Integrated Pest Management Plan
for
Joint Base Langley-Eustis (Eustis),
Fort Eustis, Virginia

2020 - 2024

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INTEGRATED PEST MANAGEMENT PLAN JOINT BASE LANGLEY-EUSTIS FORT EUSTIS, VIRGINIA PLAN YEARS 2020-2024

APPROVAL:

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EXECUTIVE SUMMARY

1. Authority. This Integrated Pest Management Plan (IPMP) was prepared in accordance with the guidance set forth in Department of Defense Instruction (DoDI) 4150.07, DoD Pest Management Program, 29 May 2008; DoDI 4150.07, Vol. 1, 23 May 2013, DoD Pest Management Training and Certification Program: The DoD Plan for Pesticide Applicators; DoDI 4150.07, Vol. 2, 23 May 2013, DoD Pest Management Training and Certification Program: The DoD Plan for Non-Federal Insecticide, Fungicide and Rodenticide Pesticide Applicators; DoDI 4150.07, Vol. 3, 23 May 2013, DoD Pest Management Training and Certification Program: The DoD Plan for Federal Insecticide, Fungicide and Rodenticide Pesticide Applicators; and Air Force Manual (AFMAN) 32-1053, Integrated Pest Management Program,6 August 2019.

2. Purpose. This plan provides implementing instructions in resolving all pest problems known to occur on JBLE-E, Fort Eustis in accordance with DOD/USAF policies including invertebrate, vertebrate and vegetation pest organisms.

3. Goal. The goal of the Fort Eustis Integrated Pest Management Program is to provide maximum pest control relief to meet mission requirements while limiting the application of pesticides and maximizing the use of nonchemical control strategies. This goal ensures Fort Eustis meets one of the primary environmental Measures of Merit for pest management.

A. Through the end of FY 24 Fort Eustis shall maintain the achieved reduction in annual pesticide use. By achieving this goal, less pesticide will be released into the environment and installation personnel will experience reduced pesticide exposures.

B. The pest management activity that requires the greatest application of pesticides involve use of herbicides to control undesirable vegetation. This involves control in rights of way (railroad, road shoulders, and parking lots/motorpools), landscape/building perimeters, invasive/undesirable vegetation (including training areas, the Fort Eustis Dredge Material Management Area, and natural areas/habitat improvement projects) and turf management at The Pines Golf Course.

4. Authorized Pest Control/Pesticide Applicators. All pesticide applications accomplished on Fort Eustis must be performed by personnel who are employees of the federal government holding current DOD pesticide application certifications or contract personnel holding current pesticide application certifications issued by the Virginia Department of Agriculture and Consumer Services (VDACS). The primary pesticide application activities are performed by the Civil Engineer Division (CED) Base Operations Support (BOS) contractor (Pest Control Shop consisting of 2 Pest Controllers), CED grounds maintenance contractor (2 applicators), Force Support

Squadron (FSS) that manages the Pines Golf Course (1 pesticide applicator), CED Fort Eustis Railroad maintenance contract (1 applicator), and natural resources staff within the CED Environmental Element (1 applicator as well as contractors). The BOS contractor applications, grounds maintenance contractor applications, railroad vegetation applications, the FSS and Environmental Element pesticide applications are monitored by the Fort Eustis Installation Pest Management Coordinator (IPMC). All other pest control/pesticide applications must be coordinated through and approved by the IPMC. The IPMC is a staff member within the Environmental Element of CED and is appointed by the 733 CED Director.

5. All personnel including civilian employees, contractors and military personnel are responsible for implementing preventive measures to reduce the need for pest control.

6. Only those pesticides included in this pest management plan are approved for use on Fort Eustis. However, a working list is maintained by the IPMC and updated lists are included in annual reviews.

7. This IPMP is integrated with the Fort Eustis Integrated Natural Resources Management Plan (INRMP) and the ancillary Invasive Species Management Plan.

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Acronyms

AAFES	Army and Air Force Exchange Service
ABW	Air Base Wing
ACC	Air Combat Command
AEM	Activity Environmental Management
AF	Air Force
AFCEC	Air Force Civil Engineer Center
AFI	Air Force Instruction
AFMAN	Air Force Manual
AFPMB	Armed Forces Pest Management Board
ASA	Army Support Activity
ASSON	Aerial Spray Statement of Need
BBC	Belfour Beattie Communities
BOS	Base Operations Support
CAPS	Cooperative Agricultural Pest Survey
CED	Civil Engineer Division
CEIE	Environmental Element
COR	Contracting Officer's Representative
DBH	diameter at breast height
DEET	N,N-Diethyl-meta-toluamide or diethyltoluamide
DOD	Department of Defense
DODI	Department of Defense Instruction
DPH	Department of Public Health
EEE	Eastern Equine Encephalitis
EMP	Environmental Management Procedure
EO	Executive Order
EPCRA	Emergency Planning and Community Right To Know Act
ESA	Endangered Species Act
EPA	Environmental Protection Agency
FE	Fort Eustis
FIFRA	Federal Insecticide, Fungicide and Rodenticide Act
FSS	Force Support Squadron
ICRMP	Integrated Cultural Resources Management Plan
IGR	Insect Growth Regulator
INRMP	Integrated Natural Resources Management Plan
IPaC	Information for Planning and Consultation
IPM	Integrated Pest Management
IPMC	Installation Pest Management Coordinator
IPMIS	Integrated Pest Management Information System
IPMP	Integrated Pest Management Plan
JBLE	Joint Base Langley-Eustis
JBLE-E	Joint Base Langley-Eustis (Eustis)

Acronyms (continued)

JBLEI	Joint Base Langley-Eustis Instruction
LAFB	Langley Air Force Base
MAHC	McDonald Army Health Center
MASS	Modular Aerial Spray System
MBTA	Migratory Bird Treaty Act
MEDDAC	U.S. Army Medical Department Activity
MOM	Measures of Merit
MSG	Mission Support Group
OP	Organophosphate insecticide
PAI	Pounds of Active Ingredient
PDMP	Pesticide Discharge Management Plan
PMQAE	Pest Management Quality Assurance Evaluator
PPE	Personal Protection Equipment
PPQP	Plant Protection and Quarantine Program
RCI	Residential Communities Initiative
ROW	Right Of Way
SDS	Safety Data Sheet
SFS	Security Forces Squadron
SLE	St. Louis Encephalitis
SO	Service Order
SOO	Standard Operations Order
sp.	Species (singular)
spp.	Species (plural)
TG	Technical Guide
TO	Task Order
TRADOC	Training and Doctrine Command
USC	United States Code
VA	Virginia
VAC	Virginia Code
VDACS	Virginia Department of Agriculture and Consumer Services
VDEQ	Virginia Department of Environmental Quality
VPDES	Virginia Pollutant Discharge Elimination System
USAPHC	US Army Public Health Command
USATSCH	US Army Transportation School
USDA-WS	US Department of Agriculture – Wildlife Services
USDA-APHIS	US Department of Agriculture-Animal & Plant Health Inspection Service
USATSCH	US Army Transportation School
USFWS	US Fish & Wildlife Service
WNV	West Nile Virus
WO	Work Order

WPA Workers Progress Administration

Special Terms

Arthropod. Invertebrate animals being characteristic of a chitinous exoskeleton, paired and jointed appendages, and segmented body regions. Examples include insects, spiders, ticks, mites and crayfish.

Chitin. A structural carbohydrate that constitutes a major component of the arthropod exoskeleton ("chitinous" means containing chitin).

DEET. "DEET" stands for N,N-diethyl-meta-toluamide (or diethyltoluamide) and is the active ingredient in insect repellents. It is a slightly yellow oil intended to be applied to the skin or to clothing and provides protection against biting arthropods including mosquitoes, ticks, chiggers, and other biting insects. It is available as liquids, lotions, sprays, and impregnated materials (such as towelettes, etc).

Integrated Pest Management (IPM). "A planned program, incorporating continuous monitoring, education, record-keeping, and communication to prevent pests and disease vectors from causing unacceptable damage to operations, people, property, materiel, or the environment. IPM uses targeted, sustainable (effective, economical, environmentally sound) methods including habitat modification, biological control, genetic control, cultural control, mechanical control, physical control, regulatory control, and where necessary, the judicious use of least-hazardous pesticides." (Definition source: DoD Instruction 4150.07, 28 May 2008).

Invertebrate organisms. Animals that lack a backbone or vertebrae/internal skeleton. Examples include arthropods (such as the examples noted above) as well as worms, nematodes, clams, octopuses, squid, barnacles, slugs, starfish, snails, etc.

Nematode. Roundworms that exist in various habitats and are usually microscopic or difficult to see with the naked eye. Some adversely affect vegetation while others are parasitic of animals and humans.

Pest. An organism that adversely affects military readiness (including various military operations and military training), damages equipment and supplies, damages real property or serves as a vector of disease. Such organisms include invasive or undesirable vegetation, disease-vectoring arthropods, ornamental arthropod pests, forest arthropod pests, stored product invertebrate pests, wood-destroying arthropods, algae under certain conditions and certain vertebrate organisms.

Pest control. A technique to control a particular pest and is a component of the overall pest management program. Techniques or controls include physical, mechanical, cultural, chemical and regulatory.

Special Terms (continued)

Pest management. A system or program of utilizing various pest control techniques collectively considered towards overall management of pests affecting a given facility.

Pesticide. "Any substance or mixture of substances including biological control agents, that may prevent, destroy, repel, or mitigate pests and is specifically labeled for use by the EPA. Also, any substance or mixture of substances used as a plant regulator, defoliant, desiccant, disinfectant or biocide." (Definition source: DODI 4150.07, 28 May 2008). There are several types of pesticides based on the target pest(s). These include acaricides, algaecides, fungicides, herbicides, insecticides, nematocides and rodenticides as well as other pesticide categories. Those types of pesticides most likely to be used at Fort Eustis are defined below.

Acaricide. Chemical/biologically-derived substances used to control ticks and other mites.
Algaecide. Chemical/biologically-derived substances used to control algae.
Fungicide. Chemical/biologically-derived substances used to control fungi.
Herbicide. Chemical/biologically-derived substances used to control vegetation.
Insecticide. Chemical/biologically-derived substances used to control insect pests.
Nematocide. Chemical/biologically-derived substances used to control nematodes.
Rodenticide. Chemical/biologically-derived substances used to control rats, mice and other rodents.

Ticks. Ticks are arthropods that are related to spiders and similar organisms. Two basic types include hard ticks and soft ticks based on their external appearance. Both groups are parasitic of vertebrate organisms including humans and many are vectors of disease. Hard ticks are the most significant arthropod disease vectors on Fort Eustis.

Vertebrate organisms. These are animals having a backbone/internal skeleton and typically constitute larger animals including mammals, birds, reptiles and amphibians. Several vertebrate organisms are pests that affect military operations, and human health and safety depending on the situations and their proximity to military operations. These include but not limited to rodents, raccoons, bats, snakes, deer, resident Canada geese, etc.

Zoonotic diseases. Often referred to as a zoonosis (plural zoonoses). These are infectious diseases occurring in animals that can be transmitted to humans. Examples include but not limited to rabies, Lyme disease, encephalitis caused by West Nile virus and babesiosis.

I. BACKGROUND.

1. Purpose. This plan describes a comprehensive Integrated Pest Management (IPM) program for Fort Eustis. IPM uses a wide variety of technological and management practices to achieve long-term and environmentally-sound pest suppression and prevention. Adherence to this plan ensures effective, economically and environmentally acceptable pest management and maintains compliance with pertinent laws and regulations.

2. Authority.

A. Integrated Pest Management is implemented in accordance with DODI 4150.07, The DoD Pest Management Program, and is further implemented in the AFMAN 32-1053, AF Pest Management Program. Section 4.3 of DODI 4150.07 specifies compliance with all Executive Orders and Federal, State and local statutory and regulatory requirements pertaining to IPM. When federal law is not in agreement with state or local law, the more stringent law shall be followed.

B. Fort Eustis adheres to State laws concerning the use of pesticides and pest control actions. The Virginia Pesticide Control Act, Sections 3.1-249.27 through 3.1-249.78 and numerous parts of VR-115-04-22 and VR-115-04-23 govern JBLE pest management programs. Virginia Department of Agriculture and Consumer Services (VDACS) provides guidance, and enforcement related to pesticides utilized in the state. Questions or concerns can be forwarded to the following VDACS office:

Virginia Department of Agriculture and Consumer Services
Office of Pesticide Management
102 Governor Street, 1st Floor
Richmond, VA 23219
http://www.vdacs.virginia.gov/pesticides/index.shtml
(804)-786-3798

C. Fort Eustis complies with the provisions of Joint Base Langley-Eustis Instruction (JBLEI) 32-101, Environmental Management. Integrated pest management and use of pesticides are program areas under the direction of the Environmental Element (CEIE).

3. Plan maintenance. The IPMP is reviewed and updated annually by the IPMC. Coordination with internal and external stakeholders shall be conducted during the reviews. However, IPMP is completely revised AND formally staffed every five years. The format/form used for reviews is found at Appendix Y.

4. The long title of this plan is the *Fort Eustis Integrated Pest Management Plan*. The short title is the *FE IPMP*. Both titles are unclassified.

6. This plan is unclassified and requires no special handling.

7. This document may be reproduced in whole or in part as required for the preparation of supporting documents, checklists, briefing aids, etc.

8. The provision of AFI 10-701, *Operations Security (OPSEC) Program* has been considered in the development and implementation of this plan.

9. Pesticide applications. As stated above pest control procedures at Fort Eustis follow the IPM philosophy. Pesticides are used only when other non-chemical techniques cannot achieve relief of the pest condition. Only those persons who are DOD-certified or VDACS certified in applicable respective categories are authorized to apply pesticides on the installation. Pesticide applicator certifications issued by other states are not applicable for Fort Eustis. All pest control activities including all pesticide applications are approved by the IPMC prior to the actual work. Authorized pest control activities are noted in Sections V and VI. There are no self-help pesticide activities available at Fort Eustis.

II. RESPONSIBILITIES.

1. AFCEC Command Entomologist.

A. Approves the IPMP.

B. Reviews and approves as applicable pesticide use requests received from the IPMC.

2. Commander, 633 Air Base Wing. Approves the IPMP.

3. Director, 733 Civil Engineer Division.

A. Provides oversight of the integrated pest management program and all pest control activities.

B. Appoints a Federal Government employee as the Integrated Pest Management Coordinator in writing.

C. Executes the Base Operations Support (BOS) contract that includes pest control services.

D. Executes grounds maintenance and railroad maintenance contracts that typically include vegetation control requiring use of herbicides.

E. Designates a Pest Management Quality Assurance Evaluators (PMQAE) to evaluate the performance of the pest control services associated with BOS, grounds maintenance, and railroad maintenance contracts.

4. Installation Pest Management Coordinator [IPMC] (Environmental Element).

A. Serves as the Commander's representative for all pest management actions.

B. Authorized agent to discontinue/shut down any unauthorized or unsafe pest control activity/pesticide application.

C. Implementation and oversight for integrated pest management program.

D. Prepares, updates and implements the Fort Eustis Integrated Pest Management Plan.

E. Ensures only properly certified and licensed contractors and pesticide applicators apply pesticides on Fort Eustis.

F. Assists McDonald Army Health Center staff (Department of Public Health/Environmental Health Officer) with arthropod-borne disease surveillance.

G. Coordinates aerial applications of pesticides/prepares Aerial Statements of Need (ASSON).

H. Approves all pest control activities and pesticide applications performed on the installation (with the exception of Residential Communities Initiative privatized housing properties).

I. Coordinates arthropod/vertebrate disease vector issues/incidents and surveillance/ study results with McDonald Army Health Center staff (Department of Public Health/ Environmental Health Officer).

J. Provides other entomological support to McDonald Army Health Center staff (Environmental Health Officer) as needed.

K. Serves as an alternate PMQAE when feasible based on manpower.

L. Obtains approval for all pesticides used on Fort Eustis.

M. Prepares monthly pesticide use reports, annual reviews/updates to IPMP and annual Measures of Merit reports.

N Assists the Natural Resources Manager with management of invasive species and nuisance wildlife.

O. Maintains copies of applicator certifications for all DOD and Virginia certified pesticide applicators applying pesticides on Fort Eustis as well as Virginia Pesticide Business Licenses.

P. Completes initial DOD pest management certification in the core phase and categories 3, 5, 6, 7, 8 and 11 (and successfully completes refresher training).

5. PMQAE.

A. Evaluates the performance of the pest control services component of the BOS, grounds maintenance, and railroad maintenance contracts.

B. Provides copies of monthly QAE reports to the IPMC.

C. Completes initial DOD PMQAE training (and 3-year refresher) or pest management certification in the core phase and categories 3, 5, 6, 7 and 8 (and 3-year refresher training).

6. Chief, Engineering Flight, CED.

A. Provide written contractor termite control plans to the IPMC for review and approval at least 30 days prior to applications for new construction or other projects requiring termite control.

B. Coordinate pest control needs for various applicable projects with the IPMC.

7. Chief, Operations Flight/Contractor Officer Representatives (CORs) for contracts involving pesticide applications.

A. Ensures copies of pesticide applicator certifications, Virginia Pesticide Business Licenses and certificate of insurance liability are obtained from respective contractors and provides copies of these documents to the IPMC immediately upon implementation of a given contract.

B. Provides copies of the pesticide applicator certifications and Virginia Pesticide Business Licenses to the IPMC when new applicators are assigned, when new contracts are awarded, and when these existing documents expire.

C. Ensures all pesticides brought onto or used by their contractors are registered through the HazMart and are on their HazMart Authorized Use List (AUL).

8. Base Operations Support (BOS) contractor/pest controllers/pesticide applicators. Perform pest control services in accordance contract specifications, the Fort Eustis Integrated Pest Management Plan, JBLE I 32 – 101, and as directed by the IPMC.

9. Director, Force Support Squadron.

A. Submits monthly pesticide use reports for The Pines Golf Course to the IPMC no later than the 5th working day of the month following report period.

B. Submits monthly pesticide inventory no later than the 5th working day of the month following the inventory period.

C. Provides copies of DOD/VDACS pesticide applicator certifications to the IPMC.

D. Ensures The Pines Golf Course staff use approved pesticides by submitting pesticide use requests to the IPMC and maintaining a copy of the current list of pesticides approved for use at Fort Eustis.

E. Ensures all pesticides brought onto or used by the golf course are registered through the HazMart and are on their HazMart Authorized Use List (AUL).

10. Chief, Department of Public Health, McDonald Army Health Center.

A. Oversees arthropod-borne disease surveillance.

B. Informs the IPMC of receipt of disease vector surveillance directives or information.

C. Requests pest control support from CED by submitting service orders unless previously coordinated with IPMC.

D. Consults with the IPMC on disease vector arthropod issues.

E. Coordinates information regarding ticks received from patients or other personnel who bring ticks to the Department of Public Health office.

11. Director, 733d Security Forces Squadron.

A. Monitors installation access control points and vets pest control/pesticide applicator personnel for installation access requirements.

12. Army & Air Force Exchange Service Post/Base Exchange Manager.

A. Maintain a current pesticide inventory.

B. Only markets non-restricted pesticides with current Environmental Protection Agency (EPA) registrations and authorized for use in Virginia.

C. Provides safety data sheets and labels of its pesticide products to any person requesting such.

13. Defense Commissary Agency Manager.

A. Maintain a current inventory of pesticides offered for sale.

B. Only markets non-restricted pesticides with current Environmental Protection Agency (USEPA) registrations and authorized for use in Virginia.

C. Provides safety data sheets and labels of its pesticide products to any person requesting such.

14. Commander, Army Support Activity.

A. Ensures RCI staff inform the IPMC of known or suspected imported fire ant infestations on RCI housing partner property.

B. Provide a list of pest control contractors authorized to perform pest control on RCI privatized housing partner property to the IPMC with monthly updates.

C. Ensure pest controllers contracted with the privatized housing partner are certified in respective categories to apply pesticides in Virginia, use only those pesticides authorized for use in Virginia and apply such pesticides in accordance with the labels.

D. Ensures nuisance wildlife issues occurring on privatized housing property are reported to the natural resources staff in the Environmental Element or 733 SFS Game Warden (such wildlife include snakes, birds, deer and small mammals that can potentially transmit rabies (such as bats, raccoons, foxes and opossums).

E. Ensures RCI staff report swarms of feral honeybees observed in privatized housing to the IPMC to determine appropriate course of action.

F. Ensures pest control requirements existing for training areas and weapons ranges are submitted to CED for action including mosquitoes, ticks, invasive vegetation, etc.

15. Commanders and Directors of all tenant activities.

A. Requests pest control support from CED via service orders by calling 878-HELP.

B. Coordinates for all pest control issues with the IPMC.

C. Ensures personnel under their direction or supervision (soldiers, airmen, civilian employees, and contractors) do not apply any pesticides in working or living areas without prior approval from the IPMC.

D. Report military personnel and civilian arthropod-borne disease case information to Chief, Department of Public Health, McDonald Army Health Center.

E. Reports feral domestic honeybee swarms to the IPMC for action.

F. Ensures personnel follow effective preventive measures (such as articulated in Appendix X) to reduce the need for pest control.

G. Reports feral/stray cats observed in their respective areas to CED by calling 878-HELP.

H. Ensures personnel under their direction or supervision (soldiers, airmen, and civilian employees, and contractors) do not take action to capture or kill feral/stray cats or wildlife.

III. INTEGRATED PEST MANAGEMENT (IPM).

1. Legal Mandate. All Federal agencies including the Department of Defense are mandated by Public Law (Section 136r-1 of the Federal Insecticide, Fungicide and Rodenticide Act) to use IPM.

2. IPM Principles.

A. General concept. IPM uses a set of principles that employs the best approach towards resolving the effects of pest organisms. These principles include first identifying whether a pest(s) does in fact exist. Once this is ascertained other factors including (but not necessarily limited to) the biology of the pest organism(s) and the environmental conditions are evaluated towards the appropriate control technique to be employed. This process reduces costs, reduces resistance of the pest(s) to pesticides, enhances public health and safety, reduces risks to non-target organisms, and reduces risks of damage to other environmental media. Pest management at Fort Eustis follows the IPM concept.

B. Types of controls.

(1) Biological Control. Pest control is performed using living organisms or products of other organisms.

(2) Mechanical Control. Pest control is performed using a mechanical device such as traps or exclusionary devices.

(3) Physical Control. Pest control is performed using non-mechanical or environmental techniques such as heat, cold, light, sound, ultraviolet or infrared light, etc.

(4) Regulatory Control. Pest control is enhanced by compliance with regulations and laws (such as quarantines).

(5) Cultural Control. Pest control is met by using non-chemical modifications to the operating environment making the environment less favorable for a pest (includes habitat modification, sanitation, hygiene, etc.).

(6) Chemical Control. Pest control is accomplished via use of chemical substances notably pesticides, repellents, pheromones or growth regulators to kill, attract to traps or killing devices, or to repel pests from specific areas).

(7) Combinations of the above controls.

C. Prevention. Taking actions that prevent (or significantly reduce) the need for pest control is the first step in the installation's IPM program. All personnel are responsible for prevention. Prevention begins with the individual. Examples of preventive measures are discussed in Appendix X.

IV. PRIORITY OF PEST MANAGEMENT WORK.

1. General. Pest management is conducted to support military mission requirements. Such support may involve reducing the risks of vector-borne diseases to military personnel and the civilian workforce, maintaining wood structures used to house operations against wood-damaging insects or managing insect pests of forested areas used for training. Priority for pest management is based on risks to human health and safety, structural property, land sustainment, recreation and aesthetics in that order.

2. Priority of pest management work. The following priorities exist for Fort Eustis:

A. Situations involving mammals posing as immediate risks of rabies exposure.

Any mammal species can contract and transmit the rabies virus though the incidence is variable amongst different species. Those mammals occurring on Fort Eustis that have higher risks include raccoons, red foxes, feral/stray domestic cats, bats, opossums and coyotes. The risk exists in situations where the wildlife/feral animal is in close proximity to operations.

B. Disease vectoring biting arthropods. These are arthropods capable of transmitting microorganisms via bites that cause disease in humans. For the installation, such arthropods are primarily mosquitoes and ixodid (hard) ticks. Both arthropods are important health risks in cantonment and training areas.

C. Venomous animals posing immediate health and safety risks. Venomous animals at Fort Eustis include primarily widow spiders (Lactrodectus spp.), bees, hornets, and wasps. Venomous snakes have never been documented on the installation. The three venomous snakes that occur in Virginia (Eastern copperhead [Agkistrodon contortrix], Northern cottonmouth [Agkistrodon piscovorous] and timber rattlesnake [Crotalus horridus]) have never been documented by natural resources staff on the installation; however these species do occur in the local area. The likelihood of venomous snakes on the installation remains low based on their biology, habitat preferences, and current distribution information. Responses to snakes are generally limited to those observed in or around buildings where natural resources staff shall remove and release without lethal take. No brown recluse spiders (Loxosceles reclusa) have been documented on the installation. The likelihood of Loxosceles reclusa occurrence is low because Virginia is outside of normal range of this species. Red imported fire ants (Solenopsis invicta) are also venomous having the ability to sting. However, only one colony has been documented on the installation and has since been eliminated.

D. Bats and rodents in occupied or storage buildings. Bats, rats and mice may vector diseases or carry other arthropod disease vectors such as fleas, lice, bat bugs and mites.

E. Mechanical disease transmitting pests. This group primarily includes cockroaches, certain flies and rodents that can transmit disease pathogens to consumables such as food or surfaces that in turn can infect humans. These pests are often associated with food-handling facilities, storage areas, medical facilities and living quarters.

F. Nuisance biting arthropods. These include “no-see-ums” (Diptera: Ceratopogonidae, usually the genus Culicoides), deer flies (species within the genus Chrysops), yellow flies (Diachlorus ferrugatus), horse flies (Diptera: Tabanidae), and mosquitoes.

G. Poisonous plants (such as poison ivy, poison oak, and giant hogweed). Poison ivy is the only plants on the installation that may pose health risks to personnel via contact with skin. It may occur in cantonment and training areas. However, stands of poison oak may occur. Giant hogweed is now documented in parts of Virginia and could conceivably spread to the installation over time.

H. Structurally-damaging pests. These include termites, carpenter ants, carpenter bees, rodents, certain wood-boring beetles and wood-destroying fungi.

I. Stored product pests. Pests associated stored products and food preparation facilities. These primarily include cockroaches, ants, certain beetle species, certain moth species, and rodents.

J. Vegetation affecting security. Weeds, trees, shrubs and other vegetation may encroach upon, cover and damage security fence areas, fencing and building perimeters. This precludes visibility and compromise the integrity of fences. Additionally, this may include invasive common reed (Phragmites australis) in certain locations.

K. Animal and plant pests affecting land sustainment. Land resources containing various habitat types exist on Fort Eustis. Many of these habitat types are important to sustaining military training. This is particularly important concerning forested areas. Forest pests that can adversely affect these resources include gypsy moths, other lepidopteran larvae, bark beetles, ambrosia beetles, certain cerambycid long-horned beetles, certain buprestid beetles and others. This also includes invasive vegetation such as common reed (Phragmites australis), tree of heaven (Ailanthus altissima), Chinese privet (Ligustrum sinense) and many others.

L. Vegetation affecting rights-of-way. Weeds and other vegetation may encroach upon parking lots, motorpools, roads and rail lines.

M. Animal and plant pests affecting recreation. A number of serious pests can affect recreational areas such as The Pines Golf Course and some sport fields as well as forested areas where recreational hunting takes place.

N. Animal and plant pests affecting aesthetics. Turf, lawns and ornamental plants. This group includes weeds and other plants that adversely affect landscaped areas or manicured lawns as well as arthropod and certain vertebrate species such as moles, voles and woodchucks.

V. Fort Eustis Pest Management Resources.

1. Environmental Element, CED staff (CEIE). The Natural Resources and IPM Branch within CEIE consists of staff knowledgeable of entomology and wildlife biology. Currently, two staff members are assigned. These staff members provide expertise on arthropod, wildlife and other fauna identification and biology. The IPMC position resides in this branch that provides expertise on pest management and directs the pest control technicians of the BOS contract. Additionally, this staff oversees execution of contracts that control invasive vegetation and undesirable vegetation associated with habitat management.

2. BOS contract. This contract includes pest control services. It provides the majority of the pest control support at Fort Eustis. Activities requiring pest control support obtain support by submitting requests to the CED Help desk at 878-HELP.

3. Grounds maintenance contract. This contract includes pest control services to control vegetation associated with rights of way and turf. This includes parking lots, roads, fence lines, etc. with the exception of the installation railroad.

4. Railroad maintenance contract. This contract controls undesirable vegetation along the installation railroad and associated ballast.

5. The Pines Golf Course. A VDACS-certified grounds maintenance staff performs control of vegetation, fungal pathogens, or invertebrate pests of golf course turf areas.

VI. Other Pest Management Resources.

1. 910th Airlift Wing based at Youngstown Air Reserve Station, Ohio. The 910th Airlift Wing provides aerial treatment for mosquito control under certain conditions such as high mosquito populations or increased risks of mosquito-borne diseases. The IPMC coordinates these efforts.

2. Termite control contracts for new construction. Normally, new construction requires termite control. Engineering Flight, CED or USACE agents contract for this service. Termite control plans are submitted through the IPMC for approval.

3. City of Newport News. Pest control services needed at the General Stanford Elementary School is performed by certified applicators from Newport News or by certified applicators under contract with Newport News.

4. Privatized housing. Pest control services required in privatized housing is performed under contract with the housing partner.

VII. Health and Safety.

1. General. Pesticides and other substances used in pest control operations may pose hazards to pest control personnel, other personnel/Fort Eustis community and emergency responders. As required by law, ALL pesticides are applied only by certified applicators on the installation and must be done in strict conformance to the given pesticide label.

2. Pest Control Facilities. Currently, only BLDG 1422 (CED BOS contract Pest Control Shop) and BLDG 3515 (The Pine Golf Course maintenance facility) are the authorized pesticide storage (and pesticide mixing) facilities for actual pest control operations.

BLDG 1386 (AAFES/Post Exchange/Base Exchange) may store pesticide products intended for sale (that have current EPA registrations and are authorized for use in Virginia) but it is not a pest control operation).

3. Medical Surveillance of Pest Management Personnel.

A. BOS contract pest control personnel. BOS Contractor ensures its pest control personnel receive initial and annual physical examinations. Additionally, those BOS contract pest control personnel holding Category 7d (Vertebrate Pest Control) certifications shall have rabies pre-exposure vaccinations and titer tests every 2 years with follow-up vaccinations as deemed by the appropriate medical facility. Proof of vaccinations and titers shall be provided to the IPMC.

B. Federal employees. CED natural resources staff and Pines Golf Course staff who apply pesticides shall enter the medical surveillance programs administered by the McDonald Army Health Center prior to application of pesticides. CED natural resources staff who handle wildlife shall have rabies pre-exposure vaccinations and titer tests every 2 years with follow-up vaccinations as deemed by the appropriate medical facility. Proof of vaccinations and titers will be provided to the IPMC.

4. Hazard Communication. Safety Data Sheets (SDS) and labels for authorized pesticides (whether or not a given quantity is on hand) shall be maintained at BLDG 1422 (BOS Contractor Pest Control Shop), BLDG 1386 (Post/Base Exchange) and BLDG 3515 (Pines Golf Course), and readily accessible to all pesticide applicators. Copies of SDSs and labels shall be maintained in organized SDS books and copies shall accompany pesticide applicators when the given pesticide is being used or transported on the installation. Copies of all SDSs and labels shall be provided to the IPMC.

5. General/routine safety procedures are described below for pest control staff.

A. Personal protective equipment (PPE). Appropriate PPE and related protective clothing are required for all individuals applying pesticides. The appropriate PPE/clothing shall be used as stated by the given pesticide label. Such PPE shall be obtained with appropriate training completed before using the PPE and applying the pesticide. Respirators, when required are to be cleaned daily after use, to have cartridges changed after 8 hours of actual use and to be stored when not used in a sealed container. Pest controllers are instructed on the proper fitting of respirators and will be clean shaven when respirators are worn. Annually, the pest controllers will be medically evaluated for respirator wear and shall be fit-tested by the installation Safety Office or a licensed industrial hygienist using a quantitative procedure. Pest control personnel shall not wear street clothing while applying pesticides. All clothing worn during pesticide application must be laundered at the Pest Control Shop or Golf Course (or by using a laundry service). At no time will such clothing be worn home or laundered at home. Additionally, all pesticide applicators shower at the end of the workday using installation shower facilities. An emergency eyewash is placed on each pest control vehicle. An

emergency eyewash fountain and deluge shower is located in the pesticide mixing room and pesticide storage room. Safety is given top priority, especially when applying and handling pesticides and limiting pesticide exposure to all installation personnel.

B. Indoor Pesticide Applications. To prevent unnecessary pesticide exposure, building occupants are required to vacate the treatment area prior to treatment and for at least 2 hours following most pesticide applications. This procedure allows ultra-low dose/ultra-low volume (ULD/ULV) applied pesticides to settle, permits residual sprays to dry and reduces pesticide-related odors. Pesticides are not applied to sites having exposed foods or cooking/eating utensils. Occupants are instructed to wash food preparation surfaces and storage shelves following pesticide treatments. Special precautions are taken in sites with fish that cannot be removed during treatment. Fish tanks are covered and the air pumps are turned-off. Generally speaking, work areas should not contain pets or fish tanks as these conditions could disrupt pest control operations or actually contribute to pest control requirements.

C. Outdoor Pesticide Applications. A major portion of the CED Pest Control Shop, all right of way vegetation maintenance, all invasive/undesirable vegetation management and all of The Pines Golf Course pest control operations are performed outdoors. Golf course personnel primarily apply pesticides as sprays and granules to turf areas. CED Pest Control Shop personnel fog for mosquitoes and other biting flies, mist tree lines and wooded areas for tick and mosquito control, spray trees, ornamental plants, turf; aquatic sites, building exteriors, etc. for control of a wide variety of pests and apply granule and dust pesticide formulations. For outdoor pesticide applications, preventing incidental pesticide exposure to personnel in and around the treatment site is of primary importance. Treatment sites are controlled to prevent personnel entering the site during the pesticide application and until the pesticide has dried or dissipated. Prior to commencing seasonal adult mosquito control and immediately prior to each aerial mosquito control mission, the public is notified of control activities. For aerial fogging missions, local beekeepers are individually notified of the aerial fogging mission and proper precautions for their beehives. While ground fogging, the vehicle and ULV fogger stops operations when pedestrians are encountered until they have moved safely out of the treatment area. Coordination with stakeholders and other components of the installation community is also required for aerial treatments using herbicides such as might occur with larger area coverage against certain invasive vegetation.

D. Fumigation. Fumigation of stored products shall only be used if the economic values of the product(s) outweigh the cost/risks of fumigation. The CED Pest Control Shop does not have the necessary equipment to perform a fumigation mission; therefore, if fumigation is required, this function must be a contracted service. Fumigation services shall be coordinated and approved by the IPMC. The affected area to be fumigated must be secured to prevent access of unauthorized individuals.

6. Emergency Procedures. Both the Fire & Emergency Services and McDonald Army Health Center provide emergency services.

A. Fire & Emergency Services, CED. The Fire & Emergency Services are notified of the pesticides stored in Approved Pesticide Storage Facilities (Buildings 1422, 1386 and 3515). This information is part of the Pre-fire Plan for these facilities. The Fire & Emergency Services can respond as First Responders, Level 2 and 3.

B. McDonald Army Health Center (MAHC). The clinic provides emergency medical support in the event of accidental pesticide poisoning. The clinic emergency room has been notified of the pesticide types used on Fort Eustis. In event of an emergency, both a pesticide label and a SDS for the pesticide causing the poisoning will be provided with the patient.

VIII. Environmental Considerations.

1. General. Fort Eustis is joint military installation located adjacent to the independent city of Newport News in the mid-Atlantic coastal plain of southeast Virginia. Geographically, it is located on the James River near the confluence with the Chesapeake Bay and is therefore in the Chesapeake Bay watershed. The James River is on the western boundary and the Warwick River is on the eastern boundary.

2. Installation description. The following information is unique to Fort Eustis:

- Mission: Training and administrative support
- Approximate number of personnel: 15,700
- Approximate total acreage: 7,869 acres
- Approximate building space: 6,554,728 square feet
- Approximate acreage of wetlands: 3,600 acres
- Approximate acreage of commercial forest: 2,700 acres
- Approximate miles of shoreline including James and Warwick Rivers and Skiffes Creek: 21 miles
- Family housing is privatized under a 75-year lease administered by the Residential Communities Initiative (RCI). Pest management in RCI housing is not managed or administered by the IPMC as per DODI4150.07.
- Major facilities include 3d Port, Range and Training Complex, Fort Eustis Dredge Material Management Area (FEDMMA), The Pines Golf Course,

Felker Army Airfield, US Army Transportation School (USATSCH) railroad network, and Maritime Administration's James River Reserve Fleet.

3. Sensitive areas. Sensitive areas include (but not necessarily limited to) wetlands and ephemeral pools, surface waters (James River, Warwick River, Skiffes Creek, drainage ditches, tidal creeks, ponds, Eustis Lake and Browns Lake), Environmental Restoration Program (ERP) sites, bald eagle nest sites and two Conservation sites.

4. Federally and State Listed Species. Federally and State listed species must be addressed regarding pest management at Fort Eustis. Pest control techniques have potential to impact listed species. Such techniques could primarily include pesticide applications and habitat manipulation. Knowledge of listed species associated with the installation is necessary to mitigate potential effects of pest management.

A. Atlantic sturgeon. The federally endangered Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) occurs in the James River at certain times of the year. No direct pest management activities are expected in the habitat used by the Atlantic sturgeon.

B. Indiana and Northern-longed Eared Bats. The federally endangered Indiana bat (*Myotis sodalis*) and the federally threatened Northern long-eared bat (*Myotis septentrionalis*) occur at the installation. These species are expected to primarily occur in natural areas. Use of pesticides in natural areas include herbicides to control invasive vegetation or control undesirable vegetation to make habitat improvements. Treatments of herbaceous vegetation is not expected have a significant contact with bats. Other pesticides used in natural areas could include various insecticides to control mosquitoes, ticks and chiggers. Aerial applications of insecticides for mosquitoes would presumably be the more potentially significant technique; however, historically aerial applications have been very infrequent. Insecticide applications for ticks and chiggers are limited to ground surfaces where these pests have been documented. Such areas might include Range 2/3 firing line, bivouac sites and perimeters. However, these applications are also infrequent. Probably the more significant technique is habitat manipulation. In reference to these particular species, this technique would primarily involve timber removal in response to forest pest infestation.

C. Tri-colored and Little Brown Bats. The state-listed tri-colored bat (*Perimyotis subflavus*) and little brown bat (*Myotis lucifugus*) also occur on the installation. Pest management issues would be the same for these species as discussed for the Indiana and Northern long-eared bats mentioned above.

D. Rusty patched bumble bee (*Bombus affinis*). This species was listed as endangered effective March 21, 2017. It is not listed in the US Fish & Wildlife Service (USFWS) Information for Planning and Consultation system (IPaC) for area of the installation; however, various sources include Virginia as part of the species historical range. Specific information concerning its distribution is not available. FE has

conducted insect inventories; however, limited data exists for apids. The presence of the rusty patched bumble bee on FE remains unknown; however, U.S. Air Force Pollinator Conservation Reference Guide (2017) suggests the possibility. The potential for its existence is considered when pesticide use must occur in natural areas.

E. Other federally-listed insects. Virginia Department of Game and Inland Fisheries notes the American burying beetle (Nicrophorus americanus) as federally endangered in Virginia but USFWS only documents natural populations occurring in Rhode Island, Oklahoma, Arkansas, and Nebraska. It has not been documented at Fort Eustis. Mitchell's satyr butterfly (Neonympha mitchellii) is a federally endangered butterfly documented from one county in western Virginia. The Insects, Other Arthropods & Other Invertebrates Observed on Fort Eustis: Understanding the Significance of Invertebrate Taxa on Military Missions report at Appendix Z includes an exhaustive survey of butterflies and Mitchell's satyr was not documented and its presence is not expected on the installation. The federally threatened Northeastern beach tiger beetle (Cicindela dorsalis dorsalis) is documented on coastal lands of Accomack, Lancaster, Mathews, Middlesex, Northampton, and Nothumberland Counties of Virginia. It has not been documented at Fort Eustis. Collectively these listed insects are not expected to be impacted by pest management at Fort Eustis.

F. Federally-listed plants. No known federally listed plants are documented at Fort Eustis based on previous flora/botanical field surveys and natural resources staff knowledge.

G. State listed plants and insects. A listing of endangered and threatened plants and insects is noted in the Virginia Code. This list can be found at the following link: 2VAC5-320-10. Listing of Endangered and Threatened Plant and Insect Species. https://law.lis.virginia.gov/admincode/title2/agency5/chapter320/section10/. None of these species have been documented on the installation to date.

5. Cultural and Historical Sites. There are over 240 known archaeological sites on Fort Eustis. This includes several historical sites including the Matthew Jones House, Fort Crafford, Compton-Davis Brick Yard, Workers Progress Administration (WPA) cemetery, Confederate officer grave site and others. Pests affecting these resources are variable. Weeds and other vegetation could present problems at nearly any of the sites. Birds particularly European starlings (*Sturnus vulgaris*) and English house sparrows (*Passer domesticus*) could damage components of the Matthew Jones House. Currently, the Compton-Davis Brick Yard contains overgrowth of trees. Requests for pest control at these sites are likely to be initiated by the installation archaeologist. Consequently, should such needs arise; the IPMC, pest control staff and the archaeologist will discuss whether these resources could be adversely affected by pest control activities including non-chemical controls.

6. Hazardous materials management. All pest control activities including pesticide applications must comply with JBLEI 32-101, respective Environmental Management Procedures (EMPs) and this plan. As pesticides are considered hazardous materials, their acquisition, storage and use are subject to EMP 4.4.6.6. This ensures appropriate documentation exists to comply with the provisions of the Emergency Planning and Community Right To Know Act (EPCRA).

A. BOS contract and Environmental Element. All pesticides used by the CED pest control shop under the BOS contract and special cases where Environmental Element staff directly apply pesticides for habitat management shall be registered through the HazMart in accordance with EMP 4.4.6.6. All pesticides must be approved by the IPMC for use on the installation. All pesticides brought onto or used on the installation are registered through the HazMart and are on their HazMart Authorized Use List (AUL).

B. The Pines Golf Course. All pesticides used at the Pines Golf Course in accordance with EMP 4.4.6.6. All pesticides must be approved by the IPMC for use on the installation. All pesticides brought onto or used on the installation are registered through the HazMart and are on their HazMart Authorized Use List (AUL).

C. Grounds maintenance contract and railroad management contract. All pesticides brought onto the installation shall be accomplished in accordance with EMP 4.4.6.6.1. All pesticides must be approved by the IPMC for use on the installation. Pesticides used by these contractors are not stored at Fort Eustis. Usage/application data is reported to CEIE by the IPMC based on application reports received from the contractors.

D. Short-term, special projects involving management of invasive vegetation and habitat management. When resources are available, the Environmental Element implements contracts to control invasive vegetation and manage habitats by controlling undesirable vegetation. Pesticide use data is coordinated by the Environmental Element. All pesticides must be approved by the IPMC for use on the installation. Pesticides used by these contractors are not stored at Fort Eustis. Usage/application data is reported to CEIE by the IPMC based on application reports received from the contractors.

E. Pesticide Spills and Remediation. Pesticide spills (or any condition or event where the release/discharge of a pesticide was not done so in accordance with its respective label) will be reported to Fire & Emergency Services (FES) immediately by the individual(s) responsible for the spill (or any person witnessing such a spill). FES responds to pesticide spills as it does for any hazardous material. Additionally, unauthorized releases/discharges of pesticides into surface waters, wetlands or storm drains will be reported to the National Response Center and Virginia Department of Environmental Quality immediately.

IX. Program Administration.

1. General. The Integrated Pest Management Program is administered by the 733d CED. Specifically, the program is managed by the Installation Pest Management Coordinator (IPMC) whose position resides within the Environmental Element. All aspects and components of integrated pest management are executed, recorded and monitored by the IPMC. Pest Management Quality Assurance Evaluators (PMQAE) assist the IPMC by ensuring contracted pest control work is accomplished in accordance with the respective contract and the Fort Eustis Integrated Pest Management Plan. Responsibilities of the IPMC, PMQAEs, and other personnel are articulated in Section II (RESPONSIBILITIES).

2. Pest Management Operations.

A. General. Fort Eustis implements an integrated pest management (IPM) program that utilizes various control strategies. Most of the program utilizes contract support to control given pest species. This overall IPM program is managed by the IPMC. PMQAEs prepare monthly reports and submit these to the IPMC normally by the 5th working day of the month following the report period. The IPMC reviews these reports to determine successes, identify improvements, evaluate pesticide use, ensure IPM philosophy is being followed, etc. Data is obtained from these reports and observations made by the IPMC which is conveyed to AFCEC in the form of monthly and annual reports.

B. Integration of Pest Management and Natural Resources Management. These two program areas are integrated in order to develop effective pest control strategies against invasive (and other undesirable) vegetation and arthropods affecting the health of wildlife and other fauna in order to improve natural habitats, improve biodiversity, identify and monitor wildlife diseases and those considered zoonotic, and reduce effects on non-target organisms. Additionally, close consultation between the IPMC and the natural resources staff reduces risks of pesticides affecting wildlife and ecosystems. Furthermore, native bird species could also pose issues, and control of such birds must be coordinated through the Natural Resources & IPM Branch to ensure compliance with the Migratory Bird Treaty Act (MBTA). Currently, the positions of IPMC and natural resources manager are held by the same person.

C. Pest control support requests.

(1) All installation tenant activities. Installation tenant activities submit a pest control request (service order) to the CED Help Desk by visiting BLDG 1407 or calling 878-HELP.

The Help Desk assigns a service order (SO) number and a priority. This request is transferred to the BOS contractor who then visits the customer to determine which pest(s) are present and the appropriate course of action in accordance with the contract and the IPMP. The contractor consults with the IPMC as appropriate. The majority of all pest control is accomplished through this contract.

(2) The BOS contractor also performs Standard Operating Order (SOO) for recurring, scheduled tasks.

(3) Issues. Tenant activities address any issues with the BOS pest control services to the PMQAE or IPMC.

D. Other pest management operations. Several other contract mechanisms and pest control work is articulated in section 3 below.

3. Installation Pest Control Contracts.

A. Contract requirements. All contracts involving pest control must be approved through the IPMC. All contractor must provide copies of the following documents:

- Virginia Pesticide Business License
- VDACS pesticide applicator certifications* for all who will apply pesticides on Fort Eustis (*Registered technicians are NOT authorized to apply pesticides at Fort Eustis. Applicators must be fully certified in their respective categories.)

B. BOS contract. This contract comprises the majority of pest control services performed on the installation. Pest control services are conducted IAW all Federal, State and local regulations including DODI 4150.07, AFMAN 32-1053 and the Fort Eustis Integrated Pest Management Plan. All BOS pest control personnel are Virginia State Certified Pesticide Applicators. Pest control work is coordinated with and directed by the IPMC. A PMQAE is designated for this contract.

C. Other Pest Control-Related Contracts.

(1) New Construction. The US Army Corps of Engineers contract termite or weed control for new construction at Fort Eustis. These contracts are reviewed and approved by the IPMC. The contractor adheres to this Plan. Contracts for termite control shall include authorized insecticides intended for termites that contain the active ingredient fipronil. Fipronil is not water-soluble and binds to soil particles making it less likely leach/migrate into sensitive habitats/microhabitats and is intended to work better in

conditions of higher soil moisture. Furthermore, studies suggest that the effectiveness lasts longer, i.e., closer to 10 years.

(2) Railroad vegetation control. CED oversees a contract to manage the rail line on the installation. This includes control of vegetation that impacts rail operations. The contractor shall adhere to this Plan.

(3) Grounds maintenance contract. A grounds maintenance contract established by 633 Air Base Wing Contracting to perform right of way and turf pest control. Pest control of weeds and other vegetation associated with parking lots and roads is the extent of this contract. The contractor shall adhere to this Plan.

(4) Contracts for control of invasive/undesirable vegetation affecting habitats. The Natural Resources and IPM Branch of the CED Environmental Element is responsible for natural resources management. Natural resources management includes management of invasive species (plant and animal). The Natural Resources and IPM Branch Chief (installation natural resource manager) contracts projects to support management of invasive species and improve habitats that may require use of pesticides. Personnel applying the pesticides must be certified to operate in Virginia and be fully certified by VDACS.

(5) Inter-service Support Agreements. Several tenant organizations require periodic pest control support but may not be supported using the CED BOS contract. In such cases where the tenant organization must obtain pest control services, the tenant organization adheres to the support agreement. Consequently, these tenant organizations must obtain approval for all pest control contracts or any type of pest control work. This is accomplished through coordination with the IPMC. In some cases the CED BOS contract for pest control supports the tenant organization when that organization provides funding for such services to CED.

(6) General Stafford Elementary School pest control. The City of Newport News performs pest control for the school building and the immediate grounds. Pest control staff from Newport News and any contractors shall coordinate with the IPMC in advance of applications and report pesticide usage IAW this plan.

4. Other pest control work.

A. The Pines Golf Course. The Pines Golf Course is responsible for controlling arthropod, vegetation, fungal and nematode pests that directly affect the golf course turf and greens. Personnel who apply pesticides to control these pests must be DOD certified in the respective categories (or state certified in the case of contractors). The manager or superintendent is responsible for ensuring all pesticide use reports, copies of applicator

certifications, copies of labels and safety data sheets and other pertinent information is provided to the IPMC in accordance with this Plan. Other pest issues such as mosquito control, other biting flies, nuisance wildlife shall be managed by the BOS contractor, IPMC or Environmental Element Natural Resources & IPM Branch staff.

B. Natural Resources. The Natural Resources & IPM Branch of the CED Environmental Element is responsible for natural resources management. Natural resources management includes management of invasive and undesirable vegetation as well as animal species. At times Natural Resources & IPM Branch staffs are DOD certified and may perform some pesticide application in habitat management. Only pesticides approved in the Fort Eustis Integrated Pest Management Plan are used.

5. Other contracted pest control work. Generally, special case pest control requirements may arise other than what is articulated above. All other such pest control services or pest control contracts needed by installation tenants are addressed to and must be approved by the IPMC. All pest control contracts and any pest control work performed on the installation must be approved by the IPMC prior to execution of such contracts or initiation of any pest control work.

6. Access of contract pest control personnel/pesticide applicators to Fort Eustis. Application of pesticides by unauthorized individuals on the installation poses potential health and safety risks for the installation community as well as potential environmental damage including violations of federal or state law. Consequently, only pest control personnel/pesticide applicators approved by the IPMC shall be granted access to the installation following inspection at the entrance gate.

7. Agricultural outleases. There are no agricultural outleases at this time. Any changes to such requires revision of the IPMP.

8. List of Approved Pesticides. All pesticides intended for use on the installation must exist on the Fort Eustis List of Approved Pesticides. The IPMC maintains this list which is updated periodically because some pesticides may no longer be registered by the EPA and/or no longer authorized for use in Virginia. Additionally, DOD policies may ban the use of given pesticides from use on military installations. Furthermore, Fort Eustis may deem certain pesticides are not appropriate on the installation based on unique issues even when such pesticides are approved for use in Virginia. This list is specific to the Fort Eustis environment and supersedes any other authorized list. The list is found at Appendix A but this list is a living document and is updated periodically.

9. Pesticides Approval Process. All pesticides used on the installation must first be approved for use. Once approved, the pesticide is included on the installation's List of Approved Pesticides. The following process shall be used to obtain inclusion on the Fort Eustis List of Approved Pesticides.

A. Proponent/contractor provides copies of the pesticide safety data sheet(s) and label(s) along with the product name, EPA registration number, container size, quantity requested, active ingredient(s), intended application location(s), target pest(s), and applicator name and VDACS certification number to the IPMC. The form used for these requests is found at Appendix W.

B. The IPMC confirms its EPA registration and authorization for use in Virginia as well as determine whether it poses any risks to unique aspects of the installation.

C. If EPA registration is current, authorization for use in Virginia exists, and no issues specific to the installation exist, the IPMC submits a formal request to AFCEC Command Entomologist for approval.

D. If approved by the AFCEC Command Entomologist, the IPMC conveys the product details to the Hazmart thus ensuring all pesticides brought onto or used on the installation are registered through the HazMart and are on the using Activity's HazMart Authorize Use Lists (AUL) to ensure the installation complies with the Emergency Planning and Community Right To Know Act.

E. Application outcomes shall be conveyed to the proponent/contractor.

10. Reports and Records.

A. General. Pest control and pesticide use reports are prepared and submitted monthly and annually by the IPMC. Pesticide applicators prepare reports for each application. These reports and other pertinent pest management data are retained until perpetuity.

B. Integrated Pest Management Information System (IPMIS). IPMIS is the AF pest management software required by AF installations. However, it became unavailable in June 2016 and remains unavailable until further notice. Once IPMIS becomes available again, all pest control work and pesticide applications shall be recorded in this system by all pesticide applicators.*

C. BOS Contract Records and Reports for Pest Management. The BOS contractor shall perform the following tasks regarding records and reports.

(1) Written documentation shall exist for the following and maintained on file to perpetuity, and made available during reviews/inspections of the installation integrated pest management program.

(a) Standing operating orders (SOO) for current year (CED Pest Control Shop).

(b) Individual job orders (service orders) for current year (CED Pest Control Shop)

(c) Service order logbook/employee timesheet (CED Pest Control Shop).

(d) Post a daily work schedule.

(e) Each month provide report using an Excel spreadsheet that includes the following data fields:

- Date of application/pest control task.
- Target pest(s).
- Acres affected (if applicable).
- Location description.
- Pesticide product concentrate.
- Active ingredient
- Percentage of active ingredient
- Formulation
- Quantity applied
- Pesticide application time (hours).
- Non-chemical pest control time (hours).

This report is based on contractor/employee timesheet.

* Once IPMIS becomes available and reimplemented, monthly reports are not likely to be needed. Entry of pest control work into IPMIS shall be accomplished within a specified period as determined with its reimplementation.

(f) Past inspections and surveys.

(g) Emergency information (as applicable).

(h) Provide copies of the Virginia Pesticide Business License, proof of liability insurance and copies of all the VDACS pesticide applicator certifications and categories for each pest control staff member that performs pest control services to the IPMC/PMQAE.

(i) Inform the IPMC and PMQAE if any certification expires before renewal.

(j) Provide the documents noted in subparagraph (k) within 5 working days of any renewals or recertifications.

(k) Provide an updated pesticide (and other hazardous materials used by the Pest Control Shop staff) inventory to the IPMC each month by the 5th working day of the month following the report period.

(l) Provide copies of safety data sheets (SDS) and labels for all pesticides in its inventory to the IPMC. Provide updated/corrected SDSs and labels as appropriate.

(m) Weekly adult mosquito counts in accordance with Appendix M (Annex M-2, Mosquito Management Plan).

(mi) Perform monthly tick surveillance in accordance with Appendix M (Annex M-1, Tick Management Plan). Provide tick specimens to the IPMC upon response to pest control request or following surveys for ticks when ticks are observed along with an informal report as to the location(s) and conditions where ticks were collected.

(mii) Provide gypsy moth specimens, trapping results and egg mass survey to the IPMC in accordance with Appendix P (Forest Pest Management Plan).

(miii) Perform weekly surveillance for red imported fire ants at selected sites between April and October in accordance with Appendix O. These sites shall include the athletic field and adjacent TRADOC parade field (area between Walker Street, Jefferson Avenue, Lee Boulevard and BLDG 950), open lawn area around BLDG 705, immediate vicinity of BLDG 704 and the Washington Boulevard median between Jefferson Avenue and Hines Circle. However, surveillance locations may change.

D. All other pesticide applicator contractors, Newport News pest control staff, and DOD certified applicators, All other applicators performing pest control work and applying pesticides must report their work and pesticide applications. Each individual application is reported to the IPMC using the JBLE-Fort Eustis Pesticide Application Record Report form found at Appendix J (unless the IPMIS system is available). Reports are submitted within 5 working days of any given application.

E. FSS/The Pines Golf Course applicators. The Pines Golf Course applicator submits a monthly pesticide inventory and a report that consists of the following information by the 5th working day of the month following the report month:

- Date of task/pesticide application
- Target pest(s)
- Acres involved (as applicable)
- Location description
- Pesticide product concentrate applied
- EPA Registration Number
- Active ingredient (AI) and percentage in formulation

- Formulation
- Quantity (in units) of pesticide product concentrate applied
- Pounds of AI applied
- Hours spent applying pesticide
- Hours spent performing non-chemical control
- Description of pest control technique if other than pesticide application

11. Pesticide Applicator Categories. This list constitutes the DOD and Virginia certification categories that a given pest control/pesticide applicator are required to hold to apply pesticides on Fort Eustis. Additionally, the list provides examples of pests for which a given individual must be certified to control within the category (though not necessarily limited to these examples).

Category 2 – Forest Pest Control (more than one tree in a continuous treatment): webworms, gypsy moths, bark beetles, ambrosia beetles, long-horned beetles, jewel beetles, weevils, metallic wood-boring beetles, bagworms, and tent caterpillars.

Category 3a - Ornamental Pest Control: Control of tree and plant pests in outdoor settings often in landscaped areas and related to selective weed control, bagworms, mites, lacebugs, webworms, stink bugs, scales, and aphids.

Category 3c - Turf Pest Control: Control of white grubs, sod webworms, cutworms, armyworms, selective weed control, fungi and turf diseases.

Category 5a - General Aquatic Pest Control: Control of weeds in and around drainage systems, weeds in and around ponds or other surface waters, invasive or undesirable plants in aquatic systems, algae in ponds, other surface waters or man-made water systems.

Category 6 - Right-of-Way Pest Control: Control of weeds and other undesirable vegetation associated with bare ground requirements along railroad tracks, roadways, parking lots, sidewalks, utility sites, airfield, and fence lines.

Category 7a - General Pest Control: Control of most insect and rodent pests found in and around buildings.

Category 7b - Wood-Destroying Pest Control: Control of termites, carpenter ants, wood borers, and wood destroying fungi.

Category 7c – Fumigation: Soils and commodities infested with stored products pests.

Category 7d - Vertebrate Pest Control (other than mice and rats): Control of English house sparrows, European starlings, pigeons, bats, moles, ground hogs, raccoons, opossums, skunks, squirrels, snakes, muskrats, and feral cats.

Category 8 - Public Health Pest Control: Control of adult and immature mosquitoes, ticks, and chiggers.

Category 11 – Aerial application of pesticides via fixed or rotor-wing aircraft.

12. Training and Certification.

A. DOD Certified Applicators. Federal Government employees who apply pesticides shall receive initial certification training in the respective category(ies). Upon successful completion, a copy of the training certificate is forwarded to the IPMC. The entity conducting the training forwards a copy of the training certificate to the AFCEC Command Entomologist who then issues Certificates of Competency to the IPMC. The IPMC provides the original to the applicator and retains copies on file. Certifications remain effective for 3 years. The applicator must successfully complete recertification training prior to expiration. In the event training courses are not available, an extension request may be issued. In such cases, the IPMC submits a request for a 6-month extension from the AFCEC Command Entomologist. This extension is valid for a maximum of 6 months; no additional extensions are authorized. Failure to be recertified by end of this 6-month period invalidates the applicator's certification. The applicator is then required to attend initial training and precluded from applying pesticides until a new Certificate of Competency is issued.

B. IPMC training. The 733d Civil Engineer Director appoints an individual to serve as the IPMC. In order to be appointed as such, the designated person must have successfully completed Pest Management Training. A copy of a Certificate of Competency is retained with the IPMC appointment letter. This is a one-time training requirement.

C. PMQAE training. Persons with assigned duties of PMQAE must successfully complete PMQAE training or have successfully completed initial DOD pest management certification in the core phase and categories 3, 5, 6, 7 and 8 (and successfully completes refresher training). This training is usually offered in conjunction with initial applicator certification and recertification training courses. A copy of the training certificate is provided to the IPMC. This training must be conducted every 3 years.

D. Aerial Application of Pesticides. Only DOD employees are authorized to attend this training and obtain the subsequent Category 11 certification. The IPMC attends this training and obtains this certification.

E. Training courses for Federal Government employees. All military Services offer periodically scheduled initial applicator certification, recertification, IPMC and PMQAE training courses. The schedule and locations for these courses are listed on the Armed Forces Pest Management Board website (http://www.afpmb.org/content/training-and-certification). It is the responsibility of pesticide applicators to plan their recertification training. The IPMC monitors the expiration dates and advises the applicators accordingly.

F. Training and certification of non-Government pesticide applicators at Fort Eustis. All contractors authorized to apply pesticides in Virginia shall provide copies of the Virginia Department of Agriculture and Consumer Services (VDACS) Certificates of Competency to the IPMC prior to performing work on the installation. It is the responsibility of the contractor to obtain such certificates and attend respective training requirements set by the Commonwealth of Virginia. Registered technicians or contract personnel in training and lacking Certificates of Competency may NOT apply pesticides on Fort Eustis under any circumstances.

G. Advanced Environmental Management (AEM) Training. This course is required for all DOD-certified, BOS contract and The Pines Golf Course pesticide applicators IAW EMP 4.4.2 Environmental Awareness & Competency Training

H. IPMC and DOD-certified applicators shall attend the 40-hour Hazardous Waste Operations and Emergency Response (HazWOPER) and annual refresher courses.

13. Pesticide Security.

A. General. Accidental or intentional misuse of pesticides can have serious implications on health, moral and welfare of the Fort Eustis community. Because pesticides in general have varying degrees of toxicity to the community and its ecology, such materials must be managed and stored properly to avoid misuse by unauthorized persons.

B. Pesticide security requirements. Pesticide security requirements shall be met by all pesticide applicators whether such persons operate daily from facilities on the installation or perform short-term pesticide work under special contracts. The following requirements shall be met:

- Pesticide storage areas must be approved in advance by the IPMC. Currently there are 3 authorized storage locations. There are BLDG 1422 (BOS contract pest control shop), BLDG 3515 (Pines Golf Course pesticide storage facility) and BLDG 1386 (AAFES).

- All pesticide storage facilities shall be secured in accordance with installation physical and operational security policies.

- All pesticide storage, pesticide equipment/storage and mixing areas shall be locked when not in use.

- Pesticide applicators shall not be afforded access to the installation unless they have been approved by the IPMC to perform pest control/pesticide applications on Fort Eustis and the IPMC is aware of their scheduled work in advance.

- The IPMC notifies the 733d Security Squadron at least one day in advance of scheduled inbound pest control/pesticide applicator contractors. Only these persons are will be allowed access.

- Pest control vehicles will be clearly marked as such and contractors shall identify themselves upon entry to the access control point (main entrance).

14. Status of Arthropod Disease Vectors Surveillance and Control. Currently, mosquitoes (Diptera: Culicidae) and hard ticks (Acari: Ixodidae) constitute the primary arthropod disease vectors at Fort Eustis. Populations vary considerably by seasons and environmental conditions.

A. Mosquitoes on Fort Eustis. The following mosquito species have been documented as occurring on Fort Eustis as of 2017:

Aedes albopictus
Aedes c. canadensis Aedes
sollicitans
Aedes taeniorhymchus
Aedes triseriatus
Aedes vexans
Anopheles bradleyi
Anopheles crucians
Anopheles punctipennis
Anopheles quadrimaculatus
Coquillettiola perturbans
Culex pipiens
Culex nigripalpus
Culex restuans
Culex salinarius
Ochlerotatus canadensis
Ochlerotatus japonicas
Orthopodomyia signifera
Psorophora ciliata
Psorophora columbiae
Psorophora ferox

Uranotaenia sapphirina

B. Ticks on Fort Eustis. The following tick species and respective vectored pathogens (and disease condition) have been documented on the installation as of 2018:

Ticks:
Ixodes scapularis (Deer/black-legged tick)
Amblyomma americanum (Lone Star tick)
Dermacentor variabilis (Dog tick)
Amblyomma maculatum (Gulf Coast tick)
Ixodes affinis (No common name)
Haemaphysalis leporispalustris (Rabbit tick)
Ixodes rugosus (No common name)
Rhipicephalus sanguineus (Brown Dog Tick).

Pathogens:
Babesia microti (Human Babesiosis)
Babesia canis (Canine Babesiosis)
Borrelia burgdorferi (Human Lyme Disease)
Borrelia lonestari (Southern Tick Associated Rash Illness) *Borrelia miyamotoi* (Borrelia miyamotoi Disease)
Ehrlichia chaffeensis (Human Monocytic Ehrlichiosis)
Ehrlichia ewingii (Canine Granulocytic Ehrlichiosis)
Anaplasma phagocytophilium (Human Granulocytic Anaplasmosis)
Rickettsia parkeri (Tidewater Spotted Fever)

C. Emergency surveillance and control. Emergencies related to arthropod disease vectors usually occurs with little to no warning conditions. Higher level staff and state or local public health officials inform the installation of possible or expected situations where the risk of disease may exponentially increase. Local climatic conditions may also increase risks including but not necessarily limited to heavy sustained precipitation and storm events. In the event of such conditions, key personnel coordinate sustained surveillance and develop control measures. Key personnel include representatives from the Civil Engineer Division and Department of Public Health. The process is discussed in Appendix M (Annex N-2).

15. Special topics.

A. Feral honeybees (*Apis melifera*). Currently, no bee keepers maintain artificial honeybee hives on the installation. However, feral swarms do exist at times and may occur in areas of close proximity to work or living areas. When such conditions are observed, the IPMC shall be notified. The IPMC evaluates the situation and determines the best course of action. If the situation appears to pose a health and safety risk, the

IPMC contacts local bee keepers to inform of the availability. The IPMC decides whether lethal removal is necessary and directs the BOS contractor in such circumstances. Generally, lethal removal is considered the last resort.

B. Snakes. Currently, no venomous snakes have been documented on Fort Eustis by qualified biologists. Various environmental factors influence this situation. However, because the 3 venomous species native to Virginia exist in areas near the installation, the risk cannot be assumed to be zero. However, the risk is considered to be low. Snakes are important components of the installation ecosystem and lethal take, destruction or euthanasia is prohibited unless approved by the installation natural resources manager. Snakes shall be removed and released elsewhere on the installation by the Environmental Element natural resources staff. **SNAKE GLUE BOARDS AND CHEMICAL SNAKE REPELLENTS ARE PROHIBITED FROM USE ON THE INSTALLATION.** Snake glue boards are inherently unethical and inhumane. No scientific research exists that proves chemical snake repellents work, and they contain toxic substances that should not be introduced into the environment. This includes the prohibition of using mothballs or any commercially related snake repellent product within buildings or the external environment.

C. Rodents. Rodents may be vectors of disease as well as be destructive of property, equipment and supplies; and increase the risk of electrical fires. Control techniques primarily involve the use of mechanical traps and similar devices. Chemical controls such as poison baits are generally not used due to carcass disposal issues and may pose health hazards to non-target organisms.

D. Aerial Application of Pesticides. Aerial applications of pesticides are necessary under certain conditions. Such conditions typically include mosquito control, herbicide treatments against certain invasive vegetation and certain cases involving control of forest pest outbreaks. All aerial applications are approved and coordinated by the IPMC. Appendix D provides policy and procedures concerning aerial applications.

E. Termite control for new construction. Typically, termite control is included in new construction contracts. The CED Engineering Flight project managers shall provide a written termite control plan to the IPMC for review and approval at least 30 days in advance. Once approved, the CED Engineering Flight project managers provide a JBLE Pesticide Application Record Report (Appendix J) to the IPMC no later than the 5th working of the month following applications.

F. Pesticide labels. The federal statute Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) promulgates control of pesticide distribution, sale, and use as implemented by the U.S. Environmental Protection Agency (EPA). All pesticides used in the United States (whether manufactured in the United States or imported) must be registered by the EPA. This registration process ensures that pesticides will be properly labeled and when applied in accordance with label specifications, will not cause

unreasonable harm to the environment. Consequently, it is unlawful to use or apply any registered pesticide in a manner that is inconsistent with label specifications. All pesticide applicators working on Fort Eustis will use/apply pesticides in accordance with label specifications. **THE LABEL IS THE LAW.**

X. Sale and Distribution of Pesticides. The only components of the installation involving the sale of pesticides are the AAFES and the Commissary. Such pesticides are those products authorized for sale to the general public. These products must have current, valid EPA registration numbers and be authorized for use in Virginia. It is the responsibility of AAFES and Commissary to ensure such. These products may NOT be used for ANY purpose on the installation. All pest control services are provided by CED with the exception of that performed by the Pines Golf Course at that particular facility.

XI. Prohibited Practices. The following practices are prohibited on Fort Eustis:

1. Disposing of Christmas trees into the installation environment. Do not dispose of Christmas trees into the environment. This increases risks of gypsy moth infestation as well as other potential damaging insects.

2. Bringing soil onto the installation that has not been documented as free of red imported fire ants and approved by the IPMC. Do not bring soil onto the installation unless it has been approved by the IPMC following documented confirmation that no red imported fire ants (of any life stage) exists.

3. Any persons applying pesticides who are not VDACS or DOD certified. Only VDACS and DOD-certified applicators shall apply pesticides on the installation.

4. Any pesticide application not approved by the IPMC. No pesticide application shall occur unless approved by the IPMC. CED provides the majority of the pest control services and the associated contracts have been approved and in compliance with this IPMP.

5. Pesticide applications performed by Registered Technicians. Registered Technicians are not fully certified applicators. Only fully certified applicators can apply pesticides as approved by the IPMC. No Registered Technicians shall apply pesticides on the installation.

6. Removing any insect species from Fort Eustis or liberation of any insect species onto Fort Eustis. No insects or other arthropods shall be removed from nor liberated on the installation unless approved by the natural resources manager and the IPMC.

7. Disposing of tree or other vegetation debris on the installation that was generated from outside the installation boundary. Do not dispose of tree or other vegetation on the installation if obtained outside the installation boundary.

8. Cutting standing timber or collecting fallen trees or tree parts (i.e., limbs, branches, crown, slash, kindling, etc.). Do not cut standing timber or collect fallen trees or tree parts (i.e., limbs, branches, etc.). Collection of these products for firewood or other purposes is prohibited.

9. Bringing firewood onto the installation from areas outside the installation boundary. Do not bring firewood onto the installation from areas outside the installation boundaries. Firewood can contain insect pests that could impact mission requirements.

10. Disposing or abandoning tires into the environment or any location other than the Fort Eustis Solid Waste Facility. Unmanaged, improperly disposed tires can serve asmosquito breeding sites.

11. Trapping or collecting honey bees. No honey bees shall be collected, trapped, or otherwise removed from the installation except in special cases where the natural resources manager or IPMC authorizes qualified bee keepers to do so when bee swarms pose risks to human health and safety.

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APPENDIX A:

Pesticides Approved for Use at Fort Eustis

NOTE:

THIS LIST IS A LIVING DOCUMENT BASED ON REQUESTS FOR USE OF ADDITIONAL PESTICIDES, AND CHANGES IN EPA, DOD AND VIRGINIA POLICIES REGARDING PESTICIDES

The list contained here is as of November 13, 2019.

A more current list is maintained on file by the Integrated Pest Management Coordinator at BLDG 1409. An updated list is submitted to approved pesticide applicators by the 10th working day of each month.

Inspectors and other interested parties shall contact the Fort Eustis Installation Pest Management Coordinator
for the current list of Pesticides Approved for Use at Fort Eustis if needed.

This is NOT an inventory.
Pesticides listed here are not necessarily stored on the installation nor in current use on the installation.

Product Name	EPA Reg. No.	Target Pest(s)	Pesticide Type
3336F	1001-69	Fungi on turf/ornamentals	Fungicide
Abate Tire Treatment	8329-30	Container-breeding mosquitoes	Insecticide
Accord XRT II	62719-556	Weeds, undesirable vegetation	Herbicide
Acclaim	432-950	Weeds, undesirable vegetation	Herbicide
Advanced 360 A Dual Choice	499-496	Ants	Bait station
Advance Granular Carpenter Ant Bait	499-370	Ants	Bait station
Advion Ant Gel	100-1498	Ants	Insecticide
Advion Ant Bait Arena	352-664	Ants	Bait station
Agnique MMF	2302-14	Mosquitoes	Larvicide
Agnique Mosquito Larvicide	53263-28	Mosquitoes	Larvicide
Alligare Imazapyr 2SL	81927-23	ROW broadleaf weeds, grasses	Herbicide
Alligare Panoramic 2SL	66222-141-81927	Broadleaf weeds	Herbicide
Alpine WSG	499-561	Indoor & outdoor arthropods	Insecticide
Altosid Briquets	2724-375	Mosquito larvae	Growth regulator
Altosid Liquid Larvicide (20%)	2724-446	Mosquito larvae	Growth regulator
Altosid Liquid Larvicide (5%)	2724-392	Mosquito larvae	Growth regulator
Altosid Pellets	2724-448	Mosquito larvae	Growth regulator
Altosid SBG	2724-489	Mosquito larvae	Growth regulator
Altosid XR	2724-421	Mosquitoes larvae	Growth regulator
Amdro Fire Ant Bait	73342-1	RIFA/Native fire ants	Bait
Anvil 2+2	1021-1687-8329	Mosquitoes	Insecticide
Appear Fungicide	100-1451	Pathogens on turf of golf courses	Fungicide
AquaNeat	228-365	Aquatic vegetation	Herbicide
Aqua-Reslin	432-796	Adult mosquitoes	Insecticide
Aquashade	33068-1	Aquatic vegetation	Herbicide
Arsenal	241-346	Weeds	Herbicide
Banner	100-741	Prev/treat trees of fungal pathogens	Fungicide

Product Name	EPA Reg. No.	Target Pest(s)	Pesticide Type
Banol	432-942	Fungal pathogens of turfgrass/ornamentals	Fungicide
Barricade 65WG	100-834	Grasses & broadleaf weds	Herbicide
Bayleton 50	432-1360	Fungal pathogens of turf	Fungicide
Bensumec 4lf	2217-696	Preemergence grass	Herbicide
Boric Acid (35.5%)	499-384	Various indoor/outdoor arthropods	Insecticide
Briskway	100-1433	Fungal pathogens of golf turfgrasses	Fungicide
Bullzeye	524-454-534	Weeds	Herbicide
Capestone	62719-572	Trees	Herbicide
Casoron 4G	400-168	Weeds	Herbicide
Catalyst	2724-450	German cockroaches	Insecticide
CB 80 Extra	9444-175	Various arthropod pests	Insecticide
CHIPCO® 26019 FLO brand Fungicide	432-888	Fungal pathogens of turfgrasses	Fungicide
Compass	432-1371	Fungal pathogens of turfgrasses	Fungicide
Cornerstone Plus	524-454-1381	Undesirable vegetation	Herbicide
Crossfire Aerosol	1021-2788	Indoor bed bugs	Insecticide
Crossfire Insecticide	1021-2776	Indoor bed bugs	Insecticide
Curalan EG	7969-224	Fungal pathogens of turfgrasses	Fungicide
Daconil Action	100-1364	Fungal pathogens of turfgrasses	Fungicide
Daconil Ultrex	50534-202-100	Fungal pathogens of turfgrasses	Fungicide
Daconil Weather Stik	50534-209-100	Fungal pathogens of turfgrasses	Fungicide
Daconil ZN	50534-211-100	Fungal pathogens of turfgrasses	Fungicide
Delta Dust	432-772	Various arthropod pests	Insecticide
Demand Pestab Insecticide	100-1082	Various arthropod pests	Insecticide
Dibrom Concentrate	5481-480	Adult mosquitoes	OP insecticide
Dicamba DMA Salt	42750-40	Weeds	Herbicide
Dimension 40 WP	62719-445	Grasses &broadleaf weeds	Herbicide
Dipel 10 G Biological Insecticide	4-336	Leaf-eating caterpillars	Insecticide
Diquat SPC 2L	228-675	Landscape/aquatic plants	Herbicide

Product Name	EPA Reg. No.	Target Pest(s)	Pesticide Type
Disappear	3862-145-13103	Broadleaf weeds	Herbicide
Dismiss	279-3295	ROW undesirable vegetation	Herbicide
Drax Ant Kil Gel	9444-131	Ants	Insecticide
Drione Insecticide	432-992	Various arthropod pests	Insecticide
Dylox 80	3125-184	Fungal pathogens of turfgrasses	Fungicide
Echelon 4SC	279-3323	Grasses, broadleaf weeds	Herbicide
Echo 720	60063-7	Fungal pathogens of turfgrasses	Fungicide
Emerald	7969-196	Fungal pathogens of turfgrasses	Fungicide
Extinguish Plus/RF-2012 Bait	2724-496	Fire ants	Bait/insecticide
Fame SC Fungicide	66330-64-279	Fungal pathogens	Fungicide
Firstline GT Plus	279-3196	Termites	Bait station
FLIT 10 EC	8329-67	Various arthropods	Insecticide
Fore 80WP Rainshield	62719-388	Fungal pathogens of turfgrasses	Fungicide
Fosal Select	89442-8	Fungal pathogens of ornamentals	Fungicide
Garlon 3A Specialty Herbicide	62719-37	Woody plants, broadleaf weeds	Herbicide
Garlon 4 Ultra/GF-1529	62719-527	Woody plant/vines & annual/perennial broadleaf weeds	Herbicide
Gentrol Aerosol/RF-9707	2724-484	Various insects/cockroaches	Growth Regulator
Gentrol IGR	2724-351	Various insects/cockroaches	Growth Regulator
Glyfos Extra	4787-23	Broad-spectrum weeds	Herbicide
Gly Pho-Sel Pro 41%	72159-14	Weeds, woody brush, trees	Herbicide
GlyphoMate 41	2217-847	Weeds, woody brush, trees	Herbicide
Glysophate 4 Plus	81927-9	Weeds, woody brush, trees	Herbicide
Habitat	241-426	Aquatic undesirable vegetation	Herbicide
Heritage	100-1093	Fungal pathogens of turf/ornamentals	Fungicide
Honcho	524-445	Weeds, woody brush, trees	Herbicide
Honor	7969-255	Fungal pathogens of golf course turf	Fungicide
Hyvar X-L	352-346	Undesirable/invasive vegetation	Herbicide

Product Name	EPA Reg. No.	Target Pest(s)	Pesticide Type
I MaxxPro 2F Insecticide	432-1331-73748	Termites	Insecticide
Imazuron	228-654	ROW weeds and grasses	Herbicide
Insignia Fungicide	7969-184	Fungal pathogens of golf course turf	Fungicide
Insignia SC Intrinsic Brand Fungicide	7969-290	Fungal pathogens of golf course turf	Fungicide
Invader hpx	9444-186	Various arthropods	Insecticide
Iprodione 2se	89442-13	Fungal pathogens of golf course turf	Fungicide
Journey	241-417	Weeds	Herbicides
JTEaton 4 the Birds Repellent	8254-5-56	Discourage starlings & pigeons	Repellent
Katana	71512-12-2217	Grasses, broad-leaf weeds	Herbicides
Lesco Prosecutor	524-536-10404	Grasses, broad-leaf weeds	Herbicides
Lexicon Instrinsic Brand Fungicide	7969-350	Fungal pathogens of golf course turf	Fungicide
Mach 2	62719-473	Insects of turfgrass	Insecticide
Maxforce FC Ant Bait Gel	432-1264	Ants	Bait
Maxforce Impact Roach Gel Bait	432-1531	Cockroaches	Bait
Medallion	100-769	Fungal pathogens of turfgrasses	Fungicide
Mefenoxam 2	55146-73-60063	Fungal pathogens of turfgrasses	Fungicide
Mefenoxam 2AQ	66222-216	Fungal pathogens of turfgrasses	Fungicide
Method 240SL	432-1565	ROW preemergent vegetation	Herbicide
Milestone Specialty Herbicide	62719-519	Broadleaf weeds	Herbicide
MSM Turf	66222-146	Grasses and weeds	Herbicide
Neem Oil (70%)	70051-2-54705	Fungal pathogens of plants	Fungicide
Niban	64405-2	Ants, cockroaches, other insects	Bait/insecticide
NIBOR-D Insecticide	64405-8	Various insect pests	Insecticide
Nitro Vandetta/MGK® Formula 3113	1021-2796	Cockroaches	Bait/Insecticide
Nyguard IGR	1021-1603	Various arthropods	IGR
Ornamec	2217-728	Weeds	Herbicide
Orthene	499-373	Various insect pests	Insecticide

Product Name	EPA Reg. No.	Target Pest(s)	Pesticide Type
Oust XP	352-601	Weeds	Herbicide
Panoramic 2SL	81927-19	ROW undesirable vegetation	Herbicide
Pathfinder II	62719-176	Terrestrial woody plants (forest, ROW)	Herbicide
Pennant	100-950	Weeds	Herbicide
Permanone 10% EC	432-1132	Mosquitoes	Pyrethrin insecticide
Phantom	241-392	Termites	Insecticide
Plateau Herbicide	241-365	Weeds, grasses, turf	Herbicide
Polaris	228-534	Undesirable vegetation in aquatic systems	Herbicide
Poast Plus	7969-88-51036	Weeds	Herbicide
Pramitol 25E	66222-22	Weeds	Herbicide
Precor IGR Concentrate Zoecon	2724-352	Fleas	IGR
Precor Plus	2724-454	Fleas	IGR/Insecticide
Preen	961-280	Weeds	Herbicide
Prescription Treatment PT221L	499-473	Various arthropods, termites	Insecticide
Primo Maxx	100-937	ROW/undesirable vegetation	Herbicide
Primera Triplet SF Selective Herbicide	228-312	Weeds	Herbicide
ProDeuce	228-509	Weeds	Herbicide
Prosecutor Pro	524-536-10404	ROW/undesiable vegetation	Herbicide
Prostar 70 WP	432-1223	Fungal pathogens of turfgrasses	Fungicide
Prodiamine 65 WDG Herbicide	66222-89	Golf course grasses & broadleaf weeds	Herbicide
Proplant	55260-9	Fungal pathogens of turfgrasses	Fungicide
Pyrocide 300	1021-1177	Various arthropods	Insecticide
Q4 Plus	2217-930	Grasses & weeds	Herbiicde
Quali Pro MSM Turf Herbicide	66222-146	ROW/undesiable vegetation	Herbicide
QUALI-PRO Prodiamine 4L	66222-230	ROW/undesiable vegetation	Herbicide
QUALI-PRO T/I 2.5 G	66222-224	ROW/undesiable vegetation	Herbicide
Quali-Pro T-NEX	53883-353	Turfgasses	Herbicide
QuikPro	524-535	Undesiable vegetation	Herbicide

Product Name	EPA Reg. No.	Target Pest(s)	Pesticide Type
Ranger Pro Herbicide	524-517	ROW/ undesiable vegetation	Herbicide
Razor Herbicide	228-366	ROW/ undesiable vegetation	Herbicide
Reward	100-1091	Landscape & aquatic undesirable plants	Herbicide
Rodeo	62719-324	Undesirable aquatic plants	Herbicide
Roundup Pro	524-475	Weeds, woody brush, trees, vines	Herbicide
Roundup Pro Dry	524-505	Weeds, woody brush, trees	Herbicide
Round Up Pro Max	524-579	Weeds, woody brush, trees	Herbicide
Roundup Weather Max	524-537	Weeds, woody brush, trees	Herbicide
Roundup Weed and Grass Killer Concentrate Plus	71995-29	Grasses, weeds	Herbicide
Sahara	241-372	ROW undesirable vegetation	Herbicide
Scoot Mole	65615-1	Moles	Repellent
Secure	71512-20-100	Fungal pathogens of turfgrasses	Fungicide
Segway Fungicide	71512-13- 2217	Fungal pathogens of turfgrasses	Fungicide
Seige Gel Insecticide	241-313	Cockroaches	Bait
Shockwave 1 Aerosol	1021-2804	Various arthropods, cockroaches	Insecticide
Shockwave Fogging Concentrate	1021-1810	Various arthropods	Insecticide
Signature XTRA Stressgard	432-1541	Fungal pathogens of turfgrasses	Fungicide
Simizine 4L	19713-60	Preemergent weeds	Herbicide
Sedgehammer	81880-1-10163	Weeds	Herbicide
Snapshot	62719-175	Preemergent grasses & broadleaf weeds	Herbicide
Spectro 90 WDG	1001-72	Fungal pathogens of turfgrasses	Fungicide
Speckos Evercide Total Release Aerosol	1021-1635-72113	Various arthropods, fleas	Insecticide
Subdue GR	100-794	Fungal pathogens of golf turfgrasses	Fungicide
Scythe	53219-7	Grasses & weeds	Herbicide
Stalker	241-296	Weeds	Herbicide
Strobe 50 WG	53883-343	Fungal pathogens of golf turfgrasses	Fungicide
Talstar TC Flowable Termiticide/Insecticide	279-3206	Termites	Insecticide

Product Name	EPA Reg. No.	Target Pest(s)	Pesticide Type
Talstar GC	279-3156	Various arthropods	Insecticide
Talstar S	279-3155	Various arthropods	Insecticide
Target 6.6	42519-1	Undesirable vegetation/golf course	Herbicide
Tempo SC Ultra	432-1363	Various arthropods	Insecticide
Tempo Ultra WP	432-1304	Various arthropods	Insecticide
Tempo WP	432-1306	Various arthropods	Insecticide
Tempo WP	432-1338	Various arthropods	Insecticide
Termidor 80 WG	7969-209	Termites	Insecticide
Termidor SC	7969-210	Termites	Insecticide
Terrazole	400-416	Fungal pathogens of turfgrasses/golf	Fungicide
T-Nex	66222-212	Grasses	Herbicide
Touchdown	100-1169	Weeds, woody brush, trees	Herbicide
Touche EG	7969-224	Fungal pathogens of turfgrasses/golf	Fungicide
Transport Mikron Insecticide	8033-109-279	Termites	Insecticide
Tribute Total	432-1519	Grasses & weeds	Herbicide
Triclorpyr 4	81927-11	Woody plants in forests, weeds	Herbicide
Trimec Classic	2217-543	Grasses	Herbicide
Trimec Plus	2217-709	Weeds	Herbicide
Trinity	7969-257	Fungal pathogens of turfgrasses/golf	Fungicide
Trin-pac Select	89442-7	Grasses	Herbicide
Triton Flo	432-1487	Fungal pathogens of turfgrasses/golf	Fungicide
Trumpet EC Insecticide	5481-481	Adult mosquitoes	OP Insecticide
Turf Max MSMA 6+	42750-28-72112	Weeds, grasses for golf, ROW	Herbicide
Ultracide	499-404	Fleas	IGR
UP-Star SC	70506-23	Various arthropods of turf, ornamentals	Insecticide
Vectobac G Biological	73049-10	Mosquitoes	Biological insecticide
Vendetta Nitro Cockroach Gel Bait	1021-2796	Cockroaches	Bait
Wasp freeze	499-362	Bees, wasps, hornets	Insecticide

Appendix B:

Description of BOS Pest Control Contract Operation
and General Procedures for Pest Control

I. SHOP FACILITIES. The CED BOS contractor provides the majority of pest control services performed at Fort Eustis. The CED BOS Contract Pest Control Shop is located at Building 1422. This facility was originally designed in accordance with guidelines set forth by the former U.S Army Center for Health Promotion and Preventive Medicine (has since been renamed as the U.S. Army Public Health Command) prior to Fort Eustis being realigned with Langley Air Force Base as Joint Base Langley-Eustis. This building meets the installation fire and safety codes and has a fire detection and sprinkle system that is tied to the central system located at the post fire station. Fire extinguishers labeled for chemical fires are positioned throughout the facility. Signs are posted on the building exterior warning personnel that this is a pesticide store facility.

1. Staffing. The Pest Control Shop is staffed with two pest control personnel who are certified to apply pesticides in Virginia.

2. Pesticide Storage Area. This facility has approximately 2,000 square feet storage for pesticides and pest control equipment. The pesticide storage area has a 3-inch lip around the interior area to contain any pesticide spills or leaks. Bait products are stored in the mixing room to prevent them from acquiring pesticide odors thereby reducing their effectiveness. Herbicides are segregated from other pesticides by an aisle, 4 feet wide. Storage area shall comply with EMP 4.4.6.6 Hazardous Materials Management (HMM), EMP 4.4.6.6 Tab 1 Hazardous Materials Storage and Container Management, and EMP 4.4.6.6 Tab 2 Monthly Hazardous Material Site Inspections FEVA Form 32-680.

3. Equipment Storage. An overhang over the outdoor mixing area is used to store powered sprayers during the off-season. The site is large enough to store the trailer-mounted sprayers with room to park an additional application vehicle. The sprayers including truck mounted sprayers are covered when not stored under the overhang. All other pesticide application equipment is stored within the mixing and pesticide storage rooms.

4. Vehicle Storage. The single-purpose, pest control vehicles are parked outside the CED Pest Control Shop within the fenced CED compound.

5. Security. All doors and windows to the building are locked after duty hours and whenever the building is unoccupied. The two entrance doors contain cipher locks. A seven-foot fence with a climb-proof barrier and locked gates surrounds the CED compound to provide security for vehicles and equipment during non-duty hours.

6. Ventilation. The mixing and storage rooms are equipped with a ventilation system that provides 6 air changes per hour. This system operates 24 hours per day. Additionally, an exhaust hood is located in the mixing room. Pest control staff are instructed to wear a respirator while mixing pesticides when indicated on the respective pesticide label.

7. Equipment Wash-down Area. Pest control vehicles and pesticide application equipment are washed/rinsed in the outdoor mixing area. Rinsates are channeled through a floor drain and collected in the wastewater filtration room sump.

8. Pesticide Formulation Area. A stainless-steel, double-basin, deep sink is used for indoor pesticide mixing. The sink is equipped with a local exhaust ventilation system. An emergency eyewash and deluge shower is located next to the sink. All drains in this room lead to the sump in the wastewater filtration room. Countertops are covered with formica which is impervious to pesticide spills. Electrical switches, outlets and lighting are all spark-proof for fire safety. The concrete floor is sealed to resist chemical spills and ease cleaning.

9. Clean Personnel Areas. The CED Pest Control Shop is equipped with an office area, a break room and two change rooms/restrooms, one for men and the other for women. These areas are considered clean areas and uncontaminated with pesticides. Each pest controller is provided two wall lockers, one for street clothing and the other for clean work uniforms. Dirty clothing is placed in a hamper. All work uniforms are laundered using the laundry facility at BLDG 1422.

10. Wastewater Filtration Room. The entrance to the wastewater filtration room is adjacent to the outdoor pesticide mixing area. Wastewater generated from pest control operations is collected in the sump and recycled. Recycled wastewater is not applied indoors or applied to ornamental plants.

11. Acquisition of pesticides. ALL pesticides and other hazardous materials must be ordered and obtained through the Hazmart in accordance with Environmental Management Procedure (EMP) 4.4.6.6.1.

II. PEST CONTROL EQUIPMENT INVENTORY

1. Major Items of Pesticide Application Equipment.

   a. Model: Cougar (Clarke)
   Type: ULV fogger
   Tank capacity: 15 gal
   Quantity: 1
   Purpose: Insecticide treatment

   b. Model: Honda sprayer
   Type: skid-mounted, power sprayer
   Tank capacity: 100 gal
   Quantity: 1
   Purpose: herbicide treatment

   c. Model: Solo Mister 451
   Type: Back Pack Mist Blower
   Tank capacity: 3.5 gal
   Quantity: 3
   Purpose: Insecticide treatment

   d. Model: Solo Backpack Manual Sprayers
   Type: Backpack sprayer
   Tank capacity: 3 gal
   Quantity: 2
   Purpose: Herbicide treatment

   e. Model: B & G Hand-held Sprayer
   Type: Hand-held sprayer
   Tank capacity: 1 gal
   Quantity: 3
   Purpose: Insecticide treatment

   f. Model: North Star Sprayer
   Type: Electric power sprayer
   Tank capacity: 24 gal
   Quantity: 1
   Purpose: Herbicide treatment

g. Model: Maruyma Backpack Sprayer Type:
Backpack sprayer
Tank capacity: 3 gal
Quantity: 1
Purpose: Herbicide treatment

h. Model: Electric Fog Master Fogger Type:
Hand held
Tank Capacity: 2 gal
Quantity: 1
Purpose: Insecticide treatment

i. Model: B & G Electric Fogger
Type: Hand held
Tank capacity: 1.5 gal
Quantity: 1
Purpose: Insecticide treatment

j. Model: Curtis Trail Blaze Dyna Fogger
Type: Hand-held
Tank capacity: 1 gal
Quantity: 1
Purpose: Insecticide treatment

k. Model: Maruyma Sprayer
Type: Sprayer
Tank capacity: 50 gal
Quantity: 1
Purpose: Insecticide treatment

l. Model: Sprayer
Type: Gas-operated sprayer
Tank capacity: 50 gal
Quantity: 1
Purpose: Herbicide treatment

m. Model: Northstar Sprayer
Type: Gator-mounted
Quantity: 1
Tank capacity: 15 gal
Purpose: Insecticide treatment

n. Model: LESCO Commercial Plus
Type: Granular spreader
Quantity: 1
Purpose: Insecticide and herbicide treatment

o. Root finder.

p. Model: Pres-To-Blo Duster
Type: Power duster.
Quantity: 3

q. Maxforce Bait Guns
Type: Held-held bait dispensing device
Quantity: 3
Purpose: Dispense ant and cockroach insecticide bait

r. Biting Fly Traps
Type: Durable, collapsible non-chemical biting fly trap
Quantity: 17 (4 of these are maintained at Golf Course)
Purpose: Capture biting flies including horse flies, yellow flies and deer files

s. Bird traps
Type: Non-lethal (live) wood and metal traps
Quantity: 4
Purpose: Live capture birds entering buildings

t. Animal traps
Type: Non-lethal (live) metal traps
Quantity: 8
Purpose: Live capture mammals indoors and outdoors

u. Mosquito traps
Type: Light/CO2 traps
Quantity: 10
Purpose: Capture mosquitoes to conduct female mosquito counts

v. Tool termite slbjet (Quantity = 1).

w. Unit dual injector (Quantity = 1).

x. Vacuum, wet/dry.

2. Vehicle inventory.

   a. Name: Truck, ¾ ton 2 x 4
      Make, Year, Body-type: Ford F150, 2013, open bed
      GSA Number: Company-owned vehicle

   b. Name: All-Terrain Vehicle Kawasaki MULE 4010, 4X4 (2)

3. **Workday Productivity.** Workday productivity is the time spent actually at the work site performing pest management services. Productivity is verified by reviewing monthly reports or when IPMIS becomes available. The workday productivity goal is spent performing direct pest management services.

4. **General Operations (BOS pest control contractors and CEIE applicators).**

1. Work uniform. The Pest Control technician duty uniform is long-sleeved white shirt, light colored trousers, safety shoes/boots, coveralls, cap (optional) and coat (optional). **Personal clothing** cannot be worn during the application of pesticides. Pest Controllers are expected to change into their duty uniform immediately upon their arrival to the Pest Control Shop. The duty uniform is normally worn once for the entire workday and removed at the end of the workday. The uniform should be changed more frequently if directly contaminated by pesticides. Dirty uniforms shall be laundered using laundry facilities at the Pest Control Shop unless the Pest Control Shop uses contracted laundry services to clean pest control uniforms. Dirty laundry shall be laundered at least once weekly. **Home laundering of pesticide contaminated clothing is prohibited**.

2. Smoking. Smoking is not permitted in and around the Pest Control Shop and at worksites, except in designated smoking areas. Smoking is prohibited in all government vehicles.

3. Worksite Supervision. All Pest Control staff are expected to work independently with minimal direct supervision. Pest Control staff generally receive general supervision in the form of taskings: Service Orders (SO), SOOs and Task Order (TO).

4. Compliance with installation IPM policies. Pest Control staff are expected to review and be familiar with the Fort Eustis Integrated Pest Management Plan. This serves as the installation policy for pest management. Additionally, Pest Control are expected to read and apply pesticides in accordance with respective labels.

VI. Safety.

1. Vehicles. Pest control vehicles are designated to the pest control shop and are prohibited from non-pesticide applicators use. Driver and passenger(s) shall wear seat belts while driving a vehicle. Passengers are not permitted in the vehicle cargo

compartment. Pesticides **shall not** be transported or stored in the passenger compartment of any vehicle. All pesticides and pest control equipment must be secured in the vehicle during transport. Operators of the Buffalo Turbine shall wear a seat belt during misting operations. Safety boots and safety helmet shall be worn while operating the ATV. Passengers are not permitted on the ATV. At no time will pesticides be transported in privately owned vehicles.

2. Medical Examination and Tests. All personnel shall complete all required tests including pulmonary function tests.

3. Respirators. All Pest Control Shop personnel shall be assigned a full-face or half-face, negative pressure, air-purifying respirator NIOSH approved for use with pesticide contaminants. A positive-pressure, air-purifying respirator approved for use with pesticides shall be provided to Pest Controller(s) who fail the pulmonary function test. The respirator must be worn whenever exposed to pesticides or pesticide vapors. The care and maintenance of respirators is the individual responsibility of the person assigned the respirator. When not in use, respirators shall be stored clean in a sealed container. Filters/cartridges shall be changed whenever breathing is difficult or if vapors are detected or IAW manufacturer's instructions. A respirator shall be worn while mixing pesticides at the sink.

4. Showers. Showering is the primary method of removing pesticide residues from the body and preventing secondary pesticide contamination of personal clothing and family members. End-of-day showering is required if workday activity involved pesticide application. Showering and changing work uniform is required anytime a person becomes noticeably contaminated with pesticides.

5. Eye Protection. Most pesticide application requires wearing eye protection: splash-proof goggles and/or face-shield with a half-face respirator or a full-face respirator. Safety glasses should also be worn if eyeglasses are required. **Safety goggles are not substitutable for splash-proof goggles.** Each pest control vehicle shall be equipped with an emergency eyewash fountain. During the winter season the eyewash fountain must be placed indoors if the overnight temperature could potentially drop below freezing. Because bacteria can grow in the eyewash tank, refill tank every other week or sooner if eyewash is used to wash hands or IAW manufacturer's instructions. Annotate on attached card that eyewash has been serviced and inspected.

6. Personal Protective Equipment (PPE). Pesticide applicators shall wear the PPE specified in a given pesticide label at a minimum. In addition to normal work uniform, safety boots/shoes, respirator and eye protection listed above, rubber (nitrile) gloves should be worn with most pesticide applications. The hands have a greater direct exposure to pesticides than any other part of the body. Wash hands each time after handling pesticides. Rubber boots or overshoes should be worn during most outdoor pesticide applications where walking through treated areas cannot be avoided.

A nitrile apron shall be worn while mixing pesticides in the large power sprayers (those sprayers having a 50 plus gallon spray tank capacity) and the large ULV foggers using concentrated pesticides. A hard hat/safety helmet shall be worn at any site where a head injury could occur. Ear plugs and/or ear muffs are required while operating all pesticide application equipment having gasoline powered engines. A safety helmet must be worn while operating the ATV. A head net should be worn while performing bee/wasp pesticide applications. Work uniforms should be treated with Permanone or permethrin prior to conducting tick surveys and control missions or before entering natural areas where ticks are likely to occur. Treatment of clothing with Permanone/permethrin shall be accomplished in accordance with the label. Permanone/permethrin shall NEVER be applied to the skin. Face shields and heavy anti-bite/leather gloves should be worn while removing animals from live traps.

7. Heat Injury Prevention. Wearing duty uniforms and respirators increases personnel risk for heat related injury during the summer months. Whenever the worksite temperature exceeds 90 degrees Fahrenheit, heat injury prevention counter measures must be taken. These measures include increased drinking of water and implementing work/rest cycles appropriate for heat exposure. Supervisor and Pest Controller(s) must insure that worksite(s) has an adequate supply of drinking water, at least one quart of water per employee for every hour of work.

8. Ladders. Ladders shall be inspected every time before use and properly maintained. Defective ladders must not be used and immediately taken out of service.

9. Electrical. Whenever applying pesticides in and around electrical equipment and devices, do not apply products in a manner that could cause electrical shock to yourself or cause shorting and fire to equipment being treated. Do not apply water-based pesticides to exposed wires or devices. Use dust formulations in and around electrical fixtures. Do not use dusts around fans and motors while operational. For termite work, use a **ground fault adapter** while drilling slabs to prevent damage to any buried wires and plumbing and to prevent damage to the drill and drill bit.

10. Safety Checklist for Powered Equipment. A safety inspection must be performed by the equipment operator prior to using any powered equipment. The safety inspection insures equipment is operational and prevents accidental pesticide discharge resulting from faulty hoses, fittings, tires, connectors, valves, trailer hitches and filters.

11. Safety Data Sheets (SDS) and Pesticide Labels. Both SDSs and pesticide labels are integral parts of the Pest Control Shop's Hazard Communication Program. Copies of labels and SDSs for all pesticides and other hazardous materials in the Pest Control Shop inventory shall be organized and at the storage location at all times. Pest controllers will bring a copy of the SDS and label to the application/treatment site for each pesticide/hazardous material used. Pest controllers will read both documents before

applying the pesticide. SDSs will correspond with the product Manufacturer and EPA registration number. The acquisition of new products must be authorized by the FE IPMC prior to purchase. Whenever the shop acquires a new product, all shop personnel must review the SDS and insure that they understand all safety requirements for using that product. For pesticides, **THE LABEL IS THE LAW!** The pesticide label must be read every time prior to pesticide usage and must be closely followed. Only one exception applies to shop operation: the site of application must be listed on the label even if the specific pest requiring control is not listed. The label and SDS shall accompany the Pest Control staff on the work site for immediate reference. All spray tanks containing pesticides must be labeled with: pesticide name, percent active ingredient (as mixed), EPA Registration Number, and signal word from pesticide container (Danger, Warning or Caution).

12. Hazardous Materials. All shop personnel must be properly trained in handling hazardous materials including pesticides. Additionally, it is the responsibility of all shop personnel to insure all hazardous materials are properly stored when not in use and during transport. Additionally, personnel require annual training in handling hazardous wastes.

13. Customer Safety. Customer safety is directly related to the measures that limit pesticide exposure to our customers. The following control methods to limit pesticide exposure must be used to the maximum extent possible.

(a) Survey site to evaluate customer's concerns for pest problems and to validate the need for pesticide application.

(b) Insure customer prepares for pesticide application. Pest control staff shall inform the customer in advance of pesticide applications. Pest control staff shall advise the customer as to preparations needed prior to applications. Pesticides shall not be applied if they are likely to contaminate food, food preparation surfaces, cooking/eating utensils or surfaces likely to be touched by children or pets. Pesticides shall not be applied if the customer has not acceptably prepared treatment site.

(c) Select the least toxic pesticide and use the pest control techniques that limit any direct contact between the customer and their children and pets. Examples: crack and crevice treatments, outdoor perimeter vs. indoor treatment, maximize non-chemical control techniques, baits, etc.

(d) Require customer to vacate area being treated for a minimum of 2 hours or IAW Product label instructions. This allows the pesticide odors to dissipate. The odors are primarily solvents that off-gas following applications. Instruct customers to ventilate treated areas upon their return.

VII. Security. Security of pesticide treatment site is provided by ensuring unauthorized persons, children and pets do not enter treated areas IAW product label instructions or at minimum until pesticide has dried (unless otherwise specified by the label). Ensure treated facilities are secured following treatment, if occupant vacated building during pesticide application. Pest control vehicle and storage compartments shall be locked when not in use. Pest Control Shop shall be locked whenever building is unoccupied. All Pest Control Shop keys shall be inventoried monthly. The **certified pesticide applicator contractor personnel and Fire & Emergency Services are the ONLY** personnel that shall have possession of shop keys/access. All shop vehicles and pest control equipment shall be secured within the CED Compound at the close of each day.

VIII. Customer Relationship. Pest control staff shall provide prompt, courteous and professional response to all customer requests for services. Pest control staff shall forward any customer complaints or issues to the PMQAE or IPMC. The IPMC or PMQAE shall assist in resolving any customer issues.

IX. Coordination.

1. Customer. Pest Control staff must provide customers guidance on properly preparing for pesticide treatments and must evaluate the treatment area to validate need for pesticide application.

2. Aerial Pesticide Applications. The IPMC (this position is normally assigned from the Environmental Element unless a different federal government employee is designated by the Director, CED) evaluates the situations and decides whether aerial treatment is needed and feasible.

3. Medically important pests. Pest Control staff maintain close coordination with IPMC in matters pertaining to the control of medically important pests, such as mosquitoes, ticks, cockroaches in food service facilities, filth flies, bed bugs, red imported fire ants, rodents and any cases of vector-borne diseases. The IPMC conveys related issues to JBLE-E Department of Public Health (McDonald Army Health Center) and Veterinary Services.

4. Stored Food Pests. Frequently coordination is required with Food Inspectors, Veterinary Activity, on matters pertaining to stored food pests.

5. Vertebrate mammalian animals. Trapping and disposal of vertebrate mammalian animals, such as raccoons, opossums, muskrats, ground hogs and feral cats must be coordinated with the Natural Resources & IPM Branch, Environmental Element.

6. Pest Surveillance. Because most preventive pesticide applications are prohibited, pest surveillance is critical to validate pesticide usage requirements.

X. Pest Control Procedures. Non-chemical controls shall be considered before deciding to apply pesticides. The following provides general procedural policies for implementing specific pest control programs.

1. Maximize the use of non-chemical control techniques prior to applying pesticides. This includes instructing customers on preventive measures to prevent or reduce the need for pest control.

2. Pest control staff shall attempt to target pest populations while they are immature and most susceptible to pesticide applications.

3. Pest control staff survey pest problems to identify the pest and to validate the best course of action and the need for pesticide applications.

4. Select the least toxic and lowest cost per application pesticide. Eliminate older stockages of pesticides before using newer products.

5. PESTICIDE LABELS SHALL BE READ BEFORE USAGE! IT IS THE LAW!

6. Minimize pesticide exposures to self and to customers. Maximize wear of personal protective equipment.

7. Utilize pest control procedures that are least disruptive to customer operations and minimizes overtime costs.

8. Request advice and address issues to the IPMC as needed.

XI. Pesticide Usage. Pesticide usage must be consistent with pesticide label requirements.

1. Storage. Small containers of new pesticides and opened large containers (2 gallon or more) shall be maintained in the pesticide storage room of the Pest Control Shop. Opened containers of pesticides that require mixing can be maintained adjacent to the pesticide mixing sink. If pesticide usage is not anticipated within a 2 week period, return open container to pesticide storage room. **Ensure that all pesticides are segregated (herbicides, insecticides, fungicides, rodenticides, nematicides, etc are stored separately)**. Store pesticide containers upright with labels easily readable. Rotate inventory so that old pesticides are used before newer products. **Do not store more pesticide on the pest control vehicle than what can be used within an average workday period.** Insure pesticide storage compartments remain locked, except during use. Insure that all pesticide storage areas including vehicles are kept clean and clutter free.

2. Mixing. **ALL** pesticide mixing shall be performed at the Pest Control Shop.

A. Hand sprayers, 3 gallons or less, shall be mixed at the pesticide mixing sink.

B. Backpack sprayers and all large sprayers shall be mixed under cover on the outdoor hardstand mixing area. Pesticides shall be measured on the pesticide mixing sink and shall be carried to the outdoor mixing area through the pesticide storage room. **Do not** carry pesticides to the outdoor mixing area around the front of the shop. Do not leave any sprayer unattended while filling with water.

C. Service containers, if used, shall only carry enough product for a single dosage application. Service containers must be labeled with: Product Name, active ingredient(s) with percentage(s), EPA Registration Number and signal word (Danger, Warning or Caution).

D. A slurry will be made when mixing wettable powders for use in the powered sprayers. Place measured quantity of wettable powder in a bucket, then add a small quantity of water. Stir mixture, continuing to add water until bucket is approximately half full. Add slurry to spray tank, triple rinse bucket adding rinseate to spray tank.

E. Transport. Larger containers of concentrated pesticide, greater than 2 and 1/2 gallons, shall not be transported off the installation without carrying a manifest for those products. Remove all large pesticide containers prior to leaving Ft. Eustis to fuel the pest control vehicles. Transport pesticide containers in a manner that prevents any spillage.

F. Labeling Spray Tanks. Containers of formulated or concentrated pesticide for all pesticide application equipment must be labeled with their contents. Application equipment, that require an attached label, are hand sprayers, Multi-Jector sprayer, backpack sprayers, all powered sprayers, skid-mounted foggers, hand-held foggers, hand dusters, powered duster, Press-To-Blow dusters and granular spreaders. Labels require the following information: Product Name, active ingredient with percentage (as formulated), EPA Reg # and signal word (Danger, Warning or Caution).

G. Environmental Concerns. The application of all pesticides must be consistent with pesticide label environmental precautionary requirements. The following information addresses concerns unique to Fort Eustis.

(1) Surface Water. Most pesticides cannot be directly applied to any surface water source. Care must be given in sites where runoff can contaminate surface water. While applying herbicide to the railroad track, do not apply pesticide within 30 feet of any permanent water source. Many mosquito control agents can be applied to surface water, but cannot be applied to fish habitats (where recreational and/or commercial fishing occur). Fort Eustis fish habitat areas include Eustis Lake, Browns Lake, Golf

Course ponds, James River, Warwick River, and Skiffes Creek. Other surface water habitats include Bailey Creek and Milstead Island Creek.

- Additionally, Eustis Lake and Browns Lake are Installation Restoration Sites undergoing special remedial action. Pesticide applications to these sites shall be coordinated with the Environmental Element/AFCEC installation restoration manager prior to actual applications.

- Virginia Code specifies special regulatory requirements regarding discharges of pesticides into surface waters. Pesticide applications shall be performed in accordance with Virginia Pollutant Discharge Elimination System (VPDES) General Permit VAG87 as specified in 9VAC25-800. Compliance will be met by all applicators in accordance with Fort Eustis Pesticide Discharge Management Plan (PDMP) found at Appendix T.

(2) Ground Water. To prevent ground water contamination, do not apply pesticides for outdoor treatments at any rates higher than necessary to manage pest problems. Never exceed pesticide label application rates. Certain pre-emergent herbicides have potential to migrate into groundwater.

(3) Federally listed species and other significant potentially affected species. The Atlantic sturgeon (federal and state endangered) occurs in James River at various times of the year. The Indiana bat (*Myotis sodalis*) and Northern long-eared bat (*Myotis septentrionalis*) represent the two federally listed species occurring on the installation. State-listed species found on the installation include the tri-colored bat (*Perimyotis subflavus*) and the little brown bat (*Myotis lucifugus*). Bald eagles occur and nest on the installation. Currently, there are 14 active nests on the installation. Contact the Environmental Element Natural Resources & IPM Branch (which oversees the natural resources program) to identify specific nesting sites. Exercise extreme care whenever applying pesticides within 1/2 mile of nesting sites to prevent pesticide drift over nesting sites.

(4) Application. Apply pesticides consistent with pesticide label requirements, example: using a fan spray nozzle when label requires a crack and crevice application. Select appropriate pesticide application equipment for required pest control operation. Generally, use a powered sprayer when 10 or more gallons of formulated pesticide must be applied. Implement procedures to prevent any off-target pesticide applications. Use direct sprays instead of misting to provide area control when uniform coverage (gallons per acre) is required.

(5) Fogging.

(a) Outdoors. Outdoor fogging operations provide short duration area control of adult mosquitoes and other biting flies. Fogging does not provide residual control and

only affects those pests immediately within the control area. Therefore if the **target pest** is not active during the scheduled time fogging is to take place **do not** fog. Use winds advantageously; try to fog perpendicular to the wind direction. Start fogging operations at the most downwind point and work swatches upwind. This should prevent driving through areas already treated with pesticide. Operate fogger with vehicle windows closed. Constant vehicle speed is required to prevent under or over applications of pesticides. Drive vehicle at a constant 10 MPH. Stop fogging when children, pedestrians or bicyclists could potentially be in the fog. Additionally, fogging operations must stop when wind speed exceeds 5 MPH. A wind speed meter should be carried with Pest controller during fogging operations and use the meter periodically to measure wind speeds. To achieve maximum benefit from fogging, application should be applied at dawn or dusk when mosquitoes are most active. The preferred times for fogging are from 6:30 PM to 10:30 PM and 4:00 AM to 8:00 AM. Fogging can be best performed from both vehicles assigned to the Pest Control shop. The use of 2 trucks on the road ensures adequate treatment post wide. Fogging operation is a task that can be accomplished by one individual. Pest controllers should possess communication equipment for emergencies and maintain hourly communication with the CED Service Desk. For nuisance pest control, fogging can occur several days between treatments; **for disease vector suppression, fogging should be performed daily until pest populations are consistently below the action levels (but in accordance with pesticide labels)**. The public must be notified prior to commencing any large-scale fogging operations in and around the Fort Eustis cantonment area.

(b) Indoors. When indoor fogging is required, insure site being treated is measured to determine total cubic feet. Most indoor fogging applications require ounces of pesticide (or seconds of application) per thousand cubic feet. For foggers providing ounces of pesticide, measure required quantity into spray tank and apply all products into treatment site. For cans of aerosol, determine the seconds of application needed to treat the entire area. Apply aerosol for calculated time. Try to direct fog throughout entire site, not from a single application point such as a doorway or window. Secure treated building for at least the minimal time specified on the pesticide label. Immediately upon entry into treated area, ventilate site to reduce pesticide exposure to personnel who occupy the building.

(6) Misting. The Buffalo Turbine is the primary tool used for misting operations. Adult mosquito resting sites and area tick control are the main Ft. Eustis misting operations. For both of these operations, a single Pest Controller can perform the procedure. Angle the mist flow so that it is directed upward at approximately 30 degrees to the right side of the vehicle. Secure steering wheel in this position. For misting operations, the towing vehicle should not travel faster than 5 MPH. Because assigned Pest Control Shop vehicles speedometers do not register speeds less than 10 MPH, the towing vehicle should use 4X4 (high range) with transmission positioned in drive-1. Two personnel are required to mist ornamental plants and trees. One person operates the Buffalo Turbine directing thorough spray coverage of treated plants. The second person

drives the tow vehicle. The vehicle driver must continuously observe the hand and arm signals of the Buffalo Turbine operator, who directs the misting operation.

(7) Power and Hand Sprayers. Powered and hand sprayers are used to apply liquid formulations of pesticides such as emulsifiable concentrates, wettable powders and microencapsulants. Hand sprayers are used primarily indoors and to treat small areas on building exteriors such as around doorways and windows, and under eaves. Backpack sprayers are used mainly to control pests in and around ornamental plant beds. Powered sprayers should be used whenever 10 or more gallons of formulated pesticide are required. Use a spray gun to apply pesticide around buildings, and in and around ornamental plant beds. Use power sprayer booms to treat large areas of open, flat ground such as TRADOC parade field, Seay Plaza and along the railroad tracks.

(8) Dusters. Dusts can be applied in attics, drop ceilings, crawlspaces, voids, hollow timbers of playground equipment and around bee/wasp nests. Use hand dusters for treating voids and hollow timbers. Use Press-To-Blow (PTB) duster for attics and drop ceilings. Use a water trap when pressurizing PTB duster to prevent water condensation. Use electric duster to dust under crawlspaces. Use Dustick to dust in and around bee/wasp nests. Use maximum number of Dustick extensions to safely reach wasp nests.

(9) Calibration. For every pesticide application, there is a strong possibility for misapplication if equipment is not calibrated. Equipment will be calibrated in accordance with the manufacturers' recommendations. Ensure nozzles and sprayers are thoroughly clean before calibrating. Besides calibrating application equipment output, knowledge of the treatment site (square feet, cubic feet or acres) is critical for insuring pesticides are not over applied or an excessive quantity of pesticide is formulated. Measure area to be treated. Insure no more pesticide is formulated than what is needed to treat the area requiring control.

XII. Pesticide Waste Disposal.

1. All waste disposal (Hazardous, Non-Hazardous, and Universal) will be handled and disposed IAW JBLE – I 32-101 and specifically the following EMPs:

A. EMP 4.4.2 Environmental Awareness & Competency Training.

B. EMP 4.4.6.8 Hazardous Waste Management (HWM).

C. EMP 4.4.6.8 Tab 1 Waste Description Log FEVA Form 32-697.

D. EMP 4.4.6.8 Tab 2 Hazardous Material - Waste Evaluation Report FEVA Form 32-693.

E. EMP 4.4.6.8.1 Hazardous Waste Accumulation Facility (HWAF) Operations.

F. EMP 4.4.6.8.1 Tab 1 DD Form 1348-1A Disposal Turn-In Document (DTID).

G. EMP 4.4.6.8.1 Tab 2 Instructions for Container Contents Log (CCL) FEVA Form 32-646.

H. EMP 4.4.6.8.1 Tab 3 HWAF Reimbursement Log FEVA Form 32-690.

I. EMP 4.4.6.8.1 Tab 4 Container Turn-in Log FEVA Form 32-696.

J. EMP 4.4.6.8.2 Hazardous, Universal, and Non Hazardous Waste Accumulation Site Management.

K. EMP 4.4.6.8.2 Tab 1 TSS, SAS, NHS Site Approval FEVA Form 32-699.

L. EMP 4.4.6.8.2 Tab 2 Weekly TSS, SAS, & NHS Inspections FEVA Form 32-698.

M. EMP 4.4.6.8.2 Tab 3 Monthly Universal Waste Site Inspections FEVA Form 32-695.

2. Specific instructions for Pesticide Wastes before turning-in at the HWAF IAW paragraph (1) above):

A. Empty Containers. Triple rinse all empty containers of concentrated pesticides that are dissolvable in water, i.e. emulsifiable concentrates, wettable powders, and microencapsulants. For concentrated pesticides that are not water dissolvable, ensure container has completely drained into applicator. Invert empty container into applicator's holding tank for 5 minutes to minimize non-dissolvable material remaining within the pesticide container. Bags and containers of dust, granule and bait formulations shall be thoroughly emptied prior to disposal. Aerosol containers of pesticides must be completely expended (less than 1 inch of residue) before disposal. Render all empty pesticide containers unserviceable for any other purpose.

B. Rinseate. The rinseate from triple rinsing empty pesticide containers shall be used as initial make-up water for pesticide formulations. Add rinseate to spray tank before adjusting final pesticide formulation volume. Rinseate from cleaning hand sprayers and exteriors of large spray equipment can drain into wastewater sump for subsequent filtration. Rinseate from cleaning interiors of large sprayers must be applied to the site where pesticide was applied.

C. Excess or Expired Pesticides. To prevent excess formulated pesticide, **pesticides shall not be formulated in quantity than what can be applied during the workday and no more than what is needed for the area(s) requiring application**. Prevent accumulation of excess or expired pesticides by using older pesticides before using newer products. Expired pesticides must turned-in to Hazardous Waste Facility.

D. Wastewater Filtration Residue. Residue, i.e. filters and charcoal, from wastewater filtration is classified as non-regulated hazardous waste. Because waste is generated from a single operation, both residue products can be placed into a single waste storage container. Refer to JBLEI 32-101 for the storage, handling, use, and disposal of non-regulated waste and regulated waste.

XIII. Documentation. Documenting pesticide usage is critical for validating pesticide usage, determining quantity of pesticide used, maximizing non-chemical control techniques and assessing pesticide exposure for self and for personnel exposed to the pesticides.

1. Service Orders (SOs) and Standard Operating Orders (SOOs). The majority of work received by the Pest Control Shop is via SO. CED Pest Control Shop staff shall direct customers to the CED Help Desk or the IPMC if a customer calls the pest control shop directly requesting services unless customer has a valid SOO covering the work request. After recording SO into Service Order Log Book, the SO is assigned to a Pest Control staff member. The Pest Control staff member is responsible for contacting the customer to schedule and survey the pest problem, to provide non-chemical control and self-help guidance, to coordinate pesticide application, if required, and any follow-up treatments or post-treatment surveys. If after surveying the SO pest problem, it appears that the SO requires greater than 40 man-hours of service or supplies or pesticides will cost greater than $20,000, the Service Order shall become a work order (WO).

2. Service Order Log Book. All Service Orders received by the Pest Control Shop shall be recorded in the Service Order Log Book that is maintained in the pest control shop. The Pest control staff enter the following data into the log book: Service Order number, building number, POC, POC phone number, date Service Order received by the shop, pest problem as identified on Service Order and Pest Controller assigned the Service Order. Pest Controller enters date of initial customer contact, identifies pest and date

Service Order is completed. Identification of the pest indicates pest problem was surveyed and validates pesticide usage. Also, the time interval between the date the shop received the Service Order and the date of initial contact provides a measure of responsiveness. The goal for initial contact is one workday after receiving the Service Order.

3. Daily pest management records. All personnel performing pest control services must record the pest control task(s) on the employee timesheet. Information is derived from these timesheets to prepare the monthly report discussed in Section 10.C.(1)(h). A separate line entry is required for each pest management procedure, for each pesticide used and for each building site, indoors or outdoors.

4. Pest Surveillance. All pest infestations must be surveyed to validate any pesticide usage. Appendix L provides a survey form for general pest surveillance in and around buildings. Appendix M refers to the Mosquito Management Plan and Tick Management Plan. Appendix O refers surveillance for imported red fire ant surveillance. Appendix Q provides a termite and wood decay inspection form. After inspecting a building for termites and termite damage, diagram surveyed building on the back of the form and indicate specific sites of termite activity and/or termite damage.

5. Labor and Equipment (L&Es). L&Es are the means by which CED charges our customers for pest control services. L&Es must be completed daily by COB. Attach completed Service Orders to L&Es and submit package to Supervisor for review. The Pest Control Services are covered by a SOO and an L&E covering each pay period is submitted every other week. All services performed by the Pest Control Shop, that are chargeable to customers, must be entered on L&Es as separate line entries.

6. Fort Eustis Integrated Pest Management Plan. The Fort Eustis Integrated Pest Management Plan is a comprehensive document that is reviewed and updated accordingly annually by the IPMC. The completed plan is approved by the 633 ABW Commander and the AFCEC Command Entomologist. The plan provides detailed guidance on the implementation of an integrated pest management program.

7. Daily Work Schedule. All pest control work is subject to worksite inspections to ensure effective and proper use of pesticides and IPM techniques. The Contractor shall communicate this schedule with the IPMC/PMQAE to include if work start is early or delayed or canceled.

8. Weekly Work Plan. The Contractor shall develop and implement a weekly work plan. The plan shall take into consideration projected weather conditions for the following week; adequate work must be programmed to account for periods of fair and adverse weather conditions. The Contractor shall ensure that there is adequate pesticide and material to support the programmed pest control missions and that pesticide application

equipment is calibrated and operational. The weekly work plan for the following week shall be submitted to the IPMC by the last work day of the current work week.

9. Monthly Pest Management Report*. The IPMC prepares a monthly pest management report based on all pest control actions and pesticide applications performed by the BOS contractor occurring in each given month. The BOS contractor prepares a report by entering data into an Excel spreadsheet that is accessible CED public drive (P drive) by the 5th working day of the month following the report month (or submit to the IPMC). This report includes the following information for each pest control task:

- Date of task/pesticide application
- Target pest(s)
- Acres involved (as applicable)
- Location description
- Pesticide product concentrate applied
- EPA Registration Number
- Active ingredient (AI) and percentage in formulation
- Formulation
- Quantity (in units) of pesticide product concentrate applied
- Pounds of AI applied
- Hours spent applying pesticide
- Hours spent performing non-chemical control
- Description of pest control technique if other than pesticide application

* This monthly report shall be replaced when the Integrated Pest Management Information System (IPMIS) becomes available again.

10. Monthly Work Plan. The Contractor shall develop a monthly work plan to coordinate that month's pest control mission requirements as per the Annual Work Plan (as identified in Appendix C). The plan shall describe the tasks scheduled for the coming month. The Contractor shall be aware of surveillance requirements for seasonal pests and their minimum threshold levels for chemical control. The Contractor shall discuss mission requirements with CED/IPMC to determine if any changes have occurred from the Annual Work Plan. The monthly work plan for the following month shall be submitted to the IPMC by the last work day of the current month.

11. Annual Work Plan. An annual work plan is provided at Appendix C. The annual work plan covers the entire calendar year. From this plan, the Contractor can ensure certified personnel are available to perform the work, plan for obtaining pesticides and other pest control related materials, schedule for equipment maintenance, and program lower priority pest control requirements though the entire work year. During periods when workload requirements are heavy, the highest priority work should be performed and lower priority work delayed until workload requirements are reduced.

12. Termite Inspections. The Pest Control Shop primarily receives notice of termite infestations through adult termite swarming activity. Because swarming activity is over a rather short period of time, **accurate records** must be maintained to insure effective control can be used at a later time when manpower is available to perform sub-slab injections. Because most post building have been previously treated with chlordane, spot treatments using sub-slab injections of termiticide provides acceptable levels of control. For spot treatments to be successful, the treatment must be targeted specifically at the site of swarming activity.

13. Pesticide/Hazardous Material Inventory. The shop Supervisor must make a comprehensive listing of all hazardous materials used by the shop. All hazardous materials including pesticides are obtained through the Hazmart.

14. Pesticide Inventory. Monthly, the shop Supervisor must conduct a comprehensive pesticide inventory and report this to the IPMC with its Monthly Pest Management Report.

XIV. Wastewater. All wastewater, generated from pesticide mixing and cleaning application equipment, shall be collected in the Pest Control Shop sump room. Collected wastewater is used as pesticide formulation make-up water. Pesticide formulations using wastewater shall not be applied to sites having ornamental plants that might be sensitive to trace amounts of herbicide residue.

XV. Spill Response Procedures. ALL PESTICIDE SPILLS MUST BE REPORTED TO FIRE & EMERGENCY SERVICES IMMEDIATELY BY CALLING 911 OR 878-1008. Spills can be defined as any release or discharge of a pesticide that occurred not in accordance with its label. The Pest Control Shop has two large spill kits, one in the pesticide storage room and the other in the pesticide mixing room. **Equip each shop vehicle with a spill kit.** Place spill kit behind seat in passenger compartment. The procedures, that have the highest risk of a pesticide spill, are during mixing and while transporting the large sprayers trailers having 50 or more gallons of formulated pesticides. Because of an increased risk of spillage, the ATV and its sprayer, when loaded, should not travel faster than 15 MPH.

XVI. Property Accountability. All property book and durable equipment and tools must be properly accounted.

XVII. Resource Management. The shop Supervisor must insure the Pest Control Shop has adequate supplies and materials to perform pest management activities. **First-in, first-out inventory management shall be practiced.** Older products shall be fully consumed in shop operations prior to using newer replacement products that are intended for a similar purpose. The shop shall maintain a comprehensive inventory of all pesticides and other consumable products. This inventory shall be reported to the IPMC monthly.

XVIII. Equipment Maintenance. All shop equipment and vehicles are expected to be maintained in a clean and operable condition. Report to shop Supervisor any equipment that is inoperable. Maintaining clean equipment is critical in presenting a professional image and preventing off-target pesticide contamination. Equipment should be inspected prior to every use. During the winter season equipment should be maintained and preparations made to ensure proper operation of equipment during peak season.

APPENDIX C:

CED (BOS Contract) Pest Shop Annual Work Plan
(Survey and Control of Pests)

BOS Pest Management Contract SOO Requirements

BOS PEST MANAGEMENT CONTRACT SOO REQUIREMENTS

	January	February	March	April	May	June	July	August	September	October	November	December
ADMIMISTRATION												
Daily Pest Management Log	■	■	■	■	■	■	■	■	■	■	■	■
Pest Control Administration	■	■	■	■	■	■	■	■	■	■	■	■
Monthly Pest Management Reports	■	■	■	■	■	■	■	■	■	■	■	■
Pesticide Inventory	■	■	■	■	■	■	■	■	■	■	■	■
Annual Work Plan												■
FOOD FACILITY												
Food Preparation Facility Surveillance report	■	■	■	■	■	■	■	■	■	■	■	■
Filth Fly Surveillance					■	■	■	■	■			
CHILDCARE FACILITY												
Childcare Facilities				■	■	■	■	■	■	■		
MEDICAL FACILITY												
Medical Facilities	■	■	■	■	■	■	■	■	■	■	■	■
VEGETATION												
High Visibility Turf Areas Survey for Turf	■	■	■	■	■	■	■	■	■	■	■	■
Ornamental Plants and Tree Pests, and Weeds in Ornamental Plant Beds.	■	■	■	■	■	■	■	■	■	■	■	■
Vegetation Control				■	■	■	■	■	■	■		
Felker Army Airfield				■	■	■	■	■	■	■		
Utility Industrial Sites and Material Storage Yards				■	■	■	■	■	■	■		
				■	■	■	■	■	■	■		
Weed Control along Fence lines	■	■	■	■	■	■	■	■	■	■	■	■
Weed Control Warehouse					■							
Weed Control along Security Fence lines				■	■	■	■	■	■	■		
Weed Control in Storm Drainage System				■			■					
PEST SURVALIANCE												
Red imported fire ants				■	■	■	■	■	■	■		
Gypsy moth (egg mass survey)	■	■	■									■
Gypsy moth Adult trapping)						■	■	■				
Tabanid flies					■	■	■	■	■	■		
Bees/wasps					■	■	■	■	■	■		
Ticks				■	■	■	■	■	■	■		
Mosquito larvae					■	■	■	■	■	■		
Mosquito adult				■	■	■	■	■	■	■		
Poison ivy					■		■		■			
Termite inspection	■											■

APPENDIX D:

Aerial Applications of Pesticides

Policies and Procedures for Aerial Applications of Pesticides

1. General. Aerial application of pesticides represents a tool in controlling certain arthropod and vegetation pests when such pests pose significant impacts on the military mission. Such applications are typically used when other techniques are not feasible and when aerial techniques can be employed without significant risks to the installation community and its ecology.

2. Pest conditions targeted for aerial applications. Three types of pests may require the use of aerial pesticide applications. These include mosquitoes, certain invasive/undesirable vegetation (primarily common reed) and forest pest outbreaks.

A. Mosquito numbers or increased disease risks. Mosquitoes may pose serious nuisance issues or potential disease vectors when the numbers reach certain levels. When such conditions exist most other techniques will not adequately bring them under control. As discussed in Appendix M mosquito surveillance serves to determine when aerial applications will be used. Surveillance involves weekly mosquito trapping and when the number of female mosquitoes in traps exceeds 45 per night, aerial application options may be considered. Additionally, increases of human health risks from mosquito-borne diseases may qualitatively direct the need for aerial application.

B. Large area vegetation control. Under certain conditions, certain plant species may spread across large areas in a manner that impacts military operations or is detrimental to the natural habitats where natural resources are damaged and land sustainment compromised. In such cases, accessibility or logistical constraints prevent ground-control techniques. This is most typical with some invasive plants such as Common reed (*Phragmites australis*) though not necessarily exclusively. Common reed expands rapidly and quickly out-competes native wetland plant species. As a result, many native wetland habitats become degraded from major losses of biodiversity. Additionally, the large, thick stands of common reed reduce land use for military training and pose as potential wildland fire risks and compromise force protection.

C. Forest pest outbreaks. Fort Eustis contains approximately 2,700 acres of commercial mixed hardwood-pine forests as well as an estimated 1,000 acres of urban forest. Forest habitats are critical for the military mission and management of these habitats contributes to their long-term sustainment. Various arthropods particularly a number of insects (both native and invasive) can severely damage these habitats under certain conditions such as outbreaks. Controlling these insects is very problematic and pesticides are not always a feasibly solution for all species considered. However, certain insects can be brought under control with aerial applications. Such insects may include (but not necessarily all) defoliating caterpillars, beetles (such as bark beetles, ambrosia beetles, long-horned beetles, jewel/metallic wood-boring beetles), sawflies, Sirex wasps, weevils and chafers.

3. Authorization for aerial applications. The IPMC determines whether aerial applications are necessary or feasible. If it is deemed appropriate, the IPMC prepares an Aerial Spray Statement of Need (ASSON) and submits this document to the AFCEC Command Entomologist for ultimate approval. ASSONs remain in effect until perpetuity and require revision and approval only if a new target pest is identified or if the application method is different from the original ASSON.

4. The IPMC shall hold a DOD certification for category 11.

5. Personnel performing the applications must be certified in the aerial application category. Pesticides used must be formulated for aerial applications, and pesticide labels are followed as with any application. Coordination with tenant activities is performed in advance. This includes ASA (Range Operations, RCI, etc.), Fire & Emergency Services, 733 SFS, and 1st Fighter Wing (Felker Army Airfield), Public Affairs and CED. Additionally, installation-wide notifications are needed.

6. Aerial Applications of Mosquito Control.

A. Aerial applications are considered when female mosquito numbers exceed 45 per trap per night or notification is received through the chain of command or military health professionals of increased mosquito-borne disease risks.

B. Resources are provided by the US Air Force 910TH Air Wing from Youngstown Air Reserve Station, Ohio) and requests are routed through the IPMC at Langley Air Force Base (LAFB). However, aerial treatments are based on a collective decision by members of the Lower Peninsula Mosquito Control Advisory Board based on mosquito numbers and associated risks. Members of this Board include LAFB, Fort Eustis, City of Hampton, City of Newport News and York County. Fort Eustis purchases the pesticide that is used on its installation.

C. The aircraft and application system used is normally a C-130H Modular Aerial Spray System (MASS). The aircraft and certified personnel are based at the US Air Force Youngstown Air Reserve Station located in Vienna, Ohio. LAFB serves as the base of operations. Aircraft spray overflights would occur at elevations between 150-300 feet, and spray missions occur either from two hours before sunset to sunset or from sunrise to two hours after sunrise (depending on weather conditions).

D. The pesticides used consist of Trumpet (NSN 6840- 01-532-5414 and EPA Registration No. 5481-481) which is an organophosphate containing 78% naled (1,2-dibromo-2,2-dichloroethyl dimethyl phosphate) used against adult mosquitoes and *Bacillus thuringiensis* var. *israelensis* (*B.t.i.*) and a similar material, *Bacillus sphaericus (B.s.)* which are naturally occurring bacteria that are applied to wetlands to control larval mosquitoes. Basically, an ultra low volume (ULV) application rate is 0.5 to 1.0 fluid ounces of undiluted Trumpet per acre, or 1.0 fluid ounce per acre of a 1:1 Trumpet to

heavy aromatic naphtha (HAN) mixture (0.50 fluid ounce of Dibrom to 0.50 fluid ounce of HAN/acre).

E. As part of the planning process, notification of local bee keepers and citizens in the local area is required. Normally, this is accomplished by LAFB. Units, personnel and family members working or residing on Fort Eustis would be notified by the Environmental Element/CED.

7. Large area vegetation control.

A. Most vegetation control is accomplished by ground-based techniques. However, aerial treatments are considered in cases where it is logistically infeasible due to affected areas containing large acreage and/or is inaccessible. Currently, control of the invasive grass common reed (*Phragmites australis*) is the primary focus for aerial treatments. This plant grows in large impenetrable stands where rhizomes extend for acres precluding growth of native vegetation. Affected areas can easily exceed 10 acres. Some locations easily exceed 80 acres of monocultures of this plant especially in marshes. The total acreage for the installation likely exceeds 600 acres.

B. The IPMC and the natural resources program manager oversee control of invasive vegetation. When these positions are held by two individuals, close coordination is required. An approved ASSON is required.

C. Aerial applications of this type are typically performed under contract with a commercial pest control contractor certified for aerial treatments. Rotary-wing aircraft is normally used. Actual aircraft and dissemination system may vary and must be properly calibrated. Appropriate measures are implemented to reduce drift.

D. Actual pesticides (in this case herbicides) used may vary depending on frequency of treatments, potential for resistance of target vegetation, risks to non-target adjacent vegetation, costs and efficacy. Typically glysophate and imazypyr herbicides are used.

8. Forest pest outbreaks.

A. The frequency of using aerial applications against forest pests is expected to be low. The primary need for this technique is expected in cases of severe outbreaks occur, where aerial techniques can effectively target the pest, other techniques are not feasible and large scale losses of forested areas are expected. To date no recent aerial applications have been required.

B. If aerial applications are required, it is likely the operation will be under a contract with a commercial applicator that is certified in the forestry and aerial application categories. Aircraft type may be fixed or rotary wing. Actual pesticides may vary. All other requirements discussed above are applicable.

APPENDIX E:

Statement of Need for the Aerial Dispersal of Mosquito Adulticides

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

1 Aug 2011

MEMORANDUM FOR 733 MSG/CC

FROM: HQ ACC/A7O
129 Andrews Street, Suite 206
Langley AFB VA 23665-2769

SUBJECT: Statement of Need for the Aerial Dispersal of Mosquito Adulticides on Fort Eustis

1. Attached is the approved Statement of Need for the aerial dispersal of mosquito adulticides on Fort Eustis. The Statement of Need verifies the need to apply mosquito adulticides for the control of disease vectors and nuisance mosquitoes on Fort Eustis, VA.

2. In accordance with AFI 32-1074, *Aerial Application of Pesticides*, an on-site validation of aerial application requirements is required. The on-site survey was conducted on 6 July 2011 by Mr. Steve Robertson, the ACC Command Entomologist.

3. This statement of need is valid indefinitely provided there is no change in acreage, chemicals, or other environmental considerations. Sites identified within this validation, application rates, label restrictions, and timing must be strictly followed to avert accidental release into non-target areas. The recommended mosquito adulticide, Dibrom Concentrate, has an EPA Registration number (5481-480) and a Virginia Product Number (26). The approved product will be applied by a DoD or State of Virginia Certified Pesticide Applicator.

4. An Environmental Assessment (EA) for this project must be completed prior to the application of any pesticide by air. The EA is required to comply with the National Environmental Policy Act of 1969, as amended, and in accordance with: Title 40, Code of Federal Regulations, Part 1500-1508, Council on Environmental Quality; Department of Defense Instruction 4150.07, DOD Pest Management Program; and Air Force Instruction 32-1074, Aerial Application of Pesticides.

5. For additional information, please contact Mr. Steve Robertson, ACC/A7OO, at DSN 574-2766 or (757) 764-2766.

Bobbie A. Moore

BOBBIE A. MOORE, Lt Col, USAF
Chief, Operations Support Branch
Directorate of Installations and Mission Support

Attachment:
Statement of Need for the Aerial Application of Mosquito Adulticides on Fort Eustis

Global Power For America

Aerial Spray Statement of Need for the Aerial Application of Mosquito Adulticides on Fort Eustis, Virginia

PEST MANAGEMENT CONSULTANT (STATEMENT OF NEED PREPARER):	Steven B. Robertson Command Entomologist HQ ACC/A7OO 129 Andrews Street, Suite 206 Langley AFB, VA 23665-2769 Phone Commercial: 757-764-2766 Phone DSN: 574-2766 DoD Aerial Applicator Certification Number: AA-017-07-1010
DATE OF ON-SITE SURVEY:	6 July 2011
INSTALLATION:	Fort Eustis, VA
PERIOD OF VALIDATION:	Indefinite provided there is no change in acreage, chemicals, or other environmental considerations
AUTHORITY:	AFI 32-1074, Aerial Application of Pesticides AFI 32-1053, Integrated Pest Management Program DoDI 4150.07, DoD Pest Management Program

1. Purpose and Decision for the Need

a. **Purpose of Project:** Validate the requirement for aerial application of mosquito adulticides for disease vectors and nuisance mosquitoes on Fort Eustis, VA.

b. **Need Justified:** The need for aerial spray is justified for mission accomplishment and to protect the health and welfare of personnel on Fort Eustis, VA.

c. **Rationale for Decision:**

1. **Direct Importance of Protection in Maintaining Installation's Operational Capabilities.** An outbreak of a mosquito-borne disease among base personnel could seriously degrade mission-essential operations and readiness. Additionally, severe mosquito annoyance can reduce the mental concentration and overall productivity of personnel who are required to work or train outdoors.

2. **Disease Transmission.** High populations of mosquitoes can seriously degrade mission-essential operations and put installation personnel and their dependents at risk of vector-borne disease. Many of the mosquitoes endemic to Fort Eustis are potential vectors of human and animal diseases including West Nile virus (WNV), eastern equine encephalitis (EEE), Venezuelan equine encephalitis (VEE), other arboviral encephalitides, and canine heartworm.

   Disease vectors found on Fort Eustis include, but are not limited to the following:
   - *Aedes albopictus* is a vector of dengue fever, WNV, and dog heartworm
   - *Aedes vexans* is a secondary vector of EEE and has been found positive for WNV
   - *Psorophora columbiae*, is a vector of EEE, VEE and WNV
   - *Coquilletidia perturbans* is a vector of EEE and WNV
   - *Culex salinarius* is a vector of the WNV
   - *Culex pipiens* is a vector of VEE, WNV, and other forms of enchephalitis

3. **Effect of Infestation on Morale and Efficiency.** The efficiency of troops in training, maintenance, military police, fire department employees, and others who work outdoors may be adversely affected when mosquito numbers are high. While an individual's predisposition to mosquito bites vary, morale and productivity are generally adversely impacted during

periods of high mosquito activity. Adverse psychological reactions can be a factor in some individuals. The use of outdoor bivouac areas and recreation facilities such as the golf course, athletic fields, playgrounds, and picnic areas may decline at times due to intense mosquito activity. Such restrictions reduce productivity and have a negative effect on the morale of assigned personnel, their dependents, transient personnel, guests and residents of civilian communities. Use of recreational sites such as golf course, athletic fields, playgrounds and picnic areas may decline due to intense mosquito activity. This will have a negative effect on the morale of assigned personnel, their dependents, transient personnel, guests and residents of civilian communities.

2. Aerial Application Project Parameters

a. **Pests and Stages to be Controlled.** This Aerial Spray Statement of Need supports the aerial application of insecticides to control adult mosquitoes. The primary mosquito species found on Fort Eustis include: *Aedes albopictus*; *Aedes vexans*; *Anopheles quadrimaculatus*; *Culex salinarius*; *Culex pipiens*; *Coquillettidia* spp; *Ochlerotatus sollicitans*; *Orthopodomyla* spp; *Psorophora ciliata*; *Psorophora columbiae*; and *Uranotaenia* spp. Many of these species are potential vectors of human and animal diseases including West Nile virus, eastern equine encephalitis, other arboviral encephalitides, and canine heartworm.

b. **Recommended Timing of Application.** The heaviest mosquito infestations occur on and around Fort Eustis from May through October. The decision to use aerial spray will be based upon the threat of human and animal disease; environmental and climatic conditions; larval and adult mosquito surveillance; and customer complaints.

Based on several decades of surveillance data, Fort Eustis has established the following thresholds for the chemical control of adult mosquitoes:

- 15 females per trap night = resting site barrier treatment
- 25 females per trap night = area fogging 2-4 times per week
- 35 females per trap night = consider aerial spray application

Therefore, when adult mosquito surveillance data indicate threshold limits have exceeded the capabilities of ground control methods, an aerial application may be required.

Aerial application of pesticides will not exceed three applications per season and will normally begin as close to sunset as possible. Aerial spray requests will be coordinated with the Command Entomologist HQ ACC/A7OO and the Fort Eustis Installation Pest Management Coordinator.

c. **Treatment Area.** The Fort Eustis validated aerial spray area is represented by the attached map (Atch 1). Fort Eustis is located at 37°7' North Latitude and 76°35' West Longitude on the lower Virginia peninsula.

d. **Acreage and Description of Spray and Surrounding Area.** Fort Eustis has approximately 8,228 acres of which 2,167 acres is designated wetlands. Topography of the lower Virginia peninsula area is mostly flat, with elevations ranging from sea level to 8 feet.

e. **Recommended Pesticides and Application Rate.** The insecticide Dibrom Concentrate, (NSN 6840-01-270-9765, 30 gallon drum, EPA registration number 5481-480) is recommended in an aerial application for adult mosquito control. The chemical is a formulation of 87% naled (1, 2-dibromo-2, 2 dichloroethyl dimethyl phosphate) with 13% inert ingredients. The label recommended rate of application is 0.5-1.0 ounces of undiluted Dibrom Concentrate per acre by means of aerial ultra-low-volume (ULV) equipment. The label also permits application of a mixture of Dibrom Concentrate and highly aromatic naptha (HAN). Application will normally use 0.5 ounces of concentrated Dibrom per acre and will never exceed the label maximum rate of 1.0 ounce per acre. If Dibrom Concentrate cannot be used due to non-availability or ineffectiveness, another EPA approved alternate insecticide can be selected after consultation with the appropriate

state authorities, the 910 AW Aerial Spray Branch, and the ACC Command Entomologist (HQ ACC/A7OO).

These recommendations are made using Dibrom Concentrate's current labeling. If the labeling changes then the application rates will need to be adjusted according to the labeling. This is necessary because in accordance with (IAW) the Federal Insecticide, Fungicide, and Rodenticide Act (7 USC § 136), it is a violation of Federal Law to use any pesticide in a manner inconsistent with its labeling.

f. **Recommended Applicator Source.** The 757th Airlift Squadron, Youngstown Air Reserve Base, Ohio, which uses C-130H aircraft equipped with a Modular Aerial Spray System and Differential Global Positioning System, is the proposed applicator source. This Air Force Reserve unit can provide aircraft, aircrews, and Virginia State Certified/DoD certified entomologists to coordinate and oversee all aspects of aerial application of pesticides. Fort Eustis will provide the pesticide product. In the event that the 757th Airlift Squadron is unavailable, an alternate certified aerial applicator (contractor) can be selected after consultation with the ACC Command Entomologist (HQ ACC/A7OO).

3. **Other Information**

a. **Possibility of Damage to Beneficial Plants and Animals:** All pesticides used in the United States must be registered (licensed) by the Environmental Protection Agency (EPA). EPA registration assures that pesticides will be properly labeled and, if used IAW label specifications, the pesticides will not cause unreasonable harm to people or the environment.

Dibrom Concentrate is registered with the EPA (EPA Registration Number 5481-480) and in the State of Virginia (Virginia Product Number 29). When used IAW its labeling, it poses minimal risks to people and the environment. Additional constraints and best management practices adhered to by the USAF Reserve Aerial Spray Branch applicators will also minimize environmental risks. A detailed discussion of environmental factors will be included in the environmental assessment written for this project.

b. **Threatened and Endangered Species:** Six threatened and 14 endangered species live within a 50-mile radius of Fort Eustis. Bald Eagle (*Haliaeetus leucocephalus)* nests are located on Mulberry Island on Fort Eustis. All environmentally sensitive areas will be identified on the spray map prior to any spray mission and only sprayed if proper approval is obtained.

Because US Environmental Protection Agency rulings may prohibit the use of certain pesticides within the range of critical habitat of certain endangered species, a copy of the installation pest management plan should be submitted to the regional USFWS office for review and consultation.

c. **Installation and Public Notifications:** If an aerial spray project is scheduled, the Public Affairs Office will disseminate information to base personnel and the surrounding communities concerning the proposed times of application, areas to be sprayed, the presence of low-flying aircraft, the relatively harmless properties of the pesticide to plants, property, and vertebrate animals, and the fact that apiaries and other sensitive operations should be protected during the aerial application. Notifications should also be made to outdoor recreation facilities in the Fort Eustis area include athletic fields, playgrounds, picnic grounds, tennis courts, swimming pools, riding stables, jogging courses, and golf courses.

d. **Air Traffic Control Notification:** If the 757th Airlift Squadron is unavailable and contracted services are acquired, then proper coordination with local air traffic control personnel and base operations must also be arranged to ensure safety. Contract applicators will need to obtain DoD clearance to treat areas on Fort Eustis, particularly in consideration of ongoing military flight operations. DoD clearance can be facilitated through the 733rd Mission Support Group. The following forms must be used if necessary:

- DD Form 2400 **Civil Aircraft Certificate of Insurance**
  http://www.dtic.mil/whs/directives/infomgt/forms/eforms/dd2400.pdf
- DD Form 2402 **Civil Aircraft Hold Harmless Agreement**
  http://www.dtic.mil/whs/directives/infomgt/forms/eforms/dd2402.pdf

e. **Civilian Communities Surrounding Fort Eustis:** This statement of need is valid **only** for Fort Eustis, VA. Civilian communities are **not** required to participate in DoD aerial spray projects. However, if Fort Eustis schedules an aerial spray, agreements with local civilian communities allow the USAF Reserve Aerial Spray Branch to provide aerial applications to those communities upon request. Requests are made by the locally elected officials of those communities.

In order to minimize the areas to be sprayed, the Lower Peninsula Mosquito Control Council (with representatives from Fort Eustis, Newport News, York County, Poquoson, and Hampton) will determine where mosquito hot spots are located on the peninsula to ensure that only problem areas are treated. In general, these hot spots occur where mosquito infestations cannot be managed by ground control measures. Under most circumstances, only hot spots within specifically identified spray areas will be treated unless a significant mosquito-borne disease threat is present.

If needed, civilian communities are responsible for environmental assessments or other environmental actions necessary for conducting the aerial application of pesticides over their communities.

If needed, civilian communities are responsible for any permitting requirements (i.e. National Pollutant Discharge Elimination System (NPDES)) necessary for the aerial application of pesticides over their communities.

Civilian communities will provide Aerial Spray Hold Harmless Agreements and other required legal documentation before aerial spray projects are conducted over their communities.

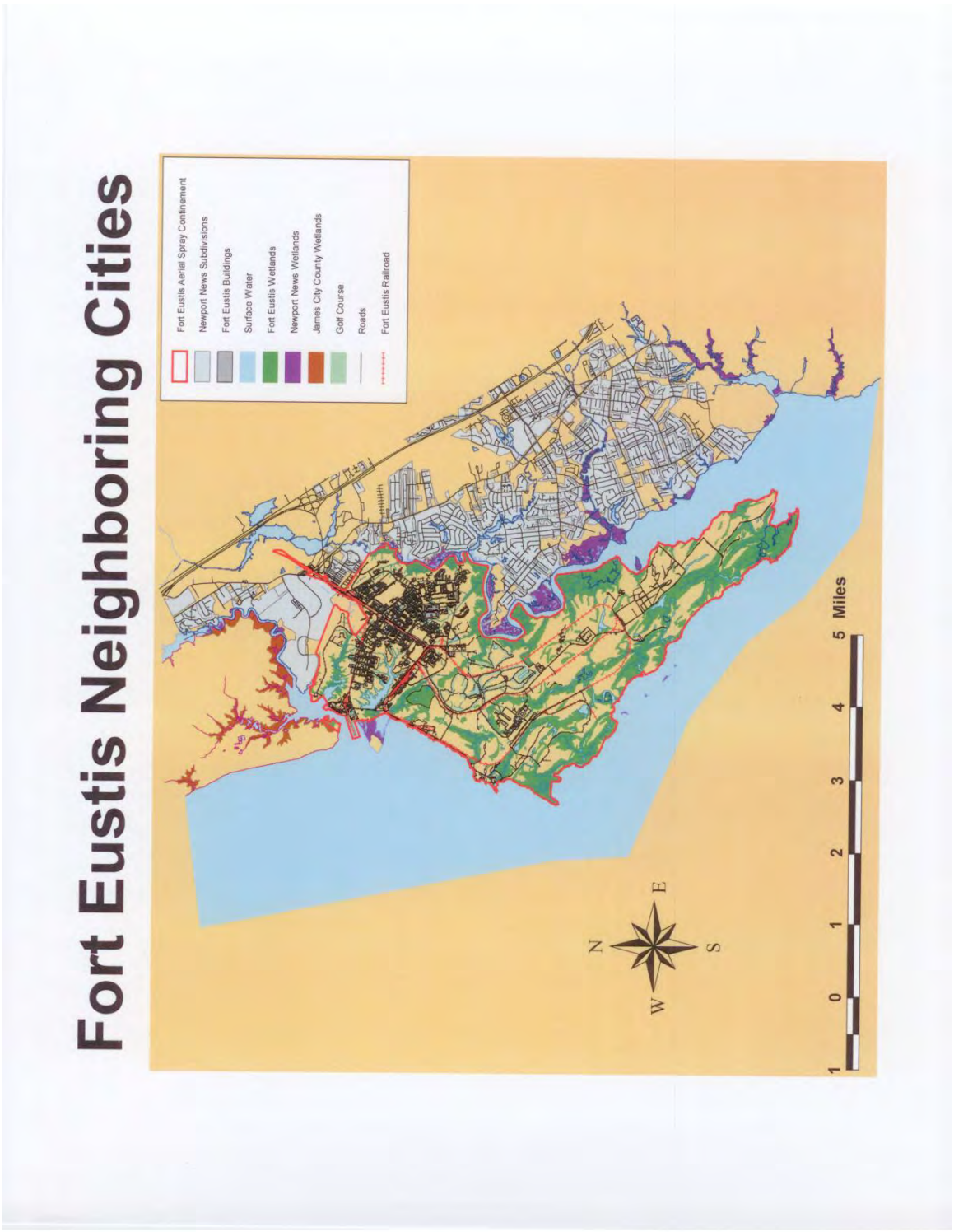
Civilian communities will provide the pesticides necessary to treat the designated spray areas within their communities.

Steven B. Robertson

STEVEN B. ROBERTSON
Command Entomologist

Attachments:
1. Proposed Treatment Area Map – Fort Eustis
2. Dibrom Concentrate Label
3. Dibrom Concentrate MSDS

4


Fort Eustis Neighboring Cities
Fort Eustis Aerial Spray Confinement
Newport News Subdivisions
Fort Eustis Buildings
Surface Water
Fort Eustis Wetlands
Newport News Wetlands
James City County Wetlands
Golf Course
Roads
Fort Eustis Railroad
N
E
S
W
0
1
2
3
4
5 Miles

DIBROM® CONCENTRATE

INSECTICIDE

ACTIVE INGREDIENT:	By Wt.
*Naled	87.4%
OTHER INGREDIENTS:	12.6%
TOTAL	100.0%

*1,2-dibromo-2,2-dichloroethyl dimethyl phosphate

KEEP OUT OF REACH OF CHILDREN

DANGER

FOR THE FOLLOWING EMERGENCIES, PHONE 24 HOURS A DAY:
Transportation: CHEMTREC.....1-800-424-9300
Other: AMVAC.....1-323-264-3910

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

DANGER

CORROSIVE: Causes irreversible eye and skin damage. May be fatal if swallowed, inhaled or absorbed through the skin. May cause allergic skin reaction. Do not get in eyes, on skin, or on clothing. Do not breathe vapor or spray mist.

When handling this material wear: coveralls over long-sleeved shirt and long pants; chemical-resistant gloves such as barrier laminate, butyl rubber ≥ 14 mils, nitrile rubber ≥ 14 mils and viton ≥ 14 mils; chemical-resistant footwear plus socks; protective eyewear; chemical-resistant headgear for overhead exposure; chemical-resistant apron when cleaning equipment, mixing, or loading; and respirator with either an organic-vapor removing cartridge with a pre-filter approved for pesticides (MSHA/NIOSH approval number prefix TC-23C), or a canister approved for pesticides (MSHA/NIOSH approval number prefix TC-14G).

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240 (d) [(4-6)], the handler PPE may be reduced or modified as specified in the WPS. Wash thoroughly with soap and water after handling and before eating, drinking, or using tobacco. Remove contaminated clothing and wash before reuse.

STATEMENT OF PRACTICAL TREATMENT

If in eyes: Immediately hold eyelids open and flush with a steady, gentle stream of water for 15 minutes. Get medical attention immediately.
If on skin: Wash with plenty of soap and water. Get medical attention immediately.
If swallowed: Drink a large quantity of milk, egg whites, gelatin solution, or if these are not available, drink large quantities of water. Avoid alcohol. Contact a physician, Poison Control Center, or emergency center. Do not induce vomiting. Take person and product container to the nearest medical emergency treatment center.
If inhaled: Remove victim to fresh air. If not breathing, give artificial respiration and get medical attention immediately.
Note to Physicians: Emergency information -call 24 hours a day 1-323-264-3910. Naled is a cholinesterase inhibitor. Measurement of blood cholinesterase activity may be useful in monitoring exposure. If signs of cholinesterase inhibition appear, atropine sulfate is antidotal. 2-PAM (Protopam) is also antidotal and may be used in conjunction with atropine, but should not be used alone. Probable mucosal damage may contraindicate the use of gastric lavage.

ENVIRONMENTAL HAZARDS

This pesticide is toxic to fish, aquatic invertebrates, and wildlife. Do not apply directly to water except when used over water as labeled for adult mosquito, blackfly, or housefly control. For terrestrial uses, do not apply directly to water, or to intertidal areas where surface water is present or to intertidal areas below the mean high water mark. Runoff from treated areas may be hazardous to aquatic organism in neighboring areas. Do not contaminate water when disposing of equipment washwaters. This product is highly toxic to bees exposed to direct treatment on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds while bees are actively visiting the treatment area.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

READ ENTIRE LABEL. USE STRICTLY IN ACCORDANCE WITH PRECAUTIONARY STATEMENTS AND DIRECTIONS, AND WITH APPLICABLE STATE AND FEDERAL REGULATIONS.

EPA REG. NO. 5481-480 **EPA EST. NO. 5481-CA-1**

AMVAC
4100 E. Washington Blvd.
Los Angeles, CA 90023, USA
1-323-264-3910 • www.amvac-chemical.com

TANK MIXES

NOTICE: Tank mixing or use of this product with any other product, which is not specifically and expressly authorized by the label, shall be the exclusive risk of user, applicator, and/or application advisor. Read and follow the entire label of each product to be used in the tank mix with this product.

DIBROM CONCENTRATE IS FOR USE ONLY BY TRAINED PERSONNEL IN COMMERCIAL PEST CONTROL AND PUBLIC HEALTH OR PEST ABATEMENT PROGRAMS.

DIBROM Concentrate is a special formulation for use undiluted or diluted in diesel oil to be applied for the control of mosquitoes, houseflies and certain other nuisance insects. **This product cannot be diluted with water.**

OPERATIONAL USE INSTRUCTIONS

• All equipment used in the mixing or application (by ground or air) of DIBROM Concentrate should be constructed of corrosion-resistant materials. Stainless steel, bronze, brass, fiberglass, polypropylene and rigid PVC have all proven fairly resistant to the effects of DIBROM Concentrate.

• Use of Teflon or Viton seals is recommended. Avoid use of steel or galvanized steel. Even when these materials are used to construct a spray system, a careful maintenance program involving flushing, cleansing and constant inspection must be followed.

• Strain DIBROM Concentrate as it is being loaded. Use a 100 mesh stainless steel or nylon screen. If product crystallization occurs, warm at 70°F until crystals disappear. The use of DIBROM Concentrate and some grades of diesel fuel may result in precipitates, which cause nozzle clogging and operational difficulties.

• Flushing the system following application is essential. Use of Heavy Aromatic Naphtha (HAN), "Jet A" aircraft fuel, Aromatic 150, Aromatic 200, and Aromatic 200ND have been reported as successful. Isopropyl or methyl alcohol is not recommended for flushing due to their flash point.

• DIBROM Concentrate must be applied using the correct droplet size. Over-atomization produces finer particles which either evaporate or dissipate too quickly and become unavailable for mosquito contact. The spread factor for DIBROM Concentrate on silicone or Teflon-coated slides is 0.54 and 0.7, respectively. If applied incorrectly, DIBROM Concentrate will spot certain automobile paint finishes. Careful attention to recommendations concerning nozzles, nozzle positioning, air speed and droplet size is essential to avoid paint spotting.

A technical bulletin *"DIBROM Concentrate for use in Mosquito Control Programs"* contains detailed information on equipment for ULV applications.

Aerial Application: Aerial application must be made with closed cockpit aircraft. Spray during periods when wind is 10 mph or less and when thermal activity is low. Nozzles must be positioned 45° to 90° (perpendicular to air flow) into the wind. This positioning results in the maximum wind shear across the face of the nozzles and creates the smallest particles. Air speed should be in excess of 100 mph to assure enough force to create maximum spray atomization. Aircraft flying at slower speeds should be equipped with atomizing nozzles. Use spray nozzles that will produce 30 to 80 micron size droplets. No more than 5% of the droplets should be larger than 80 microns.

ADULT MOSQUITO CONTROL

Adult Mosquito Control in Residential Areas, Municipalities, Tidal Marshes, Swamps, Woodlands, Agricultural Areas (when applied in wide-area public pest control programs sponsored by governmental entities), Livestock Pastures, Feed Lots and Pastures including Dairy Cattle: It is not necessary to avoid farm buildings, dairy barns, feed or forage areas. Not for use on trees being grown for sale or other commercial use, or for commercial seed production, or for the production of timber or wood products, or for research purposes (unless applied in wide-area public pest control programs sponsored by governmental entities). Use in agricultural areas should be in a manner as to ensure that residues do not exceed the established federal tolerance for the active ingredient in or on raw agricultural commodities resulting from use for area pest control. Treat shrubbery and vegetation where mosquitoes may rest. Shrubbery and vegetation around stagnant pools, marshy areas, swamps, residential areas, municipalities, woodlands, pastures, farm buildings and feed lots may be treated.

11119-3

Ultra Low Volume (ULV) Aerial Application: Apply 1/2 to 1 fl. oz. of undiluted product per acre. Use the 1 oz. rate where heavy vegetation exists i.e., woodlands, etc.

Dilute Aerial Application: Dilute 50 to 100 oz. (1.6 to 3.1 qts.) DIBROM Concentrate in 100 gals. No. 2 Fuel Oil or diesel oil. Apply at the rate of 1 gal. diluted material per acre. This is equivalent to 0.05 to 0.10 lb. actual DIBROM per acre or dilute 1.0 fl. oz. DIBROM Concentrate with HAN (Heavy Aromatic Naphtha) to make 16 fl. oz. Apply at the rate of 16 fl. oz. of dilute mixture per acre. This is equivalent to 0.10 lb. actual DIBROM per acre.

Ultra Low Volume (ULV) Ground Application: Apply DIBROM Concentrate undiluted at the rate of 0.6 fl. oz. per minute at 5 mph; 1.2 fl. oz. per minute at 10 mph; and 1.8 fl. oz. per minute at 15 mph, applying a 300 ft. swath. These flow rates are equivalent to 0.02 lb. actual DIBROM per acre.

Special Instructions:
CAUTION: This application can be made only under the following conditions:
1. Application can be made only by appropriately licensed and certified personnel with public agencies or private contractors operating in conjunction with or under contract with such government agencies.
2. Application in calm air conditions is to be avoided.
3. Application is not to be made in the immediate vicinity of pedestrians.
4. Vehicles used to apply DIBROM Concentrate must be air conditioned or equipped with automatic speed control flow device.

Dilute Ground Application: Dilute 2 qts. (64 fl. oz.) of DIBROM Concentrate in soybean oil or HAN to make 5 gals. of dilute solution. Apply at the rate of 3 to 6 fl. oz. per minute at a vehicle speed of 5 mph applying a swath 300 ft. wide at 10mph; deliver 6 to 12 fl. oz. per minute; and at 15 mph deliver 9 to 18 fl. oz. per minute. This is equivalent to 0.01 to 0.02 lb. actual DIBROM per acre. Use the high rate and slower speed to penetrate dense vegetation.

Thermal Fog Application: Dilute 3.1 qts. (100 fl. oz.) to 99 gals. No. 2 Fuel Oil or diesel oil or 10 oz. per 10 gals. oil. Apply either at the rate of 40 gals. per hour at 5 mph vehicle speed, 80 gals/hour (10 mph) or 120 gals./hour (15 mph) applying swath 300 to 400 feet wide.

BLACKFLIES, HOUSEFLIES, GNATS, CERTAIN OTHER NUISANCE INSECTS Small Flying Moths, Crane Flies, Midges, Adult Stable Flies (Dog Flies) in Residential Areas, Municipalities. Woodlands, Livestock Pastures, Feed Lots and Pastures Including Dairy Cattle: It is not necessary to avoid farm buildings, dairybarns and, feed or forage areas. Not for use on trees being grown for sale or other commercial use, or for the production of timber or wood products, or for research purposes. (unless applied as wide–area public pest control programs sponsored by governmental entities).

Thermal Fog Ground Application: Dilute 1 gal. to 99 gals. of No. 2 Fuel Oil or diesel oil or 13 oz. per 10 gals. oil. Apply at a rate of 40 gals. per hour output at an average vehicle speed of 5 mph, applying swath 300 to 400 feet wide.

Thermal Fog Aerial Application: Dilute 100 to 230 fl. oz. (3/4 to 1-3/4 gals.) DIBROM Concentrate in 100 gals. No. 2 Fuel Oil or diesel oil. **Smaller insects – Gnats and Midges:** 3/4 to 1 gal. **Houseflies, Flying Moths:** 1 to 1-3/4 gals. Apply 1 gal. diluted material per acre. This is equivalent to 0.1 to 0.2 lb. actual DIBROM per acre. **Suppression of Blackflies:** Dilute 1.5 fl. oz. DIBROM Concentrate with 14.5 fl. oz. HAN. Apply at the rate of 16 fl. oz. diluted mix per acre. This is equivalent to 0.16 lb. actual DIBROM per acre.

HORN FLIES (Range Cattle)

Airplane Application: Apply 2 to 4 fl. oz. DIBROM Concentrate undiluted per acre. Use higher rate for heavier fly populations. This is equivalent to 0.2 to 0.4 lb. actual DIBROM per acre.

SUPPRESSION OF DEER FLIES

Aerial Application: Apply 1 to 2 fl. oz. DIBROM Concentrate undiluted per acre. Use higher rate in denser vegetation. This is equivalent to 0.1 to 0.2 lb. actual DIBROM per acre.

Do not apply under conditions involving possible drift to food, forage or other plantings that might be damaged or the crops there of rendered unfit for sale, use,or consumption.

STORAGE AND DISPOSAL

PROHIBITIONS: Do not contaminate water, food, or feed by storage, disposal or cleaning of equipment. Open dumping is prohibited.

STORAGE: Keep pesticide in original container. Do not put concentrate or dilute into food or drink containers. For help with any spill, leak, fire, or exposure involving this material, call day or night 1-800-424-9300.

PESTICIDE DISPOSAL: This product is acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste Representative at the nearest EPA Regional Office for guidance.

CONTAINER DISPOSAL: Triple rinse (or equivalent). Do not reuse container. Offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or incineration, or, if allowed by State and local authorities, by burning. If burned, stay out of smoke. Dispose of in a sanitary landfill or by other procedures allowed by State and local authorities.

OR (the following statement is to be used on returnable containers)

CONTAINER REUSE
RETURNABLE CONTAINER: This container is a dedicated, single product returnable container. Refill this container only with pesticide. Return empty container to seller or to location designated by seller as a collection point. Do not break seals, add anything to container or open container after use. Do not rinse or contaminate empty container. Do not dispose of empty container or use it for any other purpose.

LIMITED WARRANTY AND DISCLAIMER

The manufacturer warrants (a) that this product conforms to the chemical description on the label, (b) that this product is reasonably fit for the purposes set forth in the directions for use, subject to the inherent risks referred to herein, when it is used in accordance with such directions; and (c) that the directions, warnings, and other statements on this label are based upon responsible experts' evaluations of reasonable tests of effectiveness, of toxicity to laboratory animals and to plants and residues on food crops, and upon reports of field experience. Tests have not been made on all varieties of food crops and plants, or in all states or under all conditions.

THERE ARE NO EXPRESS WARRANTIES OTHER THAN THOSE SET FORTH HEREIN. THE MANUFACTURER NEITHER MAKES NOR INTENDS, NOR DOES IT AUTHORIZE ANY AGENT OR REPRESENTATIVE, TO MAKE ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, AND IT EXPRESSLY EXCLUDES AND DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY OF FITNESS FOR A PARTICULAR PURPOSE, OR ANY WARRANTY OF QUALITY OR PERFORMANCE. THIS WARRANTY DOES NOT EXTEND TO, AND THE BUYER SHALL BE SOLELY RESPONSIBLE FOR, ANY AND ALL LOSS OR DAMAGE WHICH RESULTS FROM THE USE OF THIS PRODUCT IN ANY MANNER WHICH IS INCONSISTENT WITH THE LABEL DIRECTIONS, WARNINGS OR CAUTIONS.

BUYER'S EXCLUSIVE REMEDY AND MANUFACTURER'S OR SELLER'S EXCLUSIVE LIABILITY FOR ANY AND ALL CLAIMS, LOSSES, DAMAGES, OR INJURIES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT, WHETHER OR NOT BASED IN CONTRACT, NEGLIGENCE, STRICT LIABILITY IN TORT OR OTHERWISE, SHALL BE LIMITED, AT THE MANUFACTURER'S OPTION, TO REPLACEMENT OF, OR THE REPAYMENT OF THE PURCHASE PRICE FOR, THE QUANTITY OF PRODUCT WITH RESPECT TO WHICH DAMAGES ARE CLAIMED. IN NO EVENT SHALL MANUFACTURER OR SELLER BE LIABLE FOR SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT.

AMVAC offers this product, and Buyer accepts it, subject to the foregoing Limited Warranty which may be varied only by agreement in writing signed by an authorized representative of AMVAC.

Dibrom® is a registered trademark of AMVAC Chemical Corporation.

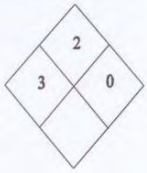
Amvac Chemical Corporation
4100 E. Washington Boulevard
Los Angeles, CA 90023 U.S.A.
1-323-264-3910
www.amvac-chemical.com

AMVAC CHEMICAL CORPORATION
DIBROM® CONCENTRATE
DIBROM® 14 CONCENTRATE (HIGH FLASH)

AMVAC MSDS No.: 260_8

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION



PRODUCT NAME: DIBROM® CONCENTRATE; DIBROM® 14 CONCENTRATE (HIGH FLASH)
GENERAL USE: Insecticide
PRODUCT DESCRIPTION: Off-white to straw yellow liquid with a sharp, pungent odor
EPA Registration Number: 5481-480
MSDS No.: 260_8
Current Revision Date: 23 October 2003

MANUFACTURER:
AMVAC CHEMICAL CORPORATION
4100 E. Washington Blvd.
Los Angeles, CA 90023-4406
Ph: 323-264-3910
FAX: 323-268-1028

EMERGENCY TELEPHONE NUMBERS:
MANUFACTURER: 323-264-3910
TRANSPORTATION (24 HOURS)
CHEMTREC: 800-424-9300
OTHER (24 HOURS)
AMVAC: 323-264-3910

2. COMPOSITION/INFORMATION ON INGREDIENTS

Component	Naled	DDVP	Naphthalene
Synonyms	1,2-Dibromo-2,2-dichloroethyl dimethylphosphate; DIBROM®	2,2-Dichloroethenyl dimethylphosphate; DICHLORVOS	
CAS Number	300-76-5	62-73-7	91-20-3
Hazard	Poison; Corrosive	Poison, Possible carcinogen	Possible Carcinogen
Wt%, Typical	87.4%	less than 2%	less than 1%
Exposure Limits	OSHA PEL: 3 mg/m^3 ACGIH TLV: 0.1 mg/m^3	OSHA PEL: 1 mg/m^3 ACGIH TLV 0.1 mg/m^3	OSHA PEL: 10 ppm ACGIH PEL: 10 ppm ACGIH STEL: 15 ppm

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

DANGER! POISON! CORROSIVE! An off-white to straw yellow liquid with a sharp, pungent odor that causes irreversible eye and skin damage. May be fatal if swallowed, inhaled or absorbed through skin and eyes. Is a cholinesterase inhibitor. Rapidly absorbed through skin. Repeated inhalation or skin contact may, without symptoms, progressively increase susceptibility to organophosphate (including Naled) poisoning. May be an aspiration hazard. May cause an allergic reaction.
Product is combustible.
Toxic to fish, birds, and other wildlife.

POTENTIAL HEALTH EFFECTS

ROUTE(S) OF ENTRY: May be fatal if swallowed, inhaled or absorbed through skin and eyes. May produce acute cholinesterase depression. May cause corrosive destruction of the skin, mucous membranes and the eyes.

SIGNS OF ACUTE OVEREXPOSURE: Acute cholinesterase depression may be evidenced by headache, nausea, vomiting, diarrhea, abdominal cramps, excessive sweating, salivation and tearing, constricted pupils, blurred vision, tightness in chest, weakness, muscle twitching and confusion; in extreme cases, unconsciousness, convulsions, severe respiratory depression and death may occur.

This product is expected to be corrosive to the eyes. The degree of injury will depend on the amount and duration of the contact and the speed and thoroughness of the first aid treatment. Expected adverse health effects resulting from direct exposure to the eye may include pain, tears, swelling, redness, blurred vision, irreversible eye damage and possibly blindness.

This product is expected to be corrosive to the skin. The degree of injury will depend on the amount and duration of the contact and the speed and thoroughness of the first aid treatment. The expected adverse health effects resulting from a direct exposure to the skin may include pain or a feeling of heat, discoloration, swelling, blistering, and irreversible tissue damage.

This product is expected to be corrosive to the digestive tract, and, if ingested, may cause nausea, vomiting and diarrhea.

This product is expected to be corrosive to the respiratory tract, and, if inhaled, may cause symptoms that include nasal discharge, sore throat, coughing, bronchitis, pulmonary edema, and difficulty in breathing.

3. HAZARDS IDENTIFICATION, cont'd

SIGNS OF CHRONIC OVEREXPOSURE: Repeated exposures to small doses of Naled and other organophosphates may lower the cholinesterase to levels where the above symptoms of acute overexposure are observed.

CARCINOGENICITY: EPA under its 1999 proposed Guidelines for Carcinogen Risk Assessment has classified DDVP, an impurity in Naled, as having "suggestive evidence of carcinogenicity, but not sufficient to assess human carcinogenic potential.". IARC lists DDVP (Dichlorvos) as being possibly carcinogenic to humans (Group 2B). Based on the results of testing in mice, the IARC has recently classified Naphthalene, a component of the solvent used for this formulation, as being possibly carcinogenic to humans (Group 2B). **CARE SHOULD BE EXERCISED IN HANDLING THIS FORMULATION.**

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Preexisting conditions which lower cholinesterase levels increase vulnerability to cholinesterase depression. These include: (for plasma) genetic cholinesterase deficiency; advanced liver disease; chronic alcoholism; malnutrition; dermatomyositis; existing toxicity from exposure to carbon disulfide; benzalkonium salts, organic mercury compounds, ciguatoxins or solanines; and (for RBC) hemolytic anemias.

4. FIRST AID MEASURES

DIBROM® 14 CONCENTRATE (High Flash) CONTAINS A CHOLINESTERASE INHIBITOR (NALED). A PHYSICIAN SHOULD BE CONTACTED IN ALL CASES OF EXPOSURE TO NALED AND ITS FORMULATIONS. THIS PRODUCT IS CORROSIVE TO EYES AND SKIN.

EYES: Immediately flush the eyes with copious amounts of clear, cool running water for a minimum of 15 minutes. Hold the eyelids apart during the flushing to ensure rinsing of the entire surface of the eyes and lids with water. Contact a physician immediately. If there will be a delay in getting medical attention, rinse the eyes for at least another 15 minutes.

INHALATION: Remove victim to fresh air. If breathing has ceased, clear the victim's airway and start mouth-to-mouth artificial respiration. If breathing is difficult, give oxygen. Contact a physician immediately.

INGESTION: DO NOT induce vomiting. If victim is conscious, administer an 8 oz. glass of water containing 2 tbsp. activated charcoal. Have person lie on their left side to slow down absorption of the ingested material. Never give anything by mouth to an unconscious person. Contact a physician immediately.

SKIN: Immediately flush all affected areas with large amounts of clear water for at least 15 minutes. Remove contaminated clothing. Do not attempt to neutralize with chemical agents. Wash clothing before reuse. Contact a physician immediately.

4. FIRST AID MEASURES, cont'd

NOTE TO PHYSICIANS: This is an Organophosphate (OP) Insecticide. Do not wait for laboratory confirmation to treat patients with strong clinical evidence of poisoning. In the USA and other countries, contact your local or national poison control center for more information.

Do Not handle the patient without the following protective equipment in place: chemical resistant gloves and apron (preferably nitrile). Remove contaminated clothing and do not reuse without thorough cleaning with detergent and hot water. Dispose of heavily contaminated clothing, including shoes, as a hazardous waste.

Establish airway and oxygenation. IV Atropine sulfate is the antidote of choice. Moderately severe poisoning: use 0.4-2.0 mg in adults or 0.05 mg/kg in children. Repeat every 15 minutes until atropinization is achieved. Severe poisoning may require larger doses. Cholinergic toxicity may recur as atropinization wears off; monitor patient closely. Draw blood for RBC and plasma cholinesterase. In addition, Pralidoxime (2-PAM) is indicated during the first 36 hours in severe poisonings. Slow IV administration (no less than 2 minutes) of 1 g in adults or 20-50 mg/kg in children may be repeated in 1 to 2 hours if muscle weakness, twitching, and/or respiratory depression persist. Avoid morphine, aminophylline, phenothiazines, reserpine, furosemide and ethacrynic acid.

Bathe and shampoo contaminated skin and hair. If ingested, empty stomach. Due to the presence of aromatic solvents, gastric lavage should be considered following intubation with a cuffed endotracheal tube to prevent aspiration of vomitus. Activated charcoal is useful to further limit absorption.

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5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

Flash Point: 151°F (closed cup)
Autoignition Temperature: No data available
Flammable Limits:
Lower flammable limit: No data available
Upper flammable limit: No data available
Flammability: This is a combustible liquid that will burn when heated (NFPA rating = 2)

EXPLOSIVITY

Mechanical Impact: Not explosive
Static Discharge: Will not occur

HAZARDOUS COMBUSTION PRODUCTS: This product will emit toxic fumes when burned, including hydrogen chloride, hydrogen bromide, phosphorous oxides and carbon monoxide. Vapors of the unburned product may also be hazardous. Contact with the fumes and vapors should be avoided by staying upwind and by wearing impervious clothing and positive pressure self-contained breathing apparatus.

EXTINGUISHING MEDIA: Foam, dry chemical, carbon dioxide, water spray (fog).

5. FIRE FIGHTING MEASURES, cont'd

FIRE FIGHTING INSTRUCTIONS: Evacuate nonessential personnel from the area. Keep upwind. Wear self-contained breathing apparatus and impervious clothing, including gloves and eye protection. Clean all clothing before reuse.

6. ACCIDENTAL RELEASE MEASURES

GENERAL: Evacuate personnel and thoroughly ventilate the area. Use adequate ventilation and air-supplied respirators, as well as impervious clothing and safety goggles. Keep bystanders upwind and away from the spill.

SMALL SPILL: Cover with nonflammable absorbent (clay, sand, oil dry, kitty litter, etc.) to absorb the liquid. Sweep into an open plastic drum. Decontaminate the area and equipment with dilute alkali or ammonia (less than 5% solution) and detergent. Flush the area with water. Absorb and sweep into the same open plastic drum. Close the drum and dispose of as a hazardous waste.

LARGE SPILL: Dike the spill to prevent contamination of local water sources. Siphon the majority of the liquid into drums for use or disposal, depending on the circumstances. Clean the area as described for a small spill.

7. HANDLING AND STORAGE

HANDLING: Prevent skin contact. Do not breathe fumes. Wear appropriate personal protective equipment (See Section 8). Wash thoroughly and change clothes after handling. Keep product away from food drink, cosmetics, and tobacco products. See product label for more detailed handling procedures.

STORAGE: Do not contaminate water, food or feed by storage or disposal. Store product in a cool, dry, locked place out of reach of children. Store in original container.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: A well-ventilated area is recommended for handling DIBROM® 14 Concentrate. Use of mechanical or local exhaust systems is recommended.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION, cont'd

RESPIRATORY PROTECTION: When respiratory protection is required, or concentrations may exceed the PEL, use a NIOSH/MSHA approved air-purifying respirator equipped with organic vapor cartridges or canisters. For emergency and other conditions where the exposure limit may be greatly exceeded, use an approved positive-pressure, self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply.

SKIN PROTECTION: Chemical resistant gloves (preferably nitrile), body covering clothing that has long sleeves and long pants, and chemical resistant shoes or boots, are required to prevent skin contamination. A chemical resistant apron is required when there is a risk of spillage or splashing. Wear clean clothes daily. Wash well with soap and water after handling this product. See the label for more specific instructions.

EYE PROTECTION: Safety glasses should be worn whenever working with chemicals. Goggles or a faceshield are required if there is a chance of splashing.

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9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
Appearance:	An off-white to straw yellow color
Odor:	Sharp, pungent, with overtones of aromatic solvent
Odor Threshold:	No data available
Boiling Point:	320°F/160°C
Freezing/Melting Point:	60°F/15°C
Specific Gravity:	1.794 to 1.831
Density:	14.97 to 15.28 lb/gal
Vapor Pressure (mm/Hg):	10 mm Hg @ 100°F
Vapor Density:	Heavier than air
Percent Volatile by Vol:	5%
Solubility in Water:	0.2%
Solubility (Other):	This product is soluble in aromatic hydrocarbons, chlorinated hydrocarbons, ketones, and esters
Partition Coefficient (O/W):	Approx. 100 (a.i.) at ambient temperatures
pH:	Not available
Evaporation Rate:	Not available

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10. STABILITY AND REACTIVITY

CHEMICAL STABILITY (Conditions to avoid): This product is stable under normal use and storage conditions. It may be photochemically reactive.

10. STABILITY AND REACTIVITY, cont'd

INCOMPATIBILITY: Unstable in the presence of iron or alkaline media. Corrosive to iron, aluminum and magnesium. Hydrolyzes slowly under neutral or acid conditions.

HAZARDOUS DECOMPOSITION PRODUCTS: Heating product to decomposition will cause emission of acrid smoke and fumes of hydrogen chloride, hydrogen bromide, phosphorous oxides, carbon oxides and unknown organic compounds.

HAZARDOUS POLYMERIZATION: This product will not polymerize.

11. TOXICOLOGICAL INFORMATION

The following information is available for Naled technical and two related formulations, DIBROM® 8 and DIBROM® 14:

INGESTION:	Oral LD_{50} (rat):	92/191 mg/kg (female/male)(Naled Technical)
INHALATION:	Inhalation LC_{50} (rat):	1520 mg/m^3, 4 hr (DIBROM® 8)
DERMAL:	Skin LD_{50} (rabbit):	360/390 mg/kg (female/male) Naled Technical)
IRRITATION:	Eye irritation:	Corrosive (DIBROM® 14) Toxicity Category I
	Skin irritation:	Corrosive (DIBROM® 14) Toxicity Category I
SENSITIZATION:	Skin sensitization: (guinea pig)	Weak Skin Sensitizer (Naled Technical)

CORROSIVENESS (DOT): A study run with Naled Technical showed that Naled Technical is considered noncorrosive by DOT criteria when applied to the intact skin of albino rabbits.

TERATOGENICITY: Maternal toxicity in rats was observed at 40 mg/kg/day (body weight loss, tremors, painful or difficult breathing, and decreased activity) using Naled Technical (a.i.). No developmental effects were observed at this dose level. The maternal NOEL was 10 mg/kg/day. The developmental NOEL was 40 mg/kg/day.

REPRODUCTIVE TOXICITY: In a two-generation rat reproduction study with Naled Technical (a.i.), a decrease in male body weight gain was observed at 18 mg/kg/day; however, no effects on reproduction were found in adult animals. Decreases in offspring survival, number of pups born and decreased pup weights were noted at 18 mg/kg/day. The NOEL for both adults and offspring was 6 mg/kg/day.

MUTAGENICITY: No evidence of mutagenicity activity from *in vitro* and *in vivo* tests, using Naled Technical (a.i.).

CARCINOGENICITY: No evidence of carcinogenicity in laboratory animals with Naled Technical. However, EPA under its 1999 proposed Guidelines for Carcinogen Risk Assessment has classified DDVP, an impurity in Naled, as having "suggestive evidence of carcinogenicity, but not sufficient to assess human carcinogenic potential." Based on the results of testing in mice, the IARC has recently classified Naphthalene, a component of the solvent used for this formulation, as being possibly carcinogenic to humans (Group 2B).

TOXICOLOGICALLY SYNERGISTIC PRODUCTS: No data available.

12. ECOLOGICAL INFORMATION

This product is toxic to fish, birds, and other wildlife. Keep out of any body of water. Do not contaminate water when disposing of equipment washwaters or wastes.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture or rinsate is a violation of Federal law. If these wastes cannot be disposed by use according to label instructions, contact your nearest State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA regional office for guidance. Open dumping is prohibited.

Container Disposal: Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of container in a sanitary landfill or by incineration, or, if allowed by State and local authorities, by burning. If burned, stay out of smoke. Contact the State or local authorities to determine the current regulations.

14. TRANSPORTATION INFORMATION

DOT Class:	6.1
CANADA Shipping Class:	6.1
ADR Class (road):	6.1
AUSTRALIAN Shipping Class:	6 Subsection 111
UN Number:	UN3018
IMDG Class (sea):	6.1
IATA Class (air):	6.1
Marine Pollutant:	Yes
Packing Group:	III
Hazard Label(s):	TOXIC
Proper Shipping Name(s):	Organophosphorus pesticides, liquid, toxic (Naled)
Reportable Quantity: (DOT, 172.101, Appendix A)	Yes

PACKAGING

General description:	5 gallon , 15 gallon, 30 gallon, and 60 gallon polyethylene drums

15. REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS:

This product is registered under EPA/FIFRA Regulations. It is a violation of Federal Law to use this product in any manner inconsistent with its labeling. Read and follow all label directions. This product is excluded from listing requirements under EPA/TSCA.

CANADIAN REGULATIONS:

This product is not registered under the Pest Control Product Act of Canada.

EUROPEAN UNION REGULATIONS:

This product is not registered in the European Union.

AUSTRALIAN REGULATIONS:

This product is undergoing registration in Australia. It is a violation of Australian Law to use this product in any manner inconsistent with its labeling.

SARA TITLE III DATA

Section 311 & 312 Hazard Categories:

Immediate Health Hazard:	Yes
Delayed Health Hazard:	Yes
Fire Hazard:	Yes
Reactive Hazard:	No
Sudden Pressure Release Hazard:	No

Section 302 Extremely Hazardous Substances: DDVP (Dichlorvos, 62-73-7)

Section 313 Toxic Chemicals: Naled (300-76-5); DDVP (Dichlorvos, 62-73-7); Naphthalene (91-20-3)

CERCLA/EHS Reportable Quantities: DDVP (Dichlorvos) - 10 lbs; Naled - 10 lbs; Naphthalene -100 lbs; Product (calc'd) - 11 lbs

STATE REGULATIONS:

CALIFORNIA (Proposition 65): This product contains chemicals known to the State of California to cause cancer - DDVP, Naphthalene.

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16. OTHER INFORMATION

MSDS Status:

Date This Revision: 23 October 2003
Date Previous Revision: 5/02/02
Person Responsible for Preparation: Gary A. Braden

Reasons for Revision: Annual review. New information has been added in section 2, 3, and 15.

16. OTHER INFORMATION, cont'd

DISCLAIMER:

This information is provided for the limited guidance to the user. While AMVAC believes that the information is, as of the date hereof, reliable, it is the user's responsibility to determine the suitability of the information for its purposes. The user is advised not to construe the information as absolutely complete since additional information may be necessary or desirable when particular, exceptional, or variable conditions or circumstances exist (like combinations with other materials), or because of applicable regulations. No express or implied warranty of merchantability or fitness for a particular purpose or otherwise is made hereunder with respect to the information or the product to which the information relates.

ABBREVIATIONS:

a.i.	-	active ingredient
ACGIH	-	American Conference of Governmental Industrial Hygienists
ADR	-	Mark used to indicate European Approval for the Transport of Dangerous Goods by Road
CERCLA	-	Comprehensive Environmental Response, Compensation, and Liability Act
DOT	-	Department of Transportation (USA)
EPA	-	Environmental Protection Agency
FIFRA	-	Federal Insecticide, Fungicide, and Rodenticide Act
IARC	-	International Agency for Research on Cancer
IATA	-	International Air Transport Association
IMDG	-	International Maritime Dangerous Goods
NTP	-	National Toxicology Program
SARA	-	Superfund Amendments and Reauthorization Act
TSCA	-	Toxic Substances Control Act

This is the last page of this MSDS. There should be 10 pages.

APPENDIX F:

Statement of Need for the Aerial Application of Herbicides

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

19 Jun 2014

MEMORANDUM FOR 733 MSG/CC

FROM: HQ ACC/A7O
129 Andrews Street, Suite 206
Langley AFB VA 23665-2769

SUBJECT: Statement of Need for the Aerial Application of Herbicides to control common reed, *Phragmites australis*, on Fort Eustis, VA

1. Attached is the approved Statement of Need for the aerial application of herbicides to control the common reed, *Phragmites australis*, on Fort Eustis. The Statement of Need verifies the need to apply the herbicides for the control of this invasive species on Fort Eustis, VA.

2. In accordance with AFI 32-1074, *Aerial Application of Pesticides*, an on-site validation of aerial application requirements is required. The on-site survey was conducted on 14 Mar 2014 by Mr. Steve Robertson, the ACC Command Entomologist.

3. This statement of need is valid indefinitely provided there is no change in acreage, chemicals, or other environmental considerations. Sites identified within this validation, application rates, label restrictions, and timing must be strictly followed to avert accidental release into non-target areas. The first recommended herbicide, Habitat, has an EPA Registration number (421-426) and a Virginia Product Number (0008100169). The second recommended herbicide, Polaris, has an EPA Registration number (228-534) and a Virginia Product Number (0068300139). The approved products will be applied by a DoD or State of Virginia Certified Pesticide Applicator.

4. An Environmental Assessment (EA) was completed in 2004 and a Supplemental EA was completed in 2012. The EA is required to comply with the National Environmental Policy Act of 1969, as amended, and in accordance with: Title 40, Code of Federal Regulations, Part 1500-1508, Council on Environmental Quality; Department of Defense Instruction 4150.07, DOD Pest Management Program; and Air Force Instruction 32-1074, Aerial Application of Pesticides.

5. For additional information, please contact Mr. Steve Robertson, ACC/A7OO, at DSN 574-2766 or (757) 764-2766.

JOHN M. BALZANO, Col, USAF
Chief, Operations Division (A7O)
Directorate of Installations and Mission Support

Attachment:
Statement of Need for the Aerial Application of Herbicides to Control Common Reed (*Phragmites australis*) on Fort Eustis, VA

Global Power For America

Aerial Spray Statement of Need for the Aerial Application of Herbicides to Control Common Reed (*Phragmites australis* (Cavanilles)) on Fort Eustis, VA

PEST MANAGEMENT CONSULTANT (STATEMENT OF NEED PREPARER):	Steven B. Robertson Command Entomologist HQ ACC/A7OO 129 Andrews Street, Suite 206 Langley AFB, VA 23665-2769 Phone Commercial: 757-764-2766 Phone DSN: 574-2766 DoD Pesticide Applicator Certification #: NJ-008-07-0813 DoD Aerial Applicator Certification #: AA-017-07-1013
DATE OF ON-SITE SURVEY:	14 Mar 2014
INSTALLATION:	Fort Eustis, VA
PERIOD OF VALIDATION:	Indefinite provided there is no change in acreage, chemicals, or other environmental considerations
AUTHORITY:	AFI 32-1074, Aerial Application of Pesticides AFI 32-1053, Integrated Pest Management Program DoDI 4150.07, DoD Pest Management Program

1. **Purpose and Decision for the Need**

   a. **Purpose of Project:** Validate the requirement for aerial application of herbicides to control Common Reed (*Phragmites australis* (Cavanilles)) on Fort Eustis, VA.

   b. **Need Justified:** The need for aerial spray is justified, based on several years of surveillance. Fort Eustis has identified approximately 600 acres of land containing Common Reed. Additional areas are likely to exist and will be assessed pending availability of resources in the near future.

   c. **Rationale for Decision:** Environmental compliance with Executive Order 31112, *Invasive Species*, dated 3 February 1999 "requires all federal agencies to prevent the introduction or invasive species, provide for their control and minimize their economic, ecological and human health impacts." The invasive grass common reed has spread across the installation primarily in wetlands but also into some upland areas to a lesser extent. Continued spread adversely alters wetlands by out-competing native aquatic vegetation and overall reducing biodiversity. This also leads to impacts to military mission requirements by impacting force protection, increasing the risks of wildland fires, reducing line of sight along some roads and trails, reducing recreational fisheries, and marring aesthetics.

2. **Aerial Application Project Parameters**

   a. **Pests and Stages to be Controlled.** This Aerial Spray Statement of Need supports the aerial application of herbicides to control Common Reed (*Phragmites australis* (Cavanilles)) on Fort Eustis, VA.

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b. **Recommended Timing of Application.** Efficacy of herbicides works best on common reed in late summer to early fall (August-October) because the plant continues to grow while other plants in adjacent areas begin to go dormant. This reduces risks of damage to other plant species. Aerial applications of herbicide will not exceed one application per season with the need expected to be reduced in succeeding seasons depending on efficacy determined by monitoring. Aerial spray requests will be coordinated by the Fort Eustis Installation Pest Management Coordinator, U.S. Air Force Air Combat Command, 733rd Security Squadron, Army Support Activity, Force Support Directorate, 1st Fighter Wing, and the Office of Public Affairs.

c. **Treatment Area.** The proposed area (Atch 1) to be validated for aerial application is Fort Eustis. Fort Eustis is located at 37°7' North Latitude and 76°35' West Longitude on the lower Virginia Peninsula.

d. **Acreage and Description of Spray and Surrounding Area.** Topography of the lower Virginia peninsula area is mostly flat with elevations ranging from sea level to 8 feet Fort Eustis has approximately) 7,900 acres of which approximately 3,000 acres is designated wetlands. Newport News has 12,000 acres and is comprised of wetlands, woods and civilian residential communities. No federally listed species occur on Fort Eustis. The Atlantic sturgeon (*Acipenser oxyrinchus*) was listed as endangered in February 2012 and is known to occur in the James River and its tributaries; however, aerial spray will not be performed directly into open waters or areas not containing common reed. Seven active bald eagle (*Haliaeetus leucocephalus*) nests are located on Mulberry Island on Fort Eustis. These locations are mapped and will be avoided by the aircraft. All environmentally sensitive areas will be identified on the spray map and prior to any spray mission and only sprayed if proper approval is obtained. Areas treated via aerial application constitute areas where personnel do not normally enter. Some of the proposed treated areas are adjacent to areas of operation but treatment will be performed in accordance with the label to preclude drift and prior coordination will be made.

e. **Recommended Pesticides and Application Rate.** In addition to the glyphosate that was approved during the 2004 EA process, the use of imazapyr was suggested by the US EPA Region III in a memo dated 15 Aug 2012 to Mr. Tim Christensen (733 MSG/CED), during the 2012 EA process. The suggestion was made in the body of the memo as well as in the Technical Comments that were attached.

The herbicides Habitat or Polaris (EPA registration number 241-426 and 228-534. respectively) are recommended in an aerial application for common reed in aquatic systems. Habitat (EPA reg #: 241-426) and Polaris (EPA reg #: 228-534) are both registered for use in the State of Virginia (VA Product #s: 0008100169 and 0068300139, respectively). When used IAW their labeling, these herbicides pose minimal risks to people and the environment. These products both contain the active ingredient isopropylamine salt of imazapyr (2-[4,5-dihydro-4-methyl-4-(1 -methylethyl)-5-oxo-1 H-imidazol-2-yl-3-

pyridinecarboxylic acid). Habitat contains 28.7% while Polaris contains 27.7% of the imazapyr active ingredient. Labels for both recommend 4-6 pints per acre.

f. **Recommended Applicator Source.** The 757th Airlift Squadron cannot perform this aerial spray operation because the size and shape of the spray area does not lend itself to being sprayed with a large, fixed-winged aircraft such as the C-130. Helicopters are more suitable for this type of aerial application. Therefore, contracted helicopter pesticide application services must be acquired. The preferred applicator is Helicopter Applicators, Inc., 1670 York Road, Gettysburg, PA 17325. This firm uses a Bell OII58A (or alternative), Bell206 BII, Bell 206 L3 or Bell OH58A (+) helicopter, holds a valid Virginia Pesticide Business License and valid Virginia Pesticide Applicator Certificate for Category 11.

3. **Other Information**

a. **Possibility of Damage to Beneficial Plants and Animals:** All pesticides used in the United States must be registered by the Environmental Protection Agency (EPA). EPA registration assures that pesticides are properly labeled and, if used IAW label specifications, the pesticides will not cause unreasonable harm to people or the environment.

A detailed discussion of environmental factors are included in the environmental assessment (EA) and supplemental EA written for this project.

b. **Threatened and Endangered Species:** Six threatened and 14 endangered species live within a 50-mile radius of Fort Eustis. Bald Eagle (*Haliaeetus leucocephalus)* nests are located on Mulberry Island on Fort Eustis. All environmentally sensitive areas will be identified on the spray map prior to any spray mission and only sprayed if proper approval is obtained.

Because US Environmental Protection Agency rulings may prohibit the use of certain pesticides within the range of critical habitat of certain endangered species, the project's information was entered into the USFWS's Information, Planning, and Conservation System. Only two threatened and endangered species were flagged for Ft Eustis: (1) sensitive joint-vetch and (2) the bald eagle. The plant, sensitive joint-vetch, does not occur on Ft Eustis therefore, no precautions are necessary to protect this plant. However, to protect the bald eagles, other actions, such as buffer zones and not spraying during breeding season, will be taken to protect the bald eagles.

In a memo dated 21 Aug 2012, the National Oceanic and Atmospheric Administration (NOAA) stated that if used IAW label directions, the use of both, glyphosate and imazapyr, "were not likely to affect" listed species. Additionally, in a memo dated 30 Aug 2012 the Virginia Department of Environmental Quality agreed with NOAA's assessment for the Atlantic sturgeon and added that they did not anticipate adverse impacts to the bald eagle or the Anadromous fish areas. In the same memo, the Virginia

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Department of Conservation and Recreation stated that the activity would "not affect any documented state-listed plants or insects" and the Virginia Department of Agriculture and Consumer Services concurred.

c. **Installation and Public Notifications:** If an aerial spray project is scheduled, the Public Affairs Office will disseminate information to base personnel concerning the proposed times of application, areas to be sprayed, the presence of low-flying aircraft, the relatively harmless properties of the pesticide to non-target plants and vertebrate animals, and property.

d. **Air Traffic Control Notification:** The 757th Airlift Squadron cannot perform this aerial spray project due to the size and shape of the spray area. Therefore, contracted services must be acquired. The contractor must properly coordinate with local air traffic control personnel and base operations must also be arranged to ensure safety. Contract applicators will need to obtain DoD clearance to treat areas on Fort Eustis, particularly in consideration of ongoing military flight operations. DoD clearance can be facilitated through the 733rd Mission Support Group. The following forms must be used if necessary:

- DD Form 2400 **Civil Aircraft Certificate of Insurance**
  http://www.dtic.mil/whs/directives/infomgt/forms/eforms/dd2400.pdf
- DD Form 2402 **Civil Aircraft Hold Harmless Agreement**
  http://www.dtic.mil/whs/directives/infomgt/forms/eforms/dd2402.pdf

Steve B. Robertson

STEVEN B. ROBERTSON
Command Entomologist

18 June 2014

Attachments:
1. Proposed Treatment Area Map – Fort Eustis
2. 2004 Environmental Assessment (EA) and FONSI
3. 2012 Supplemental EA and FONSI
4. Habitat Label
5. Habitat MSDS
6. Polaris Label
7. Polaris MSDS

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APPENDIX G:

IPMP Implementation Plan

IMPLEMENTATION PLAN

1. Integrated Pest Management Program Responsibility. The 733d Civil Engineer Division, Environmental Element (Conservation Branch) has overall responsibility for the Integrated Pest Management Program. A staff member from this organization is assigned the duties of Installation Pest Management Coordinator (IPMC). The duties of the IPMC include directing and managing the operations needed to accomplish all pest management issues affecting the Fort Eustis mission. These duties specifically include overall integrated pest management program oversight, prepares and implements the Fort Eustis Integrated Pest Management Plan, directs priorities for pest control, approves all pesticides used on the installation, invasive species management, pest identification, maintaining all pest management records and pesticide inventory, supporting arthropod disease vector surveillance, aerial pesticide spray planning and coordination, quarantine oversight, coordinating fumigation work, forest pest management, and technical and regulatory information and guidance.

2. Arthropod disease vector surveillance. The JBLE-E Department of Public Health (within McDonald Army Health) is responsible for surveillance of arthropods capable of transmitting disease. The Department of Public Health Environmental Health Officer and the IPMC share information and coordinate control activities.

3. Base Operations Support – Pest Control Functional Area. The 733d Civil Engineer Division oversees the Base Operations Support (BOS) contract that includes pest control services. The pest control services portion of the BOS contract is staffed with two (2) pest control contractors to complete all required pest control services described in the contract. The implementation plan provides guidance for establishing mission priorities and maximizes the use of available resources. This plan provides approximate manpower needed for each mission/task. Furthermore, this plan ensures efforts are directed towards required higher priority pest control missions.

A. Base Operations Support – Pest Control Functional Area time. With the contract work force a total of 320 hours per month is available for the entire pest mission. However, 25% of available time or 80 hours per month is required for Pest Control Shop operations such as record-keeping, equipment maintenance, and personnel hygiene. This results in 240 hours available for direct pest control services.

B. Because pests are dynamic biological systems subject to a wide range of variability, pest populations may or may not be in sufficient numbers to justify pest control services. For planning purposes, an additional 36 hours may be required a 15% variability factor or 36 hours is added to the 240 hours to provide 276 hours targeted for direct pest control services. However, actual hours of pest control services shall not

exceed 320 hours per month unless manpower constraints are reduced. Work efforts shall ensure higher priority pest control services are performed as needed.

C. Approximately two/thirds of the available hours in the implementation plan are programmed. Programming pest control services instead of waiting for service orders ensures higher priority pest problems are controlled when pests are immature and are more effectively controlled using less manpower and pesticide. Waiting on calls often results in pest control efforts being performed with a shortage of manpower, to control a mature pest population that may or may not be controlled using pesticides. Usually a mature pest population requires substantially higher rates of pesticide usage, usually twice the rates required for control of immature pests.

D. In addition to determining manpower requirements, this implementation plan provides guidance for determining which pesticide and quantities are required for planned/ coordinated pest control missions/tasks.

E. All BOS pest control contract work is reimbursable. This Implementation Plan allows major installation activities with reimbursable accounts to review their pest management requirements/needs. Work orders can be developed that accurately reflect manpower and material (pesticide) requirements. Currently only 30 percent of the direct pest control mission is covered by work orders, the remaining 70 percent is developed by service orders. However, service orders alone do not provide adequate funding for materials and equipment, nor do they ensure manpower is directed to higher priority missions. Without work orders it is difficult to manage manpower and resources to provide maximum benefit to the entire installation. Service orders are extremely valuable when used to manage resources provided by work orders.

F. If the Pest Control Shop cannot meet the needs of each activity, possibly other arrangements, such as augmentation contracts for pest control services, may be needed. Any contracts must be reviewed and approved by Installation Pest Management Coordinator.

3. Other pest control work. As discussed, there are other pest control contracts and some work performed by DOD certified personnel. These contracts and other work include:

A. New construction requiring termite control. The US Army Corps of Engineers contract termite (and possibly weed control for new landscaping for new construction) for new construction at Fort Eustis. These contracts are reviewed and approved by the IPMC. The contractor shall adhere to this Plan when applying pesticides to include submitting pesticide use reports contained herein.

B. Rail line vegetation control. CED oversees a contract to manage the rail line on the installation. This includes control of vegetation that impacts rail operations. The contractor shall adhere to this Plan.

C. Grounds maintenance contract. A grounds maintenance contract established by 633 Air Base Wing Contracting Office to perform right of way and turf pest control. Pest control of weeds and other vegetation associated with parking lots, fence lines, and roads is the extent of this contract. The contractor shall adhere to this Plan.

D. Contracts for control of invasive/undesirable vegetation. The Natural Resources & IPM Branch of the CED Environmental Element is responsible for natural resources management. Natural resources management includes management of invasive species (plant and animal). The Natural Resources & IPM Branch Chief (installation natural resources manager) occasionally contracts projects to support management of invasive species and improve habitats that may require use of pesticides (such as herbicides against invasive or undesirable vegetation that impact habitats) and other techniques. Personnel applying the pesticides must be certified to operate in Virginia and be fully certified by VDACS. All such projects are coordinated with the IPMC.

E. Pest control work and contracts utilized by other tenant organizations. Several tenant organizations entered into Support Agreements (SA) with Fort Eustis that requires the tenant organization to comply with installation policies. Such installation policies include complying with the Fort Eustis Integrated Pest Management Plan. In such cases tenant organizations obtain pest control services from external sources. In so doing the tenant organization obtains approval from the Fort Eustis IPMC of all pest control contracts prior to execution and provides the following documents to the IPMC prior to execution:

- Virginia Pesticide Business License
- Certification of insurance liability for pesticide use
- VDACS pesticide applicator certifications for all who apply pesticides on Fort Eustis
- Copy of the contract involving pest control
- Copies of labels and SDS for all proposed pesticides to be used

The tenant organization ensures applicators submit a JBLE Pesticide Application Record Report for each application to the IPMC within 5 working days. Tenant organizations obtain approval for all pesticides intended to be used at Fort Eustis from the IPMC prior to use. It is the responsibility of tenant organizations to keep the IPMC informed of updates or changes in contract pest control work. Tenant organizations obtain pest control services only when a known or suspected pest condition exists; tenant organizations shall NOT obtain services involving preventive spraying. All wildlife issues shall be addressed to the Environmental Element Natural Resources & IPM Branch staff or 733 SFS game warden.

F. Pest control at the Pines Golf Course. All pest control work performed at the Pines Golf Course must comply with the provisions of the Fort Eustis Integrated Pest Management Plan.

4. Additional implementation requirements.

A. Violations. Any violation of this Plan, DODI 4150.07, AFMAN 32-1053 or any federal or state law/regulation pertaining to pesticide applications shall be reported immediately to the IPMC. Any action where illegal or improper discharge of pesticides occurs shall immediately cease actions. Violations of federal or state law shall be conveyed immediately to an appropriate supervisor who will immediately notify the IPMC.

B. Informing the installation community. Environmental Element staff or the IPMC shall utilize various forums and media as opportunities to inform the Fort Eustis community regarding pests and the issues and risks they pose, ways of reducing the need for pest control, aerial applications and other topics. Forums include but are not necessarily limited to notices through the Installation Operations Center, articles in the Warrior, the Command Channel; the Environmental, Safety and Occupational Health Council and the Activity Environmental Management (AEM) training.

C. Access to the IPMP. The IPMP and annual reviews are posted to the CED public drive (P drive). Operations Flight, Engineering Flight, Fire & Emergency Services and Installation Management Flight are notified when the plan is posted. The IPMP and annual reviews are also posted to the JBLE website and thus immediately available to the BOS contractor, The Pines Golf Course manager/maintenance superintendent, Environmental Element (CED), JBLE-E Department of Public Health, AFCEC, and the installation community.

APPENDIX H:

Pre-Fire Plan for Pesticide Storage Buildings

MEMORANDUM FOR Chief of Fire and Emergency Services, CED

SUBJECT: Pre-Fire Plan for Pesticide Storage Buildings

1. Large quantities of pesticides are stored on JBLE, Fort Eustis. There are three authorized locations on the installation which are:

- Civil Engineer Division Pest Control Shop, Building 1422
- the Pines Golf Course Pesticide Storage/Mixing Facility, Building 3515
- Army and Air Force Exchange Service (AAFES) Home and Garden Supply area, Building 1386

2. A fire in one of these pesticide storage buildings could increase the health hazards associated with toxic smoke and absorption of toxic material through the skin and have increased potential for explosions.

3. Request your activity perform inspections of these facilities and include these buildings as pesticide storage facilities in your pre-fire plans.

4. Copies of pesticide inventories will be provided to you monthly and copies of material safety data sheets are retained by the Installation Pest Management Coordinator at BLDG 1409.

5. Recommend the Emergency Room staff be advised of pesticides normally applied on Fort Eustis. In event of an accidental pesticide poisoning, they can quickly recognize pesticide poisoning signs and symptoms, and can provide speedy treatment.

6. For further assistance contact Tim Christensen, Installation Pest Management Coordinator, 878-4231 (OFFICE) and 757-880-6111 (CELL).

TIMOTHY P. CHRISTENSEN
Installation Pest Management Coordinator

APPENDIX I:

Notification of Pesticide Usage and Potential Pesticide Poisoning

MEMORANDUM FOR Chief of Fire and Emergency Services, CED

SUBJECT: Notification of Pesticide Usage and Potential Pesticide Poisoning

1. The pesticide applicators from the CED Pest Control Shop and The Pines Golf Course routinely apply pesticides on Fort Eustis. Although these personnel take normal protective precautions such as the wear of respirators, protective clothing, goggles, gloves, etc., potential pesticide poisoning could occur. This notification is given so that your activity can be prepared to render appropriate medical treatment in the event of a pesticide poisoning incident.

2. Possible modes of poisoning include absorption through the skin, inhalation and/or ingestion.

3. Large quantities of pesticides are stored on JBLE, Fort Eustis. Three authorized locations exist on the installation which are:

- Civil Engineer Division Pest Control Shop, Building 1422
- The Pines Golf Course Pesticide Storage/Mixing Facility, Building 3515
- Army and Air Force Exchange Service (AAFES) Home and Garden Supply area, Building 1386

4. Copies of material safety data sheets are retained by the Installation Pest Management Coordinator at BLDG 1409.

5. For further assistance contact Tim Christensen, Installation Pest Management Coordinator, 878-4231 (OFFICE) and 757-880-6111 (CELL).

TIMOTHY P. CHRISTENSEN
Installation Pest Management Coordinator

APPENDIX J:

JBLE Pesticide Application Record Report

JBLE Pesticide Application Record Report

Description/Location of Area Treated:

Day/Month/Year of Application:

Applicator Name, Certified Applicator #, Certified Categories, License Expiration Date:

Business/Business License #:

Name/Address/Phone # of Customer:

Pesticide Product Used (include active ingredients and EPA REG #):

Target Pest(s) to be controlled by this application:

Basis for pesticide application (include date of inspection warranting pesticide use):

Amount of pesticide product concentrate used (include appropriate unit, ie, gallons, etc.):

Amount of diluent used (by weight or volume), in mixture applied (include appropriate unit, i.e., gallons, etc.):

Total Pounds of Active Ingredient (AI) applied this application:

Hours spent applying pesticide for this application:

Type of application equipment used:

Physical/Non-Chemical removal techniques and hours spent:

Submit information within 5 working days of pesticide application to (via hardcopy or email):

Timothy P. Christensen
IPMC
Environmental Element
Civil Engineer Division
733d Mission Support Group
1407 Washington Blvd
Joint Base Langley Eustis
Fort Eustis, VA 23604
Timothy.p.christensen.civ@mail.mil
757-880-6111 (cell)

APPENDIX K:

Pest Management References

Pest Management References

1. Federal and State Laws, Regulations and Executive Orders.

   A. Federal Insecticide, Fungicide and Rodenticide Act of 1972 (FIFRA).
   http://www.epa.gov/oecaagct/lfra.html.

   B. Clean Water Act (CWA).
   http://www2.epa.gov/laws-regulations/summary-clean-water-act

   C. Clean Air Act/ Clean Air Act Amendments (CAA/CAAA).
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APPENDIX L:

Pest Survey Procedures

Pest Survey Procedures.

1. General. IPM uses a set of principles that employs the best approach towards resolving the effects of pest organisms. These principles include first identifying whether a pest(s) does in fact exist. Once this is ascertained other factors including (but not necessarily limited to) the biology of the pest organism(s) and the environmental conditions are evaluated towards the appropriate control technique to be employed.

2. Each situation will be evaluated by conducting and documenting a pest survey. This involves thoroughly inspecting the site, identifying the presence or absence of pests and if a pest is identified, determine the extent of the problem.

3. All surveys will be completed as a written document and retained with each respective pest control activity (BOS pest control contractor, Pines Golf Course maintenance superintendent, Conservation Branch, Environmental Element/IPMC, CED grounds maintenance contract COR and CED rail line maintenance contract COR). The following survey will be a written document that includes the following information at a minimum using the inspection form below:

A. Location.
B. Date, start time and finish time of survey.
C. Person and contact information performing the survey.
D. Issue/pest condition addressed by customer.
E. Description of the affected area/facilities.
F. Sampling method.
G. Pest(s) identified (or absence of any pests) and numbers observed.
H. Special/additional comments.
I. Proposed course of action/control technique.
J. Recommendations to customer to reduce or eliminate further pest control.

Pest Survey/Inspection Form

Service Order No.: _____

LOCATION: _____ BLDG #: _____

Facility Type: Billets Office Child Care Club Dining facility
Medical facility School Training Area No. _____ MOUT
UOS

Other: _____

POC/Contact Info: _____

Exterior: Dumpster/Refuse Containers Clean: ____ Drain plug: ____ No. _____
Tight-fitting lids: _____ Doors/lids open: _____ Doors/lids good repair_____
Plastic bags used:_____ Plastic bags sealed: _____
Trash/clutter around the bldg: _____
Vegetation around bldg (tall grass, etc): _____

Exclusion: Screens: _____ Windows: _____ Doors: _____ Bay Doors: _____ Fans/vents: ____
Good repair/functional:
_____

Closed or remain open frequently? _____

Air curtain: _____ (Operational/functional? _____)

Gap under doors? _____

Holes in pipes, doors, bldg structure: _____

_____

Sanitation (interior): Excellent Good Fair Poor
Food debris

Food residue/grease on walls/counters/surfaces: _____
Rodent-proof containers used: _____
Trash cans with lids: _____ Properly disposed: _____
Food left out overnight: _____
Cluttered store room: _____
Trash under shelves: _____

Harborage: Holes in walls: _____ Holes around pipes: _____ Cracks:_____ Crevices: _____
Salad bar: _____ Bar: _____ Bathroom: _____ Sinks: _____ Food prep areas: _____
Stove/oven: _____ Equipment: _____ Crawl space: _____ Ceiling/attic: _____

Survey method: Visual: _____ Flashlight: _____ Traps: _____ Aerosol: _____

Pest(s) identified as:
_____

How identified: Live/Dead Specimen(s): _____ No. observed_____ Fecal droppings: _____

Damage:
_____
__

Egg cases/mass: _____ Burrows: _____ Gnaw marks: _____ Rub marks: _____

Location of Pest:
_____

Recommendation:
_____

Pines Golf Course greens/fairway damage:
_____
_____

Rail line maintenance:

Vegetation within 15-foot rail line YES NO

Estimated distance of rail line affected by vegetation: _____

Invasive vegetation management:

Species present: _____

Location (Training Area, road intersection, landfill, etc):
_____

Estimated affected acreage:
_____
_____
_____

Inspector(s): Date: Start: End:

APPENDIX M:

Integrated Vector Management

Integrated Vector Management

1. General. Integrated Vector Management (IVM) consists of integrating various techniques to identify, monitor and manage disease vectoring arthropods. Ticks and mosquitoes comprise those arthropods capable of transmitting pathogens that cause disease in humans on Fort Eustis.

2. Tick and mosquito management is divided into two annexes:

Annex M-1: Tick Management
Annex M-2: Mosquito Management

3. Annex M-3 discusses a form to use when conducting tick surveillance.

ANNEX M-1: Tick Management Plan

1. General. Ticks are arthropods that constitute the most important disease vector arthropods on the installation. This group is found in a number of natural areas but can be brought inside buildings/work areas by personnel who enter tick habitats. All life stages (adults, nymphs and larvae) and both genders parasitize vertebrate hosts and are capable of transmitting disease pathogens. Most ticks are active in spring through summer and early fall especially during warm weather. They can also become active in winter when temperatures remain above freezing. Unlike mosquitoes and other biting flies, ticks cannot fly and must come in contact with exposed skin in order to attach and feed. Attachment/feeding typically lasts several hours to days before ticks become engorged and drop off. The Department of Public Health (formerly Preventive Medicine) began collecting ticks from personnel and analyzing for selected pathogens at least since 1998. In 2007, the Environmental Element initiated a Tick and Tick-borne Disease Threat Assessment to monitor tick species and vectored pathogens from the field environment to help augment the Department of Public Health (DPH) work. This assessment continues annually pending availability of resources.

2. Tick species. All ticks documented on Fort Eustis are of the order Acari and the family Ixodidae. Ixodidae are often referred to as “hard ticks”. At the time of this Plan revision, no members of the family Agarsidae (often referred to as “soft ticks”) have been documented on the installation. The following hard ticks have been documented on Fort Eustis to date:

- *Ixodes scapularis* (Deer/black-legged tick)
- *Amblyomma americanum* (Lone Star tick)
- *Dermacentor variabilis* (Dog tick)
- *Amblyomma maculatum* (Gulf Coast tick)
- *Ixodes affinis* (No common name)
- *Haemaphysalis leporispalustris* (Rabbit tick)
- *Rhipicephalus sanguineus* (Brown Dog Tick).
- *Ixodes rugosus* (no confirmed common name)

3. Vectored pathogens. The following pathogens vectored by ticks have been documented in ticks and wildlife samples collected from the installation (all are considered pathogenic to humans):

- *Babesia microti* (Human Babesiosis)
- *Babesia canis* (Canine Babesiosis)
- *Borrelia burgdorferi* (Human Lyme Disease)
- *Borrelia lonestari* (Southern Tick Associated Rash Illness)
- *Borrelia miyamotoi* (Borrelia Miyamotoi Disease)
- *Ehrlichia chaffeensis* (Human Monocytic Ehrlichiosis)
- *Ehrlichia ewingii* (Canine Granulocytic Ehrlichiosis)

- *Anaplasma phagocytophilium* (Human Granulocytic Anaplasmosis)
- *Rickettsia parkeri* (Tidewater Spotted Fever)

4. Management of tick-borne diseases.

A. Integrated approach. Management of ticks and tick-borne disease risks at Fort Eustis follows an integrated approach similarly for any pest management program. Landscape management and use of personal protection measures constitute the preventive measures that are implemented by installation organizations and individuals and do so to reduce the need for pesticides.

B. Continued surveillance. Fort Eustis follows an ecosystem approach for tick and tick-borne disease surveillance. Surveillance consists of two activities. The JBLE-E DPH obtains ticks found associated with people. CED collects ticks from the natural environment as well as biological samples from wildlife.

(1) CED Tick & Tick-borne Disease Threat Assessment. The Environmental Element staff initiated a Tick and Tick-borne Disease Threat Assessment in 2007. Between 2007 and 2019, the Environmental Element staff with assistance from the USAPHC surveyed for ticks in their natural habitats as well as wildlife reservoir and host species. This program continues annually pending manpower and funding resources. Additionally, the BOS pest shop conducts tick surveys of selected areas between April and October.

(2) DPH, MAHC tick collection program. The DPH collects tick specimens found on personnel or in proximity to working or living areas. Installation community members bring ticks to Department of Public Health (BLDG 2792A) or MAHC clinic staff provides ticks removed from patients to DPH. DPH submits tick specimens to USAPHC using the Tick Test Kits. The identification and pathogen analysis is sent back to DPH. Personnel diagnosed with a tick-borne disease that may have been contracted from an infected tick on Fort Eustis are encouraged to report this to the DPH, MAHC. This provides information to pest control and community health specialists in determining risks and implementing control methods.

(3) The BOS contractor performs tick surveillance monthly from 1 April through 31 October at locations selected by the IPMC. BOS Pest Control staff provide tick specimens to the IPMC following tick surveys based on service orders.

(4) Surveys are performed using tick drags, flags, walking or via carbon dioxide traps. This typically occurs between April and October. Pathogen analysis focuses on those pathogens listed in section 3 above; however, other pathogens are considered based on changes in distribution of tick species or pathogen biology.

(5) A biting arthropod survey form is provided to units by Range Control when reserving training areas to describe any tick (or other biting arthropod) issues experienced. Forms are returned to Range Control who submits completed forms back CED. Similar forms were designed for the installation golf course and recreational hunters.

C. Control of ticks.

(1) General. When areas are known or suspected to contain ticks in close proximity to work sites personnel shall request pest control support via a service order through the CED Help Desk. Pest control staff shall visit the affected site(s) and a perform survey(s) to determine if ticks exist. Depending on the outcome of the surveys, the weather conditions and the planned use of the affected area, pest control staff determine the best course of action.

(2) Responsibilities.

(a) IPMC. The IPMC oversees the tick management program and the Tick and Tick-borne Disease Threat Assessment. The IPMC identifies tick species, coordinates information and directs control measures.

(b) BOS Pest Control Contractor. Performs tick surveys based on the BOS contract. Monthly surveys between 1 April and 31 October are performed for the MWR Dog Park, Magnolia Park, the forest edge adjacent to buildings 925, 926 and 1102; firing lines at Ranges 2 and 3, and the forest edge along the fence line of building 899 (working military dog kennels).Surveys are conducted using the Tick Drag and Walk Data Sheet noted below. The contractor provides a recommendation and consults with the IPMC.

(3) Control techniques. Management of ticks is a major challenge based on their biology. No single control technique eliminates ticks from the installation.

(a) Education. Educating the installation community is the primary control technique. Education occurs via various forums and documents. Examples of existing or possible future opportunities include (but are not limited to):

- Including insight on ticks during the Advanced Environmental Management (AEM) training.
- Including insight on ticks during Advanced Marine Warrant Officer courses.
- Presentations and displays including tick information at annual Earth Day events to include for privatized housing residents.
- Inclusion during Clean the Bay Day safety briefings.
- Tick and tick-borne disease presentations and displays were provided by IPMC for tenant organizations as part of the units' annual safety week events.

- Tick information presented by IPMC to military personnel attending DPH Field Sanitation courses.
- Information brochure entitled “Natural Resources, Wildlife & IPM” that includes discussion on ticks that are distributed during Earth Day events, AEM training, training area scheduling, Newcomers Orientation, all other events as well as at the Environmental Element main office and Natural Resources building.
- Tick awareness documents posted on the JBLE-E website.
- Various forums/meetings such as ESOH Council meetings.
- JBLE-E Integrated Natural Resources Management Plan (INRMP) and the Integrated Pest Management Plan (IPMP) are cross-referenced and revisions are staffed with tenant activities. Completed plans are posted to the installation website and include discussions about ticks and tick-borne diseases at the installation.
- Advise recreational hunters during hunter councils or through the iSportsman program to inspect harvested wildlife (particularly deer, wild turkey, and rabbits) for ticks and remove them prior to placing in vehicles or taking carcasses home.

(b) Avoidance. Members of the installation community, contractors and visitors should avoid tick habitat whenever possible. Entering habitat that may contain ticks should occur only when necessary and while utilizing appropriate personal protective measures. Remain on the trail when using the Fort Eustis Nature Trail. Warning signage has been proposed for the entrances of the Fort Eustis Nature Trail and training areas and is pending availability of funding. The installation community as a whole should avoid feeding wildlife and feral domestic cats as this increases risks of ticks occurring near or gaining entrance to buildings.

(c) Personal protection measures. Use of personal protective clothing is the most effective technique. Personnel should follow these attire/procedure guidelines when entering tick habitat.

- Wear white/light colored clothing in the form of long pants and long-sleeve shirts that are bloused in boots or socks to prevent these arthropods from crawling underneath clothing. The effectiveness is greatly enhanced when clothing is treated with permethrin and taping around sock/boot – pant interface. Allow treated clothing to dry before wearing.
- DEET can also be sprayed on clothing as well as exposed skin in accordance with respective product’s label.
- Check clothing and do a full body check for ticks periodically while in tick habitat, before entering vehicles, and before entering work areas or home. Use the buddy system if possible. Use masking tape or adhesive lint rollers to remove ticks crawling on clothing. Place clothing in sealed plastic bags until washing or place in dryer at high temperature. Shower as soon as possible upon returning indoors.

- For military uniforms, keep sleeves rolled down and blouse pant legs in socks/boots. Wear an undershirt underneath the coat and tuck the undershirt into the pants.

(d) Habitat manipulation. Selected areas are mowed routinely via the grounds maintenance contract to keep grass cut short and reduce overgrowth of vegetation that would create conditions favorable to ticks. Keep areas around buildings or bivouac areas in state of police. Remove debris or unnecessary vegetation from these areas. Reduce leaf litter around buildings or work areas. Avoid landscape design or planting with low-lying ground cover vegetation around buildings. In some cases terrestrial invasive vegetation is controlled to improve habitats. This contributes to reducing thick stands that could contribute to maintaining tick populations. Prescription fires exist as a possible tool but are primarily not used many habitats cannot be burned for various reasons, results would be temporary, and some components of the literature suggests that prescription fires may actually contribute to tick populations. Furthermore, fires would not affect those ticks attached to hosts and current Air Force policy precludes installation flexibility in conducting prescription fires. Remove materials that attract rodents away from buildings/work areas. This includes but is not necessarily limited to bird feeders, pet food, miscellaneous debris that may serve as refugia or food sources, woody debris, woodpiles and stacked firewood.

(e) Close/seal openings around buildings, sheds, storage containers and dumpsters to reduce harborage for small mammals.

(f) Keep playground equipment/areas away from forest edges or adjacent areas containing tall grass and establish a minimum 3-foot cleared area between these areas. These cleared areas could consist of mulch, stone, pavers, routinely mowed grass to short height, etc.

(g) Deer management. White tail deer are common on JBLE-E and serve as hosts for certain tick species. Deer population control is necessary for several reasons including preventing habitat damage from overbrowse, reducing vehicular accidents and maintaining an appropriate biological carrying capacity. A recreational hunting program exists, and this can be augmented with managed hunts.

(h) Exclusion. Use of bed nets elevated from the ground when bivouacking reduces contact with ticks.

(i) Do not bring pets into work areas. Do not take pets into training areas or areas containing tick habitat. Do not allow domestic dogs or cats to roam freely.

(j) Application of pesticides. Use of pesticides remain as a control technique but is the least effective control method. Ticks occur across large areas of the installation. This makes large-scale pesticide applications cost-prohibitive, temporary and would not contribute to controlling ticks attached to hosts. Small-scale treatments are feasible for activities or events occurring in tick habitat pending various conditions.

ANNEX M-2: Mosquito Management Plan

1. General. Mosquitoes constitute one the major nuisance and potential health risks at Fort Eustis. The geographical location contains natural breeding areas for this insect group. Implementation of control techniques that are part of the overall management program is accomplished based on surveillance. Preventive spraying is unauthorized.

2. Management program. Mosquito management involves two types of surveillance activities which dictates the control techniques implemented. These surveillance consist of:

- Number of female mosquitoes, and
- Mosquito species inventory.

3. Responsibilities.

A. CED/IPMC.

(1) The IPMC has overall responsibility for the mosquito management program and directs the BOS contract Pest Control Shop as well as coordinating aerial treatments in accordance with installation policy.

(2) Reviews and assesses weekly adult female mosquito counts and informs the chain of command of the assessment.

(3) Recommends when aerial treatments are needed. This occurs when 45 female mosquitoes are collected per trap per night and ground treatments are not sufficient or when human health risk is increased based on local or regional surveillance.

(4) Conducts mosquito breeding site surveys and mosquito species inventories by collecting 4th instar larvae from selected locations based on rain events or other conditions from May 15-October 30 annually. Identifies to genera or species.

(5) Advises and assists Department of Public Health with adult mosquito species inventories and mosquito biology.

(6) Reports mosquito species inventory results to Department of Public Health.

(7) Provides instruction or advice on preventing mosquito breeding to privatized housing or other garrison operations such as (but not limited to) Earth Day events, unit health and safety forums, field sanitation classes, Activity Environmental Management (AEM) classes, and upon request by installation activities.

B. BOS Pest Control Contractor.

(1) Adult Mosquito Surveillance. Performs weekly mosquito surveillance and forwards the results of the surveillance to the IPMC in accordance with the following procedures.

(a) Maintains five adult mosquito dry ice/light trap sites by ensuring the trap contains dry ice and light fixtures are functioning properly. Monitoring begins with the installment of traps on 1 April. Monitoring continues weekly and ends with the removal of the traps on 31 October.

(b) The Contractor places traps at the following locations: Magnolia Park (vicinity 3d Port), MWR horse stables, Range 3, Pines Golf Course maintenance facility and the Child Development Center at building 1140. Some variations may occur as needed.

(c) The Contractor collects mosquito specimens from each trap on Tuesdays and Thursdays. The Contractor reports the number of female mosquitoes collected from each trap on each day to the IPMC no later than the following work day.

(2) Adult Mosquito Control. Based on the weekly adult female mosquito counts noted above, control techniques are performed in accordance with the following action thresholds:

- 15 females per trap night = Resting Site Barrier Treatment
- 25 females per trap night = Area Fogging 2-3 times per week
- 35 females per trap night = Implement increased ground operations.
- 45 females (or more) in all traps = aerial treatment operations.
- Presence of any human health risk = Any or all of the above mentioned action thresholds

(3) Mosquito Larvae Surveillance.

(a) Conducts weekly larvae surveys from 15 May – 31 October.

(b) Locations include permanent wetlands, drainage ditches, vehicular – generated ruts, pond along Lee Boulevard adjacent to Magnolia Park/3d Port, and the Obstacle Course (Training Area 8).

(c) Based on B(3)(b) above, priorities for larvae surveillance should include:

- Training Area 8 (Obstacle Course) tires and low lying areas containing water.
- Pond along Lee Boulevard (vicinity of 3d Port adjacent to Magnolia Park).
- Drainage ditches/storm retention ponds when stagnant water remains.
- Ponds lacking aerators or ponds if the aerator malfunction.
- Roadside ruts or low areas retain water in the general vicinity of the horse stables.

(4) Mosquito Larvae Control. Perform larvae control throughout the 15 May-31 October period based on consultation with the IPMC.

(5) Report any mosquito breeding sites to the IPMC that can be reduced or eliminated.

C. Department of Public Health (DPH), MAHC.

(1) Overall responsible for arthropod disease vector surveillance.

(2) Conducts adult mosquitoes in accordance with protocols established by the US Army Public Health Command (USAPHC).

(3) Collects adult mosquitoes and submits to USAPHC for species identification and laboratory analysis for the following mosquito-borne pathogens:

- Eastern equine encephalitis virus (EEE)
- West Nile virus (WNV)
- Saint Louis encephalitis virus (SLE)

(4) Includes other mosquito species/pathogens based on DOD policy.

(5) Obtains equipment and supplies needed to meet surveillance requirements.

(6) Reports mosquito genus/species and pathogen analysis results to Installation Pest Management Coordinator.

D. Commanders and Directors, tenant activities. All tenant activities shall ensure that their organizations and related activities do not create conditions that serve as mosquito breeding sites. This can be accomplished by preventing creation of depressions in the ground and artificial containers that would otherwise fill with rainwater. Examples include but are not necessarily limited to:

- Abandoned tires
- Abandoned buckets or other similar containers (that retain rain water).
- Bird baths
- Other debris or conditions that may collect precipitation

3. Surveillance Methods and Materials.

A. Materials. The following equipment and supplies are used.

- BG-Sentinel Mosquito Traps (*Aedes* mosquitoes).
- BG-Lure. This lure is supplied with the BG-Sentinel traps having a duration of 5 months.
- Octenol Lure. Used to augment the BG-Lure and having a duration of 2 months.
- Carbon dioxide gas or dry ice. Carbon dioxide is used to replicate human carbon dioxide emission to augment lures or overall improve capture of mosquito species.
- Gravid traps (*Culex* mosquitoes).
- Petri dishes for specimen shipping.
- Shipping boxes for specimens.
- Fabricated covers to protect traps from weather (stakes, tarp, etc).
- Black buckets with paint spatula to monitor for *Aedes* larvae.
- Insect aspirators. Hand-held or powered backpack aspirators to collect resting adults.
- Collection cassettes for aspirators.
- Bricks to secure traps.
- 12-volt batteries.
- Battery charger.
- Microscope.
- Dichotomous keys.
- Dipper.
- Whirl-Pak collection bags.

B. Methods.

(1) Surveillance duration. The objective is to begin trapping on/about 15 May and end on/about 31 October pending any directives or weather conditions.

(2) Adult mosquito trapping operations. Trapping is accomplished by combining the use of BG-Sentinel and gravid traps. This improves capture of the mosquito vectors for EEE, SLE and WNV. BG-Sentinel traps are placed in outdoor locations that avoid direct sunlight and wind, and must be set up to prevent effects of heavy rainfall. A total of 4 BG-Sentinel traps are deployed. The number of traps is based on available manpower to maintain traps and collect specimens. Locations chosen are based on potential breeding sites and proximity to people working outdoors but also to avoid potential vandalism or theft of traps. Gravid traps are also used to augment the BG-Sentinel traps. The following locations are used (though locations are subject to change):

- Magnolia Park.
- Child Development Center/BLDG 1102-1140 complex.
- Golf course maintenance area.
- MWR Campground.

(3) Frequency of BG-Sentinel trap operation and specimen collection. Traps are run 2 days per week for approximately 13 hours per day (approximately 0630-1930). Specimens are collected at the end of the day. Actual days will vary to avoid heavy rainfall or storm events that could damage the traps and specimens.

(4) Specimen preservation and shipping. Specimens are placed in a freezer until ready for shipping unless directed by USAPHC protocols. The objective is to ship specimens weekly.

4. Response plan.

A. Communication and coordination.

(1) Adult female mosquito counts. Installation-wide notifications are implemented by CED in cases where high mosquito counts exist and subsequent increased area fogging, increased ground operations or aerial treatments are needed.

(2) Mosquito-borne pathogens exceeding thresholds.

(a) MAHC convenes a meeting with 733 CED/IPMC as soon as practically possible upon receipt results exceeding thresholds.

(b) MAHC informs the 733d Mission Support Group Commander of the results and the control techniques 733 CED will implement immediately following this meeting.

(c) IPMC informs the Pest Management Professional at the Air Force Civil Engineer Center.

B. Materials and methods.

(1) 733 CED utilizes the pest control section of the BOS contract to conduct ground-based mosquito control. Control consists of the following sequence:

(a) Source reduction. 733 CED/BOS contract staff fill or eliminate depressions/non-permanent precipitation collection areas and abandoned artificial container breeding sites to the extent practical.

(b) Larviciding. Larvicides shall be used in breeding sites that cannot be eliminated.

(c) BOS contract pest control utilize EPA-registered, Virginia-approved and Air Force-approved pesticides for mosquito control when source reduction techniques (supported by exclusion techniques directed by MAHC staff) and larviciding have been exhausted. The contractor maintains an inventory of insecticides suitable for mosquito control. The insecticide inventory is a living document with products added or removed depending on efficacy, availability, or discontinuance. The IPMC obtains approval for additional insecticides in accordance with DODI 4150.07, AFI 32-1053 and the JBLE-E IPMP. The following insecticides currently exist in the inventory:

- Abate 5% Tire Treatment
- Zoecon Altosid XR Extended Residual Briquets
- Anvil 2 + 2 ULV
- CB-80 Extra
- FLIT 10 EC
- NyGuard IGR Concentrate

(d) The BOS contractor maintains and utilizes the following equipment for ground-based mosquito control (additional equipment will be added as resources and need is identified):

- Clarke Cougar ULV Fogger, truck-mounted, 15-GAL.
- Clarke Pesticide Applicator Equipment ULV fogger, truck-mounted, 35-GAL.
- Clarke Beeconomist Pro-Mist MP, truck-mounted, 5-GAL.
- Maruyama 50-GAL sprayer.
- LESCO 5-GAL Backpack Sprayers (quantity 3).
- Fog-Master Tri-Jet, electric, 1-GAL.
- Dyno-Fog Thermal Aerosol Applicator, gas-powered, 110-fl oz.
- Truck, ¾-ton, 4x4, Ford F150, 2013, open bed.
- All Terrain Vehicle, Kawasaki MULE 4010, 4X4 (quantity 2).

(e) BOS contract pest control staff utilize available equipment and pesticides to control mosquito populations using ground-based techniques. Techniques for adult mosquito control include resting site application and area fogging in accordance with the JBLE-E IPMP, respective pesticide labels, respective equipment and weather conditions.

(2) Aerial insecticide treatment. This technique is considered when the above techniques fail to significantly reduce mosquito populations. This technique is the last resort to be used.

ANNEX M-3: Tick Drag Form. This form is used when conducting tick drags or walks or can be modified for use of tick traps.

Tick Drag or Walk Data Sheet

Date: _____ Start time: _____ End time: _____

Study Site/Location:

_____

Weather Conditions: Sunny Partly Cloudy Overcast Rain Temperature:

Ground conditions: Wet Moist Dry

Note Species, Life Stage (Adult, Nymph, Larva) and Number of Each:

Walk 1 Random Coordinate: _____ Walk 5 Random Coordinate:_____

Species	Larvae	Nymphs	Adults	Species	Larvae	Nymphs	Adults
_____	____	____	____	_____	____	____	____
_____	____	____	____	_____	____	____	____
_____	____	____	____	_____	____	____	____
_____	____	____	____	_____	____	____	____

Total: _____ Total: _____

Walk 2 Random Coordinate: _____ Walk 6 Random Coordinate: _____

Species	Larvae	Nymphs	Adults	Species	Larvae	Nymphs	Adults
_____	____	____	____	_____	____	____	____
_____	____	____	____	_____	____	____	____
_____	____	____	____	_____	____	____	____
_____	____	____	____	_____	____	____	____

Total: _____ Total: _____

Walk 3 Random Coordinate: _____ Walk 7 Random Coordinate:_____

Species	Larvae	Nymphs	Adults	Species	Larvae	Nymphs	Adults
_____	____	____	____	_____	____	____	____
_____	____	____	____	_____	____	____	____
_____	____	____	____	_____	____	____	____
_____	____	____	____	_____	____	____	____

Total: _____ Total: _____

Walk 4 Random Coordinate: _____ Walk 8 Random Coordinate: _____

Species	Larvae	Nymphs	Adults	Species	Larvae	Nymphs	Adults
_____	____	____	____	_____	____	____	____
_____	____	____	____	_____	____	____	____
_____	____	____	____	_____	____	____	____
_____	____	____	____	_____	____	____	____

Total: _____ Total: _____

Comments/other observations:

APPENDIX N

Management of Other Biting Arthropods

1. General. Several other biting arthropods occur on the installation. Though not necessarily vectors of human disease, these arthropods can be biting nuisances that is disruptive to various operations.

2. Other biting arthropods. Other biting arthropods occurring on the installation include:

- Horse flies
- Deer flies
- Yellow flies
- "No-see-ums" (biting midges)
- Bed bugs

3. Additional arthropods considered but do not constitute a major biting nuisance issues.

A. Spiders. Many spider species occur on the installation. The current inventory of spider species is noted in Appendix Z. All spiders with the exception of one family (Uloboridae) have venom. However, only widow spiders (*Latrodectus* spp.) are the species of concern. They do not occur in large numbers and no confirmed bites have been documented. Brown recluse spiders are not native to Virginia and have never been documented on the installation. Regardless of any given species, spider bites in general are rare.

B. Centipedes. Centipedes represent another group of venomous arthropods capable of biting. Various centipede species occur primarily in moist forested areas of the installation. One species called the house centipede (*Scutigera coleoptrata*) may enter buildings on occasion. However, they are not aggressive and do not occur in large numbers. Bites are rare.

4. Management. Annexes N-1 and N-2 describe the management plan for other biting flies and bedbugs, respectively.

5. Annex N-3. Annex N-3 contains a biting arthropod survey form for military units and other personnel to record biting arthropod issues when using training areas and firing ranges. Units/personnel are requested to complete this form when reserving training areas/firing ranges through Range Control, ASA. Completed forms are returned to Range Control who forwards to the IPMC. These forms are recorded and evaluated to determine whether biting insects or ticks are particularly troublesome and what means of mitigation may be best.

ANNEX N-1: Other Biting Flies

Biting flies (Order Diptera) occurring at JBLE-E include mosquitoes, "no-see-ums", deer flies, yellow flies and horse flies. Mosquitoes are discussed in Appendix N (Annex N-2).

Most other biting flies occurring on the installation are not considered vectors of disease; however, they can be significant annoyances disrupting various outdoor activities including military training and recreation. Some members of the genus *Culicoides* may transmit the virus that causes Hemorrhagic Disease in deer. Deer flies may be capable of mechanically transmitting the pathogen that causes tularemia to people (this may be associated with infected rabbits or rodents).

Fly type	Other Common Names/	Taxonomy	Description	Approximate Activity Season	Habitat	Affected Activities
No-see-um	Biting midges	Ceratopogonidae: *Culicoides* spp.	Very tiny, barely visible to naked eye.	March-May	Larvae: muddy substrate, shorelines. Adults: near breeding sites but may disperse.	Any outdoor activity.
Deer fly	May flies	Tabanidae: *Chrysops* spp.	Similar to house fly.	April-June	Larvae: wet soil of wetlands, pond/stream. Adults: wide ranging	Outdoor military training, golf course, most outdoor activities.
Yellow fly	Yellow Fly of the Dismal Swamp, doctor fly	Tabanidae: *Diachlorus ferrugatus*	Similar to house fly but yellow color.	May-July	Larvae: moist, decaying matter in shaded areas. Adults: near breeding sites but may disperse.	Outdoor military training, golf course, most outdoor activities.
Horse fly	Greenheads,	Tabanidae: Tabaninae (5 genera, many species)	Large, robust body	June-October		Outdoor military training, golf course, most outdoor activities.

Management. Controlling biting flies is difficult and most techniques have limited effectiveness. The following combined techniques constitute management of biting flies on the installation.

1. Trapping.

A. Tabanidae (tabanid flies). Primary control technique involves deployment of biting fly traps in selected locations. Traps are deployed normally April – October at the following locations:

(1). Range 3.
(2). Selected areas of the golf course.
(3). Lakeside Club community pool.
(4). Magnolia Park.

B. No-see-ums. Light traps with a carbon dioxide contribute to capture but overall trapping for no-see-ums has limited contribution. A light trap with carbon dioxide is used at Magnolia Park captures some no-see-ums.

2. Personal protective measures. The effects of mosquitoes and the other biting flies noted above can be greatly mitigated by taking appropriate personal protective measures (PPM). Information on PPM is found in Appendix X.

3. Pesticide applications. Insecticide use against these flies is highly inefficient. Breeding sites remain unknown due to life cycle of the immature stages precluding larviciding. Adult dispersal behaviors limit the use of insecticides.

ANNEX N-2: Bed Bug Management

Bed bugs are small obligate blood feeding insects of which several species parasitize humans. The common bed bug (*Cimex lectularius*) is the typical species found throughout the United States and worldwide. Bed bugs are not associated with nor are the result of a lack of proper sanitation. They are typically acquired during travel or can be brought from one structure to another. More typically they are found in housing or lodging areas but can infest office areas.

Prevention and early detection of infestations are critical as these techniques reduce the impact on personnel, unit operations, and the amount of resources needed to deal with large infestations.

1. Responsibilities.

A. Unit commanders, directors, supervisors.

(1) Shall advise all subordinates to implement the following preventive measures:

- Use duffel bag-style luggage if possible when traveling. These types of luggage generally lack external surface irregularities (i.e., folds, buttons, flaps, etc.) in which bed bugs can hide.
- Pack and inspect luggage before leaving home and ensure it is not damaged.
- Keep clothing inside luggage while staying in lodging facilities.
- Place luggage on luggage stand after inspecting it.
- Keep clothing sealed (i.e., inside plastic bags) within luggage if possible.
- Avoid clutter in work areas, living areas and while TDY/on travel.
- Inspect clothing & luggage before departing TDY/training site.
- Inspect again before bringing luggage inside living or work areas.
- Place clothing in dryer upon return to living quarters.

(2) Shall ensure the following procedures occur if bed bugs are suspected or persons appear to sustain bites while residing in lodging facilities:

- Place specimens in a container and bring to the IPMC for identification (bring to CEIE either building 1409 or 1407).
- Place a service order by calling 878-HELP.
- Persons experiencing possible bed bug bites should contact MAHC.

B. CED/IPMC/BOS pest shop. Respond to service orders/complaints and take appropriate course of action to eliminate the situation.

2. Control. CED BOS pest control or IPMC responds to service orders regarding bed bug issues and implement the following procedures:

- Inspect the affected area/room.
- Inform occupants, unit leader or facility manager of the inspection outcome.
- Direct affected area personnel to remove clutter that may impede treatments.
- Inspect rooms adjacent to the affected room.
- Utilize all appropriate control measures to include directing appropriate insecticides into areas of harborage.
- Inform unit/facility manager of planned treatment and status of affected area following treatment.
- Conduct follow-up inspections no later than 14 days following initial treatment.

ANNEX N-3: Biting Arthropod Survey

JBLE – Fort Eustis Biting Insect Survey

1. Date(s): _____ Time: _____

2. What was your location today?
Training Area number _____
Other (i.e., nearest road/intersection, etc.):
_____

3. Did you encounter biting insects today? Circle one: Yes / No

If no…….you are finished with this survey – Thank you for your feedback

If yes, please continue with the survey to help us identify the biting insect problem.

4. Which of the following insect/arthropod types did you encounter? Check all that apply:

- Biting flies including horseflies, deer flies, etc. ____
- Other biting flies: Mosquitos ____
- Other biting flies: "no-see-ums"/biting midges ____
- Ticks ____
- Other (please specify if known _____)
- Uncertain ____

5. How severe was the biting insect encounter today? Check only one:

- Rarely - One or two swats or tick removals: no noticeable effects

- Often – Frequently swatting or performing tick removal: noticeably annoying

- Continuous - Non-stop swatting or tick removal: significantly detracted from ability to concentrate/enjoy hunting experience

6. Was there any particular area within the training site that presented more of a biting insect problem than others, please describe the location. (Example: Firing lanes X - Y, Building X, Bivouac X, Near water body at the south end of X, or Obstacle X, Y, Z)?

_____

Thank you for providing feedback on your experience with biting insects in the training areas. We will use this information to assist the pest management program for military training activities.

APPENDIX O:

Red Imported Fire Ant Management Plan

1. General. Red imported fire ants (*Solenopsis invicta*) were first identified on Fort Eustis in October 2013. Three ant mounds were found adjacent to the new shoppette (BLDG 704) along Wright Street. At that time no evidence of other colonies had been identified on the installation. Surveillance of additional mounds is conducted in those adjacent areas noted in subparagraph 2. D.(1) below. This species is considered a high priority for surveillance and control because it has the potential to spread across large portions of the installation and become a serious health risk to personnel and adversely impact wildlife species such as ground-nesting birds, reptiles, amphibians and small mammals.

2. Responsibilities.

A. Director, Civil Engineer Division. Directs subordinate Flights to prevent removal of soil and other regulated articles from the installation that would otherwise exist in the quarantine area. Directs subordinate Flights for contractors removing soil and other regulated articles to engage in Cooperative Agreements or inspection of soil/regulated articles with or by the Virginia Department of Agriculture and Consumer Services.

B. IPMC.

(1) The IPMC is overall responsible for the management of imported fire ants.

(2) Reports new colonies and respective locations through the chain of command and recommends courses of action for affected personnel.

(3) Directs the BOS Pest Control Contractor on control techniques.

(4) Consult with Newport News and York County Cooperative Extensions on identification and control.

C. Operations Flight and Engineer Flight. Ensure regulated articles (such as soil) are confirmed free of all RIFA life stages before contractors bring soil or other regulated articles onto the installation. Confirmation shall be in writing.

D. BOS Contractor.

(1) Perform weekly surveillance of selected sites between April and October. These sites shall include the athletic field and adjacent TRADOC parade field (area between Walker Street, Jefferson Avenue, Lee Boulevard and BLDG 950), open lawn area around BLDG 705, immediate vicinity of BLDG 704 and the Washington Boulevard median between Jefferson Avenue and Hines Circle. Surveillance locations may change.

(2) Report weekly surveillance results to include collected specimens by close of business each Friday to the IPMC. Negative results can be accomplished via email or voice message. New mounds and locations will be reported to the IPMC immediately.

(3) Control methods shall include use of approved baits followed by approved insecticide application based on product labels. The contractor advises the IPMC weekly on the efficiency of the control methods.

D. Directors and Commanders, tenant activities. Tenant activities that suspect red imported fire ants in their areas should immediately notify the IPMC.

E. Residential Communities Initiative (RCI) office. Report any known or suspected red imported fire ants or mounds found on BBC property to the IPMC.

3. RIFA control techniques. The IPMC shall direct the BOS pest control shop. Use of baits shall be the primary technique.

APPENDIX P:

Forest Pest Management

1. General. Fort Eustis contains approximately 2,700 acres of commercial/natural forest conditions. Loblolly pine is the predominant tree across much of the installation but also includes mixed oak, sweet gum, red maple, American beech, and other deciduous trees. Training Area 1 and 2 however, is primarily hardwoods with American beech being the dominant hardwood in those two training areas.

2. Purpose of forest management at Fort Eustis. Forested areas are necessary to meet certain outdoor training activities as well as prevent erosion, maintain biodiversity, improve air quality, and improve water quality. Consequently, silvicultural practices are intended to maintain healthy natural forest habitat conditions. Installation forest acreage is limited and damage via insect pests could be significant. Regular surveillance and early detection of forest insect pest species are critical for the protection of these resources at Fort Eustis.

3. Potential forest pests. The following insects have the potential to occur at Fort Eustis or have the potential to occur in the future. A surveillance and detection plan for all insect species noted below with the exception of the Emerald Ash Borer as described below.

A. Coleoptera (beetles).

- Emerald Ash Borer (Agrilus planipennis).
- Asian Longhorned Beetle (Anoplophora glabripennis).
- Southern Pine Beetle (Dendroctonus frontalis).
- Redbay Ambrosia Beetle (Xyleborus glabratus).

B. Hymenoptera (Bees, Wasps, Hornets, Ants and Sawflies).

- Sirex Woodwasp (Sirex noctilio).

C. Hempitera (true bugs, cicadas, hoppers & allies).

- Beech Scale (Cryptococcus fagisuga).
- Spotted lanternfly (Lycorma delicatula).

D. Lepidoptera (moths and butterflies).

- Gypsy moth (Lymantria dispar).

4. Risk of damage.

A. Emerald Ash Borer (Agrilus planipennis). This species is invasive and has serious impacts on ash trees in the genus Fraxinus. It only impacts these trees. It is documented in Virginia. Fort Eustis does not contain any significant stands of ash trees. This pest does not pose a major risk to Fort Eustis forest habitats. No specific surveillance plan is included; however, notifications shall be made to the York County and Newport News Cooperative Extensions should the species be found.

B. Asian Longhorned Beetle (*Anoplophora glabripennis*). This is a serious invasive species that can have major impacts on hardwood trees. It impacts trees species of the following genera that occur at the installation: Ash (*Fraxinus*), Birch (*Betula*), Elm (*Ulmus*), Maple (*Acer*), Poplar (*Populus*) and Willow (*Salix*). Tree damage becomes evident in approximately 3-4 years following infestation with mortality occurring in approximately 10-15 years. Affected trees do not survive nor regenerate. This beetle is not yet documented in Virginia. Currently, it does not pose risks for the installation; however, surveillance is included in this plan. Early detection can make a difference in preventing large-scale damage.

C. Southern Pine Beetle (*Dendroctonus frontalis*). This tiny beetle is native to southeastern United States to include Virginia. It attacks several pine species to include loblolly pine (*Pinus taeda*) which is the predominant tree in most areas of the installation. Previous forest insect surveys have not documented this species on Fort Eustis. However, potential for significant impacts exists by virtue of the species being native to the area and the availability of host trees. Occurrence on the installation may be limited by the James and Warwick Rivers as potential barriers and that most trees on the northern land boundary are deciduous trees. Furthermore, the documented presence of Dubious Checkered Beetle (*Thanasimus dubious*), a natural predator of the Southern pine beetle may be representing a natural controlling factor. However, the effectiveness of the surface water barriers, the forest type on the land boundary and natural predators remains speculative. This beetle is the top surveillance species for forest pests at the installation due to loblolly pine being the predominant tree.

D. Sirex woodwasp (*Sirex noctilio*). This species can cause severe loss of pine stands including loblolly pine though it is not yet established in Virginia. Currently, it poses no risk to the installation. Current surveillance consists of monitoring the information sites noted in section 6 of this appendix.

E. Beech Scale (*Cryptococcus fagisuga*). This invasive aphid causes beech bark disease in American beech by feeding on the sap of beech trees that create cracks in the bark, which are colonized by the fungal pathogens. It is currently found in several counties in the western mountains of Virginia but is not yet identified in the coastal plain.

F. Spotted lanternfly (*Lycorma delicatula*). This pest was only discovered in the United States in 2014. It does occur in Virginia though its current distribution appears to be in northern Virginia particularly in Frederick County. The nonnative tree known as tree of heaven (*Ailanthus altissima*) is a preferred host though the spotted lanternfly is known to attack 70 host species including fruit trees, ornamental trees, vines, apple trees, birch, cherry, dogwood, grapes, lilac, maples, and poplar. The combination of natural barriers such as the James River and Warwick River and that stands of tree of heaven may be limited in at least some portions of Newport News lying adjacent to the boundary may contribute to preventing establishment of the lanternfly. Its risk of damage at the installation remains uncertain at this time.

G. Gypsy moth (*Lymantria dispar*). The Gypsy moth is an invasive lepidopteran having the potential to inflict severe damage to hardwood trees by defoliation. This species was supposedly documented on the installation in the 1980s-time frame but none have been observed in recent years and no evidence of serious damage has been evident. However, due to its occurrence in the local area previously and its potential to cause significant damage surveillance is warranted.

4. Other forest pests. Various other native forest insects occur on the installation or could occur. Some have potential to impact forest health. An insect inventory was prepared and incorporated into the JBLE-E Integrated Natural Resources Management Plan that was approved/signed by the 633 ABW Commander 5 June 2019. This inventory while extensive remains a living inventory. The inventory, entitled *Insect & Other Arthropod Species Inventory at Fort Eustis, VA* (27 December 2018) identifies documented insects considered to be potential forest pests. The inventory is found at Appendix Z.

A. Sawflies. Sawflies are hymenopterans (bees, wasps, hornets and ants) and are also referred to as wood wasps and horntails. These terms are based on members of this group having an ovipositor that cuts into plant tissues (including trees) to deposit eggs. Females of several species have long ovipositors; however, they are not capable of stinging. Larvae look similar to lepidopteran caterpillars and many feed on foliage. Members of this group are not well represented in the current insect species inventory. Currently, the major species of potential concern is the Sirex woodwasp (*Sirex noctilio*).

B. Beech bark aphid (*Grylloprociphilus imbricator*). This aphid is gregarious and easily observed on branches and twigs of American beech based on their waving white tails that look like snowflakes. It is a native species but an outbreak or their effects in conjunction with the invasive Beech Scale (*Cryptococcus fagisuga*) could lead to significant damage to beech stands on the installation (should the latter become established). Two other aphids have also been documented on the installation and may pose as forest pests as discussed in the inventory at Appendix Z.

C. Long-horned beetles. This group includes beetles of the family Cerambycidae. The invasive Asian Longhorned Beetle (mentioned above) is a member of this family. Currently, 53 species are documented from the installation of which 4 have potential as forest pests. Additionally, the White oak borer (*Goes tigrinus*) represents a potential pest of white oak though it has not yet been documented on Fort Eustis.

D. Metallic Wood-boring Beetles. This group includes members of the beetle family Buprestidae. Approximately 20 species are documented on the installation. Currently, no significant issues are expected from this group.

E. Snout and Bark Beetles. This group comprises the beetle family Curculionidae. It includes weevils, bark beetles, pinhole borers and others. This group includes the Southern pine beetle discussed above. Several other bark beetles and weevils are documented on the installation, and six are potential forest pests as discussed in the inventory at Appendix Z.

F. Other lepidopterans. At least three documented caterpillar moths have potential to cause damage by defoliation. This include the Fall Webworm Moth (*Hyphantria cunea*), Eastern Tent Caterpillar Moth (*Malacosoma americanum*), and Forest Tent Caterpillar Moth (*Malacosoma disstria*).

5. Resources required. Surveillance work requires considerable resources. These include:

- Staffing. Trained staff manpower to design plans, place and monitor traps, monitor federal and state websites and forums regarding statuses of pests, and identification of pests.
- Time. Time must be factored into the overall workload of CEIE.
- Traps. Various traps can be used and the number of traps varies on the target species. Generally speaking, most traps are inexpensive.
- Lures. Various target insects must be collected from traps with the use of lures. Generally speaking, most lures are inexpensive.
- Storage. Collection of specimens is important to document species present. Storage capability for specimens is needed. Storage containers are durable for years making costs minimal. However, several containers would be needed and building 1409 has limited space.

6. Information sources to support surveillance plans. Surveillance activities shall include periodic review and monitoring of federal and state information to stay apprised on native and non-native forest pests that could impact the installation. The IPMC monitors the following sites routinely and uses related information to design new or adjust existing surveillance plans accordingly:

A. USDA-APHIS Cooperative Agricultural Pest Survey (CAPS) program (https://www.aphis.usda.gov/aphis/ourfocus/planthealth/pest-detection).

B. USDA-APHIS National Invasive Species Information Center (https://www.invasivespeciesinfo.gov/).

C. Virginia Department of Agriculture and Consumer Services Plant Industry Services (https://www.vdacs.virginia.gov/plant-industry-services.shtml).

D. Virginia Department of Forestry (http://www.dof.virginia.gov/).

7. Surveillance and management plans by species.

A. Asian Longhorned Beetle. Surveillance consists of monitoring federal and state information and monitoring sources. No specific trapping program exists; however, this would be implemented should new information suggest risks to the installation. The following sources shall be examined by the IPMC periodically:

(1) Results of Virginia Polytechnic and State University surveillance trapping.

(2) Monitor the U.S. Department of Agriculture's National Invasive Species Information Center at https://www.invasivespeciesinfo.gov/.

(3) Consult with the Virginia Cooperative Extension (Newport News and York County).

(4) Monitor information from the Armed Forces Pest Management Board website.

(5) Monitor information posted on the USDA-APHIS CAPS website (https://www.aphis.usda.gov/aphis/ourfocus/planthealth/pest-detection).

B. Gypsy moth. Gypsy moth (*Lymantria dispar*). Gypsy moth larvae feed on over 300 tree and shrub species; however, their preferred hosts appear to be oaks. Additionally, they also show preferences for apple, basswood, birch, boxelder, hawthorn, sumac, sweetgum, and willow and may also feed on American beech, blackgum, butternut, cherry, chestnut, hackberry, hickories, American hornbeam, maples, paw paw, pear, persimmon, all pines, sassafras and spruces. Most of these trees occur to some extent on the installation.

(1) Responsibilities.

a. IPMC.

- Has overall responsibility for management of this pest.
- Evaluates surveillance data to determine the control measure(s) to be implemented.
- Directs additional surveillance measures if this insect becomes documented on the installation.
- Consults with local extension offices (Newport News and York County) in the event of documented findings.

- Directs control measures performed by the BOS contractor or designs and implements other control measures if needed.

- Designates trapping locations and egg mass survey plots.

b. BOS Contractor. Contractor is responsible for conducting egg mass surveys and adult trapping tasks in accordance with this plan and the BOS contract.

(2) Procedures. Surveillance occurs via egg mass surveys and trapping for adults. Procedures are primarily based on the USDA Gypsy Moth Program Manual, 2d Edition, issued 2019.

(a) Egg mass surveys.

(1) Conduct one egg mass survey each month of September, October, November and December. Use the record form found in this section.

(2) Count all observed egg masses. Remove eggs masses that are accessible and mark the tree or object on which the egg mass was found. GPS this point if possible. Place egg mass in zip lock bag and submit to the IPMC.

(3) Look for egg masses on preferred egg-laying sites:

- Tree trunks where sheltered spots exist such as beneath limbs.
- Use binoculars to observer higher locations.
- Look in bark cavities and crevices including loose bark.
- Branches or debris on the ground (limbs, cans, etc.).

(4) Conduct egg mass surveys at the following locations:

- Training Area 2
- Training Area 1
- Tracey Place (forested area along Wilson Avenue between the 2500 and 2700 blocks)
- Nature Trail
- Forested area south of BLDG 836 parking lot (1 trap)
- Forested area south of BLDG 850/860.
- Two forested areas at the Pines Golf Course.

(5) Perform a targets visual survey by establishing a transect at each location noted above. Transects shall be 50 feet in length (minimum) with an intersection area of 10 feet on each side of the transect line. Inspect trees and objects noted above. Count the number of egg masses and record data for each site. Submit completed forms to the IPMC within 3 days if no egg masses are observed. Notify the IPMC within 24 hours if any egg masses are observed.

B. Adult moth surveys.

(1) Obtains and installs gypsy moth pheromone traps at the locations noted above. Place one trap per location. Number of traps are based on available staff to inspect and replace traps while attempting to have sufficient survey coverage.

(2) Place traps no later than 15 June annually and inspects these traps on/about 15 July, on/about 31 July, on/about 15 August and on/about 30 August, on/about 15 September and on/about 30 September annually. New traps are obtained and installed annually.

(3) Installs and monitors these traps at:

- Training Area 2 (1 traps) – one plot.
- Training Area 1 (1 traps) – one plot.
- Tracey Place (forested area along Wilson Avenue between the 2500 and 2700 blocks (1 trap) – one plot.
- Nature Trail (1 trap) – one plot.
- Forested area south of BLDG 836 parking lot (1 trap).
- Forested area immediately north of Wilson Avenue/Browns Lake (1 trap).
- One trap each of two forested areas at the Pines Golf Course.

Data is recorded using the form noted below (Gypsy Moth Trap Record).

(4) Negative findings are reported to the IPMC within 3 working days of trap monitoring.

(5) Known or suspected moths are brought to the IPMC within 24 hours of collection from traps.

Gypsy Moth Trap Record

Trap #: _____ Date Set: _____
month /day/ year

Brief description of trap:
_____
_____

Location (Training Area #, nearest bldg #, cantonment, etc. – GPS location if possible):
_____

GPS Coordinates: _____

HABITAT:

Mixed hardwoods ☐

Pine/Evergreen ☐

Pine/Hardwoods ☐

Open/few trees ☐

Single tree ☐

TRAP RESULTS:

Date	Total # male moths
_____	_____

Comments/other observations:

Management plan for gypsy moth. Gypsy moths have not been documented on the installation though limited records suggest aerial treatments were implemented against gypsy moth in the late 1980s. The information is limited however. Surveillance shall dictate the extent of the problems and what control measures to use.

A. Eggs. Egg masses within reach can be removed by scraping them off trees or other objects. The eggs can then be destroyed by freezing, crushing or placing in a solution of soapy water.

B. Wrapping burlap near the base of trees will trap females as they look for a place to lay eggs.

C. Adult females within reach can be collected mechanically since they are unable to fly.

D. Traps used in surveillance contributes to reducing breeding males to some extent.

E. Insecticides. Insecticides can be used against young/early instar caterpillars. Risks of caterpillars could be estimated from adult and egg surveys. Localized or aerial treatments may be feasible depending on the situation. Consideration for the biological control agent *Bacillus thuringiensis* serotype *kurstaki* (BtK) since this has much less impact on non-target organisms

F. Southern pine beetle (SPB). Surveillance for the SPB is critical though resource-intensive and control actions challenging. Considerable manpower and time is significant. Traps and lures have associated costs, but these are expected to minimal as the traps are typically durable and lures are relatively inexpensive. Surveillance shall consist of three techniques: trapping, ground surveys and aerial monitoring.

(1) Trapping. Trapping is the primary technique used at the installation. Lindgren 12-funnel traps (baited with SPB aggregation pheromone such as a frontalin and alpha-pinene) are placed in pine stands with trees 12 inches or greater diameter at breast height (DBH) and sparse understory vegetation. Traps are hung suspended between two hardwood trees, at least 30 feet from the nearest living pine. Collection cups are filled with 100% U.S. Pharmacopeia (USP) food grade propylene glycol to serve as a non-toxic preservative. Several traps are deployed at least one mile apart. The trap site shall be recorded with GPS coordinates, site description, tree species present, site name, date trap was set and removed, and trap type. Traps are checked weekly, bi-weekly, or monthly depending data required and personnel available. Specimens are placed through a strainer and rinsed with water or alcohol. Microscopes having sufficient magnification and dichotomous keys are necessary. Identification is challenging and may require contract work with a qualified entomologist unless support is available from USDA or Cooperative Extensions. The number of traps deployed are based on partly on available staffing and time. Trapping is planned in warmer months starting in May and may occur through October.

(2) Ground surveys. Areas are selected for transects and area coverage shall be similar to that used for gypsy moth. Ground surveys shall be performed between May and October. Surveys shall take into account the three types of infestation symptoms.

(a) Stage 1.

- Foliage is still green and soft, white or light pink popcorn-sized lumps of pitch, or pitch tubes appear on the outer bark from ground level to 60 feet.
- Adult Clerid beetles (particularly *Thanasimus dubius*) are visible on the bark (foraging for bark beetles and their eggs).
- Bark is tight on the trunk and difficult to remove; no sign of exit holes on the bark surface nor accumulations of fine dust produced by ambrosia beetles.
- Wood under bark is white (except near the galleries).

(b) Stage 2.

- Trees have green to yellow crowns (occurs just before emergence.
- Pitch tubes are white and hard.
- Clerid beetle larvae are present in the brood galleries.
- The few emergence holes in the loose
- Wood below the bark is light brown with blue or black areas.
- Localized accumulations of ambrosia beetle dust exists at the base of the tree.

(c) Stage 3.

- Needles have turned red and beginning to fall.
- The crown is bare.
- The hardened pitch tubes are yellow and easily crumble.
- Mature clerid beetle larvae and pupae are found in pockets of the outer bark.
- Numerous emergence holes exist.
- Wood underneath is dark brown to black.
- Wood dust at the base of trees is yellow and abundant.

(3) Aerial surveys. Aerial surveys are difficult to schedule due to limitations on availability to use military aircraft. This is the least reliable survey method and is used only when resources permit. When it can be accomplished, such surveys are conducted in spring usually April and continued as feasible throughout the summer and into September. Surveys look for groups of dead and dying pines with discolored foliage. These spots shall be plotted onto maps and quickly followed up by ground evaluation.

(4) Pest Detection. Detection programs for SPB involve aerial survey, ground checking, and trapping.

(5) Management plan.

(a) Forest stands containing pine as the dominant tree species shall be managed with a basal area of approximately 80 square feet per acre where feasible based on resources and military training needs.

(b) Complete forest inventories every ten years in accordance with AFI 32-7064.

(c) Improve forest habitats by planting mixed oak species and longleaf pine.

(d) In cases where an outbreak spot is identified, trees surrounding the spot shall be cleared at a distance of 1.5 times the height of the tallest tree on the edge of the spot. Infected trees within the spot will be felled and bark shall be removed. Timber salvage shall be offered.

D. Redbay Ambrosia Beetle. This species appears to not occur Virginia currently though its distribution does reach the southern areas of North Carolina. The beetle vectors pathogens that cause the fatal disease laurel wilt in redbay trees (*Persea borbonia*) and sassafras (*Sassafras albidum*). Surveillance shall consist of the following procedures:

- Monitor the status of this species via the three websites noted in section 6 above.
- Complete a new forest inventory. While this was supposed to have been completed in 2017, it is now slated as a project for FY 20.
- GPS/map the locations of individual and stands of redbay and sassafras trees on the installation.
- A specific surveillance plan shall be designed based on the new inventory and subsequent number and location of potentially affected trees.

E. Sirex Woodwasp. Surveillance shall consist of monitoring the information sites noted in section 6 of this appendix. Identification of suspected Sirex woodwasps shall be coordinated with the Virginia Department of Forestry, Virginia Department of Agriculture and Consumer Services and Newport News Cooperative Extension.

F. Beech Scale. Surveillance shall consist of monitoring the information sites noted in section 6 of this appendix. Additionally, primary beech stands shall be mapped and monitoring plan designed based on potentially affected stands. Identification of suspected beech scale or beech bark disease shall be coordinated with the Virginia Department of Forestry, Virginia Department of Agriculture and Consumer Services and Newport News Cooperative Extension.

G. Spotted lanternfly. The spotted lanternfly is not documented beyond northern Virginia/Frederick County at the time this plan was revised. The following surveillance and management procedures shall be implemented:

(2) Continue control measures to work towards eradication of Tree of Heaven from the installation.

(3) Review existing forest inventory, urban forest inventories, and other plant/flora survey data to identify possible stands of plants that may serve as hosts beyond tree of heaven. This could include ornamental fruit-bearing trees such as Chinaberry (*Melia azeradach*), and wild grape (*Vitis* spp.). Map these areas.

(4) Inspect remaining Tree of Heaven stands. Do this from the base of the tree to the canopy and branches. Utilize binoculars to observe taller areas of trees. Inspect for all life stages (eggs, nymphs and adults). Eggs can be found any time of year. Eggs can be found on the vertical surface of the tree as well as smooth surfaces of rocks or debris near the trees. Fourth instar nymphs and adults may occur between June and October. Utilize sticky band traps on the bases of tree of heaven and monitor at least weekly if spotted lanternflies become documented in Hampton Roads (Peninsula or Southside) and stands of Tree of Heaven exist. Additionally, inspect tree of heaven for feeding damage. Look for weeping sap wounds, honeydew accumulation, and sooty mold growth at the base of the tree.

(5) Inspect vines and underside of leaves of other possible hosts such as wild grape for aggregations of adults and nymphs.

(6) Retain specimens and consult with Department of Forestry, Virginia Department of Agriculture and Consumer Services and Newport News Cooperative Extension to confirm identification. Count and record the number of Spotted Lanternflies on each host plant (adults and nymphs).

(7) Egg masses within reach can be scrapped off the base of trees (or other surfaces) mechanically. Adhesive tree bands can be applied to known host trees beginning in April through August and replaced every 2 weeks. Adhesive bands shall be used only on tree of heaven once the spotted lanternfly has been documented on the installation or documented in the local area (unless an assessment suggests otherwise). Aggregations of nymphs and adults can be collected mechanically also since they are poor fliers. Chemical treatment remains as a last resort and use of this technique shall depend on the extent of the situation.

Surveillance would consist primarily of sticky bands placed on trees exhibiting feeding damage by lanternflies. Since the lanternfly is not documented beyond northern Virginia/Frederick County, the use of sticky bands is avoided to prevent by-catch impacts. However, control against the potential establishment of the lanternfly is already underway. Large stands of the invasive tree of heaven have been removed as part of the installation's invasive species management program. The current task is to map the remaining tree of heaven stands and continue their removal. The objective is to achieve eradication of tree of heaven. The combination of natural barriers such as the James River and Warwick River and that stands of tree of heaven may be limited in at least some portions of Newport News lying adjacent to the boundary may contribute to preventing establishment of the lanternfly.

Pest summaries for each species include information on life history, distribution, plant hosts, and classification. Surveillance protocols, including the selection of appropriate sites for detection activities, ground checking and/or trapping methods, season of surveillance, and trap maintenance are provided, along with links for trapping resources and select references.

Maps and other data location data for susceptible host species generated from forest and urban tree surveys are needed for the development of a long-term pest surveillance and detection program. The frequency and intensity of surveillance activities at JBLE-E, Fort Eustis, along with the development of a budget, may be determined by conducting a pest risk analysis (PRA) that assesses the probability of introduction and spread for each pest, as well as its potential economic and environmental impacts.

Only the Emerald Ash Borer, Southern Pine Beetle, and Beech Scale are presently known to occur in Virginia. Currently, only Southern Pine Beetle is found at JBLE-E, Fort Eustis. Virginia is within the federal quarantine area for the Emerald Ash Borer. It and the Southern Pine Beetle are most likely to be detected on base, while the Asian Longhorn Beetle and Sirex Woodwasp are less likely to be encountered. Redbay Ambrosia Beetle is uncommon and typically found as scattered individuals, which reduces the possibility of RAB becoming an invasive insect pest. The Beech Scale is documented in Virginia; however, It is possible that genetic strain of beech trees growing in the coastal plain (and possibly including beech stands at JBLE-E), Fort Eustis is likely resistant to the Neonectria fungal infections vectored by the Beech Scale.

APPENDIX Q:

Termite and Wood Decay Inspection

Termite and Wood Decay Inspection

Inspector: _____ Date: _____

BLDG No.: _____

CONDITIONS FAVORABLE TO TERMIE AND FUNGI INFESTATIONS

____ Wood in contact with soil
____ Form boards left in concrete
____ Wood members set in concrete floor
____ Wood steps in contact with soil
____ Wood siding in contact with soil
____ Pipes in contact with soil & wood
____ No shields on foundation
_____ Faulty termite shield(s)
_____ Poor ventilation under bldg
_____ Water collecting under bldg
_____ Vines & shrubs against bldg
_____ Leaky plumbing in bldg
_____ Wood scrap piled under bldg
_____ Inadequate drainage from bldg

LOCATION OF INFESTATION

____ Foundation timbers
____ Wood pillars
____ Cross beams
____ Furniture
____ Floor joist
____ Floor
____ Spot
____ Entire structure
_____ Studs
_____ Base boards
_____ Door frames
_____ Window frames
_____ Steps
_____ Roof
_____ Bathroom
_____ Kitchen

Type of damage: Structural weakening_____or superficial _____ Wood moisture content____%

Pest: Subterranean termite ____Fungi (decay ____ staining ____) Mold _____

RECOMMENED NONCHEMICAL REPAIR AND TREATMENT

____ Remove wood from soil contact
____ Seal cracks in concrete
____ Replace poor mortar
____ Lower grade level
____ Cap concrete foundation
____ Improve drainage under bldg
_____ Improve ventilation under bldg
_____ Repair termite shields
_____ Remove concrete forms
_____ Remove vines & shrubs
_____ Remove wood trash

CHEMICAL CONTROL

Subslab_____	Wood inject _____	Wood surface _____	Trench/inject _____
Lin. Feet_____	Lin. Feet_____	Sq ft _____	Lin. Feet_____
Gallons _____	Ounces _____	Gallon_____	Gallon_____
# holes	# holes _____		
Gal/hole _____	Gal/hole_____		

APPENDIX R:

Application of Herbicides to Control Vegetation Along Rail Lines

Proper Use of Herbicides along the Installation Rail Line System

1. Control of vegetation along the installation rail line is necessary to maintain an operational rail line. Large portions of the rail line exists adjacent to surface waters and wetlands and at least 8 surface water crossings exist. Currently, aquatic emergent and submerged vegetation does not pose issues for rail line management. As a result only vegetation existing in the rail bed is managed. Consequently, proper application of herbicides is imperative to prevent releases that impact or damage surface water and wetland aquatic systems. Failure to do so would constitute violations of federal and state laws.

2. This work is normally accomplished via a contract associated with overall rail line maintenance.

3. The following procedures shall be implemented.

a. The COR or other individual from CED shall be designated in writing as the QAE for pesticide applications associated with rail line management after that person has received PMQAE training.

b. Contractor shall notify the PMQAE/COR at least 7 calendar days prior to proposed pesticide applications and finalize at least one day prior.

c. Submit a written plan at least 30 days in advance of applications detailing how the applications will be accomplished without releases to wetlands and surface waters associated with the route/area to be treated. It must comply with Virginia Permit VAG87 (or existing equivalent) and the installation's VAG87 Pesticide Discharge Management Plan. This plan must address whether soil sterilant pesticides are proposed and whether these materials pose risks to ground water based on product activity and high water table.

d. All pesticide applicator contractors must be approved by the Installation Pest Management Coordinator to operate at Fort Eustis. All contractors shall be inspected at the main entrance to the installation prior to gaining access and applying pesticides. All contractors shall have photo identification and all documents in his possession including VDACS applicator certificates, Pesticide Business License, proof of insurance, written plan, labels and materials safety data sheets for all pesticides to be used at Fort Eustis. Pesticide applicators must possess a category 6 Right-of-Way pest control certification. Registered technicians are NOT authorized to apply pesticides on Fort Eustis. NO EXCEPTIONS.

e. Pesticide contractors shall submit a "JBLE Pesticide Application Record Report" within 5 working days following each application to the Installation Pest Management Coordinator.

f. Contractor shall follow appropriate integrated pest management procedures in accordance with DODI4150.07 and AFMAN 32-1053. This includes identifying the pest condition that warrants application of pesticides with only the appropriate amounts of pesticides used.

g. Treat only area within the 15-foot width of the rail line.

h. Physically remove vegetation when feasible.

i. Turn off pesticide application equipment where there is no vegetation requiring control unless preemergent herbicide application is deemed appropriate and approved by the IPMC..

j. Prevent discharge of pesticide into any surface water source or wetland. Contractor shall not apply pesticide within 30 feet of any permanent water source or wetland. There may be cases where vegetation is less than 30 feet of a permanent water source; in such cases, physical removal, cutting or low pressure spot treatment shall be used.

k. Turn off pesticide application equipment prior to crossing bridges/trestles over surface waters and wetlands.

l. Spot treat (or physically remove) that vegetation within the rail line width that is in close proximity to surface water or wetlands.

m. Mixing of pesticides is not authorized on the installation.

n. All spills of pesticide or any hazardous material or unauthorized releases/discharges shall be reported to the Fort Eustis Fire and Emergency Services immediately by calling 757-878-1008. Spills are defined as any intentional or accidental spill, discharge, or release of any pesticide/hazardous material of any quantity into media for which the pesticide/hazardous material was not intended.

o. Contractor shall have an appropriate spill kit(s) on hand during all pesticide applications.

p. Some soil sterilants can migrate into groundwater or adjacent wetlands/surface waters. This situation can be problematic due to the high water table associated with the installation. Consequently, use could impact aquatic systems or adjacent non-target vegetation. Use of soil sterilant pesticides must be approved by the IPMC before use.

APPENDIX S:

9VAC25-800 - Virginia Pollutant Discharge Elimination System (VPDES) General Permit for Discharges Resulting From the Application of Pesticides to Surface Waters

General Permit No.: VAG87 Effective Date: March 1, 2019
Expiration Date: February 29, 2024

Virginia Administrative Code Title 9. Environment
Agency 25. State Water Control Board
Chapter 800. Virginia Pollutant Discharge Elimination System (VPDES) General Permit Regulation for Discharges Resulting from the Application of Pesticides to Surface Waters

9VAC25-800-60. General Permit.

Any operator who is authorized to discharge shall comply with the requirements contained in this general permit and be subject to all requirements of 9VAC25-31-170.

General Permit
No.: VAG87
Effective Date:
March 1, 2019
Expiration Date: February 29, 2024

GENERAL PERMIT FOR DISCHARGES RESULTING FROM THE APPLICATION OF PESTICIDES TO SURFACE WATERS OF VIRGINIA

AUTHORIZATION TO DISCHARGE UNDER THE VIRGINIA POLLUTANT DISCHARGE ELIMINATION SYSTEM AND THE VIRGINIA STATE WATER CONTROL LAW

In compliance with the provisions of the Clean Water Act (33 USC § 1251 et seq.), as amended, and pursuant to the State Water Control Law and regulations adopted pursuant thereto, operators that apply pesticides that result in a discharge to surface waters are authorized to discharge to surface waters within the boundaries of the Commonwealth of Virginia.

The authorized discharge shall be in accordance with this cover page, Part I-Effluent Limitations, Monitoring Requirements, and Special Conditions, and Part II-Conditions Applicable to All VPDES Permits, as set forth in this general permit. Coverage under this VPDES general permit does not relieve any operator of the responsibility to comply with any other applicable federal, state, or local statute, ordinance, or regulation, including the pesticide product label.

Part I
Effluent Limitations, Monitoring Requirements, and Special Conditions

A. Effluent limitations.

1. Technology-based effluent limitations. To meet the effluent limitations in this permit, the operator shall implement pest management measures that minimize discharges of pesticides to surface waters.

a. Minimize pesticide discharges to surface waters. All operators who perform the application of pesticides or who have day-to-day control of applications shall minimize the discharge of pollutants resulting from the application of pesticides, and:

(1) Use the lowest effective amount of pesticide product per application and optimum

frequency of pesticide applications necessary to control the target pest, consistent with reducing the potential for development of pest resistance without exceeding the maximum allowable rate of the product label;

(2) No person shall apply, dispense, or use any pesticide in or through any equipment or application apparatus unless the equipment or apparatus is in sound mechanical condition and capable of satisfactory operation. All pesticide application equipment shall be properly equipped to dispense the proper amount of material. All pesticide mixing, storage, or holding tanks, whether on application equipment or not, shall be leak proof. All spray distribution systems shall be leak proof, and any pumps that these systems may have shall be capable of operating at sufficient pressure to assure a uniform and adequate rate of pesticide application;

(3) All pesticide application equipment shall be equipped with cut-off valves and discharge orifices to enable the operator to pass over nontarget areas without contaminating them. All hoses, pumps, or other equipment used to fill pesticide handling, storage, or application equipment shall be fitted with an effective valve or device to prevent backflow into water supply systems, streams, lakes, other sources of water, or other materials. However, these backflow devices or valves are

not required for separate water storage tanks used to fill pesticide application equipment by gravity systems when the fill spout, tube, or pipe is not allowed to contact or fall below the water level of the application equipment being filled, and no other possible means of establishing a back siphon or backflow exists; and

(4) Assess weather conditions (e.g., temperature, precipitation, and wind speed) in the treatment area to ensure application is consistent with product label requirements.

b. Integrated pest management (IPM) practices. The operator with control over the financing for or the decision to perform pesticide applications that result in discharges, including the ability to modify those decisions, shall to the extent practicable consider integrated pest management practices to ensure that discharges resulting from the application of pesticides to surface waters are minimized. Operators that exceed the annual treatment area thresholds established in 9VAC25-800-30 C are also required to maintain a pesticide discharge management plan (PDMP) in accordance with Part I C of this permit. The PDMP documents the operator's IPM practices.

The operator's IPM practices shall consider the following for each pesticide use pattern:

(Note: If the operator's discharge of pollutants results from the application of a pesticide that is being used solely for the purpose of "pesticide research and development," as defined in 9VAC25-800-10, the operator is only required to fully implement IPM practices to the extent that the requirements do not compromise the research design.)

(1) Mosquito and other flying insect pest control. This subpart applies to discharges resulting from the application of pesticides to control public health, nuisance and other flying insect pests that develop or are present during a portion of their life cycle in or above standing or flowing water.

(a) Identify the problem. Prior to the first pesticide application covered under this permit that will result in a discharge to surface waters, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year, the operator shall consider the following for each pest management area:

(i) Identify target pests;

(ii) Establish densities for pest populations or identify environmental conditions, either current or based on historical data, to serve as action thresholds for implementing pest management measures;

(iii) Identify known breeding sites for source reduction, larval control program, and habitat management;

(iv) Analyze existing surveillance data to identify new or unidentified sources of pest problems as well as sites that have recurring pest problems; and

(v) In the event there are no data for the pest management area in the past calendar year, use other available data as appropriate to meet the conditions in Part I A 1 b (1) (a).

(b) Pest management options. Prior to the first pesticide application covered under this permit that will result in a discharge to surface waters, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year, the operator shall select and implement for each pest management area efficient and effective pest management measures that minimize discharges resulting from application of pesticides to control mosquitoes or other flying insect pests. In developing these pest management measures, the operator shall evaluate the following management options, including a combination of these options, considering impact to water quality, impact to nontarget organisms, pest resistance, feasibility, and cost effectiveness:

(i) No action;

(ii) Prevention;

(iii) Mechanical or physical methods;

(iv) Cultural methods;

(v) Biological control; and

(vi) Pesticides.

(c) Pesticide use. If a pesticide is selected to manage mosquitoes or flying insect pests and application of the pesticide will result in a discharge to surface waters, the operator shall:

(i) Conduct larval or adult surveillance in an area that is representative of the pest problem or evaluate existing larval surveillance data, environmental conditions, or data from adjacent areas prior to each pesticide application to assess the pest management area and to determine when the action threshold is met;

(ii) Reduce the impact on the environment and on nontarget organisms by applying the pesticide only when the action threshold has been met;

(iii) In situations or locations where practicable and feasible for efficacious control, use larvicides as a preferred pesticide for mosquito or flying insect pest control when larval action thresholds have been met; and

(iv) In situations or locations where larvicide use is not practicable or feasible for efficacious control, use adulticides for mosquito or flying insect pest control when adult action thresholds have been met.

(2) Weed and algae pest control. This subpart applies to discharges resulting from the application of pesticides to control weeds, algae, and pathogens that are pests in surface waters.

(a) Identify the problem. Prior to the first pesticide application covered under this permit that will result in a discharge to surface waters, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year, the operator shall consider the following for each pest management area:

(i) Identify target pests;

(ii) Identify areas with pest problems and characterize the extent of the problems, including, for example, water use goals not attained (e.g., wildlife habitat, fisheries, vegetation, and recreation);

(iii) Identify possible factors causing or contributing to the pest problem (e.g., nutrients, invasive species, etc.);

(iv) Establish past or present pest densities to serve as action thresholds for implementing pest management strategies; and

(v) In the event there are no data for the pest management area in the past calendar year, use other available data as appropriate to meet the conditions in Part I A 1 b (2) (a).

(b) Pest management options. Prior to the first pesticide application covered under this permit that will result in a discharge to surface waters, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year, the operator shall select and implement, for each pest management area, efficient and effective pest management measures that minimize discharges resulting from application of pesticides to control pests. In developing these pest management measures, the operator shall evaluate the following management options, including a combination of these options, considering impact to water quality, impact to nontarget organisms, pest resistance, feasibility, and cost effectiveness:

(i) No action;

(ii) Prevention;

(iii) Mechanical or physical methods;

(iv) Cultural methods;

(v) Biological control; and

(vi) Pesticides.

(c) Pesticide use. If a pesticide is selected to manage pests and application of the pesticide will result in a discharge to surface waters, the operator shall:

(i) Conduct surveillance in an area that is representative of the pest problem prior to each pesticide application to assess the pest management area and to determine when the action threshold is met that necessitates the need for pest management; and

(ii) Reduce the impact on the environment and nontarget organisms by applying the pesticide only when the action threshold has been met.

(3) Animal pest control. This subpart applies to discharges resulting from the application of pesticides to control animal pests in surface waters.

(a) Identify the problem. Prior to the first pesticide application covered under this permit that will result in a discharge to surface waters, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year, the operator shall consider the following for each pest management area:

(i) Identify target pests;

(ii) Identify areas with pest problems and characterize the extent of the problems, including, for example, water use goals not attained (e.g., wildlife habitat, fisheries, vegetation, and recreation);

(iii) Identify possible factors causing or contributing to the problem (e.g., nutrients and invasive species);

(iv) Establish past or present pest densities to serve as action thresholds for implementing pest management strategies; and

(v) In the event there are no data for the pest management area in the past calendar year, use other available data as appropriate to meet the conditions in Part I A 1 b (3) (a).

(b) Pest management options. Prior to the first pesticide application covered under this permit that will result in a discharge to surface waters, and at least once each year thereafter prior to the first pesticide application during that calendar year, the operator shall select and implement, for each pest management area, efficient and effective pest management measures that minimize discharges resulting from application of pesticides to control animal pests. In developing these pest management measures, the operator shall evaluate the following management options, including a combination of these options,

considering impact to water quality, impact to nontarget organisms, pest resistance, feasibility, and cost effectiveness:

(i) No action;

(ii) Prevention;

(iii) Mechanical or physical methods;

(iv) Biological control; and

(v) Pesticides.

(c) Pesticide use. If a pesticide is selected to manage animal pests and application of the pesticide will result in a discharge to surface waters, the operator shall:

(i) Conduct surveillance prior to each application to assess the pest management area and to determine when the action threshold is met that necessitates the need for pest management; and

(ii) Reduce the impact on the environment and nontarget organisms by evaluating site restrictions, application timing, and application method in addition to applying the pesticide only when the action threshold has been met.

(4) Forest canopy pest control. This subpart applies to discharges resulting from the application of pesticides to the forest canopy to control the population of a pest species where, to target the pests effectively, a portion of the pesticide unavoidably will be applied over and deposited to surface waters.

(a) Identify the problem. Prior to the first pesticide application covered under this permit that will result in a discharge to surface waters, and at least once each calendar year thereafter prior to the first pesticide application in that calendar year, the operator shall consider the following for each pest management area:

(i) Identify target pests;

(ii) Establish target pest densities to serve as action thresholds for implementing pest management measures;

(iii) Identify current distribution of the target pest and assess potential distribution in the absence of pest management measures; and

(iv) In the event there are no data for the pest management area in the past calendar year, use other available data as appropriate to meet the conditions in Part I A 1 (b) (4) (a).

(b) Pest management options. Prior to the first pesticide application covered under this permit that will result in a discharge to surface waters, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year, the operator shall select and implement for each pest management area efficient and effective pest management measures that minimize discharges resulting from application of pesticides to control forestry pests. In developing these pest management measures, the operator shall evaluate the following management options, including a combination of these options, considering impact to water quality, impact to nontarget organisms, pest resistance, feasibility, and cost effectiveness:

(i) No action;

(ii) Prevention;

(iii) Mechanical or physical methods;

(iv) Cultural methods;

(v) Biological control; and

(vi) Pesticides.

(c) Pesticide use. If a pesticide is selected to manage forestry pests and application of the pesticide will result in a discharge to surface waters, the operator shall:

(i) Conduct surveillance prior to each application to assess the pest management area and to determine when the pest action threshold is met that necessitates the need for pest management;

(ii) Assess environmental conditions (e.g., temperature, precipitation, and wind speed) in the treatment area to identify conditions that support target pest development and are conducive for treatment activities;

(iii) Reduce the impact on the environment and nontarget organisms by evaluating the restrictions, application timing, and application methods in addition to applying the pesticide only when the action thresholds have been met; and

(iv) Evaluate using pesticides against the most susceptible developmental stage.

(5) Intrusive vegetation pest control. This subpart applies to discharges resulting from the application of pesticides along roads, ditches, canals, waterways, and utility rights of way where, to target the intrusive pests effectively, a portion of the pesticide will unavoidably be applied over and deposited to surface waters.

(a) Identify the problem. Prior to the first pesticide application covered under this permit that will result in a discharge to surface waters, and at least once each calendar year thereafter prior to the first pesticide application in that calendar year, the operator shall consider the following for each pest management area:

(i) Identify target pests;

(ii) Establish target pest densities to serve as action thresholds for implementing pest management measures;

(iii) Identify current distribution of the target pest and assess potential distribution in the absence of pest management measures; and

(iv) In the event there are no data for the pest management area in the past calendar year, use other available data as appropriate to meet the conditions in Part I A 1 (b) (5) (a).

(b) Pest management options. Prior to the first pesticide application covered under this permit that will result in a discharge to surface waters, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year, the operator shall select and

implement for each pest management area efficient and effective pest management measures that minimize discharges resulting from application of pesticides to intrusive vegetation pests. In developing these pest management measures, the operator shall evaluate the following management options, including a combination of these options, considering impact to water quality, impact to nontarget organisms, pest resistance, feasibility, and cost effectiveness:

(i) No action;

(ii) Prevention;

(iii) Mechanical or physical methods;

(iv) Cultural methods;

(v) Biological control; and

(vi) Pesticides.

(c) Pesticide use. If a pesticide is selected to manage intrusive vegetation pests and application of the pesticide will result in a discharge to surface waters, the operator shall:

(i) Conduct surveillance prior to each application to assess the pest management area and to determine when the pest action threshold is met that necessitates the need for pest management;

(ii) Assess environmental conditions (e.g., temperature, precipitation, and wind speed) in the treatment area to identify conditions that support target pest development and are conducive for treatment activities;

(iii) Reduce the impact on the environment and nontarget organisms by evaluating the restrictions, application timing, and application methods in addition to applying the pesticide only when the action thresholds have been met; and

(iv) Evaluate using pesticides against the most susceptible developmental stage.

2. Water quality-based effluent limitations. The operator's discharge of pollutants must be controlled as necessary to meet applicable numeric and narrative water quality standards for any discharges authorized under this permit, with compliance required upon beginning such discharge.

If at any time the operator become aware, or the board determines, that the operator's discharge of pollutants causes or contributes to an excursion of applicable water quality standards, corrective action must be taken as required in Part I D 1 of this permit.

B. Monitoring requirements.

All operators covered under this permit must conduct a visual monitoring assessment (i.e., spot checks in the area to and around where pesticides are applied) for possible and observable adverse incidents caused by application of pesticides, including the unanticipated death or distress of nontarget organisms and disruption of wildlife habitat, recreational, or municipal water use.

A visual monitoring assessment is only required during the pesticide application when feasibility and safety allow. For example, visual monitoring assessment is not required during the course of treatment when that treatment is performed in darkness as it would be infeasible to note adverse effects under these circumstances. Visual monitoring assessments of the application site must be performed:

1. During any post-application surveillance or efficacy check that the operator conducts, if surveillance or an efficacy check is conducted.

2. During any pesticide application, when considerations for safety and feasibility allow.

C. Pesticide discharge management plan (PDMP). Any operator applying pesticides and exceeding the annual application thresholds established in 9VAC25-800-30 C must prepare a PDMP for the pest management area. The plan must be kept up-to-date thereafter for the duration of coverage under this general permit, even if discharges subsequently fall below the annual application threshold levels. The operator applying pesticides shall develop a PDMP consistent with the deadline outlined in Table I-1 below.

Table I-1. Pesticide Discharge Management Plan Deadline

Category	PDMP Deadline
Operators who know prior to commencement of discharge that they will exceed an annual treatment area threshold identified in 9VAC25-800-30 C for that year.	Prior to first pesticide application covered under this permit.
Operators who do not know until after commencement of discharge that they will exceed an annual treatment area threshold identified in 9VAC25-800-30 C for that year.	Prior to exceeding an annual treatment area threshold.
Operators commencing discharge in response to a declared pest emergency situation as defined in 9VAC25-800-10 that will cause the operator to exceed an annual treatment area threshold.	No later than 90 days after responding to declared pest emergency situation.

The PDMP does not contain effluent limitations; the limitations are contained in Parts I A 1 and I A 2 of the permit. The PDMP documents how the operator will implement the effluent limitations in Parts I A 1 and I A 2 of the permit, including the evaluation and selection of

pest management measures to meet those effluent limitations and minimize discharges. In the PDMP, the operator may incorporate by reference any procedures or plans in other documents that meet the requirements of this permit. If other documents are being relied upon by the operator to describe how compliance with the effluent limitations in this permit will be achieved, such as a pre-existing integrated pest management (IPM) plan, a copy of the portions of any documents that are being used to document the implementation of the effluent limitations shall be attached to the PDMP. The pest management measures implemented must be documented and the documentation must be kept up to date.

1. Contents of the pesticide discharge management plan. The PDMP must include the following elements:

a. Pesticide discharge management team;

b. Problem identification;

c. Pest management options evaluation;

d. Response procedures:

(1) Spill response procedures;

(2) Adverse incident response procedures; and

e. Signature requirements.

2. PDMP team. The operator shall identify all the persons (by name and contact information) who compose the team as well as each person's individual responsibilities, including:

a. Persons responsible for managing pests in relation to the pest management area;

b. Persons responsible for developing and revising the PDMP; and

c. Persons responsible for developing, revising, and implementing corrective actions and other effluent limitation requirements.

3. Problem identification. The operator shall document the following:

a. Pest problem description. Describe the pest problem at the pest management area, including identification of the target pests, sources of the pest problem, and sources of data used to identify the problem in Part I A 1 b (1) through b (5).

b. Action thresholds. Describe the action thresholds for the pest management area, including how they were determined.

c. General location map. Include a general location map that identifies the geographic boundaries of the area to which the plan applies and location of major surface waters.

4. Integrated pest management options evaluation. Operators shall document the evaluation of the pest management options, including a combination of the pest management options, to control the target pests. Pest management options include the following: no action, prevention, mechanical or physical methods, cultural methods, biological control agents, and pesticides. In the evaluation, decision makers shall consider the impact

to water quality, impact to nontarget organisms, feasibility, cost effectiveness, and any relevant previous pest management measures.

5. Response procedures. Document the following procedures in the PDMP:

a. Spill response procedures. At a minimum the PDMP must have:

(1) Procedures for expeditiously stopping, containing, and cleaning up leaks, spills, and other releases to surface waters. Employees who may cause, detect, or respond to a spill or leak must be trained in these procedures and have necessary spill response equipment available. If possible, one of these individuals should be a member of the PDMP team.

(2) Procedures for notification of appropriate facility personnel, emergency response agencies, and regulatory agencies.

b. Adverse incident response procedures. At a minimum the PDMP must have:

(1) Procedures for responding to any incident resulting from pesticide applications; and

(2) Procedures for notification of the incident, both internal to the operator's agency or organization and external. Contact information for DEQ, nearest emergency medical facility, and nearest hazardous chemical responder must be in locations that are readily accessible and available.

6. PDMP signature requirements.

a. The PDMP, including changes to the PDMP to document any corrective actions taken as required by Part I D 1, and all reports submitted to the department must be signed by a person described in Part II G 1 or by a duly authorized representative of that person described in Part II G 2.

b. All other changes to the PDMP, and other compliance documentation required under this permit, must be signed and dated by the person preparing the change or documentation.

c. Any person signing documents in accordance with Part I C 6 a must include the certification from Part II G 4.

7. PDMP modifications and availability.

a. PDMP modifications. The operator shall modify the PDMP whenever necessary to address any of the triggering conditions for corrective action in Part I D 1 a, or when a change in pest control activities significantly changes the type or quantity of pollutants discharged. Changes to the PDMP must be made before the next pesticide application that results in a discharge, if practicable, or if not, as soon as possible thereafter. The revised PDMP must be signed and dated in accordance with Part II G.

The operator shall review the PDMP at a minimum once per calendar year and whenever necessary to update the pest problem identified and pest management strategies evaluated for the pest management area.

b. PDMP availability. The operator shall retain a copy of the current PDMP, along with all supporting maps and documents. The operator shall make the PDMP and supporting information available to the department upon request. The PDMP is subject to the provisions and exclusions of the Virginia Freedom of Information Act (§ 2.2-3700 et seq. of the Code of Virginia).

D. Special conditions.

1. Corrective action.

a. Situations requiring revision of pest management measures. If any of the following situations occur, the operator shall review and, as necessary, revise the evaluation and selection of pest management measures to ensure that the situation is eliminated and will not be repeated in the future:

(1) An unauthorized release or discharge associated with the application of pesticides occurs (e.g., spill, leak, or discharge not authorized by this or another VPDES permit);

(2) The operator becomes aware, or the board concludes, that the pest management measures are not adequate or sufficient for the discharge of pollutants to meet applicable water quality standards;

(3) Any monitoring activities indicate that the operator failed to meet the technology- based effluent limitations in Part I A 1 a of this permit;

(4) An inspection or evaluation of the operator's activities by DEQ, VDACS, EPA, or a locality reveals that modifications to the pest management measures are necessary to meet the non-numeric effluent limits in this permit; or

(5) The operator observes (e.g., during visual monitoring that is required in Part I B) or is otherwise made aware of an adverse incident.

b. Corrective action deadlines. If the operator determines that changes to the pest management measures are necessary to eliminate any situation identified in Part I D 1 a, such changes must be made before the next pesticide application that results in a discharge if practicable, or if not, as soon as possible thereafter.

2. Adverse incident documentation and reporting.

a. Twenty-four-hour adverse incident notification. If the operator observes or is otherwise made aware of an adverse incident that may have resulted from a discharge from the operator's pesticide application, the operator shall immediately notify the department (see Part I D 5). This notification must be made within 24 hours of when the operator becomes aware of the adverse incident and must include at least the following information:

(1) The caller's name and telephone number;

(2) Operator's name and mailing address;

(3) The name and telephone number of a contact person if different than the person providing the 24-hour notice;

(4) How and when the operator became aware of the adverse incident;

(5) Description of the location of the adverse incident;

(6) Description of the adverse incident identified and the EPA pesticide registration number for each product that was applied in the area of the adverse incident; and

(7) Description of any steps the operator has taken or will take to correct, repair, remedy, cleanup, or otherwise address any adverse effects.

If the operator is unable to notify the department within 24 hours, notification shall be made as soon as possible and the rationale for why the notification was not possible within 24 hours shall be provided.

The adverse incident notification and reporting requirements are in addition to what the registrant is required to submit under FIFRA § 6(a)(2) and its implementing regulations at 40 CFR Part 159.

b. Reporting of adverse incidents is not required under this permit in the following situations:

(1) The operator is aware of facts that clearly establish that the adverse incident was not related to toxic effects or exposure from the pesticide application.

(2) The operator has been notified in writing by the board that the reporting requirement has been waived for this incident or category of incidents.

(3) The operator receives notification of a potential adverse incident but that notification and supporting information are clearly erroneous.

(4) An adverse incident occurs to pests that are similar in kind to pests identified as potential targets.

c. Five-day adverse incident written report. Within five days of a reportable adverse incident pursuant to Part I D 2 a, the operator shall provide a written report of the adverse incident to the appropriate DEQ regional office at the address listed in Part I D

5. The adverse incident report must include at least the following information:

(1) Information required to be provided in Part I D 2 a;

(2) Date and time the operator contacted DEQ notifying the department of the adverse incident, and with whom the operator spoke at DEQ, and any instructions the operator received from DEQ;

(3) Location of incident, including the names of any waters affected and appearance of those waters (sheen, color, clarity, etc.);

(4) A description of the circumstances of the adverse incident including species affected, estimated number of individuals, and approximate size of dead or distressed organisms;

(5) Magnitude and scope of the affected area (e.g., aquatic square area or total stream distance affected);

(6) Pesticide application rate, intended use site, method of application, and name of pesticide product, description of pesticide ingredients, and EPA registration number;

(7) Description of the habitat and the circumstances under which the adverse incident occurred (including any available ambient water data for pesticides applied);

(8) If laboratory tests were performed, indicate what tests were performed, and when, and provide a summary of the test results within five days after they become available;

(9) If applicable, explain why it is believed the adverse incident could not have been caused by exposure to the pesticide;

(10) Actions to be taken to prevent recurrence of adverse incidents; and

(11) Signed and dated in accordance with Part II G.

The operator shall report adverse incidents even for those instances when the pesticide labeling states that adverse effects may occur.

d. Adverse incident to threatened or endangered species or critical habitat.

(1) Notwithstanding any of the other adverse incident notification requirements of this section, if the operator becomes aware of an adverse incident to threatened or endangered species or critical habitat

that may have resulted from a discharge from the operator's pesticide application, the operator shall immediately notify the:

(a) National Marine Fisheries Service (NMFS) and the Virginia Department of Game and Inland Fisheries (DGIF) in the case of an anadromous or marine species;

(b) U.S. Fish and Wildlife Service (FWS) and the DGIF in the case of an animal or invertebrate species; or

(c) FWS and the Virginia Department of Agriculture and Consumer Services in the case of plants or insects.

(2) Threatened or endangered species or critical habitats include the following:

(a) Federally listed threatened or endangered species;

(b) Federally designated critical habitat;

(c) State-listed threatened or endangered species; and

(d) Tier I (critical conservation need) or Tier II (very high conservation need) species of greatest conservation need (SGCN) as defined in Virginia's Wildlife Action Plan (www.bewildvirginia.org).

(3) This notification must be made by telephone immediately upon the operator becoming aware of the adverse incident and must include at least the following information:

(a) The caller's name and telephone number;

(b) Operator's name and mailing address;

(c) The name of the affected species, size of area impacted, and if applicable, the approximate number of animals affected;

(d) How and when the operator became aware of the adverse incident;

(e) Description of the location of the adverse incident;

(f) Description of the adverse incident, including the EPA pesticide registration number for each product the operator applied in the area of the adverse incident;

(g) Description of any steps the operator has taken or will take to alleviate the adverse impact to the species; and

(h) Date and time of application. Additional information on federally listed threatened or endangered species and federally designated critical habitat is available from NMFS (www.nmfs.noaa.gov) for anadromous or marine species or FWS (www.fws.gov) for terrestrial or freshwater species. Additional information on state-listed threatened or endangered wildlife species is available through the Virginia Fish and Wildlife Information Service (www.dgif.virginia.gov). Listing of state threatened or endangered plants and insects can be found in §§ 3.2-1000 through 3.2-1011 of the Code of Virginia and 2VAC5-320-10 of the Virginia Administrative Code (both the Code of Virginia and the Virginia Administrative Code must be referenced in order to obtain the complete plant and insect list). (Contact information for these agencies can be found on the contact information form or through the DEQ website.)

3. Reportable spills and leaks.

a. Spill, leak, or other unauthorized discharge notification. Where a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR Part 110, 117, or 302 occurs in any 24-hour period, the operator shall notify the department (see Part I D 2) as soon as the operator has knowledge of the release. Department contact information must be kept in locations that are readily accessible and available in the area where a spill, leak, or other unpermitted discharge may occur.

b. Five-day spill, leak, or other unauthorized discharge report. Within five days of the operator becoming aware of a spill, leak, or other unauthorized discharge triggering the notification in subdivision 3 of this subsection, the operator shall submit a written report to the appropriate DEQ regional office at the address listed in Part I D 5. The report shall contain the following information:

(1) A description of the nature and location of the spill, leak, or discharge;

(2) The cause of the spill, leak, or discharge;

(3) The date on which the spill, leak, or discharge occurred;

(4) The length of time that the spill, leak, or discharge continued;

(5) The volume of the spill, leak, or discharge;

(6) If the discharge is continuing, how long it is expected to continue and what the expected total volume of the discharge will be;

(7) A summary of corrective action taken or to be taken including date initiated and date completed or expected to be completed; and

(8) Any steps planned or taken to prevent recurrence of such a spill, leak, or other discharge, including notice of whether PDMP modifications are required as a result of the spill or leak.

Discharges reportable to the department under the immediate reporting requirements of other regulations are exempted from this requirement.

The board may waive the written report on a case-by-case basis for reports of noncompliance if the oral report has been received within 24 hours and no adverse impact on state waters has been reported.

4. Recordkeeping and annual reporting. The operator shall keep records as required in this permit. These records must be accurate, complete, and sufficient to demonstrate compliance with the conditions of this permit. The operator can rely on records and documents developed for other obligations, such as requirements under FIFRA and state or local pesticide programs, provided all requirements of this permit are satisfied. The board recommends that all operators covered under this permit keep records of acres or linear miles treated for all applicable use patterns covered under this general permit.

a. All operators must keep the following records:

(1) A copy of any adverse incident reports (see Part I D 2 c).

(2) The operator's rationale for any determination that reporting of an identified adverse incident is not required consistent with allowances identified in Part I D 2 b.

b. Any operator performing the application of a pesticide or who has day-to-day control of the application and exceeding the annual application thresholds established in 9VAC25-800-30 C must also maintain a record of each pesticide applied. This shall apply to both general use and restricted use pesticides. Each record shall contain the:

(1) Name, address, and telephone number of customer and address or location, if different, of site of application;

(2) Name and VDACS certification number of the person making the application or certification number of the supervising certified applicator;

(3) Day, month, and year of application;

(4) Type of plants, crop, animals, or sites treated and principal pests to be controlled;

(5) Acreage, area, or number of plants or animals treated;

(6) Brand name or common product name;

(7) EPA registration number;

(8) Amount of pesticide concentrate and amount of diluting used, by weight or volume, in mixture applied; and

(9) Type of application equipment used.

c. All required records must be assembled as soon as possible but no later than 30 days following completion of such activity. The operator shall retain any records required under this permit for at least three years from the date of the pesticide application. The operator shall make available to the board, including an authorized representative of the board, all records kept under this permit upon request and provide copies of such records, upon request.

d. Annual reporting.

(1) Any operator applying pesticides that reports an adverse incident as described in Part I D 2 must submit an annual report to the department no later than February 10 of the following year (and retain a copy for the operator's records).

(2) The annual report must contain the following information:

(a) Operator's name;

(b) Contact person's name, title, email address (where available), and phone number;

(c) A summary report of all adverse incidents that occurred during the previous calendar year; and

(d) A summary of any corrective actions, including spill responses, in response to adverse incidents, and the rationale for such actions.

5. DEQ contact information and mailing addresses.

a. All incident reports under Part I D 2 must be sent to the appropriate DEQ regional office within five days of the operator becoming aware of the adverse incident.

b. All other written correspondence concerning discharges must be sent to the address of the appropriate DEQ regional office listed in Part I D 5

NOTE: The immediate (within 24 hours) reports required in Part I D 2 may be made to the department's regional office. Reports may be made by telephone, fax, or online (http://www.deq.virginia.gov/Programs/PollutionResponsePreparedness/MakingaReport .aspx). For reports outside normal working hours, leave a message, and this shall fulfill the immediate reporting requirement. For emergencies, the Virginia Department of Emergency Management maintains a 24-hour telephone service at 1-800-468-8892.

c. DEQ regional office addresses.

(1) Blue Ridge Regional Office (BRRO) 3019 Peters Creek Road
Roanoke, VA 24019
(540) 562-6700

(2) Northern Virginia Regional Office (NVRO) 13901 Crown Court
Woodbridge, VA 22193
(703) 583-3800

(3) Piedmont Regional Office (PRO) 4949-A Cox Road
Glen Allen, VA 23060 (804) 527-0
(4) Southwest Regional Office (SWRO) 355 Deadmore St.
P.O. Box 1688 Abingdon, VA 24212 (276) 676-4800
(5) Tidewater Regional Office (TRO) 5636 Southern Blvd.
Virginia Beach, VA 23462 (757) 518-2000
(6) Valley Regional Office (VRO) 4411 Early Road
P.O. Box 3000 Harrisonburg, VA 22801
(540) 574-7800

Part II
Conditions Applicable to all VPDES Permits

A. Monitoring.

1. Samples and measurements taken as required by this permit shall be representative of the monitored activity.

2. Monitoring shall be conducted according to procedures approved under 40 CFR Part 136 or alternative methods approved by the U.S. Environmental Protection Agency, unless other procedures have been specified in this permit.

3. The operator shall periodically calibrate and perform maintenance procedures on all monitoring and analytical instrumentation at intervals that will ensure accuracy of measurements.

B. Records.

1. Records of monitoring information shall include:

a. The date, exact place, and time of sampling or measurements;

b. The individuals who performed the sampling or measurements;

c. The dates and times analyses were performed;

d. The individuals who performed the analyses;

e. The analytical techniques or methods used; and

f. The results of such analyses.

2. The operator shall retain records of all monitoring information, including all calibration and maintenance records and copies of all reports required by this permit for a period of at least three years from the date that coverage under this permit expires. This period of retention shall be extended automatically during the course of any unresolved litigation regarding the regulated activity or regarding control standards applicable to the operator, or as requested by the board.

C. Reporting monitoring results. Monitoring results under this permit are not required to be submitted to the department. However, should the department request that the operator submit monitoring results, the following subdivisions would apply.

1. The operator shall submit the results of the monitoring required by this permit not later than the 10th day of the month after monitoring takes place, unless another reporting schedule is specified elsewhere in this permit. Monitoring results shall be submitted to the department's regional office.

2. Monitoring results shall be reported on a discharge monitoring report (DMR) or on forms provided, approved, or specified by the department.

3. If the operator monitors any pollutant specifically addressed by this permit more frequently than required by this permit using test procedures approved under 40 CFR Part 136 or using other test procedures approved by the U.S. Environmental Protection Agency or using procedures specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted on the DMR or reporting form specified by the department.

4. Calculations for all limitations that require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in this permit.

D. Duty to provide information. The operator shall furnish to the department, within a reasonable time, any information that the board may request to determine whether cause exists for terminating coverage under this permit or to determine compliance with this permit. The board may require the operator to furnish, upon request, such plans, specifications, and other pertinent information as may be necessary to determine the effect of the wastes from

the permittee's discharge on the quality of state waters, or such other information as may be necessary to accomplish the purposes of the State Water Control Law. The operator shall also furnish to the department, upon request, copies of records required to be kept by this permit.

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

F. Unauthorized discharges. Except in compliance with this permit, or another permit issued by the board, it shall be unlawful for any person to:

1. Discharge into state waters sewage, industrial wastes, other wastes, or any noxious or deleterious substances; or

2. Otherwise alter the physical, chemical, or biological properties of such state waters and make them detrimental to the public health, to animal or aquatic life, or to the use of such waters for domestic or industrial consumption, recreation, or other uses.

G. Signature requirements.

1. The PDMP, including changes to the PDMP to document any corrective actions taken as required by Part I D 1, and all reports submitted to the department must be signed by a person described in this subsection or by a duly authorized representative of that person described in subdivision 2 of this subsection.

a. For a corporation: by a responsible corporate officer. For the purpose of this subsection, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy-making or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions that govern the operation of the regulated activity including having the explicit or implicit duty of making major capital investment recommendations and initiating and directing

other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

c. For a municipality, state, federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this subsection, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit or the agency.

2. A person is a duly authorized representative only if:

a. The authorization is made in writing by a person described in subdivision 1 of this subsection;

b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated activity such as the position of superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. A duly authorized representative may thus be either a named individual or any individual occupying a named position; and

c. The signed and dated written authorization is included in the PDMP. A copy of this authorization must be submitted to the department if requested.

3. All other changes to the PDMP, and other compliance documentation required under this permit, must be signed and dated by the person preparing the change or documentation.

4. Any person signing documents in accordance with subdivision 1 or 2 of this subsection must include the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information contained therein. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information contained is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

H. Duty to comply. The operator shall comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the State Water Control Law and the federal Clean Water Act, except that noncompliance with certain provisions of this permit may constitute a violation of the State Water Control Law but not the Clean Water Act. Permit noncompliance is grounds for enforcement action, for permit coverage termination, or denial of permit coverage renewal.

The operator shall comply with effluent standards or prohibitions established under § 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if this permit has not yet been modified to incorporate the requirement.

I. Duty to reapply. If the operator wishes to continue an activity regulated by this permit after the expiration date of this permit, the operator must have coverage under a new permit.

J. Effect of a permit. This permit does not convey any property rights in either real or personal property or any exclusive privileges, nor does it authorize any injury to private property or invasion of personal rights, or any infringement of federal, state, or local law or regulations.

K. State law. Nothing in this permit shall be construed to preclude the institution of any legal action under, or relieve the operator from any responsibilities, liabilities, or penalties established pursuant to any other state law or regulation or under authority preserved by § 510 of

the Clean Water Act. Nothing in this permit shall be construed to relieve the operator from civil and criminal penalties for noncompliance.

L. Oil and hazardous substance liability. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the operator from any responsibilities, liabilities, or penalties to which the operator is or may be subject under §§ 62.1-44.34:14 through 62.1- 44.34:23 of the State Water Control Law.

M. Proper operation and maintenance. The operator shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the operator to achieve compliance with the conditions of this permit. Proper operation and maintenance also include effective plant performance, adequate funding, adequate staffing, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems that are installed by the operator only when the operation is necessary to achieve compliance with the conditions of this permit.

N. Disposal of solids or sludges. Solids, sludges, or other pollutants removed in the course of treatment or management of pollutants shall be disposed of in a manner so as to prevent any pollutant from such materials from entering state waters.

O. Duty to mitigate. The operator shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

P. Need to halt or reduce activity not a defense. It shall not be a defense for an operator in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

Q. Inspection and entry. The operator shall allow the director, or an authorized representative (including an authorized contractor acting as a representative of the director), upon presentation of credentials and other documents as may be required by law, to:

1. Enter upon the operator premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

4. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act and the State Water Control Law, any substances or parameters at any location.

For purposes of this section, the time for inspection shall be deemed reasonable during regular business hours or whenever the facility is discharging. Nothing contained herein shall make an inspection unreasonable during an emergency.

R. Permit actions. Permit coverage may be terminated for cause. The filing of a request by the operator for a permit termination or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

S. Transfer of permit coverage. Permits are not transferable to any person except after notice to the department. The transfer of permit coverage under this pesticide general permit is not anticipated since coverage is automatic where an operator meets the permit eligibility requirements.

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

Statutory Authority

§ 62.1-44.15 of the Code of Virginia; § 402 of the federal Clean Water Act.

Historical Notes

Derived from Virginia Register Volume 27, Issue 26, eff. October 31, 2011; amended, Virginia Register Volume 30, Issue 4, eff. January 1, 2014; Volume 35, Issue 11, eff. March 1, 2019.

Virginia
Administrative
Code Title 9.
Environment
Agency 25. State Water Control Board
Chapter 800. Virginia Pollutant Discharge Elimination System (VPDES) General Permit Regulation for Discharges Resulting from the Application of Pesticides to Surface Waters

9VAC25-800-30. Authorization to Discharge.

A. Any operator that meets the eligibility requirements in subsection B of this section is hereby authorized for his discharges resulting from the application of pesticides to surface waters of the Commonwealth of Virginia.

The definition of operator in 9VAC25-800-10 provides that more than one person may be responsible for the same discharge resulting from pesticide application. Any operator authorized to discharge under this general permit is responsible for compliance with the terms of this permit for discharges resulting from the application of pesticides.

B. Eligibility. This permit is available to operators who discharge to surface waters from the application of (i) biological pesticides, or (ii) chemical pesticides that leave a residue (pesticides), when the pesticide application is for one of the following pesticide use patterns:

1. Mosquito and other flying insect pest control - to control public health, nuisance and other flying insect pests that develop or are present during a portion of their life cycle in or above standing or flowing water.

2. Weed and algae pest control - to control weeds, algae, and pathogens that are pests in surface waters.

3. Animal pest control - to control animal pests in surface waters.

4. Forest canopy pest control - application of a pesticide to the forest canopy to control the population of a pest species (e.g., insect or pathogen) where to target the pests effectively, a portion of the pesticide unavoidably will be applied over and deposited to surface water.

5. Intrusive vegetation pest control - to control vegetation along roads, ditches, canals, waterways, and utility rights of way where to target the intrusive pests effectively, a portion of the pesticide unavoidably will be applied over and deposited to surface water.

C. Operators applying pesticides are required to maintain a pesticide discharge management plan (PDMP) if they exceed the annual calendar year treatment area thresholds in Table 1 of this subsection:

Table 1. Annual Treatment Area Thresholds

Pesticide Use	Annual Threshold
Mosquito and Other Flying Insect Pest Control	6400 acres of treatment area[1]
Weed and Algae Pest Control	80 acres of treatment area[1] or 20 linear miles of treatment area[2]
Animal Pest Control	80 acres of treatment area[1] or 20 linear miles of treatment area[2]
Forest Canopy Pest Control	6400 acres of treatment area[1]
Intrusive Vegetation Pest Control	6400 acres of treatment area[1] or 20 linear miles of treatment area[2]

[1]Calculations include the area of the applications made to: (i) surface waters and (ii) conveyances with a hydrologic surface connection to surface waters at the time of pesticide application. For calculating annual treatment area totals, count each pesticide application activity as a separate activity. For example, applying pesticides twice a year to a 10-acre site is counted as 20 acres of treatment area.

[2]Calculations include the extent of the application made to linear features (e.g., roads, ditches, canals, waterways, and utility rights of way) or along the water's edge adjacent to: (i) surface waters and (ii) conveyances with a hydrologic surface connection to surface waters at the time of pesticide application. For calculating annual treatment totals, count each pesticide application activity or area as a separate activity. For example, applying pesticides twice a year to a one mile linear feature (e.g., ditch) equals two miles of treatment area regardless of whether one or both sides of the ditch are treated. Applying pesticides twice a year along one mile of lake shoreline equals two miles of treatment area.

D. An operator's discharge resulting from the application of pesticides is not authorized under this permit in the event of any of the following:

1. The operator is required to obtain an individual VPDES permit in accordance with 9VAC25-31-170 B 3 of the VPDES Permit Regulation.

2. The discharge would violate the antidegradation policy stated in 9VAC25-260-30 of the Virginia Water Quality Standards. Discharges resulting from the application of pesticides are temporary and allowable in exceptional waters (see 9VAC25-260-30 A 3 (b) (3)).

3. The operator is proposing a discharge from a pesticide application to surface waters that have been identified as impaired by that pesticide or its degradates. Impaired waters include both impaired waters with board-adopted, EPA-approved or EPA-imposed TMDLs, and impaired waters for which a TMDL has not yet been approved, established, or imposed.

If the proposed discharge would not be eligible for coverage under this permit because the surface water is listed as impaired for that specific pesticide, but the applicant has evidence that shows the water is no longer impaired, the applicant may submit this information to the board and request that coverage be allowed under this permit.

E. Discharge authorization date. Operators are not required to submit a registration

statement and are authorized to discharge under this permit immediately upon the permit's effective date of March 1, 2019.

F. Compliance with this general permit constitutes compliance with the federal Clean Water Act (33 USC § 1251 et seq.) and the State Water Control Law with the exceptions stated in 9VAC25-31-60 of the VPDES Permit Regulation. Approval for coverage under this VPDES general permit does not relieve any operator of the responsibility to comply with any other applicable federal, state, or local statute, ordinance, or regulation. For example, this permit does not negate the requirements under FIFRA and its implementing regulations to use registered pesticides consistent with the product's labeling. It also does not negate the requirement to fully comply with applicable state wetland program requirements administered by DEQ and the Virginia Marine Resources Commission.

G. Continuation of permit coverage.

1. This general permit shall expire on February 29, 2024, except that the conditions of the expired pesticides general permit will continue in force for an operator until coverage is granted under a reissued pesticides

general permit if the board, through no fault of the operator, does not reissue a pesticides general permit on or before the expiration date of the expiring general permit.

2. General permit coverages continued under this section remain fully effective and enforceable.

3. When the operator that was covered under the expiring or expired pesticides general permit is not in compliance with the conditions of that permit, the board may choose to do any or all of the following:

a. Initiate enforcement action based upon the pesticides general permit that has been continued;

b. Issue a notice of intent to deny coverage under a reissued pesticides general permit. If the general permit coverage is denied, the operator would then be required to cease the activities authorized by the continued general permit or be subject to enforcement action for operating without a permit;

c. Issue an individual permit with appropriate conditions; or

d. Take other actions authorized by the VPDES Permit Regulation (9VAC25-31).

Statutory Authority

§ 62.1-44.15 of the Code of Virginia; § 402 of the federal Clean Water Act.

Historical Notes

Derived from Virginia Register Volume 27, Issue 26, eff. October 31, 2011; amended, Virginia Register Volume 30, Issue 4, eff. January 1, 2014; Volume 35, Issue 11, eff. March 1, 2019.

APPENDIX T:

Virginia Pollutant Discharge Elimination System (VPDES)
Pesticide General Permit – VAG87

Fort Eustis Pesticide Discharge Management Plan (PDMP)

Virginia Pollutant Discharge Elimination System (VPDES)
Pesticide General Permit – VAG87
Pesticide Discharge Management Plan (PDMP)

Company Name: Joint Base Langley-Eustis 733 MSG CED AMF Environmental Element

Address: 1407 Washington Boulevard

City: Fort Eustis State: Virginia Zip: 23604-5332

Phone: (757) 878-4231

Email: timothy.p.christensen.civ@mail.mil

Section 1 - Pesticide Discharge Management Team

1	Name: Tim Christensen Title: Chief, Natural Resources & IPM Branch/ Installation Pest Management Coordinator
	Responsibilities include:
x	Managing pests in relation to the pest management area *(includes applying pesticides)*
x	Developing and revising the PDMP
x	Developing, revising and implementing control measures to meet effluent limits
x	Developing, revising and implementing corrective actions during adverse incidents
x	Surveillance and monitoring pest populations, identifying pests.
x	Implement IPM control measures when required.

2	Name: Mike Parise Title: BOS Contractor Pest Management Technician
	Responsibilities include:
x	Managing pests in relation to the pest management area (includes applying pesticides).
x	Providing input to the IPMC in developing and revising the PDMP.
x	Developing, revising and implementing control measures to meet effluent limits.
x	Developing, revising and implementing corrective actions during adverse incidents.

3	Name: Jacob Adams Title: Pines Golf Course Maintenance Superintendent
	Responsibilities include:
x	Managing pests in relation to the pest management area *(includes applying pesticides)*.
x	Providing input to the IPMC in developing and revising the PDMP.

x	Developing, revising and implementing control measures to meet effluent limits.
x	Developing, revising and implementing corrective actions during adverse incidents.

4	Name: Keith Banks Title: BOS Contractor Pest Management Technician
	Responsibilities include:
x	Managing pests in relation to the pest management area *(includes applying pesticides)*
x	Providing input to the IPMC in developing and revising the PDMP.
x	Developing, revising and implementing control measures to meet effluent limits
x	Developing, revising and implementing corrective actions during adverse incidents

Section 2 – Pest Management Area Description

Pest Problem Description

x	**Mosquito and other flying insect pest control** - to control public health/nuisance and other flying insect pests that develop or are present during a portion of their life cycle in or above standing or flowing water.
x	**Weed, algae and pathogen control** – to control invasive or other nuisance weeds, algae and pathogens in surface water and wetlands.
x	**Forest insect pest control –** to control arthropods that could are destructive of forested areas.

General Description of Application Site(s)

2,784 acres of forested land; 3,600 acres of wetlands; Fort Eustis Lake; Browns Lake; James River Shoreline; Warwick River Shoreline; Pines Golf Course.

Target Pest(s):

MOSQUITOES. Includes any species of the following genera: *Aedes, Anopheles, Culex, Coquillettidia, Culiseta, Ochlerotatus, Orthopodomyia, Psorophora* and *Uranotaenia.*

Source of the Pest Problem

There are several species of mosquitoes that breed and thrive on Fort Eustis. Several of the species are considered medically important and the remaining are considered nuisance pests. All active species identified on Fort Eustis rely on the various storm drains, ditches, wetlands, tidal pools and salt marshes to breed. Due to the vast areas that provide excellent breeding habitat, the efforts to control the various species continues to be a daily, weekly or monthly occurrence during the peak season, April through November, annually.

Action Thresholds

- 15 females per trap night = Resting Site Barrier Treatment
- 25 females per trap night = Area Fogging 2-3 times per week
- 35 females per trap night = Implement increased ground operations.
- 45 females per trap night, if ground control is not successful, or presence of any human health risk = Aerial Treatment

Target Pest(s):

UNDESIRABLE AND INVASIVE PLANTS. Invasive plants include Common Reed (*Phragmites australis*), Tree of Heaven (*Ailanthus altissima*), Chinese Privet (*Ligustrum sinense*), Autumn Olive (*Elaeagnus umbellate*), Mimosa tree (*Albizia julibrissin*), Beef Steak Plant (*Perilla frutescens*), Kudzu (*Pueraria lobata*), Japanese Stiltgrass (*Microstegium vimineum*), Japanese Honeysuckle (*Lonicera japonica*), Princess Tree (*Paulownia tomentosa*), Paper Mulberry (*Broussonitia papyrifera*), Field Bind Weed (*Convolvulus arbensis*), Common Periwinkle (*Vinca minor*), Golden Bamboo (*Phyllostachys aurea*), Shrubby Bushclover (*Lespedeza bicolor*), Chinese lespedeza (*Lespedeza cuneata*), English Ivy (*Hedera helix*), Multiflora Rose (*Rosa multiflora*), Tall Fescue (*Festuca arundinacea*), Johnsongrass (*Sorghum halepense*), Chinaberry (*Melia azedarach*) and Thorny Olive (*Elaeagnus pungens*). Undesirable plants may include any of the above invasive plants but may also include native plants that adversely impact mission requirements or management of natural resources which could include woody plants such as (but not limited to) loblolly pine (*Pinus taeda*), sweet gum (*Liquidambar styraciflua*) and red maple (*Acer rubrum*). Plants may be aquatic species or may be upland species in or near an aquatic system interface. These may also include woody or herbaceous plants of various species occurring along rights-of-way such as the installation rail line, roads, parking lots, fencing, motorpools and sidewalks as well as in/on turf grasses and ornamentals at the Pines Golf Course and landscaped areas.

Source of the Pest Problem

An invasive species is identified as a foreign species whose introduction does, or is likely to, cause economic or environmental harm or harm to human health. Invasive plants infest areas reducing the ecological balance, and increasingly degrade diversity and wildlife habitat as well as impacting the military mission. Some were introduced into the US accidentally but most were brought here as ornamentals and were intentionally released. Invasive plants are robust and have no natural control organisms or systems. They increase across the landscape with little opposition. Native plants may also be undesirable based on their biology and location that create safety issues, adversely affect natural habitats or impact mission requirements in other ways.

Action Thresholds

Results of an assessment performed to determine which invasive or undesirable (native or non-native) plant species are having a negative impact on training and/or natural areas of Fort Eustis and which species should be targeted for management. Thresholds in the form of priority have been identified within the Fort Eustis Integrated Natural Resources Management Plan (INRMP) and the Fort Eustis Invasive Species Management Plan which exists as an annex to the INRMP.

General Service Area Map(s) –

Aquatic habitats on Fort Eustis include the lower James and Warwick rivers, Eustis Lake and Brown's Lake, Skiffes Creek, Bailey Creek; and numerous unnamed creeks and ponds. The shallow coves of Eustis Lake are characterized primarily as lacustrine wetland communities dominated by emergent species; however, there are a few coves that are dominated by stands of bald cypress. An upland community of mixed hardwood-pine forests surrounds the lake. Brown's Lake has little emergent vegetation and is surrounded by shrubs. Uplands on the western and northern sides are vegetated with mixed hardwood-pines, and parkland is to the east. The drainage on the southern end flows through a riparian woodland and into a tidal marsh prior to entering the Warwick River waters. Refer to figure 2.1.

Figure 2.1: General Service Area.

Target Pest(s):

FOREST INSECT PESTS. Bark and ambrosia beetles (Curculionidae: Scolytinae), longhorned beetles (Cerambycidae), jewel beetles (Buprestidae), and weevils and pinhole borers (Curculionidae), Sirex woodwasp (*Sirex noctilio*), beech scales (*Cryptococcus fagisuga*), beech blight aphids (*Grylloprociphilus imbricator*), and gypsy moth (*Lymantria dispar*).

Source of the Pest Problem
Various native and potentially invasive forest insect species can adversely affect the health of forested areas. Their affects may be the result of outbreaks or recent establishment of species not previously observed. Some species are generalist feeders while others may be host-specific. Some forested areas are upland while others constitute forested wetlands/ephemeral pools or certain potentially affected trees may occur in either uplands or wetlands, or along riparian corridors.

Action Thresholds
Pest control strategies for forest pests will be based on monitoring for the related pests.

Section 3 –Schedules and Procedures for Minimizing Pesticide Discharges (Control Measures to Meet Effluent Limits)

Roles and Responsibilities:

A. The Installation Pest Management Coordinator (IPMC) and the Pest Management Quality Assurance Evaluator (PMQAE) will ensure that all personnel, including contractors, performing pest management operations will be accredited, trained, and certified in the appropriate Environmental Protection Agency (EPA) categories.

B. DoD Pest Management Personnel, Pest Control Contractors, and all Pesticide Applicators will ensure that their accreditation, training, and certifications are current for the appropriate EPA category of the pest management operations prior to performing the operation (refer to table 1).

C. Pest Management Program requirements are governed by several laws and regulations including Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA); Federal Environmental Pesticide Control Act (FEPCA); Federal Pesticide Act (FPA); Clean Water Act (CWA); Endangered Species Act (ESA); National Environmental Policy Act (NEPA); Occupational Safety and Health Act (OSHA); DoD 4150.07, DoD Pest Management Program; DoD Pest Management Measures of Merit; AFMAN 32-1053, Integrated Pest Management Program; Virginia Pest Control Act; JBLE-I 32-101, Environmental Management.

DoD Category	Virginia State Equivalent and Number
2 Forest	Forest Pest Control (2)
3 Ornamental and Turf	Ornamental Pest Control (3A), Turf Pest Control (3B)
5 Aquatic Plant and Animal	Aquatic Pest Control (5A)
6 Right-of-Way	Right-of-Way Pest Control(6)
7 Industrial, Institutional, Structural and Health-Related	General Pest Control (7A), Vertebrate Pest Control (Excluding Structural Invaders) (7D), Wood Destroying Pest Control (7B)
8 Public Health	Public Health Pest Control (8)
11 Aerial	Aerial Pesticide Application (11)

Table 1: DoD and VDACS Pest Management Certification Categories

Supporting Documentation

- **A.** JBLE 32-101 Environmental Management and supporting EMPs.
- **B.** Fort Eustis Integrated Pest Management Plan.
- **C.** Applicator Certification Spreadsheet and hardcopies of certifications.
- **D.** Monthly Pesticide Management Reports.

Integrated Pest Management (IPM) That Will Be Used *(check all that apply*).

x	Properly identify the pest.
x	If necessary consult with local Cooperative Extension, Virginia Tech or Department of Agriculture and Consumer Services pest management specialists regarding pest management principals and techniques.
x	Regularly monitor pest populations.
x	Utilize non-pesticide control methods where feasible.
x	Other procedures as described below.

IPM Control Methods That Will Be Used *(Check all that apply and explain method used and, if unchecked, why a method is not feasible. Note: No explanation is needed for pesticides to be used because further description follows later in this document.)*

x	No Action: Survey/monitoring results determine there is no target pest present.
x	Prevention: Sound surveillance/monitoring techniques and public awareness
x	Mechanical/Physical: • Physical Control: Use of energy factors in the environment such as heat, cold, light, water management (including diversion and draining), etc to kill or attract pest to a killing mechanism. • Mechanical Control: Removing pest by hand or using mechanical devices to trap, kill, or exclude. (burning, mowing, and harvesting) (light traps, sticky, pheromone, and other traps).
x	Cultural: Modifications of management practices that make the environment less favorable to pest reproduction, dispersal, and survival.
x	Biological: Reduction of pest populations by using living organisms (insects, vertebrate organisms, and/or pathogens) encouraged by man.
x	Regulatory Control: Use of regulations and laws in areas to eradicate, prevent, or control infestations or reduce damage by pests.

IPM Roles and Responsibilities, and Implementation:

A. The Installation Pest Management Coordinator (IPMC) and the Pest Management Quality Assurance Evaluator (PMQAE) will ensure the implementation and maximization of IPM.

B. All DoD staff and contractor pest control/pesticide applicators will use all appropriate technological and management techniques that bring about an effective degree of pest prevention and suppression in a safe, cost effective, and environmentally sound manner.

C. IPM will be implemented consisting of the following criteria:

(1). Regulatory compliance.
(2). Reduce cost of pest control.
(3). Reduce pest resistance to pesticides.
(4). Reduce pesticide residues.
(5). Limit pest recurrence.
(6). Controls secondary pests.
(7). Reduce hazard to pesticide applicators and non-target organisms.

IPM Procedures.

A. The following considerations will be examined before implementing the control measure:

(1). Is there a pest problem?
(2). Where does the problem exist?
(3). When did the problem occur?
(4). What is the Damage/Economic Threshold of the problem and the proposed control?
(5). Is the control practical or cost effective?
(6). Is the pest or control method the least disruptive?
(7). What is the ease of implementing the control measure?
(8). Will control be temporary or permanent?

B. IPM will consist of the following components:

(1). Pest and potential problem surveillance.
(2). Monitor for pest activity.
(3). Establish thresholds.
(4). Accurate record keeping.
(5). Least toxic treatments first.
(6). Monitor and Evaluate success.
(7). Education.

C. Surveillance and Monitoring will be utilized for all pest control operations and will include the following:

(1). Interviewing customers/affected parties.
(2). Perform physical inspection of area involved.
(3). Use monitoring tools (sticky traps, glue boards, etc.).

D. Control Measures. Consideration of all applicable control measures will be made. The following measures will be considered:

(1). Cultural Control: Modifications of management practices that make the environment less favorable to pest reproduction, dispersal, and survival.
(2). Physical Control: Use of energy factors in the environment such as heat, cold, light, water management (including diversion and draining), etc to kill or attract pest to a killing mechanism.
(3). Mechanical Control: Removing pest by hand or using mechanical devices to trap, kill, or exclude. (burning, mowing, and harvesting) (light traps, sticky, pheromone, and other traps).

(4). Biological Control: Reduction of pest populations by using living organisms (insects, vertebrate organisms, and/or pathogens) encouraged by man.
(5). Regulatory Control: Use of regulations and laws in areas to eradicate, prevent, or control infestations or reduce damage by pests.
(6). Chemical Control: Use of pesticides, when all other control measures have proven unsuccessful, to achieve control of a target pest.

Pesticides

Information on pesticide application, spill prevention, equipment maintenance, and pest surveillance methods that will be used is provided here **(***check all that apply).*

x	Pest surveillance is conducted or environmental conditions are assessed that can no longer be tolerated based on economic, human health, aesthetic or other effects, prior to pesticide application.
x	Pesticides are applied when action thresholds are met.
x	Most susceptible developmental stage (e.g., larvicides) considered and used when practical and feasible (if applicable).
x	Environmental conditions are assessed (temperature, precipitation, wind) prior to application.
x	When necessary consult with local Cooperative Extension and Department of Agriculture pest management specialists.
x	Use the lowest effective amount of pesticide per application and optimum frequency of pesticide applications necessary to control the target pest consistent with reducing the potential for development of pest resistance.
x	Read and comply with pesticide labeling.
x	Mix and apply the pesticide according to pesticide labeling.
x	Perform regular maintenance activities to reduce leaks, spills, or other unintended discharges of pesticides.
x	All pesticide application equipment is properly equipped to dispense the proper amount of material.
x	All mixing, storage, or holding tanks are leak proof, whether on application equipment or not.
x	All spray distribution systems are leak proof, and any pumps that these systems have are capable of operating at sufficient pressure to assure a uniform and adequate rate of pesticide application.
x	All pesticide application equipment has cut-off valves and discharge orifices to enable the operator to pass over non-target areas.
x	All hoses, pumps or other equipment used to fill pesticide handling, storage or application equipment is fitted with an effective valve or device to prevent back flow into water supply systems, streams, lakes, other sources of water, or other materials.[7]
x	Inspect all application equipment including hoses, tanks, nozzles, and valves before each application.
x	Replace or repair broken or worn application equipment per manufacturers guidelines.
x	Maintain pesticide application equipment in proper operating condition which includes proper cleaning, repairing, and calibration.
x	Individuals on the PDMP team have attended pesticide applicator training or continuing education programs.

Describe the Schedule and Procedure for Determining the Proper Pesticide Application, Spill Prevention, Equipment Maintenance and Pest Surveillance That Will Be Used:

Proper Pesticide Application.
All pesticides used on Fort Eustis must be approved for use on the installation prior to their actual application. Such pesticides must be authorized for use in Virginia and exist on the most current approved pesticide list. Apply pesticides consistent with pesticide label requirements (**Label is the law**). Select appropriate pesticide application equipment for required pest control operation. Generally, use a powered sprayer when 10 or more gallons of formulated pesticide must be applied. Implement procedures to prevent any off-target pesticide applications. Use direct sprays instead of misting to provide area control when uniform coverage (gallons per acre) is required.

Calibration of application equipment is crucial. For every pesticide application, there is a strong possibility for misapplication if equipment is not calibrated. Misapplication of pesticide is a label (and EPA) violation, and could result in termination of employment as a Pest Controller. Insure nozzles and sprayers are thoroughly clean before calibrating. Besides calibrating application equipment output, knowledge of the treatment site (square feet, cubic feet or acres) is critical for insuring pesticides are not over applied or an excessive quantity of pesticide is formulated. Measure the area to be treated. Insure no more pesticide is formulated than what is needed to treat the area requiring control.

In accordance with Part I A.1 of the VPDES Pesticide General Permit, all pesticide products applied through JBLE 733 MSG CED AMF EE are to be used at "the lowest effective amount of pesticide product per application and optimum frequency of pesticide applications necessary to control the target pest, consistent with reducing the potential for development of pest resistance without exceeding the maximum allowable rate of the product label." Before any product mixing takes place all operators must first read the respective specimen label of the {pesticide, herbicide, insecticide, etc.…} in which they plan to apply, specifically focusing on the target species and treatment applications being implemented. The following spray solution guidelines should be strictly adhered to during all application processes:

Product Name	*Active Ingredient*	*Controlled Species*	*Percent Solution Used (Note – proprietary information is not required, including percentages that are considered proprietary.)*	*Volume Product Used Per Gallon*
Agnique MMF Mosquito Larvicide	*Poly-isooctadecyl-hydroxyl*	*Mosquito*	*100.0%*	*1.0 gallons per acre of water surface*
Altosid Briquets	*Methoprene*	*Mosquito*	*8.62%*	*1 briquet per 100 square feet of water surface area*
Anvil 2+2	*Pyrethrin*	*Mosquito*	*4.0% (no diluents)*	*3.0 oz. per acre*
Aqua-Reslin	*Permethrin*	*Mosquito*	*40.0% (no diluents)*	*0.0015 pounds per acre*

Dibrom Concentrate	*Naled*	*Mosquito*	*87.4% (undiluted)*	*1 fl. oz. per acre*
Trumpet	*Naled*	*Mosquito*	*78% (undiluted)*	*0.6 to 1.2 fl. oz. per acre*
Flit 10 EC	*Permethrin*	*Mosquito*	*10.0%*	*6.5 oz. per gallon*
Permanone 10% EC	*Permethrin*	*Mosquito*	*10.0%*	*1.3 oz. per gallon*
Vectobac G Biological	*Bacillus Thuringiensis*	*Mosquito*	*2.80%*	*2.5 pounds per acre*
Habitat	*Isopropylamine salt of imazapyr*	*Invasive Plants*	*0.75%*	*0.96 oz. per gallon*
Rodeo	*Glyphosate*	*Invasive Plants*	*2.0%*	*2 2/3 oz. per gallon*
Polaris	*Isopropylamine salt of imazapyr*	*Invasive Plants*	*0.75%*	*0.96 oz. per gallon*
Reward	*Diquat Dibromide*	*Invasive Plants*	*1.0%*	*1 gallon per acre of water with 4 foot average depth*
Aquashade	*Acid Blue* *Acid Yellow*	*Invasive Plants*	*2 ppm* *2 ppm*	*2 gallons per acre of water with 4 foot average depth*

In the event that these solutions are not adequately controlling the target species, the concentration of the solution may need to be increased only after the specimen label has been checked to ensure the maximum allowable rate of the product is not exceeded and MODIFICATION of this document indicating the concentration of the solution increase. If the target species is showing signs of resistance, an alternative chemical should be investigated and used during the next application. Whenever possible, alternative chemicals should be used for sites being treated on multiple occasions in order to decrease the chances of pest resistance and unnecessary chemical residues.

Spill Prevention.

All mixing and storage of pesticides will be performed at the designated pesticide mixing and storage facility. Currently, only BLDG 1422 (CED BOS contract Pest Control Shop) and BLDG 3515 (The Pine Golf Course maintenance facility) are the authorized pesticide storage (and pesticide mixing) facilities for actual pest control operations. BLDG 1386 (AAFES/Post Exchange/Base Exchange) may store pesticide products intended for sale. Pesticide equipment will be well maintained to manufacturer's specifications. All equipment prior to use will be inspected for operational readiness. Any equipment found deficient will be placed in a non operational status and must be serviced prior to being placed back into use.

Equipment Maintenance.
All shop equipment and vehicles are expected to be maintained in a clean and operable condition. Operators will immediately report to shop Supervisor any equipment that is defective or inoperable and operator will tag equipment as non-operational. The operator tagging the equipment non-operational, after adequate repairs will then certify the equipment as operational by removing the non-operational tag. Maintaining clean equipment is critical in presenting a professional image and preventing off-target pesticide contamination. Equipment will be inspected prior to every use. During the winter season equipment will be maintained and preparations made to ensure proper operation of equipment during peak season.

Pest Surveillance.
All pests will be properly identified and pest infestations will be surveyed to ensure the appropriate control measures required and to validate any pesticide usage. Pest specimens will be delivered to Environmental Element (733MSG CED) Conservation Branch for identification (BLDG 1409).

Spill and Adverse Incident Response Procedures

x	Immediately report the spill (no matter how small) to Fire Department at 757-878-1008 or at 911.
x	If safe to do so STOP the release.
x	If safe to do so, control, contain (using absorbents, booms, and pads), and clean up the spill immediately.
x	Secure the area, keeping the public and others out of the spill area.
x	The Environmental Element reports adverse incidents immediately to the National Response Center and to DEQ by telephone (see table below).
x	Provide written adverse incident report within five days to DEQ (see table below).
x	Fire & Emergency Services will in emergency situations, contact the VA Dept of Emergency Management (see table below).
x	Natural Resource Manager will report adverse incidents to threatened and endangered species immediately to additional federal/state agencies (see table below).
x	Fire & Emergency Services will provide written spill report within five days to DEQ (see table below).
x	Implement spill response IAW JBLE 32-101 Environmental Management.

Complete the Emergency Phone Number List and Post in a Readily Accessible Location

Agency	Phone Number/Web
National Response Center	1-800-424-8802
VA Dept of Environmental Quality (DEQ)	http://www.deq.state.va.us/prep/h2rpt.html Tidewater Regional Office (TRO) 5636 Southern Blvd Virginia Beach, VA 23462 757-518-2000
Virginia Department of Emergency Management	For emergencies only 1-800-468-8892 (24-hour hotline)
VA Department of Agriculture and Consumer Services	No VDACS reporting is required for this permit unless it is for endangered or threatened plants or insects (below); HOWEVER, you might need to contact VDACS under their regulations or FIFRA requirements.
Nearest Medical Facility	McDonald Army Medical Facility
733 MSG CED F&E Flight	648 Washington Blvd JBLE Fort Eustis, VA 23604 757-878-1008
733d Security Forces Squadron Desk	648 Washington Blvd JBLE Fort Eustis, VA 23604 757-878-4555
733 MSG CED Environmental Element	1407 Washington Blvd JBLE Fort Eustis, VA 23604 757-878-4123
Additional Phone Numbers When Adverse Incidents Occur to Threatened or Endangered Species	
VA Dept of Game and Inland Fisheries (when aware of adverse incidents to endangered or threatened anadromous fish, other animal or invertebrate species)	(804) 367-6913 collectionpermits@dgif.virginia.gov
National Marine Fisheries Service (when aware of adverse incidents to endangered or threatened anadromous or marine species)	NOAA OLE Hotline 1-800-853-1964
U.S. Fish and Wildlife Service (when aware of adverse incidents to endangered or threatened animal, invertebrate, insects or plants)	USFWS Law Enforcement (804) 771-2883 VA Field Office (804) 693-6694
VA Dept of Agriculture and Consumer Services (when aware of adverse	(804) 786-3515

incidents to endangered or threatened plants or insects)	
733d Security Forces Squadron Desk	648 Washington Blvd JBLE Fort Eustis, VA 23604 757-878-4555
733 MSG CED AMF Environmental Element	1407 Washington Blvd JBLE Fort Eustis, VA 23604 757-878-4123

The Process, Schedule, and Site Selection For Monitoring Includes *(check all that apply).*

☐	Visual monitoring for possible and observable adverse incidents including but not limited to the unanticipated death or distress of non-target organisms and disruption of wildlife habitat, recreational, or municipal water use (to be conducted before, during, and after pesticide applications, if feasible).
x	Monitoring includes visual counts and/or photos and surveys if an adverse incident occurs or non-target organisms are affected.
x	Visual monitoring occurs during post-application surveillance or efficacy checks.
☐	Monitoring sites are selected based on pesticide application locations, human population, pest sightings, pest population, and environmental conditions.
☐	Other procedures and processes as described below.

List the Name of the Pesticide(s) Used and the Active Ingredient(s).

Pesticide Name	Active Ingredient
Agnique MMF Mosquito Larvicide	Poly-isooctadecyl-hydroxyl (100%)
Altosid Briquets	Methoprene (8.62%)
Anvil 2+2	Pyrethrin (2%)
Aqua-Reslin	Permethrin (20%)
Dibrom Concentrate	Naled (87.4%)
Trumpet	Naled (78%)
FLIT 10 EC	Permethrin (10%)
Permanone 10% EC	Permethrin (10%)
Vectobac G Biological	Bacillus Thuringiensis (0.2%)
Habitat	Isopropylamine salt of Imazapyr (28.7%)
Polaris	Isopropylamine salt of Imazapyr (53.1%)
Reward	Diquat Dibromide (37.3%)
Rodeo	Glyphosate (53.8%)
Aquashade	Acid Blue (23.63%); Acid Yellow (2.39%)

Pesticide Discharge Management Plan (PDMP) Modifications

Modification to the PDMP will occur whenever necessary to address any of the triggering conditions for corrective action in Part I D 1 of the Pesticide General Permit or when a change in pest control activities significantly changes the type or quantity of pollutants discharged. Changes to the PDMP must be made before the next pesticide application that results in a discharge to surface water, if practicable, or if not practicable, as soon as possible thereafter. A new signature and date must be added to the revised PDMP.

All operators shall also review the PDMP at a minimum once per calendar year and whenever necessary to update the pest problem identified and pest management strategies evaluated for the pest management area.

A copy of the current PDMP, along with all supporting maps and documents will be retained. The PDMP and supporting information will be made available to the Department of Environmental Quality upon request.

Signature Section Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information contained therein. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information contained is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations.

_____ _____

Signature of Responsible Party **Date**

_____

Position/Title

APPENDIX U:

Pesticide Disposal

PESTICIDE DISPOSAL. All BOS Contract Pest Control Shop and The Pines Golf Course personnel shall be trained in the disposal of hazardous and non-hazardous (regulated) wastes.

1. Concentrated Pesticide Formulations. Unless otherwise directed, all pesticide concentrates will be used only for their intended purpose. Concentrates that are excess, unserviceable or those whose EPA registration has been suspended or cancelled will be disposed of in accordance with the directives given or through DRMO, Cheatham Annex for distribution, sale or disposal. Those concentrates awaiting disposal will be stored in an approved pesticide storage facility (Buildings 1422 [CED BOS Contract Pest Shop] or 3515 [The Pines Golf Course Maintenance Facility]). Concentrates awaiting disposition will be monitored for rust, leaks, etc. and repackaged when necessary with appropriate labeling as to contents and precautions.

2. Formulated Pesticides. Appropriate planning will be taken and mathematical calculations performed to assure that only the proper amount of chemical will be mixed to complete the assigned work. Equipment used to disperse pesticides will be inspected and calibrated to ensure proper operation and uniform coverage during the application of pesticides. All formulated pesticide shall be applied to the designated sites. If any mixture remains due to equipment failure, it will be containerized and/or transferred to another sprayer and applied as soon as possible. Any remaining formulated pesticide will be used as diluent for subsequent spray operations using the same concentration or formulation appropriately to ensure the correct concentration. Small quantities of formulated liquid pesticides, such as the residue remaining in hoses and booms of power sprayers, will be discharged into the wastewater filtration system.

3. Rinsates. Rinsates from triple rinsing concentrated pesticide containers will be immediately added to spray tank as part of pesticide formulation. Wastewater generated from cleaning pesticide application equipment will be discharged into the wastewater holding tank. Wastewater will be then used as a diluent for subsequent spraying operations. Wastewater shall not be used to control pests in and around buildings and sensitive plants.

4. Leakage Residues and Large Spills: Pesticide spills can best be reduced and prevented by taking precautionary measures such as adequate storage facilities, frequent inspection of facility, equipment and pesticide and other hazard s material containers, and maintaining emergency spill clean-up kits. Procedures to follow for prevention and response to spills are outlined in AFPMB Technical Information Memorandum 15, Pesticide Spill Prevention and Management. The Pest Control Shop Pollution Prevention Plan and the Fort Eustis Spill Response Plan provides addition guidance in spill response. Additionally, Pest Control Shop personnel will comply with the Hazardous Waste Operations and Emergency Response (HazWOPER) Standard for first responders at a spill site involving a hazardous material. Buildings 1422 and 3515 were both designed specifically for pesticide storage and mixing. Large spills of concentrated material are

contained within the storage area by a three inch lip around the base of the walls and floor. Drains in the indoor and outdoor mixing rooms lead to the containment area in the wastewater filtration room. The pesticide storage room does not have any drains. Pesticide storage and mixing rooms and pest control vehicles are equipped with spill kits. The Pest Control Shop pest controllers are equipped with radios in the event of a pesticide spill at remote sites. All contaminated materials, including cloth, soil, wood, etc., that cannot be effectively decontaminated, will be removed and placed in sealed leak-proof containers. All containers will be properly labeled and disposed of through the Hazardous Waste Accumulation Facility.

5. Empty Pesticide Containers: Empty pesticide containers are disposed of in accordance with pesticide label guidance. Empty aerosol containers of pesticides and other hazardous materials are collected and transported to the Hazardous Waste Accumulation Facility for final disposition.

APPENDIX V:

Possible But Unconfirmed Arthropod Bites

Possible But Unconfirmed Arthropod Bites

1. External symptom/lesion: Welt, rash, itching, other: _____.

2. Location of body: _____.

3. When did bite occur: _____.

4. Was an arthropod observed inflicting the bite: Yes ____ No ____.

5. Specimen collected: Yes _____ No _____.

6. Photo of arthropod: Yes _____ No _____.

7. Other persons bitten _____.

8. Facility/location/room number:
_____.

9. Infestation by possible host species (birds, bats, squirrels, other):
_____
_____
_____.

10. Pets at the location:
_____.

11. Age of BLDG/facility: _____ General condition:
_____.

A/C: _____ A/C condition:
_____.

Heating: _____ Heating condition:
_____.

Bay doors: _____ Remain open?
_____.

12. Possible environmental contaminants (paper fibers, dust, ventilation, dry air, static electricity, odors, house/potted plants, mold, new furniture/paneling/carpet, air cleaners, fragrances, laundry detergent, cosmetics, print cartridge, soaps, etc.):

APPENDIX W:

Pesticide Use Request Form

PESTICIDE USE REQUEST

AF APPROVAL REQ
FOR NON-STANDAR

Double-click on the above icon to access the electronic (fillable) Pesticide Use Request Form.

Complete the PESTICIDE INFORMATION, TARGET PEST, and APPLICATOR INFORMATION sections. Omit the NSN field.

Return the form to the IPMC (Environmental Element, 733 CED) along with a copy of the pesticide label and Safety Data Sheet.

Electronic submissions are preferred. However, if you have difficulty providing electronic submissions, contact the IPMC. The following information is needed:

- Pesticide product trade name
- EPA Registration #
- Active ingredient
- Formulation
- Container size
- Quantity requested
- Target pest species
- Justification statement (provide details as to need):
- Applicator name:
- Applicator DOD/VDACS certification number
- Hard copies of label and safety data sheet

Appendix X:

Preventive Measures to Reduce Pest Control Requirements

1. Keep lawns and similar grounds cut low. Modify landscape design around buildings by reducing or eliminating brushy plants or tall grass.

2. Avoid clutter and unsanitary conditions in work and housing areas.

3. Restrict areas where food consumption is allowed and avoid food debris.

4. Store food items in durable, rodent-proof containers.

5. Eliminate collection and retention of rainwater in artificial containers (such bins, recycling bins, open jugs, tires, abandoned containers, etc.), potted plants, bird baths, low-lying areas and any condition allowing for retention of water to prevent mosquito breeding.

6. Keep doors and windows closed and utilize screens and drop curtains (and/or high air fans) to exclude arthropods and vertebrate animals from buildings.

7. Inspect buildings for potential entry points for birds, bats, rodents, other small mammals, and snakes, and submit service orders to have these sealed.

8. Do not leave debris around buildings that serve as refugia for snakes and rodents, and other small mammals.

9. Do not feed wildlife or feral/stray cats.

10. Do not use bird feeders at government buildings/areas.

11. Avoid bringing arthropod pests into work areas or housing areas by inspecting clothing, luggage or other items that could harbor bed bugs, ticks, fleas, and other biting pests.

12. Avoid bringing potted plants to work areas that may contain eggs or immature stages of insects in the potted soil.

13. Avoid tick habitat whenever possible and utilize personal protective measures if entrance is necessary. Perform tick checks before entering government vehicles or work areas. See additional information below.

14. Avoid planting fruit-bearing trees or other fruit-bearing plants in the cantonment area or in close proximity to buildings.

15. Conduct routine inspections of storage areas for evidence of rodents.

16. Eliminate food debris and keep lunch break areas clean.

17. Maintain high standards of sanitation at all food handling facilities to include cleaning all surfaces, removing food debris, and keeping areas dry.

18. Do not allow pets to run loose.

19. Avoid bringing domestic cats and dogs into work areas to prevent potential flea or tick infestations.

20. Avoid bringing ticks into work areas following field activities. Do full body and clothing checks for ticks before returning to work areas following field work or other outdoor activities occurring in tick habitat. Use masking tape to remove ticks crawling on clothing.

21. Avoid animal burrows.

22. Avoid contact with bird nests.

PPM to reduce risks of biting arthropods

1. Biting flies. Biting flies at Fort Eustis primarily include mosquitoes, “no-see-ums”, deer flies, yellow flies, and horse flies. These are winged insects making them mobile and often considerable distances from breeding sites. Control is often limited making PPM particularly important.

A. Avoid peak biting periods for mosquitoes when possible. Most species bite in dawn/early morning, dusk and at night. Fewer species are active around mid-day. Most of these biting flies are less active during windy days.

B. Wear light colored clothing in the form of long pants and long-sleeve shirts with collars pulled up to cover the back of the neck when outside. The effectiveness is greatly enhanced when clothing is treated with permethrin in accordance with respective product’s label. When using permethrin, avoid spraying it on your skin. Allow treated clothing dry before wearing.

C. DEET can also be sprayed on clothing as well as exposed skin in accordance with the respective product’s label. This a reliable repellent for biting flies.

D. Wear wide brimmed hats to mitigate tabanid flies. Wear insect head nets when available.

E. For military uniforms, keep sleeves rolled down and collar closed when in field conditions. Wear the uniform loosely with an undershirt worn underneath the coat. Tuck the undershirt into the pants. Wear field cap.

F. Use bed nets when bivouacking.

2. Ticks and chiggers. Ticks and chiggers are types of mites. They are not capable of flight. They tend to occur in forest leaf litter and on vegetation of various heights with sufficient moisture. Consequently, they are crawling arthropods that climb onto clothing or exposed skin while moving through habitat.

A. Avoid tick/chigger habitat whenever possible.

B. Remain on the trail when using the Fort Eustis Nature Trail.

C. During respective hunting seasons, inspect harvested wildlife (particularly deer, wild turkey, and rabbits) for ticks and remove them prior to placing in vehicles or taking carcasses home.

D. Wear white/light colored clothing in the form of long pants and long-sleeve shirts clothing that are bloused in boots or socks to prevent these arthropods from crawling underneath clothing. The effectiveness is greatly enhanced when clothing is treated with permethrin as discussed for biting flies. When using permethrin, avoid spraying it on skin. Allow treated clothing to dry before wearing.

E. DEET can also be sprayed on clothing as well as exposed skin in accordance with respective product's label.

F. Check clothing and do a full body check for ticks periodically while in tick habitat, before entering vehicles, and before entering work areas or home. Use the buddy system if possible. Use masking tape or adhesive lint roller to remove ticks crawling on clothing. Place clothing in sealed plastic bags until washing or place in dryer at high temperature. Shower as soon as possible upon returning indoors.

G. For military uniforms, keep sleeves rolled down and blouse pant legs in socks/boots. Wear an undershirt underneath the coat and tuck the undershirt into the pants.

H. Use bed nets when bivouacking but keep the system elevated to avoid contact with chiggers and ticks.

APPENDIX Y:

IPMP Annual Review Form

AFSPC FY20XX Installation Pest Management Plan Annual Update

Submission Date:

1.0 INSTALLATION NAME:

2.0 CURRENCY OF INSTALLATION PEST MANAGEMENT PLAN (IPMP)

1.	Does the installation have an approved Installation Pest Management Plan (IPMP)?	
2.	Date the IPMP received final signature	
3.	Are you planning to rewrite/revise the IPMP?	
	If yes, when?	
4.	Have monthly reports been sent to the AFSPC Command Entomologist as required by AFI 32-1053, para 3.5.15? [Pesticide Inventory report, Pesticide Applicator Certification report, Pesticide Application report] If no, please submit all required reports along with this form. These are considered monthly updates to the IPMP.	

3.0 INTEGRATED PEST MANAGEMENT COORDINATOR

1.	Has an integrated pest management coordinator been assigned in writing as required by AFI 32-1053, para 3.4.5? Please forward copy of appointment letter to AFSPC Command Entomologist along with this form.	

4.0 PLAN MAINTENANCE:

Please list any minor changes (i.e. personnel changes, certifications, standard operating procedures, etc.) to the plan for the new Fiscal Year. Major plan revisions require re-staffing and re-submittal of the IPMP.

Awaiting AFSPC Review

5.0 ON-SITE ASSISTANCE

Please indicate if you would like a Staff Assistance Visit (SAV) this year and briefly describe the reason for the visit.

No

6.0 AERIAL APPLICATIONS

1.	Are there any projects requiring the aerial applications of pesticides for the upcoming FY?	
2.	Does the installation have an approved aerial spray Statement of Need for the project(s) from the AFSPC Pest Management Consultant?	
3.	Does the installation have the appropriate Environmental Assessment(s) (EA) or Environmental Impact Statement(s) (EIS)?	

7.0 ADDITIONAL COMMENTS

8.0 INSTALLATION PESTICIDE APPLICATION POINTS OF CONTACT

	BOS Pest Control Contractor	BOS Pest Control Contractor
Name	Mike Parise	Keith Banks
Duty Title	Pest control applicator	Pest control applicator
Office Symbol		
Street Address	BLDG 1422	BLDG 1422
City, ST Zip Code	Fort Eustis, VA 23604	Fort Eustis, VA 23604
Phone Number		
DSN		
e-mail		

	Golf Course Superintendent	Natural Resources / Environmental/IPMC/BOS pest control PMQAE
Name	Jacob Adams	Tim Christensen
Duty Title	Maintenance Superintendent	Installation Pest Mgmt Coordinator
Office Symbol		733 CED/CEIE
Street Address	3518 Mulberry Island Road	1407 Washington Blvd
City, ST Zip Code	Fort Eustis, VA 23604	Fort Eustis, VA 23604
Phone Number		757-878-4231
DSN		
e-mail		Timothy.p.christensen.civ@mail.mil

	Grounds Maintenance Contractor	Contract Quality Assurance Evaluator
Name	Gary Leckie	Vivan Evans
Duty Title	Contractor	COR
Office Symbol	Byrd Enterprises Unlimited, Inc.	733 CED/CEOE
Street Address	2000 Main Street	1407 Washington Blvd
City, ST Zip Code	Lynchburg, VA 24504	Fort Eustis, VA 23604
Phone Number	434-485-8233	757-878-7385
DSN		

e-mail	gleckie@byrdenterprises.net	Vivian.l.evans.civ@mail.mil

	Flight Safety/BASH POC	**Other**
Name	Teddy Harlow	
Duty Title	Airfield Safety	
Office Symbol	1st Fighter Wing	
Street Address	Felker Army Airfield	
City, ST Zip Code	Fort Eustis, VA 23604	
Phone Number	757-878-5865	
DSN		
e-mail	Teddy.d.harlow.civ@mail.mil	

9.0 FYXX ANNUAL IPMP CERTIFICATION

This FY__ Annual IPMP Update is submitted by:	
Name	
Duty Title	
Office Symbol	
Street Address	
City, ST Zip Code	
Phone Number	
DSN	
e-mail	

Command IPMP Annual Update Certification
Armando Rosales
Command Entomologist
AFCEC/COSC
139 Barnes Dr. Suite 1
Tyndall AFB, FL 32403
DSN
Armando.rosales.1@us.af.mil
Signature:
Date:

Maintain a signed copy of this form with the IPMP.

Appendix Z:

Insect & Other Arthropod Species Inventory at Fort Eustis, VA

Insects, Other Arthropods & Other Invertebrates Observed on Fort Eustis: Understanding the Significance of Invertebrate Taxa on Military Missions

Timothy P. Christensen, MS, CHMM, BCE
Environmental Element
733d Civil Engineer Division
Joint Base Langley-Eustis (Eustis.
Fort Eustis, VA 23604

27 December 2018

1. General. Invertebrate fauna represent a highly significant group of organisms in relation to ecosystem management. Arthropods represent the largest number of invertebrates and are characterized by having body segmentation, paired jointed legs and a chitinous exoskeleton. Insects constitute the largest number of arthropods and are characterized by having three body segments and three pairs of jointed legs.

2. Purpose of this report. This report consolidates and records the current inventory of primarily insect taxa but including to a lesser extent other arthropods and other invertebrates. It serves as a baseline for continued inventories and surveys, and surveillance plans.

3. Data sources.

A. An Inventory of Insect and Medically Important Arthropod Taxa at Joint Base Langley-Eustis, Fort Eustis, Virginia (Christensen, February 2014).

B. Forest Insect Survey at Joint Base Langley-Eustis, Fort Eustis, Virginia (A. Evans, Parsons, December 2015).

C. Tick & Tick-Borne Disease Threat Assessment (USA Public Health Command and the College of William & Mary, 2007-2018 which includes bird and mammalian host surveys).

D. 2017 Mosquito Species Inventory (Christensen, 2017).

E. Planning Level Surveys for Amphibians and Reptiles, Mammals, Birds, and Fish, As Well As Pest Insects and Invasive Plants at FE, Virginia in 2004-2005 (Versar, August 2006).

F. Data from previous Integrated Natural Resources Management Plans, Integrated Pest Management Plans and respective annual reviews.

G. Annual records/observations.

H. Integrated pest management reports.

I. Historical collections and photographs.

J. Cooperative Agricultural Pest Survey (CAPS) data (Eric Day/Virginia Polytechnic & State University).

4. Significance of the data. Macroinvertebrates include arthropods (such as insects, spiders, harvestmen, ticks, mites, crayfish, crabs, copepods, isopods, etc.), flatworms, snails, clams, and annelids (such as earthworms, leeches, etc.). These organisms are critical components of the ecosystem and have numerous ecological roles. Insects have the greatest diversity of any group of organisms and are often overlooked when one considers management of wildlife and habitats. Their species richness and high fecundity make this group substantial components of biomass. Collectively, macroinvertebrates as well as multicellular microscopic forms serve as food sources, predators, parasitoids, disease vectors, soil constituents, pollinators, decomposers, seed dispersing, and herbivory. Some may be pests of habitat vegetation and wildlife while others are nuisance pests and disease vectors. Comprehensively, these organisms influence habitat structure through direct and indirect means as well as affect missions.

5. Summary of invertebrate taxa documented on JBLE-E. Arthropods constitute the predominant group of invertebrates documented at JBLE-E. Insect fauna represent the largest group of arthropods documented on the installation as would be expected. Not surprisingly, the insect orders Coleoptera (beetles), Hymenoptera (bees, wasps, ants, sawflies), Lepidoptera (butterflies, moths, skippers), and Diptera (true flies) comprise the largest documented orders. The order Odonata (dragonflies, damselflies) are common as expected; however, this group did not receive as much attention and more data is needed. The order Megaloptera (alderflies, dobsonflies & fishflies) was expected but also requires more attention. Only one ephemeropteran (mayflies) was observed. One source suggested the presence of caddisflies (order Trichoptera) but no individuals were identified below the order. Plecoptera (stoneflies) remain undocumented. The classes Protura, Collembola and Diplura remain undocumented. Several arachnid taxa are represented. The arachnid orders Araneae (true spiders) and Ixodida (ticks) are well represented but additional inventory is needed. The orders Decapoda (crabs, crayfish, etc), other crustaceans, Chilopoda (centipedes), and Diplopoda (millipedes) as well as Opiliones (harvestmen, daddy longlegs) are also limited and require considerable review. Inventories of other invertebrates particularly molluscs and annelids (segmented worms) exist but are extremely limited. Insects, though well represented, warrant continuous examination due to their vast diversity and subsequent relationships in the installation ecosystem as well as establishment of invasive taxa (including but not limited to forest pests and some other arthropods such as ticks) as well as native fauna that affect the ecosystem.

6. Invertebrate inventories.

A. Consolidated Arthropod Inventory Categories as of CY 2018 (Phylum Arthropoda is represented in A(1) – (5).

(1) Class Insecta (Insects).

Orders (18)	Families	Genera	Species
Blattodea (Cockroaches & Termites)	3	4	2
Coleoptera (Beetles)	45	131	149
Dermaptera (Earwigs)	2	2	2
Diptera (True Flies)	19	23	43
Ephemeroptera (Mayflies)	1		
Hemiptera (True Bugs, Cicadas, Hoppers, Aphids & Allies)	18	22	23
Hymenoptera (Bees, Wasps, Hornets, Sawflies & Ants)	18	32	30
Lepidoptera (Butterflies, Moths & Skippers)	18	78	92
Mantodea (Mantids)	1	1	1
Mecoptera (Scorpionflies, Hangingflies & Allies)	1		
Megaloptera (Alderflies, Dobsonflies & Fishflies)	2	1	2
Microcoryphia (Bristletails)	1		
Neuroptera (Antlions, Owlflies, Lacewings & Mantidflies)	4	2	
Odonata (Dragonflies & Damselflies)	5	3	
Orthoptera (Grasshoppers, Katydids & Crickets)	5	7	2
Phasmida (Stick Insects)	1		
Psocodea (Barklice, Booklice & Parasitic Lice)	1	1	1
Trichoptera (Caddisflies)			
	145	307	347

(2) Class Arachnida (Arachnids).

Orders (6)	Families	Genera	Species
Aranae (Spiders)	13	16	15
Mesostigmata (Mites)	2	2	2
Trombidiformes (Mites)	2	3	
Ixodida (Ticks)	1	4	6
Opiliones (Harvestmen, daddy longlegs)	1	1	
Pseudoscorpiones (Pseudoscorpions)			
	20	26	23

(3) Subphylum Crustacea/Class Malacostraca.

Orders	Families	Genera	Species
2	4	5	6

(4) Class Diplopoda (Millipedes).

Orders	Families	Genera	Species
2	3	1	1

(5) Class Chilopoda (Centipedes).

Orders	Families	Genera	Species
2	1	1	1

B. Phylum Mollusca is represented in B(1), and Phylum Annelida is represented in B(2)-(3).

(1) Phylum: Mollusca/Class: Bivalvia (Molluscs).

Orders	Families	Genera	Species
1	1	2	2

(2) Phylum Annelida/Class: Clitellata (Segmented worms).

Orders	Families	Genera	Species
2	2	1	1

(3) Phylum: Platyhelminthes (Flatworms)/Class: Rhabditophora

Orders	Families	Genera	Species
1	1	1	1

7. Numbers of insects and other arthropods species posing issues. Tables 1 & 2 identify the number of species per order that reflect some given issue. The following issues are reflected in the tables using the following acronyms:

B = Beneficial. Natural enemy (of a pest), pollinator, or decomposer.
NB = Nuisance Biting/Stinging. Insects/arthropods that bite humans or sting in defense to include those considered medically significant.
DV = Disease Vector. Capable of transmitting disease pathogens to humans, domestic animals, wildlife or plants.
NN = Non-Native. Introduced into the United States at some point. May or may not be invasive.
I = Invasive. Proliferates to create serious conditions affecting native fauna or habitat.
FP = Forest Pest. May cause significant damage to trees/forest stands.
OP = Other Pest. Creates undesirable pest conditions by means other than biting or stinging.
WP = Wildlife Pest. Adversely affects the health of a given wildlife species. Usually parasitic.

A. Table 1: Insects.

ORDER	B	NB	DV	NN	I	FP	OP	WP
Blattodea							2	
Coleoptera	3		2	16	2	10	3	
Dermaptera								
Diptera	1	33	13	2	1		2	16
Ephemeroptera								
Hemiptera		2		3		3	2	1
Hymenoptera	3	3		1	1			1
Lepidoptera								
Mantodea				1	1?			
Mecoptera								
Megaloptera								
Microcoryphia								
Neuroptera								
Odonata								
Orthoptera								
Phasmida								
Psocodea		1						
Trichoptera								

B. Table 2: Other arthropods.

ORDER	B	NB	DV	NN	I	FP	OP	WP	Comments
Araneae		1							Black widows
Pseudoscorpiones									
Opiliones									
Ixodida		6	6					6	Hard ticks.
Mesostigmata		1						2	
Trombidiformes		1							
Polydesmida									
Spirobolida									
Decapoda									
Isopoda									
Scutigeromorpha									

Since no agriculture out lease occurs at Fort Eustis, insects noted as pests are primarily nuisance biting/stinging or disease vectors to humans, pets, working military dogs or wildlife; urban pests, forests pests or landscape plants.

8. Class Insecta (Insects)* genera/species organized by family.

* Some insects and other arthropods are disease vectors. The following acronyms are used for respective diseases shown below: WNV = West Nile Virus, EEE = Eastern Equine Encephalitis, SLE = ST. Louis Encephalitis, LAC = La Crosse Encephalitis, EHD = Epizootic Hemorrhagic Disease, STARI = Southern tick-associated rash illness, RMSF = Rocky Mountain spotted fever.

Order Coleoptera (Beetles).

Aderidae (Ant-like Leaf Beetles)
Zonantes subfasciatus

Alleculidae? (Comb-clawed Beetles)

Anthribidae (Fungus Weevils)
Euparius marmoreus

Archeocrypticidae (Cryptic Fungus Beetles)

Buprestidae (Metallic Wood-boring Beetles)
Acmaeodera ornata
Acmaeodera tubulus
Agrilus celti
Agrilus ruficollis
Brachys aeruginosus
Brachys floricola
Buprestis apricans
Buprestis lineata?
Buprestis maculipennis
Buprestis rufipes
Chrysobothris femorata
Chrysobothris orono
Dicerca juncea (new state record when observed 2015)
Dicerca lepida
Dicerca lurida
Dicerca obscura
Pachyschelus laevigatus
Paragrilus tenuis
Spectralia gracilipes
Taphrocerus howardi

Cantharidae (Soldier Beetles)
Chauliognathus pensylvanicus
Discodon planicolle

Carabidae (Ground Beetles)

Acupalpus
Acupalpus pauperculus
Amphasia interstitialis
Anisodactylus nigerrimus
Bradycellus badipennis
Calosoma
Calosoma scrutator
Cicindela sexguttata
Cymindis platicollis
Stenolophus ochropezus

Cerambycidae (Long-horned Beetles)

Acanthocinus nodosus
Acanthocinus obsoletus
Aegomorphus morrisii
Anelaphus parallelus
Anelaphus villosus
Arhopalus rusticus?
Asemum
Asemum striatum
Astylopsis arcuata
Astylopsis sexguttata
Ataxia crypta
Cyrtophorus verrucosus
Eburia quadrigeminata
Elaphidion mucronatum
Elytrimitatrix undata
Enaphalodes atomarius
Enaphalodes rufulus (potential FP)
Euderces pini
Eupogonius tomentosus
Gaurotes cyanipennis
Graphisurus fasciatus
Leptostylus asperatus?
Mallodon dasystomus (potential FP)
Molorchus bimaculatus
Monochamus caroliniensis (potential FP - principal vector of the pinewood nematode in central US; Pinewood nematode, *Bursaphelenchus xylophilus*, is the causal agent of pine wilt disease in North America)
Monochamus titillator?
Neandra brunnea
Neoalosterna capitata
Neoclytus acuminatus

Neoclytus scutellaris
Oberea tripunctata
Oberea tripunctata
Orthosoma brunneum
Parelaphidion incertum
Phymatodes amoenus
Prionus imbricornis
Prionus laticollis
Prionus pocularis
Psenocerus supernotatus
Rhagium inquisitor (NN, FP - can spread fungus spores from infected to healthy trees, thus indirectly causing the blue-staining of the wood.)
Smodicum cucujiforme
Sphenostethus taslei
Strangalia famelica
Strangalia luteicornis
Styloleptus biustus
Tessaropa tenuipes
Typocerus acuticauda
Typocerus zebra
Xylotrechus colonus
Xylotrechus convergens
Xylotrechus sagittatus
Xylotrechus schaefferi

Chelonariidae (Turtle Beetles)
Chelonarium lecontei

Chrysomelidae (Leaf Beetles)
Altica chalybea
Donacia
Exema elliptica
Labidomera clivicollis

Cleridae (Checkered Beetles)
Enoclerus
Enoclerus nigripes
Phyllobaenus corticinus?
Thanasimus dubius (B - predator of southern pine beetle)

Coccinellidae (Lady Beetles)
Harmonia axyridis (NN, OP)

Cucujidae (Flat Bark Beetles)
Cucujus clavipes

Curculionidae (Snout & Bark Beetles)
Ambrosiodmus
Ambrosiodmus obliquus
Carphoborus bicornus
Cnesinus strigicollis
Cnestus mutilatus (NN)
Curculio
Cyclorhipidion bodoanum (NN)
Dendroctonus terebrans (potential FP)
Dryophthorus americanus
Dryoxylon onoharaensis (NN)
Euplatypus compositus
Euwallacea validus (NN, I?, potential FP)
Gnathotrichus materiarius
Hylastes porculus
Hylastes salebrosus
Hylastes tenuis
Hylesinus aculeatus
Hylesinus fasciatus
Hylobius pales (potential FP)
Hylocurus langstoni
Hylurgops pinifex
Hypothenemus (NN?)
Ips grandicollis (potential FP)
Monarthrum fasciatum
Myoplatypus flavicornis
Naupactus cervinus (NN)
Orthotomicus caelatus
Otiorhynchus sulcatus (NN)
Oxoplatypus quadridentatus
Pachylobius picivorus (potential FP)
Pissodes
Pityophthorus
Pseudopityophthorus minutissimus
Pseudothysanoes lecontei
Stenoscelis brevis
Thysanoes
Xyleborinus saxesenii (NN, potential FP)
Xyleborus
Xyleborus celsus
Xyleborus pubescens

Xylosandrus crassiusculus (NN)
Xylosandrus germanus (NN, potential FP)

Disteniidae

Dytiscidae (Predaceous Diving Beetles)
Dytiscus

Elateridae (Click Beetles)
Alaus myops (B - larvae feed on wood borers)
Alaus oculatus (B - larvae feed on wood borers)
Ampedus nigricollis
Lacon
Lacon discoideus
Orthostethus infuscatus

Endomychidae (Handsome Fungus Beetles)
Rhanidea unicolor

Erotylidae? (Pleasing Fungus Beetles)

Eucinetidae? (Plate-thigh Beetles)

Eucnemidae (False Click Beetles)

Geotrupidae (Earth-Boring Scarab Beetles)
Bolbocerosoma farctum

Histeridae (Clown Beetles)
Platysoma leconti

Hybosoridae (Scavenger Scarab Beetles)
Hybosorus illigeri (NN)

Hydrophilidae (Water Scavenger Beetles)

Laemophloeidae (Lined Flat Bark Beetles)
Charaphloeus convexulus

Lampyridae (Fireflies)
Ellychnia corrusca

Latridiidae (Minute Brown Scavenger Beetles)
Corticaria

Melandryidae (False Darkling Beetles)

Meloidae (Blister Beetles)
Epicauta funebris
Lytta aenea
Meloe

Monotomidae (Root-eating Beetles)
Rhizophagus

Nitidulidae (Sap-feeding Beetles)
Aethina tumida (NN, WP - pest of bees)

Oedemeridae (False Blister Beetles)

Passalidae (Bess Beetles)
Odontotaenius disjunctus

Ptilodactylidae (Toe-winged Beetles)
Ptilodactyla

Ptinidae (Death-watch and Spider Beetles)
Ptinus bimaculatus

Rhysodidae (Wrinkled Bark Beetles)
Omoglymmius americanus

Scarabaeidae (Scarab Beetles)
Ataenius
Canthon
Cotinus nitida (potential OP)
Deltochilum gibbosum
Dyscinetus morator
Dynastes tityus
Gnorimella maculosa
Hoplia trivialis
Pelidnota punctata
Phanaeus vindex
Phileurus truncatus
Phyllophaga
Plectris aliena? (NN)
Popillia japonica (NN, OP)
Trigonopeltastes delta
Valgus
Valgus canaliculatus?

Valgus seticollis
Xyloryctes jamaicensis

Scirtidae (Marsh Beetles)
Cyphon (genus changed to *Contacyphon*?)

Silphidae (Carrion Beetles)
Necrodes surinamensis
Necrophila americana
Nicrophorus tomentosus
Oiceoptoma inaequale
Oiceoptoma noveboracense

Sylvanidae (Silvanid Flat Bark Beetles)
Silvanus

Staphylinidae (Rove Beetles)
Arpedium
Asclera ruficollis
Creophilus maxillosus
Hesperus apicialis?
Platydracus exulans?
Sepedophilus

Tenebrionidae (Darkling Beetles)
Alobates pennsylvanica

Trogossitidae (Bark-gnawing Beetles)
Temnoscheila virescens
Tenebroides collaris
Tenebroides corticalis
Tenebroides

Zopheridae (Ironclad Beetles)
Microsicus parvulus (*Synchita parvula*)

Diptera (True flies).

Asilidae (Robber Flies)
Diogmites
Efferia
Promachus

Bibionidae (March Flies)

Bombyliidae (Bee Flies)
Xenox tigrinus (B - larvae are parastoids of carpenter bees in conditions where carpenter bees are pests)

Calliphoridae (Blow Flies).
Lucilia

Ceratopogonidae (Biting Midges)
Culicoides (NB, DV/WP – EHD virus virus in ruminants in North America and principally having lethal effects on whitetail deer.)

Chironomidae (Midges)

Culicidae (Mosquitoes)
Aedes
Aedes albopictus (NN, I, NB, DV)
Aedes (*Ochlerotatus*) *c. canadensis* (NB)
Aedes cinereus (NB)
Aedes hendersoni (NB)
Aedes j. japonicas (NB, DV [WNV], WP [WNV])
Aedes sollicitans (NB)
Aedes taeniorhynchus (NB)
Aedes triseriatus (NB, DV [LAC], WP (squirrels))
Aedes trivittatus?
Aedes vexans (NB, DV [EEE], WP [mammalian hosts])
Anopheles
Anopheles quadrimaculatus (NB, DV [malaria, WNV, EEE, *Dirofilaria immitis,* the causative agent of dog heartworm disease])
Anopheles bradleyi (NB)
Anopheles crucians (NB)
Anopheles punctipennis (NB)
Coquillettidia perturbans (NB, DV [EEE, WNV])
Culex
Culex erraticus (NB, WP [birds])
Culex nigripalpus (NB, DV [SLE & WNV, dog heartworm])
Culex pipiens (NB, DV [SLE, WNV, dog heartworm], WP [birds])
Culex pipiens-quinquefasciatus (NB, DV [SLE, WNV, dog heartworm], WP [birds])
Culex restuans (NB, DV [WNV, EEE])
Culex salinarius (NB, WP [birds and mammals])
Culex territans (WP [amphibians and reptiles])
Culiseta impatiens (NB)
Culiseta inornata (NB, DV [WNV])
Orthopodomyia

Orthopodomyia signifera (NB, DV [EEE], WP [birds])
Psorophora
Psorophora ciliata (NB, WP [mammals])
Psorophora columbiae (NB, WP [mammals]))
Psorophora ferox (NB, WP [mammals])
Psorophora mathesoni? (NB)
Uranotaenia sapphirina (WP [amphibians and reptiles])

Drosophilidae (Vinegar Flies)
Drosophila suzukii (NN, OP)

Muscidae (House Flies & Kin)
Musca domestica (OP)

Mydidae (Mydas Flies)

Oestridae (Bot Flies)
Cephenemyia phobifer (WP [deer])

Rhagionidae (Snipe Flies)
Chrysopilus thoracicus

Sarcophagidae (Flesh Flies)

Simuliidae (Black Flies)

Syrphidae (Syrphid Flies)
Mallota
Meromacrus

Tabanidae (Horse, Yellow and Deer Flies)
Chrysops (NB, DV- mechanically vector Tularemia)
Chrysops dimmocki (NB)
Diachlorus ferrugatus (NB)
Tabanus
Tabanus atratus? (NB, DV [surra, anthrax], WP)
Tabanus fusciocostatus (NB? DV?)
Tabanus lineola (NB, WP)
Tabanus nigrovittatus (NB?, WP?)
Tabanus stygius (NB?, WP?)
Tabanus sulcifrons (NB?, WP?)

Tachinidae (Parasitic Flies).

Tipulidae (Large Crane Flies).

Therevidae (Stiletto Flies).

Blattodea (Cockroaches and termites).

Blattidae
Eurycotis
Parcoblatta
Periplaneta americana (OP)

Ectobiidae
Blattella germanica (OP)
Rhinotermidae? (Subterranean Termites)

Lepidoptera (moths, butterflies and skippers).

Attevidae (Tropical Ermine Moths)
Atteva aurea

Crambidae (Crambid Snout Moths)
Desmia funeralis

Erebidae
Caenurgina erechtea
Catocala ilia
Estigmene acrea?
Hyphantria cunea
Pyrrharctia isabella

Geometridae (Geometrid Moths)
Ematurga amitaria
Erannis tiliaria

Hesperiidae (Skippers)
Achalarus lyciades
Amblyscirtes vitalis
Anatrytone logan
Ancyloxypha numitor
Atalopedes campestris
Epargyreus clarus
Erynnis horatius
Euphyes dion
Euphyes vestris

Hylephila phyleus
Lerema accius
Nastra lherminier
Panoquina panoquin
Poanes viator
Poanes yehl
Poanes zabulon
Polites origenes
Polites themistocles
Pompeius verna
Pyrgus communis
Thorybes pylades
Wallengrenia egeremet
Wallengrenia otho

Lasiocampidae (Tent Caterpillar and Lappet Moths)
Malacosoma americana
Malacosoma disstria

Lycaenidae (Blues, Coppers, Hairstreaks, Harvesters)
Atlides halesus
Calycopis cecrops
Celastrina ladon
Cupido comyntas
Feniseca tarquinius
Satyrium calanus
Satyrium favonius
Satyrium kingi
Satyrium liparops
Strymon melinus

Megalopygidae (Flannel Moths)
Megalopyge opercularis (NB)

Noctuidae (Owlet Moths)
Autographa
Trichoplusia ni

Notodontidae (Prominent Moths)
Nadata gibbosa

Nymphalidae (Brush-footed Butterflies)
Asterocampa celtis
Cercyonis pegala
Chlosyne nycteis
Cyllopsis gemma
Danaus plexippus
Enodia anthedon (now *Lethe anthedon*)
Euptoieta claudia
Hermeuptychia sosybius
Junonia coenia
Libytheana carinenta
Limenitis archippus
Limenitis arthemis astyanax
Megistro cymela
Nymphalis antiopa
Phyciodes tharos
Polygonia comma
Polygonia interrogationis
Satyrodes appalachia
Speyeria cybele
Vanessa atalanta
Vanessa virginiensis

Papilionidae (Swallowtails & Parnassians)
Eurytides marcellus
Papilio glaucus
Papilio palamedes
Papilio polyxenes
Papilio troilus

Pieridae (Whites, Sulphurs, Yellows [butterflies])
Abaeis nicippe
Colias eurytheme
Phoebis sennae
Pieris rapae
Pyristia lisa

Psychidae (Bagworm Moths)

Saturniidae (Giant Silkworm and Royal Moths)
Actias luna
Antheraea imperialis
Antheraea polyphemus
Anisota virginiensis
Callosamia
Dryocampa rubicunda
Eacles imperialis
Hyalophora cecropia

Sphingidae (Sphinx Moths)
Darapsa myron
Eumorpha pandorus
Manduca sexta

Torticidae (Tortricid Moths)
Acleris subnivana

Zygaenidae (Leaf Skeletonizer Moths)
Harrisina americana
Hemaris diffinis
Pyromorpha dimidiate

Hemiptera (True bugs, cicadas, hoppers, aphids and allies).

Aphididae (Aphids)
Cinara strobi (potential FP of white pine)
Grylloprociphilus imbricator (potential FP of beech).
Longistigma caryae (potential FP - several tree species)

Aleyrodidae (Whiteflies)
Pealius azaleae (OP of azaleas)

Aradidae (Flat Bugs)
Aradus

Belostomatidae (Giant Water Bugs)
Abedus

Cercopidae (Froghoppers)
Prosapia bicincta

Cicadidae (Cicadas)
Neotibicen auletes -
Neotibicen canicularis (originally reported as *Tibicen canicularis*)
Neotibicen tibicen

Cimicidae (Bed Bugs)
Cimex adjunctus (potential NB, WP (bats).
Cimex lectularius (NB)

Coreidae (Leaf-footed Bugs)
Acanthocephala declivis
Leptoglossus
Leptoglossus fulvicornis
Leptoglossus phyllopus
Fulgoridae (Fulgorid Planthoppers)

Gerridae (Water Striders)

Lygaeidae (Seed Bugs)
Oncopeltus fasciatus

Membracidae (Treehoppers)

Notonectidae (Backswimmers)
Notonecta

Pentatomidae (Stink Bugs)
Euthyrhynchus floridanus
Halyomorpha halys (NN)

Plataspidae (a single recently introduced species).
Megacopta cribraria (NN, pest of some plants but not at Fort Eustis; potential hosts include soybean, kudzu, Fabaceae (legumes, peas, beans), sweet potatoes, potatoes, corn & cotton)

Reduviidae (Assassin Bugs)
Apiomerus crassipes
Arilus cristatus
Melanolestes? *picipes*?
Pselliopus cinctus

Rhopalidae (Scentless Plant Bugs)
Boisea trivitatta (OP when invading structures during winter)

Tingidae (Lace Bugs)
Stephanitis pyrioides (NN)

Hymenoptera (Bees, wasps, hornets, ants and sawflies).

Ampulicidae (Cockroach Wasps)
Ampulex canaliculata

Apidae (Cuckoo, Carpenter, Digger, Bumble, and Honey Bees)
Apis mellifera (B – pollination)
Bombus pensylvanicus (B – pollination but declining)
Xylocopa virginica

Aulacidae
Pristaulacus stigmaterus

Chrysididae (Cuckoo Wasps)

Crabronidae
Trypoxylon politum

Evaniidae (Ensign Wasps)
Evania appendigaster
Hyptia thoracica

Formicidae (Ants)
Camponotus pennsylvanicus
Crematogaster
Formica exsectoides
Solenopsis invicta (one colony documented but was eliminated in 2015, NB, WP)

Ichneumonidae (Ichneumon Wasps)
Megarhyssa macrurus

Mutillidae (Velvet Ants)
Dasymutilla occidentalis
Sphaeropthalma

Orussidae (Parasitic Wood Wasps)
Orussus (B - against some buprestid wood-borers)
Orussus sayii

Pompilidae (Spider Wasps)
Entypus

Rhopalosomatidae (Rhopalosomatid Wasps)
Rhopalosoma nearcticum

Sapygidae (Sapygid Wasps)
Sapyga centrata

Scoliidae (Scoliid Wasps)
Scolia nobilitata

Siricidae (Horntails)
Sirex nigricornis

Sphecidae (Thread-waisted Wasps)
Ammophila
Chalybion californicum
Eremnophila aureonotata
Sceliphron caementarium?
Sphecius speciosus

Tenthridinidae (Common Sawflies)
Empria maculata
Thrinax dubitatus (*Hemitaxonus dubitatus*)

Vespidae (Yellowjackets and Hornets, Paper Wasps; Potter, Mason & Pollen Wasps)
Dolichovespula maculata
Monobia quadridens
Polistes
Polistes exclamans?
Vespa crabro (NN, I?)
Vespula
Vespula germanica (NN, potential NB)
Vespula maculifrons (potential NB)

Megaloptera (Alderflies, dobsonflies, and fishflies).

Corydalidae (Dobsonflies and Fishflies)
Chauliodes pectinicornis
Chauliodes rastricornis

Sialidae (Alderflies).

Microcoryphia (Bristletails).

Meinertellidae.

Neuroptera (Antlions, Owlflies, Lacewings, Mantidflies and Allies).

Ascalaphidae (Owlflies)

Chrysopidae (Green Lacewings)
Chrysopa

Hemerobiidae (Brown Lacewings)

Mantispidae (Mantidflies)

Myrmeleontidae (Antlions)

Odonata (Dragonflies and damselflies).

Aeshnidae (Darners)

Calopterygidae (Broad-winged Damselflies)
Calopteryx

Coenagrionidae (Narrow-winged Damselflies)

Gomphidae (Clubtails)

Libellulidae (Skimmers)
Erythemis
Libellula

Orthoptera (Grasshoppers, katydids and crickets).

Acrididae (Short-horned Grasshoppers)
Dissosteira
Leptysma marginicollis

Gryllidae (True Crickets)

Gryllotalpidae (Mole Crickets)
Neocurtilla hexadactyla

Rhaphidophoridae (Camel Crickets)
Ceuthophilus

Tettigonidae (Katydids)
Atlanticus
Microcentrum
Neoconocephalus

Psocodea (Barklice, Booklice, and Parasitic Lice).

Trichodectidae
Trichodectes canis (NB of military working dogs & pets, WP)

Dermatoptera (Earwigs).

Carcinophoridae? / Anisolabididae
Euborellia annulipes (NN)

Forficulidae
Forficula auricularia (NN)

Phasmida (Stick Insects).

Phasmatidae

Mecoptera (Scorpionflies, Hangingflies and Allies).

Bittacidae (Hangingflies)

Mantodea (Mantids).

Mantidae
Tenodera sinensis (NN, I?)

Ephemeroptera (Mayflies).

Baetidae?

Trichoptera (Caddisflies).

9. Class Arachnida genera/species organized by family.

Order Araneae (True spiders).

Agelenidae (Funnel Weavers)
Agelenopsis

Araneidae (Orb Weavers)
Argiope aurantia
Araneus marmoreus
Gasteracantha cancriformis
Larinioides cornutus
Lariniodes sclopetarius? (Found in box shipped from Pennsylvania)
Neoscona domiciliorum

Ctenidae (Wandering Spiders)

Filistatidae (Crevice Weavers)
Kukulcania
Kukulcania hibernalis

Gnaphosidae (Ground Spiders)

Lycosidae (Wolf Spiders)
Hogna?
Rabidosa

Philodromidae (Running Crab Spiders)
Philodromus vulgaris

Pholcidae (Cellar Spiders)

Pisauridae (Nursery Web & Fishing Spiders)
Dolomedes tenebrosus
Dolomedes triton

Tetragnathidae (Long-jawed Orb Weavers)
Leucauge venusta

Theridiidae (Cobweb Spiders)
Latrodectus mactans (potential NB)
Steatoda grossa

Thomisidae (Crab Spiders)

Salticidae (Jumping Spiders)
Lyssomanes viridis
Phidippus audax
Platycryptus

Order Pseudoscorpiones. Observed and identified only at order level.

Order Opiliones.

Sclerosomatidae
Leiobunum?

Order Ixodida (Ticks).

Ixodidae (Hard Ticks).
Amblyomma americanum (NB, DV [Ehrlichiosis, STARI, tularemia], WP)
Amblyomma maculatum (NB, DV [*Rickettsia parkeri* rickettsiosis], WP)
Dermacentor variabilis (NB, DV [RMSF, tularemia], WP)
Haemaphysalis leporispalustris (NB, DV?, WP)
Ixodes affinis (NB?, DV?, WP)
Ixodes rugosus? (NB?, DV?, WP?)
Ixodes scapularis (NB, DV [Lyme disease, human babesiosis, canine babesiosis, anaplasmosis, *Borrelia miyamotoi*, Powassan disease], WP)

Order: Mesostigmata (mites).

Dermanyssidae
Steatonyssus ceratognathus (WP)

Macronyssidae
Ornithonyssus sylviarum (potential NB, WP)

Order: Trombidiformes (mites).

Tetranychidae (Spider Mites)
Bryobia praetiosa? (Clover mite?)

Erythraeidae
Balaustium? (Sidewalk mite?)

Trombidiidae (true velvet mites)
Trombidium (Chigger mite) (NB)

Phoretic mites observed on cerambycid beetles but taxonomy undetermined.

10. Other arthropods.

Class Diplopoda
Order: Polydesmida
Xystodesmidae?

Order Spirobolida
Spirobolidae
Narceus americanus

Class Malacostraca.
Order Decapoda
Ocypodidae (Fiddler Crabs and Ghost Crabs)
Uca pugnax (Atlantic Marsh Fiddler Crab) – family observed/species assumed.

Portunidae (Swimming Crabs)
Callinectes sapidus (Atlantic Blue Crab) – previously documented.

Grapsidae (Marsh Crabs, Shore Crabs, and Talon Crabs)
Sesarma reticulatum

Cambaridae
Cambarus bartonii bartonii
Cambarus robustus
Orconectes immunis

Order Isopoda (Isopods) – sow bugs observed.

Class Chilopoda (Centipedes)
Order Scutigeromorpha (House Centipedes).

Scutigeridae
Scutigera coleoptrata (House Centipede)

(other centipedes different from this order observed but not ID beyond class)

11. Other invertebrates.

Class Bivalvia
Order: Unionoida
Unionidae
Anodonta cataracta
Elliptio complanata

Phylum: Annelida
Class: Clitellata
Order: Haplotaxida
Lumbricidae
Earthworms

Subclass: Hirudinea
Leeches

Phylum: Platyhelminthes (Flatworms)
Class: Rhabditophora (All parasitic flatworms & most free-living species)
Order: Tricladida (Free-living flatworms)
Geoplanidae (Land planarians or land flatworms)
Bipalium kewense

12. Arthropod surveillance. This report represents a consolidation of all arthropods (and to a lesser extent other invertebrates) identified on the installation as of CY 2018. Surveillance programs for certain taxa may be needed based on their potential impacts that could affect missions.

A. Several taxa noted in the report suggest a need for surveillance. These could include the following:

(1) Red Oak Borer (*Enaphalodes rufulus*) (potential FP). The larvae of this taxon has the potential to affect healthy, living oak tree species if numbers become high enough. This may be important given the objective of planting mixed oak species as part of habitat management. More information regarding numbers is needed as well as a new forest inventory in order to design a surveillance plan.

(2) Hardwood Stump Borer (*Mallodon dasystomus*) (potential FP). Larvae infest the heartwood of several deciduous trees such as oaks, elm, willow, pecan, maple, and sycamore. More information regarding numbers is needed as well as a new forest inventory in order to design a surveillance plan.

(3) Carolina pine sawyer (*Monochamus carolinensis*) (potential FP). This species has been observed with some degree of frequency and may be relatively common on the installation. It has the potential to transmit the *Bursaphelenchus xylophilus* nematode that can affect the health of several pine species. Given its apparent common occurrence and no apparent compromising of pine tree health on the installation, it may be of limited risk. Nonetheless, various abiotic and biotic factors could change the conditions. Surveillance could be included as part of a general forest pest surveillance program.

(4) Ribbed Pine Borer (*Rhagium inquisitor*) (NN, FP). This non-native beetle can cause significant damage to various pine species as well as some deciduous trees including birch, oak and poplar. It more typically attacks weakened or stressed trees. Its frequency on the installation is unknown. Surveillance could include this in a general forest pest surveillance program.

(5) *Euwallacea validus* (No common name) (NN, I?, potential FP). This beetle has the potential to be beneficial but also detrimental depending on the conditions. It transmits the fungus *Verticillium nonalfalfae* that causes lethal Verticillium wilt in the invasive Tree of Heaven (*Ailanthus altissima*) in Virginia and other states. However, large portions of Tree of heaven have undergone control on the installation and no obvious effects of this beetle on that tree have been confirmed. Additionally, it may impact a large number of deciduous and conifer trees. More information is needed about its effects on forests is needed. This may need a routine surveillance plan.

(6) Pales weevil (*Hylobius pales*) (potential FP). This species is native to our area and is frequently collected in lingren funnel traps using various baits. It probably has little impact on pine trees on the installation. No specific surveillance is likely needed though control using these traps might maintain numbers. However, this trapping method tends to target a variety of insect taxa including beneficial species such as Dubious Checkered Beetle (*Thanasimus dubius*). This weevil is a potential pest of pine seedlings. Consequently, monitoring of damage to planted pine represents the primary surveillance.

(7) Eastern Five-Spined Engraver (*Ips grandicollis*) (potential FP). By itself, this beetle is probably not a major forest pest concern because it more typically attacks stressed, dying or dead trees including slash or felled trees. Its presence is likely suggest activity of forest pests.

(8) Pitch-eating Weevil (*Pachylobius picivorus*) (potential FP). Similar to pales weevil but not nearly as frequently observed at JBLE-E. This taxon has potential to damage pines including seedlings and branches on older trees. It tends to be attracted to conditions created by fire and timber clearing. This species would be considered for surveillance in pine stands adjacent to tree clearing or fires.

(9) Fruit-tree Pinhole Borer (*Xyleborinus saxesenii*) (NN, potential FP). This non-native beetle apparently has a wide host range that includes ornamental trees and trees bearing stone fruits. However, the literature suggests that nearly all conifers and deciduous trees may be susceptible. More information is needed about its effects on forests is needed. This may need a routine surveillance plan.

(10) Alnus Ambrosia Beetle (*Xylosandrus germanus*) (NN, I?, potential FP). This non-native beetle is well established in the United States to include Virginia. The extent of its distribution on the installation is unknown and information about native host trees needs further research. This may need a routine surveillance plan.

(11) Japanese beetle (*Popillia japonica*) (NN, OP). This beetle is well established and is common everywhere locally including the installation. Adults feed on foliage of many plants while larvae feed on roots in the soil. Excluding landscaped plants, it tends to pose issues on certain habitat management such as converting herbaceous invasive vegetation to native vegetation in wetlands. Surveillance is probably not feasible or appropriate in general but should be considered for specific habitat management.

(12) White Pine Aphid (*Cinara strobi*) (potential FP of white pine). This taxon has the potential to be an important pest of white pine with heavy infestations. Distribution of white pine on the installation is limited though a new forest inventory is needed and is now significantly overdue. Surveillance could be developed based on completing a new forest inventory.

(13) Beech Blight Aphid (*Grylloprociphilus imbricator*) (potential FP of beech). This native taxon is easily identified by their colonies on beech limbs. Two separate (well segregated) locations were observed. General perspectives as to their damage to beech remains uncertain. Large infestations may possible affect tree health. Surveillance would involve spot checks of forest stands containing beech trees.

(14) Giant Bark Aphid (*Longistigma caryae*) (potential FP - several tree species). This species may have been identified once in 2004 and consequently, little information about its distribution or potential impact on the installation exists. It does have a large range of tree hosts including American elm, pin oak, live oak, post oak, blackjack oak, pecan, hickory, sycamore, maple, basswood, birch, beech, walnut, chestnut, and willow. More information is needed.

(15) Red Imported Fire Ant (*Solenopsis invicta*) (NN, I). This species was documented once near the new Shoppette but the colony was eliminated in 2015. No new colonies have been documented to date. Several potential areas are monitored through the Base Operating Services contract.

(16) European hornet (*Vespa crabro*) (NN, I?). This species is well established across its range. Issues pertain to predation on other insects and possibly competition with other insect taxa. Only a few individuals have been observed, and no nests have been documented. Those individuals observed were competing with other hymenopterans and lepidopterans for access to tree sap. Likely no specific surveillance plan is feasible or needed at this time.

(17) Chinese mantis (*Tenodera sinensis*) (NN, I?). This species is likely well established in the eastern United States. Only a few individuals were observed at the installation. Its impact would be related to predation on native insects and competition with native mantids. Surveillance and evaluation of impacts would be difficult in terms of time and resources.

B. Other taxa for consideration. Several potential invasive taxa were not identified in the surveys/inventories and other documentation cited in this report. Some of these taxa currently occur in portions of Virginia while others have not yet been found in Virginia but could expand into the Commonwealth in the future. This report suggests that current conditions represent low risk to forest habitats while biting nuisance and disease vector taxa remain important concerning human health and mission accomplishment. Based on potential future impacts and what has been documented thus far, surveillance for the following taxa is should be considered:

(1) Mosquitoes (by species). Knowledge of the various species contributes to determining control techniques and reduces over use of pesticides. Currently, mosquito-borne pathogens represent a lower risk at JBLE-E (see 2018 Mosquito Management report). However, consultation with Preventive Medicine suggests surveillance for WNV, EEE, LAC and SLE. Overall, species surveillance was conducted in 2009 and then a more comprehensive inventory was accomplished in 2017. Time was not available for a species inventory in 2018. However, on-going discussions with Preventive Medicine may allow pooling of resources to make this an annual event beginning in 2019.

(2) Hard ticks (by species and disease pathogens). Tick and tick-borne pathogen surveillance has been on-going at least as far back as 1998. Preventive Medicine has disseminated tick specimens to US Army Public Health Command (and its preceding organizational names) from 1998 through the current time. These tick specimens are brought to that office by personnel who find a given tick(s). In 2007, CEIE began executing a Tick & Tick-borne Disease Threat Assessment that acquired ticks from the environment as well as biological samples from mammalian and avian wildlife. Collectively, these two surveillance programs provide current information to support tick risk assessments and management. However, changes in tick species and vectored pathogens and other conditions have been observed since 2007. Some tick species were not identified until after the 2007 program began, several pathogens were documented only recently, and new information on host species hase been noted. Additionally, a new invasive tick species was only recently found in the United States. The Asian long-horn tick (*Haemaphysalis longicornis*) was first documented in 2017 and has since been found in several states including Virginia by 2018. JBLE-E participated in a 2018 surveillance program with US Army Public Health Command with 24 whitetail deer examined and subsequent ticks sent for identification. Consequently, the current surveillance programs need to remain in effect.

(3) Red swamp crayfish (*Procambarus clarkii*) and Rusty crayfish (*Orconectes rusticus*). Both species are invasive in aquatic systems to include areas where water retention is not constant. The author documented the Red swamp crayfish at a York County location in 2015. These two taxa are included in an ACES project for FY 2020.

(4) Asian long-horned beetle (*Anoplophora glabripennis*). This taxon has been found in certain parts of North America and may not be established in the United States and is thus not likely in Virginia as yet. However, it could be devastating to the installation forest resources should this condition change. Monitoring in advance of possible spread reduces risks of potential impacts. It attacks healthy trees and has a wide range of deciduous host species. Surveillance could be included with Alnus Ambrosia Beetle (*Xylosandrus germanus*), Fruit-tree Pinhole Borer (*Xyleborinus saxesenii*), *Euwallacea validus*, Ribbed Pine Borer (*Rhagium inquisitor*), and Carolina pine sawyer (*Monochamus carolinensis*).

(5) European gypsy moth (*Lymantria dispar*). This species is established in the United States and does occur in Virginia. The Base Operating Services contract includes surveillance for this pest. None have been documented on the installation. Surveillance should continue.

(6) Sirex woodwasp (*Sirex noctilio*). This species is established in portions of the northeast and upper Midwest but is not yet documented in Virginia. The survey performed in 2015 included monitoring for this wasp but none were found. Nonetheless, surveillance should be designed and implemented in advance as with the Asian longhorned beetle.

(7) Spotted lanternfly (*Lycorma delicatula*). This hemipteran is established in portions of the United States and was confirmed in Virginia in 2017. It has not been documented thus far at JBLE-E. Specific host plants at the installation are uncertain; however, damage to at least some herbaceous plants from feeding and deposition of honeydew that contributes to black sooty mold could be of concern. Surveillance should be initiated.

(8) Redbay ambrosia beetle (*Xyleborus glabratus*). This beetle is established in the United States and caused major damage to redbay trees in Florida and other areas. It is known to occur in North Carolina and is probably not yet found in Virginia. It vectors a fungal pathogen (*Raffaelea*) that causes lethal laurel wilt. Some redbay stands exist on JBLE-E but their distribution on the installation needs clarification. A new forest inventory would support this. This taxon was included in the 2015 inventory but none were found. Surveillance could be included with the Alnus Ambrosia Beetle, Fruit-tree Pinhole Borer, *Euwallacea validus*, Ribbed Pine Borer, Carolina pine sawyer and Asian longhorn beetle.

(9) Beech scale (*Cryptococcus fagisuga*). This scale insect causes beech bark disease in healthy beech trees. It is established in portions of the United States and occurs in portions of central and western Virginia. Surveillance should begin.

(10) Southern pine beetle (*Dendroctonus frontalis*). This tiny beetle is native to the United States including Virginia yet it can be one of the most destructive pests of southern forests. Monitoring too place between 2011-2013 and again in 2015; however, none were identified. Purely based on speculation, it may be in low numbers due to various barriers and/or adequate predators particularly the Dubious Checkered Beetle (*Thanasimus dubius*) which was collected in large numbers during the 2011-2013 survey. Nonetheless, surveillance is necessary based on its destructive impacts on pines. JBLE-E forests are primarily dominated by loblolly pine with the exception of Training Areas 1 and 2 along the north boundary of the installation.