollutants (NESHAPS) preconstruction approval under the Clean Air Act;
(g) Ocean dumping permits under the Marine Protection Research and Sanctuaries Act;
(h) Dredge or fill permits under section 404 of the Clean Water Act;
(i) Other relevant environmental permits, including state permits.

The following is a list of environmental permits held by this facility:

- RCRA permit, EPA ID number MDD 003067121
- NPDES permit, number MD 0000078

State of Maryland permits

- Controlled Hazardous Substances Facility Permit Number A052
- Discharge Permit Number 98-DP-0238
- Water Appropriation and Use Permit Number CE57G003 (04), CE92G074 (02), and CE1996G054 (01)
- Oil Operations Permit Number 2002-OPT-3496
- License for Asbestos Removal/Encapsulation Number M21-07-001
- Rocket Fuel Manufacturing Plant Operating Permit No. 07-00055

Air Management Registrations:

Registration No.	Equipment
MDE Registration 2-0012	Incinerator
MDE Registration 9-0075	A-82 Air Stripper
MDE Registration 4-0204	Boiler G-29
MDE Registration 4-0084	Boiler C-31, No. 1
MDE Registration 4-0085	Boiler C-31, No. 2
MDE Registration 4-0086	Boiler G-11
MDE Registration 4-0087	Boiler B-1
MDE Registration 4-0088	Boiler A-8, No. 1
MDE Registration 4-0089	Boiler A-8, No. 2
MDE Registration 4-0090	Boiler A-66
MDE Registration 4-0194	Boiler C-59
MDE Registration 4-0203	Boiler A-12
MDE Registration 6-0094	Paint Spray Booth A-57
MDE Registration 6-0095	Paint Spray Booth G-20
MDE Registration 6-0096	Paint Spray Booth A-7
MDE Registration 6-0097	Paint Spray Booth C-56
MDE Registration 7-0057	Beryllium Propellant Manufacturing
MDE Registration 7-0058	Air Stripper A-80
MDE Registration 7-0060	Metal Cleaning in G-20
MDE Registration 7-0061	Case Cleaning
MDE Registration 7-0062	Rocket Firing
MDE Registration 7-0063	Metal Cleaning in A-66
MDE Registration 9-0041	Waste Propellant Disposal
MDE Registration 9-0058	Air Stripper C-68
MDE Registration 9-0074	Above Ground Gasoline Tank, 2,000 gallon
MDE Registration 6-0182	G-18 Carbon Room Bag Filter
MDE Registration6-0189	C-50 IPDI Scrubber

COMAR 26.13.07.02 D(6) A topographic map (or other map if a topographic map is unavailable) extending 1 mile beyond the property boundaries of the source, depicting the facility and:

(a) Each of its intake and discharge structures;
(b) Each of its hazardous waste treatment, storage, or disposal facilities;
(c) Each well where fluids from the facility are injected under ground; and
(d) Those wells, springs, other surface water bodies, and drinking water wells listed in public records or otherwise known to the applicant within ½ mile of the facility property boundary.

Map, Drawing Number E40750, Rev. E, sheets 1 of 2, shows the outline of the ATK Tactical Systems Company, LLC, Elkton Operations, property limits and the surrounding features extending more than 1 mile from our property limits. The scale of the map is 1 inch = 2,000 feet. The map is from the Elkton, Bay View, North East, and Newark West 15-minute quadrangles prepared by the U.S. Geological Survey.

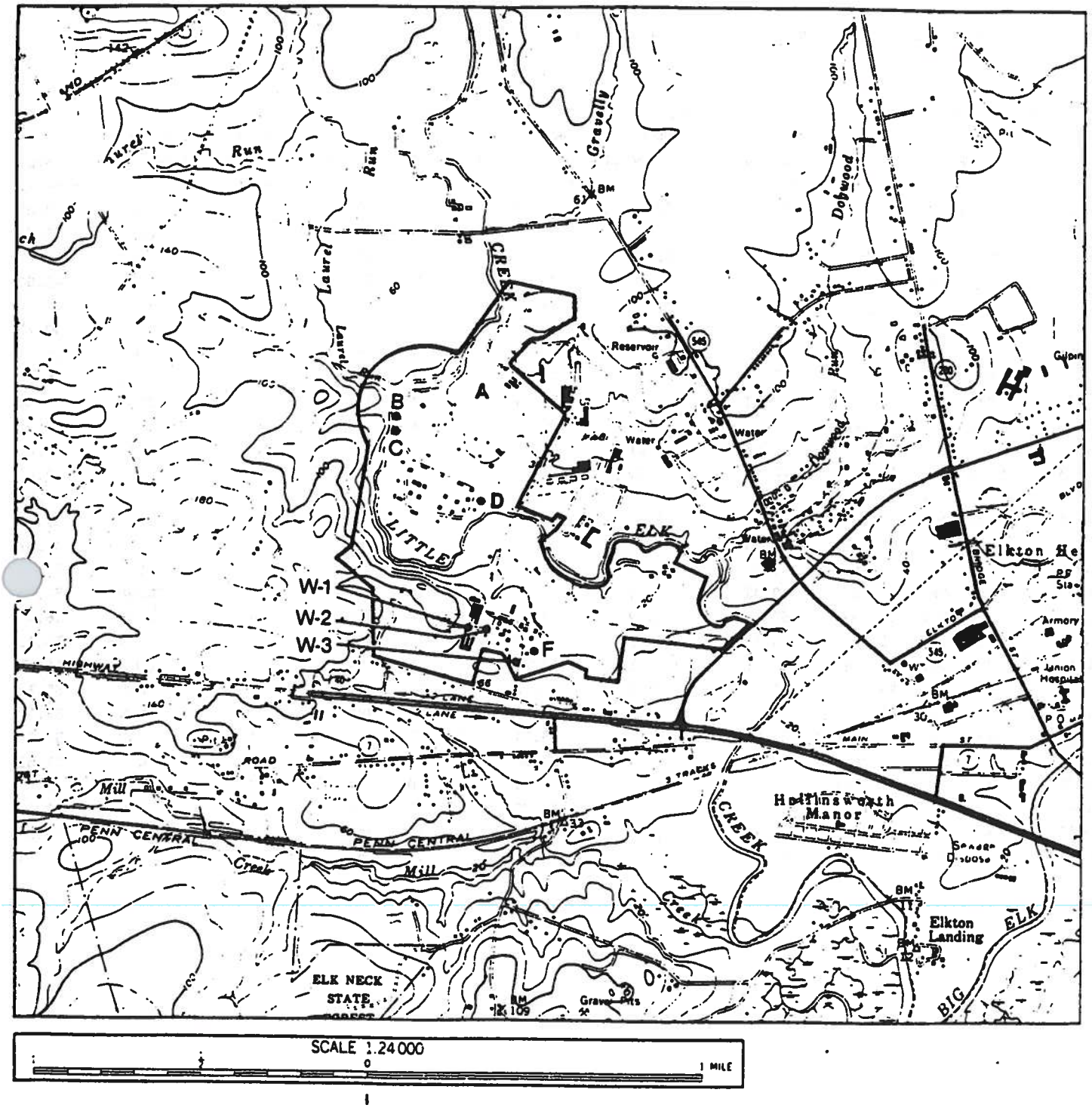
Elkton Operations does not have any active surface water intakes or process water discharges. All sanitary discharges are now connected by a sewer to the privately owned Trinco Industrial Park Waste Treatment Plant. We do operate two intake wells and these are labeled on the map, as are the locations of all other known production and monitoring wells. Refer to the table on page 6.03 for more specific well identification data. Each of our existing hazardous waste treatment storage or disposal facilities is also labeled as follows:

(A) Building H-22 CHS Container Storage
(B) Thermal Treatment Propellant Open-Burn Area
(C) Laboratory Waste Storage Area, Building A-26
(D) Waste Detonator Storage Magazine D-2

There are no underground injection wells at this facility.

All surface waters are depicted. All the drinking water and monitoring wells listed in the public records of the Cecil County Health Department are also shown and marked on the maps.

SA12683A


Laurel Run
Laurel Run
Gravelly
Dogwood
CREEK
Reservoir
Water
Water
Water
Aqueduct
A
B
C
D
F
W-1
W-2
W-3
LITTLE
ELK
Elkton He
Armory
Union Hospital
HIGHWAY
LANE
ROAD
Mill
PENN CENTRAL
PENN CENTRAL
Creek
Mill
3 TRACKS
CREEK
Hollinsworth Manor
CREEK
Elkton Landing
ELK
BIG
ELK NECK STATE
Gravel Pits
SCALE 1:24 000
0
1 MILE

MONITORING WELL INFORMATION PRINTOUT

FCID: MDD003067121 Site Name: Thiokol Corp. Elkton Division

Well ID	Datum	Well Depth	Top of Casing Elv	Top of Screen Elv	Bottom of Screen Elv	Screen Height	Casing Material	Pipe Diameter	Gradient Position	Surface Elevati
MW-01	Mean Sea	12.5 feet	42.85	32.35	27.35	5	PVC	4"	DOWN	39.85
MW-02	Mean Sea	11.5 feet	42.43	33.53	28.53	5	PVC	4"	DOWN	40.03
MW-03	Mean Sea	15.0 feet	41.89	32.75	25.25	8	PVC	4"	DOWN	40.25
MW-04	Mean Sea	16.5 feet	45.96	36.52	26.52	10	PVC	4"	UP	43.02
MW-05	Mean Sea	11 feet	41.16	37.24	29.24	8	PVC	4"	DOWN	40.24
MW-06	Mean Sea	14'7"	41.21	36.73	25.14	12	PVC	4"	DOWN	39.73
MW-07	Mean Sea	11'3"	40.25	36.25	28.0	8	PVC	4"	DOWN	39.25
MW-08	Mean Sea	13 feet	40.61	37.11	27.11	10	PVC	4"	DOWN	40.11
MW-10	Mean Sea	15 feet	41.88	34.44	24.44	10	PVC	4"	DOWN	39.44
MW-11	Mean Sea	12 feet	39.63	35.07	25.07	10	PVC	4"	DOWN	37.07
MW-12	Mean Sea	9 feet	40.48	34.23	29.23	5	PVC	4"	DOWN	38.23
MW-13	Mean Sea	14 feet	42.53	36.41	26.41	10	PVC	4'	DOWN	40.41
MW-14	Mean Sea	14 feet	42.70	36.70	26.70	10	PVC	4"	DOWN	40.70
MW-15	Mean Sea	14 feet	42.36	35.67	25.67	10	PVC	4"	DOWN	39.67
MW-16	Mean Sea	12 feet	42.40	34.67	24.67	10	PVC	4"	DOWN	36.67
MW-17	Mean Sea	13 feet	41.33	34.50	24.50	10	PVC	4"	DOWN	37
MW-18	Mean Sea	13 feet	40.85	34.48	24.48	10	PVC	4'	DOWN	37.
MW-19	Mean Sea	12 feet	39.66	34.49	24.49	10	PVC	4"	DOWN	36.49
MW-20	Mean Sea	12 feet	40.17	34.13	24.13	10	PVC	4"	DOWN	36.13
MW-21	Mean Sea	13 feet	42.00	35.73	25.73	10	PVC	4'	DOWN	38.73
MW-22	Mean Sea	13 feet	41.99	35.32	25.32	10	PVC	4"	DOWN	38.32
MW-23	Mean Sea	13 feet	41.74	34.55	24.55	10	PVC	4"	DOWN	37.55
MW-24	Mean Sea	12 feet	39.60	33.94	23.94	10	PVC	4"	DOWN	35.93
MW-25	Mean Sea	12 feet	39.49	33.82	23.82	10	PVC	4"	DOWN	35.82
MW-26	Mean Sea	13 feet	39.94	33.25	23.25	10	PVC	4"	DOWN	36.25
MW-27	Mean Sea	13 feet	38.99	32.70	22.70	10	PVC	4"	DOWN	35.70
MW-28	Mean Sea	13 feet	39.55	33.34	23.34	10	PVC	4"	DOWN	36.34
MW-29	Mean Sea	13 feet	40.13	34.21	24.21	10	PVC	4"	DOWN	37.21

Date: 12/03/96

MONITORING WELL INFORMATION PRINTOUT

FCID: 33 Site Name: TCE Monitoring Wells

Well ID	Datum	Well Depth	Top of Casing Elv	Top of Screen Elv	Bottom of Screen Elv	Screen Height	Casing Material	Pipe Diameter	Gradient Position	Surface Elevation
GM-01A	MD MLW	98	34.54	-41.76	-61.76	20	PVC	4"	DOWN	32.24
GM-01B	MD MLW	50	34.08	-7.87	-17.87	10	PVC	4"	DOWN	32.13
GM-01S	MD MLW	20	34.85	26.85	14.85	12	PVC	4"	DOWN	31.85
GM-02A	MD MLW	146	19.81	-103.49	-123.49	20	PVC	4"	DOWN	17.51
GM-02B	MD MLW	95	19.55	-47.55	-57.55	10	PVC	4"	DOWN	17.45
GM-03A	MD MLW	140	60.17	-45.85	-76.85	31	PVC	4"	DOWN	58.15
GM-03B	MD MLW	86.5	59.97	28	18	10	PVC	4"	DOWN	58
GM-04A	MD MLW	94	22.46	-53.76	-73.76	20	PVC	4"	DOWN	20.24
GM-04B	MD MLW	51.5	22.01	-18.99	-26.99	8	PVC	4"	DOWN	20.01
GM-04S	MD MLW	20	22.64	16.14	1.4	15	PVC	4"	DOWN	21.4
GM-05A	MD MLW	172	118.89	-23.36	-53.36	30	PVC	4"	DOWN	116.64
GM-05B	MD MLW	95	118.5	41.71	21.71	20	PVC	4"	DOWN	116.71
GM-06	MD MLW	172	108.59	-45.41	-65.41	20	PVC	4"	DOWN	106.59
GM-07	MD MLW	46	79.96	42	32	10	PVC	4"	DOWN	78
GM-08	MD MLW	69	80.27	29.25	9.25	20	PVC	4"	DOWN	78.2
GM-09D	MD MLW	90	38.88	-32.79	-52.79	20	PVC	4"	UP	37.2
GM-09M	MD MLW	58	38.71	-11.1	-21.1	10	PVC	4"	UP	36.9
GM-09S	MD MLW	20	39.71	30.59	17.59	13	PVC	4"	UP	37.59
GM-10D	MD MLW	99	31.08	-40.07	-70.07	30	PVC	4"	UP	28.93
GM-10M	MD MLW	49	30.96	-9.83	-19.83	10	PVC	4"	UP	29.17
GM-10S	md mlw	18	30.90	21.07	11.07	10	PVC	4"	UP	29.07
GM-11D	MD MLW	109	31.18	-50.28	-80.28	30	PVC	4"	UP	28.72
GM-11M	MD MLW	50.2	30.58	-11.04	-21.24	10	PVC	4"	UP	28.96
GM-11S	MD MLW	15	40.79	23.85	13.85	10	PVC	4"	UP	28.85
GM-12D	MD MLW	55	41.28	-0.93	-15.93	15	PVC	4"	UP	39.07
GM-12M	MD MLW	30	40.85	19.27	9.27	10	PVC	4"	UP	39.27
GM-12S	MD MLW	15	40.79	28.87	23.87	5	PVC	4"	UP	38.87
GM-13D	MD MLW	107	46.72	-42.4	-62.4	20	PVC	4"	DOWN	44.6
GM-13M	MD MLW	60	46.43	-5.51	-15.51	10	PVC	4"	DOWN	44.49
GM-13S	MD MLW	20	46.69	39.86	24.86	15	PVC	4"	DOWN	44.86
GM-14D	MD MLW	146.5	44.34	-84.33	-104.33	20	PVC	4"	DOWN	42.17
GM-14M	MD MLW	109	45.22	-36.57	-66.57	30	PVC	6"	DOWN	42.43
GM-14S	MD MLW	65	46.5	-18.48	-38.48	20	PVC	4"	DOWN	26.52
GM-15D	MD MLW	85	31.92	-41.63	-56.63	15	PVC	4"	UP	28.37
GM-15M	MD MLW	45	30.23	-6.6	-16.6	10	PVC	4"	UP	28.4
GM-15S	MD MLW	20	30.42	23.5	8.5	15	PVC	4"	UP	28.5
GM-16D	MD MLW	106	12.13	-75.87	-95.87	20	PVC	4"	DOWN	10.13
GM-16M	MD MLW	74	12.33	-43.5	-63.5	20	PVC	6"	DOWN	10.5
GM-16S	MD MLW	32	11.75	-13.33	-22.33	10	PVC	4"	DOWN	9.67
GM-17	MD MLW	17	66.47	59.47	49.47	10	PVC	4"	DOWN	66.47
GM-18D	MD MLW	37	63.72	36.72	26.72	10	PVC	4"	UP	63.7
GM-18S	MD MLW	20	63.36	53.36	43.36	10	PVC	4"	UP	63.36
GM-19	MD MLW	15	60.62	55.62	45.62	10	PVC	4"	DOWN	60.62

MONITORING WELL INFORMATION PRINTOUT

FCID: 33 Site Name: TCE Monitoring wells

Well ID	Datum	Well Depth	Top of Casing Elv	Top of Screen Elv	Bottom of Screen Elv	Screen Height	Casing Material	Pipe Diameter	Gradient Position	Su El
GM-20D	MD MLW	65	88.92	41.92	21.92	20	PVC	4"	DOWN	8
GM-20S	MD MLW	31	89.02	66.02	56.02	10	PVC	4"	DOWN	8
GT-1	MD MLW	89	106.35	35	15	20	PVC	2"	UP	1
W-4	MD MLW	79.2	71.48	12.28	-7.72	20	steel	6"	DOWN	7
WCC-1	MD MLW	82	98.91	24.2	14.2	10	Stainles	4"	UP	9
WCC-2	MD MLW	97	113.73	24.1	14.1	10	Stainles	4"	UP	1
WCC-3	MD MLW	62	81.2	26.9	16.9	10	Stainles	4"	UP	7
WCC-4	md mlw	77	91.34	21.8	11.8	10	Stainles	4"	UP	8

(7) A brief description of the nature of business.

ATK Tactical Systems Company LLC, Elkton Operations, designs and manufactures solid propellant rocket motors, gas generators, and rocket propulsion units for use in both space and defense applications.

Laboratory-scale basic research on new propellants is also conducted to advance the state of the art in propulsion systems. This may include using our expertise in manufacturing solid propellants that contain non-traditional ingredients such as beryllium. This technology may be applied to design propulsion systems for boost phase interceptor applications.

We conduct pilot-plant-scale operations manufacturing liquid propellants containing hydroxyl ammonium nitrate (HAN) for various applications. We plan to expand our development and manufacturing operations in this area.

We also manufacture ordnance items such as safe-and-arm devices and SCB electric detonators.

(8) The latitude and longitude of the facility.

The latitude and longitude of the ATK Tactical Systems Company LLC, Elkton Operations facility, as measured from the approximate center of the facility's property is 39° 37' North, 75° 51' 55" West.

The following are the USGS grid coordinants of each specific hazardous waste unit:

Container storage area, Building H-22	39° 37' 22.0" North, 75° 51' 55" West
Lab pack container storage, Building A-26	39° 36' 37.5" North, 75° 51' 47.7" West
Waste propellant open burn facility	39° 37' 16.3" North, 75° 52' 10.2" West
Closed incinerator feed surface impoundment	39° 37' 14.8" North, 75° 52' 1.3" West
Waste explosive storage magazine D-2	39° 37' 32" North, 75° 51' 46" West

(9) The name, address, and telephone number of the owner of the facility.

ATK Tactical Systems Company, LLC
Elkton Operations
P.O. Box 241
Elkton, Maryland 21922-0241
Telephone: 410-392-1626

ATK Tactical Systems Company, LLC is a subsidiary of:

Alliant Techsystems Inc.
5050 Lincoln Drive
Edina, MN 55436
Telephone: 952-351-3000
Internet Address: www.atk.com

(10) An indication of whether the facility is new or existing and whether it is a first or revised application.

Thiokol began using the Elkton facility in 1947. A Part A application was submitted in November 1980. The Part A application was revised on June 10, 1986. A Part B permit application was originally submitted on February 13, 1984, and was revised on the following dates in direct response to comments from the regulatory agencies to update information.

Revision 1 - 5/16/84
Revision 2 - 10/3/84
Revision 3 - 6/10/86
Revision 4 - 11/7/86
Revision 5 - 12/15/86
Revision 6 - 1/16/87

On May 22, 1987, the Maryland Department of Health and Mental Hygiene issued a Part B permit to Morton Thiokol, Inc., with an expiration date of May 21, 1990. On November 8, 1988, an RCRA Part B, Subpart X, permit application for thermal treatment open burning was submitted to the U.S. Environmental Protection Agency, Region III, which had sole authority for Subpart X. The State of Maryland now has Subpart X authority.

Revision 7 to the Part B application was submitted to renew the Part B permit. Only minor technical changes were made to the application. On August 22, 1991, the Maryland Department of the Environment reissued the Part B permit with an August 22, 1994, expiration date.

On May 7, 1993, the Maryland Department of the Environment issued a major modification to the permit allowing Thiokol to receive annually from off-site 1,000 lbs of vintage MC 3502 rocket motors and treat them by open burning.

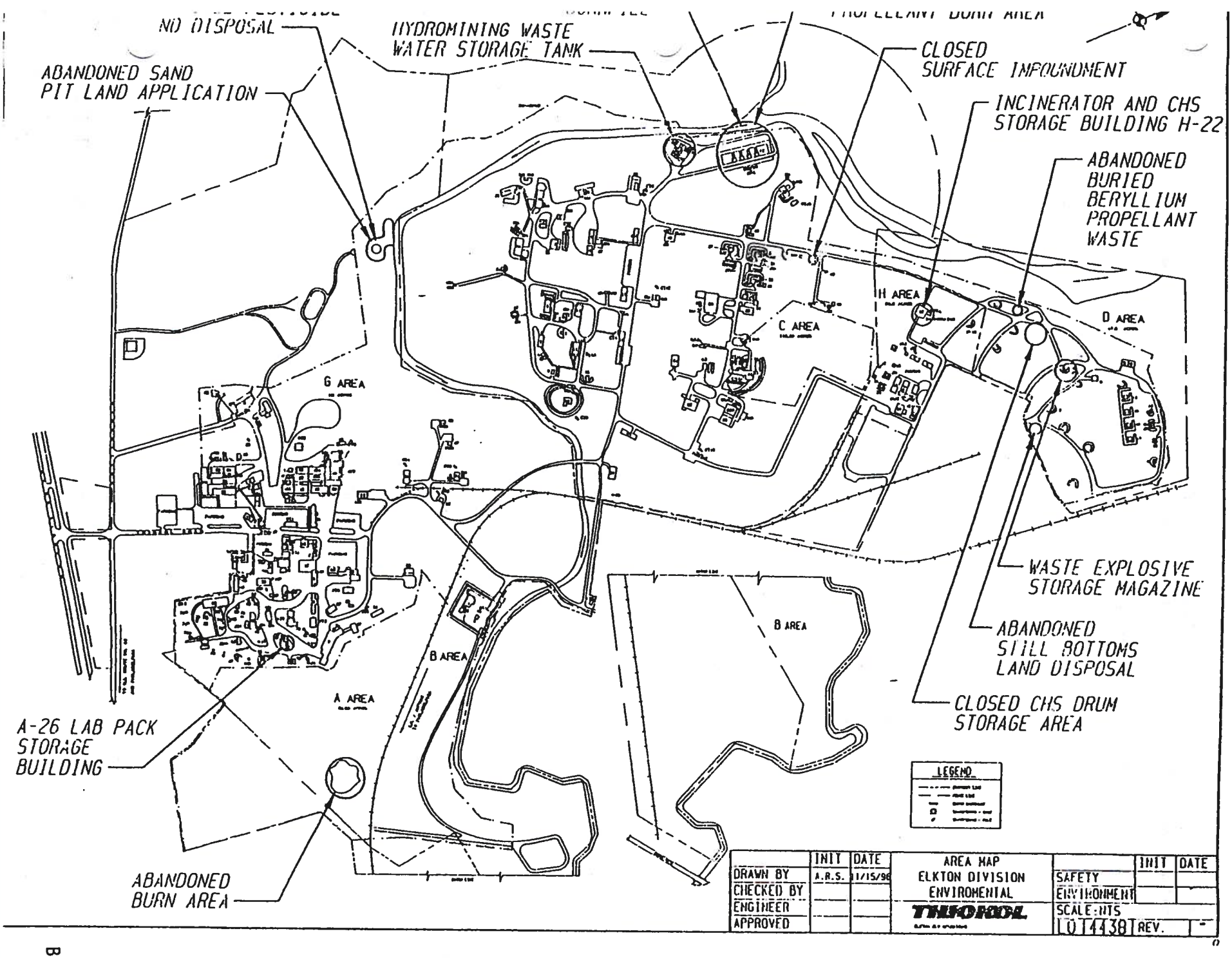
Revision 8 to the Part B application was submitted to renew the permit on August 1, 1994. The renewal application included: updated hazardous waste descriptions and facility organizational changes. Two new waste streams received from off-site were added waste detonators and waste liquid gun propellant. A new waste detonator popping furnace was added.

After a public hearing process MDE reissued the permit on September 22, 1997. No physical changes have been made to the hazardous waste operations since the last renewal, except that the status of the H-22 Incinerator has been changed. The various aqueous solutions of oxidizers charged to the incinerator were reclassified as a non hazardous waste. The change was made based on the chemical analysis of this stream that proved it did not contain hazardous constituents above the allowable limits and because the solutions are not reactive, nor are they a DOT oxidizer.

Several name changes and ownership changes have also occurred since 1997.
In 1998 Thiokol Corporation changed its name to Cordant Technologies. In 2000 Alcoa Corporation acquired all of the Cordant Stock and in April 2001, Alliant Techsystems, Inc. purchased this facility and renamed it to Alliant Missile Products Company LLC. On January 1, 2002 the name was changed to ATK Tactical Systems Company LLC, Elkton Operations, which is a subsidiary of Alliant Techsystems, Inc. In 2003 the name was again changed to ATK Elkton LLC.

COMAR 26.13.07.02 D(11) For existing facilities, a scale drawing of the facility showing the location of all past, present, and future treatment, storage, and disposal areas.

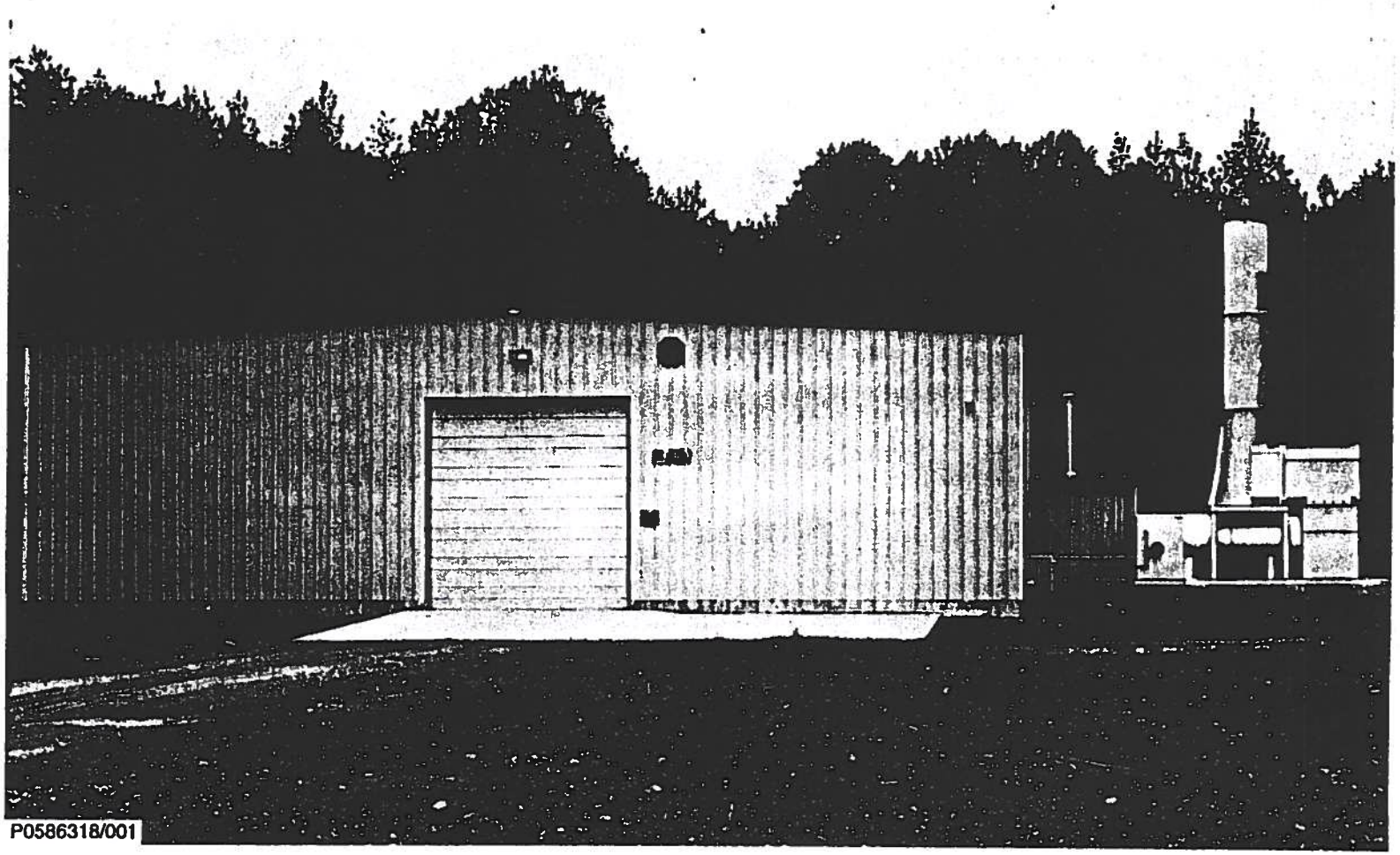
See drawing LO14438 revision E attached.


NO DISPOSAL
HYDROMINING WASTE WATER STORAGE TANK
PROPELLANT BURN AREA
ABANDONED SAND PIT LAND APPLICATION
CLOSED SURFACE IMPOUNDMENT
INCINERATOR AND CHS STORAGE BUILDING H-22
ABANDONED BURIED BERYLLIUM PROPELLANT WASTE
H AREA
C AREA
D AREA
G AREA
B AREA
A AREA
B AREA
WASTE EXPLOSIVE STORAGE MAGAZINE
ABANDONED STILL BOTTOMS LAND DISPOSAL
CLOSED CHS DRUM STORAGE AREA
A-26 LAB PACK STORAGE BUILDING
ABANDONED BURN AREA
LEGEND
AREA MAP
ELKTON DIVISION
ENVIRONMENTAL
THIOKOL
DRAWN BY
CHECKED BY
ENGINEER
APPROVED
INIT
DATE
A.R.S.
11/15/96
SAFETY
ENVIRONMENT
SCALE: NTS
LOT 4438
REV.

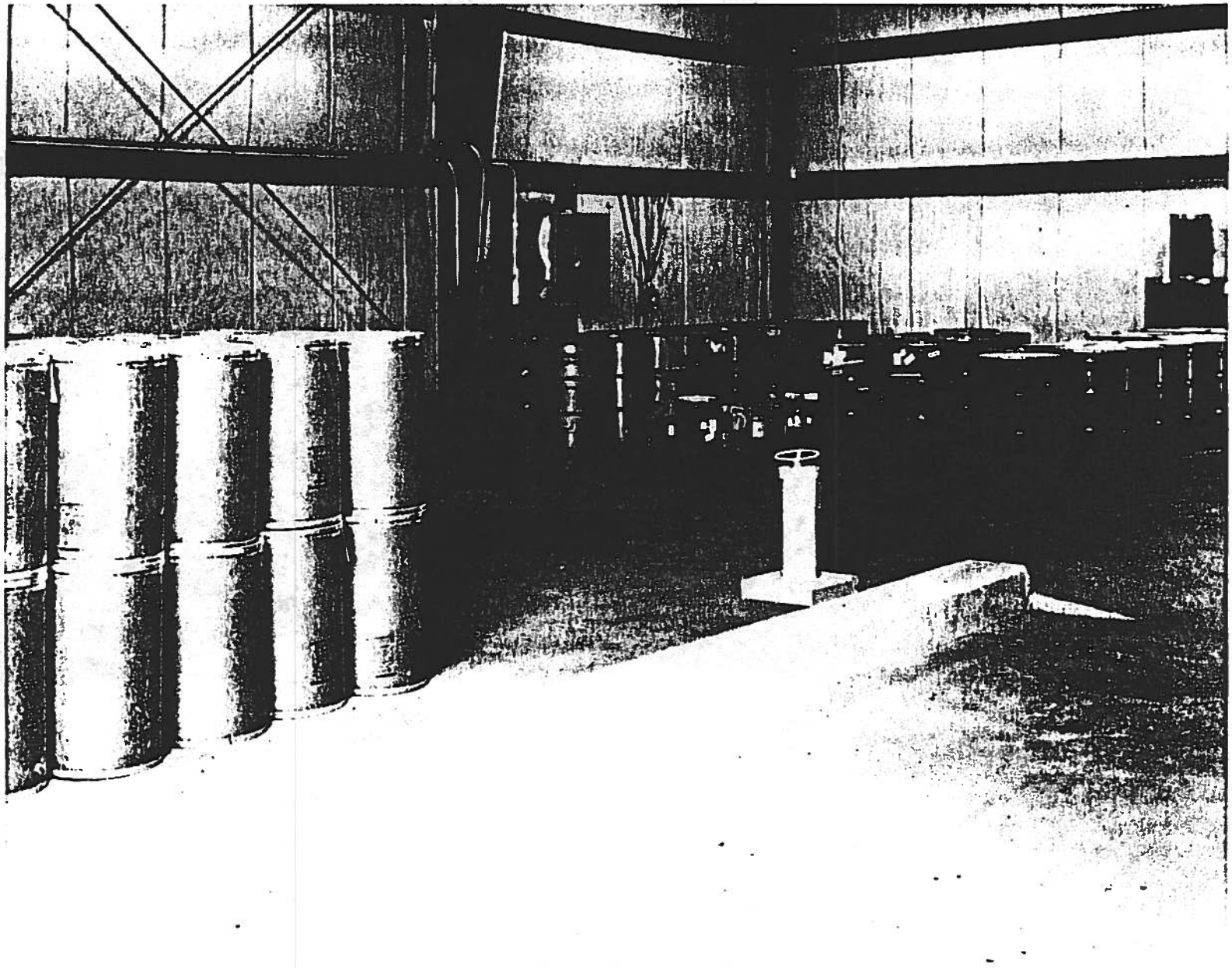
COMAR 26.13.07.02 D(12) For existing facilities, photographs of the facility clearly delineating all:

(a) Existing structures;
(b) Existing treatment, storage, and disposal areas, and
(c) Sites of future treatment, storage and disposal areas.

See attached drawings of Hazardous Waste Container Storage Building H-22, Lab Pack Storage Building A-26, the waste propellant open burning facility, and waste detonator storage, magazine D-2.

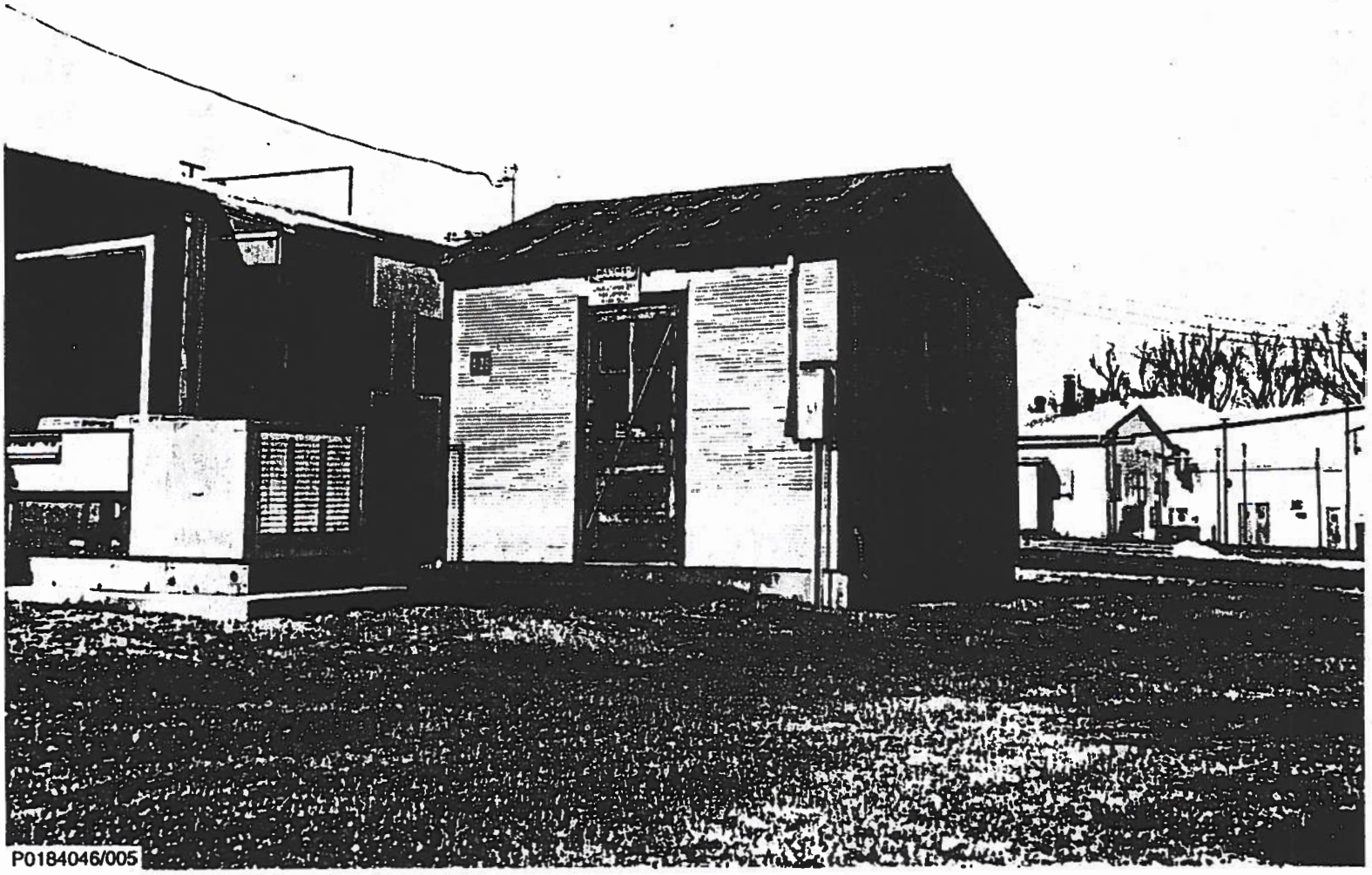


CHS Incinerator and Building H-22, CHS Container and Bulk Liquid Storage



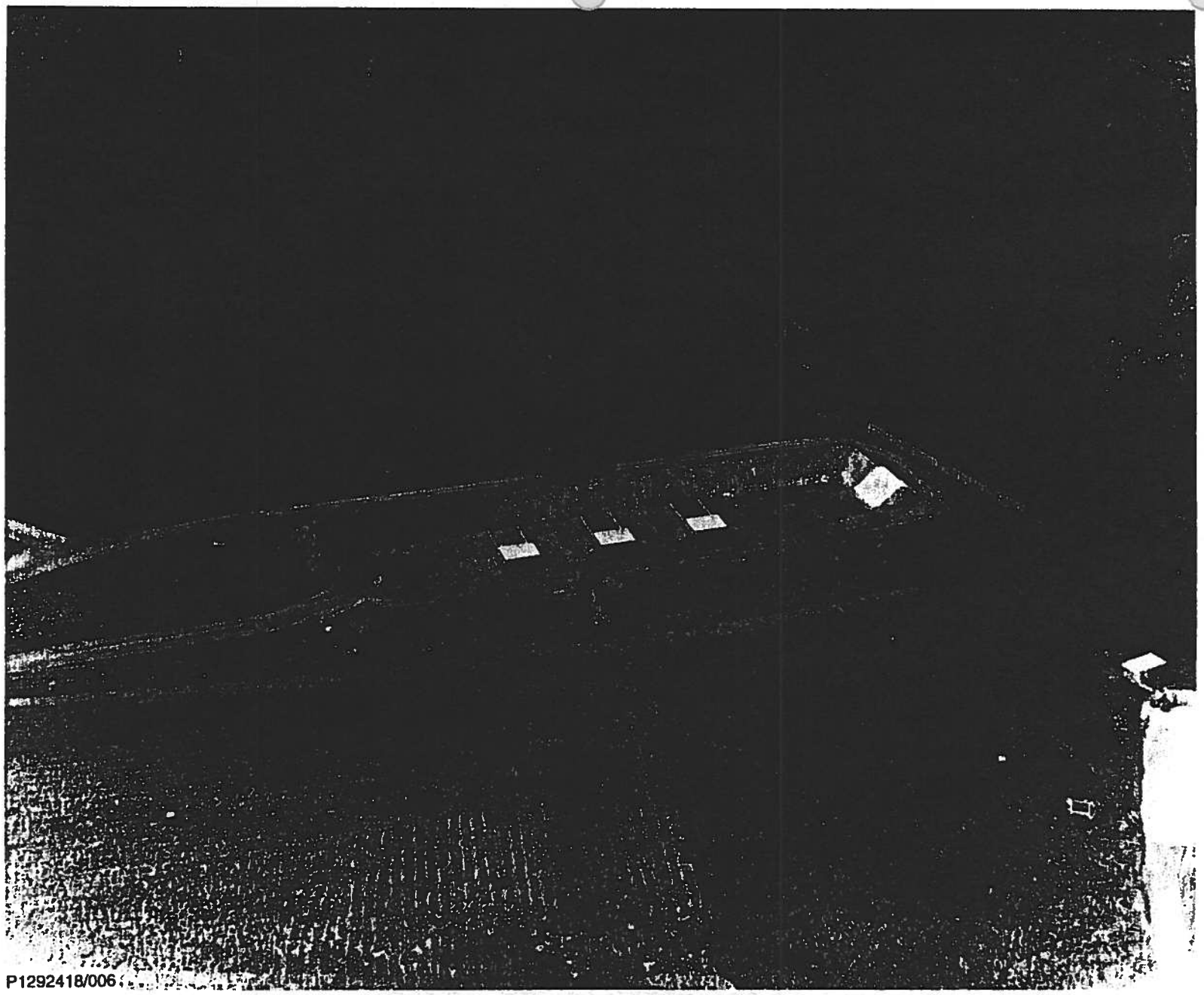
P0586318/002

CHS Container Storage Area Inside Building H-22



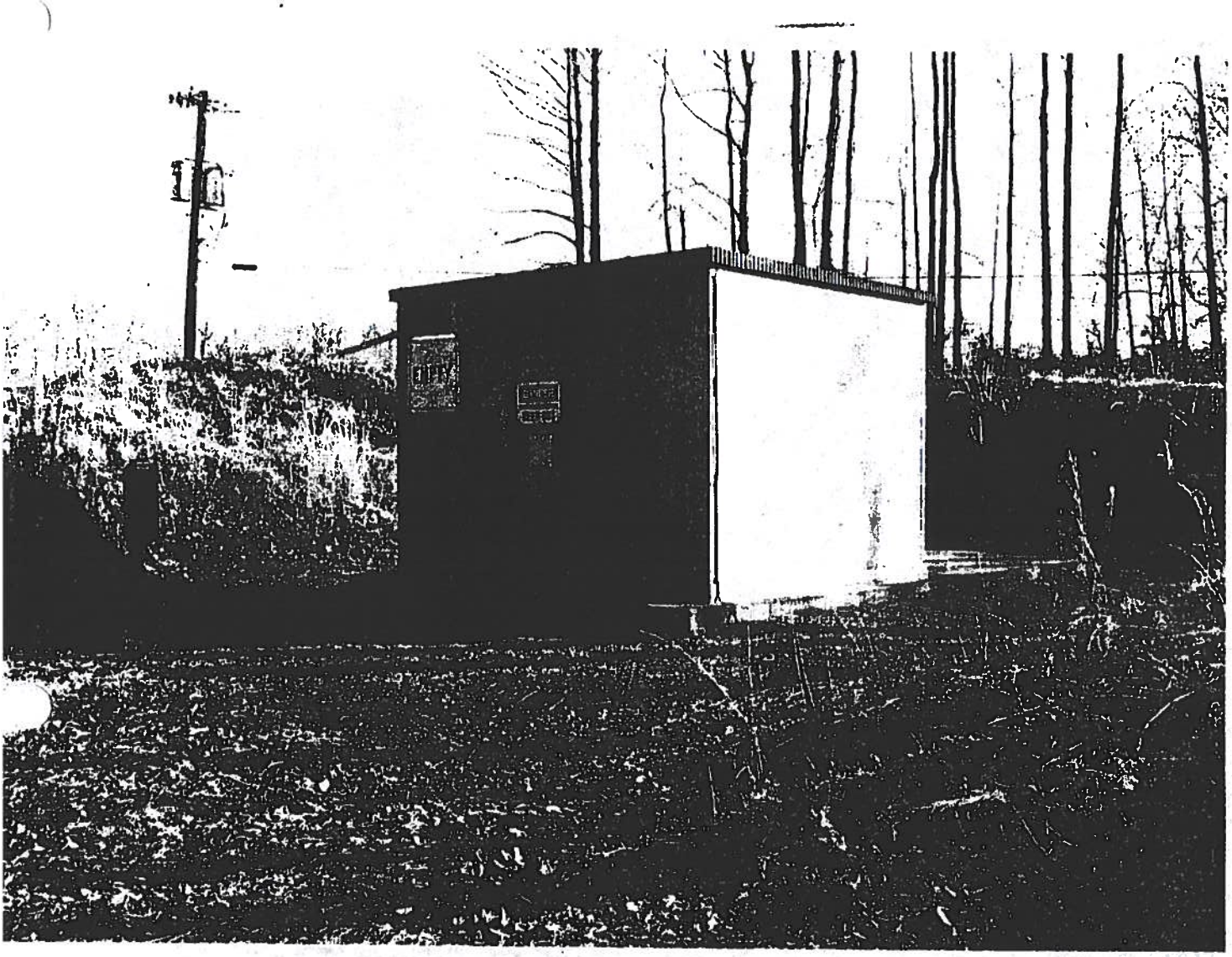
P0184046/005

Building A-26, Lab Pack Storage Building



P1292418/006

Thermal Treatment Propellant Open-Burn Area



Waste Detonator Magazine Building D-2

COMAR 26.13.07.02 D(13) A description of the processes to be used for treating, storing, and disposing of hazardous waste and the design capacity of these items.

This facility currently may store and treat the following types and quantities of CHS at any one time:

Thermally treats by open burning:

a. Up to 50 tons per year of waste explosives (solid rocket propellant wastes, which have the potential to detonate). This waste is classified as EPA primary waste code D003 reactive.
b. Up to 50 lbs per year of waste high-explosive detonators or blasting caps. These may be made by ATK or others and be generated by ATK or others. These wastes may be received from off-site. This waste is classified as EPA waste code D003 reactive.
c. Up to 0.5 ton per year of vintage MC 3502 rocket motors. These wastes will be received from off-site. These rocket motors are classified as EPA waste code D003 reactive.

Stores in containers:

a. 22 tons of 250-gallon containers and drums (100 drums) of photographic waste water (D006, D011)
b. 22 tons of 250-gallon containers and drums (100 drums) of waste aqueous solutions of water-soluble cleaners that contain cadmium (D006)
c. 7 tons (30 drums) of spent chlorinated cleaning solvent (Oxsol 325) and other ignitable cleaning solvents (F001, D001)
d. 7 tons (30 drums) of waste ammonia and water solution (29 wt% NH_4OH) (D002)
e. 7 tons (30 drums) of a mixture of ignitable, toxic liquids purchased and used to clean parts and equipment, paint parts, formulate adhesives, and as reagents in laboratories (D001, F001, F005)
f. 7 tons (300 fiber drums) of 95% solid material (rags, paint brushes, Q-tips, sponges, filters, paper, etc) wetted with solvents and other raw materials rags (D001, F001, F005)
g. 5 tons (15 drums) paint related wastes (D001, D007, D035)
h. 7 tons (30 drums) of waste oxidizers or powdered aluminum that are raw materials used to manufacture solid and liquid rocket propellant. This includes TEA, TEAN, HA, HAN, AP, AN and others.
i. 1 ton of waste methyl ethyl ketone (U159)
j. 1 ton of waste toluene diisocyanate (U223) or other diisocyante compounds.
k. 0.5 tons (10 drums) of articles that may contain beryllium dust (disposable clothing, laboratory equipment, and air filters)

COMAR 26.13.07.02 D(15) A general description of the facility.

This facility designs and manufactures solid fuel rocket propellants, gas generators, and rocket propulsion units for use in space and defense. On a smaller scale, we also manufacture safe-and-arm devices, semiconductor bridge (SCB) detonators, and liquid Hydroxyl Ammonium Nitrate (HAN) propellants. Thiokol began using this facility in 1947; after 2 years, the operation was moved to Huntsville, Alabama. The early work involved proof of principle for case-bonded solid propellant rocket motors. In 1951, Elkton operations commenced again in the form of R&D laboratory work on solid propellants. Production began in 1955.

This facility does little manufacturing in the usual sense of the word but rather is a compounding and assembly plant.

The major raw materials used to formulate solid propellants are:
70% ammonium perchlorate (NH_4ClO_3)
10% powdered aluminum
20% polymeric rubber binders

These materials are used as received or require some preparation such as grinding of the ammonium perchlorate. The materials are mixed to form raw propellant. The propellant is cast into molds or a motor case and cured by holding it at prescribed temperatures.

In order to assure quality control, excess ammonium perchlorate (AP) is ground and excess propellant is compounded. Both of these wastes are classified as hazardous because they demonstrate reactive (D003) and ignitable (D001) characteristics.

Following manufacturing operations we wash down our facilities with water to remove any tramp propellant or AP oxidizer. When these wastes are in an aqueous solution they do not exhibit the reactive (D003) or ignitable (D001) characteristics and are not a hazardous waste. These water solutions are also not classified as a DOT oxidizer.

Rarely (about once a year) batches of the following special rocket fuel oxidizers, dihydroxyglyoxime (DHG), hydroxyl ammonium perchlorate (HAP), hydroxyl ammonium nitrate (HAN), triethanolaminenitrate (TEAN), and glycidyl nitrate (GN), are made for use in certain specific rocket motors. These are made in the small B-1 pilot plant equipment, and the wastewater generated in the process is not classified as a CHS.

We have the capability for manufacturing liquid HAN based propellants that can either provide propulsion independently or in combination with a solid propellant (hybrid rocket motor). Liquid HAN propellants are mixtures of hydroxylamine nitrate (HAN), triethanolamine nitrate (TEAN), and water.

We are also developing our manufacturing capabilities to include some TPEG (Tetrahydo furan polyethylene glycol) propellants and HTPE (Hydroxyl terminated Polyether) propellants. These propellants use ammonium nitrate and butyl-NENA (N butyl 2nitrato ethyl nitromine plasticizer)(1.) in moderate quantities (about 10% wt each in propellant).

Development work will also resume with polyglycidal nitrate, PGN. This work will involve a "new" nitrate ester (DGTN, diglycerol tetranitrate).

Metallic or composite rocket motor cases for the propellants are either manufactured here or purchased from others. Case preparation work must be performed before the propellant can be cast into them. Case preparation involves thoroughly cleaning the case so that the lining, insulation and propellant will properly bond to it. Cleaning is accomplished using various cleaning solvents such as Oxsol 325, isopropanol, or methyl ethyl ketone (MEK). Two water based cleaners are also used, Brulin 1990GD and PF degreaser. Cleaning is accomplished using hand wiping methods or using waterbased parts washers. These cleaning operations generate hazardous wastes that consists of the spent or dirty cleaning solvent and the wiping rags. These wastes are classified as hazardous because they may contain a halogenated solvent (F001), an ignitable solvent (F005), or because they might contain cadmium (D006). Our Machine Shop does not do machining on cadmium metal or cadmium rocket cases. Some of our rocket motors do have cadmium-plating on them but these are not machined. These cadmium-plated cases are degreased using the water based parts washer, and thus cause the cadmium contamination in the waste water from the parts washer. Our machine shop personnel are very cognizant of the hazards of cadmium and are always observant to prevent cadmium parts from entering the shop.

Quality assurance is of prime importance in the manufacture of solid rocket motors. We operate a Quality Laboratory that assures the quality of our raw, intermediate, and final products. In the process of doing this, the laboratory generates small quantities of chemical wastes, lab packs, which are classified as a CHS. We also do extensive X-rays of the motors to assure quality. X-rays generate a photographic wastewater stream also classified as a CHS.

Drums of raw materials are also wastes. These drums are not classified as hazardous when they are emptied. A drum is empty when all the material has been removed from it that can be removed by pumping, pouring or by means of suction and no more than 1 inch of residue remains. Empty drums are generated from using the following raw materials.

Oxsol 325
Methyl ethyl ketone
Toluene diisocyanate
Ammonium perchlorate plastic drum liners
Methanol
Isopropanol
Toluene
Other isocyanate-containing compounds

Various adhesives and rubber compounds are used to manufacture solid fuel rocket motors. These raw materials in their uncombined and uncured state often contain hazardous constituents. However, when each component is properly mixed and cured (reacted), they form solid nonhazardous adhesive and rubber.

We operate a machine shop to fabricate various metal and carbon parts that are used in our rocket motors. Some of these machines use a water-based coolant to cool the cutting tools and aid in the machining process. The mixture of the coolant and water is not a hazardous waste. We accumulate the coolant in 250-gallon containers prior to disposing of it.

Metal parts are inspected using a fluorescent dye penetrant oil. When viewed under a UV light the dye will show if there are any cracks in the metal. The dye is washed off the part using water. We accumulate this mixture of water and dye penetrant in 250-gallon containers. This mixture is not a hazardous waste.

SCB detonators are a unique type of explosive detonator developed at Elkton and also manufactured here. The SCB detonator has the advantage over conventional detonators because the SCB can be timed to perform with extreme accuracy. They are used to initiate

larger explosive charges such as those used in surface-mining blasting. Each SCB detonator contains approximately 100 mg of titanium subhydride/potassium perchlorate (TSPP) pyrotechnic explosive. Any SCB manufactured that is out of specification and has no further use is a reactive (D003) hazardous waste.

COMAR 26.13.07.02 D(23) Traffic Pattern, volume, and control (for example, show turns across traffic lanes, and stacking lanes if appropriate, provides access road surfacing and load bearing capacity, show traffic control signals, provide estimates of traffic volume [number of type of vehicles]).

Access to Elkton Operations is from the General Pulaski Highway (U.S. Route 40), a four-lane, divided-center, heavy-duty, asphalt road. All roads within the facility are two-lane, light-duty asphalt, which regularly support 40,000-pound gross weight truck traffic. The bridge across Little Elk Creek was constructed in 1983 and is designed for heavy-duty loads. The bridge was reconstructed in 1999 after it was damaged by hurricane Floyd. Speed limit signs for 25 and 35 mph are posted. Stop signs are posted at intersections. Traffic in the facility is light, and hazardous waste traffic is very light. Light- and medium-duty company vehicles usually do not move hazardous wastes in the facility more than once a day. Heavy-duty commercial tractor trailers used to transport hazardous waste to offsite disposal facilities generally do not enter the facility more than once per quarter. The roads within the plant are shown on the enclosed facility map drawing E40750 Rev. E.

Building H-22 has a drive-through loading and unloading area. Trucks can drive directly into and out of the building using the two 14-ft overhead doors. There is no need for a truck to back up. The approach roads to H-22 have a minimum 55-ft radius curves, are 18 ft wide and have a 5-ft shoulder, which are safe for tractor trailer trucks to enter the building.

The roads for entering the thermal treatment open burn area has a 10% slope when they cross over the 5 foot high flood protection dike. The roads are 20 foot wide and consist of 4 inches of crusher run on a 6 inch base of crushed stone. The turning radius for the road around the diked area is 50 feet which can safely handle vehicles as large as a tractor trailer.

COMAR 26.13.07.02 D(25) The political jurisdiction in which the facility is proposed to be located.

This facility is located in Cecil County, Maryland, approximately 1 mile west of the Elkton city limits.

COMAR 26.13.07.02 D(26)

a. **Owners and operators of all facilities shall provide an identification of whether the facility is located within a 100-year flood plain. This identification shall indicate the source of data for the determination and include a copy of the relevant Federal Insurance Administration (FIA) flood map, if used, or the calculations and maps used if an FIA map is not available. Information shall also be provided identifying the 100-year flood level and any other special flooding factors (for example, wave action) which shall be considered in designing, constructing, operating, or maintaining the facility to withstand washout from a 100-year flood.**

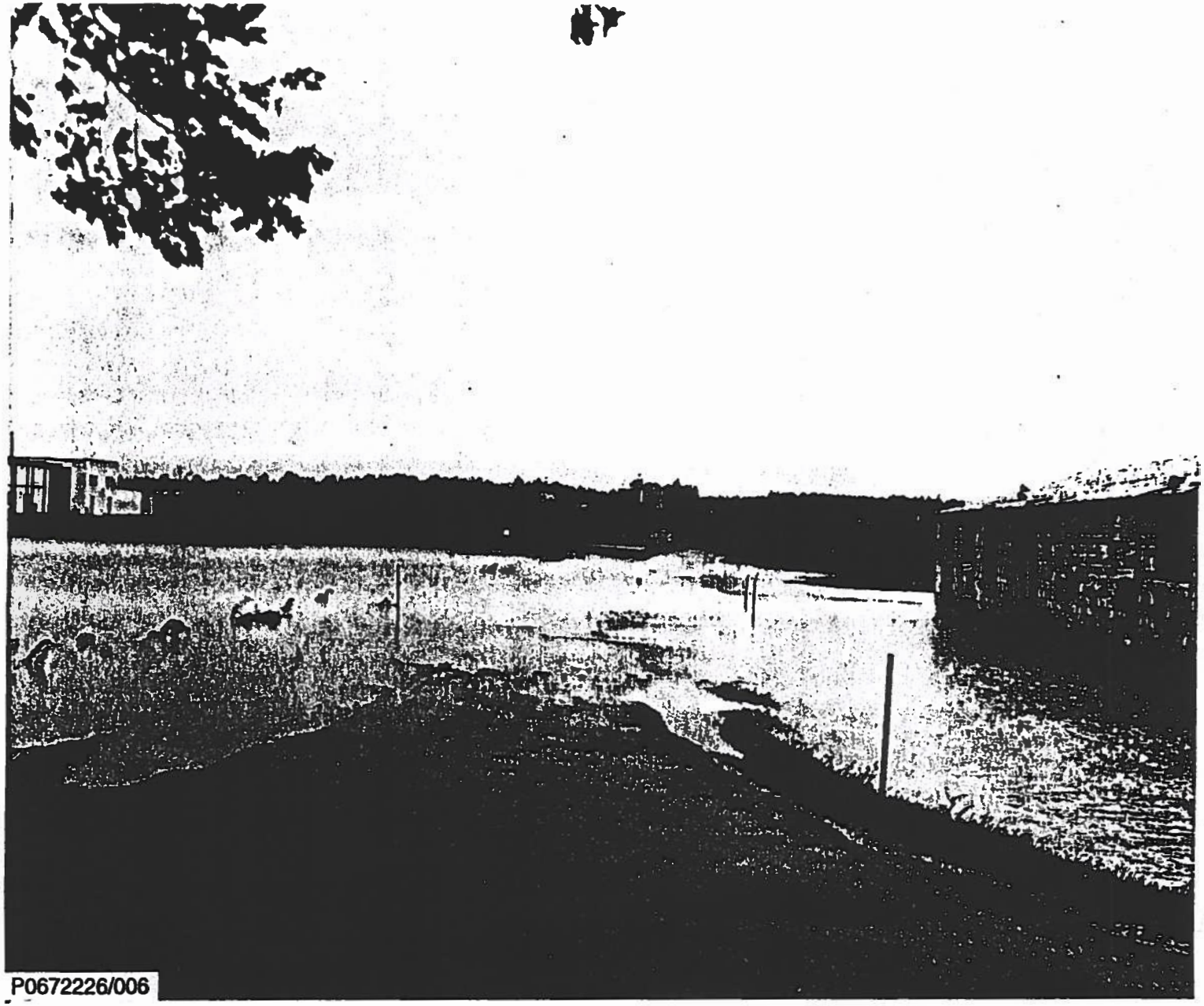
b. **If maps for the National Flood Insurance Program produced by the Federal Insurance Administration (FIA) of the Federal Emergency Management Agency are available, they will normally be determinative whether a facility is located within or outside of the 100-year flood plain. However, if the FIA map excludes an area (usually areas of the flood plain less than 200 ft wide), these areas shall be considered and a determination made as to whether they are in the 100-year flood plain.**

c. **If FIA maps are not available for a proposed facility location, the owner or operator shall use equivalent mapping techniques to determine whether the facility is within the 100-year flood plain and, if so located, what the 100-year flood elevation would be.**

Map E36669 shows the 100-year flood plain for this location. The 100-year flood elevation is 32.75 feet above mean sea level, 1929 adjustment. A Federal Insurance Administration detailed flood plain map for this area has not been prepared. The map was prepared using U.S. Army Corps of Engineers and U.S.D.A. Soil Conservation Service calculation methods. Copies of the calculation and approval correspondence are included in this section. Due to the inland, protected location of this facility, wave action is not a factor.

We have also verified and documented this flood line by taking more than 75 photographs on June 22, 1972, of the flood levels reached during hurricane Agnes, which was a 100-year flood. We have also experienced a 500 year flood during hurricane Floyd on September 15 and 16, 1999. During this flood none of our permitted hazardous waste facilities were damaged thus confirming that they are adequately protected from flood waters. Photographs were taken showing the flood levels as a result of the March 21, 1983, storm. During this storm, 3 inches of rain fell in 1-1/2 hours, a near 100-year storm, which is defined as 3.2 inches of rain in 1 hour.

The waste propellant open burning facility is the only permitted CHS facility located within the 100 year flood plain. The facility is protected by an earthen berm that is 6 inches higher than the 500 year flood elevation. This berm was not breached during the September 15 and 16, 1999 Hurricane Floyd 500 year flood. On 712/04 we experienced another near 500-year storm that struck with less than 8 hours warning We received 7.3"of rain in less than 8 hours. For our area a 100-year flood is 7.3" and a 500-year flood is 9.2". Three (3) 5-gallon pails and 5 bags of waste propellant were washed away in the flood. Due to the sudden nature of this storm and the overall increased frequency of violent weather we are experiencing, we will discontinue using the three waste propellant pick up pads that are in the 100-year flood plain of little Elk Creek and construct a new replacement 90-day pad located outside of the flood plain.



100-Year Flood Elevation Reached During Hurricane Agnes, June 1972

SA12679

WEIR RELIEF LOOKING NORTH

UPSTREAM SIDE

RR LOOKING SOUTH

'C' AREA BANK LOOKING WEST

FLOOD LEVELS — MARCH 21, 1983

Permit No. A-052

ATK Elkton LLC

ATTACHMENT 8
Section E
of the Permit Application
Groundwater Monitoring
(31 pages)

Section E – Groundwater Monitoring

The ATK Tactical Systems Company, LLC, Elkton Operations is currently implementing a Corrective Action Monitoring Plan for a closed Incinerator Feed Surface Impoundment and a closed C Area Waste Propellant Open Burning area. Both units are within close proximity to each other and are monitored using a common Corrective Action Groundwater Monitoring Plan. COMAR 26.13.05.06-6 is the applicable; however several conditions in the current Part B permit make slight changes to the reporting requirements.

COMAR 26.13.05.06-6 Corrective Action Program.

A. Corrective Action Program Content. An owner or operator required to establish a corrective action program under this regulation shall, at a minimum, discharge the following responsibilities:

(1) Take corrective action measures to ensure that regulated units are in compliance with the ground water protection standards under Regulation .06-1A of this chapter specified by the Secretary in the facility permit, including:

- **(a) A list of the hazardous constituents identified under Regulation .06-1B of this chapter;**
- **(b) The concentration limits under Regulation .06-1C of this chapter for each of those hazardous constituents in § A(1)(a) of this regulation;**
- **(c) The compliance point under Regulation .06-1D of this chapter; and**
- **(d) The compliance period under Regulation .06-1E of this chapter;**

(2) Implement a corrective action program that prevents hazardous constituents from exceeding their respective concentration limits at the compliance point by removing the hazardous waste constituents or treating them in place, in accordance with the measures specified in the facility permit;

(3) Begin corrective action within a reasonable time period after the ground water protection standard is exceeded, as specified by the Secretary in the facility permit;

(4) In conjunction with the corrective action program, establish and implement a ground water monitoring program to demonstrate the effectiveness of the corrective action program;

(5) Ensure that the ground water monitoring program, under § A(4) of this regulation, which may be based on the requirements for a compliance monitoring program under Regulation .06-5 of this chapter, is as effective as the compliance monitoring program in determining:

(a) Compliance with the ground water protection standard under Regulation .06-1A of this chapter; and

(b) The success of a corrective action program under § A(6) of this regulation, when appropriate;

(6) Comply with the following requirements for the corrective action program:

(a) In addition to the other requirements of this chapter, conduct a corrective action program to remove or treat in place any hazardous constituents under Regulation .06-1B of this chapter that exceed concentration limits under Regulation .06-1C of this chapter in ground water:

(i) Between the compliance point under Regulation .06-1D of this chapter and the downgradient facility property boundary, and

(ii) Beyond the facility boundary when necessary to protect human health and the environment, except as provided in § A(6)(b) of this regulation;

(b) Instead of the requirements of § A(6)(a)(ii) of this regulation to conduct a corrective action program beyond the facility boundary, implement on-site measures as determined by the Secretary on a case-by-case basis to address any release that has migrated beyond the facility boundary, if the owner or operator is able to demonstrate to the Secretary's satisfaction that, despite best efforts, the owner or operator was unable to obtain the necessary permission to undertake a corrective action program beyond the facility boundary;

(c) Initiate and complete corrective action measures under this regulation within a reasonable period of time, considering the extent of contamination;

(d) Continue implementing corrective action measures under this regulation at least until the concentrations of hazardous constituents under Regulation .06-1B of this chapter are reduced to levels below their respective concentration limits under Regulation .06-1C of this chapter.

B. **Program Duration, Reporting Requirements, and Modification. An owner or operator required to conduct a corrective action program under the requirements of this regulation shall:**

(1) **Comply with the following requirements concerning the duration of corrective action measures:**

(a) **Continue corrective action measures during the compliance period to the extent necessary to ensure that the ground water protection standard is not exceeded,**

(b) **If the owner or operator is conducting corrective action at the end of the compliance period, continue the corrective action for as long as necessary to achieve compliance with the ground water protection standard,**

(c) **Continue corrective action measures taken beyond the period equal to the active life of the waste management area, including the closure period, at least until the owner or operator can demonstrate, based on data from the ground water monitoring program under § A(4) and (5) of this regulation, that the ground water protection standard of Regulation .06-1A of this chapter has not been exceeded for a period of 3 consecutive years;**

(2) **Report in writing to the Secretary on the effectiveness of the corrective action program through reports submitted semiannually;**

(3) **Within 90 days of determining that the corrective action program no longer satisfies the requirements of this regulation, submit an application for a permit modification to make any appropriate changes to the program.**

Corrective Action Plan
Closed Incinerator Feed Surface Impoundment and Abandoned Open Burning/Open Detonation Area

Introduction

On September 22, 1997, Thiokol Corporation (Thiokol), Elkton Division, was re-issued CHS Permit A-052 by the Maryland Department of the Environment (MDE). Part VI of the permit details the terms and conditions of the post-closure care for the closed Incinerator Feed Surface Impoundment (IFSI) and abandoned Open Burning/Open Detonation (OBOD) Area. Permit Condition VI.H.1. requires Thiokol to submit a Corrective Action Progress Report (CAPR). This CAPR was prepared by the hydrogeological consulting firm of ARCADIS Geraghty and Miller, Inc. and submitted to MDE on November 21, 1997. The CAPR included the following:

- Corrective action program (CAP) and correspondence relating to the CAP,
- Maps depicting general site information, groundwater flow conditions, and volatile organic compound plume boundaries,
- Discussion of performance of the interceptor trench,
- QA/QC procedures for sampling and analysis of groundwater,
- Groundwater quality database, and
- Identification of data gaps.

The narrative portion of this report is attached to this section (no tables, figures or appendices).

Permit Condition VI.H.2 requires Thiokol to submit an amended Corrective Action Plan (CAP) that addresses reported data gaps and includes a Groundwater Monitoring Plan. Permit Condition VI.M.1 states that Thiokol must submit an updated Groundwater Monitoring Plan that includes the following:

- Description of the groundwater monitoring network;
- Outline of groundwater sampling and analysis procedures, including standard operating procedures and QA/QC methods;
- Procedures for water-level monitoring and determination of groundwater flow conditions; and
- Evaluation of water-quality data using statistical methods and demonstration of effectiveness of corrective action program.

This Corrective Action Plan was prepared by ARCADIS Geraghty & Miller on December 21, 1997 and provides an updated Groundwater Monitoring Plan and an amended Corrective Action Plan as required by Permit Conditions VI.M.1. and VI.H.2., respectively.

The narrative portion of this plan is attached, no appendices.

The current evaluation of the Corrective Action Plan can be found in our annual Groundwater Monitoring Report that is provided to MDE and EPA by March 31st of each year. The latest report was submitted on 2/1/2002.

CORRECTIVE ACTION PROGRESS REPORT
CLOSED INCINERATOR FEED SURFACE IMPOUNDMENT AND ABANDONED OPEN BURNING/OPEN DETONATION AREA

November 21, 1997

Prepared for:

Thiokol Corporation
Elkton Division
55 Thiokol Road
Elkton, Maryland 21922

Prepared by:

Geraghty & Miller, Inc.
1131 Benfield Boulevard, Suite A
Millersville, Maryland 21108
(410) 987-0032

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TABLE

1. Influent VOC Concentrations to C-68 Air Stripper, Thiokol Corporation, Elkton, Maryland.

FIGURES

1. Site Location Map, Thiokol Corporation, Elkton, Maryland.

2. Groundwater Elevation Contours and Inferred Flow Directions, September 22, 1997, Thiokol Corporation, Elkton, Maryland.

3. Extent of 1,1,1-Trichloroethane From Data Collected September 23, 1997, Thiokol Corporation, Elkton, Maryland.

4. Extent of TCE From Data Collected September 23, 1997, Thiokol Corporation, Elkton, Maryland.

APPENDICES

A. Groundwater Elevation Database, Thiokol Corporation, Elkton, Maryland.

B. Water-Quality Database, Thiokol Corporation, Elkton, Maryland.

C. Time versus Concentration Graphs for 1,1,1-Trichloroethane.

D. Time versus Concentration Graphs for TCE.

INTRODUCTION

On September 22, 1997, Thiokol Corporation (Thiokol), Elkton Division, was re-issued CHS Permit A-052 by the Maryland Department of the Environment (MDE). Part VI of the permit details the terms and conditions of the post-closure care for the closed Incinerator Feed Surface Impoundment (IFSI) and abandoned Open Burning/Open Detonation (OBOD) Area. Permit Condition VI.H.1. requires Thiokol to submit a Corrective Action Progress Report that includes the following: corrective action program (CAP) and correspondence relating to the CAP, maps depicting general site information, groundwater flow conditions, and volatile organic compound plume boundaries, discussion of performance of the interceptor trench, QA/QC procedures for sampling and analysis of groundwater, groundwater quality database, and identification of data gaps (if warranted). This report includes all of the above mentioned required data.

Thiokol operated the IFSI from approximately 1976 to 1988 when the impoundment was closed. The OBOD was abandoned in 1992. On May 22, 1987, Thiokol was issued a CHS permit; this permit was re-issued on August 22, 1991 and September 22, 1997. Condition VII.II of the August 22, 1991 permit required Thiokol to submit a CAP. This CAP was submitted on October 21, 1991 and reviewed, but not approved, by MDE on January 20, 1992. Thiokol resubmitted the CAP on March 30, 1992 and MDE conditionally approved the CAP on May 29, 1992. On February 20, 1992, Thiokol sent a hazardous waste notification letter to the Cecil County Zoning Department. The CAP and the above mentioned correspondence regarding the CAP are included in this submittal under separate cover.

GROUNDWATER FLOW CONDITIONS

The CAP included the installation of 29 groundwater monitoring wells (wells MW-1 through MW-29) (Figure 1). The wells are installed in the uppermost water-bearing zone, with the exception of well MW-09 which is installed in bedrock. With the exception of well MW-9, all of the wells are monitored quarterly for water levels and water quality. Water-level data from November 1994 to the present are supplied in Appendix A. Water-level data for the period 1983 to 1994 are included in the CAP correspondence submitted under separate cover.

The most recent round of water-level measurements was collected on September 22, 1997. The water-level measurement was subtracted from the surveyed monitoring point elevation to calculate the groundwater elevation at each well location. Groundwater elevation contours and inferred directions of groundwater flow from the September 22, 1997 data are shown in Figure 2. Groundwater at the facility flows in a west to southwest direction, following site topography. Groundwater beneath the facility presumably discharges to Little Elk Creek, located to the north and west of the facility.

Based on the September 22, 1997 groundwater contour map, the average hydraulic gradient beneath the site, as measured between wells MW-14 and MW-27, is 0.0047 (dimensionless). Using an average hydraulic conductivity value of 1.03×10^{-4} cm/sec (estimated by slug tests performed by Groundwater Technology) and an average hydraulic gradient of 0.0047 (dimensionless), the groundwater flow velocity beneath the site is calculated to be approximately 2 feet/year. This calculation is based on the following equation:

$V = KI/n \times 1.03 \times 10^6$, where

V = groundwater flow velocity (feet/year)
K = average hydraulic conductivity (cm/sec)
I = average hydraulic gradient (dimensionless)
n = effective porosity (assumed to be 0.25 for silty sand)
1.03×10^6 = conversion factor from cm/sec to feet/year.

The calculated groundwater flow velocity appears to be low based on constituent migration patterns (Figures 3 and 4).

INTERCEPTOR TRENCH/PHYTOREMEDIATION

INTERCEPTOR TRENCH

In 1993, an interceptor trench was constructed to remove VOC-impacted groundwater at the facility. The interceptor trench is located in the vicinity of well MW-6 (see Figure 1). The trench is 100-feet long, 12-feet deep, and constructed of 4-inch PVC well screen. The interceptor trench creates a depression in the groundwater table, most notable in the vicinity of wells MW-6 and MW-12. The area of influence is conservatively interpreted by the hachured circle on Figure 2, but may be larger that the area shown.

In 1996, groundwater from the interceptor trench was pumped at an average rate of 11.4 gallons per minute (Table 1). Groundwater from the interceptor trench is routed to a low profile air stripper located in Thiokol Building C-68. Concentrations of VOCs in the influent to the Building C-68 air stripping tower are shown in Table 1. The air stripper removes the VOCs and treated water is reinjected into the shallow groundwater to promote flushing of the source area. In 1996, 214 pounds of VOCs were removed from the groundwater. The infiltration gallery is constructed of 2-inch perforated PVC and is located near well MW-14 (Figure 1).

The reinjection of the treated water is regulated by NPDES Permit Number MD0000078. The discharge is identified as Outfall 021. The permit requires monthly sampling for VOCs by EPA Method 624. The permit contains maximum daily effluent limitations for total purgeable hydrocarbons (TPH), trichloroethylene, 1,1-dichloroethene and benzene. The typical discharge contains below detection limit concentrations and there has never been an exceedence of the permit limits.

PHYTOREMEDIATION

In December 1995, 175, 10 feet tall, 1-2 inch caliper Weeping Willow trees were planted on a 50 foot square grid in areas where the groundwater exhibited low VOC concentrations. While the exact processes are unclear, the following can occur under favorable conditions:

- contaminated groundwater is bioremediated by microbial populations that thrive, often in a symbiotic relationship, in the area immediately surrounding the roots (the rhizosphere).
- contaminated groundwater is absorbed by the roots and the contaminants are metabolized within the tree.
- contaminated groundwater is absorbed by the roots and transpired through the leaves.

The trees show no visible stress and are now 11 feet tall and have a caliper of 1.5-2.0 inches. One very successful tree is very well branched and has a caliper of 4 inches. The effectiveness of the phytoremediation has not been evaluated. Evaluating the effectiveness of the phytoremediation is identified in the Data Gaps section of this report.

GROUNDWATER QUALITY CONDITIONS

Monitoring wells installed into the uppermost water-bearing zone are sampled on a quarterly basis and analyzed for volatile organic compounds. The water-quality database includes data from March 1992 to the present and is included as Appendix B. Water-quality data for the period 1983 to 1992 are included in the CAP correspondence submitted under separate cover. Rather than evaluate data for each individual analyte, data for two analytes (1,1,1-trichloroethane and trichloroethene) were evaluated. These analytes were chosen because they are most prevalent at the site. Plume boundary maps for 1,1,1-trichloroethane and trichloroethene (TCE) were constructed using the most recent (September 23, 1997) analytical data (Figures 3 and 4, respectively). In addition, time versus concentration graphs for 1,1,1-trichloroethane and TCE were plotted for selected wells to evaluate trends in water quality (Appendices C and D, respectively). The wells that were selected for graphing included wells in the areas of the highest concentrations, medium concentrations and low concentrations, historically.

1,1,1-TRICHLOROETHANE

The September 23, 1997 1,1,1-trichloroethane concentration data and inferred plume boundaries are shown on Figure 3. The figure shows that the area of the most elevated 1,1,1-trichloroethane concentrations (indicated by the 50 ppm contour) is located around well MW-1; this is the area of the closed IFSI shown in Figure 1. The plume extends to the west and southwest in the general direction of groundwater flow (Figure 2). There is an inflection in the plume boundary in the vicinity of well MW-12, possibly caused by groundwater capture by the interceptor trench (see Figure 2). Lower concentrations of 1,1,1-trichloroethane encircle the 50 ppm contour to the north and northeast. There is an area of elevated 1,1,1-trichloroethane concentrations in the vicinity of the abandoned OBOD (wells MW-27 and MW-28).

Time versus concentration graphs for selected wells are presented in Appendix C. Time versus concentration graphs were plotted for wells located in historically elevated areas for 1,1,1-trichloroethane - MW-1, MW-2, MW-6, and MW-20. These graphs indicate that 1,1,1-trichloroethane concentrations fluctuate in wells MW-1 and MW-2. Concentrations in well MW-6 have decreased substantially since September 1995. The trend for well MW-20 appears to be decreasing.

Time versus concentration graphs were plotted for wells located in historically "medium" concentration areas for 1,1,1-trichloroethane - MW-16, MW-23, MW-24, MW-27, MW-28 and MW-29. These wells are all located downgradient of the main plume and are also located around the periphery of the site. The trends for the wells were of three types: decreasing (wells MW-23, MW-28 and MW-29), increasing (well MW-16), and consistent, neither increasing nor decreasing (wells MW-24 and MW-27). Recent data for well MW-16 indicate that 1,1,1-trichloroethane concentrations may be decreasing; future monitoring will determine whether this trend continues.

Time versus concentration graphs were plotted for wells located in historically "low" concentration areas for 1,1,1-trichloroethane - MW-4, MW-5, MW-14, MW-15, and MW-22. These wells are located upgradient of the main plume area. Trends for these wells were not apparent; however, the form of the data were of two types: fluctuating (wells MW-5, MW-14 and MW-22) and relatively consistent (wells MW-4 and MW-15).

TCE

The September 23, 1997 TCE concentration data and inferred plume boundaries are shown on Figure 4. The figure shows that the area of the most elevated TCE concentrations (indicated by the 100 ppb contour) is roughly V-shaped, with the apexes

of the plume defined by wells MW-10, MW-4 and MW-22. The reported source of the TCE was a shallow depression located in the vicinity of well MW-13. From approximately the 1940's to 1974, the depression was reportedly used to dispose ot TCE. The plume extends to the west and southwest in the general direction of groundwater flow (Figure 2). TCE concentrations decrease substantially in the vicinity of wells MW-3, MW-6 and MW-12, possibly due to groundwater capture by the interceptor trench (see Figure 2). The stormwater drainage ditch shown on Figure 1 may also be affecting the shape of the TCE plume. Lower concentrations of TCE encircle the 100 ppb contour to the northeast. There is an area of elevated TCE concentrations in the vicinity of the abandoned OBOD (well MW-28).

Time versus concentration graphs for selected wells are presented in Appendix D. Time versus concentration graphs were plotted for wells located in historically elevated areas for TCE - MW-5, MW-7, MW-8, MW-10 and MW-13. These graphs indicate that TCE concentrations in wells MW-5, MW-7, MW-8 and MW-10 show a decreasing trend. The data for well MW-13 fluctuate, with no apparent trend.

Time versus concentration graphs were plotted for wells located in historically "medium" concentration areas for TCE - MW-6, MW-14, and MW-17. The trends for wells MW-6 and MW-14 are decreasing, while the data for well MW-22 fluctuate, with no apparent trend.

Time versus concentration graphs were plotted for wells located in historically "low" concentration areas for TCE - MW-15, MW-16, MW-20, MW-24, MW-27 and MW-29. These wells are located downgradient of the plume area, along the periphery of the site. Trends for these wells were generally decreasing, with the following exceptions: well MW-20 data fluctuate, with no apparent trend and well MW-27 data were consistent, neither increasing nor decreasing.

SAMPLING QA/QC PROCEDURES

Thiokol personnel perform quarterly water-level and water-quality monitoring in the vicinity of the closed IFSI and OBOD. Thiokol personnel follow standard industry practices for purging and sampling groundwater monitoring wells. Specifically, Thiokol performs the following procedures when sampling the closed IFSI groundwater monitoring wells:

1. Schedule the sampling dates when there is a weather forecast of at least 3 consecutive dry days.

2. Check with the operating departments (propellant mixing and propellant machining) that the area will be safe to work in.

3. Issue work order to Plant Engineering to clear any areas overgrown with heavy vegetation.

4. Check that there are at least 60 new clean 40 oz. VOA vials.

5. Call the contract laboratory and advise them to prepare for the analysis and schedule the sample pick up date for the last day that the samples are taken.

6. Acidify bottles with HCl, 2 drops per bottle.

7. Prepare the sample vial labels and put on sample vials.

Thiokol Corp/Elkton DLV
MW-
date_____ time_____
analyze using EPA method 601
Preservative: HCl
sampled by_____

8. Check that the following sampling equipment is available, and in good working order:
   - Ford tractor
   - 250 gallon tank wagon
   - gasoline powered purging pump
   - pH meter
   - temperature meter
   - water-level indicator

- sample cooler
- ice
- indelible pen
- sampling forms
- latex gloves
- trash buckets
- gasoline can
- hoses
- tool kit
- electrical tape
- absorbent pads
- No 44 environmental van
- plastic sandwich bags

9. On the day of the sampling calibrate the pH meter and temperature meter.

10. Put ice in cooler, transport all equipment and supplies to sampling site.

11. Start with the upgradient well MW-4.

12. Put on safety equipment to include new fresh latex gloves.

13. Unlock well, remove cap, measure and record depth to water, measure from the black mark on the well case.

14. Pull the dedicated sample bailer out of the well. Pour water from bailer into 5 gallon bucket. Hang empty bailer from well so it cannot become contaminated.

15. Connect the well's dedicated purging tube to the purging pump suction hose. Screw the tube tight to the hose and make air tight by wrapping with electrical tape.

16. Start purging pump, put discharge hose from pump into empty 5 gallon bucket, open shut-off valve on end of hose.

17. Run pump on fast until suction is gained and pump starts to flow water, then slow down pump.

18. Pinch down on valve on end of discharge hose until flow rate is about 1 gallon per minute. Measure flow by timing the rate the 5 gallon bucket is being filled.

19. When 1 bucket is filled, triple rinse a plastic beaker in the flowing purge water, then fill the beaker and measure and record the pH.

20. Measure and record the temperature in the bucket being filled in degrees Fahrenheit.

21. If the pH is in the typical range of 5.4 to 6.3 and the temperature is less than 68° F sample the well after 3 well volumes or 25 gallons have been purged from the well (the gallons of water in the well can be calculated by multiplying the depth of water in the well by 0.66).

22. Slowly lower the sample bailer to the bottom of the well until it is full. Slowly bring it back up, and slowly fill two 40 ml clear borosilicate VOA vials with Teflon septa. Do not open the vial until just before it is to be filled. Fill it slowly, and close the cap. Check to make sure there are no bubbles in the vial. (The reason to do everything slowly is because we do not want to agitate the water and release any contaminant gases dissolved in the water.

23. Put the time of the sampling on the field form and sample vial label, put the sample in the iced cooler.

24. Put the bailer, and purge tube back in the well, put the cover on the well, lock the protective case.

25. Pour the purge water in to the tank wagon, complete all portions of the sampling form.

26. Move all equipment to next well, and proceed as before. Make sure to change latex gloves so as not to possibly cross contaminate the samples.

27. Do one duplicate well sample and mark as MW-9.

28. If any breaks are taken, take the samples to A-63 and put in the locked sample refrigerator.

29. After all sampling is complete, turn the refrigerated samples over to the laboratory courier as soon as possible using chain-of-custody documents. Note: If the laboratory does not analyze the samples within 10 days, the results are invalid and the wells must be resampled.

30. Pump all the purge water from the 250 gallon tank wagon into the C-68 air stripper.

31. Clean and put away all equipment. Have any damaged equipment repaired, re-order any depleted sampling supplies.

32. Turn all sampling documents over to environmental engineer for record keeping and monitoring report preparation.

One blind duplicate sample is collected each quarter and analyzed for VOCs by Method 601. The laboratory runs matrix spike and matrix spike duplicates with each analytical event for Thiokol. In addition, the laboratory runs laboratory fortified blanks (LFB) and method blanks. Surrogate compounds are analyzed per Method 601.

DATA GAPS

Data gaps and measures to correct identified data gaps will be presented in the Corrective Action Plan, to be submitted in 30 days, as required by Permit Condition VI.H.2. The following data gaps were identified:

- While the interceptor trench is removing elevated concentrations of VOCs in groundwater, the interceptor trench is not containing the VOC plume which is migrating off-site to the creek. While conditions at the site may be favorable for bioremediation, this has not been tested or documented. Furthermore, mass loading to the stream should be quantified for risk purposes.
- The effectiveness of the tree remediation should be evaluated.
- The calculated flow velocity at the site is too low based on constituent migration patterns; aquifer testing may be needed to adequately characterize the hydraulic properties of the shallow aquifer sediments.
- The monitoring wells at the site need to be surveyed for location.

CORRECTIVE ACTION PLAN
CLOSED INCINERATOR FEED SURFACE IMPOUNDMENT AND ABANDONED OPEN BURNING/OPEN DETONATION AREA

December 21, 1997

Prepared for:

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CORRECTIVE ACTION PLAN
CLOSED INCINERATOR FEED SURFACE IMPOUNDMENT AND ABANDONED OPEN BURNING/OPEN DETONATION AREA

December 21, 1997

Prepared by GERAGHTY & MILLER, INC.

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1. Site Location Map, Thiokol Corporation, Elkton, Maryland.

2. Groundwater Elevation Contours and Inferred Flow Directions, September 22, 1997, Thiokol Corporation, Elkton, Maryland.

3. Extent of 1,1,1-Trichloroethane From Data Collected September 23, 1997, Thiokol Corporation, Elkton, Maryland.

4. Extent of TCE From Data Collected September 23, 1997, Thiokol Corporation, Elkton, Maryland.

5. Proposed Groundwater Monitoring Network, Thiokol Corporation, Elkton, Maryland.

APPENDICES

A. Groundwater Sampling and Analysis Procedures, Thiokol Corporation, Elkton, Maryland.

B. Standard Operating Procedures and QA/QC Methods, Artesian Laboratory.

INTRODUCTION

On September 22, 1997, Thiokol Corporation (Thiokol), Elkton Division, was re-issued CHS Permit A-052 by the Maryland Department of the Environment (MDE). Part VI of the permit details the terms and conditions of the post-closure care for the closed Incinerator Feed Surface Impoundment (IFSI) and abandoned Open Burning/Open Detonation (OBOD) Area. Permit Condition VI.H.1. requires Thiokol to submit a Corrective Action Progress Report (CAPR). This CAPR was submitted to MDE on November 21, 1997. The CAPR included the following:

- corrective action program (CAP) and correspondence relating to the CAP,
- maps depicting general site information, groundwater flow conditions, and volatile organic compound plume boundaries,
- discussion of performance of the interceptor trench,
- QA/QC procedures for sampling and analysis of groundwater,
- groundwater quality database, and
- identification of data gaps.

Permit Condition VI.H.2. requires Thiokol to submit an amended Corrective Action Plan (CAP) that addresses reported data gaps and includes a Groundwater Monitoring Plan. Permit Condition VI.M.1. states that Thiokol must submit an updated Groundwater Monitoring Plan that includes the following:

- description of the groundwater monitoring network;
- outline of groundwater sampling and analysis procedures, including standard operating procedures and QA/QC methods;
- procedures for water-level monitoring and determination of groundwater flow conditions; and

- evaluation of water-quality data using statistical methods and demonstration of effectiveness of corrective action program.

This submittal provides an updated Groundwater Monitoring Plan and an amended Corrective Action Plan as required by Permit Conditions VI.M.1. and VI.H.2., respectively.

GROUNDWATER MONITORING PLAN

BACKGROUND

Thiokol currently monitors 28 groundwater wells - wells MW-1 through MW-29, with the exception of MW-9 which is not monitored (Figure 1). The wells are installed in the uppermost water-bearing zone, with the exception of well MW-9 which is installed in bedrock. With the exception of well MW-9, all of the wells are currently monitored quarterly for water levels and water quality. Comprehensive water-level and water-quality databases for these wells were provided in the CAPR in Appendices A and B, respectively (Geraghty & Miller, Inc., 1997).

GROUNDWATER MONITORING NETWORK

The current 28 monitor wells are located in relatively close proximity to one another, situated on a total of approximately 25 acres. While these wells were initially useful in characterizing groundwater flow (Figure 2), water-quality conditions, and the extent of VOC-impacted groundwater (Figures 3 and 4), continued monitoring of some of the wells is duplicative.

New data from all of these wells do not provide more accurate or reliable information on flow and quality than could be obtained from fewer wells strategically located. Therefore, a reduction in the number of wells monitored at the site is warranted based on the ongoing corrective action and the focus on groundwater quality at the property boundary. Table 1 lists all of the wells currently monitored along with rationale for continuing or discontinuing monitoring. The wells that are recommended to be monitored quarterly are divided into two groups - wells monitoring the perimeter of the facility and wells monitoring the source areas (Figure 5). The perimeter wells that are recommended to be monitored include (counterclockwise from MW-4): MW-4, MW-22, MW-20, MW-29, MW-27, MW-24, MW-16, and MW-15. Wells monitoring the source areas that are recommended to be monitored include: MW-6, MW-1, MW-3, MW-12 and MW-10. This monitoring strategy focuses on water quality within the source areas and along the downgradient property boundary. Monitoring these 13 wells will ensure that the interceptor trench/air stripper are effecting contaminant mass reduction in the source area and that groundwater along the property boundary is adequately characterized. These wells will provide no less information than the current 28 wells.

GROUNDWATER SAMPLING AND ANALYSIS PROCEDURES

The groundwater sampling and analysis procedures used by Thiokol for routine monitoring are presented in Appendix A. Standard Operating Procedures and QA/QC Methods for the analyzing laboratory are presented in Appendix B.

DETERMINATION OF GROUNDWATER FLOW

Thiokol monitors water levels for each well installed in the uppermost water-bearing zone at the facility on a quarterly basis. Water-level measurements are

subtracted from the surveyed monitoring point elevation to calculate the groundwater elevation at each well location. Groundwater elevation contours and inferred directions of groundwater flow for each data set are plotted and presented quarterly. Groundwater at the facility flows in a west to southwest direction, following site topography. Groundwater beneath the facility presumably discharges to Little Elk Creek, located to the north and west of the facility.

Following approval of this CAP, Thiokol will obtain more accurate estimates of hydraulic conductivity (see Corrective Action Plan section) for the uppermost water-bearing zone. Groundwater flow velocity calculations will be submitted in the quarterly report. Groundwater flow velocities at the site will be estimated using the equation:

$V = KI/n \times 1.03 \times 10^6$, where

V = groundwater flow velocity (feet/year)
K = average hydraulic conductivity (cm/sec)
I = average hydraulic gradient (dimensionless)
n = effective porosity (assumed to be 0.25 for silty sand)
1.03×10^6 = conversion factor from cm/sec to feet/year.

DATA EVALUATION AND EFFECTIVENESS OF CORRECTIVE ACTION

Thiokol proposes to evaluate groundwater data collected at the facility in the following manner: 1) present data for each well and each constituent in time-series order so that trends can be evaluated; 2) develop time versus concentration graphs for 1,1,1-trichloroethane and TCE as these analytes are most prevalent at the facility; 3) compare water-quality data for each constituent listed in Permit Condition VI.I.1. to the Maryland Maximum Contaminant Level (MCL) and present exceedences in tabular form (see discussion below); and 4) present plume boundary maps for 1,1,1-trichloroethane and TCE.

Permit Condition VI.I.1. lists 11 analytes at the facility that are identified as having exceeded at least once the Maryland MCL for groundwater. These constituents are benzene, chlorobenzene, chloroform, 1,2-dichloroethane, 1,1-dichloroethene, methylene chloride, tetrachloroethene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, trichloroethene (TCE), and vinyl chloride. On a quarterly basis, groundwater data for these analytes will be compared to MCLs with exceedences presented in tabular form.

Permit Condition VI.L. requires that groundwater monitoring data be statistically evaluated to determine the effectiveness of corrective action measures. For this site, trend analysis (see discussion below) and comparison to MCLs appear to be the most appropriate statistical methods for evaluating changes in groundwater quality through time. Furthermore, VOC concentrations in the influent to the air stripper and groundwater pumping rates from the interceptor trench will continue to be monitored. These data are used to calculate the amount of VOCs removed from groundwater and provide an additional measure of the effectiveness of corrective action.

The application of trend analysis techniques for linear and exponential models will be considered. The data for a particular parameter and sampling location will be examined, and the linear or exponential model will be selected for the trend analysis based on the following considerations:

- The shape of the plotted data.
- An analysis of the residuals.
- How closely the data fit the regression line.

In conducting the regression analyses, all results reported as below detection limit (BDL) will be assumed to equal the detection limit. Based on a study by Gilliom and Helsel (1986), using the detection limit concentrations for the BDL results to calculate the mean and standard deviation (interim calculations in a trend analysis) is comparable to setting the BDL equal to zero or a fraction of the detection limit. Nonzero values are needed for the

exponential model because natural logarithms are used (that is, the exponential model $y=ce^{kx}$, which is equivalent to $\ln y=kx + C$ where y is the concentration and x is time) and the natural logarithm of zero is undefined.

The first step in the trend analysis will be to calculate the percentage of the data that can be explained by both the linear and exponential models. If the amount of data that can be explained by either the linear or exponential model is less than 40 percent, no further statistical analyses will be performed. If the amount of data that can be explained by either model exceeds 40 percent, the F-statistic (ratio of the sum of squares of the residuals to the sum of squares of the regression) will be calculated. A trend will be statistically demonstrated at the specified confidence level if the F-statistic exceeds the appropriate comparator F-statistic. An 80 percent confidence level will be used for this evaluation. For trend analysis, the values for the comparison are based on the degrees of freedom (df) where df = n - 2 (where n= number of data points).

CORRECTIVE ACTION PLAN

The CAPR (Geraghty & Miller, Inc., 1997) discusses in detail the two methods of corrective action at the facility to treat groundwater impacted by VOCs. The first involves an interceptor trench that captures groundwater downgradient of the closed IFSI, routes the groundwater to an air stripper for treatment, and reinjects treated groundwater (NPDES Permit Number MD0000078) to an infiltration gallery (Figure 1). The second involves phytoremediation using willow trees which may be removing VOC-impacted groundwater (Figure 1). The following presents the data gaps as outlined in the CAPR, with the proposed response to the data gap.

Data Gap #1: While the interceptor trench is removing elevated concentrations of VOCs in groundwater, the interceptor trench is not containing the VOC plume which is

migrating off-site to the creek. While conditions at the site may be favorable for bioremediation, this has not been tested or documented. Furthermore, mass loading to the stream should be quantified for risk purposes.

Response to Data Gap #1: Thiokol will quantify the loading of VOCs from groundwater at the facility to Little Elk Creek. On the basis of this calculation, the effect to indigenous stream biota will be determined and an initial ecological risk assessment will be performed. Estimates of flow in Little Elk Creek will be determined by using flow data provided by the U.S.G.S. at their gauging station in Childs, Maryland (approximately two miles from Thiokol).

Groundwater beneath the site flows west toward Little Elk Creek. Based on hydrogeological information, it is likely that groundwater discharges to Little Elk Creek over a large portion of the streambed as opposed to seeping from the bank of the creek. Constituents of concern detected in groundwater consist of volatile organic compounds (VOCs) which, based on their physical and chemical characteristics, would be expected to volatilize and rapidly attenuate upon release to the creek. The bioaccumulation potential of these constituents is also considered to be low. Therefore, the potential for exposure primarily is associated with the aquatic ecosystem.

To determine potential adverse effects to aquatic life, VOC concentrations detected in surface water will be compared with available surface-water quality criteria. Surface-water quality criteria will include Maryland Department of the Environment (MDE) chronic surface-water quality criteria (COMAR 26.08.02.03-2, MDE, 1996). Where state criteria are not available, USEPA ambient water-quality criteria (USEPA, 1995) for the protection of freshwater organisms will be used for comparison. If state and/or federal water-quality criteria are unavailable for constituents detected in surface water, comparison values will be derived from numeric databases (Aquatic Toxicity Information Retrieval [AQUIRE] database), and/or peer-reviewed literature-derived toxicity values.

In the event that surface-water data are unavailable, potential impacts to surface water will be evaluated by comparing VOC concentrations in groundwater to MDE and/or USEPA criteria for the protection of aquatic organisms. Additionally, based on the available criteria, groundwater flow data, and VOC concentrations detected in groundwater, a minimum flow in the creek required to dilute groundwater VOC concentrations to acceptable levels will be calculated.

To calculate minimum flow in the creek required to dilute groundwater VOC concentrations to acceptable levels and estimate VOC concentrations in Little Elk Creek as a result of groundwater discharge, the following conservative simplifying assumptions will be made: (1) the aquifer is homogeneous and isotropic; (2) the groundwater acts as a continuous source; and (3) no dispersion, biodegradation, or adsorption occurs along the flow path from the site to the creek.

Results of slug tests conducted by Groundwater Technology will be reviewed (see Data Gap #3) and used by Geraghty & Miller to determine the transmissivity of the aquifer. The creek bank exposure, or width (w), will be assumed to be the linear extent of the creek bank potentially exposed to groundwater contamination. The average slope of the water table, or gradient (g), conservatively will be assumed to be 0.1 feet per foot (ft/ft). The groundwater discharge rate into the creek will be estimated by the equation:

$$Q = T*w*g$$

where:

Q	=	groundwater discharge rate (cubic feet[ft^3]/day);
T	=	transmissivity (ft^2/day);
w	=	creek bank exposure (ft);
g	=	slope of water table (ft/ft); and
86,400	=	conversion factor for ft^3/day to ft^3/sec.

U.S.G.S. flow data for Little Elk Creek are available for a location approximately two miles upstream of the creek. The following equation will be used to determine the minimum flow required to achieve available water-quality criteria for constituent detected in groundwater at the site:

$$Flow_{min} = \frac{Q \times C_{gw}}{C_{sw}}$$

where:

$Flow_{min}$	=	minimum flow required to achieve available water-quality criteria (ft^3/sec);
Q	=	groundwater discharge rate (ft^3/sec);
C_{gw}	=	groundwater concentration ($\mu g/L$); and
C_{sw}	=	water-quality criteria ($\mu g/L$).

Flow requirements for the dilution of VOC concentrations for any constituents exceeding available criteria to acceptable levels will be determined.

In addition to the ecological risk assessment described above, Thiokol will determine if intrinsic bioremediation is occurring. Groundwater data will be reviewed to ascertain if breakdown products of 1,1,1-trichloroethane and TCE are present. If breakdown products of these compounds are present, Thiokol may initiate field testing of groundwater to determine if conditions are favorable to enhance intrinsic bioremediation.

Data Gap #2: The effectiveness of the phytoremediation should be evaluated.

Response to Data Gap #2: Geraghty & Miller will extrapolate field data on the consumptive use of trees to evaluate the effectiveness of the tree remediation. The calculations will estimate the groundwater uptake by the trees based on differing maturity levels using literature and known values for water uptake. The mass removal of VOCs by the trees will be estimated.

Data Gap #3: The calculated flow velocity at the site is too low based on constituent migration patterns; aquifer testing may be needed to adequately characterize the hydraulic properties of the shallow aquifer sediments.

Response to Data Gap #3: Geraghty & Miller will review previously completed aquifer testing at the facility. If necessary, Geraghty & Miller will propose additional aquifer testing be performed to adequately characterize the hydraulic properties of the shallow groundwater system.

Data Gap #4: The monitoring wells at the site need to be surveyed for location.

Response to Data Gap #4: The monitoring wells at the site will be surveyed for location.

REFERENCES

Geraghty & Miller, Inc. November 21, 1997. Corrective Action Progress Report, Closed Incinerator Feed Surface Impoundment and Abandoned Open Burning/Open Detonation Area.

Gilliom, R.J. and D.R. Helsel, 1986. Estimation of Distributional Parameters for Censored Trace Level Water Quality Data, 1. Estimation Techniques, 2. Verification and Applications, Water Resources Research, Vol. 22, No. 2, February 1986, pp. 135-155.

Maryland Department of the Environment (MDE), 1996. Surface Water Quality Criteria. Code of Maryland Administrative Record (COMAR) 26.08.02.03.

U.S. Environmental Protection Agency (USEPA), 1995. Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants. 40 CFR Part 131. August 24.

Permit No. A-052

ATK Elkton LLC

ATTACHMENT 9
Section A
of the Permit Application
Part A Permit Application
(8 pages)

Please print or type with ELITE type (12 characters per inch) in the unshaded areas only

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GSA No. 0248-EPA-OT

For EPA Regional Use Only		
Date Received Month Day Year		

EPA

United States Environmental Protection Agency
Washington, DC 20460

Hazardous Waste Permit Application Part A

(Read the Instructions before starting)

I. Facility's EPA ID Number *(Mark 'X' in the appropriate box)*

[ ] A. First Part A Submission	[X] B. Revised Part A Submission (Amendment # 5)

C. Facility's EPA ID Number	D. Secondary ID Number *(If applicable)*
MDD 003 067 121	

II. Name of Facility

ATK Elkton LLC

III. Facility Location *(Physical address not P.O. Box or Route Number)*

A. Street

55 Thiokol Road

Street *(Continued)*

City or Town	State	Zip Code
Elkton	MD	21921 – 0241

County Code *(If known)*	County Name
015	Cecil

B. Land Type (Enter code)	C. Geographic Location		D. Facility Existence Date		
	LATITUDE (Degrees, minutes, & seconds)	*LONGITUDE (Degrees, minutes, & seconds)*	Month	Day	Year
P	39° 37' 000"	75° 51' 55"	02	20	1948

IV. Facility Mailing Address

Street or P.O. Box

P. O. Box 241

City or Town	State	Zip Code
Elkton	MD	21921 – 0241

V. Facility Contact *(Person to be contacted regarding waste activities at facility)*

Name *(Last)*	*(First)*
Lucas	William

Job Title	Phone Number *(Area Code and Number)*
Environmental Engineer	(410) 392-1626

VI. Facility Contact Address *(See instructions)*

A. Contact Address Location	Mailing	Other	B. Street or P.O. Box
X			

City or Town	State	Zip Code
		–

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VII. Operator Information *(See Instructions)*

A. Name of Operator

ATK Elkton LLC

Street or P.O. Box

P. O. Box 241

City or Town	State	ZIP Code
Elkton	MD	21922 0241

Phone Number *(Area Code and Number)*	B. Operator Type	C. Change of Operator Indicator	Date Changed Month	Day	Year
(410) 392-1626	P	Yes [ ] No [x]			

VIII. Facility Owner *(See Instructions)*

A. Name of Facility's Legal Owner

ATK Elkton LLC

Street or P.O. Box

P. O. Box 241

City or Town	State	ZIP Code
Elkton	MD	21922 – 0241

Phone Number *(Area Code and Number)*	B. Owner Type	C. Change of Owner Indicator	Date Changed Month	Day	Year
(410) 392-1000	P	Yes [ ] No [X]			

IX. NAICS Codes *(In order of significance; start in left box)*

First		Third	
336415			
(Description) Guided missile & space vehicile		*(Description)*	
Second		**Fourth**	
(Description)		*(Description)*	

X. Other Environmental Permits *(See Instructions)*

A. Permit Type *(Enter code)*	B. Permit Number	C. Description
R	MDD 003 067 121	RCRA Permit
R	A-052	Maryland CHS Facility permit
N	MD00000078	NPDES Discharge permit
N	98-DP-0238	Maryland Discharge permit
E	07-000055	MD AMA rocket Fuel Man.permit
E	07-OP-0097D	MD Oil Operations permit
E	CE1992G074 03	MD Water Apropriations & Use
E	CE1996G054 01	MD Water Apropriations & Use
E	CE 1997G003 04	MD Water Apropriations & Use

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XI. Nature of Business *(Provide a brief description)*

This facility designs and manufactures solid propellant rocket motors, gas generators and propulsion units for use in both space and defense. Pilot plant operations for manufacturing liquid propellants are conducted We also manufacture safe-and-arm devices and SCB electric detonators. Limited laboratory scale research on new propellants is conducted.

XII. Process Codes and Design Capacities

A. PROCESS CODE - *Enter the code from the list of process codes below that best describes each process to be used at the facility. Thirteen lines are provided for entering codes. If more lines are needed, attach a separate sheet of paper with the additional information. For "other" processes (i.e., D99, S99, T04 and X99), describe the process (including its design capacity) in the space provided in item XIII.*

B. PROCESS DESIGN CAPACITY - *For each code entered in column A, enter the capacity of the process.*

1. **AMOUNT** - *Enter the amount. In a case where design capacity is not applicable (such as in a closure/post-closure or enforcement action) enter the total amount of waste for that process.*
2. **UNIT OF MEASURE** - *For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.*

C. PROCESS TOTAL NUMBER OF UNITS - *Enter the total number of units used with the corresponding process code.*

PROCESS CODE	PROCESS	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
	Disposal:	
D79	Underground Injection Well Disposal	Gallons; Liters; Gallons Per Day; or Liters Per Day
D80	Landfill	Acre-feet; Hectare-meter; Acres; Cubic Meters; Hectares; Cubic Yards
D81	Land Treatment	Acres or Hectares
D82	Ocean Disposal	Gallons Per Day or Liters Per Day
D83	Surface Impoundment Disposal	Gallons; Liters; Cubic Meters; or Cubic Yards
D99	Other Disposal	Any Unit of Measure Listed Below
	Storage:	
S01	Container	Gallons; Liters; Cubic Meters; or Cubic Yards
S02	Tank Storage	Gallons; Liters; Cubic Meters; or Cubic Yards
S03	Waste Pile	Cubic Yards or Cubic Meters
S04	Surface Impoundment Storage	Gallons; Liters; Cubic Meters; or Cubic Yards
S05	Drip Pad	Gallons; Liters; Acres; Cubic Meters; Hectares; or Cubic Yards
S06	Containment Building Storage	Cubic Yards or Cubic Meters
S99	Other Storage	Any Unit of Measure Listed Below
	Treatment:	
T01	Tank Treatment	Gallons Per Day; Liters Per Day; Short Tons Per Hour; Gallons Per Hour; Liters Per Hour; Pounds Per Hour; Short Tons Per Day; Kilograms Per Hour; Metric Tons Per Day; or Metric Tons Per Hour
T02	Surface Impoundment Treatment	Gallons Per Day; Liters Per Day; Short Tons Per Hour; Gallons Per Hour; Liters Per Hour; Pounds Per Hour; Short Tons Per Day; Kilograms Per Hour; Metric Tons Per Day; or Metric Tons Per Hour
T03	Incinerator	Short Tons Per Hour; Metric Tons Per Hour; Gallons Per Hour; Liters Per Hour; Btu Per Hour; Pounds Per Hour; Short Tons Per Day; Kilograms Per Hour; Gallons Per Day; Liters Per Day; Metric Tons Per Hour; or Million Btu Per Hour
T04	Other Treatment	Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; Btu Per Hour; Gallons Per Day; Liters Per Hour; or Million Btu Per Hour
T80	Boiler	Gallons; Liters; Gallons Per Hour; Liters Per Hour; Btu Per Hour; or Million Btu Per Hour
T81	Cement Kiln	Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; Btu Per Hour; Liters Per Hour; Kilograms Per Hour; or Million Btu Per Hour
T82	Lime Kiln	
T83	Aggregate Kiln	
T84	Phosphate Kiln	
T85	Coke Oven	
T86	Blast Furnace	
T87	Smelting, Melting, Or Refining Furnace	Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; Btu Per Hour; Gallons Per Hour; Liters Per Hour; or Million Btu Per Hour
T88	Titanium Dioxide Chloride Oxidation Reactor	
T89	Methane Reforming Furnace	
T90	Pulping Liquor Recovery Furnace	
T91	Combustion Device Used In The Recovery Of Sulfur Values From Spent Sulfuric Acid	
T92	Halogen Acid Furnaces	
T93	Other Industrial Furnaces Listed in 40 CFR §260.10	
T94	Containment Building - Treatment	Cubic Yards; Cubic Meters; Short Tons Per Hour; Gallons Per Hour; Liters Per Hour; Btu Per Hour; Pounds Per Hour; Short Tons Per Day; Kilograms Per Hour; Metric Tons Per Day; Gallons Per Day; Liters Per Day; Metric Tons Per Hour; or Million Btu Per Hour
	Miscellaneous (Subpart X):	
X01	Open Burning/Open Detonation	Any Unit of Measure Listed Below
X02	Mechanical Processing	Short Tons Per Hour; Metric Tons Per Hour; Short Tons Per Day; Metric Tons Per Day; Pounds Per Hour; Kilograms Per Hour; Gallons Per Hour; Liters Per Hour; or Gallons Per Day
X03	Thermal Unit	Gallons Per Day; Liters Per Day; Pounds Per Hour; Short Tons Per Hour; Kilograms Per Hour; Metric Tons Per Day; Metric Tons Per Hour; Short Tons Per Day; Btu Per Hour; or Million Btu Per Hour
X04	Geologic Repository	Cubic Yards; Cubic Meters; Acre-feet; Hectare-meter; Gallons; or Liters
X99	Other Subpart X	Any Unit of Measure Listed Below

UNIT OF MEASURE	UNIT OF MEASURE CODE
Gallons	G
Gallons Per Hour	E
Gallons Per Day	U
Liters	L
Liters Per Hour	H
Liters Per Day	V
Short Tons Per Hour	D
Metric Tons Per Hour	W
Short Tons Per Day	N
Metric Tons Per Day	S
Pounds Per Hour	J
Kilograms Per Hour	R
Million Btu Per Hour	X
Cubic Yards	Y
Cubic Meters	C
Acres	B
Acre-feet	A
Hectares	Q
Hectare-meter	F
Btu Per Hour	I

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XII. Process Codes and Design Capabilities *(Continued)*

EXAMPLE FOR COMPLETING ITEM XII (Shown in line number X-1 below): A facility has a storage tank, which can hold 533.788 gallons.

Line Number	A. Process Code (From list above)	B. PROCESS DESIGN CAPACITY 1. Amount (Specify)	B. PROCESS DESIGN CAPACITY 2. Unit Of Measure (Enter code)	C. Process Total Number Of Units	For Official Use Only
X 1	S 0 2	533.788	G	001	
1	S 0 1	(Building H-22) 14,080.	G	001	
2	S 0 1	(Building A-26) 568.	G	001	
3	X 0 1	Waste propellant 1.0	N	001	
4	X 0 1	Waste detonators .05	N	001	
5	S 0 1	(Magazene D-2) 35.	Y	001	
6		.			
7		.			
8		.			
9		.			
10		.			
11		.			
12		.			
13		.			

NOTE: If you need to list more than 13 process codes, attach an additional sheet(s) with the information in the same format as above. Number the lines sequentially, taking into account any lines that will be used for "other" processes (i.e., D99, S99, T04 and X99) in item XIII.

XIII. Other Processes *(Follow instructions from item XII for D99, S99, T04 and X99 process codes)*

Line Number (Enter #s in seq w/XII)	A. Process Code (From list above)	B. PROCESS DESIGN CAPACITY 1. Amount (Specify)	B. PROCESS DESIGN CAPACITY 2. Unit Of Measure (Enter code)	C. Process Total Number Of Units	D. Description Of Process
X 1	T 0 4	.			In-situ Vitrification
1		.			
2		.			
3		.			
4		.			

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XIV. Description of Hazardous Wastes

A. EPA HAZARDOUS WASTE NUMBER - *Enter the four-digit number from 40 CFR, Part 261 Subpart D of each listed hazardous waste you will handle. For hazardous wastes which are not listed in 40 CFR, Part 261 Subpart D, enter the four-digit number(s) from 40 CFR, Part 261 Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.*

B. ESTIMATED ANNUAL QUANTITY - *For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non-listed waste(s) that will be handled which possess that characteristic or contaminant.*

C UNIT OF MEASURE - *For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:*

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
POUNDS	P	KILOGRAMS	K
TONS	T	METRIC TONS	M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

D. PROCESSES

1. PROCESS CODES:

For listed hazardous waste: For each listed hazardous waste entered in column A select the code(s) from the list of process codes contained in item XII A. on page 3 to indicate how the waste will be stored, treated, and/or disposed of at the facility.

For non-listed hazardous waste: For each characteristic or toxic contaminant entered in column A, select the code(s) from the list of process codes contained in item XII A. on page 3 to indicate all the processes that will be used to store, treat, and/or dispose of all the non-listed hazardous wastes that possess that characteristic or toxic contaminant.

NOTE: THREE SPACES ARE PROVIDED FOR ENTERING PROCESS CODES. IF MORE ARE NEEDED:

1. *Enter the first two as described above.*
2. *Enter "000" in the extreme right box of item XIV-D(1).*
3. *Use additional sheet, enter line number from previous sheet, and enter additional code(s) in item XIV-E.*

2. PROCESS DESCRIPTION: *If a code is not listed for a process that will be used, describe the process in the space provided on the form (D.(2)).*

NOTE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER - Hazardous wastes that can be described by more than one EPA Hazardous Waste Number shall be described on the form as follows:

1. *Select one of the EPA Hazardous Waste Numbers and enter it in column A. On the same line complete columns B, C and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.*
2. *In column A of the next line enter the other EPA Hazardous Waste Number that can be used to describe the waste. In column D(2) on that line enter "included with above" and make no other entries on that line.*
3. *Repeat step 2 for each EPA Hazardous Waste Number that can be used to describe the hazardous waste.*

EXAMPLE FOR COMPLETING ITEM XIV (shown in line numbers X-1, X-2, X-3, and X-4 below) - A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non-listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

Line Number	A. EPA HAZARD WASTE NO. (Enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (Enter code)	D. PROCESS (1) PROCESS CODES (Enter)	D. PROCESS (2) PROCESS DESCRIPTION (If a code is not entered in D(1))
X 1	K 0 5 4	900	P	T 0 3 D 8 0	
X 2	D 0 0 2	400	P	T 0 3 D 8 0	
X 3	D 0 0 1	100	P	T 0 3 D 8 0	
X 4	D 0 0 2				Included With Above

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XIV. Description of Hazardous Wastes *(Continued; use additional sheets as necessary)*

Line Number	A. EPA Hazardous Waste No. (Enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (Enter code)	D. PROCESSES (1) PROCESS CODES (Enter code)	D. PROCESSES (2) PROCESS DESCRIPTION (If a code is not entered in D(1))
1	D003	50	T	X01	
2	D001				included with above
3	F001				included with above
4	F003				included with above
5	D006	22	T	S01	
6	D011			S01	included with above
7	D006	22	T	S01	
8	F001	7	T	S01	
9	D001				included with above
10	D002	7	T	S01	
11	D001	14	T	S01	
12	F001				included with above
13	F005				included with above
14	D001	5	T	S01	
15	D007				included with above
16	D035				included with above
17	D001	7	T	S01	
18	D003		T	S01	included with above
19	U159	1	T	S01	
20	U223	1	T	S01	
21	D001	0.5	T	S01	
22	D002	0.5	T	S01	
23	D003	0.5	T	S01	
24	D005	0.5	T	S01	
25	D006	0.5	T	S01	
26	D007	0.5	T	S01	
27	D008	0.5	T	S01	
28	D009	0.5	T	S01	
29	D011	0.5	T	S01	
30	D018	0.5	T	S01	
31	D035	0.5	T	S01	
32	D038	0.5	T	S01	
33	U002	0.5	T	S01	

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XIV. Description of Hazardous Wastes *(Continued; Additional Sheet)*

Line Number	A. EPA Hazardous Waste No. (Enter code)	B. Estimated Annual Quantity of Waste	C. Unit of Measure (Enter code)	D. PROCESSES (1) PROCESS CODES (Enter code)	D. PROCESSES (2) PROCESS DESCRIPTION (If a code is not entered in E(1))
34	U009	0.5	T	S01	
35	U012	0.5	T	S01	
36	U041	0.5	T	S01	
37	U044	0.5	T	S01	
38	U053	0.5	T	S01	
39	U056	0.5	T	S01	
40	U061	0.5	T	S01	
41	U113	0.5	T	S01	
42	U151	0.5	T	S01	
43	U154	0.5	T	S01	
44	U159	0.5	T	S01	
45	U188	0.5	T	S01	
46	U196	0.5	T	S01	
47	U205	0.5	T	S01	
48	U210	0.5	T	S01	
49	U213	0.5	T	S01	
50	U220	0.5	T	S01	
51	U223	0.5	T	S01	
52	U226	0.5	T	S01	
53	U239	0.5	T	S01	
54	P002	0.5	T	S01	
55	P015	0.5	T	S01	
56	P054	0.5	T	S01	

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XV. Map	see Part B application

Attach to this application a topographic map, or other equivalent map, of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in this map area. See instructions for precise requirements.

XVI. Facility Drawing	see Part B application

All existing facilities must include a scale drawing of the facility (See instructions for more detail).

XVII. Photographs	see Part B application

All existing facilities must include photographs (aerial or ground-level) that clearly delineate all existing structures; existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas (see instructions for more detail).

XVIII. Certification(s)	

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Owner Signature	Date Signed
	4.3.2003
Name and Official Title (Type or print)	
Donald E. Shaffer, President	
Owner Signature	Date Signed
Name and Official Title (Type or print)	
Operator Signature	Date Signed
Name and Official Title (Type or print)	
Operator Signature	Date Signed
Name and Official Title (Type or print)	

XIX. Comments	

Note: Mail completed form to the appropriate EPA Regional or State Office. (Refer to instructions for more information)