

STATE OF MISSOURI

PERMIT BOOK



DEPARTMENT OF NATURAL RESOURCES

MISSOURI AIR CONSERVATION COMMISSION

PERMIT TO CONSTRUCT

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

Permit Number: 082015-007

Project Number: 2015-03-015
Installation Number: 097-0138

Parent Company: General Dynamics Ordnance and Tactical Systems

Parent Company Address: 11399 - 16th Court North, Suite 200, St. Petersburg, FL 33716

Installation Name: General Dynamics Ordnance and Tactical Systems Munition Services

Installation Address: 4174 County Road 180, Carthage, MO 64836, Carthage, MO 64836

Location Information: Jasper County, S25, T28N, R32

Application for Authority to Construct was made for:
Construction of a Nitrocellulose Propellant Thermal Treatment Facility. This review was conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

Standard Conditions (on reverse) are applicable to this permit.

Standard Conditions (on reverse) and Special Conditions are applicable to this permit.

AUG 12 2015

EFFECTIVE DATE

Handwritten signature of Kyrna L. Moore in cursive script.

DIRECTOR OR DESIGNEE
DEPARTMENT OF NATURAL RESOURCES

STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within 18 months from the effective date of this permit. Permittee should notify the Air Pollution Control Program if construction or modification is not started within 18 months after the effective date of this permit, or if construction or modification is suspended for one year or more.

You will be in violation of 10 CSR 10-6.060 if you fail to adhere to the specifications and conditions listed in your application, this permit and the project review. In the event that there is a discrepancy between the permit application and this permit, the conditions of this permit shall take precedence. Specifically, all air contaminant control devices shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the Department's Air Pollution Control Program of the anticipated date of start up of these air contaminant sources. The information must be made available within 30 days of actual startup. Also, you must notify the Department of Natural Resources' regional office responsible for the area within which you are located within 15 days after the actual start up of these air contaminant sources.

A copy of this permit and permit review shall be kept at the installation address and shall be made available to Department of Natural Resources' personnel upon request.

You may appeal this permit or any of the listed special conditions to the Administrative Hearing Commission (AHC), P.O. Box 1557, Jefferson City, MO 65102, as provided in RSMo 643.075.6 and 621.250.3. If you choose to appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed. If it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC.

If you choose not to appeal, this certificate, the project review and your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant sources(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources and other applicable federal, state and local laws and ordinances.

The Air Pollution Control Program invites your questions regarding this air pollution permit. Please contact the Construction Permit Unit at (573) 751-4817. If you prefer to write, please address your correspondence to the Missouri Department of Natural Resources, Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102-0176, attention: Construction Permit Unit.

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SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

The special conditions listed in this permit were included based on the authority granted the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060 paragraph (12)(A)10. "Conditions required by permitting authority."

General Dynamics Ordnance and Tactical Systems Munition Services
Jasper County, S25, T28N, R32

1. Annual Emission Limitation
 - A. General Dynamics Ordnance and Tactical Systems Munition Services (GD-OTS MS) shall emit less than 10.0 tons of Dibutyl Phthalate (DBP) (CAS 84-74-2) and less than 5.0 of Diethylene Glycol Dinitrate (DEGDN) (CAS 693-21-0) from the Nitrocellulose Based Propellant Treatment Unit (NCP TTU) stack (EP11) in any consecutive 12-month period.
 - B. GD-OTS MS shall develop and use forms (paper or electronic) to demonstrate compliance with Special Condition 1.A. The forms shall contain at a minimum the following information,
 - 1) Current month
 - 2) Current 12-month date range
 - 3) Amount and type of NCP treated (in tons) containing DBP or DEGDN
 - 4) DBP emission factor and DEGDN emission factor developed from source testing as required by Special Condition 4.A,
 - 5) Current month's DBP emissions (in tons) as calculated using values from 3) and 4) of this special condition (in tons)
 - 6) Current month's DEGDN emissions (in tons) as calculated using values from 3) and 4) of this special condition (in tons)
 - 7) 12-month rolling total DBP emissions (in tons)
 - 8) 12-month rolling total DEGDN emissions (in tons)
 - 9) Indication of compliance status with Special Condition 1.A.
2. Wet Scrubber (CD-3) Requirements
 - A. GD-OTS MS shall control emissions from the NCP TTU using a wet scrubber consisting of a quench, a high-efficiency venturi and a cyclonic separator as specified in the permit application.
 - B. GD-OTS MS shall develop and implement a control device monitoring plan to verify proper operation of the wet scrubber. The plan shall be documented and available for review by any Missouri Department of Natural

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SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

- Resources' personnel upon request. At a minimum, the plan shall include the following:
- 1) A minimum pressure drop across the wet scrubber on a 60-minute rolling average; and
 - 2) A minimum pH on a 60-minute rolling average; and
 - 3) A minimum scrubber water flowrate on a 60-minute rolling average; and
 - 4) A maximum flue gas flowrate on a 60-minute rolling average.
- C. GD-OTS MS shall record the monitoring parameters as specified in the plan developed according to Special Condition 2.B at least once per day. The monitored parameters shall be maintained within design conditions specified in the plan and developed during source testing as required in Special Condition 4.A.
- D. GD-OTS MS shall maintain an operating and maintenance log for the wet scrubber which shall include the following:
- 1) Incidents of malfunction, with impact on emissions, time, date and duration of event, probable cause, and corrective actions; and
 - 2) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.
3. Record Keeping and Reporting Requirements
- A. General Dynamics Ordnance and Tactical Systems Munition Services shall maintain all records required by this permit for not less than five years and shall make them available immediately to any Missouri Department of Natural Resources' personnel upon request.
- B. General Dynamics Ordnance and Tactical Systems Munition Services shall report to the Air Pollution Control Program's Compliance/Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than 10 days after the end of the month during which any record required by this permit show an exceedance of a limitation imposed by this permit.
4. Performance Testing
- A. General Dynamics Ordnance and Tactical Systems Munition Services shall conduct an initial performance test as described in the approved NCU TTP Comprehensive Performance Test Plan (CPTP) submitted to Department January 2015.

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SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

- B. GD-OTS MS shall conduct additional performance testing on the NCP TTU stack to develop an emission factor in pounds of DBP per ton NCP burned and an emission factor in pounds of DEGDN per ton NCP burned. Testing shall be conducted within 30 days of treating a propellant containing DBP or DEGDN in the NCP TTU. The developed emission factors shall be used to demonstrate annual compliance with the limitations in Special Condition 1.A.
- C. GD-OTS MS shall conduct initial performance testing on the NCP TTU stack to confirm the emission rate of Nitrogen Oxides as shown in Table 1.

Table 1: Nitrogen Oxide (NOx) Emissions

Emission Point	Description	Pollutant	Lbs/hr
EP-11	Nitrocellulose Based Propellant Treatment Unit	NOx	2.76

- D. These tests, with the exception of those specified in Special Condition 4.B shall be performed within 60 days after achieving the maximum production rate of the installation, but not later than 180 days after initial start-up for commercial operation and shall be conducted in accordance with the Stack Test Procedures outlined in the approved CPTP. The time frames associated with this performance testing condition may be extended upon written request of GD-OTS MS and approval by the Air Pollution Control Program staff director.
- E. Performance tests shall be conducted under representative conditions. Operations during periods of startup, shutdown, and malfunction shall not constitute representative conditions for the purpose of a performance test.
- F. Two copies of a written report of the performance test results shall be submitted to the Air Pollution Control Program Director within 90 days of completion of any required testing. The report must include legible copies of the raw data sheets, analytical instrument laboratory data, and complete sample calculations from the required U.S. EPA Method for at least one sample run.
- G. The test report is to fully account for all operational and emission parameters addressed both in the permit conditions as well as the approved CPTP.

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SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

- H. In the event that the measured emission rates of NO_x exceed the emission rates used in the potential emissions calculations (Table 1), then within 90 days of completion of the performance testing GD-OTS MS shall submit to the Air Pollution Control Program an application for an amendment to this construction permit with the revised potential emissions calculations.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE
SECTION (5) REVIEW

Project Number: 2015-03-015
Installation ID Number: 097-0138
Permit Number:

Installation:

General Dynamics Ordnance and Tactical Systems Munition Services
4174 County Road 180
Carthage, MO 64836

Parent Company:

General Dynamics Ordnance and Tactical Systems
11399 - 16th Court North, Suite 200
St. Petersburg, FL 33716

Jasper County, S25, T28N, R32

REVIEW SUMMARY

- General Dynamics Ordnance and Tactical Systems Munition Services has applied for authority to construct a Nitrocellulose Propellant Thermal Treatment Facility.
- This application was deemed completed on March 4, 2015
- HAP emissions are expected from the proposed equipment.
- None of the New Source Performance Standards (NSPS) apply to the project. This determination is based on the fact that the thermal treatment units do not combust municipal or medical waste.
- The Maximum Achievable Control Technology (MACT) standard, 40 CFR Part 63, Subpart EEE, *National Emission Standards for Hazardous Air Pollutants from Hazardous Waste Combustors* does not apply to the proposed equipment because the Nitrocellulose Propellant Thermal Treatment Unit does not meet the 40 CFR 260.10 definition of an incinerator as referenced in the MACT as it does not use controlled flame combustion. However the facility will meet similar emission limits as part of meeting the air emission requirements under 40 CFR 264 Subpart X including comprehensive performance testing.
- A wet scrubber system consisting of a high-efficiency venturi and a cyclonic separator is being used to control nitric acid and particulate emissions from the equipment in this permit.
- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of all pollutants are below de minimis levels. Dibutyl phthalate is conditioned to its SMAL of 10 tons per year.

- This installation is located in Jasper County, an attainment area for all criteria pollutants.
- This installation is not on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2. The installation's major source level is 250 tons per year and fugitive emissions are not counted toward major source applicability.
- Ambient air quality modeling was not performed since potential emissions of the application are below de minimis levels. Project emissions are conditioned below the SMAL for DBP. The Screening Model Action Level for DBP is 10 tons per year.
- Emissions testing is required for the equipment to verify the emission rate of NOx and to establish emission factors for DBP and DEGDN to be used in demonstrating compliance with a 10.0 and 5.0 ton per year limitation, respectively. The comprehensive performance test plan will be used to establish operating parameters for the TCU and scrubber system.
- A Part 70 Operating Permit Amendment is required for this installation within one year of equipment startup.
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

General Dynamics Ordnance and Tactical Systems Munition Services (GD-OTS MS), formerly known as EBV Explosives Environmental Company, is a reactive hazardous waste processing facility located in Jasper County, Missouri near the city of Carthage. The facility accepts hazardous waste from the following groups: government agencies, such as the Department of Defense, the explosives manufacturing industry, users of explosive devices and materials, and various other manufacturing industries. The hazardous wastes processed include explosive/reactive materials, explosive and energetic devices, propellants, nitroglycerin containing pharmaceuticals, ammunition and materials contaminated with explosive/reactive waste.

GD-OTS MS operates rotary kiln incinerator and a car bottom furnace incinerator (EP-03 for both) which are subject to the Hazardous Waste Combustor MACT, 40 CFR 63 Subpart EEE. As a requirement of the MACT regulation, the facility obtained a Part 70 Operating Permit from the Air Pollution Control Program. The facility also holds a Hazardous Waste Facility Permit, known as a Resource Conservation and Recovery Act (RCRA) permit, from the Missouri Department of Natural Resources. The following table summarizes the construction permits that have been issued to GD-OTS MS from the Air Pollution Control Program.

Table 2: Permit History

Permit Number	Description
0990-002	The installation of two (2) hazardous waste incinerators.
0894-007	The installation of a diesel fired emergency generator.
0990-002B	The elimination of the direct liquid feed system for the incinerator.
072009-004	The installation of a thermal treatment system for the treatment and disposal of MLRS rocket motors (ammonium perchlorate – based propellant).
072009-004A	An amendment to correct the as-built maximum design rate of the propellant thermal treatment chambers.
072009-004B	Sorbent Evaluation
012012-001	Propellant Destruction

MLRS=Multiple Launch Rocket System

PROJECT DESCRIPTION

This project is for a nitrocellulose based propellant treatment unit (NCP TTU), also known as Building #12. NCP is used in ammunition to propel a projectile. The NCP TTU includes a Receiving Bay, Drum Handling Room, Safety Cell, and two Thermal Treatment Chambers (TTC), EU1 and EU2, with an Air Pollution Control System (APCS). The NCP is transferred from drums into the feed system. The feed system meters a fixed weight per minute of NCP into one of the TTCs. The NCP is ignited when it falls on an electrically heated plate in the TTC. The NCP feed is reacted in less than five seconds. The TTC is held at a negative pressure by an Induced Draft (ID) Fan on the APCS through which the emissions are pulled for cleaning. The APCS consists of a wet scrubber to cool the gases, neutralize acid gases and remove particulates out of the exhaust gases. The ID fan pulls all emissions from the TTC thru the wet scrubber to the stack.

The NCP TTU is designed to burn 600 pounds per hour feed rate of the NCP. The NCP TTU is expected to get a destruction efficiency of the propellants of 99.99%. Some of the propellants contain DBP and DEGDN which are considered HAPs. Since the new NCP TTU's destruction efficiency of these components has not been confirmed, emission testing will be conducted to establish an emission factor for each of the HAPs. Since GD-OTS MS is not expecting to treat any propellants containing these HAPs in the next year, testing for DBP and/or DEGDN will occur within 30 days of using any propellant containing these HAPS for the first time. The wet scrubber, designed by Bionomic Industries, consists of a quench, a high-efficiency venturi and a cyclonic separator. The wet scrubber is designed for an inlet gas flow of 11,744 acfm at 1,200°F (3,850 dscfm). The scrubber is expected to neutralize 90% of the acid gases and is expected to remove 99% of the particulates.

EMISSIONS/CONTROLS EVALUATION

The emission calculations are based on 10 other units located at the facility with a safety margin and will be verified by emissions testing. PM and PM₁₀ emissions are based on exhaust grain loading of 0.0015 gr/dscf. NO_x and CO emissions were based on 50 and 25 ppmv, respectively, with a safety factor of 2 and an exhaust flowrate of 3,850 dscfm. The NO_x flowrate will be confirmed during stack testing. The CO₂ concentration produced during the operation of the other thermal treatment units, ranged from 0.05% to 1.05%. As a conservative estimate, the emission calculation was

based on 10,000 ppmv with a safety factor of 1.5. Emissions of methane and nitrous oxide were not estimated as they are expected to be negligible. The following table provides an emissions summary for this project. Existing actual emissions were taken from the installation's 2014 EIQ. Potential emissions of the application represent the potential of the new equipment, assuming continuous operation (8760 hours per year).

Table 3: Emissions Summary (tons per year)

Pollutant	Regulatory <i>De Minimis</i> Levels	Existing Potential Emissions	Existing Actual Emissions (2014 EIQ)	Potential Emissions of the Application	New Installation Conditioned Potential
PM	25.0	N/D	N/A	0.22	N/A
PM ₁₀	15.0	N/D	0.49	0.22	N/A
PM _{2.5}	10.0	N/D	0.21	0.22	N/A
SO _x	40.0	N/D	0.11	N/D	N/A
NO _x	40.0	N/D	47.22	12.12	N/A
VOC	40.0	N/D	0.42	N/D	N/A
CO	100.0	N/D	10.85	3.68	N/A
GHG (CO ₂ e)	75,000 / 100,000	N/D	N/A	1733.32	N/A
GHG (mass)	0.0 / 250.0	N/D	N/A	1733.32	N/A
HAPs	10.0/25.0	N/D	0.78	<10.0	N/A
DBP	10.0 / 10.0 ¹	N/D	N/D	<10.0	N/A
DEGDN	10.0 / 5.0 ¹	N/D	N/D	<5.0	N/A

N/A = Not Applicable; N/D = Not Determined

¹This value represents the SMAL.

PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of all pollutants are below de minimis levels.

APPLICABLE REQUIREMENTS

General Dynamics Ordnance and Tactical Systems Munition Services shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations should be consulted for specific record keeping, monitoring, and reporting requirements. Compliance with these emission standards, based on information submitted in the application, has been verified at the time this application was approved. For a complete list of applicable requirements for your installation, please consult your operating permit.

GENERAL REQUIREMENTS

- *Submission of Emission Data, Emission Fees and Process Information*, 10 CSR 10-6.110
- *Operating Permits*, 10 CSR 10-6.065

- *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*, 10 CSR 10-6.170
- *Restriction of Emission of Visible Air Contaminants*, 10 CSR 10-6.220
- *Restriction of Emission of Odors*, 10 CSR 10-6.165

STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, I recommend this permit be granted with special conditions.

Susan Heckenkamp
Environmental Engineer

Date

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated February 2015, received March 4, 2015, designating General Dynamics Ordnance and Tactical Systems as the owner and operator of the installation.
- NCPTTU Comprehensive Performance Test Plan, dated January, 2015.

APPENDIX A

Abbreviations and Acronyms

%	percent	m/s	meters per second
°F	degrees Fahrenheit	Mgal	1,000 gallons
acfm	actual cubic feet per minute	MW	megawatt
BACT	Best Available Control Technology	MHDR	maximum hourly design rate
BMPs	Best Management Practices	MMBtu	Million British thermal units
Btu	British thermal unit	MMCF	million cubic feet
CAM	Compliance Assurance Monitoring	MSDS	Material Safety Data Sheet
CAS	Chemical Abstracts Service	NAAQS ...	National Ambient Air Quality Standards
CEMS	Continuous Emission Monitor System	NESHAPs	National Emissions Standards for Hazardous Air Pollutants
CFR	Code of Federal Regulations	NO_x	nitrogen oxides
CO	carbon monoxide	NSPS	New Source Performance Standards
CO₂	carbon dioxide	NSR	New Source Review
CO_{2e}	carbon dioxide equivalent	PM	particulate matter
COMS	Continuous Opacity Monitoring System	PM_{2.5}	particulate matter less than 2.5 microns in aerodynamic diameter
CSR	Code of State Regulations	PM₁₀	particulate matter less than 10 microns in aerodynamic diameter
dscf	dry standard cubic feet	ppm	parts per million
EQ	Emission Inventory Questionnaire	PSD	Prevention of Significant Deterioration
EP	Emission Point	PTE	potential to emit
EPA	Environmental Protection Agency	RACT	Reasonable Available Control Technology
EU	Emission Unit	RAL	Risk Assessment Level
fps	feet per second	SCC	Source Classification Code
ft	feet	scfm	standard cubic feet per minute
GACT	Generally Available Control Technology	SDS	Safety Data Sheet
GHG	Greenhouse Gas	SIC	Standard Industrial Classification
gpm	gallons per minute	SIP	State Implementation Plan
gr	grains	SMAL	Screening Model Action Levels
GWP	Global Warming Potential	SO_x	sulfur oxides
HAP	Hazardous Air Pollutant	SO₂	sulfur dioxide
hr	hour	tph	tons per hour
hp	horsepower	tpy	tons per year
lb	pound	VMT	vehicle miles traveled
lbs/hr	pounds per hour	VOC	Volatile Organic Compound
MACT	Maximum Achievable Control Technology		
µg/m³	micrograms per cubic meter		

Mr. David Zoghby
Senior Director of Marketing & Commercial Contracts
General Dynamics Ordnance and Tactical Systems Munition Services
7282 Flint Hill Road
New Tripoli, PA 18066

RE: New Source Review Permit - Project Number: 2015-03-015

Dear Mr. Zoghby:

Enclosed with this letter is your permit to construct. Please study it carefully and refer to Appendix A for a list of common abbreviations and acronyms used in the permit. Also, note the special conditions, if any, on the accompanying pages. The document entitled, "Review of Application for Authority to Construct," is part of the permit and should be kept with this permit in your files. Operation in accordance with these conditions, your new source review permit application and with your amended operating permit is necessary for continued compliance. The reverse side of your permit certificate has important information concerning standard permit conditions and your rights and obligations under the laws and regulations of the State of Missouri.

If you were adversely affected by this permit decision, you may be entitled to pursue an appeal before the administrative hearing commission pursuant to Sections 621.250 and 643.075.6 RSMo. To appeal, you must file a petition with the administrative hearing commission within thirty days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the administrative hearing commission, whose contact information is: Administrative Hearing Commission, Truman State Office Building, Room 640, 301 West High Street, P.O. Box 1557, Jefferson City, Missouri 65102, phone: (573) 751-2422, fax: (573) 751-5018, website: www.oa.mo.gov/ahc.

Mr. David Zoghby
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If you have any questions regarding this permit, please do not hesitate to contact me, at the Department of Natural Resources' Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102 or at (573) 751-4817. Thank you for your attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Susan Heckenkamp
New Source Review Unit Chief

SH:dg

Enclosures

c: Southwest Regional Office
PAMS File: 2015-03-015

Permit Number: