

STATEMENT OF WORK

**COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
BUREAU OF FORESTRY
DIVISION OF FOREST HEALTH**

2022 *LYMANTRIA DISPAR* SUPPRESSION PROJECT

Project FPM 22-02 (Fixed Wing-Btk)

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A. SCOPE OF WORK:

The Department of Conservation and Natural Resources, Bureau of Forestry, Division of Forest Health requires the services of a contractor for the aerial application of insecticides over certain populated and non-populated forested areas in the Commonwealth of Pennsylvania to prevent defoliation of high-value trees by *Lymantria dispar* on approximately **26,992 acres**.

Project FPM 22-02 (Fixed Wing-Btk) for approximately **26,992** ($\pm 15\%$) acres in **75** spray blocks (estimated) in 2022. Treatment areas consist of DCNR State Forests. Reference E. Project Specifications for additional information.

The contractor's per acre price must be inclusive of all costs for insecticides and other materials and services required for the Contractor to fulfill the requirements of this Statement of Work. The awarded Contractor(s) will be compensated at its bid price per acre only. No additional charges will be permitted.

Questions regarding the technical aspects of this bid should be directed Donald Eggen, PhD, at 717.514.6714 or deggen@pa.gov. Questions regarding the bidding or contracting procedures should be directed to Lynda Cashner at 717.783.4884 or lcashner@pa.gov.

B. GENERAL STIPULATIONS:

1. SCOPE OF CONTRACT - It is the purpose and intent of this document to provide specifications for aircraft, insecticide, equipment, application, and other operational requirements necessary for a properly prepared and executed Agreement and for securing properly certificated and approved aircraft, dispersal systems, insecticides, service facilities, qualified ground personnel, and FAA certificated and qualified pilots capable of making a proper aerial application of insecticide and performing necessary related functions.

2. APPLICATION PERIOD AND STARTING DATE - The application period begins on the date when the Contractor is required to report on site and continues until the final acceptable application is made. It is our objective to get all applications applied consistent with program requirements and restraints in as short a period of time as possible. Weather conditions that influence insect and tree foliage development will determine the specific starting date of the application period in each project. Estimated starting dates, based upon previous experience, are given in Section E. Each project is to be completed within *10 to 28* days depending upon weather and leaf and insect development. It is possible that the starting date could start a minimum of 15 days earlier or later than estimated in Section E. Five (5) days advance notice will be given to the Contractor of the date on which to report. The reporting date may be adjusted by mutual agreement due to inclement weather or other reasons beyond the control of either party.

The Department reserves the right to start all the aircraft required in a project on the same date or to separate the starting dates for particular aircraft by several days and reserves the right to suspend operations based on differences in insect development or phenology.

3. AIRCRAFT RECALL - The Contractor is required to keep one aircraft, an approved pilot, ground-support equipment, and crew on recall status for a period of ten workdays (Monday

through Friday, excluding holidays) after the final spray block in the project is completed. This aircraft will be recalled on 48 hours' notice to treat any approved areas that were deleted by the Department from the project but then experienced an unexpected outbreak, or to treat any areas that were missed, or to retreat areas because of faulty application, wash-off, or inadequate insecticide effectiveness. The Contractor will not be compensated for any recall spraying or re-spraying that result from misses or faulty application in excess of two (2) percent of the total contracted acreage.

4. EXPERIMENTAL SPRAYING - The Department may request a successful bidder to conduct a small amount of experimental spraying. This would be done to gain knowledge and experience with new insecticides, formulations, equipment, and/or technology to evaluate their operational potential. In such cases, equitable compensation would be negotiated if extra work or expense is involved.

5. DELETING ACREAGE - If insect population levels, because of unforeseen biological or environmental conditions, do not warrant treatment, the Department may delete acreage as stated in the Contract. If this reduction in acreage should exceed 15 percent of the acreage stated in the fully executed Contract, the Contractor will be compensated at the rate of 25 percent of the accepted bid price for the acres so deleted in excess of 15 percent and for any associated documented direct costs which are in excess of 25 percent of the accepted bid price. However, in no case will the Contractor be compensated in excess of the accepted bid price for any acreage so deleted.

C. PRE-BID CONFERENCE:

A virtual, mandatory pre-bid conference will be held on January 19, 2022, from 1:00 pm to 3:00 pm. Staff will present the suppression program objectives, information on products to be used, and technology interface requirements, as well as the mechanical and support aspects, including safety and security requirements needed for the successful development and conclusion of the program. Bidders or their designees must register for the meeting no later than 3:00 pm on Monday, January 17 2022, by contacting Mark Faulkenberry at 717.514.6711 or by email at mfaulkenbe@pa.gov. Instructions for the virtual meeting will be emailed to each registrant.

D. CONTRACTOR QUALIFICATIONS:

1. This invitation for bid (IFB) is reserved for the Small Business Procurement Initiative as designated in Executive Order 211-09 dated November 21, 2011. Only Self Certified Small Businesses which have been certified by the Department of General Services prior to the bid opening date and time may submit a response to this IFB.

Your self-certification form from the Department of General Services must be submitted along with your IFB response. Failure to produce a valid Self Certified Small Business certificate (which must be dated prior to the opening date of this IFB) will render your submission non-responsive.

For more information on the Department of General Services Small Business Self Certification process please visit: www.smallbusiness.pa.gov.

2. To bid on this contract, a contractor must have the aircraft, equipment, pilots, employees, and mechanics for the make and type of equipment indicated in these specifications.
3. Pesticide Application Business License - The Contractor must show proof of a valid Pesticide Application Business License issued by the Pennsylvania Department of Agriculture (PADA) in the category appropriate for ground spraying of forests. The current, valid certificate must be submitted with the contractor's Invitation for Bid.
4. Contractor must maintain a principal base of operations. Further, the Contractor may also, at their discretion, operate a main operation base and a main maintenance base pursuant to part 119.47 of Title 14 of the Code of Federal Regulations (CFR).
5. The Contractor must conduct operations specified herein under the applicable section of the Federal Aviation Regulations (FAR) to include, but not limited to, 14 CFR Part 137 and 14 CFR Part 137.19 (c) (d) (e).

E. PROJECT SPECIFICATIONS:

PROJECT NUMBER FPM 22-02 (Fixed Wing-Btk)

1. Counties Involved: Adams, Centre, Clinton, Cumberland, Forest, Franklin, Huntingdon, Jefferson, Lycoming, Mifflin, Pike, Potter, Union, and Warren
2. Type of Areas to Be Treated: DCNR State Forests
3. Total Acres: approximately 26,992 acres (estimated)
4. Number of Spray Blocks: 75 blocks (estimated)
5. Estimated Spray Dates: May 1-31, 2022, dependent on weather and larval/foilage development
6. Estimated Completion Time: One (1) to four (4) weeks
7. Required Fixed Wing Aircraft: (see Section L.3 for aircraft classes) Aircraft type and numbers can be discussed at the mandatory pre-bid meeting on January 11, 2022. Estimated Need: Two (2) fixed wing aircraft from Category A; or one (1) fixed wing aircraft from Category A and one (1) fixed wing aircraft from Category B; or two (2) fixed wing aircraft from Category B.

This Project may require the need for support equipment and ground crew personnel to work simultaneously from multiple airports/loading zones on a daily basis (See Section M.2).

8. Insecticides: *Bacillus thuringiensis subspecies kurstaki*
Foray 76B, 38 CLU per acre, undiluted, spray volume of ½ gallon per acre
9. Adjuvants: none

10. Contact: Air Operations Manager, Scott A. Stitzer
717.783.2066 – Main Office
717.536.3484 – Direct
717.514.6706 – Cell
sstitzer@pa.gov

11. Loading Zones and/or Airfields: See Section F.5 and Section M for details on deadlines and equipment/personnel requirements.

12. Detailed GIS maps available upon request from the Air Operations Manager.

F. OBLIGATIONS OF THE CONTRACTOR:

1. **GENERAL** - The Contractor is obligated to furnish spray aircraft, support equipment, personnel, and insecticide necessary to produce an insecticide application in accordance with the Invitation for Bid, Contract Specifications, and the Contract. Other sections in these Contract Specifications give more specific information on the aircraft, equipment, insecticide, and personnel required. **The Contractor maintains responsibility for an entire project even if another company or sub-contractor is providing part of the equipment and personnel.**

2. **FAA WAIVER FOR CONGESTED AREAS** - The Contractor is responsible for reviewing all spray block maps and for identifying congested areas that would require an FAA waiver in order to conduct low-level flights over them. The Contractor is responsible for filing the required plan and documentation with the appropriate FAA Flight Safety District Office for congested areas so identified, for obtaining the necessary waiver(s), and for providing proof of such to the Air Operations Manager two weeks prior to the start of the project. Each aircraft must have a copy of the Congested Area Plan for the Project during operations.

3. **SPRAY MATERIALS** - The Contractor is responsible for the purchase of the insecticide used in these projects unless otherwise specified in Section E. Specific details on insecticides are given in Section J. The Contractor will not be compensated for any Contractor-supplied insecticide which is lost, spilled, dumped, or otherwise made unavailable.

4. **LOADING ZONES OR AIRFIELDS** - The selection of suitable helispots and/or airfields for use as loading zones is the sole responsibility of the Contractor. Use of the sites must not present problems from a legal aspect, and permission to use the site must be obtained by the Contractor.

The Contractor must locate and secure permission for all Loading Zones (helispots and/or airfields) prior to the start of the project and be prepared to provide evidence of such permission to the Air Operations Manager. DCNR Bureau of Forestry personnel will assist in locating usable loading zones (LZ) with the Contractor during a visit to the project area no less than one month prior to the start date.

The Contractor must notify the Air Operations Manager prior to **April 1**, of the loading zones selected for use. This notification must be in the form of a Geographical Information System (GIS) point shapefile and include data fields containing the LZ location (Latitude / Longitude in decimal degree format), the name, address, and phone number of the landowner or airfield

manager. A blank point shapefile will be provided by the Bureau of Forestry to the contractor. In addition, the Contractor(s) must obtain a signed attestation that permission has been granted by the landowner or airfield manager and that the area will be suitable and accessible for use at the time spraying operations are conducted. Enough suitable loading zones must be secured prior to **April 1**, so that locating additional or alternative sites is not necessary during the spray application period. **The contractor must follow-up on its contact with the landowner two weeks prior to the anticipated start of operations to ensure that the property is still available for use.** The contractor must supply a GIS point shapefile for all landing zones to the Air Operations Manager.

5. MAINTENANCE - The Contractor must maintain a readily available on-site inventory of commonly needed spare parts and spare equipment including, but not limited to, pumps, pump seals, and rotary atomizers to maintain the spray system, the aircraft and its electronic guidance and tracking system, the pumping system, the support trucks, and the storage tanks and to provide for immediate replacement of critically needed parts and equipment. Scheduled maintenance must be conducted only at times that will not interfere with the spray operation. Non-scheduled maintenance may be conducted but not to interfere with spray operations for longer than a period of one hour. Only emergency repairs are permitted during scheduled spray hours. Care must be taken to prevent leakage of spray material at all times and a proper spill containment plan must be included in the Contractor's Safety Plan (see Section F.10).

6. SECURITY - The Contractor must abide by any current regulations issued by the FAA with regard to aircraft and insecticide safeguarding and security, as well as any rules and/or recommendations that are issued by state agencies, the Environmental Protection Agency, the USDA Forest Service, the Department of Homeland Security or any other responsible agency. At a minimum, the Contractor must provide the following:

- a. Chain-of-custody documentation (and/or shipping manifest) from the point of manufacture to delivery to the Contractor for the insecticide utilized.
- b. All spray aircraft must be disabled when not in use so that they cannot be started by anyone other than authorized personnel.
- c. All insecticide holding containers, hoppers, mix tanks, pumps, hoses, and similar equipment must be flushed prior to the start of operations and must have all possible points of entry sealed and secured when not in use.
- d. All spray aircraft and any associated insecticide and insecticide-handling equipment must be attended or guarded at all times, unless located at a restricted access secure airfield or if a waiver for the contract year is issued by the Department. Contractor will supply security personnel during off duty hours if needed.
- e. Access to the insecticide loading and storage areas must be restricted to authorized personnel of the Contractor and the Department.

7. FIELD EXPENSES AND TRANSPORTATION - Costs incurred in the operation and maintenance of all contractor equipment are the responsibility of the Contractor. Expenses incurred by all Contractor personnel including arrangements for food, lodging, and

transportation are the responsibility of the Contractor. The Contractor is responsible for providing a means of ground transportation for Contractor personnel.

8. SPILL CLEANUP EXPENSES - The Contractor is responsible for all cleanup activity and costs resulting from any contamination caused by the accidental or intentional spilling, leakage, or dumping of insecticide, fuel, oil, or any other contaminant from Contractor-supplied equipment.

9. SAFETY PLAN - The Contractor is required to conduct all operations in a safe manner and to have a well-defined, written safety plan. The Contractor must provide essential safety equipment including, but not limited to, properly sized and coded fire extinguishers and spill-containment materials and supplies. All Contractor and DCNR Bureau of Forestry personnel must be briefed by the Contractor in their use.

Two (2) weeks prior to the start of the project, the Contractor must supply the Air Operations Manager with a copy of the Contractor's safety plan. This plan must explain how the Contractor will meet the security requirements specified in Section F.7. The safety plan must also contain a written narrative explaining how the Contractor will deal with a major (100+ gallons) fuel or insecticide spill at the loading zone and a major dump of insecticide in a residential spray block. The Contractor is also required to abide by all provisions of the Department's *Work, Safety and Security Plans*. These documents will be available at the Pre-Bid meeting in January (see Section C) or can be obtained by contacting the Division of Forest Health (see Section G).

In the event of a serious safety issue or incident during spray operations, a "stand-down" of spray operations will be required to review the issue or incident before spray operations resume.

10. ATTENDING POST-SPRAY MEETING - The Contractor is required to attend a post-spray meeting to review the spray program as described in Section I.3.

G. DEPARTMENT PERSONNEL:

The DCNR Bureau of Forestry will furnish personnel to supervise and direct the aerial and spray operations in the following capacities:

1. PROGRAM SUPERVISOR - The Program Services & Support Section Supervisor, together with the Project Field Operations Supervisor, oversee the overall operation of the suppression program. The Program Services & Support Supervisor is responsible for developing all Air, Safety, and Security Plans, liaison activities with the USDA Forest Service (necessary documentation, reports), and fills many of the "in-office" roles for the program.

Mark Faulkenberry, Ph.D.
717.514.6711
mfaulkenbe@pa.gov

2. PROJECT FIELD OPERATIONS SUPERVISOR/AIR OPERATIONS MANAGER - The Field Operations Supervisor functions as the Air Operations Manager of the program and is responsible for overseeing and supervising all air and field operations during the program,

specifying and approving spray systems, troubleshooting problems with mix and spray systems, monitoring calibration and characterization procedures, analyzing quality control checks, enforcing safety requirements.

Scott A. Stitzer
717.783.2066 – Main Office
717.536.3484 – Direct
717.514.6706 – Cell
[sstitzer@pa.gov](mailto:ssitzer@pa.gov)

3. FIELD PROJECT COORDINATORS - These persons are Forest Health Program Specialists in the Division of Forest Health who serve as the Bureau of Forestry's field liaison with the Contractor Project Supervisor and are responsible for verifying calibration of all spray aircraft prior to and during the spray program, making daily aircraft assignments, verifying acceptable spraying conditions, conducting quality control checks on the aircraft and application and, when necessary, oversees the corrections made to aircraft spray apparatus or the GPS Tracking and Guidance System by the contractor personnel. In addition, these individuals direct daily assignments of treatment area Monitoring Crews through communication with a Forest District Program Leader and monitor adherence to all safety precautions throughout the project.

Sharon Coons
717.514.6704
scoons@pa.gov

Timothy Tomon
717.514.6707
ttomon@pa.gov

Sarah Johnson
717.514.6701
sarajohnso@pa.gov

Kendra McMillin
717.514.6709
kmcmillin@pa.gov

4. RADIO TECHNICIAN - This person is responsible for checking the Contractor's compliance with contract-specified radio-related equipment, installing Bureau of Forestry radio units in the spray aircraft if needed, and evaluating the performance of those units.

Timothy Price
717.514.6710
tiprice@pa.gov

5. AIRCRAFT DISPATCHER - This person is responsible for directing the operation of one or more aircraft from a loading zone. He/she briefs the pilot on the spray block manifest and on any special conditions such as objector locations. The aircraft dispatcher coordinates the movement of treatment area Monitoring Crews and acts as record keeper. In addition, these individuals are responsible for monitoring the mixing and loading of the insecticides, maintain records for the amount of chemical mixed, aircraft loaded (kind and identification number), time of aircraft take-off, time of aircraft return, and the block number(s) treated. The mixing and loading records will be submitted at the end of each treatment day to the Project Field Operations Supervisor. Mixing and loading will be done at one location for each operations site. He/she also provides daily reports of the operation to the Field Project Coordinator and the Project Field Operations Supervisor/Air Operations Manager.

6. DISTRICT PROJECT LEADER (DPL) / DISTRICT FOREST HEALTH COORDINATOR - These individuals serve as the crew leaders for Monitoring Crews within specified Forest Districts or pre-determined counties. Their primary responsibility is to assign Monitoring Crews to scheduled treatment areas for a given day or spray session and to ensure those Monitoring Crews have the appropriate equipment and documentation to record weather readings and spray deposition. DPL's are responsible to ensure the requested number of Monitoring Crews are available for all spray sessions that are determined by the Field Project Coordinator or his/her designee.

7. MONITORING CREW - A monitoring crew consists of one or two persons equipped with a radio capable of communicating with the Aircraft Dispatcher and the spray aircraft pilot. The number of crews assigned to an aircraft is dependent upon the size of the aircraft and the scope of the project. These personnel serve as roving crews during spray operations and are responsible for monitoring and recording spray weather as well as collecting larval and foliage development information in assigned treatment areas. In addition, these crews serve a critical role to advise the spray pilot of changing conditions in the treatment area and to notify the pilot of increased public activity including, but not limited to, school children assembling for bus pickup and the presence of Unmanned Aerial System (UAS) aircraft.

8. DGPS GUIDANCE SYSTEM OFFICER - These persons are DCNR Bureau of Forestry specialists who serve as field liaisons with the Contractor and are responsible for organizing and reviewing digital post-treatment files from the treatment aircraft. Following treatment file review, these individuals may provide input to the Field Project Coordinator for possible adjustments in order to improve insecticide coverage to the treatment area.

9. SAFETY OFFICER - The Safety Officer will assist the Contractors' Project Supervisors, Project Field Operations Supervisor, Field Project Coordinators, and the Program Supervisor regarding safety provisions in the spray contract; and also make sure that the contractor and the state personnel are following all pertinent aviation and ground personnel safety guidelines. They investigate any misuse or misapplication of an insecticide, aircraft incidents or accidents, or any insecticide spill. The Safety Officer will conduct or assist in conducting safety briefings throughout the program.

H. CONTRACTOR PERSONNEL:

1. PROJECT SUPERVISOR - The Contractor must designate one of its personnel to serve as the on-site project supervisor and to represent the company in all contractual matters that require prompt attention. The Project Supervisor must be knowledgeable of all aspects of this Statement of Work and Contract. This person must be familiar with all equipment being used and, as necessary, must be certified or registered as required by the Commonwealth of Pennsylvania Pesticide Control Act and the rules and regulations of the Department. If the project involves the use of no more than one loading zone at any given time, a spray pilot, observation pilot, or ground-support person may serve as the project supervisor. If the project involves the simultaneous use of two or more loading zones, the project supervisor must not be assigned to regularly fly an aircraft or serve as ground support for any aircraft. The project supervisor may, if qualified, be used as an alternate spray pilot if the regular pilot is debilitated or otherwise unavailable.

2. GROUND-SUPPORT PERSONNEL - The Contractor must supply sufficient numbers of properly trained and qualified ground-support personnel to drive all necessary support vehicles, handle insecticides, operate and maintain the equipment used to transfer insecticides, and properly fuel, service, and maintain each aircraft. All ground-support personnel must be familiar with the aircraft's spray system and knowledgeable of calibration techniques. All personnel provided by the Contractor must be experienced and fully trained in their duties and be fully proficient in English. All ground personnel involved with the handling of insecticide must be supervised, certified, or registered as required by the Department.

All ground-support personnel must be equipped and trained to take proper action in an emergency. These people must observe all safety precautions in handling the insecticides and in refueling the aircraft. The Contractor is required to replace any ground-support person who, in the opinion of the Department does not demonstrate the knowledge and capability to perform his/her duties.

3. PILOTS

a. FAA QUALIFICATIONS - The Contractor must provide pilots that are FAA qualified to operate the aircraft specified in the bid. Each spray pilot, whether in a primary or backup role, must be qualified under FAR Part 137. Proof of qualification must be provided with bid submission.

b. PILOT LIST - The Contractor must provide a completed Contractor Personnel and Equipment form listing all pilots including alternate spray pilots slated for use on the project as designated in Section W.1.c. Each spray pilot slated for use on the project, whether in a primary or backup role, must complete an Application for Spray Aircraft Pilot Approval Form for review and approval by the Department as indicated in Section V.6. The form will be reviewed and approved/disapproved by the bureau's Aircraft Operations and Safety Specialist.

c. PESTICIDE APPLICATOR CERTIFICATION - Each spray pilot must be certified in the appropriate category by the Department for the type of spraying being done. In the event any pilot does not hold a current applicator license issued by the Pennsylvania Department of Agriculture, it must be obtained within 10 days after notification of award of contract.

d. DGPS - Each pilot must demonstrate proficiency in the operation of the aircraft's DGPS guidance system (See Section L.6.a.4)).

e. EXPERIENCE - Each spray pilot must meet or exceed the following experience minimums as pilot in command:

- 1) All aircraft 2,000 hours
- 2) Aerial Application/Agriculture flight time 1,000 hours
- 3) Night flying 100 hours
- 4) Cross Country 500 hours

- 5) Type (rotary/fixed) to be flown in project 200 hours
- 6) Category and Class to be flown on project 200 hours
- 7) Make, model, and series to be flown on project 50 hours
- 8) Forest pesticide application in designated mountainous terrain .. 100 hours

f. CONTROLLED SUBSTANCE USE - Any pilot observed by the Department using or in possession of any nonprescription, controlled substance such as, but not limited to, marijuana, hashish, cocaine, heroin, and/or amphetamines will be immediately dismissed from the project. Such findings will be reported to the appropriate law enforcement agency and the FAA for action.

g. ALCOHOL CONSUMPTION - A pilot may not consume alcohol or a nonprescription medication containing alcohol within 8 hours of scheduled flight time. Any pilot observed by the Department consuming alcohol or exhibiting symptoms of alcohol intoxication or impairment or any other intoxication or impairment will not be authorized for flight for 24 hours. A second occurrence will result in dismissal from the project.

h. THE DEPARTMENT’S RIGHT TO REJECT - The Department reserves the right to reject the Contractor’s use of any pilot who, in the Department’s opinion, has performed unsatisfactorily in previous operations whether in the Commonwealth of Pennsylvania or elsewhere. The Department reserves the right to permanently reject any pilot who, in the Department’s opinion, violates these Contract Specifications, is unsafe, or otherwise performs unsatisfactorily.

i. PILOT RESPONSIBILITY - The spray pilot is responsible for the accurate and proper application of the insecticide spray to the designated site using good application delivery procedures as generally recognized as correct by professionals in the aerial application industry.

The pilot is responsible for being able to proficiently operate all of the aircraft's electronic equipment including, but not limited to, radios, GPS guidance system. The pilot is responsible at all times for the safe operation of the aircraft. The Department will not require flying in fog, dense smoke, or under any other adverse conditions which a prudent pilot would avoid nor is the pilot required to operate from any site which the pilot considers unsafe.

The pilot is responsible for the identification and avoidance of all flight hazards in route to, from, and within the operation area. **The pilot must make a reconnaissance flight over each spray block to identify and locate any such hazards or congregations of people prior to treating the block.** The pilot must avoid spraying any congregation of people, including children waiting for school buses. The pilot is responsible for communicating with all appropriate air traffic control facilities within the area of operation.

The pilot is responsible for maintaining radio communication with the Department aircraft dispatcher. The pilot must contact, via radio, the aircraft dispatcher when the pilot begins spraying a block, when a block is finished, and when a spray load is finished. Failure to maintain proper radio communications may result in the removal of the pilot from spray operations. In situations when the distance of a treatment area from the loading zone inhibits the ability for the pilot to communicate with the program supervisor, the pilot may communicate via radio with assigned Department block monitors, if applicable.

j. DUTY LIMITATIONS - Assigned duty of any kind must not exceed 14 hours in any 24-hour period. "Duty" includes flight time, ground duty of any kind, and standby. Local travel up to a maximum of 30 minutes each way between the worksite and place of lodging will not be considered duty time. Pilots will be subject to the following duty hour limitations:

- 1)** A maximum of 14 consecutive duty hours during any assigned duty period.
- 2)** The pilot must be given 2 calendar days of rest (off duty) within any 14 consecutive calendar days.
- 3)** The pilot must be given a minimum of 10 consecutive hours of rest (off duty) prior to any assigned duty period.
- 4)** The above limits notwithstanding, pilots are expected to notify the program supervisor if they become fatigued prior to reaching the duty day limit.

The Project Field Operations Supervisor or representative may waive the "consecutive" 10-hour rest period (off duty) limitation, in this section, to provide pilots two nonconsecutive off-duty rest periods, provided the accumulated rest periods equal no less than 12 hours of off duty time in any 24-hour period. One of the rest periods must include at least 8 hours of uninterrupted rest. This waiver may not be granted more than three times in any 14-duty-day cycle.

k. FLIGHT LIMITATIONS - Each pilot must report all flight time, regardless of how or where performed, except personal pleasure flying. All pilots reporting for duty may be required to submit a record of all duty and/or flight time during the previous 14 days. This record will be used to administer flight and duty time limitations. Flight time to and from a duty station as a pilot (commuting) will be reported and counted toward limitations. Flight time includes but is not limited to military flight time, charter, flight instruction, 14 CFR Part 61.56 flight review, flight examination by FAA designees, any flight time for which a pilot is compensated, or any other flight time of a commercial nature whether compensated or not.

Pilots will be limited to the following flight hour limitations, which must fall within their duty hour limitations:

- 1)** A maximum of 8 hours flight time during any assigned duty period. Pilot flight hour computations will begin at lift off and end at touchdown.

- 2) A maximum of 42 hours flight time during any consecutive six-day period. When a pilot acquires 36 or more flight hours in a consecutive six-day period, the pilot will be given the following one calendar day off duty for rest, after which a new six-day cycle will begin.

Flights point-to-point (airport to airport, etc.) with a pilot and co-pilot will be limited to 10-flight hours per day. (An aircraft that departs from "Airport A", and flies reconnaissance on a treatment block and then flies to "Airport B" is not point-to-point). The Contractor must monitor and remove any personnel for fatigue or other causes before they reach their daily duty or flight limitations.

When pilots act as a mechanic, mechanic duties in excess of 2-hours will apply as flight hours on a one-to-one basis toward flight hour limitations.

Relief, additional, or substitute pilots reporting for duty under this Contract must furnish a record of all duty and all flight hours during the previous 14-days.

I. SPRAY PILOT PROTECTIVE GEAR - All spray pilots must wear the following Contractor-provided protective gear:

- 1) Nomex flight suit
- 2) Nomex gloves
- 3) FAA-approved helmet with headset and microphone assembly
- 4) Eight-inch-high leather boots

4. OBSERVATION AIRCRAFT PILOT/NAVIGATOR - If determined by the Department, the Contractor must supply an FAA-qualified pilot to fly any required observation aircraft (see Section K.5 and Section L.2) for assisting spray pilots as specified in Section K.5 and Section K.6. If the observation aircraft pilot is not proficient in DGPS operation, is not able to read and navigate from USGS 7.5-minute quadrangle topographic maps, aerial photos, or other images used, or is inexperienced in providing reconnaissance or orientation, then the Contractor must provide an additional person who is so qualified to serve as navigator in the observation aircraft. The observation aircraft pilot and, if needed, navigator must aurally preview in detail any and all spray blocks scheduled for treatment so that they will be prepared on the day of spraying to readily assist the spray aircraft pilot with reconnaissance and orientation.

I. **OBLIGATIONS OF THE DEPARTMENT:**

1. PRE-WORK BRIEFING - The Division of Forest Health will conduct a pre-work briefing for all Contractors by **April 1** of the current project year. All Contractors will be required to present their report on personnel and equipment as detailed in Section W. The briefing will include the Project Supervisor, the Contractors' and subcontractors' representatives, the Project Field Operations Supervisor, the Program Supervisor, the Safety Officer, Field Project Coordinators, and any other invited persons to discuss, among other things, contract specifications, project deadlines, and program safety and security. **Participation at this meeting is mandatory for all Contractors and subcontractors working on the project.**

- 2. PRE-SPRAY MEETING** - At a time, date and location agreeable to all parties, no later than two days prior to the scheduled start of aerial operations, the Project Field Operations Supervisor, the Contractor, or any representatives designated therein will meet and discuss the aerial operations and application program. Topics for discussion will include, but are not limited to, logistics for aerial application and observation aircraft (if needed); assigning treatment blocks to application aircraft; assigning observation aircraft to application aircraft (if needed); the handling, mixing and application of the insecticides; aircraft capabilities; final selection of loading zones, safety precautions, etc. The Contractor(s) must require all pilots that will be used on this project to attend the pre-spray meeting.
- 3. POST-SPRAY MEETING** - At a date, time, and location agreeable to all parties, no later than two weeks after the last day of spraying, representatives of the DCNR Bureau of Forestry and Contractor(s) will meet and review the aerial operations and application program.
- 4. EVALUATION AND PLANNING** - Pilots are required to attend evaluation and planning meetings following each treatment session to review and evaluate the previous treatments. Planning of the next treatment session will also be discussed.
- 5. MAPS** - The Division of Forest Health will supply hard copy maps, intended for spray pilot pre-treatment planning and reference. These maps will show treatment area boundaries and, if applicable, any associated exclusion area(s). All application pilots are responsible for the required reconnaissance of each assigned treatment area before beginning treatment to determine the presence of aerial hazards (Section K.5).
- 6. GIS FILES** - Treatment area information, including exclusion areas, will be provided to the contractor by DCNR, utilizing ArcView/ArcInfo Geographical Information System (GIS). The GIS shape files will be transferred to the contractor in order to translate the data, if necessary, into the applicable data format required by the spray aircraft GPS electronic tracking and guidance system.
- 7. DAILY AIRCRAFT RECORD (DAR)** - The Division of Forest Health will keep, as the basis for Contractor payment, an accurate record of the insecticide metered into the aircraft and the acreage treated. A copy of the Daily Aircraft Record, signed by the Bureau of Forestry assigned Aircraft Dispatcher and the spray pilot, will be provided to the Contractor. The Contractor will not be paid for any insecticide that is applied in unauthorized areas or is jettisoned accidentally or in emergencies. The pilot's signature indicates agreement with the data on the form.
- 8. WAIVERS FOR SPECIAL USE AIRSPACE (RESTRICTED AND PROHIBITED AREAS)** - The Contractor will obtain the necessary waivers from the FAA for flights into restricted and or prohibited airspace. A copy of each approved waiver must be provided to the Field Project Coordinator and the Air Operations Manager prior to the first flight into the restricted or prohibited area.
- 9. THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT** – The Department will be responsible for obtaining all necessary permits from the Pennsylvania Department of Environmental Protection and for submitting annual reports. A copy of the NPDES Permit will be provided to each Contractor and Sub-Contractor.

J. INSECTICIDES:

1. PURCHASING, STORAGE, AND TRANSPORTATION - The Contractor must purchase the insecticide used on this project, pay all applicable sales and use taxes, and arrange for delivery of the product to a suitable site where it will be secure and protected from damage. The Contractor must assure that adequate supplies of insecticide are strategically located in or near the project area at least 24 hours prior to the start of spraying in order to assure an efficient operation. The Contractor must also assure that appropriate Department personnel are aware of these locations.

The Contractor is also responsible for handling and transporting the insecticide from the storage site to the aircraft-loading zone and for providing security of the insecticide.

2. ADDITIONAL ACREAGE - The Contract will contain figures for the maximum number of acres to be treated—no additional acreage will be included. However, if any additional spraying is required to permit the retreatment of any treated area as the result of rain wash-off, skips, or other reasons, a contract change may be executed for up to a maximum of 10 percent of the original contract acreage. Because of the contingent nature of utilizing the insecticide necessary for treating this additional acreage, the Contractor does not have to purchase and have on-site the insecticide necessary for treatment. However, the Contractor must make arrangements so that the insecticide required to treat additional acreage can be made available on site within 48 hours.

3. LABELS AND SAFETY DATA SHEET (SDS) - The Contractor must keep a copy of the labels and SDS available on site throughout the course of the project.

4. INSECTICIDES - All spraying will be conducted with *Bacillus thuringiensis subspecies kurstaki (Btk)*. Acceptable formulations for *Btk* are identified below. Section E provides area and treatment details.

5. ACCEPTABLE BTK FORMULATIONS - All *Btk* will be applied as specified and at the rates provided in Section E. The following *Btk* formulations are labeled and acceptable for forestry applications on this contract:

FORAY 76B

a. NOTES ON BTK PRODUCTS - To avoid confusion and to simplify logistics, all *Btk* used for treatments in the project must be from the same manufacturer. All *Btk* products used in the Department's program must be new material manufactured within six months of date of application.

b. BTK PURCHASING - For information on purchasing *Btk* products, contact the following:

FORAY 76B Products:
Jacques Dugal
Forestry Sales Manager
Valent BioSciences

1910 Innovation Way, Suite 100
Libertyville, IL 60048
Phone: (418) 839-6665
Cell: (418) 261-0823
Jacques.dugal@valentbiosciences.com

6. CONTAINER DISPOSAL - The Contractor is responsible for the proper disposal of all empty insecticide containers according to label requirements, State laws and regulations.

7. APPLICATIONS/RATES/SPRAY VOLUME - Specifics on the number of applications and application rates are given in Section K.

8. OPERATIONS - All operations will conform to Federal Aviation Administration (FAA) requirements, manufacturer's pesticide label instructions, Department of Transportation (DOT) policies and the appropriate state requirements for storage, transportation, loading and application of insecticides.

K. APPLICATION SPECIFICATIONS, CONDITIONS, AND RESTRICTIONS:

1. SAFETY - Department and Contractor personnel are required to conduct themselves in a safe manner at all times. The Department and Contractor will prepare detailed safety plans that will be reviewed with all involved Department and Contractor personnel prior to the start of the spraying operations.

Caution must be exercised during spraying because of the frequent flight operations directly over residential areas. Some of the terrain may be mountainous and irregular, and elevations up to 2,900 feet above mean sea level may be encountered.

2. LOGISTICS - Once the Contracted Vendor is on site, each aircraft and its assigned pilot, ground-support equipment, and crew are under the logistical direction of the Program Supervisor. Although an effort will be made to distribute the workload equitably among all the aircraft assigned, such a distribution is not guaranteed.

3. WEATHER RESTRICTIONS - Using the following guidelines, the Department will determine when weather conditions are acceptable for spraying operations to be conducted. Information supplied by the Department's field personnel located in or near the treatment area and the Contractor's pilot will be used in making this decision.

a. WIND VELOCITY - Wind velocity should be 10 mph or less when measured in or near the spray block with a hand-held wind gauge. If excessive drifting of the spray cloud occurs, the current spray operations may be suspended by the Project Coordinator. Caution must also be exercised when dead calm conditions exist because of the formation of temperature-inversion layers. Under such conditions, the smaller droplets in the spray cloud will remain suspended and will not settle into the forest canopy. Spray operations must be curtailed until such conditions subside.

b. PROBABILITY OF PRECIPITATION - Probability of precipitation within six hours after the completion of spraying must be 50 percent or less. This probability of

precipitation is provided by Flight Service Weather (1-800-992-7433), National Weather Service (use closest local source), or other contracted weather forecasting source. Any treatment area that incurs significant precipitation (0.25 inch or more) within four hours of spraying must be evaluated and, if necessary, resprayed at the Department's expense. Consult with the insecticide manufacturer regarding appropriate spray deposit drying time.

c. **WET FOLIAGE** - Foliage must not be dripping wet either from precipitation or overnight dew.

4. ACCURACY - The Contractor must produce a complete and accurate coverage of the designated areas within the spray block as documented by GPS tracking and guidance flight logs. If any designated area is missed or improperly treated, it must be resprayed at the Contractor's expense.

Care must be exercised in ensuring that all insecticides are deposited within the designated block boundaries and away from areas indicated as sensitive and/or where property owners object to the spraying. Within the designated block boundaries, the spray is to be applied to forested areas only and must be shut off over all open bodies of water.

The Department will create associated exclusion areas for treatment areas that contain open water or designated non-forested areas based on department criteria. All areas within the treatment area boundary must be sprayed unless bounded by an exclusion area. Exclusion areas will be incorporated into the GIS based digital treatment file that is delivered to the contractor. Congregations of people, including children waiting for school buses, must be avoided at all times.

5. RECONNAISSANCE - The Department requires a reconnaissance flight by the spray pilot over each spray block prior to treatment to ascertain the block layout and to identify and avoid any flight hazards or congregations of people. If the spray pilot has difficulty in conducting adequate reconnaissance flights and/or in orienting with the spray blocks, the Contractor is required to supply an observation aircraft (Section L.2) with pilot. **Pilots are responsible for communication and must conduct operations under the FARs with the appropriate air traffic control agency for the type of air space overlying treatment areas.**

6. FERRY FLIGHTS - Ferry flights to and from the work sites or between loading zones in the project area are to be provided by the Contractor and will not be billed to the Department. This airtime must be limited to flights that are essential; ferry flights must be avoided over sensitive areas, and in or near objector locations.

7. SPRAY TIME POLICY - Because of the short spray window available, it is essential that advantage be taken of any acceptable spray weather within the limits imposed by insect development, pilot work-hour limits (Section H.3.j), certain time-of-spray restrictions (Section K.8), and safety considerations. Therefore, spraying may take place whenever weather conditions permit, including weekends and holidays.

8. TIME-OF-SPRAY RESTRICTIONS - Spraying must be curtailed at certain times in certain situations to avoid potential conflicts with land users.

a. Spraying is not permitted in state, federal, or other parks and/or campgrounds from noon on Friday through Sunday or from noon the day preceding a holiday through the holiday unless special arrangements have been made with the park manager. These special arrangements must include a written waiver signed by the park manager attesting that persons utilizing that area are not being exposed to insecticide treatment against their will or without their knowledge.

b. Evening spraying (1 p.m. until dusk) on Saturday, Sunday, or a holiday must be restricted to State Forest land or other land ownerships where potential land user conflicts would be minimal.

c. No spraying may be conducted over school buses while they are actively picking up or discharging students or over any group of schoolchildren or other persons congregated within the spray block.

9. **MORNING SPRAYING** – The primary productive spray time is in the early morning. Morning spray session take-off is scheduled for 30 minutes before legal daylight, i.e., sunrise.

10. **EVENING SPRAYING** - Evening spraying is available and permitted when the weather report is favorable and where a few hours would be helpful in keeping on schedule. Evening spraying is the biggest single factor that leads to fatigue for everyone working on the program. For these reasons, evening operations should not be automatically included in the daily spray schedule. Evening spraying will be considered only when it is essential to finish up the spray project in an area.

If evening spray operations are conducted, they may be curtailed when the Department determines that fatigue is excessive.

11. **AIRSPEED** - An exact application airspeed will be designated by the pilot at the time of calibration verification.

12. **APPLICATION ALTITUDE** - Spray application must be released 50-100 feet above the canopy of the target, except where obstruction in or adjacent to the target would endanger the safety of the pilot while applying pesticides at that altitude.

13. **URNS** - The aircraft spray boom must be shut off at the end of spray runs and during turns. Turns must be avoided over sensitive areas, including properties where the owners have objected to spraying.

L. **AIRCRAFT:**

1. **GENERAL SPECIFICATIONS AND OPERATIONAL LIMITATIONS**

a. AIRCRAFT DESCRIPTION - The Contractor must complete and submit an Aircraft Description Form for each spray aircraft, alternate spray aircraft, and auxiliary aircraft slated for use on the contract with their bid submission as specified in Section V.7.

For any renewal terms executed, the Contractor must submit an Aircraft Description Form for each spray aircraft, alternate spray aircraft, and auxiliary aircraft to the Program Supervisor prior to **March 15** of the applicable project year.

b. AIRCRAFT SUBSTITUTION - The Contractor is permitted to substitute designated aircraft with aircraft in the same or larger category three (3) weeks prior to the start of a project, with the Department's approval, provided all applicable specifications and insurance requirements for the substituted aircraft are met at the time of substitution.

c. LICENSES - Every aircraft furnished for this contract must be properly licensed and airworthy under regulations of the Federal Aviation Regulations for commercial operations. Aircraft must be maintained in accordance with 14 CFR Part 137.31. In accordance with FAR137.33 - Carrying of Certificate, a facsimile of the agricultural aircraft operator certificate, under which the operation is conducted, must be carried on that aircraft. The facsimile must be presented for inspection upon the request of the Administrator or any Federal, State, or local officer. The registration and airworthiness certificates issued for the aircraft need not be carried in the aircraft. However, when those certificates are not carried in the aircraft, they must be kept available for inspection at the base from which the dispensing operation is conducted.

d. CONDITION - Each aircraft must be clean inside and outside and must fully comply with FAA directives and specifications and to any pertinent laws and regulations of the Commonwealth of Pennsylvania.

e. SAFETY - Safety regulations prescribed by the FAA, the manufacturer of the aircraft, the Contractor, and the Department must be observed at all times. All Contractor-supplied aircraft must contain FAA-approved shoulder harnesses and lap belts for the pilot and front crew/passenger and lap belts for all rear seats. All aircraft must have a wire strike protection system (WSPS) installed.

f. EQUIPMENT - All equipment specified in these Contract Specifications for use in or upon any aircraft must be FAA approved or the Contractor must have an FAA field approval (FAA Form 337) from the FAA Flight Safety District Office serving the Contractor's home base of operations.

g. ADDITIONAL EQUIPMENT REQUIREMENTS

- 1)** Fire Extinguisher(s). As required by 14 CFR 137, the fire extinguisher supplied must be a hand-held bottle with a minimum 2-B:C rating, mounted and accessible to the flight crew. The Contractor is responsible for ensuring all company personnel are trained in the correct use of these fire extinguishers
- 2)** A flight meter or recording tachometer displaying actual flight time in hours and tenths.
- 3)** A variety of avionics (See Section L.5)
- 4)** First aid kit
- 5)** DGPS navigation system (See Section L.6)

- 6) Automated flight following equipment (See Section L.7 and Attachment)
- 7) Aircraft Spray System (See Section L.4)

h. MAINTENANCE - Aircraft must be operated and maintained in accordance with 14 CFR requirements and manufacturers' recommendations. Compliance with mandatory manufacturers' bulletins, FAA ADs, and the correction of maintenance deficiencies must be accomplished prior to the start and during the period of Contract performance.

i. INSPECTION - Department personnel or Department contracted personnel will inspect the Contractor's aircraft to determine if they meet the Contract Specifications. Performance tests, as necessary, will be conducted at a location mutually agreed upon by Department personnel and the Contractor. The Contractor must assume all expenses incident to operation of the aircraft and the pilot's time during these tests. The Department may request this inspection be held as many as forty (40) days prior to the scheduled start of spraying. On-site inspection on the reporting date may be acceptable if approved in advance by the Department.

j. EXCLUSIVE ASSIGNMENT TO THE DEPARTMENT - Once an aircraft and its assigned pilot, ground-support equipment, and support crew report on site and are under contract to the Department, no substitutions may be made unless the aircraft, equipment, or person becomes incapacitated.

While an aircraft is under contract to the Department, the aircraft and its assigned pilot, ground-support equipment, and crew are not permitted to do any other spraying for any other agency, business, or individual.

If a delay caused by a lack of insect and/or foliage development of two or more days in the spraying operation is anticipated as determined by the Department, the Contractor may be issued a written temporary release by the Program Supervisor or the Project Field Operations Supervisor for any or all aircraft, personnel, or support equipment provided that the Contractor will return on site at the time and date specified with all aircraft, personnel, and support equipment and with the aircraft configured and calibrated according to original specifications and with all spray systems and support equipment properly cleaned.

Upon completion of their work on this contract, aircraft will be released by written consent of the Program Supervisor or the Project Field Operations Supervisor and with verbal confirmation by the Contractor's Program Supervisor.

k. AIRCRAFT REPAIRS - In the event that any aircraft under contract becomes non-airworthy, it must be repaired within 24 hours of the original breakdown. If the aircraft cannot be repaired and returned safely to full operation, it must be replaced with an aircraft of similar capabilities subject to all of the provisions of these Contract Specifications within 48 hours.

- l. ENGINES - Each aircraft engine must meet manufacturer's specifications for airworthiness. Engine and airframe logs must be present at time of inspection.
- m. AIRCRAFT REFUELING - Any refueling of the aircraft done while the engine is running and/or the rotor spinning must be done by hose line and nozzle only. Fueling from containers will be permitted only during complete engine shutdown. Proper aircraft/fuel truck bonding procedures as approved by the National Fire Protection Association must be followed while refueling.
- n. RESERVE FUEL - A minimum 30-minute reserve fuel supply over the amount needed for the planned round trip is required for each flight.
- o. LOADING - The pilot is responsible for the proper loading of the aircraft. Loading is under the pilot's direction and must be inspected by the pilot before takeoff. The weight must not exceed the maximum gross weight specified by the aircraft manufacturer. The pilot must compensate for altitude, temperature, landing zone conditions, and any adverse flying conditions.
- p. VISIBILITY - The aircraft windshield or bubble must be kept clean prior to and during spray operations.

2. OBSERVATION AIRCRAFT - *(If required by the DCNR Bureau of Forestry)* - As specified in Section K.5 and Section H.4, the Contractor may have to supply one high-wing, fixed-wing aircraft (no less than an 180-185 hp), pilot, and, if necessary, navigator (see Section H.4) for every one to two spray aircraft provided (i.e., 1:1, 1:2, 2:3, 2:4, 3:5, etc.). The Contractor will use this aircraft, as needed, to provide reconnaissance and navigational assistance to the spray pilot. As specified in Section H.4, the observation aircraft and its associated crew must be on site in time for the crew to aerially preview all spray blocks scheduled for treatment. If the Contractor wishes to provide additional observation aircraft for any purpose, it may do so at no separate additional cost to the Department.

3. AIRCRAFT CATEGORIES - The numbers of estimated aircraft needed for each project are given in Section E using the spray aircraft category designations A through D. Aircraft in a larger-size category as listed in Section L.3.a and Section L.3.b may be substituted with the written approval of the Department. Specifics on the aircraft slated for the contract must be provided to the Department as indicated in Section W.2 in order for the Contract to be awarded. Because of logistical planning by the Department, the Contractor is not permitted to substitute aircraft less than three (3) weeks prior to the start of the project (see Section L.1.b).

The following tables list examples of acceptable aircraft for each category along with maximum allowable lane separations for the required nozzle systems (smaller lane separations may be used to increase deposition). The actual lane separation for the specific aircraft to be used on the project will be assigned at the time of calibration verification based upon the best available information (Section L.4.c). Aircraft not listed may be considered if they are of similar capability to those listed in that category and if the request to use them is approved by the Department prior to bid opening with the issuance of an addendum.

a. FIXED-WING

CATEGORY	HORSE-POWER	HOPPER CAPACITY (Gallons)	EXAMPLES OF ACCEPTABLE AIRCRAFT	MAXIMUM LANE SEPARATION (FEET)	
				HYDRAULIC NOZZLES	ROTARY ATOMIZERS
A	Turbine >1100	>750	Air Tractor 802	200	200
B	Turbine 750 – 1100	500 - 750	Air Tractor 502	125	150
			Air Tractor 602	125	150
			Dromader M18	125	175
			Thrush T-34	125	150
			Thrush T-41	125	150
			Thrush T-45	125	150
			Thrush 660	125	150
			Thrush G-10	125	150
C	Turbine 600 - 750	300 - 500	Air Tractor 400	125	150
			Air Tractor 500	125	150
			AgCat King C	100	125
			AgCat Turbo	100	125
			Thrush R1820	100	125
			Thrush T-15	100	125
D	Piston 600 – 750	300 - 500	Air Tractor 301	100	125
			Air Tractor 301A	100	125
			Air Tractor 302	100	125
			Air Tractor 401	100	125
			AgCat Super B	100	125
			Thrush 600	100	125
			Thrush T-11	100	125

4. AIRCRAFT SPRAY SYSTEM

a. GENERAL SPECIFICATIONS

1) TANKS – Leak-proof, corrosion-resistant tanks with exterior filler openings must be used. The location and size of tanks must be so as to not impair airworthiness by overloading or displacing the center of gravity beyond acceptable limits. Filler openings or necks must be large enough to prevent surging during filling. Tanks must be vented to the outside of the fuselage.

2) EMERGENCY DUMP SYSTEM - Each aircraft must be equipped with an emergency jettison load-dumping system or emergency non-leaking dump valves of adequate capacity and adequately vented to dump the load and installed so as to prevent blowback into the fuselage. In no case must the ratio between gallons carried and the surface area of the dump-valve opening as measured in square inches be greater than 7.65 to 1. Exposed valve-control linkage must be protected to prevent unintentional opening of the valve in any manner. The control lever must be substantially mounted in the cockpit within easy reach of the pilot when properly wearing the shoulder harness.

3) PUMPING SYSTEM - The pumping system must be securely attached and capable of maintaining the pressure required to insure the even distribution of the insecticide. All plumbing and pumps must be large enough to handle the required flow. All parts, including pump seals, must be chemically and abrasively resistant to the spray material being used.

4) PRESSURE GAUGE - An accurate liquid-filled spray pressure gauge must be located so that the pilot can easily read it.

5) SHUTOFF - To avoid contamination of areas not scheduled for treatment, the entire spray system must be leak-proof and have a positive shutoff mechanism capable of eliminating dripping from the nozzles when shut off.

6) SYSTEM CLEANING - The aircraft spray system, including tanks, must be cleaned of all foreign material and flushed with water prior to the start of the spray operation. The spray system must be flushed following spraying on a daily basis to prevent drying of spray material from becoming a problem. The Contractor must daily clean all screens, check for leaks and clogs, verify pump pressure, and monitor flow rate.

During the spray project the spray system must be flushed with water if a switch between insecticides is made.

7) STRAINER - Each aircraft must be equipped with an in-line strainer (no finer than 30 mesh) to filter all material before it enters the spray boom.

8) SPRAY TIMER - Each aircraft must be equipped with an electronic flow-metering system, such as a CropHawk®, that is activated automatically when the spray switch is operated.

The system must be capable of providing an accurate measurement of the cumulative spray time in minutes and tenths or minutes and seconds as well as an accurate measurement of the volume of spray material dispensed.

9) BOOM SYSTEM - Each aircraft must be equipped with an FAA-approved boom system of the type most commonly employed for the delivery system being used. This system must have:

(a) Nozzles located so as to minimize the spraying of insecticide onto any part of the ship's structure.

(b) All nozzles rigidly attached to the boom without flexible dropper hoses.

(c) Bleeder lines installed at the ends of the boom feeding back to the outboard nozzle if that nozzle is installed more than five inches from the boom end.

10) PUMP PRESSURE - The pump must have an effective operating pressure range of 20-50 PSI.

11) AUTOMATIC ON/OFF OF SPRAY BOOM – The aircraft spray system must be equipped with an automatic on/off of spray boom that is controlled by the aircraft’s GPS guidance system. The ability to manually over-ride the automatic on/off system must be available.

12) AUTOMATIC FLOW CONTROL – The aircraft spray system must be equipped with automatic flow control that is controlled by the aircraft’s GPS guidance system.

b. NOZZLES - Approved rotary atomizers (4-8 units per aircraft) are required for spray aircraft flying at an application airspeed of 140 mph or less. Either rotary atomizers or hydraulic nozzles are permitted on spray aircraft flying at an application airspeed of 141 mph or more. The nozzle systems must meet the following specifications.

1) HYDRAULIC

(a) TYPE - Nozzles must be of either the flat-fan or hollow-cone type. All nozzles on any aircraft must be of the same type.

(b) SIZE - Tips of the proper sizes to produce an acceptable flow rate and a droplet volume median diameter (VMD) of 80-100 microns for Foray 76B applications must be provided. A check with the manufacturer for the latest recommendations should be conducted annually. All nozzle tips being utilized on an aircraft at any given time must be the same size. Tip size must be approved by the Department’s monitoring specialist prior to reporting on site for calibration verification.

(c) MATERIAL - Only new nozzle tips are permitted.

(d) ANGLE - Nozzles must be properly positioned relative to the line of flight in order to take advantage of wind speed to assist in breakup and dispersion of droplets.

(e) NOZZLE SCREENS - Each nozzle must be equipped with a 30-mesh wire screen or slotted strainer. It is possible that the screen or strainer will be removed during the spray operation, but it must be available in case needed.

2) ROTARY ATOMIZERS

(a) TYPE - Micronair®, Beecomist®, or similar Department approved rotary atomizers are acceptable provided that the units have the capability of adjusting the screen rotation speed in order to change the droplet size. All rotary atomizers on an aircraft must be of the same type.

(b) NUMBER AND SIZE - Sufficient numbers of the proper size and type rotary atomizer must be provided for the particular aircraft being utilized in order to produce a uniformly dispersed spray cloud with a droplet volume median diameter (VMD) of 80-100 microns for Foray 76B.

(c) INSTALLATION/ADJUSTMENT/CALIBRATION - The installation, adjustment, and calibration of the rotary atomizers, must be made in strict accordance with the manufacturer's recommendations to permit the application of the specified spray volume per acre. The flow rate for each individual rotary atomizer installed on a boom must not deviate ± 10 percent from the average flow rate for all rotary atomizers installed on the boom. Any rotary atomizer that deviates by more than ± 10 percent must be replaced. All units must be properly cleaned and serviced and be in good working condition when reporting on-site for calibration verification.

c. CALIBRATION/CHARACTERIZATION - The Contractor's spray aircraft must arrive on site properly calibrated for the insecticide and rate of application specified. The Department will verify the calibration by checking the flow rate of each aircraft prior to the start of the operation. If the calibration is incorrect, the Contractor must correct it immediately without causing any delay in the start of operations.

Dependent upon the delivery system and the application rate of the insecticide being used, calibration verification will be made using either water or the insecticide slated for application.

The flow rate from the spray system will be monitored periodically during the spray operation and must be maintained within ± 5 percent of the desired flow rate. Flights over card lines to characterize spray swath and droplet size may be required prior to the start of spray operations for certain aircraft as determined by the Department's Standardized characterization techniques. Those techniques may include, but are not limited to, the use of a nonpermanent dye in the spray material. There will be no separate additional charge to the Department for flights or for the insecticide used in making calibration or characterization checks.

5. ELECTRONIC RADIO, DGPS, AND TELEPHONE EQUIPMENT

a. EQUIPMENT - Prior to being approved by the Department, all spray and observation aircraft must be equipped with electronic communications and guidance equipment as described herein. The Contractor's project supervisor must also be supplied by the Contractor with a programmable portable or vehicle installed radio which meets the same specifications as given in Section L.5.a.2). All Contractor-furnished communications and guidance equipment for use in aircraft must be of types currently approved by the FCC and the FAA. The aircraft must be bonded and shielded so as to allow optimum radio communications. The following are required for all spray and auxiliary aircraft.

1) VHF COMMUNICATIONS – The Contractor must equip each spray and auxiliary aircraft with panel mounted VHF-Am (VHF-1) aeronautical transceivers with a minimum of 760 channels covering 118.000 to 136.975 MHz. Each transceiver must have channels selectable in no greater than 25 kHz increments and a minimum of 5 watts carrier output power. The transceiver’s operational controls must be mounted so they are readily visible and accessible to the pilot. The receiver for the VHF communications system must not be part of a navigational system.

Each ground-support crew must be equipped with a mobile or portable VHF transmitter/receiver that will permit communication with the spray and/or auxiliary aircraft.

2) FM RADIO - Each spray and auxiliary aircraft must be equipped by the Contractor with a field-programmable, rack-installed or portable FM radio transmitter-receiver (10 watts output with a range of 150.0 MHz to 174.0 MHz), compatible externally mounted antenna designed for aircraft use, and a compatible crash helmet microphone/headset assembly for the pilot and each operating crewmember (microphone/headset assembly required for auxiliary aircraft pilot and crewmembers--helmet optional).

3) SELECTOR SWITCH - Each spray and auxiliary aircraft must be equipped with a three-position selector switch that permits the pilot to simultaneously monitor both the VHF and FM systems in one position, monitor and transmit on the VHF system in another position, and monitor and transmit on the FM system in a third position.

4) GPS - Each spray aircraft must have a permanently installed, panel mounted GPS utilizing an approved fixed external aircraft antenna and powered by the aircraft electrical system or an aviation portable GPS unit provided the portable unit is securely mounted, is equipped with a remote antenna, and presents information from an overhead orientation (not a drive-along-the-road-type) and is powered by the aircraft electrical system. The GPS must utilize the WGS-84 datum and reference latitude and longitude coordinates in the degrees/minutes/decimal minutes (DM) mode for aircraft positioning.

5) TRANSPONDER - Each spray and auxiliary aircraft must have one air traffic control (ATC) transponder and altitude reporting system meeting the requirements of 14 CFR Part 91.215 (a) and (b).

6) EMERGENCY LOCATOR TRANSMITTERS (ELT) – Each spray and auxiliary aircraft must be equipped with one automatic-portable/automatic-fixed or automatic-fixed ELT, certified to either Technical Standard Order (TSO)-C91a or TSO-C126, utilizing an external antenna and meeting the same requirements as those detailed for airplanes in 14 CFR Part 91.207 (excluding section f.). The ELT must be installed in conspicuous or marked location, with the required battery expiration date marking located in such a manner that is easily legible without de-mounting the ELT.

b. INSPECTION - The Department will inspect all radio and guidance system installations before the spray aircraft is approved. Installations and facilities that are substandard electrically or mechanically will not be approved. All radio systems must undergo an air-to-ground check to assure that clear and understandable communications exist. Any radio system that does not perform adequately in the opinion of the Department must be repaired or replaced by the Contractor before spray operations will be permitted to start.

c. RADIO PROGRAMMING - The Contractor's pilots must be trained in programming the radio provided and must be capable of programming it in the field. Testing of radios will be conducted during calibration prior to spray operations.

d. MAINTENANCE - The Contractor must provide evidence that the communication and guidance equipment furnished has been serviced, as required, by a qualified electronics maintenance shop. It is the responsibility of the Contractor to maintain in good working order all communications and guidance equipment it is required to furnish.

6. NAVIGATIONAL AIDS - All aircraft will be equipped with a working navigation/tracking, differentially corrected, global positioning system (DGPS). The pilot must have a working knowledge of the DGPS system installed in the aircraft that he will be operating. The Department is responsible for determining and, if necessary, editing the treatment area boundaries of all scheduled treatment areas and their associated exclusions, by utilizing GIS. The contractor is responsible for transferring the GIS data created by Department personnel into the digital file format required by use of the contractor's installed DGPS. In addition, the contractor is responsible for uploading the data into the application aircraft's DGPS. Each day after spraying is completed, the recorded flight files will be downloaded for analysis for the Department.

a. Aircraft DGPS Specifications: The make of the DGPS will be specified in the contract offer. Certain electronic guidance systems may not meet program requirements. Guidance systems that meet the following criteria are acceptable:

1) Contractor will provide DGPS system with software designed for parallel offset in increments equal to the assigned swath width of the application aircraft. A course deviation indicator (CDI) or a course deviation light bar must be installed on the aircraft and must be located in a position that will allow the pilot to view the indicator with direct or peripheral vision. Differential correction will be provided by satellite using L-band frequencies.

2) The guidance system being used will allow the flight log to be downloaded to an on-site computer for post-flight analysis and review. The flight log must show the entire flight of the aircraft from takeoff to landing and differentiate between spray on and spray off when viewed on the computer monitor. The software must have the capability to zoom to any portion of the flight for viewing in greater detail and a method to determine distance between each flight lane. The system must be able to calculate and show total acres treated during the flight. The software must be compatible with color printers and differentiate between spray on and spray off on the printed copy.

3) The DGPS (*make and model, e.g., Satloc or AgNav or other*) proposed must have been operated successfully in a similar type aerial application program and demonstrated success prior to the last 12 months. Name and phone number of previous clients or other users of the system who can validate the DGPS capabilities may be requested by the Department and must be made available within five (5) days of request.

4) Pilot proficiency or evidence of prior experience with the proposed DGPS system must be demonstrated to the Department and submitted as referenced in W.1.d. To demonstrate proficiency the contractor must provide a copy of data (printed map and original electronic format) downloaded from DGPS proposed for use which was 1) conducted in the same type aircraft proposed for the use on this project, 2) flown in similar topography and aircraft altitude (generally below 200 feet AGL), and 3) collected within the last 12 months. The printed map must display the spray block boundary, the flight path of the aircraft and clearly differentiate between spray on and spray off.

5) If at any time the DGPS is not working properly the pilot must report this to the Contractor Program Supervisor and the Project Field Operations Supervisor. If the DGPS is not working properly during application, the pilot must return immediately to the airport.

b. Electronic Guidance and Support Furnished by the Contractor

1) The guidance equipment must be capable of accurately guiding the aircraft, while flying at application altitude, along parallel flight lines equal to the assigned swath width of the application aircraft, in blocks designated by the Department. The system must be sufficiently sensitive to provide immediate deviation indications and sufficiently accurate to keep the aircraft on the desired flight path. The guidance system must be capable of updating current position at a minimum rate of five (5) times per second.

2) During operation, differentially corrected signal must be accurately recorded at least 95% of the operational time.

3) Contractor will provide a post-flight processing computer and software capable of displaying track, altitude and groundspeed of aircraft during flight, with differentiation between standard flight and flight when the application system is on. Export file format must be compatible with Arc View/ArcInfo GIS systems or translatable to ArcView/ArcInfo systems and must be on a Department approved data storage media device.

c. Salient characteristics required for the DGPS system. The equipment offered must possess the following features:

1) Precision DGPS guidance with pilot-selected cross-track error readout adjustable to one (1) foot.

2) Easy to operate, user-friendly pilot's control keypad, with swath advance and decrement function.

- 3) Visual display monitor: 1) capable of displaying swath width over flight path; 2) mounted in the aircraft in a location that will allow the pilot to view the screen with direct or peripheral vision without looking down; 3) must display in real time or be available for in-flight access immediately after application has ceased.
- 4) Must have variable swath width entry.
- 5) Record logging of application at a minimum rate of one-second intervals. Full record includes position, time, altitude, speed, cross-track error, track, application system on/off, aircraft tail number, pilot, job name or number, and differential correction status.
- 6) System memory capable of storing up to 8 hours of continuous flight log data.
- 7) Capability to accept pre-loaded reference waypoints (A-B Line). Must be able to store and retrieve, in-cockpit, at least 50 individual treatment blocks, each containing up to 50 points. Capability to link blocks together for combined treatment.
- 8) Feature which alerts pilot when he/she is about to enter or exit a specific treatment block or an exclusion area within a block. A method to display nested polygons to indicated sensitive, or no-spray areas within treatment blocks.
- 9) A course deviation indicator (CDI) or light bar which displays both cross-track error and intercept angle to desired heading must be installed on the aircraft in a location that will allow the pilot to view the indicator with direct or peripheral vision (heads up display).
- 10) HOME navigational feature that provides instant range and bearing to home base airport or heli-base.
- 11) MARK feature which allows return to pint in any swath before or after equipment shutdown.
- 12) Warning method to indicate DGPS or Differential Correction failures.
- 13) Pilot-adjustable intensity lighting for light bar, keypad, and moving map display.
- 14) Capability to end log files, rename, and start new logs in flight.

7. AUTOMATED FLIGHT FOLLOWING - All spray aircraft must be supplied with an automated flight following (AFF) system. If the Contractor supplies the AFF system it must be registered with AFF.gov (see Attachment 3 for specifications). The Department may also supply an AFF unit for use in the spray aircraft if deemed necessary.

M. GROUND-SUPPORT EQUIPMENT:

1. INSPECTION - To execute the Contract, the Contractor must supply the Department with specifics on the ground-support equipment the Contractor will provide as specified in Section M.2. The Contractor is permitted to substitute ground-support equipment up to **three (3)** weeks

prior to the start of the project. Any substitutions made must be with ground-support equipment of similar or greater capability.

Department personnel may inspect this equipment and, at the Contractor's expense, conduct performance tests, as necessary, at a mutually agreed-upon site 40 days or less prior to the start of spraying operations.

2. ACCESSORY EQUIPMENT - All accessory equipment, including any vehicles necessary for transporting the insecticide from storage or from one operational site to another, is the responsibility of the Contractor. Accessory equipment supplied by the Contractor includes, but is not limited to, trucks, insecticide storage and/or mixing tanks (equipped for agitation and recirculation), pumps, hoses, metering devices, spill containment materials, and similar equipment necessary for handling the insecticide and loading the spray aircraft. The Contractor must also supply readily accessible and properly sized and coded fire extinguishers at each loading zone.

If required by contract logistics, the Contractor must supply sufficient accessory equipment so that each aircraft can work independently of each other (see Section E and Section M.4.b).

3. EQUIPMENT CLEANING - All equipment which comes in direct contact with the insecticide must be kept thoroughly clean and free of residues and foreign particulate matter.

4. FIELD TRUCKS

a. LIGHT-DUTY TRUCK - The Contractor must supply a vehicle for each ground crew to use for transporting personnel, moving insecticides, running for parts, and similar duties. If the Contractor-provided nurse truck is unsuitable for conducting these errands in an expeditious manner, the Contractor must provide a pickup truck or other acceptable vehicle. Department owned vehicles may not be used for these purposes.

b. NURSE TRUCKS - A truck or trucks equipped for transporting insecticide are required for each independently working spray aircraft or a group of spray aircraft working from a single loading zone and must have sufficient ground-support equipment and personnel to adequately service it/them without causing any production delays. Truck and trailer combinations are acceptable if they meet all requirements of the Commonwealth of Pennsylvania Department of Transportation (PennDOT), do not exceed local road and bridge weight limits, and do not present maneuverability problems at the designated field worksites.

The field truck or trucks supplying each aircraft must be designed to separately carry the insecticide concentrate, water, additives, and aircraft fuel to the worksite. The quantities transported to the worksite must be sufficient to supply aircraft working from that site for five hours of spraying without exceeding the truck or road legal weight limits.

All trucks transporting aircraft fuel or other hazardous materials must be placarded and supplied with shipping papers as required under the U.S. Department of

Transportation's Hazardous Materials Regulations (HAZMAT). Each nurse truck must be supplied with drum wrenches if barrels are being used.

5. TANK FARM - If working from a limited number of loading zones, the Contractor may, in-lieu of the nurse trucks specified, set up a tank farm, subject to all of the equipment specifications contained in Section M, at each loading zone selected for the project area. This tank farm must be of sufficient capacity to supply and service all spray aircraft working from the loading zone. Sufficient equipment must be supplied so that each loading zone will be set up and operational far enough in advance of need so that no operational spraying time will be lost by any spray aircraft. If required by contract logistics, sufficient equipment must be provided so that each aircraft can be stationed and/or worked independently of each other.

6. FUEL TRUCKS - The Contractor must supply all fuel and lubricating oils required to operate all equipment during the contract period. All fuels must be commercial (or military) grade aviation fuel approved for use by the airframe and engine manufacturer. Only fuels meeting American Society of Testing and Material (ASTM) or Military specifications are authorized for use. **Smoking is prohibited within 50 feet of the aircraft and fuel servicing vehicles. All fuel operations are to be conducted in a secure area without presenting undue hazards to other aircraft or personnel.**

- a. The Contractor must ensure that they are in compliance with 40 CFR Par 112: Oil Pollution Prevention: Spill Prevention, Control, and Counter measure Plan Requirements (SPCC). An SPCC plan is required for each mobile fueler used on this contract regardless of tank size [refer to Section X.1.c.3)].
- b. Each aircraft fuel servicing vehicle must have two fire extinguishers, each having a rating of at least 20-B: C.
- c. Fuel trucks must be properly maintained, clean and reliable. Tanks, pumping, filters, and other required equipment must be free of rust, dirt, and other contaminants.
- d. The Fuel Truck(s) must be capable of transporting sufficient fuel to operate the application aircraft for a minimum of 8 hours.
- e. The Fuel Truck(s) manufacturer's gross vehicle weights (GVW) will not be exceeded. Barrels are not acceptable fuel containers.
- f. The filtering system must be equipped with a differential pressure monitoring system or fueling systems with which the pump produces more than 25 psi. Spare filters, fuses, seals, and other components on the fuel truck filtering system will be stored in a clean, dry area. A minimum of one spare set is required.
- g. All tanks must be securely fastened to the truck bed and must have a sump or sediment settling area of adequate capacity to provide uncontaminated fuel to the filter.
- h. All hoses must be properly secured and safeguarded when not in use. Only hoses designated for dispensing of fuel will be used. Hoses must be at least 50 feet in

length. Fuel nozzle will include a 100 mesh or finer screen, a dust protective device and a bonding clip or plug.

i. Fuel Truck(s) must have adequate bonding cables and will be utilized in accordance with National Fire Protection Association (NFPA) Manual 407.

j. Markings: "NO SMOKING" signs with three-inch minimum letters visible for both sides and rear of the truck. Each fuel-servicing vehicle must be conspicuously and legibly marked to indicate the nature of the fuel. Fuel truck(s) must be placarded in accordance with 49 CFR 172.

7. TANKS

a. GENERAL - All tanks used to transport insecticides must be leak-proof and corrosion resistant. Filler openings and air vents must be adequate to prevent surging during filling. All tanks must be equipped with properly fitting covers or hatch plates that must be kept closed except when filling or circulating to reduce the change of contamination with foreign materials. All covers and hatches should be secured during off-duty hours.

b. CLEANING - All tanks must be thoroughly cleaned and free of rust, residues, and particulate matter, such as grit and sand. The Department must inspect all tanks before they are filled with insecticide or water.

8. PUMPS

a. WATER PUMP - Each truck used to transport water must be equipped with a pump capable of drafting water a vertical distance of at least ten (10) feet. The truck must be equipped with a non-collapsing suction hose, an anti-siphon device or check valve, a coarse screen, and a bucket. The configuration must be such that water being taken into the truck can be metered if needed, and it must pass through a strainer no coarser than 50 mesh.

b. CIRCULATION PUMP - The pump used for circulation and loading must produce a sufficient flow rate to fill the aircraft in a maximum of three minutes without producing high pressures.

c. INSECTICIDE PUMP - The pump used for drafting the undiluted insecticide from a 55-gallon drum must be capable of repeatedly emptying a drum in less than three minutes.

d. NUMBER OF PUMPS - The same pump may be used for all purposes if a single truck is used for mixing and for transporting water and insecticide, provided all requirements are met. If a separate truck is used for any of these purposes, it must have its own pump.

e. PUMP SEALS - All pump seals must be chemically and abrasively resistant to the spray material being used (tungsten carbide or silicon carbide components are suggested).

f. PROHIBITED PUMPS - No high-pressure piston pumps or hand pumps are permitted.

9. METERS

a. GENERAL - The insecticide-handling system must be designed to accurately meter water and insecticide concentrate. If the system or insecticide storage system is designed such that air could be sucked into the lines and cause erroneous meter readings, the meter must be equipped with an air eliminator.

A strainer no finer than 30 mesh must be installed in line to screen the solution prior to entering the meter.

The meter must be capable of safely handling the flow rate necessary for loading the aircraft.

Meters with lighted digital displays must be shaded so that they are not difficult to see in direct full sunlight.

b. CALIBRATION - All metering devices used in the performance of this contract must be:

- 1) Inspected and calibrated by a licensed inspector within the two months prior to the start of the spraying operation.
- 2) Calibrated and certified using the insecticide formulation to be used on the project OR calibrated and certified as capable of accurately measuring various materials, each with a different viscosity without being recalibrated for each material.
- 3) A copy of the inspector's calibration report for each meter used in the project must be provided to the Department within five (5) request.

N. PERFORMANCE SECURITY:

The Contractor is required to submit performance security in the amount of 100% of the total accepted bid cost. Performance security must be in the form of a specific performance bond, an irrevocable letter of credit or a certificate of deposit, all in a form acceptable to the Commonwealth, or a certified check or a bank cashier's check drawn to the order of the "Commonwealth of Pennsylvania". All performance security shall be conditioned for faithful performance of the purchase order.

Where the Contractor does not comply with the Contract or a purchase order, the amount of the Commonwealth's damages shall be liquidated to the amount of the proceeds of the check, performance bond, letter of credit, certificate of deposit, or escrow account or the Commonwealth may, at its option,

bring legal action against the Contractor or its surety for the damages it has suffered for any default, in which case security held by the Commonwealth shall be applied as a credit in such suit for damages.

Original performance security must be mailed to the Procurement Contact located at:

FedEx, UPS, DHL, or other carriers: DCNR Bureau of Administrative Services Attn: Lynda Cashner 400 Market Street, 7th Floor Harrisburg, PA 17101	United States Postal Service (USPS): DCNR Bureau of Administrative Services Attn: Lynda Cashner PO Box 8769 Harrisburg, PA 17105-8769
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A copy of the performance security must also be emailed to lcashner@pa.gov.

O. DCNR STANDARD BOND FORM:

Should the awarded contractor elect to select a Performance Bond as its security, the contractor must utilize the DCNR Standard Bond Form. Only the awarded contractor must submit a performance bond. The DCNR Procurement Contact will email the DCNR Standard Bond Form to the awarded vendor prior to the execution of the Purchase Order. If a performance bond is submitted on a bond form other than the DCNR Standard Bond Form, the DCNR reserves the right to reject the bond.

P. INSURANCE REQUIREMENTS:

The Contractor and any subcontractor shall purchase and maintain during the term of the contract, and any extension thereof, liability insurance in such form and by such company as may be acceptable to the Department.

1. COVERAGES AND LIMITS - The required insurance must include the following coverages and minimum limits:

a. AIRCRAFT LIABILITY - \$1,000,000 single limit for each occurrence for bodily injury and property damage combined.

b. AIRCRAFT PASSENGER LIABILITY - \$1,000,000 single limit for each occurrence. Required for observation aircraft only.

c. CHEMICAL LIABILITY – Restricted chemical category coverage at limits not less than:

- \$100,000 bodily injury per person
- \$300,000 bodily injury per occurrence
- \$100,000 property damage per occurrence

Must include coverage for treating urban and residential areas.

- d. **AUTOMOTIVE LIABILITY** - \$1,000,000 single limit for each occurrence for bodily injury and property damage combined. Covers Contractor support equipment (e.g., fuel truck, personal vehicle, etc.)
- e. **AIRPORT/PREMISES LIABILITY** - \$500,000 single limit for each occurrence for bodily injury and property damage combined.
- f. **LIABILITY FOR LOSS OR DAMAGE TO PROPERTY** - Coverage limit of at least \$300,000 for each occurrence.
- g. **LIABILITY FOR BODILY INJURY TO OR DEATH OF PERSONS** - A limit of at least \$100,000 for each person in any one occurrence, and a limit of at least \$300,000 for each occurrence.
- h. **WORKER'S COMPENSATION INSURANCE** for all the Contractor's employees and those of any subcontractor, engaged in work at the site of the project as required by law.

2. SUBCONTRACTORS/LEASED EQUIPMENT - If any work under this contract is subcontracted or otherwise performed by anyone other than the Contractor or performed with equipment subcontracted or leased by the Contractor, the Contractor must provide evidence that the specified liability insurance for any persons and/or equipment so subcontracted or leased is provided for under a policy(s) maintained by the subcontractor.

Prior to commencement of the work under the Contract and at each insurance renewal date during the term of the Contract, the Contractor shall provide the Commonwealth with current certificates of insurance. **These certificates or policies shall name "The Commonwealth of Pennsylvania-DCNR" as an additional insured and shall contain a provision that the coverages afforded under the policies will not be cancelled or changed until at least thirty (30) days written notice has been given to the Commonwealth.** These certificates shall include the location and a brief description of the work to be performed under the contract.

Q. AGREED LIQUIDATED DAMAGES FOR FAILURE TO PERFORM:

1. INTRODUCTION - Due to the behavior of *Lymantria dispar* and other forest insect pests, the amount of time during which successful treatment can be made is limited. For this reason, delays caused by the Contractor during periods of acceptable spray conditions can result in potentially costly damages to the Commonwealth. From the nature of the needed results of the services, it would be impractical and extremely difficult to fix the actual damage sustained due to delays caused by the Contractor.

The Commonwealth and the Contractor, therefore, presume that the actual damages sustained in the event of any such delays will be as set forth in this Section and will be paid by the Contractor as liquidated damages and not as a penalty. Repeated occurrences of failure to perform actions are sufficient grounds for contract termination and removing the Contractor's name from the list of acceptable bidders for future projects.

The Contractor is not liable for agreed damages if the failure to meet the terms of the contract arises out of causes beyond the control and without the fault or negligence of the Contractor. Such causes may include, but are not restricted to, acts of God or of the public enemy, acts of the Commonwealth of Pennsylvania in either its sovereign or contractual capacity, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and unusually severe weather; but in every case, the failure to perform must be beyond the control and without the fault or negligence of the Contractor.

Any incident in which a Contractor is assessed damages as described in this section must be documented in writing by the Field Project Coordinator and submitted to the program supervisor for approval. A copy of this report will be given to the Contractor. All approved reports will be subject to the appropriate provisions and assessed costs will be deducted from the final payment made to the Contractor. The burden of proof to dispute these assessments is upon the Contractor.

The following items are considered failure-to-perform acts subject to the specified monetary assessment.

2. LATE ARRIVAL - Notice will be given to the Contractor of a time and location to have its equipment assembled for the program start (Section B.2). This is usually a day or two before actual spraying, and is needed for calibration checks, characterization flights, final inspection, pilot briefing, and pre-work briefing.

At that time, the aircraft, its equipment, and ground-support equipment must be ready and operating according to Contract Specifications. Also, pilots and ground-support personnel must be on site and ready to perform as required by the Contract Specifications. Failure to arrive within two hours of the agreed time on the specified day may be assessed against the Contractor at the rate of **\$1,000 per aircraft per day**.

Arrival on time but failing to have all the equipment and personnel on site and/or operational and which causes a delay in calibration checks of two hours or more may be assessed against the Contractor at the rate of **\$1,000 per aircraft**.

Failure to arrive on the specified day or a delay that makes it impossible to properly calibrate on the scheduled day may be assessed at the rate of **\$5,000 per aircraft per day**.

3. TARDINESS - The first trip takeoff for morning sessions may start as early as 30 minutes before sunrise or any time after this that may be mutually agreeable to the Department and the Contractor on a daily basis (Section K.7). The Contractor's personnel must be at the worksite far enough in advance of the first trip takeoff time to have the aircraft checked, engines warmed up, and insecticide properly loaded, agitated and ready for takeoff when conditions are acceptable.

If it becomes necessary to move the aircraft from the operational worksite to another overnight location for security or other reasons, care must be exercised to avoid selecting a fog or "frost pocket" location that could postpone takeoff and thereby delay or cancel the operation for the following day.

A delay in the first trip takeoff due to tardiness when conditions are acceptable for spraying may be assessed against the Contractor at a rate of **\$1,000 per hour or portion thereof per aircraft per session.**

4. DELAYS - The number of personnel (Section H) and the quantity and quality of insecticide, water, and aircraft fuel at the loading site must be sufficient to keep each aircraft in full production for a minimum period of five consecutive hours (Section M.4.b). A shutdown or delay caused by a shortage of qualified personnel and/or a lack of acceptable insecticide, water, or fuel when spraying conditions are acceptable during this five-hour period may be assessed against the Contractor at the rate of **\$1,000 per hour or portion thereof of acceptable spray time lost per aircraft per occurrence.**

Any other Contractor-caused delay including, but not limited to, failure to supply the required aircraft, equipment failures, aircraft problems, failure to have an approved FAA waiver for the treatment of congested areas, or spray pilot difficulties with navigation, spray block reconnaissance, spray block orientation, and/or electronic equipment operation may be assessed against the Contractor at the rate of **\$1,000 per hour or portion thereof of acceptable spray time lost per aircraft per occurrence.**

Only one delay of up to 15 minutes that results in the loss of acceptable spray time, for any reason, is permitted per aircraft per day.

5. LOADING ZONES - Failure to have an adequate number of loading zones designated two (2) weeks prior to the start of the project as specified (Section F.5) may be assessed against the Contractor at the amount of **\$5,000.**

Additional or alternative worksites used during the operation that were not designated by the due date may be assessed at the rate of **\$500 per site.**

If locating additional sites results in a loss of acceptable application time, damages will accrue as specified in Section Q.4 and may be assessed as specified.

6. IMPROPER APPLICATION - A uniform application at the proper droplet size and rate per acre within the designated area is essential for a successful program (Section L.4). Where faulty application makes it necessary to respray areas not satisfactorily covered by the Contractor, the Contractor must respray such areas at the Contractor's expense (Section K.4). The Contractor will not be paid for any acreage treated outside the designated block boundaries (Section A).

Spraying insecticide at concentrations other than those prescribed in these Contract Specifications (Section E) may be assessed against the Contractor at the rate of **\$5,000 per incident.**

7. OTHER SPRAYING - The equipment and personnel under contract to the Department are not permitted to do any other spraying for individuals, companies, or agencies while the contract is in effect without a written release (Section L.1.j). Violation of this restriction may be assessed at the rate of **\$5,000 per incident.**

8. INSECTICIDE LOSSES, SPILLS, AND DUMPS - The Contractor will not be compensated for any Contractor-supplied insecticide which is lost, spilled, dumped, or otherwise made unavailable (Section F.4).

If any insecticide loss, spill, or dump results in a loss of acceptable spray time, damages will accrue as specified in Section Q.4 and may be assessed as specified.

9. POOR PILOT PERFORMANCE - The Department reserves the right to permanently reject any pilot, who, in its opinion, violates these Contract Specifications, is unsafe, or otherwise performs unsatisfactorily (Section H.3.i).

In such an event, the Contractor must furnish a replacement pilot within 24 hours who is capable and qualified to safely fly and properly perform the application.

Failure to furnish a replacement pilot within the specified time may be assessed against the Contractor at the rate of **\$5,000 per day**. In addition, damages as specified in Section Q.4 will accrue from the time of grounding and may be assessed as specified.

10. AIRCRAFT MALFUNCTION - It is understood that aircraft will occasionally malfunction even with proper maintenance (Section L.1.I). No assessment will be charged to the Contractor for the first such malfunction if the aircraft can be made operational within 24 hours.

After the 24-hour period, damages may be assessed at the rate of **\$1,000 for each hour or portion thereof of acceptable spray time lost**. Only one 24-hour, no-assessment period will be granted for each aircraft during the course of the spraying operation.

If an aircraft suffers from frequent mechanical problems, the Department will notify the Contractor that the aircraft must be replaced with an aircraft of similar capability within 24 hours. The replacement aircraft must be covered by the Contractor's insurance policies. Failure to provide an acceptable replacement within the allotted time may be assessed against the Contractor at the rate of **\$5,000 per day**. In addition, damages as specified in Section Q.4 will accrue from the end of the allotted time and may be assessed as specified.

11. DGPS DATA - Failure to provide the data collected daily by the spray aircraft's DGPS (Section L.6) may be assessed at the rate of **\$500 per incident**.

R. CONTRACT TERM:

The contract will commence upon execution and receipt of Purchase Order and Notice to Proceed and terminates December 31, 2022.

Further, the parties may agree to renew this contract up to four (4) additional 1-year terms, with a final termination date of December 31, 2026, upon the same terms and conditions set forth in the contract. The Department, based on past contractor performance, may negotiate an increase in the unit price(s) by a rate not to exceed 3%.

The Department will reach out to the Contractor no later than August 31st prior to the termination date to begin renewal discussions.

Once the renewal terms are mutually decided, the Contractor must provide written notification of the intent to renew, including the requested price increase if desired, to the Department no later than September 30th prior to the termination date. The renewal notice must be mailed to:

DCNR, Bureau of Forestry
Division of Forest Health
Attn: Lisa DePiante
P.O. Box 8552, 400 Market St., 6th Fl RCSOB
Harrisburg, PA 17105-8552

Or emailed to: ldepiante@pa.gov

S. PAYMENT:

Payment will be based upon agreed acreage treated. If a discrepancy exists between the acreage treated and the invoiced amount, the Department's agreed upon acreage will prevail.

The Contractor will not be paid for any acreage treated outside the designated block boundaries.

This contract will be paid by Automated Clearing House (ACH), commonly referred to as direct deposit. Contractor should review Section V.23 CONTRACT-016.2 Payment – Electronic Funds Transfer of the Commonwealth's Terms and Conditions for complete details and contractor's responsibilities.

T. INVOICES:

Invoice format will be in accordance with the IFB – Invitation for Bid.

All invoices for this contract **MUST** either be:

1. Emailed to the following for a Paperless Email Invoice Option: 69180@pa.gov.

For information on the Commonwealth's E-Invoicing Program, visit:
<http://www.budget.pa.gov/Programs/Pages/E-Invoicing.aspx>.

2. Or, mailed to the following address: Commonwealth of PA – PO Invoice
P.O. Box 69180
Harrisburg, PA 17106

A copy of the invoice(s) **MUST** also be sent to the Division of Forest Health:

By mail: DCNR-Bureau of Forestry, Division of Forest Health
Attn: Lisa DePiante
P.O. 8552, 400 Market St., 6th Fl RCSOB
Harrisburg, PA 17105-8552

Or email: ldepiante@pa.gov

All invoices **MUST** have the purchase order number, your SAP Contractor Number and be itemized to include project number and dates of service on the invoice. The name and address listed on the purchase order must also be listed on each invoice. Failure to provide this information will result in a delay of payment.

Please Note: Contractors are reminded to **NOT** include employer identification numbers, Social Security Numbers, bank account information, or other personally identifiable information on their invoices. That information is uniquely tied to your SAP Contractor Number and, for security purposes, should not be explicitly stated on an invoice.

U. CONTRACTOR REFERENCES:

After the bid opening, and prior to awarding of the contract, the Department has the right to request references (names, address and telephone number) of similar work performed in the previous two (2) years as proof of qualifications to perform the work involved in this contract.

Similar work will be defined as being able to provide services for the aerial application of insecticides over certain populated and non-populated forested areas as outlined in this Statement of Work, Section E.

References are an optional tool available to the Department to help determine bidder capabilities. If any of these references are requested and the bidder cannot supply the necessary documentation and proof of compliance, the Department reserves the right to reject the bidder. The decision to both request references or reject bidders based on inadequate reference will be made solely at the discretion of the Department.

V. BID AWARD:

Bidder must complete and include the following with the bid submission:

1. The **electronic** Invitation for Bid to be found at www.pasupplierportal.state.pa.us.
2. A valid copy of your self-certification form from the Department of General Services and the Small Business Procurement Initiative. Failure to produce a valid Self-Certified Small Business certificate will render your submission as non-responsive.
3. A copy of your current, valid Pesticide Application Business License.
4. A properly executed Reciprocal Limitations Act Requirements form that lists the state of manufacture for any supplies/insecticides procured.
5. A properly executed Iran Free Procurement Certification form.
6. A completed Spray Pilot Approval Form for each spray pilot and alternate spray pilot.

Include with each Pilot Approval form:

- a. A copy of the pilot's current FAA Airman Certificate (pilot license)

- b. Current Airman Medical Certificate
 - c. Proof of FAR Part 137 qualification to include date of last Part 137 check
 - d. Pilot's current and valid Pesticide Applicator Certificate
7. A completed Aircraft Description Form for each spray aircraft, alternate spray aircraft, and observation aircraft.

Include with each Aircraft Description form:

- a. Copies of last annual inspection on engine and airframe
- b. Airworthiness directives
- c. Aircraft Spec Sheets

The unit price must include all materials, labor, superintendence, tools, equipment, and any other items necessary for the completion of this project.

Note: The Issuing Office will only accept dollar amounts out to two (2) decimal points when entering your bid. **This bid price will be inclusive of all costs for insecticides and other materials and services required for the Contractor to fulfill the requirements of this Statement of Work.** The awarded Contractor(s) will be compensated at its bid price per acre only. No additional charges will be permitted.

The contract quantities herein are estimated only and may increase or decrease depending on the needs of the Department. The awarded Contractor will be paid at the unit price for actual number of acres treated except as otherwise specified in Section B.

W. AWARDING OF CONTRACT:

If Contractor is awarded the contracts for Projects FPM 22-01 and/or FPM 22-03 in addition to this contract, **the same pilots and aircraft may not be utilized for multiple projects.**

1. The following items and information must be completely and accurately supplied to the Procurement Contact, Lynda Cashner, at lcashner@pa.gov within 10 business days of request. Failure to meet these requirements may lead to a non-responsive determination for the selected Contractor and result in the award of the contract to the next lowest responsive and responsible bidder.

- a. Performance Security in the amount of 100% of the total contract amount. Reference Section N. Performance Security.
- b. Certificates of Insurances as specified in Section P. Insurance Requirements.
- c. A completed Contractor Personnel and Equipment Form.
- d. Proof of pilot proficiency of GPS – copy of data (printed map and electronic format) downloaded from GPS proposed for use [See Section L.6.a.4]]

X. POST-AWARD OF CONTRACT:

1. The following items and information must be completely and accurately supplied to the Program Supervisor, Mark Faulkenberry, Ph.D., mfaulkenbe@pa.gov by the Contractor as follows:

- a.** April 1
 - 1)** List of all loading zones selected for use
- b.** One month prior to start of project
 - 1)** Location of loading zones and airfields
- c.** Three weeks prior to start of project
 - 1)** Any substitution(s) of designated aircraft, if applicable
 - 2)** Any substitution(s) of ground support equipment, if applicable
 - 3)** An SPCC Plan for each mobile fueler used on this contract regardless of tank size
- d.** Two weeks prior to start of project
 - 1)** FAA Waiver for Congested Areas
 - 2)** Contractor's Safety Plan

Y. RECEIPT AND OPENING OF BIDS:

Bids must be submitted via the PA Supplier Portal, to be found at www.pasupplierportal.state.pa.us. Faxed, emailed, and mailed bids will not be accepted.

No responsibility will be attached to any employee of the Department for the premature opening of, or the failure to open, a bid not properly addressed and identified, or for any reason whatsoever.

Z. BID RESULTS:

Bidder can obtain bid results by accessing www.emarketplace.state.pa.us/bidtabs.aspx. The bid results will be posted as soon as practicable. The results are the apparent bidders and all bids are under review until final award of the purchase order.

Attachments:

Reciprocal Limitations Act Requirements Form
Iran Free Procurement Certification Form
Spray Pilot Form

Aircraft Description Form
Contractor Personnel and Equipment Form
Statewide Map