

24915-70-GPE-GGPT-00035

Resource Conservation and Recovery Act (RCRA)

**Class 2 Hazardous Waste Storage & Treatment
Permit Modification Request, Addition of GB
Containerized Warhead Processing at the Static
Detonation Chamber (SDC) 1200**

for the Blue Grass Chemical Agent-Destruction Pilot Plant

Blue Grass Army Depot, Richmond, Kentucky

EPA ID KY8-213-820-105



Submitted To:

Energy and Environment Cabinet
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1.0 OVERVIEW

This document contains a Class 2 Permit Modification Request (PMR) for the addition of processing GB containerized rocket warheads at the Blue Grass Chemical Agent-Destruction Pilot Plant (BGCAPP) Static Detonation Chamber (SDC) 1200 hazardous waste storage and treatment facility. The BGCAPP SDC 1200 Facility is located at 431 Battlefield Memorial Highway, Richmond, Kentucky. The Bechtel Parsons Blue Grass (BPBG) Joint Venture (JV) is the operator of the BGCAPP and is a Co-Permittee with Blue Grass Army Depot (BGAD) under the Resource Conservation and Recovery Act (RCRA) Part B Permit (EPA ID #KY8-213-820-105, AI #2805) issued by the Kentucky Department for Environmental Protection (KDEP), Division of Waste Management (DWM). The SDC 1200 is currently permitted to process drained, containerized M56 rocket warheads (VX), munitions wastes and process wastes.

This PMR is being submitted in accordance with 401 Kentucky Administrative Regulation (KAR) 39:060 incorporating Title 40 Code of Federal Regulations (CFR) §270.42(c). The requested modifications to the Permit are as follows:

- Addition of processing drained and containerized GB warheads at the SDC 1200 Facility
 - Updated Permit Application Language
 - Revised Permit Language
 - Part A Revisions

These proposed changes are being submitted as Class 2 modifications requiring approval consistent with 40 CFR § 270.42(d)(2)(ii)(B) and 40 CFR § 270.42 Appendix I (d) *Other Modifications (1) In the case of modifications not explicitly listed in appendix I of this section, the permittee may submit a Class 3 modification request to the Agency, or he or she may request a determination by the Director that the modification should be reviewed and approved as a Class 1 or Class 2 modification. If the permittee requests that the modification be classified as a Class 1 or 2 modification, he or she must provide the Agency with the necessary information to support the requested classification.* These modifications do not change the Permittees' ability to provide protection to human health and the environment.

*Items in **RED** have been added and items with a strikethrough have been removed.

2.0 JUSTIFICATION AND DESCRIPTION OF PERMIT MODIFICATION

Per 401 KAR 39:060 Section 5 and 40 CFR §270.42(b)(1), the applicant is required to describe and explain the need for the modifications. The following section of this PMR describes and discusses the rationale for these modifications.

This permit modification seeks approval for the incorporation of processing overpacked and non-overpacked, drained, containerized GB warheads at the SDC 1200 facility. These modifications are vital to ensure the contingent operational readiness of SDC 1200 once the VX campaign has completed. Additionally, the enhanced capability to process GB at the SDC 1200 facility will effectively address any anticipated operational challenges in handling GB munitions at the SDC 2000. The proposed alternative presents operational flexibility through the utilization of well-established and innovative technologies currently in use.

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In support of completion of agent operations at the Static Detonation Chambers, BGCAPP is pursuing the potential processing of GB Containerized Rocket Warheads (CRWs) within the SDC 1200 unit. Emissions testing was previously performed for the SDC 2000 with GB in accordance with 24915-SYS-5PL-80-00002, Static Detonation Chamber (SDC) 2000 Agent Demonstration Test Plan, and for the SDC 1200 with VX in accordance with 24915-SYS-5PL-70-00002, Static Detonation Chamber (SDC) 1200 Agent Demonstration Test Plan. Results for both units fell within established requirements of the Multi-Pathway Health Risk Assessment. Notably, the demonstrated chemical agent feed rate for GB operations at the SDC 2000 was 17 lbs/hr (see 24915-SYS-5RP-80-00007, Static Detonation Chamber (SDC) 2000 Agent Demonstration Test Report). Although the detonation chambers (DCs) of each unit vary in capacity, the two units share nearly identical offgas treatment systems (OTS). Processing of GB CRWs in the SDC 1200 would be limited to approximately 6 CRWs/hr containing no more than approximately 3.2 lbs of chemical agent. Given similarities in the OTS and greater than 5-fold reduction in waste feed rate, the existing Emissions Test results for GB processing in the SDC 2000 are bounding for potential emissions from the SDC 1200 for GB processing. Similarly, prior calculations (100118441-CDPO426) have demonstrated that six-nines destruction and removal efficiency is maintained continuously for feed rates as low as 2 CRWs/hr (i.e., 1 feed box/hr) if stack emissions remain below 1.5 VSL. With the proposed action level of 1 VSL at the stack, BGCAPP will continuously demonstrate GB Destruction and Removal Efficiency (DRE) throughout operations. For this reason and in support of ensuring the rapid elimination of this waste stream, BGCAPP is proposing not to perform agent demonstration testing for GB at the SDC 1200.

3.0 DESCRIPTION OF CHANGES

3.1 Requested Changes and Related Supporting Documents

Per 401 KAR 39:060 Section 5 (40 CFR §270.42(b)(1)(i)), the applicant is required to describe the exact changes to be made to the Permit and its supporting documents. The specific requested Permit changes are shown below in red.

E.III.A.(1) Permitted Waste Streams, Descriptions, and Codes

Waste Stream	Waste Codes	Process Codes and Waste Description
E.1	D001, D003-D011, N001 , N002	X99, S01, and T04; Separated VX or GB M56 Rocket Warhead Sections in Canisters or Overpacks
E.2	D004-D011, N201 , N202	S01; SDC Residue – Metal Munition Fragments and Ash
E.3	D004-D011, N001 , N002	S01, X99; Buffer Tank Solid Residues
E.4	D004-D011, D022, N001 , N002	S01; Cyclone Dust Residues and Filters
E.5	D002, D004-D011, N801 , N802	S01 and S02; Off-gas Treatment System (OTS) Scrubber Liquids
E.6	D001, D004-D011, D022, N001 , N002	S01; Agent Derived, Listed Secondary Waste
E.7	D001-D011, D018, D019, D022, D026, D027-D030, D037, D039, D040, F001-F005, N001 , N002, N801 , N802, N901 , N902, N1001 , N1002	S01; Miscellaneous Maintenance and Secondary Waste including but not limited to PPE, Oils, Hydraulic Fluids, Paints, Solvents, and Other Wastes Exhibiting Characteristics or Potentially Listed

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Waste Stream	Waste Codes	Process Codes and Waste Description
E.8	D001-D011, D018, D019, D022, D027-D030, D035, D038, D039, D040, F001-F005, N001, N002, N701, N702, N901, N902	S01; Lab Wastes and Solvents from Testing for VX or GB Agent and by-product contamination
E.9	D002, D003, D004-D011, N901, N902	S01; Spent Decontamination Solutions
E.10	D001, D003, D004-D011, N001, N002	X99, S01, and T04; Agent and or Explosive Contaminated Secondary Waste to be Treated in the Static Detonation Chamber (SDC)
E.11	D004-D011, D022, N001, N002	S01; Agent Contaminated Carbon Filters, HEPA Filters, and Prefilters determined to have been exposed to agent

E.III.A.(3) Waste Codes

Code	Hazardous Waste
N001	GB (isopropyl methyl phosphono-fluoridate)
N001	Process Waste (Agent and or Explosive Contaminated Secondary Waste, Buffer Tank Solid Residues, Cyclone Dust Residues and Filters, Agent Derived, Listed Secondary Waste) associated with GB munitions
N001	Non-process wastes (PPE, filters, trash, concrete, rags, parts/tools, and related waste) associated with GB munitions
N001	Spent carbon, pre filters, and HEPA filters associated with GB munitions
N001	Maintenance/miscellaneous wastes associated with GB munitions
N002	VX (O-ethyl S-(2-diisopropylaminoethyl) methylphosphonothiolate)
N002	Process Waste (Agent and or Explosive Contaminated Secondary Waste, Metal Munition Fragments and Ash, Buffer Tank Solid Residues, Cyclone Dust Residues and Filters, Agent Derived, Listed Secondary Waste) associated with VX munitions
N002	Non-process wastes (PPE, filters, trash, concrete, rags, parts/tools, and related waste) associated with VX munitions
N002	Spent carbon, pre filters, and HEPA filters associated with VX munitions
N002	Maintenance/miscellaneous wastes associated with VX munitions
N102	Uncontaminated M67 Rocket Motor Assembly, Propellant Component of the Rocket Motor, Shipping Firing Tubes, and End-caps associated with VX munitions
N201	Metal Parts Treater Residue or Static Detonation Chamber Residues and Ash, and Post Thermal Oxidizer Solids and Sludges associated with GB munitions or related wastes
N202	Metal Parts Treater Residue or Static Detonation Chamber Residues and Ash, and Post Thermal Oxidizer Solids and Sludges as-associated with VX munitions or related wastes
N701	Lab Wastes associated with treated GB wastes and GB containing lab wastes treated to destroy agent with caustic
N702	Lab Wastes associated with treated VX wastes and VX containing lab wastes treated to destroy agent with caustic
N801	Off-gas Treatment (OTM) condensate associated with treated GB wastes, Off-gas Treatment System liquids including Quench Fluid, Scrubber Fluids, Electrostatic Precipitator Fluids, Process Fluid Bleed Water, Post-Thermal Oxidizer Condensates and related wastes associated with Static Detonation Chamber treatment of GB munitions
N802	Off-gas Treatment (OTM) condensate associated with treated VX wastes, Off-gas Treatment System liquids including Quench Fluid, Scrubber Fluids, Electrostatic Precipitator Fluids, Process Fluid Bleed Water, Post-Thermal Oxidizer Condensates and related wastes associated with Static Detonation Chamber treatment of VX munitions.
N901	Spent Decontamination Solution associated with treated GB wastes
N902	Spent Decontamination Solution associated with treated VX wastes

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Code	Hazardous Waste
N1001	GB contaminated waste equipment, tools, and construction materials that have been decontaminated in accordance with United States Army Guidelines and have been determined to be safe for storage or transport, and approved by the Cabinet as no longer acutely hazardous
N1002	VX contaminated waste equipment, tools, and construction materials that have been decontaminated in accordance with United States Army Guidelines and have been determined to be safe for storage or transport, and approved by the Cabinet as no longer acutely hazardous

E.III.F.(2) Air Monitoring Requirements

Level	GPL ^(a)	WPL ^(b)	STEL ^(c)	VSL ^(d)
Averaging Time	24 hrs.	8 hrs.	15 min	NA
VX (mg/m ³)	6x10 ⁻⁷	1x10 ⁻⁶	1x10 ⁻⁵	1x10 ⁻⁵
GB (mg/m ³)	1x10 ⁻⁶	3x10 ⁻⁵	1x10 ⁻⁴	1x10 ⁻⁴
Monitoring Method	Historical ^(e)	Historical ^(e)	NRT ^(f)	NRT ^(f)

(a) GPL is the General Population Limit and is an airborne agent exposure limit for the general population

(b) WPL is Worker Population Limit and is an airborne agent exposure limit for the worker population

(c) STEL is Short Term Exposure Limit and is a concentration based on a 15-minute exposure for an unprotected worker but is evaluated with an instrument using the shortest analytical cycle time practical to obtain accurate results. Since most NRT cycle times are less than 15min (typically 5-6 min), confirmed readings and exposure durations are used to calculate whether the STEL has been reached or exceeded.

(d) VSL is Vapor Screening Level and is an agent vapor concentration-only value independent of time. As such, it is used to define a level of contamination for items, wastes, engineering controls systems (for example, filter beds and vestibules) and facilities under specific environmental conditions. VSL is the readout level of certain NRT monitors and the value is applied to process or operational monitoring as opposed to worker exposure.

(e) Historical monitoring is used when the sample analyzed represents an extended period of time and the results are not known until laboratory analysis is completed after the sampling event has been completed.

(f) NRT is Near Real-Time monitoring and is conducted with instruments that have the capability to collect, analyze, and report or display results within 15 minutes. They also provide audible and remote alarms when levels are detected at, or above, a specific alarm set point.

E.III.F.(3) Environmental Releases

The Permittee shall operate the facility to prevent an environmental release of hazardous waste or hazardous waste constituents.

An environmental release shall include but is not limited to the following:

- a. Confirmed agent detection equal to or greater than 0.50 VSL of GB or VX at the ESM Ventilation Stack, or otherwise releasing agent from the ESM
- b. Confirmed agent detection equal to or greater than 0.50 VSL of GB or VX at any EB Ventilation Stack, or otherwise releasing agent from the SDC EB
- c. Confirmed agent detection equal to or greater than 1.0 VSL of GB or 0.33 SEL (10 VSL) of VX at the OTS stack
- d. Confirmed agent detection of agent equal to or greater than general population limit (GPL) at a perimeter monitoring location
- e. Confirmed detection of agent in an area that is not under engineering controls or in an airlock that is opened to the environment
- f. Confirmed detections during movement of containers in accordance with E.III.I.(14)
- g. The non-transient loss of engineering controls in an agent contaminated area that results in category A, category B, category A/B, or category C air pressures equal to or greater than the ambient air pressure in category D areas
- h. A release of agent outside of engineering controls.

The listed criteria represent the concentration of agent prior to any sample dilution.

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E.III.I.(9) Permitted Container Storage

Condition	Container Storage Area	Description of Hazardous Wastes	Waste Code	Capacity Limits and Storage Requirements Waste Capacity	Secondary Containment
E.III.I.(9)(a)	SDC 1200 Service Magazine (ESM)	Chemical agent (VX/GB) containerized M56 rocket warheads, and containerized M56 rocket warheads in overpacks. Waste stream E.1 specified in E.III.A.(1).	D003, N001, N002	475 drained and containerized VX warheads. 19 skids with 25 warheads/skid. 500 pounds (lbs.) Net Explosive Weight (NEW) Pallets and skids shall be stacked no more than two high and ensure safe storage of containers and munition items While N001 or N002 waste is present, the ESM door shall remain closed when the ESM is not being accessed	Spill pallets; portable secondary containment units
E.III.I.(9)(b)	SDC Storage Area	Munitions Items to be treated and various process wastes, and secondary wastes that will be generated at the SDC-1200. Waste streams E.1 – E.11 specified in E.III.A.(1).	D001-D011, D022, D027-D030, D037, D039, D040, F001-F005, N001, N002, N201, N202, N901, N902	2,200 gallons; 15 lbs. NEW	Spill pallets; portable secondary containment units
E.III.I.(9)(c)	OTS Storage	Secondary wastes including Waste streams E.3 – E.11 specified in E.III.A.(1).	D001-D011, D022, D026-D030, D037, D039, D040, F001-F005, N001, N002, N201, N202, N801, N802, N901, N902, N1001, N1002	2,200 gallons; 0 lbs. NEW Greater than 1 VSL waste shall not be stored in this area	Spill pallets; portable secondary containment units
E.III.I.(9)(d)	OTS Storage Area 1	Secondary wastes including Waste streams E.3 – E.11 specified in E.III.A.(1).	D001-D011, D022, D026-D030, D037, D039, D040, F001-F005, N001, N002, N201, N202, N801, N802, N901, N902, N1001, N1002	2,500 gallons; 0 lbs. NEW Greater than 1 VSL waste shall not be stored in this area	Spill pallets; portable secondary containment units
E.III.I.(9)(e)	OTS Storage Area 2	Off-Gas Treatment System Liquid Waste Shipping Area, Waste streams collected in Bleed Water Tank. Waste streams E.2 – E.11 specified in E.III.A.(1)	D002, D004-D008, D011, N801, N802	40,000 gallons, 0 lbs. NEW Two (2) 18,000-gallon portable containers	Integral secondary containment; Spill pallets; portable secondary containment units

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E.III.X.(2) Off-gas Treatment

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- Prior to initiating a feed event and while agent waste is being treated in the SDC 1200 the permittee shall:
- a. Continuously operate the Thermal Oxidizer (THO) in accordance with Attachment D, Process Information and E.III.X.(8), Operating Parameters.
 - b. Continuously operate an induced draft (ID) fan to maintain the THO and OTS at a pressure which is equal to or below the ambient air pressure.
 - c. Maintain a redundant ID fan and place it into service immediately in the event of a failure of the primary fan.
 - d. Maintain a backup power supply to continuously operate the OTS and implement its use in the event of an interruption in the primary power source.

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- 1 e. Continuously operate a carbon filtration unit with multiple banks of carbon to filter the OTS process stream
2 prior to releasing the stream to the atmosphere,
3 i. If agent is detected between banks of carbon waste feed shall be stopped, the carbon filter unit shall be taken
4 offline once any items in the DC are fully treated, and the carbon beds shall be replaced prior to feeding waste
5 to the SDC.
6 ii. The permittee shall provide notification to the Director prior to performing carbon filter changeout in
7 accordance with E.II.F. The notification shall include information explaining the necessity of the changeout.
8 f. OTS liquid shall not be shipped offsite unless it is cleared to less than 52 µg/L GB or to less than 80
9 µg/L VX.

10 **E.III.AA.(3) SDC 1200 Facility – Standards for Pressure Relief Devices in Gas/Vapor Service**

11 Pressure safety valves (PSVs) and pressure safety elements (PSEs) in gas/vapor service within the SDC 1200 facility
12 that have the potential to contact hazardous waste gas/vapor streams greater than or equal to 10 percent by weight
13 (wt.%) organics in the chemical agent VX or GB campaign are located within an area serviced by the SDC 1200
14 Enclosure Building HVAC System, which serves as a closed-vent system capable of capturing and transporting leakage
15 from the pressure relief devices to a control device as described in 40 CFR 264.1060; therefore, these are exempted
16 from monitoring requirements per 40 CFR 264.1054(c).

17 **E.III.CC.(3) Excluded Units**

- 18 a. The following containers are excluded from regulation under Subpart CC:
19 (i) Containers with a capacity less than 26.4 gallons (0.1 m³).
20 (ii) Rocket warheads containing approximately 1.2 gallons (0.0045 m³) of Chemical Agent VX or GB and 3.23
21 pounds (lbs.) of energetics.
22 (iii) Overpack containers designed to hold a single leaking rocket warhead.
23 b. Should conditions change such that the Permittee is no longer able to claim the exclusions or exemptions
24 identified in Appendix C-1, the Permittee shall immediately notify the Director and shall comply with the
25 requirements of 40 CFR 264 – Subpart CC.

26 **3.2 Part A Supplemental Information**

27 Added Waste Codes for GB containerized rocket warheads and associated processing
28 generated waste codes, See Part A submitted with this PMR for details. Changes on the Part
29 A are outlined with red boxes.

30 **3.3 Part B Supplemental Information**

31 The SDC 1200 System can process a variety of wastes. Changes in munition feed do not
32 require modification of the system, with exception of agent monitoring. Multiple chemical agents
33 will not be fed to the SDC within a campaign. An agent campaign change will be completed prior
34 to any change in agent feed. The SDC 1200 is currently permitted to process drained,
35 containerized M56 rocket warheads (VX), munitions wastes and process wastes.

36 The additional hazardous wastes managed or generated at the SDC 1200 Facility include:

- 37 1. Drained rocket warheads containing chemical agent GB

38 Detailed descriptions of the chemical agents and other wastes generated are provided in Table
39 3-1: Facility Waste Analyses Plan (WAP) Summary and Table 3-2: Composition of Chemical
40 Agents (VX/GB), Energetics, and Propellant.

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1 The HMWU addressed in this section of the permit application is considered a Miscellaneous
2 Unit (40 CFR 264 Subpart X). Wastes generated during SDC operations are accumulated in
3 containers in the EEB storage area and Bleed Water Tank (BWT). The containers will be stored
4 in permitted storage areas in the EEB (i.e., SDC storage, OTS Storage), outside of the EEB
5 (SDC 1200 Service Magazine (ESM) and OTS Storage 1), and the OTS liquid waste shipping
6 area (OTS Storage 2). Detailed descriptions of these units and the operations to be conducted
7 at the SDC 1200 Facility are provided in Section D.

8 **3.4 Part C Supplemental Information**

9 The VX and GB munitions and munitions components are treated in the SDC 1200 Facility.
10 These wastes are received from permitted HWMUs, the SDC 1200 service magazine (ESM), or
11 directly from the BGCAPP Main Plant.

SDC 1200 Feed Rates by Munition Type					
Munition Type	Agent	Pieces / Feed (projected)	Feeds / hr (projected)	Total Pieces / hr (projected)	Agent Heel %
M56 Warhead in Cannister (drained)	VX	2	3	6	5
M56 Warhead in Cannister (drained)	GB	2	3	6	12.5

% agent heel is an estimated quantity per drained containerized warheads and is not quantifiable.

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Table 3-1: Facility Waste Analyses Plan (WAP) Summary

Wastes Requiring Characterization ¹	Method of Treatment or Disposal	Type of Analysis ^{#, 1, 2}	Analytical Method ³ / Clearance Criteria (as Applicable)	Frequency of Analysis	Regulatory Requirement	Media Type
Static Detonation Chamber Residue (D004 – D011, N101 or N202)	SDC / Off-Site Shipment	TCLP Metals Agent Derived	EPA SW-846 Method 1311, 3015, 6020 ³ Generator Knowledge	As a minimum: During initial waste generation and when process changes, then annually	401 KAR 39:060 Section 3, 40 CFR 261.24	Solid
Buffer Tank Residues (D004 – D011, N001 or N002)	SDC / Off-Site Shipment	TCLP Metals Agent-Derived Headspace Monitoring Agent Screen	EPA SW-846 Method 1311, 3015, 6020 ³ Generator Knowledge MINICAMS® or DAAMS Site and waste specific extraction/analytical methods for agent developed IAW the approved LAMP	As a minimum: During initial waste generation and when process changes, then annually	401 KAR 39:060 Section 3, 40 CFR 261.24 401 KAR 39:060 Section 3, 40 CFR 261.3(a)(2)(iv) and (c)(2)(i) Based Upon U.S. Army Policy and Procedures 401 KAR 39:060 Section 3, 40 CFR 261.3(a)(2)(iv) and (c)(2)(i)	Solid
Cyclone Dust Residues and Filters (D004 – D011, D022, N001 or N002)	Off-Site Shipment	TCLP Metals Agent Derived	EPA SW-846 Method 1311, 3015, 6020 ³ Generator Knowledge	As a minimum: During initial waste generation and when process changes, then annually	401 KAR 39:060 Section 3, 40 CFR 261.24 401 KAR 39:060 Section 3, 40 CFR 261.3(a)(2)(iv) and (c)(2)(i)	Solid
Brine Liquids from Off-Gas Treatment System (OTS) Scrubbers (D002, D004 – D011, N001 or N002)	Off-Site Shipment	Corrosivity (pH) TCLP Metals Agent Derived	EPA SW-846 Methods 9040, 9041, 9045 ³ EPA SW-846 Method 1311, 3015, 6020 ³ Generator Knowledge	As a minimum: During initial waste generation and when process changes, then annually	401 KAR 39:060 Section 3, 40 CFR 261.22 401 KAR 39:060 Section 3, 40 CFR 261.3(a)(2)(iv) and (c)(2)(i) 401 KAR 39:060 Section 3, 40 CFR 261.24	Liquid

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Wastes Requiring Characterization ¹	Method of Treatment or Disposal	Type of Analysis ^{†, 1, 2}	Analytical Method ³ / Clearance Criteria (as Applicable)	Frequency of Analysis	Regulatory Requirement	Media Type
Miscellaneous Maintenance and Secondary Wastes (D001 –D011, D018, D019, D022, D026, D027 - D030, D037, D039, D040, F001 – F005, N001 or N002, N201 or N202, N901 or N902)	Decontamination / Off-site Shipment	Ignitability Corrosivity (pH) Reactivity TCLP metals Organics Agent screen (VX/GB) – liquids Headspace Monitoring – solids	EPA SW-846 Method 1010 ³ EPA SW-846 Methods 9040, 9041, 9045 ³ Generator Knowledge EPA SW-846 Method 1311, 3015, 6020 / 7470 ³ EPA SW-846 Methods 1311, 5030, 8260, 8270 ³ Site and waste specific extraction/analytical methods for agent developed IAW the approved LAMP MINICAMS® or DAAMS	Before Disposal	401 KAR 39:060 Section 3; 40 CFR 261.21 401 KAR 39:060 Section 3; 40 CFR 261.22 401 KAR 39:060 Section 3; 40 CFR 261.23 401 KAR 39:060 Section 3; 40 CFR 261.24 401 KAR 39:060 Section 3; 40 CFR 261.24, 261.31 401 KAR 39:060 Section 3; 40 CFR 261.3(a)(2)(iv) and (c)(2)(i) 401 KAR 39:060 Section 3; 40 CFR 261.3(a)(2)(iv) and (c)(2)(i)	Liquid / Solid
Laboratory Wastes (D001 –D011, D018, D019, D022, D027 - D030, D035, D038, D039, D040, F001 – F005, N001 or N002, N802 or N702, N901 or N902)	Decontamination / Off-site Shipment	Ignitability Corrosivity (pH) Reactivity TCLP metals Organics Cresols, Pentachlorophenol (phenols) Agent screen (VX) – liquids Headspace Monitoring – solids	EPA SW-846 Method 1010 ³ EPA SW-846 Methods 9040, 9041, 9045 ³ Generator Knowledge EPA SW-846 Method 1311, 3015, 6020 / 7470 ³ EPA SW-846 Methods 1311, 5030, 8260, 8270 ³ EPA SW-846 Method 1311, 3510, 3580, 8041 ³ Site and waste specific extraction/analytical methods for agent developed IAW the approved LAMP MINICAMS® or DAAMS	During initial waste generation and when process changes, then annually; agent screen at frequency required to clear each waste batch for off-site shipment	401 KAR 39:060 Section 3; 40 CFR 261.21 401 KAR 39:060 Section 3; 40 CFR 261.22 401 KAR 39:060 Section 3; 40 CFR 261.23 401 KAR 39:060 Section 3; 40 CFR 261.24 401 KAR 39:060 Section 3; 40 CFR 261.24, 261.31 401 KAR 39:060 Section 3; 40 CFR 261.24 401 KAR 39:060 Section 3; 40 CFR 261.3(a)(2)(iv) and (c)(2)(i) 401 KAR 39:060 Section 3; 40 CFR 261.3(a)(2)(iv) and (c)(2)(i)	Liquid / Solid

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Wastes Requiring Characterization ¹	Method of Treatment or Disposal	Type of Analysis ^{‡, 1, 2}	Analytical Method ³ / Clearance Criteria (as Applicable)	Frequency of Analysis	Regulatory Requirement	Media Type
Spent Decontamination Solution (D002, D003, D004 – D011, N901 or N902)	Off-site Shipment	Corrosivity (pH)	EPA SW-846 Methods 9040, 9041, 9045 ³	Before Disposal	401 KAR 39:060 Section 3; 40 CFR 261.22	Liquid
		TCLP metals	EPA SW-846 Method 1311, 3015, 6020 / 7470 ³		401 KAR 39:060 Section 3; 40 CFR 261.24	
		Agent Screen	Site and waste specific extraction/analytical methods for agent developed IAW the approved LAMP		401 KAR 39:060 Section 3; 40 CFR 261.3(a)(2)(iv) and (c)(2)(i)	
Agent and/or Explosively Contaminated Waste (D001, D003, D004 – D011, N001 or N002)	SDC / Off-Site Shipment	Ignitability/Reactivity	Generator knowledge		401 KAR 39:060 Section 3; 40 CFR 261.21 / 261.23	Solid
		TCLP Metals	EPA SW-846 Method 1311, 3015, 6020 / 7470 ³		401 KAR 39:060 Section 3; 40 CFR 261.24	
		Headspace Monitoring	MINICAMS® or DAAMS		401 KAR 39:060 Section 3; 40 CFR 261.3(a)(2)(iv) and (c)(2)(i)	
Carbon Filter, Prefilters and HEPA Filters (D004 - D011, D022, N001 or N002)	Off-site Shipment	Generator Knowledge	MINICAMS® or DAAMS	NRT Before Disposal	401 KAR 39:060 Section 3; 40 CFR 261.3(a)(2)(iv) and (c)(2)(i)	Solid
		TCLP Metals	EPA SW-846 Method 1311, 3015, 6020 / 7470 ³		401 KAR 39:060 Section 3; 40 CFR 261.24	

NOTES:

‡ Note that these represent all potential characterization requirements for a waste stream or its components; however, some parameters will not apply in cases where a particular waste stream or waste stream component can be characterized by generator knowledge or previous sampling and analysis results.

1 Generator knowledge used to determine whether waste is agent derived. Headspace monitoring used to evaluate potential risks/hazards associated with handling waste solids potentially contaminated with low levels of agent.

2 Results of "total" analyses and composed of 100 percent solids can be divided by a factor of twenty (i.e., as stated in TCLP Method 1311) and compared to the toxicity contaminant limits for each RCRA metal or other contaminant identified in the toxicity characteristic. This approach will be used to characterize wastes and determine if waste numbers D004-D011 or other waste numbers for toxicity are applicable.

3 These are suggested methods, from EPA SW-846 and other sources as referenced in 401 KAR 39:060 Section 2 (referencing 40 CFR. 260.11); the actual method used for any particular analysis will depend upon factors such as previous generator knowledge, off-site laboratory recommendations, and the specific matrix and application. See Table C-3 for potential alternative analytical methods to those listed for each waste stream. Note that not all listed analytical methods will be used for a waste stream if generator knowledge is sufficient for a characterization of the parameter of interest

Table 3-2: Composition of Chemical Agents (VX/GB), Energetics, and Propellant

Composition	VX (%)	GB (%)
O-ethyl S-(2-diisopropylaminoethyl) methylphosphonothiolate (VX)	92.7094	
Isopropyl methylphosphonofluoridate (GB)		80.2427
Diisopropylamine (DIPA)	0.1600	
Diisopropylcarbodiimide (DICDI)	0.3000	
Dicyclohexylcarbodiimide (DCCDI)	1.6000	
Diisopropylaminoethanethiol (RSH)	0.7000	
1,3-diisopropylurea (DIPU)	0.3000	1.7549
Pyrodiester [Diethyl dimethylpyrophosphonate] ((CH ₃ CH ₂ O)(CH ₃)P(O)) ₂ O	1.5000	
Diisopropyl methylphosphonate (DIMP)		11.2197
Hydrofluoric acid		0.2217
Isopropyl fluoride		0.0297
Tributylamine (TBA)		2.26831
Chloroform		0.0693
Isopropyl alcohol		0.4752
Isopropyl methylphosphonic acid (IMPA)		0.5370
Bis(2-diisopropylaminoethyl) disulfide (RSSR)	0.7000	
Other Organics	2.2700	2.2766
Aluminum	0.000183	
Nickel	0.00000135	
Copper	0.0000578	
Iron	0.0024	
Calcium	0.0154	
Silicon	0.01253	
Other Metals	0.0000375	
Total	100.000	100.000

Source: VX: Analysis of the VX agent from the Newport Chemical Agent Disposal Facility (NECDF)
GB: Analysis of the GB agent from the Anniston Chemical Agent Disposal Facility (ANCDF)

VX and GB Agent Purity

The agent purities shown in the above table are based on the source data. Purity of the Blue Grass inventory varies from date of manufacture, agent lot, and stabilizer used. There are 17 Agent Lot Numbers (ALN) within the GB 115mm munition inventory.

Documented agent purity sampling for the Blue Grass rocket inventory ranging from a low of 80.5% to a high of 95.7%, with one miscellaneous lot listed with an “unknown” agent purity.

Energetics

Energetics in warheads consists of Composition B (59.7% RDX [cyclotrimethylenetrinitramine], 38.81% TNT [2,4,6-trinitrotoluene], Calcium Silicate 0.50% and 0.99% wax).

3.5 Part F Supplemental Information

Table F-1b: Airborne and Related Exposure Limits for GB

Level	GPL	WPL	STEL ^(a)	VSL ^(b)
Averaging Time	24 hrs.	12 hrs.	15 min	Variable
Limit (mg/m ³)	1x10 ⁻⁶	2x10 ⁻⁵	1x10 ⁻⁴	1x10 ⁻⁴
Monitoring Method ^{(e)(f)}	Historic	Historic	Near real-time (NRT)	NRT

Notes:

- The STEL concentration is based on a 15-minute exposure for an unprotected worker, but is evaluated with an instrument using the shortest analytic cycle time practical to obtain accurate results. Since most NRT cycle times are less than 15min (typically 5-6min), confirmed readings, and durations are used to calculate whether the STEL has been reached or exceeded.
- The VSL is an agent vapor concentration-only value independent of time. As such, it is used to define a level of cleanliness for items, wastes, engineering controls systems (e.g., filter beds and vestibules) and facilities under specific environmental conditions. VSL is the readout level of certain NRT monitors and the value is applied to process or operational monitoring as opposed to worker exposure.
- The source emission limit (SEL) or allowable stack concentration (ASC) are vapor agent concentration values that are independent of time are measured with NRT instruments. The measured value is used for modeling and to ensure the GPL is not exceeded at the installation boundary. The higher concentration is used because of the moisture present in the air stream exiting the stack and the need to dilute this air prior to measurement with a MINICAMS®.
- Immediately dangerous to life or health (IDLH) monitoring with an NRT typically requires additional sample conditioning equipment to keep high levels of agent from saturating the detector.
- Historic monitoring is typically used where the sample analyzed represents an extended period of time and the results are not known until laboratory analysis is completed after the sampling event has been completed. As a result, AELs using historic monitoring are set at levels at which health effects are not expected to occur.
- Near real-time monitoring is conducted with instruments that have the capability to collect, analyze, and report or display results within 15 minutes. They also provide audible and remote alarms when levels are detected at, or above, a specific alarm set point.

3.6 Part L Supplemental Information

3.6.1 Part L: Organic Air Emissions [401 KAR 39:060 Section 5, 40 CFR §264.1030, §264.1050, and §264.1080]

3.6.1.1 L-2: Subpart BB

Subpart BB regulations applies to any pumps, valves, compressors, pressure relief devices, sampling connection systems, open-ended valves or lines, and flanges or other connectors, which contain or contact hazardous waste streams with equal or greater than 10 percent by weight total organics.

The chemical agent GB and VX will be present in the munitions at concentrations greater than 10 percent. The agents have a vapor pressure of <0.3 kiloPascals (kPa) at 20°C, as shown in Table L-1, and are therefore considered heavy liquids per 40 CFR §264.1031. Upon heating of the munitions to the final operating temperature, the heavy agent liquids will no longer be present, and the SDC system will contain only gases.

Table L-1: Chemical Agent GB and VX Vapor Pressures

Agent	Vapor Pressure
GB*	0.28 kPa (2.1 mm Hg) at 68°F (20°C) ¹
VX*	0.000093 kPa (0.0007 mm Hg) at 77°F (25°C) ²

*All other non-agent organics in munitions containing GB or VX are less than 20 percent by weight; consequently, only GB and VX vapor pressures are considered in classifying these as heavy liquids.

¹CDC, SARIN (GB): Nerve Agent, 2015. Retrieved March 6, 2017, from http://www.cdc.gov/niosh/ershdb/emergencyresponsecard_29750001.html.

²CDC, VX: Nerve Agent, 2015. Retrieved March 6, 2017, from https://www.cdc.gov/niosh/ershdb/emergencyresponsecard_29750005.html

The SDC 1200 and OTS contain no pumps, compressors, pressure relief devices, sampling connection systems, or open-ended valves or lines regulated under Subpart BB.

3.6.1.2 L-3: Subpart CC

Subpart CC under 40 CFR §264.1080 requires air emission controls be used for Subpart J tanks, Subpart I containers, and Subpart X miscellaneous units which manage hazardous wastes containing an average volatile organic concentration of greater than or equal to 500 ppm by weight at the point of waste origination.

The SDC 1200 Service Magazine (ESM) will be a Subpart I container storage facility used to store munitions prior to treatment in the SDC. The munitions consist of:

1. Warheads (M56) containing < 1.2 gallons capacity of chemical agent VX or GB and 3.23 lbs. of energetics – total volume <0.0076 m³.

4.0 OTHER APPLICABLE INFORMATION

Per 401 KAR 39:060 Section 5 (40 CFR §270.42(b)(1)(iv)), the applicant is required to provide applicable information required by 40 CFR 270.13 through 270.22, 270.62, 270.63 and 270.66. Appendix A provides a listing of these as well as applicable 40 CFR 264 requirements (incorporated by reference); requirements affected by this PMR are indicated, along with the section(s) of the permit that would be modified or clarified as provided in Section.

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Modification Request, Addition of GB Containerized Warhead Processing at the Static
Detonation Chamber (SDC) 1200**

**APPENDIX A. PERMIT RELATED INFORMATION OR
DOCUMENTS AFFECTED BY PMR**

Regulatory Citation(s) 401 KAR 39 (incorporating 40 CFR Part 264 where applicable)	Description of Requirement	Modified or Clarified Information		
		Yes	No	Sections of the Part B Permit Application Modified or Modified Documents
39:090 Sec. 1 (264 Subpart B)	General Facility Standards			
39:090 Sec. 1 (§264.11)	Identification number		✓	
39:090 Sec. 1 (§264.12)	Required notices		✓	
39:090 Sec. 1 (§264.13)	General waste analysis	✓		
39:090 Sec. 1 (§264.14)	Security		✓	
39:090 Sec. 1 (§264.15)	General inspection requirements		✓	
39:090 Sec. 1 (§264.16)	Personnel training		✓	
39:090 Sec. 1 (§264.17)	General requirements for ignitable, reactive, or incompatible wastes		✓	
39:090 Sec. 1	Location standards Geological Information		✓	
39:090 Sec. 1 (§264.19)	Construction quality assurance program		✓	
39:090 Sec. 1 (264 Subpart C)	Preparedness and Prevention			
39:090 Sec. 1 (§264.31)	Design and operation of facility	✓		
39:090 Sec. 1 (§264.32)	Required equipment		✓	
39:090 Sec. 1 (§264.33)	Testing and maintenance of equipment		✓	
39:090 Sec. 1 (§264.34)	Access to communication or alarm system		✓	
39:090 Sec. 1 (§264.35)	Required aisle space		✓	
39:090 Sec. 1 (§264.37)	Arrangements with local authorities		✓	
39:090 Sec. 1 (264 Subpart D)	Contingency Plan and Emergency Procedures			
39:090 Sec. 1 (§264.51)	Purpose and implementation of contingency plan		✓	
39:090 Sec. 1 (§264.52)	Content of contingency plan		✓	
39:090 Sec. 1 (§264.53)	Copies of contingency plan		✓	
39:090 Sec. 1 (§264.54)	Amendment of contingency plan		✓	
39:090 Sec. 1 (§264.55)	Emergency coordinator		✓	
39:090 Sec. 1 (§264.56)	Emergency procedures		✓	
39:090 Sec. 1 (264 Subpart E)	Manifest System, Recordkeeping, and Reporting			
39:090 Sec. 1 (§264.71)	Use of the manifest system		✓	
39:090 Sec. 1 (§264.72)	Manifest discrepancies		✓	
39:090 Sec. 1 (§264.73)	Operating record		✓	
39:090 Sec. 1 (§264.74)	Availability, retention, and disposition of records		✓	
39:090 Sec. 1	Annual report		✓	
39:090 Sec. 1 (§264.76)	Unmanifested waste report		✓	

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Regulatory Citation(s) 401 KAR 39 (incorporating 40 CFR Part 264 where applicable)	Description of Requirement	Modified or Clarified Information		
		Yes	No	Sections of the Part B Permit Application Modified or Modified Documents
39:090 Sec. 1	Additional reports		✓	
39:090 Sec. 1 (264 Subpart F)	Releases from Solid Waste Management Units			
39:090 Sec. 1 (§264.91)	Required programs		✓	
39:090 Sec. 1 (§264.92)	Ground-water protection standard		✓	
39:090 Sec. 1 (§264.93)	Hazardous constituents		✓	
39:090 Sec. 1	Concentration limits		✓	
39:090 Sec. 1 (§264.95)	Point of compliance		✓	
39:090 Sec. 1 (§264.96)	Compliance period		✓	
39:090 Sec. 1 and §264.97	General ground-water monitoring requirements		✓	
39:090 Sec. 1 (§264.98)	Detection monitoring program		✓	
39:090 Sec. 1 (§264.99)	Compliance monitoring program		✓	
39:090 Sec. 1 (§264.100)	Corrective action program		✓	
39:090 Sec. 1	Releases from solid waste management units - corrective action for solid waste management units		✓	
39:090 Sec. 1	Incorporation by reference - groundwater analysis and report forms		✓	
39:090 Sec. 1 (264 Subpart G)	Closure and Post-Closure			
39:090 Sec. 1 (§264.111)	Closure performance standard	✓		Information for this requirement will be supplied as a CSI at a later date
39:090 Sec. 1 and §264.112	Written plan, content of plan, amendment of plan, notification of partial closure and final closure, removal of wastes and decontamination or dismantling of equipment	✓		Information for this requirement will be supplied as a CSI at a later date
39:090 Sec. 1 and §264.113	Time allowed for closure	✓		Information for this requirement will be supplied as a CSI at a later date
39:090 Sec. 1 (§264.114)	Disposal or decontamination of equipment, structures, and soils	✓		Information for this requirement will be supplied as a CSI at a later date
39:090 Sec. 1 (§264.115)	Certification of closure	✓		Information for this requirement will be supplied as a CSI at a later date
39:090 Sec. 1 (§264.116)	Survey plat	✓		Information for this requirement will be supplied as a CSI at a later date
39:090 Sec. 1 and §264.117	Post-closure care and use of property	✓		Information for this requirement will be supplied as a CSI at a later date
39:090 Sec. 1 and §264.118	Post-closure plan and amendment of plan	✓		Information for this requirement will be

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		Yes	No	Sections of the Part B Permit Application Modified or Modified Documents
				supplied as a CSI at a later date
39:090 Sec. 1 (§264.119)	Post-closure notices	✓		Information for this requirement will be supplied as a CSI at a later date
39:090 Sec. 1 (§264.120)	Certification of completion of post-closure care	✓		Information for this requirement will be supplied as a CSI at a later date
39:090 Sec. 1 (264 Subpart H)	Financial Requirements		✓	
39:090 Sec. 1 (264 Subpart I)	Use and Management of Containers			
39:090 Sec. 1 (§264.171)	Condition of containers		✓	
39:090 Sec. 1 (§264.172)	Compatibility of waste with containers		✓	
39:090 Sec. 1 (§264.173)	Management of containers		✓	
39:090 Sec. 1 (§264.174)	Inspections		✓	
39:090 Sec. 1 (§264.175)	Containment		✓	
39:090 Sec. 1 (§264.176)	Special requirements for ignitable or reactive waste		✓	
39:090 Sec. 1 (§264.177)	Special requirements for incompatible wastes		✓	
39:090 Sec. 1 (§264.178)	Closure		✓	
39:090 Sec. 1 (§264.179)	Air emission standards		✓	
39:090 Sec. 1 (264 Subpart J)	Tank Systems			
39:090 Sec. 1 (§264.191)	Assessment of existing tank system's integrity		✓	
39:090 Sec. 1 (§264.192)	Design and installation of new tank systems or components		✓	
39:090 Sec. 1 (§264.193)	Containment and detection of releases		✓	
39:090 Sec. 1 (§264.194)	General operating requirements		✓	
39:090 Sec. 1 (§264.195)	Inspections		✓	
39:090 Sec. 1 (§264.196)	Response to leaks or spills and disposition of leaking or unfit-for-use tank systems		✓	
39:090 Sec. 1 (§264.197)	Closure and post-closure care		✓	
39:090 Sec. 1 (§264.198)	Special requirements for ignitable or reactive wastes		✓	
39:090 Sec. 1 (§264.199)	Special requirements for incompatible wastes		✓	
39:090 Sec. 1 (§264.200)	Air emissions standards		✓	
39:090 Sec. 1	Effective dates		✓	
39:090 Sec. 1 (264 Subpart X)	Miscellaneous Units			
39:090 Sec. 1 (§264.601)	Environmental performance standards	✓		
39:090 Sec. 1 (§264.602)	Monitoring, analysis, inspection, response, reporting, and corrective action		✓	
39:090 Sec. 1 (§264.603)	Post-closure care		✓	

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Regulatory Citation(s) 401 KAR 39 (incorporating 40 CFR Part 264 where applicable)	Description of Requirement	Modified or Clarified Information		
		Yes	No	Sections of the Part B Permit Application Modified or Modified Documents
39:090 Sec. 6	Treatment of Nerve and Blister Agents	✓		
Appendices				
39:090 Sec. 1 (264 Appendix I)	Recordkeeping instructions		✓	
39:090 Sec. 1 (264 Appendix IV)	Cochran's approximation to the Behrens-Fisher Students' T-Test		✓	
39:090 Sec. 1 (264 Appendix V)	Examples of potentially incompatible waste		✓	
39:090 Sec. 1 (264 Appendix IX)	List of hazardous constituents for groundwater monitoring		✓	

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Regulatory Citation(s) 401 KAR 39 (incorporating 40 CFR Part 270 where applicable)	Description of Requirement	Modified or Clarified Information		
		Yes	No	Sections of the Part B Permit Application Modified or Modified Documents
39:060 Sec. 5 (270 Subpart A)	General Information			
39:060 Sec. 5	Considerations under Federal law		✓	
39:060 Sec. 5 (§270.4)	Effect of a permit		✓	
39:060 Sec. 5	Prohibition of use of unpermitted facility		✓	
39:060 Sec. 5 (§270.5)	Noncompliance and program reporting by the cabinet		✓	
39:060 Sec. 5 (270 Subpart C)	Permit Conditions			
39:060 Sec. 5 and §270.30	Conditions applicable to all permits		✓	
39:060 Sec. 5 (§270.31)	Requirements for recording and reporting of monitoring results		✓	
39:060 Sec. 5 and §270.32	Establishing permit conditions		✓	
39:060 Sec. 5 (§270.33)	Schedules of compliance		✓	
39:060 Sec. 5	Contents of Part A of the Permit Application (Form 7058A)	✓		
39:060 Sec. 5	General Contents of Part B Application			
39:060 Sec. 5 (§270.14(a))	Contents of Part B: General requirements Certified documents	✓		
39:060 Sec. 5 and §270.14	General information requirements General description Topographic map Seismic considerations Subsurface geology and Karst features Groundwater monitoring Floodplain requirements Traffic information Alternative analysis plan Past compliance record Financial responsibility to construct and operate		✓	

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Regulatory Citation(s) 401 KAR 39 (incorporating 40 CFR Part 270 where applicable)	Description of Requirement	Modified or Clarified Information		
		Yes	No	Sections of the Part B Permit Application Modified or Modified Documents
39:060 Sec. 5 (\$270.14(b) (11))	Location information		✓	
39:060 Sec. 5 (\$270.14(c))	Additional groundwater protection information requirements		✓	
39:060 Sec. 5 (\$270.14(d))	Information requirements for solid waste management units		✓	
39:060 Sec. 5 (\$270.15)	Specific Part B information requirements for containers		✓	
39:060 Sec. 5 (\$270.16)	Specific Part B information requirements for tanks Number, location, and types of tanks Tank dimensions and capacity Procedures for handling incompatible, ignitable, or reactive wastes Material of construction, volume, dimensions, and all design details Type of waste contained in tanks Operating pressure and temperature Description of the feed systems, safety cutoff, bypasses systems, and pressure controls Diagrams of piping, instrumentation and process flow for each tank system		✓	
39:060 Sec. 5 (\$270.23)	Description Treatment unit design/construction details Site assessments Potential exposure pathways Effectiveness of treatment		✓	
39:060 Sec. 5 (\$270.65)	Research, development, and demonstration permits		✓	