



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.

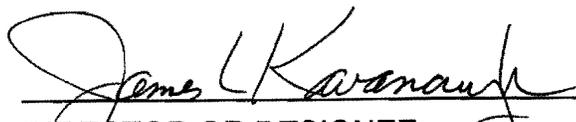
Permit Number: 122010-002 Project Number: 2010-04-031
Parent Company: Missouri Army National Guard Environmental Management Office (NGMO-EM)
Parent Company Address: 6819B N. Boundary Road, Jefferson City, MO 65101
Installation Name: Missouri Army National Guard (MOARNG) Aviation Classification Repair Activity Depot (AVCRAD)
Installation Number: 077-0220
Installation Address: 2501 N. Lester Jones Ave., Springfield, MO 65083
Location Information: Greene County, S1, T29N, R23W

Application for Authority to Construct was made for:
Four abrasive blasting booths, four surface coating booths, a flexible engine diagnostic system, heaters, and furnaces. 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.

DEC - 1 2010

EFFECTIVE DATE



DIRECTOR OR DESIGNEE
DEPARTMENT OF NATURAL RESOURCES

STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within two years from the effective date of this permit. Permittee should notify the Air Pollution Control Program if construction or modification is not started within two years 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 Departments' Air Pollution Control Program of the anticipated date of start up of this (these) air contaminant source(s). 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 this (these) air contaminant source(s).

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 source(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.

Page No.	3
Permit No.	
Project No.	2010-04-031

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."

Missouri Army National Guard (MOARNG) Aviation Classification Repair Activity Depot (AVCRAD)
Greene County, S1, T29N, R23W

1. **Superseding Condition**
The conditions of this permit supersede all special conditions found in the previously issued construction permits 1199-207D and 0209-260D issued by the Air Pollution Control Program.
2. **Emission Limitation**
 - A. MOARNG AVCRAD shall emit less than 40.0 tons of Volatile Organic Compounds (VOCs) in any consecutive 12-month period from the entire installation as listed in Table 1.
 - B. MOARNG AVCRAD shall emit less than 0.002 tons of hexavalent chromium (CAS 18540-29-9) in any consecutive 12-month period from the entire installation as listed in Table 1.
 - C. MOARNG AVCRAD shall emit less than 40.0 tons of Nitrogen Oxides (NO_x) in any consecutive 12-month period from the entire installation as listed in Table 1.
 - D. Electronic forms, approved by the Air Pollution Control Program shall be used to demonstrate compliance with Special Conditions 2.A, 2.B, and 2.C.
3. **Emission Limitation**
 - A. MOARNG AVCRAD shall emit less than the respective Screening Model Action Level (SMAL), as listed in Appendix A, of each hazardous air pollutant (HAP) in any consecutive 12-month period from the entire installation as listed in Table 1.
 - B. Electronic forms, approved by the Air Pollution Control Program shall be used to demonstrate compliance with Special Condition 3.A.

Page No.	4
Permit No.	
Project No.	2010-04-031

SPECIAL CONDITIONS:

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

4. Control Device Requirement
 - A. MOARNG AVCRAD shall control emissions from each stripping booth (EP-01 and EP-02) using separate filtration systems as specified in the permit application.
 - B. MOARNG AVCRAD shall control emissions from each total airframe paint booth (EP-03 and EP-04) using separate filtration systems as specified in the permit application.
 - C. MOARNG AVCRAD shall control emissions from each component paint booth (EP-05 and EP-06) using separate filtration systems as specified in the permit application.
 - D. The filters shall be operated and maintained in accordance with the manufacturer's specifications.
 - E. The filters shall be made of fibers appropriate for operating conditions expected to occur (i.e. temperature limits, acidic and alkali resistance, and abrasion resistance).
 - F. MOARNG AVCRAD shall maintain an operating and maintenance log for the filters which shall include the following:
 - 1) Incidents of malfunction, with impact on emissions, duration of event, probable cause, and corrective actions; and
 - 2) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.
5. Operational Requirement
MOARNG AVCRAD shall not aspirate any particulate matter emissions generated from abrasive blasting at either of the nano booth systems to the ambient air.
6. Operational Requirement
MOARNG AVCRAD shall not spray, apply, or otherwise use any surface coating containing hexavalent chromium compounds at total airframe paint booths (EP-03 and EP-04).
7. Operational Requirement
MOARNG AVCRAD shall keep all solvents, thinners, reducers, and coatings in sealed containers whenever the materials are not in use. MOARNG AVCRAD shall provide and maintain suitable, easily read, permanent markings on all solvent, thinner, reducer, and coating containers used at this installation.

Page No.	5
Permit No.	
Project No.	2010-04-031

SPECIAL CONDITIONS:

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

8. Record Keeping and Reporting Requirements
 - A. MOARNG AVCRAD shall maintain all records required by this permit for not less than five (5) years and shall make them available immediately to any Missouri Department of Natural Resources' personnel upon request. These records shall include Material Safety Data Sheets (MSDS) for all materials used.
 - B. MOARNG AVCRAD shall report to the Air Pollution Control Program's Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten days after the end of the month during which any record required by this permit shows an exceedance of a limitation imposed by this permit.

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

Project Number: 2010-04-031
Installation ID Number: 077-0220
Permit Number:

Missouri Army National Guard (MOARNG)
Aviation Classification Repair Activity Depot (AVCRAD)
2501 N. Lester Jones Ave.
Springfield, MO 65083

Complete: April 9, 2010

Parent Company:
Missouri Army National Guard Environmental Management Office (NGMO-EM)
6819B N. Boundary Road
Jefferson City, MO 65101

Greene County, S1, T29N, R23W

REVIEW SUMMARY

- Missouri Army National Guard (MOARNG) Aviation Classification Repair Activity Depot (AVCRAD) has applied for authority to install four abrasive blasting booths, four surface coating booths, a flexible engine diagnostic system, heaters, and furnaces.
- Hazardous Air Pollutant (HAP) emissions are expected from the proposed equipment. HAPs of concern from these processes are hexavalent chromium, toluene, MIBK, xylenes, ethylbenzene, cumene, naphthalene, and various HAPs from the combustion of JP-8 and natural gas, CAS 18540-29-9, 108-88-3, 108-10-1, 1330-20-7, 100-41-4, 98-82-8, and 91-20-3 respectively.
- None of the New Source Performance Standards (NSPS) apply to the installation.
- None of the National Emission Standards for Hazardous Air Pollutants (NESHAPs) apply to this installation.
- None of the currently promulgated Maximum Achievable Control Technology (MACT) regulations apply to the proposed equipment. MACT Subparts XXXXXX “National Emission Standards for Hazardous Air Pollutants Area Source Standards for Nine Metal Fabrication and Finishing Source Categories”, HHHHHH “National Emission Standards for Hazardous Air Pollutants: Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources”, and MMMM “National Emission Standard for Hazardous Air Pollutants for Surface Coating of Miscellaneous Metal Parts and Products” do not apply as the installation is owned by the Missouri National Guard. MACT Subpart PPPPP “National Emission Standard for Hazardous Air Pollutants for Engine Test Cells/Stands” does not apply as the installation is not a major HAP source.
- Cartridge pulse filters, panel filters, 3-stage filters, and complete enclosures are being used to control the particulate matter and particulate HAP emissions from abrasive

blasting and surface coating 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 NO_x and VOC are conditioned below de minimis levels. Potential emissions of hexavalent chromium are conditioned below the Screening Model Action Level (SMAL).
- This installation is located in Greene 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 installation are below de minimis levels.
- Emissions testing are not required for the equipment.
- No Operating Permit is required for this installation.
- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

MOARNG AVCRAD is an existing installation (ID 077-0220) located in Greene County. Its primary activity is rebuilding military helicopters by abrasive blasting, repairing, and surface coating airframes and rotors, and testing turbine engines. The installation is a synthetic de minimis source under construction permits and does not have an operating permit.

Table 1: Installation Description

Designation	Description	MHDR	MHDR Units
EP-01	Stripping booth 1 (total airframe)	116.5	Pounds broken media and coating / hour
EP-02	Stripping booth 2 (total airframe)	116.5	Pounds broken media and coating / hour
EP-03	Total airframe paint booth 1	46.3	Pounds coating / hour
EP-04	Total airframe paint booth 2	46.3	Pounds coating / hour
EP-05	Component paint booth 1	46.3	Pounds coating / hour
EP-06	Component paint booth 2	46.3	Pounds coating / hour
EP-07	FEDS – turbine testing	0.179	1,000 gallon JP-8 / hour (23.628 MMBtu/hr)
EP-08	Zep 501 parts cleaner	6	Square feet of working area
EP-09	JP-8 fuel tanks	0.179	1,000 gallon JP-8 / hour
EP-10	Blade Shop Furnaces (5)	0.4	MMBtu / hr natural gas (0.08 each)
EP-11	Boiler 1	6.8	MMBtu / hr natural gas
EP-12	Boiler 2	6.8	MMBtu / hr natural gas
EP-13	Boiler 3	3.0	MMBtu / hr natural gas
EP-14	Boiler 4	3.0	MMBtu / hr natural gas
EP-15	Boiler 5	3.0	MMBtu / hr natural gas
EP-16	Boiler 6	3.0	MMBtu / hr natural gas
EP-17	Boiler 7	3.0	MMBtu / hr natural gas
EP-18	Boiler 8	3.0	MMBtu / hr natural gas
EP-19	Infrared Heater 1	0.6	MMBtu / hr natural gas
EP-20	Infrared Heater 2	0.175	MMBtu / hr natural gas
EP-21	Water Heater 1	0.3	MMBtu / hr natural gas

MHDR = Maximum Hourly Design Rate

The following permits have been issued to MOARNG AVCRAD from the Springfield-Greene

County Health Department, under the jurisdiction of the Air Pollution Control Program.

Table 2: Permit History

Permit Number	Description
0209-260D	2009 construction permit for one total airframe paint booth, one component paint booth, and one stripping booth
1199-207D	1999 construction permit for one coating booth

PROJECT DESCRIPTION

This project includes the installation of surface coating booths, stripping booths, and heaters. However, during the course of this project, corrections were made in calculations for both previous permits. Therefore, all previous special conditions are superseded and all previously permitted emission units have been reevaluated.

The stripping booths (EP-01 and EP-02) each remove corrosion, cured primer, and cured topcoat from airframes. Each booth can apply 750 pounds per hour of U.S. Technology Magic II Composite Blast Media (Type VIII), with a breakdown rate of 15 percent. This application rate is capable of cleaning 120 square feet of material per hour, or 4 pounds of coating removal per hour. The total breakdown and removal rate of media and coating is 116.5 pounds per hour, per booth. Each booth is equipped with a cartridge pulse air filter.

The installation is also equipped with two nano abrasive blast booth systems. Nano describes the type of media used, equivalent to the media used in the stripping booths. However, the nano booth systems each apply 600 pounds of media per hour, with a breakdown rate of five percent. The cleaning rate is equivalent to the stripping booths' rate. Typically, smaller parts including rotors are abrasive blasted in the nano booth system. The nano booths are referred to as systems because one system is two portable booths, where one booth is for abrasive blasting, and the other booth contains air compressors, media storage, filters, etc. According to the applicant, each system is closed loop, such that blasting emissions are not released. Therefore, the nano booth systems were not considered emission units.

Once abrasive blasted and repaired, total airframes are primed and painted in the total airframe paint booths (EP-03 and EP-04). Due to the complexity of the coating operation, the most conservative method to determine the maximum hourly design rate (MHDR) of the primer and paint application was to use the spray rate of the high volume low pressure gun, 350 grams per minute. Priming and painting was conservatively assumed to each occur 8,760 hours per year per booth. Each booth will use non-hexavalent chromium containing paints and primers. This will most likely be accomplished through use of water dispersible chemical agent resistant coating (WD-CARC) topcoat and corresponding two-part primer. The primer is MIL-PRF-85582D, with a separate curing agent 44GN098CAT. Using the mixing ratio and coating densities, the application rate is 46.3 pounds per hour, or 4.02 gallons of mixed primer per hour. The topcoat is WD-CARC MIL-DTL-64159, green in color. Using the mixing ratio and coating densities, the application rate is 46.3 pounds per hour, or 4.15 gallons of mixed paint per hour (not including 0.79 gallons of water per hour).

Overspray emissions are controlled by a single stage fiberglass panel filter, one per booth.

Rotors are surface coated in component paint booths (EP-05 and EP-06). Due to the complexity of the coating operation, the most conservative method to determine the maximum hourly design rate (MHDR) of the primer and paint application was to use the spray rate of the high volume low pressure gun, 350 grams per minute. Priming and painting was conservatively assumed to each occur 8,760 hours per year per booth. One component booth will apply two part primer MIL-PRF-23377J and curing agent 02Y040ACAT. Using the mixing ratio and coating densities, the application rate is 46.3 pounds per hour, or 4.20 gallons of mixed primer per hour. The topcoat is MIL-DTL-53039B, with an application rate of 4.41 gallons per hour. The other component booth will use non-hexavalent chromium containing paints and primers. This will most likely be accomplished through use of water dispersible chemical agent resistant coating (WD-CARC) topcoat and corresponding two-part primer, such as MIL-PRF-85582D and curing agent 44GN098CAT. Using the mixing ratio and coating densities, the application rate is 46.3 pounds per hour, or 4.02 gallons per hour. This is the same primer used in the total airframe paint booths. Typically, the topcoat is WD-CARC MIL-DTL-64159, black in color. Using the mixing ratio and coating densities, the application rate is 46.3 pounds per hour, or 4.01 gallons of mixed paint per hour (before including 0.79 gallons of water per hour). Overspray emissions are controlled by a three stage filter system, one per booth.

The installation also tests helicopter turbine engines, for example the General Electric T700. According to the applicant, the Flexible Engine Diagnostic System (FEDS) (EP-07) is rated at 179 gallons of JP-8 consumed per hour, equivalent to 23.628 million British thermal units per hour (MMBtu/hr) kerosene input. Emissions from the FEDS are uncontrolled. Aircraft and the FEDS are supplied JP-8 through two 12,000 gallon horizontal tanks (EP-09). Engine and other parts are cleaned using a Zep 501 Parts Cleaner (EP-08). The parts cleaner has a working area of six square feet and uses Safety-Kleen 105 Solvent Virgin.

Rotor blades are a hollow-honeycomb design that can attract and hold water from field use. Before blades containing water are surface coated, water is evacuated by heating the blades in furnaces (EP-10). Each of the five blade furnaces is rated at 0.08 MMBtu/hr input. The installation is equipped with two 6.8 MMBtu/hr boilers (EP-11 and EP-12), six 3.0 MMBtu/hr boilers (EP-13 through EP-18), two infrared heaters (EP-19 and EP-20) rated at 0.6 and 0.175 MMBtu/hr, respectively, and a 0.3 MMBtu/hr water heater (EP-21). Each combustion unit is fueled by natural gas. Emissions are uncontrolled.

EMISSIONS/CONTROLS EVALUATION

According to the applicant, military aircraft are changing from being coated with primer containing hexavalent chromium to primer containing low or no HAPs. However, many aircraft arriving at the installation may have been coated with the traditional hexavalent chromium primer. Conservatively, abrasive blasting emissions assumed each airframe contained cured two-part hexavalent chromium primer MIL-PRF-23377J and corresponding topcoat MIL-DTL-53039B. Conservatively, all portions of the coatings including VOC were considered reacted, cured, and emitted as particulate matter during blasting. According to the manufacturer's test data, the pulse cartridge air filter is capable of removing 0.35 micron diameter particles at 99.7 percent efficiency at 2.2 inches of pressure drop. A clean filter has 0.3 inches of drop; with final drop of 4.0 inches. A clean filter removes 99.7 percent of particles 3.46 microns in diameter. Assuming abrasive blasting particulate emissions as

being predominantly larger than 3.46 microns, the filter was assigned 99.7 percent control, with one hundred percent capture for PM₁₀.

As described earlier, each nano booth system is closed loop, therefore no emissions are expected from them.

Potential emissions from the total airframe paint booths were calculated assuming all VOC as being emitted, rather than becoming part of the cured coating. The coatings used in these booths in the greatest quantities do not contain HAPs. The weight percent of each ingredient was used, with the balance as PM₁₀. Sixty percent solids transfer efficiency was assumed for the HVLP spray gun. One hundred percent capture was assumed, with 95 percent control for PM₁₀ from the single stage fiberglass panel filter.

Potential emissions for the component spray booths were calculated using the weight percent of each ingredient, 60 percent solids transfer efficiency, 100 percent capture, and 99.76 PM₁₀ control for the three stage filtration system. The filter manufacturer claims the filter system is compliant with EPA's Method 319 paint arrestor efficiency requirements. The control efficiency was calculated using the hexavalent chromium particle size distribution from *Size Distribution and Speciation of Chromium in Paint Spray Aerosol at an Aerospace Facility* published in the *Annals of Occupational Hygiene* and the particle size distribution from the filter manufacturer's test report. 59.38% of the hexavalent chromium primer overspray is larger than ten microns in diameter. Only one component booth needs the flexibility to use hexavalent chromium primer. The other booth will apply the same primer as the total airframe booths, but a black topcoat. Each of the four spray booths were assumed to use one liter of Safety-Kleen Virgin Low-Vapor-Pressure Thinner for gun cleanup per cleaning session. According to the applicant, up to five cleaning sessions are possible per booth per eight hour workday. The thinner is 100 percent volatile and mostly VOC. It includes the HAPs toluene, methyl isobutyl ketone, xylenes, and ethyl benzene. All thinner VOC were considered emitted.

The hexavalent chromium compliance worksheet prepared by MOARNG AVCRAD and approved by the Air Pollution Control Program conservatively uses the entire chromium compound weight, not just the hexavalent chromium portion of the compound for comparison to the SMAL. Using this method, MOARNG AVCRAD does not foresee actual emissions out of compliance with Special Condition 2.B.

Potential emissions from the FEDS were calculated using the emission factors from source classification codes (SCC) 2-04-003-02 and 2-01-001-01, and assuming the JP-8 fuel as kerosene. SCC 2-04-003-02 was used to calculate PM₁₀, sulfur oxides, nitrogen oxides, and carbon monoxide emissions. SCC 2-01-001-01 was used to calculate VOC and HAP emissions. Fuel tank emissions were calculated using the Environmental Protection Agency (EPA) software TANKS 4.0.9d. Parts cleaner emissions were calculated using the EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Section 4.6 "Solvent Degreasing" April 1981. The cleaning solvent is one hundred percent VOC. Control efficiency of 45 percent was assumed for recycle, fuse protection, thermostat, and lid.

Natural gas combustion emissions were calculated using AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Section 1.4 “Natural Gas Combustion” July 1998.

Existing potential emissions are cited from permit 0209-260D. Potential emissions of the installation represent the potential of all equipment, assuming continuous operation (8,760 hours per year.) The new installation conditioned potential represents voluntary limitations to avoid dispersion modeling. The following table provides an emissions summary for this project.

Table 3: Emissions Summary (tons per year)

Pollutant	Regulatory De Minimis Levels	Existing Potential Emissions	Existing Actual Emissions (2009 EIQ)	Potential Emissions of the Installation	New Installation Conditioned Potential
PM ₁₀	15.0	<15.0	0.06	12.25	N/A
SO _x	40.0	N/D	0.22	0.41	N/A
NO _x	40.0	N/D	3.30	90.80	<40.0
VOC	40.0	<40.0	0.79	648.41	<40.0
CO	100.0	N/D	1.57	17.20	N/A
Lead	0.6	N/D	N/D	1.52E-03	N/A
Combined HAPs	25.0	<25.0	0.34	12.60	N/A
Chromium VI	¹ 0.002	N/D	N/D	4.88E-03	<0.002
Cumene	10.0	N/D	N/D	0.17	N/A
Ethylbenzene	10.0	N/D	N/D	0.39	N/A
MIBK	10.0	N/D	N/D	2.90	N/A
Naphthalene	10.0	N/D	N/D	0.99	N/A
Toluene	10.0	N/D	N/D	4.83	N/A
Xylenes	10.0	N/D	N/D	2.90	N/A

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

¹ SMAL = Screening Model Action Level

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 NO_x and VOC are conditioned below de minimis levels. Potential emissions of hexavalent chromium are conditioned below the Screening Model Action Level (SMAL).

APPLICABLE REQUIREMENTS

Missouri Army National Guard (MOARNG) Aviation Classification Repair Activity Depot (AVCRAD) 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.

GENERAL REQUIREMENTS

- *Submission of Emission Data, Emission Fees and Process Information*, 10 CSR 10-6.110. The emission fee is the amount established by the Missouri Air Conservation Commission annually under Missouri Air Law 643.079(1). Submission of an Emissions Inventory Questionnaire (EIQ) is required June 1 for the previous year's emissions.
- *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 10-3.090

SPECIFIC REQUIREMENTS

- *Restriction of Emission of Sulfur Compounds*, 10 CSR 10-6.260
- *Maximum Allowable Emissions of Particulate Matter From Fuel Burning Equipment Used for Indirect Heating*, 10 CSR 10-3.060

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.

David Little
Environmental Engineer

Date

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated March 30, 2010, received April 9, 2010, designating Missouri Army National Guard as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.
- Southwest Regional Office Site Survey, dated May 5, 2010.
- *Size Distribution and Speciation of Chromium in Paint Spray Aerosol at an Aerospace Facility*. *Annals of Occupational Hygiene*, Vol 49, No 1, pp. 47-59. Oxford University Press. 2004.

Appendix A: Table of Hazardous Air Pollutants and Screening Model Action Levels (August 16, 2010 Revision 6)

Chemical	CAS #	SMAL (tons/yr)	Group ID	VOC	PM	Chemical	CAS #	SMAL (tons/yr)	Group ID	VOC	PM	Chemical	CAS #	SMAL (tons/yr)	Group ID	VOC	PM
ACETALDEHYDE	75-07-0	9		Y	N	CARBARYL	63-25-2	10	V	Y	Y	DICHLOROPROPANE, [1,2-]	78-87-5	1		Y	N
ACETAMIDE	60-35-5	1		Y	N	CARBON DISULFIDE	75-15-0	1		Y	N	DICHLOROPROPENE, [1,3-]	542-75-6	1		Y	N
ACETONITRILE	75-05-8	4		Y	N	CARBON TETRACHLORIDE	56-23-5	1		Y	N	DICHLORVOS	62-73-7	0.2		Y	N
ACETOPHENONE	98-86-2	1		Y	N	CARBONYL SULFIDE	463-58-1	5		Y	N	DIETHANOLAMINE	111-42-2	5		Y	N
ACETYLAMINOFLUORINE, [2-]	53-96-3	0.005	V	Y	Y	CATECHOL	120-80-9	5		Y	N	DIETHYL SULFATE	64-67-5	1		Y	N
ACROLEIN	107-02-8	0.04		Y	N	CHLORAMBEN	133-90-4	1		Y	Y	DIETHYLENE GLYCOL MONOBUTYL ETHER	112-34-5	5	P	Y	N
ACRYLAMIDE	79-06-1	0.02		Y	N	CHLORDANE	57-74-9	0.01		Y	Y	DIMETHOXYBENZIDINE, [3,3-]	119-90-4	0.1	V	Y	Y
ACRYLIC ACID	79-10-7	0.6		Y	N	CHLORINE	7782-50-5	0.1		N	N	DIMETHYL BENZIDINE, [3,3-]	119-93-7	0.008	V	Y	Y
ACRYLONITRILE	107-13-1	0.3		Y	N	CHLOROACETIC ACID	79-11-8	0.1		Y	N	DIMETHYL CARBAMOYL CHLORIDE	79-44-7	0.02		Y	N
ALLYL CHLORIDE	107-05-1	1		Y	N	CHLOROACETOPHENONE, [2-]	532-27-4	0.06		Y	N	DIMETHYL FORMAMIDE	68-12-2	1		Y	N
AMINOBIHENYL, [4-]	92-67-1	1	V	Y	N	CHLOROBENZENE	108-90-7	10		Y	N	DIMETHYL HYDRAZINE, [1,1-]	57-14-7	0.008		Y	N
ANILINE	62-53-3	1		Y	N	CHLOROBENZILATE	510-15-6	0.4	V	Y	Y	DIMETHYL PHTHALATE	131-11-3	10		Y	N
ANISIDINE, [ORTHO-]	90-04-0	1		Y	N	CHLOROFORM	67-66-3	0.9		Y	N	DIMETHYL SULFATE	77-78-1	0.1		Y	N
ANTHRACENE	120-12-7	0.01	V	Y	N	CHLOROMETHYL METHYL ETHER	107-30-2	0.1		Y	N	DIMETHYLAMINOAZOBENZENE, [4-]	60-11-7	1		Y	N
ANTIMONY COMPOUNDS		5	H	N	Y	CHLOROPRENE	126-99-8	1		Y	N	DIMETHYLANILINE, [N-N-]	121-69-7	1		Y	N
ANTIMONY PENTAFLUORIDE	7783-70-2	0.1	H	N	Y	CHROMIUM (VI) COMPOUNDS		0.002	L	N	Y	DINITRO-O-CRESOL, [4,6-] (Note 6)	534-52-1	0.1	E	Y	Y
ANTIMONY POTASSIUM TARTRATE	28300-74-5	1	H	N	Y	CHROMIUM COMPOUNDS		5	L	N	Y	DINITROPHENOL, [2,4-]	51-28-5	1		Y	N
ANTIMONY TRIOXIDE	1309-64-4	1	H	N	Y	CHRYSENE	218-01-9	0.01	V	Y	N	DINITROTOLUENE, [2,4-]	121-14-2	0.02		Y	N
ANTIMONY TRISULFIDE	1345-04-6	0.1	H	N	Y	COBALT COMPOUNDS		0.1	M	N	Y	DIOXANE, [1,4-]	123-91-1	6		Y	N
ARSENIC COMPOUNDS		0.005	I	N	Y	COKE OVEN EMISSIONS	8007-45-2	0.03		N	Y	DIPHENYLHYDRAZINE, [1,2-]	122-66-7	0.09	V	Y	Y
ASBESTOS	1332-21-4	0	A	N	Y	CRESOL, [META-]	108-39-4	1	B	Y	N	DIPHENYLMETHANE DIISOCYANATE, [4,4-]	101-68-8	0.1	V	Y	N
BENZ(A)ANTHRACENE	56-55-3	0.01	V	Y	N	CRESOL, [ORTHO-]	95-48-7	1	B	Y	N	EPICHLOROHYDRIN	106-89-8	2		Y	N
BENZENE	71-43-2	2		Y	N	CRESOL, [PARA-]	106-44-5	1	B	Y	N	ETHOXYETHANOL, [2-]	110-80-5	10	P	Y	N
BENZIDINE	92-87-5	0.0003	V	Y	N	CRESOLS (MIXED ISOMERS)	1319-77-3	1	B	Y	N	ETHOXYETHYL ACETATE, [2-]	111-15-9	5	P	Y	N
BENZO(A)PYRENE	50-32-8	0.01	V	Y	N	CUMENE	98-82-8	10		Y	N	ETHYL ACRYLATE	140-88-5	1		Y	N
BENZO(B)FLUORANTHENE	205-99-2	0.01	V	Y	N	CYANIDE COMPOUNDS		0.1	O	Y	N	ETHYL BENZENE	100-41-4	10		Y	N
BENZO(K)FLUORANTHENE	207-08-9	0.01	V	Y	N	DDE	72-55-9	0.01	V	Y	Y	ETHYL CHLORIDE	75-00-3	10		Y	N
BENZOTRICHLORIDE	98-07-7	0.006		Y	N	DI(2-ETHYLHEXYL) PHTHALATE, (DEHP)	117-81-7	5		Y	N	ETHYLENE GLYCOL	107-21-1	10		Y	N
BENZYL CHLORIDE	100-44-7	0.1		Y	N	DIAMINOTOLUENE, [2,4-]	95-80-7	0.02		Y	N	ETHYLENE GLYCOL MONOBUTYL ETHER (Delisted)	111-76-2				
BERYLLIUM COMPOUNDS		0.008	J	N	Y	DIAZOMETHANE	334-88-3	1		Y	N	ETHYLENE GLYCOL MONOHEXYL ETHER	112-25-4	5	P	Y	N
BERYLLIUM SALTS		0.00002	J	N	Y	DIBENZ(A,H)ANTHRACENE	53-70-3	0.01	V	Y	N	ETHYLENE IMINE [AZIRIDINE]	151-56-4	0.003		Y	N
BIPHENYL, [1,1-]	92-52-4	10	V	Y	N	DIOXINS/FURANS		6E-07	D,V	Y	N	ETHYLENE OXIDE	75-21-8	0.1		Y	N
BIS(CHLOROETHYL)ETHER	111-44-4	0.06		Y	N	DIBENZOFURAN	132-64-9	5	V	Y	N	ETHYLENE THIOUREA	96-45-7	0.6		Y	Y
BIS(CHLOROMETHYL)ETHER	542-88-1	0.0003		Y	N	DIBROMO-3-CHLOROPROPANE, [1,2-]	96-12-8	0.01		Y	N	FORMALDEHYDE	50-00-0	2		Y	N
BROMOFORM	75-25-2	10		Y	N	DIBROMOETHANE, [1,2-]	106-93-4	0.1		Y	N	GLYCOL ETHER (ETHYLENE GLYCOL ETHERS)		5	P	Y	N
BROMOMETHANE	74-83-9	10		Y	N	DIBUTYL PHTHALATE	84-74-2	10		Y	Y	GLYCOL ETHER (DIETHYLENE GLYCOL ETHERS)		5	P	Y	N
BUTADIENE, [1,3-]	106-99-0	0.07		Y	N	DICHLOROBENZENE, [1,4-]	106-46-7	3		Y	N	HEPTACHLOR	76-44-8	0.02		Y	N
BUTOXYETHANOL ACETATE, [2-]	112-07-2	5	P	Y	N	DICHLOROBENZIDENE, [3,3-]	91-94-1	0.2	V	Y	Y	HEXACHLOROBENZENE	118-74-1	0.01		Y	N
BUTYLENE OXIDE, [1,2-]	106-88-7	1		Y	N	DICHLOROETHANE, [1,1-]	75-34-3	1		Y	N	HEXACHLOROBUTADIENE	87-68-3	0.9		Y	N
CADMIUM COMPOUNDS		0.01	K	N	Y	DICHLOROETHANE, [1,2-]	107-06-2	0.8		Y	N	HEXACHLOROCYCLOHEXANE, [ALPHA-]	319-84-6	0.01	F	Y	N
CALCIUM CYANAMIDE	156-62-7	10		Y	Y	DICHLOROETHYLENE, [1,1-]	75-35-4	0.4		Y	N	HEXACHLOROCYCLOHEXANE, [BETA-]	319-85-7	0.01	F	Y	N
CAPROLACTAM (Delisted)	105-60-2					DICHLOROMETHANE	75-09-2	10		N	N	HEXACHLOROCYCLOHEXANE, [DELTA-]	319-86-8	0.01	F	Y	N
CAPTAN	133-06-2	10		Y	Y	DICHLOROPHENOXY ACETIC ACID, [2,4-]	94-75-7	10	C	Y	Y	HEXACHLOROCYCLOHEXANE, [TECHNICAL]	608-73-1	0.01	F	Y	N

Appendix A: Table of Hazardous Air Pollutants and Screening Model Action Levels (August 16, 2010 Revision 6)

Chemical	CAS #	SMAL (tons/yr)	Group ID	VOC	PM	Chemical	CAS #	SMAL (tons/yr)	Group ID	VOC	PM	Chemical	CAS #	SMAL (tons/yr)	Group ID	VOC	PM	
HEXACHLOROCYCLOPENTADIENE	77-47-4	0.1		Y	N	NITROSOMORPHOLINE, [N-]	59-89-2	1		Y	N	URETHANE [ETHYL CARBAMATE]	51-79-6	0.8			Y	N
HEXACHLOROETHANE	67-72-1	5		Y	N	NITROSO-N-METHYLUREA, [N-]	684-93-5	0.0002		Y	N	VINYL ACETATE	108-05-4	1			Y	N
HEXAMETHYLENE,-1,6-DIISOCYANATE	822-06-0	0.02		Y	N	OTACHLORONAPHTHALENE	2234-13-1	0.01	V	Y	N	VINYL BROMIDE	593-60-2	0.6			Y	N
HEXAMETHYLPHOSPHORAMIDE	680-31-9	0.01		Y	N	PARATHION	56-38-2	0.1		Y	Y	VINYL CHLORIDE	75-01-4	0.2			Y	N
HEXANE, [N-]	110-54-3	10		Y	N	PCB [POLYCHLORINATED BIPHENYLS]	1336-36-3	0.009	X	Y	Y	XYLENE, [META-]	108-38-3	10	G	Y	N	
HYDRAZINE	302-01-2	0.004		N	N	PENTACHLORONITROBENZENE	82-68-8	0.3		Y	N	XYLENE, [ORTHO-]	95-47-6	10	G	Y	N	
HYDROGEN CHLORIDE	7647-01-0	10		N	N	PENTACHLOROPHENOL	87-86-5	0.7		Y	N	XYLENE, [PARA-]	106-42-3	10	G	Y	N	
HYDROGEN FLUORIDE	7664-39-3	0.1		N	N	PHENOL	108-95-2	0.1		Y	N	XYLENES (MIXED ISOMERS)	1330-20-7	10	G	Y	N	
HYDROQUINONE	123-31-9	1		Y	N	PHENYLENEDIAMINE, [PARA-]	106-50-3	10		Y	N							
INDENO(1,2,3CD)PYRENE	193-39-5	0.01	V	Y	N	PHOSGENE	75-44-5	0.1		Y	N							
ISOPHORONE	78-59-1	10		Y	N	PHOSPHINE	7803-51-2	5		N	N							
LEAD COMPOUNDS		0.01	Q	N	Y	PHOSPHOROUS (YELLOW OR WHITE)	7723-14-0	0.1		N	N							
LINDANE [GAMMA-HEXACHLOROCYCLOHEXANE]	58-89-9	0.01	F	Y	N	PHTHALIC ANHYDRIDE	85-44-9	5		Y	N							
MALEIC ANHYDRIDE	108-31-6	1		Y	N	POLYCYCLIC ORGANIC MATTER		0.01	V	Y	N							
MANGANESE COMPOUNDS		0.8	R	N	Y	PROPANE SULTONE, [1,3-]	1120-71-4	0.03		Y	Y							
MERCURY COMPOUNDS		0.01	S	N	N	PROPIOLACTONE, [BETA-]	57-57-8	0.1		Y	N							
METHANOL	67-56-1	10		Y	N	PROPIONALDEHYDE	123-38-6	5		Y	N							
METHOXYCHLOR	72-43-5	10	V	Y	Y	PROPOXUR [BAYGON]	114-26-1	10		Y	Y							
METHOXYETHANOL, [2-]	109-86-4	10	P	Y	N	PROPYLENE OXIDE	75-56-9	5		Y	N							
METHYL CHLORIDE	74-87-3	10		Y	N	PROPYLENEIMINE, [1,2-]	75-55-8	0.003		Y	N							
METHYL ETHYL KETONE (Delisted)	78-93-3					QUINOLINE	91-22-5	0.006		Y	N							
METHYL HYDRAZINE	60-34-4	0.06		Y	N	QUINONE	106-51-4	5		Y	N							
METHYL IODIDE	74-88-4	1		Y	N	RADIONUCLIDES		Note 1	Y	N	Y							
METHYL ISOBUTYL KETONE	108-10-1	10		Y	N	SELENIUM COMPOUNDS		0.1	W	N	Y							
METHYL ISOCYANATE	624-83-9	0.1		Y	N	STYRENE	100-42-5	1		Y	N							
METHYL METHACRYLATE	80-62-6	10		Y	N	STYRENE OXIDE	96-09-3	1		Y	N							
METHYL TERT-BUTYL ETHER	1634-04-4	10		Y	N	TETRACHLORODIBENZO-P-DIOXIN,[2,3,7,8]	1746-01-6	6E-07	D,V	Y	Y							
METHYLCYCLOPENTADIENYL MANGANESE	12108-13-3	0.1	R	N	Y	TETRACHLOROETHANE, [1,1,2,2-]	79-34-5	0.3		Y	N							
METHYLENE BIS(2-CHLOROANILINE), [4,4-]	101-14-4	0.2	V	Y	Y	TETRACHLOROETHYLENE	127-18-4	10		N	N							
METHYLENEDIANILINE, [4,4-]	101-77-9	1	V	Y	N	TITANIUM TETRACHLORIDE	7550-45-0	0.1		N	N							
MINERAL FIBERS		0	T	N	Y	TOLUENE	108-88-3	10		Y	N							
NAPHTHALENE	91-20-3	10	V	Y	N	TOLUENE DIISOCYANATE, [2,4-]	584-84-9	0.1		Y	N							
NAPHTHYLAMINE, [ALPHA-]	134-32-7	0.01	V	Y	N	TOLUIDINE, [ORTHO-]	95-53-4	4		Y	N							
NAPHTHYLAMINE, [BETA-]	91-59-8	0.01	V	Y	N	TOXAPHENE	8001-35-2	0.01		Y	N							
NICKEL CARBONYL	13463-39-3	0.1	U	N	Y	TRICHLOROBENZENE, [1,2,4-]	120-82-1	10		Y	N							
NICKEL COMPOUNDS		1	U	N	Y	TRICHLOROETHANE, [1,1,1-]	71-55-6	10		N	N							
NICKEL REFINERY DUST		0.08	U	N	Y	TRICHLOROETHANE, [1,1,2-]	79-00-5	1		Y	N							
NICKEL SUBSULFIDE	12035-72-2	0.04	U	N	Y	TRICHLOROETHYLENE	79-01-6	10		Y	N							
NITROBENZENE	98-95-3	1		Y	N	TRICHLOROPHENOL, [2,4,5-]	95-95-4	1		Y	N							
NITROBIPHENYL, [4-]	92-93-3	1	V	Y	N	TRICHLOROPHENOL, [2,4,6-]	88-06-2	6		Y	N							
NITROPHENOL, [4-]	100-02-7	5		Y	N	TRIETHYLAMINE	121-44-8	10		Y	N							
NITROPROPANE, [2-]	79-46-9	1		Y	N	TRIFLURALIN	1582-09-8	9		Y	Y							
NITROSODIMETHYLAMINE, [N-]	62-75-9	0.001		Y	N	TRIMETHYLPENTANE, [2,2,4-]	540-84-1	5		Y	N							

Legend	
Group ID	Aggregate Group Name
A	Asbestos
B	Cresols/Cresylic Acid (isomers and mixtures)
C	2,4 - D, Salts and Esters
D	Dibenzofurans, Dibenzodioxins
E	4, 6 Dinitro-o-cresol, and Salts
F	Lindane (all isomers)
G	Xylenes (all isomers and mixtures)
H	Antimony Compounds
I	Arsenic Compounds
J	Beryllium Compounds
K	Cadmium Compounds
L	Chromium Compounds
M	Cobalt Compounds
N	Coke Oven Emissions
O	Cyanide Compounds
P	Glycol Ethers
Q	Lead Compounds (except elemental Lead)
R	Manganese Compounds
S	Mercury Compounds
T	Fine Mineral Fibers
U	Nickel Compounds
V	Polycyclic Organic Matter
W	Selenium Compounds
X	Polychlorinated Biphenyls (Aroclors)
Y	Radionuclides

Notes

Note 1 The SMAL for radionuclides is defined as the effective dose equivalent to 0.3 millirems per year for 7 years exposure associated with a cancer risk of 1 in 1 million