COMMONWEALTH OF VIRGINIA
STATE WATER CONTROL BOARD

DRAFT FACT SHEET

ISSUANCE OF A GENERAL VIRGINIA POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT TO DISCHARGE TO STATE WATERS AND STATE CERTIFICATION UNDER THE STATE WATER CONTROL LAW

Issuance Year: 2011
Preparation Date October 15, 2010

The State Water Control Board (Board) has under consideration the issuance of a general Virginia Pollutant Discharge Elimination System (VPDES) permit for point source discharges resulting from the application of pesticides to surface waters. The issuance of this general permit is required by the Sixth Circuit Court January 9, 2009 decision to vacate EPA's 2006 NPDES Pesticides Rule in National Cotton Council of America v. EPA, 553 F.3d 927 (6th Cir., 2009). The court held that the Clean Water Act unambiguously includes "biological pesticides" and "chemical pesticides" with residuals within its definition of "pollutant." Therefore, pesticide applications need to be permitted under discharge elimination system programs in all state and federal permitting programs. This Virginia Pollutant Discharge Elimination System (VPDES) permit is consistent with the National Pollutant Discharge Elimination System permit for discharges from the application of pesticides proposed by EPA in June 2010 (see http://cfpub.epa.gov/npdes/home.cfm?program_id=410).

Permit Number: VAGXX

Name of Permittee: Any operator with point source discharges resulting from the application of pesticides to surface waters. Operator is defined as any person involved in the application of a pesticide that results in a discharge to state waters that meets either or both of the following two criteria: (1) The person has control over the financing for, or the decision to perform pesticide applications that result in discharges, including the ability to modify those decisions; or (2) The person has day-to-day control of or performs activities that are necessary to ensure compliance with the permit (e.g., they are authorized to direct workers to carry out activities required by the permit or perform such activities themselves). In some situations, there may be two operators responsible for implementation of the permit since the financier or decision maker (e.g., homeowners association or locality hiring a contractor) may not be the person actually applying the pesticide and therefore, having day-to-day control of meeting the terms of the permit. Both parties need to understand and be responsible for the parts of the permit that apply to them. This is explained under 'Operator Requirements Summary' below.

This permit is available to operators who discharge to surface waters from the application of: (1) biological pesticides; or (2) chemical pesticides that leave a residue (hereinafter collectively "pesticides"), when the pesticide application is for one of the following pesticide use patterns:

- Mosquito and other flying insect pest control
- Aquatic weed and algae control
- Aquatic animal pest control
- Forest canopy pest control

Operator Location: Commonwealth of Virginia

Receiving Waters: Surface waters within the boundaries of the Commonwealth of Virginia, except those specifically named in Board Regulations which prohibit such discharges.

Restrictions: The Department will deem an operator ineligible to discharge under this general permit if the operator is required to obtain an individual permit (9VAC25-31-170 B 3), if the operator is proposing to discharge to surface waters specifically named in Board regulations which prohibit such discharges, if the discharge would violate the Virginia Water Quality Standards antidegradation policy (9VAC25-260-30), or if the discharge is

to surface waters that have been identified as impaired by that pesticide or its degradates. Impaired waters include both impaired waters with Board adopted, EPA approved or EPA imposed TMDLs (per 303(d) of the Clean Water Act), and impaired waters for which a TMDL has not yet been approved, established, or imposed for the discharge (those listed in theVirginia Water Quality Assessment 305(b)/303(d) Integrated Report as 'impaired' (includes all categories)).

The Board has made the determination that if the operator meets the conditions of this permit, they will comply with sections 9VAC25-26-30 A 1 and 2 (Tier 1 and 2) of the antidegradation policy in the Water Quality Standards Regulation. Section 9VAC25-260-30 A 3 provides for protection of exceptional waters (Tier 3) and does not allow new, additional, or increased discharge of waste to these waters. However, 9VAC25-260-30 A 3 b (3) allows for activities causing temporary sources of pollution in exceptional waters. The pesticides general permit regulation (9VAC25-800-30 D 2) recognizes applications of pesticides as temporary and allowable in exceptional waters. Currently, there no other Board regulations that prohibit these discharges. However, this general permit regulation prohibits coverage under this permit for operators that discharge to waters that are impaired for that pesticide or its degradates. A list of pesticide impaired waters in Virginia is in Attachment A.

The permit does not include terrestrial pesticide application or spray drift from terrestrial pesticide application, irrigation return flow and agricultural storm water. Terrestrial applications should not enter surface water because of restrictions provided under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), and therefore do not require coverage under this permit. The latter two agricultural related exclusions are specifically exempted from discharge permitting under the Clean Water Act.

On the basis of preliminary review and application of lawful standards and regulations, the Board proposes to issue the general permit subject to certain conditions and has prepared a draft permit. The Board has determined that this category of discharges is appropriately controlled under a general permit. The category of discharges to be included involves facilities with the same or similar types of operations and the facilities discharge the same or similar types of wastes. The draft general permit requires that all covered discharges meet technology and water quality based effluent limitations, special conditions and monitoring requirements, and that certain covered operators develop a pesticide discharge management plan (PDMP).

Persons may comment in writing on the proposed issuance of the general permit from October 25, 2010 – December 27, 2010. Comments should be addressed to the contact person listed below. Comments must include the name, address, and telephone number of the writer, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within the public comment period will be considered by the Board.

All pertinent information is on file and may be inspected, and arrangements made for copying by contacting William Norris at:

Virginia Department of Environmental Quality, P.O. Box 1105, Richmond, VA 23218
email: william.norris@deq.virginia.gov Telephone (804) 698- 4022, FAX (804) 698-4346

Comments may also be submitted through the Public Forum feature of the Virginia Regulatory Town Hall web site at www.townhall.virginia.gov, and through oral and written comments at the public hearings. Public hearings will be held on this draft permit at (1) the DEQ Tidewater Regional Office at 5636 Southern Blvd., Virginia Beach VA 23462 on Tuesday, November 16, 2010 starting with a Public Information/Question and Answer Session at 6:00 PM and the public hearing at 7:00 PM, (2) at the DEQ Blue Ridge Regional Office (Roanoke) at 3019 Peters Creek Road, Roanoke, VA 24019 on Thursday, November 18, 2010 starting with a Public Information/Question and Answer Session at 6:00 PM and the public hearing at 7:00 PM and (3) at the DEQ Piedmont Regional Office at 4949-A Cox Road, Glen Allen, VA 23060 on Tuesday, December 7, 2010 starting with a Public Information/Question and Answer Session at 2:00 PM and the public hearing at 3:00 PM.

Notice of these public hearings has been published in newspapers, in the Virginia Register and mailed to interested parties. Following the public comment period, the Board will make its determinations regarding the proposed issuance.

Administrative

Activities Covered by this Permit

This is a new permit and is available to operators who discharge to surface waters from the application of: (1) biological pesticides; or (2) chemical pesticides that leave a residue (hereinafter collectively "pesticides"), when the pesticide application is for one of the following pesticide use patterns:

- Mosquito and other flying insect pest control - to control public health/nuisance and other flying insect pests that develop or are present during a portion of their life cycle in or above standing or flowing water. Public health/nuisance and other flying insect pests in this use category include but are not limited to mosquitoes and black flies.
- Aquatic weed and algae control - to control invasive or other aquatic (emergent, floating or submerged) nuisance weeds and algae in surface waters. Aquatic nuisance weeds include, but are not limited to cattails, hydrilla and watermeal. (NOTE: If an operator is spraying a ditch with water in it to keep the ditch clear of weeds, the operator falls into this use pattern, regardless of how near the operator is to the ditch. If the operator is spraying to clear the ditch itself and the ditch has water in it, the operator must meet the conditions of this permit.)
- Aquatic Animal Pest Control - to control aquatic invasive or other aquatic animal pests in surface waters. Aquatic animal pests in this use category include, but are not limited to, fish (e.g., snakehead) and zebra mussels.
- Forest Canopy Pest Control - aerial application of a pesticide over a forest canopy to control the population of a pest species (e.g., insect or pathogen) where to target the pests effectively a portion of the pesticide unavoidably will be applied over and deposited to surface water.

These use patterns were chosen because they represent pesticide discharges that will unavoidably enter surface waters. Other use patterns where biological pesticides or chemical pesticides are applied (crops or other terrestrial applications) should not enter surface water when the operator correctly follows the product label and FIFRA requirements. If biological pesticides or chemical pesticide residue resulting from other use patterns enters state waters, then the operator is discharging to surface waters without a VPDES permit, and is subject to enforcement action under the State Water Control Law.

Treatment or control of discharge under these four use patterns consists of the use of best management practices which includes what is referred to by the industry as 'integrated pest management' (IPM).

No requirement to Submit a Registration Statement (Notice of Intent)

9VAC25-31-170 B e. states that discharges other than discharges from publicly owned treatment works, combined sewer overflows, primary industrial facilities, and storm water discharges associated with industrial activity, may, at the discretion of the Board, be authorized to discharge under a general permit without submitting a notice of intent where the Board finds that a notice of intent requirement would be inappropriate. In making such a finding, the Board shall consider: the type of discharge; the expected nature of the discharge; the potential for toxic and conventional pollutants in the discharges; the expected volume of the discharges; other means of identifying discharges covered by the permit; and the estimated number of discharges to be covered by the permit. The Board shall provide in the public notice of the general permit the reasons for not requiring a notice of intent. The Department is exercising this option for pesticide operators after considering the items listed above, with input from the stakeholders on the technical advisory committee that was formed to assist the Department with the development of this permit.

The Department believes this is appropriate for several reasons. First, the registration statements would only provide very general information to the staff. Also, EPA is focusing their notice of intent submittals on large entities that apply pesticides to large areas (e.g., irrigation control districts, localities with mosquito control programs, etc.). The Virginia Department of Agriculture and Consumer Services (VDACS) maintains a database with persons or businesses operating in Virginia that sell, store, distribute, mix, apply or recommend for use, pesticides. These persons or businesses are required to obtain a valid pesticide business license in accordance with 2VAC20-40-20. These persons or businesses are also required to demonstrate knowledge of pesticide laws and regulation, potential hazards of pesticides to man and the environment and safe distribution, use, and disposal of pesticides. Furthermore, the VDACS also certifies commercial applicators, registered technicians and private applicators. Certified applicators must submit an application indicating contact information and use subcategory for which they wish to be certified (e.g., aquatic, forest pest control, etc.). Commercial applicators must maintain records which contain the location, time, pest treated, pesticide and amount used. It is the Department's view that this information constitutes the information from the largest category of operators that would be on any notices of intent submitted to the

Department. Any submittal of paperwork to the Department would be a duplicative effort on the part of the applicant, and present an unnecessary use of staff resources. Not requiring registration statements also eliminates staff resources needed to review registrations, send out acceptance letters and other correspondence normally associated with registrations. Therefore, all operators falling under one or more of the four pesticide 'uses' are automatically covered for discharge to surface waters. Since there is no registration requirement, there is also no fee requirement. A list of pesticide business licensees representative of registrants (NOI submitters) is in Attachment B.

Deadlines

This permit is effective April 10, 2011 and will remain effective for two years. Permit coverage is only being issued for a 2-year period rather than the standard 5-year coverage because EPA is expected to issue their final pesticides general permit by the end of this year, and based on the substantial comments EPA has received on their draft permit, it is likely that the Technical Advisory Committee would need to be reconvened to consider changes to Virginia's permit based on changes EPA makes for their final permit. The use of this 2-year permit will allow Virginia to put in place a general permit by the court required deadline and also provide a reasonable time to evaluate the federal permit to incorporate appropriate changes for the reissuance of the Virginia general permit in June 2013.

Since there is no registration or notice of intent to apply, there are no deadlines for submittal. Included with this fact sheet is a list of pesticide businesses in Virginia certified by VDACS.

The permit requires annual reports by February 10 of each year citing adverse incidents.

Complying with other statues regulations and requirements

Having coverage under this permit does not relieve operators of their responsibility to meet other applicable federal, state or local statutes, ordinances or regulations, including the pesticide product label.

Terminations

There are no additional termination procedures when an operator decides to stop discharges resulting from the application of pesticides to surface waters.

Endangered and Threatened Species

Recommendations from other natural resource agencies on endangered and threatened species protection for this general permit was done via their participation on the technical advisory committee. The general permit requires operators to document and report adverse impacts to threatened and endangered species (see Part I D 2 below).

Operator Requirements Summary

Operators should carefully read each part of the permit to assess whether or what portion of the requirements in each part may apply to their activities. In summary, all operators are responsible for all aspects of the permit, including the monitoring requirements in Part I B 1 (described below), except only pesticide applicators exceeding the thresholds in 9VAC25-800-30 C (Table 1) must prepare a pesticide discharge management plan as specified in Part I C (described below).

All other aspects of this general permit were developed with the understanding that there may be more than one responsible entity implementing it for a given discharge. As structured, the permit provides for sharing of responsibilities to meet the end goal of discharges being in compliance with permit requirements. 40 CFR 122.21(b) clarifies that when an activity is owned by one person but it is operated by another person (e.g., contractor), it is the operator's duty to meet terms of the permit. We acknowledge, however, that in many instances the owner may still perform operator duties; as such, they may still be required to obtain permit coverage, even in situations in which, for example, the owner hires a contractor to apply the pesticides to control pests. This general permit includes a definition of an "operator" that is intended to clarify this point, focusing on the fact that operator control exists both at the decision-making level about how to control pests, including financial considerations, as well as at a level where activities are performed to ensure compliance with the specific provisions of the permit (such as calibration of pesticide application equipment). In these instances, both operators are responsible for their VPDES permit coverage; however, the permit strives to minimize any potential duplication of effort. In many instances, the requirements that operators must meet depend on how their agreements with contractors hired to perform the pest control activities are structured.

Practically, an individual or a small group (e.g., homeowners association) who hires a contractor to apply pesticides will likely expect the contractor to meet all the requirements of the permit. It is in the individual or small group's

best interest to read the permit, try to understand the requirements and ask the contractor if they know about the permit and intend to adhere to its requirements. If the owner sees something that does not appear in compliance with the permit, it is their responsibility to stop or question the activity. In a situation where a locality hires contractors to apply pesticides, the locality may want to be wholly responsible for meeting the limits and conditions of the permit. The locality may; however, specifically note in their contract with the applicator that the applicator will do the monitoring, equipment maintenance, etc.

Entities such as subcontractors or employees that are hired by an owner (e.g., of a pesticide application business) or other entity but are under the supervision of such owner or entity generally are not operators. Similarly, you are likely not an operator if, for example, you own the land, but the activities are being performed outside of your control (e.g., a public entity is spraying for mosquitoes over your property).

Operators may want to explore possible cost savings by sharing responsibilities for implementing aspects of this permit. For example, a mosquito control district could assume the overall coordination of an integrated pest management program while a hired contractor may be responsible for minimizing the pesticide discharge and for site monitoring and maintaining and calibrating pesticide application equipment. The bottom line is that any and all operators covered under this permit are still responsible, jointly and severally, for any violation of shared responsibilities that may occur, though the Department may consider this division of responsibilities when determining the appropriate enforcement response to a violation.

Part I Effluent Limitations and Monitoring Requirements:

The draft general permit requires that all covered discharges meet technology and water quality based effluent limitations (Part I A). Violation of any of these effluent limitations constitutes a violation of the permit.

Part I A.1 Technology-based limits - Minimize
Technology-based limits are required per 9VAC25-31-220 A of the VPDES Permit Regulation. Technology-based limits in this permit are not numerical, rather narrative best management practices which minimize discharges of pesticides to surface waters. All operators shall minimize the discharge of pollutants resulting from the application of pesticides. Operators can do this by using the lowest effective amount of pesticide at an optimum frequency, maintaining equipment or application apparatus appropriately, equip application equipment with cut-off and backflow valves so non-target areas can remain uncontaminated and implement Integrated Pest Management (IPM) Practices. IPM measures include identifying the target pest, densities and sources or factors contributing to the problem and making determinations about pest management options to manage that problem. Pest management options include no action, prevention, physical methods, cultural methods, biological control or pesticides. If pesticides are chosen, then conduct surveillance to assess the pest management area, determine action thresholds for its use, make sure environmental conditions are correct for application, evaluate site restrictions, application timing and application methods and evaluate using the pesticide against the most susceptible developmental stage of the pest. All these control measures to meet these limitations should be done to the extent technologically available and economically achievable.

Part I A 1.a (1) Use the lowest effective amount of pesticide product per application and optimum frequency of pesticide applications necessary to control the target pest, consistent with reducing the potential for development of pest resistance without exceeding the maximum allowable rate of the product label.

It is illegal to use a pesticide in any way prohibited by the FIFRA labeling. Also, use of pesticides must be consistent with any other applicable state or federal laws. To minimize the total amount of pesticide discharged, operators must consider lower application rates, frequencies, or both to accomplish effective control keeping in mind pesticide resistance. Using the lowest possible effective rate ensures maximum efficiency in pest control with the minimum quantity of pesticide. Using the lowest possible effective rate does not necessarily mean choosing the lowest rate on the label. Sometimes using a higher rate (without exceeding the maximum allowable rate of the product label) is more effective and more protective for the environment. The lowest effective application rate also reduces the amount of pesticide available that is not performing a specific pest-control function. Using the lowest possible effective rate and frequency of application can result in cost and time savings to the user. To minimize discharges of pesticide, operators should base the rate and frequency of application on what is known to be effective against the target pest or necessary for resistance management.

Operators must also consider pest resistance to pesticides when reducing discharges from application of pesticide. Resistance management is an important part of pest control. Some pests can develop resistance to pesticides unless

resistance management techniques are adopted by pesticide users. Resistance can result in the loss of effectiveness of pesticides and increase reliance on riskier pesticides. When resistance occurs, users may increase rates and frequency of application in an attempt to maintain pesticide effectiveness. This can lead to the loss of efficacy and increased exposure to the pesticide. Pesticide applicators should be aware of the potential for pest resistance to develop by considering the pest, the pesticide and its mode of action, the number of applications and intervals, and application rates.

Pest resistance develops because intensive pesticide use kills the susceptible individuals in a population, leaving only the resistant ones to reproduce. Several pest management tactics help prevent or delay the occurrence of pesticide resistance. One tactic is to reduce dosages in order to avoid establishing a population of resistant organisms and instead allowing some survivors to pass on genes for susceptibility. Another is to apply pesticides over limited areas to reduce the proportion of the total pest population exposed to the pesticide, thereby maintaining a large pool of individuals still susceptible to the pesticide. A third tactic to prevent development of resistant pest populations is to rotate pesticides with different modes of actions against the pests rather than depend on a single mode of action. See National Pesticide Applicator Certification Core Manual, Chapter 1 – Pest Management for additional information on pesticide resistance.

Part I A 1.a (2) No person shall apply, dispense, or use any pesticide in or through any equipment or application apparatus unless the equipment or apparatus is in sound mechanical condition and capable of satisfactory operation. All pesticide application equipment shall be properly equipped to dispense the proper amount of material. All pesticide mixing, storage, or holding tanks, whether on application equipment or not, shall be leak proof. All spray distribution systems shall be leak proof, and any pumps which these systems may have shall be capable of operating at sufficient pressure to assure a uniform and adequate rate of pesticide application.

This requirement is taken from 2VAC20-20-170 A, Rules and Regulations for Enforcement of the Virginia Pesticide Law –Application and Equipment.

Common-sense and good housekeeping practices enable pesticide users to save time and money and reduce potential for unintended discharges of pesticides to surface waters. Regular maintenance activities should be practiced and improper pesticide mixing and equipment loading should be avoided. When preparing the pesticides for application be certain that you are mixing them correctly and preparing only the amount of material that you need. Carefully choose the pesticide mixing and loading area and avoid places where a spill will discharge into surface waters. Some basic factors operators should consider are:

- Inspect pesticide containers at purchase to ensure proper containment;
- Maintain clean storage facilities for pesticides;
- Regularly monitor containers for leaks;
- Rotate pesticide supplies to prevent leaks that may result from long term storage; and
- Promptly deal with spills following manufacturer recommendations.

Part I A 1.a (3) All pesticide application equipment shall be equipped with cut-off valves and discharge orifices to enable the operator to pass over non-target areas without contaminating them. All hoses, pumps, or other equipment used to fill pesticide handling, storage, or application equipment shall be fitted with an effective valve or device to prevent backflow into water supply systems, streams, lakes, other sources of water, or other materials. However, these backflow devices or valves are not required for separate water storage tanks used to fill pesticide application equipment by gravity systems when the fill spout, tube, or pipe is not allowed to contact or fall below the water level of the application equipment being filled, and no other possible means of establishing back siphon or backflow exists.

This requirement is taken from 2VAC20-20-170 B, Rules and Regulations for Enforcement of the Virginia Pesticide Law –Application and Equipment.

To minimize discharges of pesticide, operators must ensure that the rate of application is calibrated (i.e., nozzle choice, droplet size, etc.) to deliver the appropriate quantity of pesticide needed to achieve greatest efficacy against the target pest. Improperly calibrated pesticide equipment may cause either too little or too much pesticide to be applied. This lack of precision can result in excess pesticide being available or result in ineffective pest control. When done properly, equipment calibration can assure uniform application to the desired target and result in higher efficiency in terms of pest control and cost. It is important for applicators to know that pesticide application efficiency and precision can be adversely affected by a variety of mechanical problems that can be addressed through regular calibration. Sound calibration practices to consider are:

- Choosing the right spray equipment for the application;
- Ensuring proper regulation of pressure and choice of nozzle to ensure desired application rate;
- Calibrating spray equipment prior to use to ensure the rate applied is that required for effective control of the target pest;
- Cleaning all equipment after each use and/or prior to using another pesticide unless a tank mix is the desired objective and cross contamination is not an issue;
- Checking all equipment regularly (e.g., sprayers, hoses, nozzles, etc.) for signs of uneven wear (e.g., metal fatigue/shavings, cracked hoses, etc.) to prevent equipment failure that may result in inadvertent discharge into the environment;
- Replacing all worn components of pesticide application equipment prior to application.

Part I A 1 b Technology Based Limits - Integrated Pest Management Practices (IPM)

As noted above, VPDES permits must contain technology-based effluent limitations. The additional technology-based effluent limitations in Part I A 1 b are based on integrated pest management (IPM) practices. IPM, as defined in FIFRA, is a sustainable approach to managing pests by combining biological, cultural, physical, and chemical tools in a way that minimizes economic, health, and environmental risks (FIFRA, 7 U.S.C. 136r-1). IPM is not a single pest control method but, rather, a series of pest management evaluations, decisions and controls. This requirement for all operators to use IPM was requested by the technical advisory committee. The Department expects that most of the commercial operators are already performing some of the IPM practices required in these additional technology-based effluent limitations. Operators whose discharges of pesticides to surface waters are solely from pesticide research and development activities do not have to comply with these additional technology-based effluent limitations to the extent the limits may compromise the research design.

Part I A 1 b of this permit requires all operators to identify the pest problem; to evaluate and implement efficiently and effectively pest management; and to properly use pesticides. Operators are required to perform each of these permit conditions prior to the first pesticide application covered under this permit and at least once each calendar year thereafter. Below is a general discussion describing the limitations for all use patterns. Following the general discussion are more detailed descriptions of each specific requirement under each use pattern. Requirements for documentation of the specific measures implemented are contained in Part I C (Pesticide Discharge Management Plan).

Operators required to perform IPM practices will be required to do the following regardless of use pattern:

Identify the Problem

Operators are required to identify the pest problem, identify the target pest, and establish an action threshold. Understanding the pest biology and ecology will provide insight into selecting the most effective and efficient pest management strategies (pesticidal or non-pesticidal methods), and in developing an action threshold. An action threshold is a point at which pest populations or environmental conditions indicate that pest control action must be taken. Action thresholds help determine both the need for control actions and the proper timing of such actions. It is a predetermined pest level that is deemed to be unacceptable. In some situations, the action threshold for a pest may be zero (i.e., no presence of the pest is tolerated). This is especially true when the pest is capable of transmitting a human pathogen (e.g., mosquitoes and the West Nile virus). In areas where aquatic weeds are problematic, it may be preferable to use an aquatic herbicide as a preventive measure rather than after weeds become established. In some situations, even a slight amount of pest damage may be unacceptable for ecological or aesthetic reasons. Sometime pre-emergent pesticide application is needed, as preventive measure to keep aquatic weeds at bay. Action thresholds can vary by pest, by site, and by season. Often the action threshold is expressed as the number of pests per unit area. Action thresholds may be difficult to establish. In a new IPM program, a practical approach is to establish an action threshold for the major pests. As operators gain insight and experience into specific pest management settings, the action levels can be revised up or down.

To identify the problem at a treatment area, operators may use existing data to meet the conditions of the permit. For example, a mosquito district may use surveillance data from an adjacent district to identify mosquito species at their pest management area. Operators may also use relevant historic site data.

Pest Management

Operators are required to implement efficient and effective means of pest management that most successfully minimizes discharges to surface waters resulting from the application of pesticides. Operators

must evaluate both pesticide and non-pesticide methods. Operators must consider and evaluate the following options: no action, prevention, mechanical/physical methods, cultural methods, biological control agents, and pesticides. In the evaluation of these options, operators must consider impacts to water quality, impacts to non-target organisms, pest resistance, feasibility, and cost effectiveness. Combinations of various management methods are frequently the most effective pest management strategies over the long term. The goal should be to emphasize long-term control rather than a temporary fix. For additional information, see discussion under each use pattern.

Pesticide Use

Operators are required to conduct pest surveillance and reduce the impact on the environment. Pest surveillance is important to properly time the need for pest control. To reduce the impact on the environment and non-target organisms, operators are required to apply pesticide when the action threshold has been met. As noted earlier, action thresholds help determine both the need for control actions and the proper timing of such actions. There are additional requirements designed for each use pattern in Sections Part I A 1 b (1), (2), (3) and (4) of the permit. For additional information and other limits on pesticide use, see specific IPM discussion under each use pattern.

Part I A 1 b (1) Mosquito and Other Flying Insect Pests Control IPM Practices

Mosquitoes Background

There are over 200 different species of mosquitoes occurring in the U.S. Mosquitoes can be a source of annoyance (e.g., work and leisure activities), a limiting factor in economic development (e.g., residential development and property value), a causal factor in decreased agricultural productivity from irritation and blood loss (e.g., animal weight loss/death and decreased milk production), and a source of disease transmission (e.g., malaria, encephalitis, yellow fever, dengue, and West Nile Virus).

Part I A 1 b (1)(a) Identify the Problem

Prior to the first pesticide application covered under this permit that will result in a discharge to surface waters, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year, you must do the following for each pest management area. Operators must identify the pest problem in their pest management area prior to the first application covered under this permit. Knowledge of the pest problem is an important step to developing pest management strategies. Re-evaluation of the pest problem is also important to ensure pest management strategies are still applicable. Operators must identify the pest problem at least once each calendar year prior to the first application for that calendar year. Operators may use historical data or neighboring district data to identify the species.

Establish densities for larval and adult mosquito or flying insect pest populations to serve as action threshold(s) for implementing pest management strategies. Operators must develop action thresholds for larval and adult mosquito prior to the first pesticide application covered under this permit. The action thresholds must be re-evaluated at least once each calendar year. As noted in the general discussion above, an action threshold is a point at which pest populations or environmental conditions indicate that pest control action must be taken. Action thresholds help determine both the need for control actions and the proper timing of such actions. It is a predetermined pest level that is deemed to be unacceptable. For example, "A collection of more than 10 anthropophagous (human biting) female mosquitoes per night of trap operation is considered to be the level which causes discomfort and/or complaints from the majority of people. The light trap action threshold for ground spraying of adult mosquitoes is 10-20 per trap-night. The action threshold to suppress pest populations of adult mosquitoes by aerial spraying (application of insecticide by an aircraft) is a light trap collection of 100 female mosquitoes. The action threshold for landing rate counts to justify ground spraying for the control of adult mosquitoes is 1 to 3 in 1 minute. The action threshold for aerial spraying is 12 mosquitoes per minute."[1] For larvae control, action thresholds are determined by standard mosquito dipping techniques. In another example, the established larvae density action levels for Culex species (primary disease vectors) as Low: 1-5 larvae per dip; Medium: 6-10 larvae per dip; High: > than 10 larvae per dip. The larvae density action threshold can be used to determine how much larval control products are to be used or even if any action is to be taken. In some situations, the action threshold for a pest may be zero (i.e., no presence of the pest is tolerated). This is especially true when

[1] http://www.mda.state.md.us/plants-pests/mosquito_control/mosquito_control_program_description.php

the pest is capable of transmitting a human pathogen (e.g., mosquitoes and the West Nile virus).[2] Operators may use historical data or neighboring district data to establish action thresholds.

Identify the target mosquito or flying insect pests to develop a pest-specific pest management strategy based on developmental and behavioral considerations for each pest. Knowledge of the developmental biology of mosquitoes is essential to developing pest management strategies for mosquito control. The mosquito undergoes complete metamorphosis and has four distinct stages in its life cycle: egg, larva, pupa, and adult. Depending on the species, eggs are deposited either in permanent water habitats or in temporary/floodwater habitats. Egg deposition in permanent water habitats occurs as individual eggs or as multiple egg rafts deposited directly to the water surface in natural or artificial water-holding containers found in the domestic environment or in naturally occurring pools. Egg rafts may contain 100-200 eggs. A batch laid of single eggs may range from 60-100 eggs. Egg deposition in temporary/floodwater habitats occurs as individual eggs on moist soil (e.g., roadside ditches, depressions, farmland irrigation ditches, etc.) or in other objects (e.g., flower pots, cans, tires, tree holes, etc.) in which periodic flooding will occur. Eggs deposited in permanent habitats will hatch in a few days whereas eggs deposited in temporary/floodwater habitats are resistant to desiccation in the absence of flooding and can withstand drying for extended periods of time (weeks to months) before hatching.

Following egg hatching, typically 2-3 days after laying, mosquitoes go through four larval developmental stages (instars) commonly known as wrigglers. Larval development generally is completed in a week or less, depending upon the species and environmental conditions (e.g., crowding, food availability, and water temperature). The first three larval instars continually feed on detritus, algae, bacteria, and fungi. However, some mosquito species are predacious with larva feeding on other mosquitoes and/or small aquatic invertebrates. Late in the fourth larval instar the larvae ceases to feed in preparation for pupation. The pupal stage, commonly referred to as a tumbler, is a non-feeding developmental stage in which the adult form is developed. Following a few hours to several days, dependent upon species and water temperature, the adult emerges from the pupae.

The adult mosquito is the pestiferous stage. Adults emerge from the water surface and after a short period of rest seek out a food source. Both males and females feed on nectar of flowers and other sugar sources as a source of energy. Only female mosquitoes seek out a blood meal as a source of protein and lipids for egg development. However, females of some species are autogenous (i.e., able to use energy reserves carried over from the immature stage to develop the first egg batch). In addition, most mosquitoes have preferred hosts which may include warm and cold blooded animals and birds. Human blood meals are seldom first or second choices with livestock, smaller mammals and/or birds generally preferred. Host seeking and blood feeding activities by mosquitoes are initiated by a complex variety of host and environmental cues (e.g., carbon dioxide, temperature, moisture, smell, color, movement and host preference). Adult feeding activity is generally either crepuscular (early morning, dusk and into the evening) or diurnal (daytime, particularly in relation to cloudy days and shaded areas). Although highly variable by species and environmental conditions, a complete development cycle can occur every one to three weeks. An understanding of the developmental biology of species in a given area provides the basis for developing a pest management strategy aimed at reducing pesticide discharge into surface waters.

Prior to the first pesticide application covered under this permit, operators must ensure proper identification of mosquito species to better understand the biology of the target species and develop a detailed pest management strategy. Due to the great variability in developmental habitats and adult feeding behaviors as discussed previously, proper identification is imperative in designing an effective and efficient pest management strategy. Identification of the target species will aid in development of strategies aimed at both the immature and adult developmental stages. Identification of the target species for a specific area allows 1) identification of potential breeding sites, 2) evaluation of alternative control measures aimed at controlling the immature stages (habitat modification, source reduction, larvicides, biological larvicides, and oils), and 3) assessment of potential for disease transmission.

Identify known breeding sites for source reduction, larval control program, and habitat management. Once species have been identified, mapping is a valuable tool in assessing mosquito habitats and designing control programs for a specific area to minimize pesticide discharge into surface waters. Maps may simply be township/city/county maps but may also include aerial photo assessments, topographic maps, and satellite imagery where available. Mapping is essential to identify mosquito producing areas which can and cannot be controlled using non-chemical preventative measures (e.g., source reduction). Maps should include all potential sites for mosquito development including agricultural areas in the specific area (e.g., hay, pasture, circle irrigation, orchards,

[2] http://www.canyoncountymosquito.com/CCMADMosquitoPesticideUsePlan.pdf

rill irrigated field crops, and flood irrigated pastures and farmland). Mapping should also be a priority in a surveillance program utilizing mosquito traps, biting counts, complaints, and reports from the public. Planning in coordination with mapping ensures the best pest management strategy (whether source reduction, biological, or chemical) for each particular species is chosen. Operators must identify known breeding sites prior to the first pesticide application covered under this permit.

Analyze existing surveillance data to identify new or unidentified sources of mosquito or flying insect pest problems as well as sites that have recurring pest problems. As discussed above, mapping is a valuable tool in assessing mosquito habitats and designing control programs. Operators must analyze existing surveillance data to identity any new source of mosquito problems.

Part I A 1 b (1)(b) Pest Management

Prior to the first pesticide application covered under this permit that will result in a discharge to surface waters, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year, you must select and implement, for each pest management area, efficient and effective means of pest management that minimize discharges resulting from application of pesticides to control mosquitoes or other flying insect pests. In developing these pest management strategies, you must evaluate the following management options, considering impact to water quality, impact to non-target organisms, pest resistance, feasibility, and cost effectiveness: No action; Prevention; Mechanical/physical methods; Cultural methods; Biological control agents; and Pesticides.

Operators are required to evaluate and implement a pest management strategy to minimize pesticide discharge into surface waters prior to the first pesticide application covered under this permit. Pest management strategies will vary by locality, mosquito species, and financial concerns. As noted above, combinations of various management methods are frequently the most effective pest management strategies over the long term. The goal should be to emphasize long-term control rather than a temporary fix. Operators must reevaluate every year prior to the first pesticide application for that calendar year. The following describes the management options that must be evaluated.

No Action

No action is to be taken, although a mosquito problem has been identified. This may be appropriate in cases where, for example, available control methods may cause secondary or non-target impacts that are not justified or no control methods exist.

Prevention

Prevention strategies are program activities which eliminate developing mosquito populations through environmental modification and/or habitat management. For mosquito control, these activities are physical methods such as habitat modification, cultural methods that reduce sources of mosquitoes, and biological control.

Mechanical/Physical Methods

Habitat modification, also known as physical or permanent control, is in many cases the most effective mosquito control technique available and is accomplished by eliminating mosquito breeding sites. Habitat modification activities have the potential to be both effective and economical in some areas and can virtually eliminate the need for pesticide use in and adjacent to the affected habitat. However, the ability to use prevention strategies is dependent upon local authority and restrictions.

Cultural Methods

Cultural methods can reduce sources of mosquitoes and can be as simple as properly discarding old containers that hold water capable of producing *Aedes aegypti*, *Ae. albopictus* or *Culex spp*. or as complex as implementing Rotational Impoundment Management (RIM) or Open Marsh Water Management (OMWM) techniques. RIM is a source reduction strategy that controls salt marsh mosquitoes (e.g., *Ae. taeniorhynchus* and *Ae. sollicitans*) at the same time as significant habitat restoration is occurring. Source reduction may include; water management, vegetation management and biological control.

Containers provide excellent habitats for development of numerous mosquito species. These may include but are not limited to flowerpots, cans, and tires. Container-inhabiting mosquitoes of particular concern include, *Ae. aeypti*, *Ae. albopictus, Cx. p. pipiens,* and *Cx. salinarious*. A container-breeding mosquito problem can be solved by properly disposing of such materials, covering them, tipping them over to ensure

that they do not collect water, and/or periodic draining. Urban container-breeding mosquito control is best implemented through education and surveillance programs.

Source reduction in freshwater lakes, ponds, and retention areas is more applicable to artificially created areas than natural areas. Artificial ponds can be eliminated as a breeding site simply by filling in the areas, (i.e., habitat modification). However, large permanent water bodies and areas for stormwater or wastewater retention require other methods. Options for these areas include minimizing and/or eliminating emergent and standing vegetation, maintenance of steep banks, and inclusion of deep water areas as sanctuary for larvivorous fish.

Mosquito production from stormwater/wastewater habitats can result in considerable mosquito problems as a result of engineering, poor construction or improper maintenance. However, mosquito populations can typically be managed by keeping such areas free of weeds through an aquatic plant management program and maintaining water quality that can support larvivorous fish. *Culex*, *Coquillettidia*, *Mansonia*, and *Anopheles* mosquitoes are often produced in these habitats.

Pastures and agricultural lands are enormous mosquito producers, frequently generating huge broods of *Aedes*, *Psorophora*, and *Culex* mosquitoes. Improved drainage is one effective tool for source reduction in such habitats. The second is the use of efficient, precision irrigation practices that will result in less standing water for those agricultural areas that require artificial watering.

In coastal areas with extensive coastal salt marshes, there can be tremendous production of *Aedes* mosquitoes, making coastal human habitation virtually impossible. Several source reduction efforts can greatly reduce salt-marsh mosquito production through high-to mid-intensity management that relies upon artificial manipulation of the frequency and duration of inundation.

Biological Control

The use of biological organisms or their byproducts to combat pest insects, such as mosquitoes, is termed biological control, or biocontrol. Biocontrol is utilization of parasites, predators, and pathogens to regulate pest populations. Generally, this definition includes natural and genetically modified organisms and means that the agent must be alive and able to attack the mosquito. The overall premise is simple: Biocontrol agents that attack mosquitoes naturally are grown in the lab and then released into the environment, usually in far greater numbers than they normally occur, and often in habitats that previously were devoid of them, so as to control targeted mosquito species.

One advantage of biocontrol agents is host-specificity which affords minimal disturbance to non-target species and to the environment. However, it is this specificity and the cost of commercializing biocontrol agents that deter development of biocontrol agents. In addition, utilization of biocontrol requires increased capital outlay and start up costs as well as increased training requirements for personnel.

Biocontrol should be considered a set of tools that a mosquito control program can use when it is economically feasible. When combined with conventional chemicals and physical control procedures, biocontrol agents can provide short and, occasionally, long-term control. Biocontrol, as a conventional control method, should aim at the weakest link of the life cycle of the mosquito. In most cases, this is the larval life stage.

Mosquitofish (*Gambusia affinis*) are currently the most extensively used biocontrol agent. These fish, which feed on mosquito larvae, can be placed in a variety of permanent and semi-permanent water habitats. Differences of opinion exist on the utility and actual control benefits derived from *Gambusia* implementation in an Integrated Pest Management (IPM) program with results reported from excellent control to no control at all. Recently, concerns over placing *Gambusia* in habitats where other fish species assemblages are threatened have arisen. Care must be taken in placement of this cosmopolitan species in areas where endemic fish species are sensitive to further environmental perturbation. Additionally, use of endemic fish species in these areas of concern deserves greater attention. An example of this is *Rivulus* fish species. The potential of Rivulus as mosquito predators is currently being evaluated in saltwater habitats, especially in Brevard County, Florida.

In some aquatic habitats, fish function as an excellent mosquito biocontrol mechanism. These typically are permanent habitats where *Culex* and *Anopheles* are the primary mosquito residents and where the mosquito

densities are not excessive. However, in habitats such as salt marshes fish are unable to control the sudden explosion of larvae produced by rainfall or rising tides. Here, the mosquito population numerically exceeds what the fish can consume during the brief immature mosquito developmental period. In salt marshes, fish must rely on things other than mosquito larvae for their nutritional needs most of the time, simply because there may be long delays between hatches of larvae. Mosquito larvae present an abundant food source, but only for a few days during their rapid development.

Species of predacious mosquitoes in the genus *Toxorhynchites* have been studied in a variety of urban areas for control of container-inhabiting mosquitoes, such as the Asian tiger mosquito (*Ae. albopictus*). *Toxorhynchites* mosquitoes also affect mosquito populations that develop in the treehole environment; however, their introduction into urban container habitats has proven unsuccessful.

In specific containers, *Toxorhynchites* may consume a large number of prey mosquito larvae, such as *Aedes aegypti* and *Ae. albopictus*. However, this predator does not disperse well enough to impact the vast number of natural and artificial containers used by these mosquitoes. Additionally their life-cycle is 2-3 times that of their prey making it impossible for them to keep up with the other more rapidly developing mosquitoes.

Another group of biocontrol agents with promise for mosquito control is the predacious copepods (very small crustaceans). Copepods can be readily mass reared, are easily delivered to the target sites, and perform well when used with insecticides.

Birds and bats are often promoted as potential biocontrol agents of adult mosquitoes. However, while both predators eat adult mosquitoes, they do not do so in sufficient amounts to impact the mosquito populations. Mosquitoes provide such a small amount of nutrition that birds or bats expel more energy pursuing and eating mosquitoes than they derive from them. They are not a primary food source for these predators. Additionally, with mosquito flight behavior being crepuscular they are not active during the feeding periods of most birds. While bats are active during the correct time period, they simply cannot impact the massive numbers of adult mosquitoes available.

Bio-rational products exploit insecticidal toxins found in certain naturally occurring bacteria. These bacteria are cultured in mass and packaged in various formulations. The bacteria must be ingested by mosquito larvae so the toxin is released. Therefore bio-rational products are only effective against larvae since pupae do not feed. The bacteria used to control mosquito larvae have no significant effects on non-target organisms. The possibility of creating a new invasive species by the introduction of biocontrols should be considered, evaluated, and avoided.

Pesticides

There are chemical and biological pesticide products registered for use against mosquitoes. Two biological pesticide products that are used against mosquito larvae singly or in combination are *Bacillus thuringiensis israelensis* (Bti) and *Bacillus sphaericus* (Bs). Manufactured Bti contains dead bacteria and remains effective in the water for 24 to 48 hours; some slow release formulations provide longer control. In contrast, Bs products contain live bacteria that in favorable conditions remain effective for more than 30 days. Both products are safe enough to be used in water that is consumed by humans. In addition to the biological pesticides, there are chemical pesticides for use against mosquitoes. As described below, once the determination is made to use pesticides to control mosquitoes, additional requirements under this general permit must be met.

Part I A 1 b (1)(c) Pesticide Use

Conduct larval and/or adult surveillance prior to each pesticide application to assess the pest management area and to determine when action threshold(s) are met that necessitate the need for pest management. Pest surveillance is important for timing pest control properly and to evaluate the potential need for pesticide use for mosquito control. Understanding surveillance data may enable mosquito control operators to more effectively target their control efforts. Operators are required to conduct a surveillance program to minimize discharges from control activities. Surveillance is necessary not only to establish species' presence and abundance but also as an evaluation tool of the effectiveness of source reduction and chemical control activities. Furthermore, surveillance should be used as an indicator of the need for additional chemical control activities based on pre-established criteria related to population densities in local areas.

Larval surveillance involves routine sampling of aquatic habitats for developing mosquitoes. The primary tools used to determine larval densities and species composition are a calibrated dip cup and/or a bulb syringe for inaccessible areas such as treeholes. The counts may be expressed as the number of immature (larvae and pupae) mosquitoes per dip, per unit volume, or per unit surface area of the site. However, due to natural mortality from environmental factors, disease and predators, larval dip counts do not provide an accurate indication of the potential adult population. Nevertheless, larval counts do indicate when chemical larval control measures are warranted.

Adult surveillance is a key component of any mosquito control program. Adult surveillance can be conducted using CDC traps, New Jersey light traps, resting site traps, egg oviposition traps, vehicle traps, and landing count rates. Mosquito control operators should use a variety of the available traps as adults are attracted to different traps depending on their species, sex, and physiological condition. Trapped adults provide information about local species composition, distribution, and density. In addition, the need for adulticide application may also be established through the number and distribution of service requests received from the public. Collection data also provide feedback to the mapping and planning component of the IPM program as well as to its effectiveness and also serve to identify new sources of mosquitoes or identify recurring problem sites.

Disease surveillance, where practical, is also a key component of a pest management strategy. Detecting antibodies in "sentinel" chicken flocks, equine cases, and testing dead birds and adult mosquitoes for infections are all used to determine whether disease is being transmitted in an area. Mosquito and vector control agencies also may test mosquitoes for viruses in their laboratories. Although generally less sensitive than sentinel chickens, mosquito infections may be detected earlier in the season than chicken seroconversions and therefore provide an early warning of virus activity. However, disease surveillance is not applicable to all mosquito control programs. In the absence of a dedicated disease surveillance program, mosquito control operators should stay informed of arboviral occurrence or potential for occurrence in their control areas as determined by local, state, and/or national public health agencies.

Assess environmental conditions (e.g., temperature, precipitation, and wind speed) in the treatment area prior to each pesticide application to identify whether existing environmental conditions support development of pest populations and are suitable for control activities. Environmental conditions also may affect the results of adulticide application. Wind determines how the ULV droplets will be moved from the output into the treatment area. Conditions of no wind will result in the material not moving from the application point. High wind, a condition that inhibits mosquito activity, will quickly disperse the insecticide over too wide an area but at a diluted rate too low to effectively control pests. Light wind conditions (< 10 mph) are the most desirable because they move the material through the treatment area and are less inhibiting to mosquito activity. Thermal fogs perform best under very light wind conditions.

ULV application should be avoided during hot daylight hours. Thermal conditions, particularly temperature inversion, will cause the small droplets to quickly rise, moving them away from mosquito habitats. Generally, applications are made after sunset and before sunrise, depending upon mosquito species activity. Some mosquitoes (*Culex* and *Anopheles*) are most active several hours after sunset, while others (*Ae. aegypti* and *Ae. albopictus*) are more active during the daytime, and if these species are the targets, application should be made during the period of highest activity for the target species, provided that meteorological conditions are suitable for application (seldom during daylight hours).

One notable exception to treatments made when mosquitoes are up and flying is a residual barrier treatment application. Barrier treatments are based on the natural history and behavioral characteristics of the mosquito species causing the problem. Barrier applications use a residual material and are generally applied with a powered backpack sprayer to preferred resting areas and migratory stops in order to intercept adult mosquitoes hunting for blood meals. Barrier treatments are often applied during daylight hours as a large-droplet liquid application and are designed to prevent a rapid re-infestation of specific areas, such as recreational areas, parks, special-event areas, and private residences. Barrier applications can help provide control of nuisance mosquitoes for up to one week or longer.

Reduce the impact on the environment and on non-target organisms by applying the pesticide only when the action threshold has been met. Operators must apply pesticide only as indicated by action thresholds for the pest management area. As noted above, action threshold, established by the operator, help determine both the need for control actions and the proper timing of such actions. Timing pesticide application can reduce the impact on the environment and on non-target organisms.

In situations or locations where practicable and feasible for efficacious control, use larvicides as a preferred pesticide for mosquito or flying insect pest control when larval action thresholds have been met. Operators may use larvicides, adulticides or a combination of both. However, when practicable and feasible, larviciding should be the primary method for mosquito control. Larviciding is a general term for the process of killing mosquitoes by applying natural agents or manmade pesticide products designed to control larvae and pupae (collectively called larvicides) to aquatic habitats. Larviciding uses a variety of equipment, including aerial, from boats, and on the ground, as necessitated by the wide range of breeding habitats, target species, and budgetary constraints. Applications can be made using high pressure sprayers, ULV sprayers, handheld sprayers, and back sprayers. However, larviciding is only effective when a high percentage of the mosquito production sites are regularly treated, which may be difficult and expensive.

There are advantages and disadvantages to aerial and ground larvicide treatments. Ground larviciding allows application to the actual treatment area and consequently to only those micro-habitats where larvae are present. Therefore, ground larviciding reduces unnecessary pesticide load on the environment. However, ground applications often rely on in-the-field human estimates of the size of treatment areas and equipment output with a greater chance of overdosing or under-dosing. Ground larviciding is also impractical for large or densely wooded areas and exposes applicators to greater risk of insecticide exposure.

Aerial larviciding application methods are generally used for controlling mosquito larvae present in large areas and areas that are inaccessible for ground application. However, failure to treat an entire area with good larvicide coverage can result in the emergence of large adult populations. In order to prevent poor site coverage, a global positioning system (GPS), where economically feasible, or site flagging are necessary to increase accuracy of the treatment coverage while minimizing the amount of larvicides being applied. Aerial application does provide easier calibration of equipment due to the fact that the target area is generally mapped and the material is weighed or measured when loading. However, cost of aerial application is higher than ground application (i.e., additional personnel for flagging or expensive electronic guidance systems) and also requires special FAA licenses, training of staff, and additional liability insurance. In addition, aerial larviciding has greater potential for non-target impacts.

In situations or locations where larvicide use is not practicable or feasible for efficacious control, use adulticides for mosquito or flying insect pest control when adult action thresholds have been met. Chemical treatment for adult mosquitoes, adulticiding, is the most visible and commonly used form of mosquito control. Adulticide applications may be used for nuisance or disease vectoring mosquitoes. Adulticiding consists of dispersing an insecticide as a space spray into the air column, using ground or aerial equipment, which then remains suspended in the air column through the habitat where adult mosquitoes are flying. Any mosquito adulticiding activity that does not follow reasonable guidelines, including timing of applications, avoidance of sensitive areas, and strict adherence to the pesticide label, risks affecting non-target insect species.

Operators must ensure that the adulticide applications are made only when necessary by determining a need in accordance with specific criteria that demonstrate a potential for a mosquito-borne disease outbreak, or numbers of disease vector mosquitoes sufficient for disease transmission, or a quantifiable increase in numbers of pestiferous mosquitoes. To determine the need for adulticide application, at least one of the following criteria should be met and documented by records: 1) when a large population of adult mosquitoes is demonstrated by either a quantifiable increase in, or a sustained elevated mosquito population level as detected by standard surveillance methods, 2) where adult mosquito populations build to levels exceeding community standards (e.g., 25 mosquitoes per trap night or 5 mosquitoes per trap hour during crepuscular periods), and/or 3) when service requests for arthropod control from the public have been confirmed by one or more recognized surveillance methods.

The most common forms of adulticiding are ultra-low volume spray (ULV) and thermal fogging. Ground adulticiding is almost exclusively conducted with ULV equipment and is the most common method used to control mosquitoes. Ground adulticiding can be a very effective technique for controlling most mosquito species in residential areas with negligible non-target effects.

Aerial adulticiding is a very effective means of controlling adult mosquitoes, particularly in inaccessible areas, and may be the only means of covering a very large area quickly in case of severe mosquito outbreaks or vector borne disease epidemics. Aerial adulticide applications are made using either fixed wing aircraft or rotor craft. Application is generally as ULV spray but some thermal fogging still occurs.

Adulticide application has its own set of conditions that determine success or failure. The application must be at a dosage rate that is lethal to the target insect and applied with the correct droplet size. Whether the treatment is

ground or aerially applied, it must distribute sufficient insecticide to cover the prescribed area with an effective dose. Typically with ground applications, vegetated habitats may require up to three times the dosage rates that open areas require. This is purely a function of wind movement and its ability to sufficiently carry droplets to penetrate foliage. In addition, aerial application is dependent upon favorable weather conditions.

Recommended Mosquito Control References

See the following sources for additional information on IPMs and BMPs for mosquito control.

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Part I A 1 b (1) Other Flying Insect Pests Control IPM Practices (Black Flies Example)

The Department has chosen to use black flies as a demonstration of how IPM practices would be implemented for other flying insect pest control.

Black Flies – Background
There are approximately 254 species of black flies in North America alone. Black flies can be 1) a source of annoyance to people, animals, and wildlife, 2) a limiting factor in economic development (e.g., residential development and property value), and 3) a causal factor in decreased agricultural productivity (e.g., animal weight loss/death and milk production). Black fly control in the U.S. provides economic, health and quality of life benefits. In contrast to the integrated approach used for mosquito control, due to its unique biology, black fly control in the U.S. is primarily through the use of larvicides.

Part I A 1 b (1)(a) Identify the Problem
Prior to the first pesticide application covered under this permit that will result in a discharge to surface waters, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year, you must do the following for each pest management area. Operators must identify the pest problem in their pest management area prior to the first application covered under this permit. Knowledge of the pest problem is an important step to developing pest management strategies. Re-evaluation of the pest problem is also important to ensure pest management strategies are still applicable. Operators must identify the pest problem at least once each calendar year prior to the first application for that calendar year. Operators are required to fulfill problem identification requirements to minimize discharges to surface waters in black fly control operations. Identification includes: (1) black fly biology, (2) local developmental habitats, (3) avoidance methods, and (4) the benefits and risks of chemical use as a pest management strategy. Operators may use historical data or neighboring district data to identify the species.

Black flies, commonly referred to as buffalo gnats, are the smallest of the blood feeding dipterans. Worldwide, blackflies are responsible for transmitting ochocerciasis (river blindness) to millions of people in tropical areas. Black flies can also vector bovine onchocerciasis, mansonellosis, and leucoytozoonosis in wild and domestic animals. While generally only considered nuisance pests in the U.S., epidemiological research has demonstrated that black flies are competent vectors of vesicular stomitis and suggests that these pests may be responsible for periodic outbreaks of this disease in livestock, wildlife, and humans in the western U.S. However, flies may also become so abundant as to be drawn into the air passages of livestock, occasionally resulting in death. Black fly feeding activity may also result in allergic reaction in both animals and man as a result of histaminic substances in black fly saliva.

Establish densities for larval and adult mosquito or flying insect pest populations to serve as action threshold(s) for implementing pest management strategies. Operators must develop action thresholds for black flies prior to first pesticide application covered under this permit. Operators may use historical data or neighboring district data to establish action thresholds. The action thresholds must be re-evaluated at least once each calendar year. As noted in the general discussion above, an action threshold is a point at which pest populations or environmental conditions indicate that pest control action must be taken. Action thresholds help determine both the need for control actions and the proper timing of such actions. It is a predetermined pest level that is deemed to be unacceptable.

Identify the target pests to develop pest-specific pest management strategies based on developmental and behavioral considerations for each pest. The life cycle for black fly includes four stages: egg, larva, pupa, and adult. All are aquatic except the adults, which leave the water to search for food and mates. Black fly immatures have three general life history strategies. One group of species produces 1 generation per year (univoltine) that matures in late winter or early spring. A second group is also univoltine, but these species develop during late spring or summer. The third and final group of species produces 2 or more generations per year (bivoltine or multivoltine) that typically develop from early summer through fall. Adult females deposit from 150 to 500 eggs in flowing water. Flowing water habitats capable of black fly production range from a 4-inch trickle to large rivers. Egg-laying occurs near dusk for many species. The eggs are dropped singly from the air or deposited in masses on trailing vegetation, rocks, debris and other substrates. Eggs hatch in 2 days to 8 months, depending on black fly species and water temperature. Incubation time in some species is delayed by a prolonged diapause, or resting

period. Eggs of many species can successfully withstand temperature extremes, fluctuating water levels, and desiccation associated with alternating flood and drought conditions during seasonal changes. Many species overwinter in the egg stage, but a few black flies spend the winter months as larvae and pupae, or rarely, as adults.

Larvae anchor themselves to clean vegetation, rocks, or debris by spinning a small silken pad with their mouthparts and inserting a row of hooks at the end of their enlarged abdomen into the silk pad. This technique allows the larvae to secure themselves in areas of very fast water velocity and orient their body with the abdomen pointed upstream, and head positioned downstream to feed. Larvae can easily relocate to other areas by drifting downstream on a silken thread, spinning a new silk pad, and reattaching themselves in areas with more acceptable substrates or food supplies. Feeding is accomplished by expanding a pair of fan-like structures on their hardened head capsule to efficiently filter microscopic food particles from the water column. The larvae filter or scrape very fine organic matter, filamentous algae, bacteria and tiny aquatic animals from the current or substrates. Larvae are often infected with various parasites and pathogens, including nematode worms, bacteria, fungi, protozoa and viruses.

Larval instars vary from 4 to 9, depending on species, with many species passing through an average of 7 instars. Larval development time varies from 1 week to 6 months depending on species, water temperature, stream turbidity and food availability. Larval growth is very temperature dependent, with relatively slow growth during the cold winter months and very rapid growth during warm summer water temperatures. Some summer-developing, multivoltine species are capable of completing their entire life cycle in just a few weeks. Mature larvae, with fully developed respiratory filaments visible as a dark area on each side of the thorax, stop feeding, and construct a silken pupal cocoon where metamorphosis takes place.

Pupae secure themselves inside their cocoons with rows of spine-like hooks on their abdomen. The tightly woven or loose cocoons, characteristically shaped for each species, are attached to substrates with the closed end facing upstream to protect pupae from current and sediments. Some species have a lateral aperture, or window, on each side of the cocoon to increase water circulation around the pupa. The branched respiratory organs that project from the pupal thorax are designed to function in or out of water. This adaptation allows pupae to obtain oxygen at all times, and survive normal fluctuations in water levels. The pupal stage may last from 2 days to several weeks depending on the species and water temperature.

Adults emerge from the pupal skin through an elongate slit at the top of the thorax and ride a bubble of air that propels them to the water surface. Freshly emerged adults fly to streamside vegetation where their wings and bodies quickly dry and harden. Mature adults immediately seek food sources and mates. Both sexes feed on nectar, sap, or honeydew to obtain the sugar used for flight and energy. Only females feed on blood. In most species, mating takes place in flight, with females flying into male swarms that form over landmarks such as waterfalls, vegetation or host species. Males utilize their large eyes to detect and seize females entering the swarm. Male and female pairs exit the swarm, and mating takes place in flight in just a few seconds. Females then seek a host to obtain the blood meal required to nourish their eggs. Adults are strong fliers, capable of dispersing many miles from their larval habitats.

Black fly females are attracted to their specific hosts by size, shape, color, carbon dioxide, body odor, body movement, skin texture, temperature and humidity. Females use their mouthparts to cut, or lacerate the host skin, and then drink from the resulting pool of blood. Anticoagulants in the saliva are injected into the bite to facilitate bleeding. Many domestic and wild animals have been killed by outbreaks of adult black flies. Deaths have been attributed to acute toxemia from large numbers of bites, anaphylactic shock, and weakness due to blood loss. In humans, lesions can develop at the bite, accompanied by reddening, itching, and swelling. In severe cases, allergic reactions may occur, resulting in nausea, dizziness, and fever.

Host specificity in black flies varies from highly specific species that will feed on blood from only 1 host, too much more generalized species that will draw blood from a number of different hosts. Although host preferences for many North American black flies are poorly understood, it is estimated that 67% feed on mammals and 33% feed on birds. Approximately 10% of North American species will feed on the blood of humans.

Prior to first pesticide application covered under this permit, operators must ensure proper identification of black fly species to develop a detailed pest management strategy. Due to preferred hosts and developmental habitats, proper identification of the pest species is instrumental in determining the biology (univoltine or multivoltine), and developmental habitat preference (e.g., flow rate, stream size, stream substrate composition), and flight range of the target species. By knowing these factors, a control program can 1) determine if the black fly species warrants control activities (i.e., host preference and historical problems), 2) identify habitats and delineate the potential area for ongoing monitoring and control activities, 3) determine frequency of site monitoring, 4) estimate timing for

pesticide application (i.e., historical seasonal occurrence, age distribution of susceptible immature population, environmental conditions suitable for control activity, etc.), 5) reduce discharge of pesticides into surface waters.

Identify known breeding sites for source reduction, larval control program, and habitat management. In conjunction with species identification, mapping should be considered part of control programs aimed at black fly management. Maps may simply be township/city/county maps but may also include aerial photo assessments, topographic maps, and satellite imagery where available and/or practicable. Mapping is essential to identify areas of flowing water which are suitable for production of the target species. As black flies are strong fliers and will travel great distance to obtain a blood meal, mapping should be for an extended area from the site to be protected by control activities. Species identification and mapping should also be a priority in a surveillance program (both current and historical) to determine the need for initiating control activity. Identification and mapping are both essential to planning a control program which reduces pesticide discharge into surface waters.

Analyze existing surveillance data to identify new or unidentified sources of mosquito or flying insect pest problems as well as sites that have recurring pest problems. As discussed above, mapping is a valuable tool in assessing pest habitats and designing control programs. Operators must analyze existing surveillance data to identity new sources of black fly problems.

Part I A 1 b (1)(b) Pest Management

Prior to the first pesticide application covered under this permit that will result in a discharge to surface waters, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year, you must select and implement, for each pest management area, efficient and effective means of pest management that minimize discharges resulting from application of pesticides to control mosquitoes or other flying insect pests. In developing these pest management strategies, you must evaluate the following management options, considering impact to water quality, impact to non-target organisms, pest resistance, feasibility, and cost effectiveness: No action; Prevention; Mechanical/physical methods; Cultural methods; Biological control agents; and Pesticides. Operators are required to evaluate and implement a pest management strategy to minimize pesticide discharge into surface waters prior to the first pesticide application covered under this permit. Pest management strategies will vary by locality (i.e., stream size, stream substrate, and stream vegetation), black fly species (i.e., multi/univoltine development and host specificity), and financial concerns (i.e., accessibility to streams and size/rate of flow for the streams). As noted above, combinations of various management methods are frequently the most effective pest management strategies over the long term. The goal should be to emphasize long-term control rather than a temporary fix. Operators must reevaluate every year prior to the first pesticide application for that calendar year.

Based on problem identification, two preventive strategies other than pesticides should be evaluated. The first is reducing the number of black fly breeding areas. This may include removal (physical and/or chemical) of vegetation and other objects in streams to reduce number of larval habitats. The second is temporary damming of flowing stream larval development sites to create pool habitats. As larvae require flowing water for development, pooling can kill developing black fly larvae. However, the impact of these habitat management options must be considered in relation to other environmental impacts on other aquatic species. Furthermore, due to the wide variability in stream size/flow rate and the accessibility of streams for habitat modification, these options are seldom acceptable control solutions for most black fly developmental habitats.

Part I A 1 b (1)(c) Pesticide Use

Conduct larval and/or adult surveillance prior to each pesticide application to assess the pest management area and to determine when action threshold(s) are met that necessitate the need for pest management. Larval surveillance involves routine sampling of aquatic habitats for developing black flies. Larval surveillance is primarily accomplished by collecting stream substrates (rocks, vegetation, etc.) and examining for larval and pupal occurrence. Due to the varied developmental sites for black larvae and their ability to move in streams relative to changes in flow patterns, quantitative sampling will vary from site to site and in many instances, particularly with continuously changing water levels, is not practical. Qualitative sampling is often used in lieu of quantitative sampling, as an indicator of egg hatch and to indicate the age distribution of developing larvae. Qualitative sampling alone when used in conjunction with historical occurrence data can provide a reliable indicator of the need to initiate control activities.

Adult surveillance for black flies may include sweep sampling, vacuum aspiration of adults, and the use of silhouette traps. Traps may be simple visual attractants or may be baited with artificial attractants (e.g., ocentol and CO_2). However, as different black fly species will respond differently in relation to different attractants, based on host

preference, care must be used in selecting attractants that will provide a representative sample of the complete black fly spectrum present in any given location. Choice of adult sampling will in many cases be dictated by historical occurrence of black flies in a given area. Regardless, surveillance data is a useful tool in providing feedback to the mapping and planning component of any pest management strategy.

Assess environmental conditions (e.g., temperature, precipitation, and wind speed) in the treatment area prior to each pesticide application to identify whether existing environmental conditions support development of pest populations and are suitable for control activities. Environmental conditions may affect the results of pesticide application. Operators must assess the treatment area to determine whether site conditions support pest populations and are suitable for pesticide application.

Reduce the impact on the environment and on non-target organisms by applying the pesticide only when the action threshold has been met. Operators must apply pesticide only as indicated by action thresholds for the pest management area. As noted above, action threshold help determine both the need for control actions and the proper timing of such actions. Timing pesticide application can reduce the impact on the environment and on non-target organisms.

In situations or locations where practicable and feasible for efficacious control, use larvicides as a preferred pesticide for mosquito or flying insect pest control when larval action thresholds have been met. Bacillus thuringiensis var israelensis (Bti) is the primary larvicide used for black fly control in the U.S. Bti is a gram positive, aerobic, spore-forming bacterium that produces protoxins in the form of parasporal protein crystals. In the alkaline digestive tract of black flies and mosquitoes, the protoxins become activated into highly toxic delta-endotoxins. The endotoxins cause a rapid breakdown in the lining of the mid-gut and necrosis of skeletal muscles, resulting in paralysis and mortality of target insect pests. Bti is nontoxic to most non-target organisms due to their acidic digestive systems and lack of suitable tissue receptor sites.

To minimize pesticide discharge into surface waters, operators must apply larvicides as needed for source reduction as indicated by the action threshold in situations or locations where it is practicable and feasible to do so. The action threshold may be based on occurrence of adults (current or historical) and/or larval sampling of stream substrates for immature black flies. Surveillance is also a valuable tool for assessing the effectiveness of larval control activities.

Larvicides may be applied to streams using either ground or aerial equipment. Choice of equipment is largely dictated by stream size and accessibility. Application equipment may include backpack sprayers, boats equipped with sprayers or metered release systems, helicopters or fixed wing aircraft. The amount of insecticide required to treat a stream should be based on the desired dosage and the stream discharge. Stream discharge is calculated by determining the average width and depth of the stream and the stream velocity (discharge = width (m) x depth (m) x velocity (m/s)). Proper calibration of insecticide delivery based on discharge is necessary to ensure complete coverage throughout the water column in order to expose all larval habitats to an effective insecticide dose.

Larvicide is applied across the stream width for the time specified by the application rate. The point of application should be far enough upstream from the larval habitat to ensure proper insecticide dispersal in the water passing over the treatment area. Operators should determine the effective downstream carry (maximum distance at which at least 80% larval control is achieved) of the insecticide suspension. By determining downstream carry, black fly control operators can limit the number of applications necessary to treat any given stream and thereby reduce pesticide discharge into surface waters.

In situations or locations where larvicide use is not practicable or feasible for efficacious control, use adulticides for mosquito or flying insect pest control when adult action thresholds have been met. Pesticide control of black flies in the U.S. historically relied upon both larvicides and adulticides. However, adulticide use against black fly populations is no longer a common practice. As adult black flies are seeking blood meals during the daytime, adulticide application coincides with human activity, so daytime application is no longer a standard control procedure. One reason for this change is due to environmental factors associated with daytime adulticide application, particularly thermal inversions, which cause adulticide application for black fly control to be ineffective. Furthermore, as only adults directly contacted by the adulticide application are killed, with no residual activity against other adults immigrating to the treatment area, adulticide applications are both ineffective and expensive. For these reasons, larvicides which target the immature stages before development of the pestiferous adult are now the primary means of black fly control in the U.S.

Recommended Black Fly Control References

See the following sources for additional information on IPMs and BMPs for black fly control:

Commonwealth of Pennsylvania. 2009. Black Fly Suppression Program. Available at: http://www.depweb.state.pa.us/blackfly/cwp/view.asp?a=3&Q=505536&blackflyNav=|

Government of Alberta – Agriculture and Rural Development. 1993. Black Fly Control. Available at: http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex3321

Greater Los Angeles Vector Control District. 2008. Black Flies – Vector Services and Information. Available at: http://www.glacvcd.org/Contents/Vector-Services-Info/Black-Flies.aspx

Metropolitan Mosquito Control District. 2009. Biting Gnat Control. Available at: http://www.mmcd.org/gnat.html

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North Elba – Black Fly Control Dept. 2009. About the black fly control program. Available at: http://www.northelba.org/html/black_fly_control.html

Ohio State University Extension. 1997. Factsheet – Black Flies. HYG-2167-97. Available at: http://ohioline.osu.edu/hyg-fact/2000/2167.html

The Merck Veterinary Manual. 2009. Black Flies. Available at: http://www.merckvetmanual.com/mvm/index.jsp?cfile=htm/bc/71702.htm

Undeen, AH and DP Malloy. 1996. Use of stream width for determining the dosage rates of Bacillus Thuringiensis Var. israensis for larval black fly (Diptera: Simuliidae) control. Journal of the American Mosquito Control Association. 12(2):312-315. Available at: http://www.nysm.nysed.gov/bio_molloy/patent_pubs/pdfs/undeen_&_molloy_1996_use_of_stream_width.pdf

University of Florida. 2007. Featured Creatures – Black Flies. EENY-30. Available at http://entomology.ifas.ufl.edu/creatures/livestock/bfly.htm

University of New Hampshire Cooperative Extension. 2001. Black Flies. Available at: http://www.ultimate.com/washington/wla/blackfly/

Part I A 1 b (2) Aquatic Weed and Algae Control IPM Practices

Background

Aquatic weeds and algae that negatively affect aquatic biodiversity, human health, and economic stability are considered to be pests. Aquatic weeds and algae can decrease populations of native aquatic species including threatened and endangered species. Aquatic weeds and algae can reduce aquatic biodiversity by preventing desirable species growth and unbalancing desirable aquatic species populations and development. Social, economic, and human health are all affected by a lower aesthetic appeal of a water bodies, an increased cost of agricultural irrigation water, and an increase in the risk of human diseases by providing ideal vector breeding grounds. In addition, the reduction in the utility of water can have social and economic impacts due to reduced hydroelectric operations, impeded opportunity for recreational activities (e.g., fishing, boating, and swimming), and disruption of water transport (e.g., agricultural irrigation) to name a few. As a result, if aquatic weeds and algae become established and impede the environmental stability and use goals for a body of water, control measures will be necessary. Pest control may be necessary before the pests become established.

The IPM requirements in Part I A 1 b (2) apply to pesticide discharges associated with management of aquatic weed and algae in, but not limited to, lakes, ponds, rivers, streams, irrigation canals, and drainage systems. Irrigation and drainage systems differ in the type and disposition of the water that they convey; these systems may consist of earthen or concrete lined canals or combinations of the two.

Most aquatic plants and algae are largely beneficial to water quality, especially when present in the appropriate densities. However, overabundant native algae and aquatic vegetation, as well as introduced, exotic species can decrease water quality and utility. Dense plant or algae growth can interfere with recreational activities (e.g.,

fishing, boating, and swimming), disrupt water transport, reduce aquatic biodiversity by preventing desirable plant growth and unbalancing fish populations, lower the aesthetic appeal of a water body, and increase the risk of human diseases by providing ideal vector breeding grounds.

Algae
Algae are non-vascular plant that do not have true roots, stems, leaves, or vascular tissue and have simple reproductive systems. Some macroscopic algae may resemble a plant in appearance. Algae may occur in the sea or freshwater. Algae are an important aquatic food source for many animals. However, excess algae growth such as algae blooms, frequently caused by unbalanced or elevated nutrients, can be damaging to aquatic ecosystems. Control options include mechanical, biological, and chemical methods.

Weeds
Aquatic weeds include floating, emergent, or submerged plants that negatively impact the quality and utility of surface waters. Aquatic systems need plant materials as an important part of the systems ecology; however, when vegetation becomes established to the point of impeding the use goals for a body of water, control measures will become necessary. As a part of such aquatic weed control programs a pest management strategy should consider mechanical, biological, and/or chemical controls. Details for developing an integrated aquatic weed pest management strategy can be found in the document *Aquatic Plant Management, Best Management Practices in Support of Fish and Wildlife Habitat* (January 2005. Aquatic Ecosystem Restoration Foundation. Project Leader Kurt Getsinger, Ph.D.).

The appropriate type of control for aquatic weeds and algae is dictated by the biology of the target species and by environmental conditions and concerns for a specific area. "Control" means, as appropriate, eradicating, suppressing, reducing, or managing invasive species populations, preventing spread of aquatic nuisance plants from areas where they are present, and taking steps such as restoration of native species and habitats to reduce the effects of aquatic nuisance plants and to prevent further invasions. [Source: www.invasivespeciesinfo.gov/laws/execorder.shtml#sec1] Numerous strategies are used to reduce the impact of aquatic weeds and algae, but a pest management strategy should be the basis for any pest control program. This is a comprehensive approach for managing pest populations using a variety of control methods.

Part I A 1 b (1)(a) Identify the Problem
Prior to the first pesticide application covered under this permit that will result in a discharge to surface waters, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year you must do the following for each pest management area. Operators must identify the pest problem in their pest management area prior to the first application covered under this permit. Knowledge of the pest problem is an important step to developing pest management strategies. Re-evaluation of the pest problem is also important to ensure pest management strategies are still applicable. Operators must identify the pest problem at least once each calendar year prior to the first application for that calendar year.

Identify areas with aquatic weed or algae problems and characterize the extent of the problems, including, for example, water use goals not attained (e.g., wildlife habitat, fisheries, vegetation, and recreation). Operators must be well-acquainted with the unique regional conditions of their sites and available methods for controlling the pest species present. Intended use goals for the water bodies that are being impeded because of nuisance pest infestation must also be considered based on the control site. The use of the best available mapping information to aid in identifying the problem areas is suggested. Mapping may include aerial photo assessments, topographic maps, and satellite imagery where available and/or practicable. Mapping can be essential to identify problem areas which can and cannot be controlled using non-pesticide preventative measures (e.g., mechanical control). Mapping can also be used in plotting the regional desired aquatic species, as well as water use goals and complaints or reports of aquatic weeds and algae from the public.

Identify target weeds and algae. Positive identification of the aquatic weed or algae is required because many species within the same genera may require different levels and types of control measures species. Aquatic weed and algae identification is important when determining the best pest management strategy for each particular species and for determining application areas. Operators should develop a detailed pest management strategy based on identification of the targeted pest species which occur in their area.

Identify possible factors causing or contributing to the weed or algae problem (e.g., nutrients, invasive species, etc). While there may not be reasonable means to control and/or stop the introduction and occurrence of

some nuisance species infestations, the identification of possible sources (e.g., outflows from other water systems/bodies) may help in reducing the need for control measures. Potential aquatic weed and algae sources such as changes in nutrient levels or accidental or intentional introduction of exotic species must be identified before control measures are implemented

Establish past or present aquatic weed or algae densities to serve as action threshold(s) for implementing pest management strategies. Any data and/or information regarding pest densities can be used to establish an action threshold. Determining increases in pest densities may indicate a need for action. An action threshold must be established before implementing a pest management strategy. However, action thresholds will be species specific.

Part I A 1 b (1)(b) Pest Management

Prior to the first pesticide application covered under this permit that will result in a discharge to surface waters, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year, you must select and implement, for each pest management area, efficient and effective means of pest management that minimize discharges resulting from application of pesticides to control aquatic weeds or algae. In developing these pest management strategies, you must evaluate the following management options, considering impact to water quality, impact to non-target organisms, pest resistance, feasibility, and cost effectiveness: No action; Prevention; Mechanical/physical methods; Cultural methods; Biological control agents; and Pesticides. Operators must evaluate and implement a pest management strategy to minimize pesticide discharge into surface waters prior to the first pesticide application covered under this permit. As noted above, combinations of various management methods are frequently the most effective pest management strategies over the long term. The goal should be to emphasize long-term control rather than a temporary fix. Operators must reevaluate every year prior to the first pesticide application for that calendar year. All control measures must be implemented in a manner that reduces impacts to non-target species. The following describes the management options that must be evaluated.

No Action

No action is to be taken, although an aquatic weed or algae problem has been identified. This may be appropriate in cases where, for example, available control methods may cause secondary or non-target impacts that are not justified, no available controls exist, or the pest population is stable at a level that does not impair water body uses.

Prevention

Preventing introductions of possible aquatic weeds and algae is the most efficient way to reduce the threat of nuisance species (ANS Task Force, 2009). Identifying primary pathways of introduction and actions to cut off those pathways is essential to prevention. Through a better understanding of the transportation and introduction of aquatic weeds and algae, private entities (aquaculture) and the public have the necessary knowledge to assist in local aquatic weed and algae control by reducing conditions that encourage the spread of aquatic weeds and algae in their immediate surroundings. For example, recreational water users provide a pathway of unintentional introductions. Increasing public awareness of aquatic weeds and algae, their impacts, and what individuals can do to prevent their introduction and spread is critical for prevention. Other examples of prevention include: better design of water holding sites, better management and maintenance of potential problem sites, and volunteer removal of pest species (e.g., hand weeding). Monitoring and detection also play important roles in the prevention of the spread and introduction of aquatic weeds and algae.

Cultural Method

Cultural techniques include the use of pond dyes and water-level drawdown. Use pond dyes to manage filamentous algae and submersed (underwater) vegetation. Several pond colorants and one or two dyes are EPA-registered for aquatic-weed control. Pond dyes and colorants can be effective if there is little water outflow from the pond. Dyes and colorants intercept sunlight needed by algae and other underwater plants for photosynthesis. Therefore, they are generally ineffective on floating plants like duckweed and water lilies and emergent (growing above the surface) plants like cattails and bulrushes. Dyes and colorants are nontoxic and do not kill the plants, and they are safe for use in ponds for irrigation, fishing and livestock. However, they are not intended for use in large lakes with a lot of water flow or lakes used for public water supplies.[3]

[3] http://www.grounds-mag.com/mag/grounds_maintenance_weeds_overboard/

Mechanical and Biological Control
Mechanical and biological controls will be the appropriate method in some cases, or a part of a combination of methods. In some instances, the need for chemical pesticide use in and adjacent to the affected habitat can be reduced or virtually eliminated with proper execution of alternative strategies and proper best management practices.

Mechanical control techniques will vary depending on the pest. Examples include dewatering, pressure washing, abrasive scrubbing, and weed removal by hand or machine.

Biological control of aquatic weeds and algae may be achieved through the introduction of diseases, predators, or parasites. While biological controls generally have limited application for control of aquatic weeds and algae, the operator should fully consider this option in evaluating pest management options.

Pesticide
Aquatic herbicides are chemicals specifically formulated for use in water to kill or control aquatic plants. Aquatic herbicides are sprayed directly onto floating or emergent aquatic plants or are applied to the water in either a liquid or pellet form. Systemic herbicides are capable of killing the entire plant. Contact herbicides cause the parts of the plant in contact with the herbicide to die back, leaving the roots alive and able to regrow. Non-selective, broad spectrum herbicides will generally affect all plants that they come in contact with. Selective herbicides will affect only some plants.[4]

Part I A 1 b (1)(c) Pesticide Use
Conduct surveillance prior to each pesticide application to assess the pest management area and to determine when the action threshold is met that necessitates the need for pest management. Often, each aquatic weed and algae species and pest management area warrants a different pest management strategy tailored to the regional conditions. The pest management strategy should consist of combinations of mechanical, biological, and/or pesticidal control methods. All control measures must be conducted in a manner that minimizes impacts to non-target species.

Operators should apply chemical pesticides only after considering the alternatives and determining those alternatives not to be appropriate control measures. If pesticides are used they must be used only as needed as determined by the action threshold, and proper best management practices including use of the minimum effective application rate. Also, the operator should conduct surveillance (e.g., pest counts or area survey) prior to application of pesticides to determine when the action threshold is met and necessitates the need for pest control measures.

Surveillance may include the relatively sophisticated transect method used in ecological studies to evaluate species distribution, or it may consist of simply conducting visual observations in the treated area to verify the eradication or reduction in populations of aquatic weeds and algae following pesticide application (Getsinger et al. 2005, pp 23-25).

Reduce the impact on the environment and non-target organisms by applying the pesticide only when the action threshold has been met. Operators must apply pesticide only as indicated by action thresholds for the pest management area. As noted above, action threshold help determine both the need for control actions and the proper timing of such actions. Timing pesticide application can reduce the impact on the environment and on non-target organisms.

Environmental factors such as temperature and dissolved oxygen content, as well as biological factors such as stage of growth should be considered when deciding on application timing. Partial site treatments over time may be considered to reduce risk. Pesticide application must be limited to the appropriate amount required to control the target pests. Methods used in applying pesticides must reduce the impact to non-target species.

Recommended Aquatic Weed and Algae Control References
EPA recommends the following sources for additional information on IPMs and BMPs for aquatic nuisance plant control:

[4] http://www.ecy.wa.gov/programs/wq/plants/management/aqua028.html

Aquatic Nuisance Species Taskforce. Online: http://www.anstaskforce.gov/default.php.

Aquatic Plant Management, Best Management Practices in Support of Fish and Wildlife Habitat. January 2005. Aquatic Ecosystem Restoration Foundation. Project Leader Kurt Getsinger, (http://aquanic.org/management%20practices/documents/aquaticplantmanagement.pdf)

Part I A 1 b (3) Aquatic Animal Pest Control IPM Practices

Background

Aquatic animal pests, such as fish, lampreys, and mollusks, negatively affect aquatic biodiversity, human health, and economic stability. Aquatic animal pests decrease populations of native aquatic species including threatened and endangered species. Aquatic animal pests can reduce aquatic biodiversity by preventing desirable species growth and unbalancing desirable aquatic species populations and development. Social, economic, and human health are all affected by a lower aesthetic appeal of water bodies, an increased cost of agricultural irrigation water, and an increase in the risk of human diseases by providing ideal vector breeding grounds. In addition, the reduction in the utility of water can have social and economic impacts due to reduced hydroelectric operations, impeded opportunity for recreational activities (e.g., fishing, boating, and swimming), and disruption of water transport (e.g., agricultural irrigation), to name a few. As a result, if or when aquatic animal pests become established and impede the environmental stability and use goals for a body of water, control measures will become necessary.

The requirements in this section apply to pesticide discharges associated with management of aquatic animal pests including, but not limited to, fish, lampreys, and mollusks. Aquatic animal pest control includes management of nuisance species in surface waters including but not limited to lakes, ponds, rivers, estuaries, and streams. As a part of an aquatic animal pest control program, a pest management strategy should consider mechanical, biological, and chemical controls. Details for identifying aquatic animal pests and developing a pest management strategy can be found online through the Aquatic Nuisance Species Taskforce (http://www.anstaskforce.gov/default.php).

Fish

Reasons for applications of pesticides in surface waters for controlling pest species of fish may include, but are not limited to, restoration of threatened and endangered species; fish population management; restoration of native species; and aquaculture. A pest management strategy for fish should consider mechanical, biological, and chemical controls.

Lampreys

There are approximately 40 species of lamprey, which are aquatic vertebrates. The sea lamprey is an example of a problematic non-native parasitic species that feeds on native fish species in surface waters. Lampreys may be managed using lampricides that are applied directly to surface waters. Several effective management techniques such as mechanical and biological methods are available for lamprey control in addition to lampricides and should be considered when developing a pest management strategy.

Snakeheads

There are approximately 30 species of snakeheads, which are freshwater aquatic vertebrates. Snakeheads are invasive species from Africa and Asia and cause ecological damage because they are top-level predators, meaning that they have no natural enemies outside of their native environment. Not only can they breathe atmospheric air, but they can also survive on land for up to four days, provided they are wet, and are known to migrate up to 1/4 mile on wet land to other bodies of water by wriggling with their body and fins.

Mollusks

Pest mollusks including, but not limited to, zebra and quagga mussels, may cause damage to freshwater ecosystems, degrade drinking water, clog water-intake/discharge pipes for utilities and industries, and negatively impact commercial and recreational activities. Use of molluscicides is one of several methods of control for these aquatic animal pests; however, it is important to consider the impacts of mechanical, biological, and/or chemical pesticide use for control of mussels and other aquatic pest mollusk species.

Other Aquatic Animal Pests

There may be aquatic animal pests of concern in addition to fish, lampreys, and mollusks. Control of other aquatic animals including, but not limited to, crustaceans found to be a pest and requiring management with

mechanical, biological, and/or chemical pesticides would follow the IPM practices included in Part I A 1 b (3).

The appropriate type of control for aquatic animal pests is dictated by the biology of the target species and by environmental conditions and concerns for a specific area. "Control" means, as appropriate, eradicating, suppressing, reducing, or managing invasive species populations, preventing spread of aquatic animal pests from areas where they are present, and taking steps such as restoration of native species and habitats to reduce the effects of aquatic nuisance animals and to prevent further invasions. [Source: http://www.invasivespeciesinfo.gov/laws/execorder.shtml] Numerous strategies are used to reduce the impact of aquatic animal pests, but a pest management strategy should be the basis for any pest control program. This is a comprehensive approach for managing pest populations using a variety of control methods.

Part I A 1 b (2)(a) Identify the Problem

Prior to the first pesticide application covered under this permit that will result in a discharge to surface waters, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year, you must do the following for each pest management area. Operators must identify the pest problem in their pest management area prior to the first application covered under this permit. Knowledge of the pest problem is an important step to developing pest management strategies. Re-evaluation of the pest problem is also important to ensure pest management strategies are still applicable. Operators must identify the pest problem at least once each calendar year prior to the first application for that calendar year

Identify areas with aquatic animal pest problems and characterize the extent of the problems, including, for example, water use goals not attained (e.g., wildlife habitat, fisheries, vegetation, and recreation). Operators must be well-acquainted with the unique regional conditions of their sites and available methods for controlling the pest species present. Intended use goals for the water bodies that are being impeded because of pest infestation must also be considered based on the control site.

The use of the best available mapping information to aid in identifying the problem areas is suggested. Mapping may include aerial photo assessments, topographic maps, and satellite imagery where available and/or practicable. Mapping can be essential to identify problem areas which can and cannot be controlled using non-pesticide preventative measures (e.g., mechanical control). Mapping can also be used in plotting the regional distribution of desired aquatic species, as well as water use goals and complaints or reports of aquatic animal pests from the public.

Identify target aquatic animal pests. Positive identification of the aquatic animal pest is required because many species within the same genus may require different levels and types of control measures. Aquatic animal pest identification is important when determining the best pest management strategy for each particular species and for determining application areas. Operators must develop a detailed pest management strategy based on identification of the targeted pest species which occur in their area. Operators may use historical data or neighboring district data to identify the species.

Identify possible factors causing or contributing to the problem (e.g., nutrients, invasive species). While there may not be reasonable means to control and/or stop the introduction and occurrence of some pest species infestations, the identification of possible sources (e.g., outflows from other water systems/bodies) may help in minimizing the need for control measures. Potential factors which could lead to establishment of aquatic animal pest populations such as accidental or intentional introduction of exotic species must be identified before control measures are implemented.

Establish past or present aquatic animal pest densities to serve as action threshold(s) for implementing pest management strategies. An action threshold should be established before implementing a pest management strategy. Any data and/or information regarding pest densities can serve as an action threshold. Operators may use historical data or neighboring district data to establish action thresholds.

Part I A 1 b (1)(b) Pest Management

Prior to the first pesticide application covered under this permit that will result in a discharge to surface waters, and at least once each year thereafter prior to the first pesticide application during that calendar year, you must select and implement, for each pest management area, efficient and effective means of pest management that minimize discharges resulting from application of pesticides to control aquatic animal pests. In developing these pest management strategies, you must evaluate the following management options,

considering impact to water quality, impact to non-target organisms, pest resistance, feasibility, and cost effectiveness: No action; Prevention; Mechanical/physical methods; Biological control agents; and Pesticides. Operators are required to evaluate and implement a pest management strategy to minimize pesticide discharge into surface waters prior to the first pesticide application covered under this permit. As noted above, combinations of various management methods are frequently the most effective control strategies over the long term. The goal should be to emphasize long-term control rather than a temporary fix. Operators must reevaluate every year prior to the first pesticide application for that calendar year. All control measures must be conducted in a manner that minimizes impacts to non-target species. The following describes the management options that must be evaluated.

No Action
No action is to be taken, although an aquatic animal pest problem has been identified. This may be appropriate in cases where, for example, available control methods may cause secondary or non-target impacts that are not justified or no available controls exist.

Prevention
Preventing introductions of possible pest species is the most efficient way to reduce the threat of aquatic animal pests (ANS Task Force, 2009). Identifying primary pathways of introduction and actions to cut off those pathways is essential to prevention. Through a better understanding of the transportation and introduction of aquatic animal pests, private entities (aquaculturists) and the public have the necessary knowledge to assist in local aquatic animal pest control by reducing conditions that encourage the spread of aquatic animal pests in their immediate surroundings. For example, recreational water users provide a pathway of unintentional introductions. Increasing public awareness of aquatic pest species, their impacts, and what individuals can do to prevent their introduction and spread is critical for prevention. Other examples of prevention include: better design of water holding sites, better management and maintenance of potential problem sites, and volunteer removal of pest species (e.g., fishing). Monitoring and detection also play important roles in the prevention of the spread and introduction of aquatic animal pests.

Mechanical and Biological Control
Mechanical and biological controls will be the appropriate methods in some cases, or a part of a combination of methods. Mechanical control techniques will vary depending on the pest. Examples include fishing, dewatering, netting, electrofishing, pressure washing, use of electric fences and abrasive scrubbing.

Biological control of aquatic animal pests may be achieved through the introduction of diseases, predators, or parasites. While biological control generally has limited application for control of aquatic animal pests, operators should fully consider this option in evaluating pest management options.

Cultural Method
Cultural controls require altering the habitat such that it is unsuitable for the aquatic animal pests. This is an unlikely method of control for aquatic animal pest control.

Pesticide
Chemical and biological pesticides such as lampricides, molluscides, and piscicides, are registered for use to control aquatic animal pests. These pesticides are specifically formulated for use in water where aquatic animal pests occur. In some cases, pesticide use may impact non-target species. As described below, once the determination is made to use pesticides, additional requirements must be met.

Part I A 1 b (1)(c) Pesticide Use
Conduct surveillance prior to each application to assess the pest management area and to determine when the action threshold is met that necessitates the need for pest management. Often, each aquatic animal pest and pest management area warrants a different IPM plan, tailored to the regional conditions. The IPM practices should consist of combinations of mechanical, biological, and/or pesticidal control methods. All control measures must be conducted in a manner that minimizes impacts to non-target species.

Operators must apply chemical pesticides only after considering the alternatives and determining those alternatives not to be appropriate control measures. In some instances, the need for chemical pesticide use in and adjacent to the affected habitat can be reduced or virtually eliminated with proper execution of alternative strategies and proper best management practices. If pesticides are used, they must only be used as needed as determined by an action threshold, and proper best management practices must be adopted, including use of the minimum effective

application rate. Also, the operator must conduct surveillance (e.g., pest counts or area survey) prior to application of pesticides to determine when the action threshold is met that necessitates the need for pest control measures.

Surveillance may include the relatively sophisticated transect method used in ecological studies to evaluate species distribution, or it may consist of simply conducting visual observations in the treated area to verify the eradication or reduction in populations of aquatic nuisance animals following pesticide application (Getsinger et al. 2005, pp 23-25).

Reduce the impact on the environment and non-target organisms by evaluating site restrictions, application timing, and application method in addition to applying the pesticide only when the action threshold has been met. Aquatic animal pest species and site restrictions (water use, water movement, etc.) must be identified when choosing an appropriate pesticide. Environmental factors such as temperature as well as biological factors such as migration timing should be considered when deciding on application timing. Partial site treatments over time may be considered to minimize risk to non-target organisms.

Pesticide application must be limited to the appropriate amount required to control the target pests. Methods used in applying pesticides must minimize the impact to non-target species.

Recommended Aquatic Animal Pest Control References
EPA recommends the following sources for additional information on IPMs and BMPs for ANS control:

Aquatic Nuisance Species Taskforce. Online: http://www.anstaskforce.gov/default.php.

Aquatic Plant Management, Best Management Practices in Support of Fish and Wildlife Habitat. January 2005. Aquatic Ecosystem Restoration Foundation. Project Leader Kurt Getsinger, (http://aquanic.org/management%20practices/documents/aquaticplantmanagement.pdf)

Part I A 1 b (4) Forest Canopy Pest Control IPM Practices

Background
The forest canopy is the uppermost level of the forest. It is composed of mature treetops, or the crowns of the mature trees. It provides habitat for animals and plants, some of whom live their entire lives in the canopy. Pests that threaten the health of the forest canopy must be controlled to maintain forest health. Forest canopy pest control programs are designed to integrate environment-friendly control measures (e.g., sterile insect release, pheromone trapping, mating disruption, etc.) to reduce losses and pesticide use. But pesticide applications may aerially blanket large tracts of terrain to control an entire population of pests within a delimited geographic area.

Forest canopy pest control programs included in this permit are treetop pesticide applications that may inadvertently expose surface waters to direct, but limited, pesticide application. Forest canopy pest control can be directed at a variety of pests, but primarily insects. Forest canopy pest control programs are utilized to prevent habitat elimination/modification, economic losses (e.g., habitat aesthetics, tree losses), quarantine pest outbreaks, and eradicate or prevent the spread of introduced invasive species. Therefore, forest canopy pest management programs provide environmental, economic, and quality of life benefits.

The type of forest canopy pest control is dictated by the biology of the target pest and by environmental conditions and concerns for a specific area. Forest canopy pest control programs are primarily conducted at the state and federal level but may also be conducted at the local/community level.

This permit requires IPM programs to incorporate, but not be limited to, the following components: problem identification, mapping/planning, pest survey, cultural control, biological control, chemical control, and education.

Part I A 1 b (2)(a) Identify the Problem
Prior to the first pesticide application covered under this permit that will result in a discharge to surface waters, and at least once each calendar year thereafter prior to the first pesticide application in that calendar year, you must do the following for each pest management area. In order to reduce pesticide discharge into surface waters associated with forest canopy pest control, it is important for operators to ensure proper problem identification. Problem identification is determined through pest identification, delineation of the extent and range of the pest problem, determination of the potential for pest problem expansion, and assessing the economic impact of failure to provide pest control.

Establish target pest densities to serve as action threshold(s) for implementing pest management strategies. Operators must develop action thresholds for the target pests prior to first pesticide application covered under this permit. The action thresholds must be re-evaluated at least once each calendar year. As noted in the general discussion above, an action threshold is a point at which pest populations or environmental conditions indicate that pest control action must be taken. Action thresholds help determine both the need for control actions and the proper timing of such actions. It is a predetermined pest level that is deemed to be unacceptable. Operators may use historical data or neighboring district data to establish action thresholds.

Identify target pests to develop a pest-specific pest management strategy based on developmental and behavioral considerations for each pest. Pest identification is a key activity for implementation of a forest canopy pest control system. Pest identification should only be conducted by personnel with adequate training and experience with the pests. While numerous similar pests (insects and/or pathogens) may be present in any given location, only a few of the representative species may constitute a threat which requires control activities. Through proper pest identification informed control decisions can be made based on the development biology of the pest (susceptible development stage), pest mobility (potential rate of spread), timing of selected control measures, applicable control techniques, and most effective chemical pesticides for the target species (insecticide class, resistance, etc.). Failure to identify pests can lead to unwarranted control activities and/or the need for chemical application with potential for discharge into surface waters. Control for each specific pest is also predicated on the status of the pest as native recurring, quarantine restricted, or designated as an invasive species. Operators may use historical data or neighboring district data to identify the species.

Identify current distribution of the target pest and assess potential distribution in the absence of control measures. Control activities are warranted only after exact pest identification and delineation of the extent of the pest infestation. As forest canopy pest control can involve treating large expanses of forests, mapping is also an important component in identification of the problem. The distribution of the pest, usually insects, within the area of infestation can impact the selection of treatment activities. In addition, mapping of the pest infestation will allow evaluation of the actual/potential spread of the infestation (e.g., pest biology, pest mobility, and host availability) and also serve as a tool to evaluate the effectiveness of the control activities. Mapping can also provide essential information for assessment of economic damages that can result from the current and potential pest infestation and failure to control the pest. Management decisions can thereby be based on cost/benefit evaluations based on the current and potential distribution of any pest.

The third component of problem identification is to determine the potential economic impact of not controlling the pest. By establishing economic thresholds, it is possible to determine pest density action thresholds which warrant control activities. However, control decisions must take into account not only the projected economic impact of the current pest infestation but also the potential of the pest infestation to spread. Therefore, control decisions based on economic impact must in turn rely on proper pest identification, pest biology, and current and potential pest distribution.

Part I A 1 b (4)(b) Pest Management

Prior to the first pesticide application covered under this permit that will result in a discharge to surface waters, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year, you must select and implement for each pest management area efficient and effective means of pest management that minimize discharges resulting from application of pesticides to control forestry pests. In developing these pest management strategies, you must evaluate the following management options considering impact to water quality, impact to non-target organisms, pest resistance, feasibility, and cost effectiveness: No action; Prevention; Mechanical/physical methods; Cultural methods; Biological control agents; and Pesticides. Pest control activities in forest canopy management programs may be warranted following problem identification and based solely on pest occurrence (e.g., quarantine pest, invasive species). However, in many instances control activities may only be necessary based on pest population distribution and/or pest densities. To minimize the need for pest control while also producing the best control results, a pest management strategy appropriate for the specific problem site(s) must be developed. A site-specific management plan will consider biotic (e.g., plant and animal species community structure) and abiotic (e.g., environmental) factors. Combinations of various management methods are frequently the most effective pest management strategies over the long term. The goal of a pest management strategy in forest canopy pest control should be to emphasize long-term control rather than a temporary fix.

All control measures must be conducted in a manner that minimizes impacts to non-target species. The following is a discussion of the relevant management options as they might be implemented for forest canopy pest control.

No Action
No action is to be taken, although a forest canopy pest control problem has been identified. This may be appropriate in cases where available control methods may cause secondary or non-target impacts or where aesthetic/economic losses are not anticipated.

Mechanical and Biological Control
Mechanical and biological controls will be the appropriate method in some cases, or a part of a combination of methods. In some instances, the need for chemical pesticide use in and adjacent to the affected habitat can be reduced or virtually eliminated with proper execution of alternative strategies and proper best management practices.

Mechanical control techniques will vary depending on the pest. An example of mechanical control in a forest canopy would be egg mass removal (gypsy moth).

Biological control of forest canopy pests may be achieved through the introduction/enhancement of diseases, predators, or parasites. In addition, forest canopy pest control programs aimed specifically at insects may also utilize sterile insect release, mating disruption, and biological pesticides. While biological controls generally have limited applications for forest canopy pest control programs, they should be fully considered as an option in the development of an IPM plan. The latter two control approaches are often utilized when controlling for gypsy moth.

Cultural Method
Cultural control methods are strategies that make the habitat unsuitable for a pest. An example of a cultural method to manage pests of the forest canopy would be to select a different species of tree to plant, or to plant resistant varieties of trees. Maintaining the trees in good health to discourage pests is another method of cultural control.

Pesticide
Several chemical and biological pesticides are available that may be used to reduce defoliation of the trees. These pesticides are typically used when pest populations are high and the action threshold has been reached. These products are aerially applied. As described below, once the determination is made to use pesticides, additional requirements must be met.

Part I A 1 b (1)(c) Pesticide Use
Conduct surveillance prior to each application to assess the pest management area and to determine when a pest action threshold is met that necessitates the need for pest management. Operators must apply pesticides only as needed as determined by pre-established criteria and pest action thresholds. Operators must establish a pest action threshold that warrants pesticide application based on problem identification and pest surveillance. In order to establish pest densities and determine when pest action thresholds have been met, forest canopy pest control programs must include pest surveillance activities as an integral component of pest management strategies. Pest surveillance is necessary to detect the presence (or confirm the absence) and magnitude of pest populations in a given location and precisely pinpoint zones of infestation. Surveillance activities will vary according to the pest (insect, weed, or pathogen) but in general should include observations of pest numbers, developmental stage of the current infestation, and biotic factors which would enhance development/expansion of pest populations (e.g., weather, crowding, predators, pathogens, etc.).

Pest surveillance will vary according to pest type and species. For insect pests, surveillance activities may include, but not be limited to, pheromone traps, sticky traps, light traps, defoliation monitoring. In some cases, traps used in surveillance activities have been developed to the extent that they alone provide adequate control of the targeted pest, thus eliminating the need for pesticide completely. Conversely, in the instance of quarantine pests or invasive species, pest identification alone may suffice to fulfill surveillance requirements and indicate need for control measures. Regardless, surveillance should take in to account local environmental conditions and projected environmental conditions which would support development and/or spread of the pest population and which would limit the choice or effectiveness of control activities.

It is also important to continue surveillance following control activities to assess treatment efficacy and to monitor for new pests. Surveillance can determine if the current techniques are effective and whether additional control measures are required, particularly pesticide application. Based on follow-up surveillance activity, operators can make informed decisions which serve to increase the effectiveness of their control programs and minimize the potential for pesticide discharge to surface waters. Surveillance is necessary not only to establish the species presence and their abundance but also as an evaluation tool of the effectiveness of chemical control activities. Furthermore, surveillance should be used as an indicator of the need for additional chemical control activities based on pre-established criteria related to population densities in local areas.

Assess environmental conditions (e.g., temperature, precipitation, and wind speed) in the treatment area to identify conditions that support target pest development and are conducive for treatment activities. Operator may use insecticides as dictated by the pest. Although pesticide formulations and applications vary according to pest and habitat, the focus here is on aerial applications of chemical/biological sprays. Aerial application is considered the preferred application method for large areas and areas that are inaccessible for ground application. In order to prevent poor site coverage, a guidance system (GPS), where economically feasible, or site flagging are necessary to increase accuracy of the treatment coverage while minimizing the amount of pesticides being applied.

Before using a pesticide, the forest canopy pest control operator should consider the following points; 1) do not apply a pesticide in unfavorable environmental conditions (e.g., windy, rainy, etc.) with increased potential for drift and wash off/runoff, 2) choose an application method and a pesticide formulation that will minimize the potential for movement of the material to off-site locations, 3) restrict or minimize the use of volatile pesticides on areas in or around sensitive on-target plants or animals, especially during hot weather, 4) generally, liquid pesticides applied by broadcast methods are more subject to drift than are granular formulations and their application methods, 5) during liquid application, spray droplet size should be maintained within the recommended range for the proposed target and the application method to be used, and 6) use additives to minimize drift and enhance efficacy as appropriate.

Reduce the impact on the environment and non-target organisms by evaluating the restrictions, application timing, and application methods in addition to applying the pesticide only when the action thresholds have been met. Forest canopy pest species and site restrictions (water use, water movement, etc.) must be identified when choosing an appropriate pesticide. For instance with gypsy moth control a biological insecticide, *Bacillus thuringiensis kurstaki*, is usually selected. However, if endangered or threatened butterfly or moth species are in the area, a viral insecticide that specifically targets gypsy moth larvae will be selected. Environmental factors such as temperature, as well as biological factors such as migration timing should be considered when deciding on application timing. Partial site treatments over time may be considered to minimize risk to non-target organisms. Pesticide application must be limited to the appropriate amount required to control the target pests. Methods used in applying pesticides must minimize the impact to non-target species.

Evaluate using pesticides against the most susceptible developmental stage. For forest canopy pests, pesticides should be selected that target the most susceptible life stage. For instance, with gypsy moths, the larvae are present in the canopy, are soft-bodied, and therefore are the target of chemical controls.

Recommended Forest Canopy Pest Control Reference
EPA recommends the following source for additional information on IPMs and BMPs for forest canopy pest control:

Emily Grafton and Ralph Webb. Homeowner's guide to gypsy moth management. West Virginia University Extension Service. http://www.nj.gov/agriculture/divisions/pi/pdf/GMguide.pdf

Part I A 2 Water quality-based limitations

The Permit Regulation at 9VAC25-31-220 D requires VPDES permits to meet water quality standards. We do this by including water quality-based effluent limits (WQBELs). Unlike individual permits that include requirements tailored to site-specific considerations, general permits, while tailored to specific industrial processes or types of discharges (e.g., from the application of pesticides), often do not contain site-specific WQBELs. Instead, in general, a narrative statement is included that addresses WQBELs. In this permit the WQBEL is as follows:

> *The operator's discharge of pollutants must be controlled as necessary to meet applicable numeric and narrative state, territory, or tribal water quality standards.*

If at any time you become aware, or the Board determines, that the operator's discharge of pollutants causes or contributes to an excursion of applicable water quality standards, you must take corrective action as required in Part I D 1 of this permit.

Any discharge that results in an excursion of any applicable numeric or narrative water quality standard is prohibited. The Department expects that compliance with the FIFRA label requirements, the technology-based effluent limitations, and other terms and conditions in this permit will meet applicable WQBELs. If an operator becomes aware that an excursion of water quality standards has occurred, corrective actions must be taken and documented per Part I D 1 of the permit. If a water quality standards excursion has also caused an adverse incident, the adverse incident must be documented and reported per Part I D 2. If the water quality standards excursion occurred because of a spill, leak or other unauthorized discharge, notification in excess of a reportable quantity in 40 CFR Parts 110, 117 or 302, it must be reported per Part I D 3 of this permit. A link to the 40 CFRs (Code of Federal Regulations) can be found here:
http://www.access.gpo.gov/nara/cfr/waisidx_07/40cfrv21_07.html and
http://www.access.gpo.gov/nara/cfr/waisidx_07/40cfrv27_07.html

Part I B Monitoring

Monitoring is required in any VPDES permit to demonstrate compliance with the permit conditions per 9VAC25-31-220 I. However, monitoring of pesticide discharges poses several challenges not generally encountered in "traditional" VPDES permitting situations. For example, there is no "wastewater discharge" per se from pesticide applications that is analogous to end-of-pipe discharges. A manufacturing plant would, for example, typically direct its wastewater through a treatment system to remove pollutants, and then would direct the effluent through a pipe into a receiving waterbody. However, for chemical pesticide applications, at the time of application the pesticide contains both the portion serving its intended purpose as well as the potential residual for which monitoring data would be appropriate. Thus, monitoring the "outfall" in this case would merely provide data on the amount of the product as applied (information already known through the FIFRA registration process) and would not be useful for comparing with any type of effluent limitation or water quality standard.

Ambient water quality monitoring was also considered for this permit and determined that it was infeasible/impracticable for the following reasons:

- Uncertainty: Ambient water quality monitoring would generally not be able to distinguish whether the results were from the pesticide application for which monitoring is being performed, or some other upstream source.

- Lack of applicable measurable standards: Pesticide-specific water quality standards do not exist at this time for the vast majority of constituents in the products authorized for use under this PGP.

- Safety and Accessibility: Pesticides, particularly those used for mosquito control and forestry pest control, are often applied over waterbodies in remote areas, hazardous terrain, and swamps that are either inaccessible or pose safety risks for the collection of samples.

- Difficulty of residue sampling for chemical pesticides: For chemical pesticides, the "pollutant" regulated by the PGP is the residue that remains after the pesticide has completed its activity, and it is this residue that would be the subject of any water quality monitoring requirement. However, the point at which only "residue" remains is not practically discernable at this time for a pesticide application.

- Usefulness of data: Some states have questioned the value of ambient water quality monitoring data obtained from state permitting programs. The data generally showed that water quality impacts were not occurring, and one state even discontinued the requirement in revisions of its state permit.

Given the questionable ability of ambient water quality data to demonstrate permit compliance, EPA has determined that there are suitable alternative monitoring activities to determine permit compliance, other than ambient water quality monitoring, for this permit.

Monitoring requirements in this permit for operators who are pesticide applicators (as opposed to those who are decision makers) include the amount (to ensure it is the lowest effective amount, consistent with reducing pest resistance without exceeding the maximum rate of the product label) and condition of the application equipment (including calibrating, cleaning, and repair) on a regular basis. It is understood that appropriate application rates are

variable depending on conditions, and the Board expects operators who are pesticide applicators to use their best professional judgment in combination with the label requirements in determining the appropriate amount of product needed to optimize efficacy of the treatment.

Monitoring requirements for all operators (applicators and decision makers) include visual assessment in the area where pesticides are applied to look for adverse incidents caused by application of pesticides. The visual monitoring requires spot checks in the area to and around where pesticides are applied and must be done during any post-application surveillance or efficacy check, if the operator does one, and during a pesticide application. Visual monitoring is not required when it is infeasible or unsafe to do so (e.g., when the pesticide application is performed in darkness, applications made from aircraft and applications made from a moving vehicle (road vehicle, watercraft, etc.) when the applicator is the driver). A visual monitoring assessment must also be conducted during any post-application surveillance to determine the efficacy of the pesticide treatment. Visual monitoring of this type is only required if the operator performs post application surveillance in the normal course of business. The Department expects that visual assessments may reasonably be conducted during applications and efficacy inspections may be conducted on foot or from a stationary vehicle.

The visual monitoring is not required to be submitted to DEQ. The permit does not require the operator to keep a record of the visual monitoring assessments.

Part I C Pesticide Discharge Management Plan

Any operator exceeding certain annual area thresholds must maintain a pesticide discharge monitoring plan (PDMP) in order to document how the operator will implement the effluent limitations. There is no regulatory requirement in the VPDES Permit Regulation for a PDMP; however, it is standard practice when best management practices are used to meet effluent limits to prepare some type of operations manual or a pollution prevention plan to document the management practices and adjustments to the program. EPA has included the PDMP concept in their pesticide general permit and the VA PDMP mirrors the EPA plan.

A PDMP is a "living" document that requires periodic reviews and must be kept up-to-date. Where control measures are modified or replaced to meet effluent limitations, such as in response to a Part I A 2 water quality standards violation triggering a Part I D 1 corrective action, such changes must be documented in the PDMP. The PDMP is not a limitation and does not itself impose requirements on discharges. These are already imposed by the limitations in parts I A 1 and 2. The PDMP is rather a tool for operators to document, among other things, how control measures will be implemented to comply with the permit's effluent limitations, and is a permit "term or condition." Failure to have a PDMP, where required, is a violation of the permit.[5] A PDMP worksheet is provided in Appendix X to assist the operator to develop the first draft. The PDMP can be expanded and improved over time.

The PDMP must be developed prior to the first application for those operators who know prior to commencement of discharge that they will exceed an annual treatment threshold, prior to exceeding an annual threshold for operators who do not know until after commencement of discharge that they will exceed an annual treatment threshold for that year, and no later than 90 days after responding to a declared pest emergency situation for operator commencing discharge in response to a declared pest emergency situation.

The PDMP is not required to be submitted to the Department, but must be made available to the public when requested per the Freedom of Information Act (FOIA) (Chapter 37 of Title 2.2) - see *Part I C 7 PDMP Modifications and Availability* section below.

If you exceed the following annual thresholds you must develop a PDMP:

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[5] This permit is also consistent with the decision in Texas Independent Producers and Royalty Owners Assoc., et. al. v. EPA, 410 F.3d 964 (7th Cir. 2005), where petitioners challenged EPA's issuance of the construction general permit (CGP) that covers stormwater discharges. In that case, the Court found that neither the Stormwater Pollution Prevention Plan (SWPPP) nor the Notices of Intent (NOIs) are permits or permit applications because they do not amount to limits. 410 F.3d at 978. Further, the Court found that the permit requirement to develop a SWPPP is not an effluent limitation. For the PGP, the PDMP serves a similar purpose as the CGP SWPPP.

Annual Treatment Area Thresholds
9VAC25-800-30 C (Table 1)

Pesticide Use	Annual Threshold
Mosquitoes and Other Flying Insect Pests	640 acres of treatment area[3]
Aquatic Weed and Algae Control:	
- In Water	20 acres of treatment area[1]
- At Water's Edge:	20 linear miles of treatment area at water's edge[2]
Aquatic Animal Pest Control:	
- In Water	20 acres of treatment area[1]
- At Water's Edge	20 linear miles of treatment area at water's edge[2]
Forest Canopy Pest Control	640 acres of treatment area[3]

[1] - Calculations include the area of the applications made to: (1) surface waters and (2) conveyances with a hydrologic surface connection to surface waters at the time of pesticide application. For calculating annual treatment area totals, count each pesticide application activity as a separate activity. For example, applying pesticides twice a year to a ten acre site is counted as twenty acres of treatment area. For lake acreages, the operator may include the entire lake acreage OR only the areas intended to provide pesticidal benefit.

[2] - Calculations include the linear extent of the application made along the water's edge adjacent to: (1) surface waters and (2) conveyances with a hydrologic surface connection to surface waters at the time of pesticide application. For calculating annual treatment totals, count each pesticide application activity and each side of a linear water body as a separate activity or area. For example, treating both sides of a ten mile ditch is equal to twenty miles of water treatment area.

[3] For mosquito and forest canopy control, the total acreage may include water and land for ease of calculation.

These calculations include farm ponds, ditches and storm water best management practices with a hydrologic connection to surface water. If unsure, assume any water body has a hydrologic connection and must be counted. If a ditch is dry or expected to be dry during the application period, it is not counted. Wetlands can be dry or wet, and both must be counted. If unsure about wetlands locations, include the entire spray area, even if it includes land. Wetlands information and acreages can be found at http://www.fws.gov/wetlands/data/Mapper.html . At the web site, zoom to the application area and use the information tool to see the wetlands acreages.

The rationale for the annual treatment area threshold for each use pattern is as follows:

For mosquitoes and other flying insect pests, the annual treatment area threshold has been set at 640 acres. The Department believes that the vast majority of mosquito control and abatement districts in Virginia manage areas significantly larger than this threshold and may reasonably expect to exceed it during any given year.

For aquatic weeds and algae, the annual treatment area threshold has been set at 20 acres or 20 linear miles of treatment on canals and irrigation system conveyances. This threshold has been set to capture operators treating relatively large portions of surface waters and watersheds, such as water management districts, wildlife and game departments, and some homeowner and lake associations.

Aquatic animal pest control is most commonly treated by public agencies such as departments of fish and game or utilities such as water management districts that manage areas of surface water in excess of 20 acres. The high mobility and prolific breeding ability that necessitate control of aquatic animals usually means that their treatment most often occurs in the entirety or large portions of the water bodies they inhabit.

Forest canopy pest suppression programs are designed to aerially blanket large tracts of terrain, throughout which operators may not be able to see surface waters beneath the canopy. The annual treatment area threshold at 640 acres for this use pattern will exclude only the smallest applications from the PDMP requirement. These smaller

applications generally occur on private lands. Therefore, the Department believes the threshold appropriately captures most operators engaging in this use pattern, particularly public agencies managing large tracts of land.

All of the thresholds are based on the findings in the EPA fact sheet[6] that discusses the development of the federal permit.

The PDMP must include the following elements:

Part I C 2 Pesticide discharge management team
The permit requires that a qualified individual or team of individuals be identified to manage pesticide discharges, including the pesticide applicator. Identification of a pesticide discharge management team ensures that appropriate persons (or positions) are identified as necessary for developing and implementing the plan. Inclusion of the team in the plan provides notice to staff and management (i.e., those responsible for signing and certifying the plan) of the responsibilities of certain key staff for following through on compliance with the permit's conditions and limits.

The pesticide discharge management team is responsible for developing and revising the PDMP, implementing and maintaining the control measures to meet effluent limitations, and taking corrective action where necessary. Team members should be chosen for their expertise in the relevant areas to ensure that all aspects of pest management are considered in developing the plan. The PDMP must clearly describe the responsibilities of each team member to ensure that each aspect of the PDMP is addressed. The Department expects most operators will have more than one individual on the team, except for small entities with relatively simple plans and/or staff limitations. The permit requires that team members have ready access to any applicable portions of the PDMP and the permit.

Part I C 3 Pest management area

Pest Problem Description.
The permit requires that the PDMP include a description of the pest problem at the pest management area. A detailed pest management area description assists operators in subsequent efforts to identify and set priorities for the evaluation and selection of control measures taken to meet effluent limitations set forth in Parts I A 1 and 2 and in identifying necessary changes in pest management. The description must include identification of the target pest(s), source of the pest problem, and source of data used to identify the problem. Historic data or other available data (e.g., from another similar site) may be used to identify the problem at your site. If you use other site data, you must document in this section why data from your site is not available or not taken within the past year and explain why the data is relevant to your site. Additionally, the pest management area descriptions should include any sensitive resources in the area, such as unique habitat areas, rare or listed species, or other species of concern that may limit pest management options.

Action Threshold(s)
The permit requires that the PDMP include a description of the action threshold(s) established for the target pest, including a description of how they were determined. An action threshold is a level of pest prevalence at which an operator takes action to reduce the pest population. For some pests, action may be needed before pests or pest damage appears. In those cases, an action threshold may be defined as a set of conditions, e.g., a plant is at a susceptible stage for a disease under the right weather conditions.

General Service Area Map
The PDMP must also contain a general location map of the site that identifies the geographic boundaries of the area to which the plan applies and location of surface waters (this could be from a state wide or county wide approach or individual water bodies, depending on the extent of applications for that operator). To improve readability of the map, some detailed information may be kept as an attachment to the site map and pictures may be included as deemed appropriate.

Part I C 4 Control Measure Description
The permit requires that the PDMP include a description of the control measures to demonstrate how the operators specifically plan to meet the applicable technology-based or water quality-based effluent limitations. The

[6] U.S. Environmental Protection Agency, 2010 Public Notice of: Draft National Pollutant Discharge Elimination System (NPDES) Pesticides General Permit (PGP) for Discharges from the Application of Pesticides to or over, including near Waters of the U.S. Fact Sheet

description of the control measures selected to meet the effluent limitations must include a brief explanation of the control measures used at the site to reduce pesticide discharge, including evaluation and implementation of the six pest management tools (no action, prevention, mechanical/physical methods, cultural methods, biological control agents, and pesticides). Operators must consider impact to non-target organisms, impact to water quality, pest resistance, feasibility, and cost effectiveness when evaluating and selecting the most efficient and effective means of pest management to minimize pesticide discharge to surface waters.

All six pest management tools may not be available for a specific use category and/or treatment area. However, the PDMP must include documentation of how the six pest management tools were evaluated prior to selecting a site specific pest management strategy. For the no action option, operators should document the impact of this option without any current pest management strategy at the site. For the prevention management option, the operator should document the methods implemented to prevent new introductions or the spread of the pests to new sites such as identifying routes of invasion and how these can be intercepted to reduce the chance of invasion. Prevention may include source reduction, using pathogen-free or weed-free seeds or fill; exclusion methods (e.g., barriers) and/or sanitation methods, like wash stations, to prevent reintroduction by vehicles, personnel, etc. Some prevention management methods may fall under mechanical/physical or cultural methods as well.

For the pesticide management option, operators must include a list of the active ingredient(s) evaluated. Discussion should also identify specific equipment or methods that will prevent or reduce the risks to non-target organisms and pesticide discharges to surface waters.

Par I C 5 a Schedules and procedures pertaining to control measures used to comply with the effluent limitations in Part I A 1

Application Rate and Frequency Procedures

In the PDMP, operators must describe the procedures for determining the lowest effective amount of pesticide product per application and the optimum frequency of pesticide applications to minimize discharges from the application of pesticide.

Spill Prevention

- Per Part I A 1 a (2) operators must describe the spill prevention program for their pest management area. The program should address areas and activities at the site that typically pose a high risk for spills including loading and unloading areas, storage areas, process areas, and waste disposal activities. It should also address appropriate material handling procedures, storage requirements, and containment or diversion equipment that will minimize the potential for spills, or in the event of a spill, enable proper and timely response.
- As required in Part I D 3 of this permit, any spills or leaks that occur while covered under this permit must be documented.
- Documenting spills does not relieve operators of any reporting requirements established in 40 CFR 110, 40 CFR 117, and 40 CFR 302, or any other statutory requirements relating to spills or other releases of oils or hazardous substances.

Pesticide Application Equipment Procedures

Per Part I A 1 a (3) operators must describe the preventive equipment maintenance program to keep the pesticide application equipment in proper operating condition; including how and when the following will be addressed: calibration, regular inspections, and cleaning/repairing of the application equipment to avoid situations that may result in leaks, spills, and other releases.

Pest Surveillance Procedures

Per Parts I A 1 b (1) (c), I A 1 b (2) (c), I A 1 b (3) (c) and I A 1 b (4) (c), operators must discuss how their pest surveillance programs assess the pest treatment area, to determine when the action threshold(s) is met. The discussion should also include surveillance method(s) selected.

Assessing Environmental Conditions Procedures

Per Parts I A 1 b (1) (c) (ii) and I A 1 b (4) (c) (ii), operators must discuss the procedures and methods to assess environmental conditions in the treatment area.

Part I C 5 b Schedules and procedures pertaining to other actions necessary to minimize discharges

Spill Response Procedures

The PDMP must document procedures for expeditiously stopping, containing, and cleaning up leaks, spills, and other release. In addition, the PDMP must include documentation of the procedures for notification of appropriate facility personnel, emergency response agencies, and regulatory agencies.

Adverse Incident Response Procedures
In the PDMP, operators must document appropriate procedures for responding to an adverse incident resulting from pesticide applications. Operator must identify and document the following:

- Course of action or responses to any incident resulting from pesticide applications;
- Chain of command notification for the incident, both internal to your agency/organization and external;
- State/Federal contacts with phone numbers;
- Name, location, and telephone of nearest emergency medical facility;
- Name, location, and telephone of nearest hazardous chemical responder; including police/fire.

Pesticide Monitoring Schedules and Procedures
In the PDMP, operators must describe procedures for monitoring consistent with the requirements in Part I B including:

- The process for determining the location and timing of monitoring;
- A schedule and procedures for monitoring;
- The person (or position) responsible for conducting monitoring; and
- Procedures for documenting any observed impacts to non-target organisms resulting from your pesticide discharge.

Part I C 6 Signature Requirements
The PDMP must be signed and certified in accordance with the signatory requirements in the described in Part I C 6 of the permit. This requirement is consistent with standard VPDES permit conditions described in 9VAC25-31-110 and is intended to ensure that the operator understands his/her responsibility to create and maintain a complete and accurate PDMP. The signature requirement includes an acknowledgment that there are significant penalties for submitting false information.

Part I C 7 PDMP Modifications and Availability
While not required to be submitted to the Department, interested persons can request a copy of the PDMP through the Department, at which point the Department will likely request the operator to provide a copy of the PDMP. By requiring members of the public to request a copy of the PDMP through the Department, the Department is able to provide the operators with assurance that any Confidential Business Information that may be contained within its PDMP is not released to the public. The Water Control Law states that any information, **except effluent data**, as to secret formulae, processes, or secret methods shall be kept confidential (§ 62.1-44.21). It is the responsibility of the source providing confidential information, not that of DEQ, to identify the information as confidential and seek DEQ's acquiescence in that designation. DEQ is responsible for keeping such designation confidential. It is the Department's expectation that operators can write the PDMP appropriately without including confidential business information.

A PDMP form and example PDMP will be included as Attachment C and D (NOTE: We are awaiting EPA assistance on this and have requested EPA to provide PDMP examples and/or forms).

Part I D Special Conditions

Special conditions are included in all VPDES permits per 9VAC25-31-210 (establishing permit conditions). This states that the Board shall establish conditions, as required on a case-by-case basis, to provide for and assure compliance with all applicable requirements of the law, the CWA and regulations. These shall include conditions under 9VAC25-31-240 (duration of permits), 9VAC25-31-250 (schedules of compliance) and 9VAC25-31-220 (monitoring). With some exceptions, the special conditions in this permit mirror sections 6 and 7 of the EPA general permit[7].

[7] United States Environmental Protection Agency (EPA), National Pollutant Discharge Elimination System (NPDES), Pesticide General Permit (PGP) for Point Source Discharges to Waters of the United States from the Application of Pesticides (Draft), 2010.

Part I D 1 Corrective Action

The purpose of including corrective action requirements in this permit is to assist this new universe of VPDES operators with effectively meeting technology-based and water-quality-based effluent limitations and implementing integrated pest management practices in this permit. Corrective actions in this permit are follow-up actions an operator must take to assess and correct problems. They require review and revision of control measures and pesticide application activities, as necessary, to ensure that these problems are eliminated and will not be repeated in the future. Changes to control measures to eliminate unauthorized releases, meet effluent limits, minimize discharges or correct adverse incidents must be made before the next pesticide application, or if not practical, as soon as possible. The permit makes clear that the operator is expected to assess why a specific problem has occurred and document what steps were taken to eliminate the problem. Other than for adverse incidents and reportable spills and leaks (which have their own reporting requirements), the situation triggering corrective action and the planned corrective action must be documented within five days of the operator becoming aware of the situation. Documentation must be retained for 3 years and include the following:

- Identification of the condition triggering the need for corrective action review, including any ambient water quality monitoring that assisted in determining that discharges did not meet water quality standards;
- Brief description of the situation; date the problems was identified;
- Brief description of how the problem was identified and how the operator learned of the situation and date the operator learned of the situation;
- Summary of corrective action taken or to be taken including date initiated and date completed or expected to be completed; and
- Any measures to prevent reoccurrence of such incident, including notice of whether PDMP modifications are required as a result of the incident.

The Department believes this approach will help permittees in complying with the requirements of the permit quickly. Compliance with many of the permit's requirements -- for instance, those related to reporting and recordkeeping and some of those related to operation and maintenance -- can be accomplished immediately, and therefore, are not considered problems that trigger corrective actions.

It should be noted that a situation triggering corrective action is not necessarily a permit violation and, as such, may not necessarily trigger a modification of control measures to meet effluent limitations. However, failure to conduct (and document) corrective action reviews in such cases does constitute a permit violation.

Part I D 2 Adverse Incident documentation and Reporting

Operators are required to take specific actions in response to identified adverse incidents which may have resulted from a discharge from the pesticide application. Namely, operators are required to provide oral notice to the Department within 24 hours and then follow-up with a written report within 5 days of becoming aware of the adverse incident. "Adverse incident" is defined in section 9VAC25-800-10 of the permit regulation, but generally an adverse incident is defined as any effect of a pesticide's use that is unexpected or unintended. Adverse incidents must be reported even when the product label states that adverse effects may occur.

The 24-hour oral notification must include at least the following information:

- The caller's name and telephone number;
- Operator name and mailing address;
- The name and telephone number of a contact person, if different than the person providing the 24-hour notice;
- How and when the permittee became aware of the adverse incident;
- Description of the location of the adverse incident;
- Description of the adverse incident identified and the EPA pesticide registration number for each product that was applied in the area of the adverse incident; and
- Description of any steps the permittee has taken or will take to correct, repair, remedy, cleanup, or otherwise address any adverse effects.

If notification cannot be done in 24-hours, notification shall be as soon as possible, and a reason for why the notification was not possible within 24 hours must be provided.

The operator is still required to do FIFRA section 6(a)(2) (40 CFR Part 159) notification and reporting also.

The operator does not need to report adverse incidents under the following conditions:

- The operator is aware of facts that clearly establish that the adverse incident was not related to toxic effects or exposure from the pesticide application.
- The operator has been notified in writing by the Board that the reporting requirement has been waived for this incident or category of incidents.
- The operator receives information notifying him of an adverse incident but that information is clearly erroneous.
- An adverse incident occurs to pests that are similar in kind to pests identified as potential targets.

A written report of a reportable adverse incident must be submitted to the Department within 5 days of discovering the adverse incident and must include the following information:

- Information required to be provided in Part I D 2 a;
- Date and time you contacted the Department notifying the agency of the adverse incident and who you spoke to and any instructions you were given;
- Location of incident, including the names of any waters affected and appearance of those waters (sheen, color, clarity, etc.);
- A description of the circumstances of the incident including species affected, number of individual and approximate size of dead or distressed organisms;
- Magnitude and scope of the effected area (e.g., aquatic square area or total stream distance affected);
- Pesticide application rate, intended use site (e.g., banks, above, or direct to water), method of application and name of pesticide product, description of pesticide ingredients and EPA registration number;
- Description of the habitat and the circumstances under which the incident occurred (including any available ambient water data for pesticides applied);
- If laboratory tests were performed, indicate what tests were performed, and when, and provide a summary of the test results within 5 days after they become available;
- If applicable, explain why it is believed the adverse incident could not have been caused by exposure to the pesticide;
- Actions to be taken to prevent recurrence of adverse incidents; and
- Signed and dated in accordance with Part I C 6.

The Department believes adverse incident information associated with discharges from the application of pesticides is useful to the Agency because the information:

- Indicates the effectiveness of the permit in controlling discharges to protect water quality, including data upon which the Department may base future permit decisions (e.g., modifications to or reissuance of this permit).
- Assists review of current or future pesticide use, adherence to Best Management Practices, or effectiveness of Best Management Practices;
- Provides information on the nature, extent, and severity of incidents to decision-makers, stakeholders, and the public; and
- Provides the Agency with information on which to assess compliance with regulatory requirements, including documentation and reporting.

Immediately observable signs of distress or damage to non-target plants, animals and other macro-organisms within the treatment area may warrant concern for a possible adverse incident related to a discharge of pesticides during application. The Department acknowledges that some degree of detrimental impact to non-target species is to be expected and is acceptable during the course of normal pesticide treatment. We expect operators to use their best professional judgment in determining the extent to which non-target effects appear to be abnormal or indicative of an unforeseen problem associated with an application of pesticides.

During visual monitoring, operators should watch for distressed or dead juvenile and small fishes, washed up or floating fish, fish swimming abnormally or erratically, fish lying lethargically at the water surface or in shallow water, fish that are listless or nonresponsive to disturbance, the stunting, wilting, or desiccation of non-target submerged or emergent aquatic plants, and other dead or visibly distressed non-target organisms including amphibians, turtles, and macro-invertebrates. These observations must be noted unless they are deemed not to be aberrant (for example, distressed non-target fish are to be expected when conducting a treatment with rotenone and non-target vegetation will be stressed near the target of contact herbicides). It should be noted that observation of these impacts does not necessarily imply that a pesticide has been misused or that there has been a permit violation or an instance of noncompliance, but may provide cause for further investigation of local water quality or reconsideration of Best Management Practices. Not reporting such incidents, however, is a permit violation.

Part I D 2 d specifies which agencies the operator must notify in the event of an adverse incident to federally or state threatened or endangered species, federally-designated critical habitat and Tier I (critical conservation need) and Tier II (very high conservation need) species of greatest conservation need. These species are defined in Virginia's Wildlife Action Plan (www.bewildvirginia.org). Federally-designated critical habitat in Virginia is the Clinch River, Copper Creek to Route 72, Indian Creek to just below the Mouth of Laurel and the Powell River to a point due east of Pennington Gap (see http://crithab.fws.gov). A full listing of all aquatic and terrestrial species (except insects and plants) can be found at http://www.dgif.virginia.gov/wildlife/virginiatescspecies.pdf and can be found in Attachment E.

For location information, the wildlife information mapper can take you to any location in Virginia and if you click on 'report' it will list all species within a designated search radius (e.g., 2 or 3miles) http://vafwis.org/fwis/?Title=VaFWIS+Geographic+Search&vUT. It will list the threatened and endangered species first.

Listing of state threatened or endangered plants and insects can be found in § 3.2-1000-1011 of the Code of Virginia and 2VAC5-320-10 of the Virginia Administrative Code and is in Attachment x.

In the event of an adverse incident to threatened and endangered species, federally-designated critical habitat, Tier 1 (critical conservation need), or Tier II (very high conservation need) areas you must tell the appropriate agency (National Marine Fisheries Service and Virginia Department of Game and inland Fisheries (DGIF) for anadromous or marine species and US Fish and Wildlife Service and DGIF for terrestrial or freshwater species) the following information:

- The caller's name and telephone number;
- Operator name and mailing address;
- The name of the affected species, size of area impacted, and if applicable, the approximate number of animals affected;
- How and when the permittee became aware of the adverse incident;
- Description of the location of the adverse incident;
- Description of the adverse incident, including the EPA pesticide registration number for each product the permittee applied in the area of the adverse incident;
- Description of any steps the permittee has taken or will take to alleviate the adverse impact to the species; and
- Date and time of application.

Part I D 3 Reportable Spills and Leaks

Operators are required to call the Department (contact information in Part I D 5) to report any spill or leak of a hazardous substance or oil into surface waters with 24 hours of becoming aware of the spill or leak.[8] This must be documented with a report within 5 days of becoming aware of such spill or leak. The report shall contain the following information:

- A description of the nature and location of the spill, leak or discharge;
- The cause of the spill, leak or discharge;
- The date on which the spill, leak or discharge occurred;
- The length of time that the spill, leak or discharge continued;
- The volume of the spill, leak or discharge;
- If the discharge is continuing, how long it is expected to continue, and what the expected total volume of the discharge will be;
- A summary of corrective action taken or to be taken including date initiated and date completed or expected to be completed, and
- Any steps planned or taken to prevent recurrence of such a spill or leak or other discharge, including notice of whether PDMP modifications are required as a result of the spill or leak.

This information will be used by the Department to ascertain compliance with permit conditions.

[8] Reportable Spills and Leaks are defined as those that trigger the requirement to notify the National Response Center (40 CFR Parts 110, 117, 302) based on the type of pollutant and quantity released.

The Board may waive the written report on a case-by-case basis for reports of noncompliance of the oral report has been received within 24 hours and no adverse impact on state water has been reported

Part I D 4 Recordkeeping and annual reporting
Operators must maintain certain records to help them assess performance of control measures and to document compliance with permit conditions. These requirements are consistent with 9VAC25-31-190 J, but have been tailored to more closely reflect requirements of the PGP. The records that you keep are dependent on what kind of operator you are. Operators can rely on records and documents developed for other programs, such as requirements under FIFRA, provided all requirements of the permit are satisfied.

The Board recommends that all operators keep records of acres or linear miles treated each calendar year for all applicable use patterns covered under this general permit. All operators must keep copies of any adverse incident 5-day reports submitted to the Department, a rational for any determination that reporting of an identified adverse incident is not required per Part I D 2 a, and any corrective action documentation per Part I D 1c.

Any operators applying pesticides and exceeding the annual application thresholds in 9VAC25-800-30 C (e.g., 640 acres, 20 linear miles, etc.) must also maintain a record of each pesticide applied. This applies to both general use and restricted use pesticides. These record requirements mirror VDACS recordkeeping requirements in VAC20-40-65. The Department thinks the recordkeeping requirements for the agency mandated to administer the pesticide program in Virginia (i.e., VDACS) is sufficient information for the Department. These records are as follows:

- Name, address, and telephone number of customer and address or location, if different, of site of application;
- Name and VDACS certification number of the person making the application or certification number of the supervising certified applicator;
- Day, month and year of application;
- Type of plants, crop, animals, or sites treated and principal pests to be controlled;
- Acreage, area, or number of plants or animals treated;
- Brand name or common product name;
- EPA registration number;
- Amount of pesticide concentrate and amount of diluting used, by weight or volume, in mixture applied; and
- Type of application equipment used.

All required records must be assembled as soon as possible but no later than 30 days following completion of such activity. The operator shall retain any records required under this permit for at least 3 years from the date that coverage under this permit expires. This is consistent with 9VAC25-31-190 J 2 of the permit regulation. The operator shall make available to the Board, including an authorized representative of the Board, all records kept under this permit upon request and provide copies of such records, upon request. This is consistent with 9VAC25-31-190 H.

In addition to recordkeeping, all operators must submit annual reports of any adverse incidents as described in Part I D 2 no later than February 10 of the following year. The operator must also retain a copy for 3 years. The Department believes that the annual report of adverse incidents, along with the VDACS list of licensed pesticide businesses and certified operators, and the availability of records containing location, pest and product information with the operator, is equal to the annual reporting requirements in the federal EPA NPDES permit.

The annual report must contain the following:

- Operator's name;
- Contact person name, title, e-mail address (where available), and phone number;
- A summary report of all adverse incidents that occurred during the previous calendar year; and
- A summary of any corrective actions, including spill responses, in response to adverse incidents, and the rationale for such actions.

This information in the annual report will be used by the Department to assess permit compliance and to determine whether additional controls on pesticide discharges are necessary to protect water quality.

Part I D 5 DEQ contact information and mailing addresses
This section contains all the DEQ contact information for 24-hour reporting for adverse incidents and spills and leaks.

Part II Conditions applicable to all permits

VPDES Permit Regulation, 9VAC25-31-190, requires all VPDES permits to contain or specifically cite the conditions that are listed in this section. Some of the conditions in section 190 of the VPDES Permit Regulation have been eliminated because either there was no application to pesticide discharges or the requirement was already in Part I. For example, in monitoring Part II B we removed references to records related to sewage sludge, removed 'notice of planned changes', 'bypass' and 'upset' conditions as these relate only to treatment works. Also removed was 'signatory requirements', 'reports of unauthorized discharges' and 'reports of unusual or extraordinary discharges' as these requirements exist elsewhere in the permit.

ATTACHMENT A
Pesticide Impaired Waters
April 2010

James River (City of Richmond) **Chlordane*, DDE*, DDT***
James River from the Boulevard Bridge to the fall line at approximately the railroad trestle above Mayos Bridge.

Harwood Mills Reservoir (York County) **Copper**
Segment begins at northwest end of reservoir and ends at southeast end of reservoir, Rt 17 crossing.

Lee Hall Reservoir, East and West Segments (York County, Newport News) **Copper**
This includes the entirety of Lee Hall Reservoir. Located southeast of Lee Hall area. Northeast of Fort Eustis. Lee Hall is split by I-64.

Bailey Creek (Hopewell City, Prince George County) **Aldrin***
Segment begins at the headwaters of Bailey Creek and extends downstream to the fall line.

Bailey Branch (Surry County) **Mirex***
Bailey Branch from the headwaters to its tidal limit.

Occupacia Creek and tributaries (Essex County) **Mirex***
Occupacia Creek from the headwaters to Hunters Millpond dam, and all tributaries entering above the tidal limit.

Dan River (Halifax, Pittsylvania) **DDT*, DDE***
Dan River mainstem from VA/NC State Line downstream to its confluence with Peter Creek. (Not in 2010 305(b) report)

Lovills Creek Lake (Carroll County) **DDD*, DDE* and DDT***
The Lovills Creek flood control impoundment east of Cana.

Lovills Creek (Carroll County) **DDE* and DDT***
Lovills Creek mainstem from the North Carolina state line upstream to just above the Route 686 crossing.

New River (Giles, Montgomery and Pulaski Counties) **DDT*, DDE***
The segment begins at the Rt. 114 Bridge just downstream of the Crab Creek mouth (Watershed Boundary) on the New River and extends downstream to the VA / WVA State Line.

Difficult Run (Fairfax County) **Hepatachlor Epoxide***
Begins at the confluence with Captain Hickory Run, approximately 0.6 rivermile upstream from Route 683, and continues downstream until the confluence with the Potomac River.

Fourmile Run (Arlington County) **Chlordane***
Tidal waters of Fourmile Run; from rivermile 1.46 downstream until the confluence with the Potomac River, at the state line.

Pimmit Run (Arlington and Fairfax Counties) **Chlordane***
Location begins at the confluence with Little Pimmit Run, approximately 0.1 rivermile downstream from Route 695, and continues downstream until the confluence with the Potomac Rive

Pimmit Run (Arlington and Fairfax Counties) **Heptachlor Epoxcide***
Location begins at the confluence with Little Pimmit Run, approximately 0.1 rivermile downstream from Route 695, and continues downstream until the confluence with the Potomac River.

New River (Giles County) **DDE*, DDT*, Heptachlor Epoxide***
Mainstem New River from the confluence of Sinking Creek and continues downstream to the mouth of Stony Creek.

Bluestone River (Tazewell County) **Chlordane***

This segment includes the mainstem from the confluence with Big Branch downstream to West Virginia political boundary.

*** Legacy pesticides or used in pesticides that are currently banned in the United States. You may apply other allowable pesticides in these waters.**

List Derived From:
http://www.deq.virginia.gov/wqa/pdf/2010ir/appendices/ir10_AppendixA_Category5_Factsheets_All.pdf

ATTACHMENT B
Pesticide Business Licensees
VDACS Database
August 2010

CERT NO [1]	CLASS [2]	APPLICATOR NAME	EXPIRATION DATE	CATEGORY	RECERTIFICATION BEFORE	BUSINESS NAME	ADDRESS 1	ADDRESS 2	CITY STATE ZIP
56304	C	MICHAEL DARNELL SAVANNAH	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	A & H PEST CONTROL SERVICES	2656 BASINGSTOKE LANE		BRYANS ROAD MD 20616
24607	N	OTHEL D BOWLING	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	A & N ELECTRIC COOPERATIVE	P O BOX 355		ONLEY VA 23418
89897	C	ALVIN S ELLIS JR	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	A S E SERVICES	2516 BROAD BAY RD		VIRGINIA BEACH VA 23457
91247	C	NEIL W DODSON	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	AAA PEST PROS INC	10822 COURTHOUSE RD		FREDERICKSBURG VA 22408
104151	C	KATHRYN KNAPP	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	AARDVARK STRUCTURAL PEST CONTROL INC	145 ROCKINGHAM ST		ROCHESTER NY 14620-2435
112906	C	MATTHEW W MC MILLAN	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	ABC PROFESSIONAL TREE SERVICES, INC.	8109 LONGSTREET LN		SUFFOLK VA 23438
98848	C	MIRON M MIHALCOE JR	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	ABC TERMITE & PEST CONTROL INC	P O BOX 8786		VIRGINIA BEACH VA 23450-8786
80636	C	MATTHEW C ELSTRODT	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2013	ABOVE AND BEYOND LANDSCAPING	5540 QUARTERPATH GATE		VIRGINIA BEACH VA 23455
69925	G	KENNETH L WARD	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	ACCOMACK CO IND DEV AUTHORITY	4300 WILLIS WHARF RD	P O BOX 1415	EXMORE VA 23350
100441	G	ROBERT W EVANOFF	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	ACCOMACK COUNTY PUBLIC WORKS	P O BOX 391		MELFA VA 23410
109718	N	MARK A BELKNAP	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	ACCOMACK NORTHAMPTON ELECTRIC COOP	20182 ALLEN LN		ONANCOCK VA 23417
109507	C	JAMES R GOULD	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	ACRT INC	115 AMOS STREET		FAIRMONT WV 26554

CERT NO [1]	CLASS [2]	APPLICATOR NAME	EXPIRATION DATE	CATEGORY	RECERTIFICATION BEFORE	BUSINESS NAME	ADDRESS 1	ADDRESS 2	CITY STATE ZIP
97161	C	THEODORE G BEAN	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2014	ADAPCO INC	385 WOLSEY ROAD		FRANKLIN PA 16323
44669	C	TOLIVER GRIER	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	ADVANCED FEDERAL SERVICES CORPORATION	83 SOUTH PECAN CT		NEWPORT NEWS VA 23608
69396	C	JAMES LEE LINTON	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	ADVANTAGE LAWN CARE & LANDSCAPING	P O BOX 3		NELSONIA VA 23414
94373	C	KEVIN F LAWLOR	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	AFFORDABLE PEST LLC	7830 BACKLICK ROAD #408		SPRINGFIELD VA 22151
31168	C	RICHARD J SWIAT	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	AG AIR LLC	2 AIRPORT DRIVE		THOMASVILLE PA 17364
82974	C	JASON GRAVES	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	AJ ENTERPRISE INC	1225 FENTRESS RD		CHESAPEAKE VA 23322
104547	G	DANIEL J FOWLEY	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	ALBEMARLE COUNTY	1600 RIDING CLUB ROAD		KEEENE VA 22946
112700	G	KRISTIN L BINKLEY	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	ALEXANDRIA HEALTH DEPT-ENVIRONMENTAL HEALTH	4480 KING STREET		ALEXANDRIA VA 22314
95618	C	DAVID A SILVER	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	ALL AMERICAN PEST CONTROL INC	5613 LEESBURG PIKE #12		FALLS CHURCH VA 22041
84831	C	ERIC M WISDA	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	ALL RAILROAD SERVICES CORP	159 HAMPTON POINT DR.	SUITE 3	ST. AUGUSTINE FL 32092-3056
33372	C	ROBERT B BROWN	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	ALL SEASONS GROUNDS MANAGEMENT INC	1128 KEMPSVILLE ROAD		NORFOLK VA 23502
103669	G	GARY A HEPLER	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	ALLEGHANY COUNTY PUBLIC WORKS	7315 MILL BRANCH RD		COVINGTON VA 24426

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54178	N	KEN H RUTHERFORD	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	ALLEGHENY POWER	3463 VALLEY PIKE		WINCHESTER VA 22602-2470
37535	C	ALLEN CHORMAN	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	ALLEN CHORMAN & SON INC	30475 EAST MILL RUN		MILTON DE 19968
13055	G	JOHN BURNETT FERRELL	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	ALLIANT TECH SYSTEMS (ATK)	1100 WINDSOR AVENUE		PULASKI VA 24301
112684	C	BRYAN K OLMSTEAD	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	ALPHA SERVICES LLC	1031 LISONBEE RD		CHUNKY MS 39323
76853	C	ALBERT E SCHIFFER	30-JUN-2012	FOREST PEST CONTROL	30-JUN-2014	AL'S AERIAL SPRAYING LLC	3473 N SHEPARDSVILLE RD		OVID MI 48866-9667
34192	C	SHEPHERD P PARRISH	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	ALUTIIQ 3SG, LLC	2055 BOULDERS ROAD		CHARLOTTESVILLE VA 22911-8318
87016	C	THOMAS G CUNNINGHAM	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	AMC SPECIALTY	3737 HOLLAND BLVD	SUITE C	CHESAPEAKE VA 23323
27604	N	ROY C TATUM	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	AMERICAN ELECTRIC POWER	P O BOX 2021		ROANOKE VA 24022
36195	C	WILLIAM WAYNE WHITE	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	AMERICAN PEST MANAGEMENT	6460 NEW HAMPSHIRE AVE		TAKOMA PARK MD 20912
50456	C	MICHAEL JAY WOLFE	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	AMERITAC INC	4584 VILLAGE PARK DRIVE EAST		WILLIAMSBURG VA 23185
106233	G	CAROL R NASSEF	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	AMHERST COUNTY SCHOOL SYSTEM	137 EAGLE ROAD		AMHERST VA 24521
86696	G	MARK C STINNETTE	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2011	AMHERST COUNTY SERVICE AUTHORITY	184 ELK HUNTER TRAIL		MADISON HEIGHTS VA 24572

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26895	C	ANDREW M ANGEL	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	ANGEL SYSTEMS INC	P O BOX 304		GREAT MILLS MD 20634-0304
31099	N	KEVIN D SIGMON	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	APPALACHIAN POWER COMPANY	13563 OWENS DR		GLADE SPRING VA 24340
85402	G	JAMES C GORDON	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2011	APPOMATTOX RIVER WATER AUTHORITY	17912 NASH RD		DINWIDDIE VA 23841-2518
75294	C	PAUL BERKELEY SCHRANER	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	APPOMATTOX TERMITE & PEST CONTROL INC	P O BOX 897		PRINCE GEORGE VA 23875
76714	C	WILLIAM H KIRKPATRICK JR	30-JUN-2012	AQUATIC PEST CONTROL-GENERAL	30-JUN-2012	AQUATIC ENVIRONMENT CONSULTANTS INC	P O BOX 307		SCOTLAND PA 17254
77525	C	STEPHEN D WEEKLY	30-JUN-2012	AQUATIC PEST CONTROL-GENERAL	30-JUN-2016	AQUATIC RESOURCE MANAGEMENT INC	P O BOX 8426		VIRGINIA BEACH VA 23450-8245
42448	C	DAVID REESE SCHOONOVER	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	AQUMIX INC	218 SIMMONS DRIVE		CLOVERDALE VA 24077
91333	C	WILLIAM C DAVIS	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	ARBORSCAPES LLC	P O BOX 35284		RICHMOND VA 23235
57179	C	RICHARD F CARPENTER	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	ARBORTECH TREE SPECIALISTS	P O BOX 413		NOKESVILLE VA 20182
84370	G	ELI S COLON	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	ARLINGTON COUNTY ENV HEALTH BUREAU	12582 GARRY GLEN DR		BRISTOW VA 20136
51665	G	KURT L LOUIS	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	ARLINGTON COUNTY PARKS	13117 MOSS RANCH LANE		FAIRFAX VA 22033

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110045	C	HORACE EDWARD ARNETTE	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	ARNETTE LANDSCAPES, INC.	168 QUAKER LANE		WINCHESTER VA 22603
25327	C	DAVID J LOPES	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	ASHE FACILITY SERVICES INC	7 SAMPSON PLACE		PORTSMOUTH VA 23702
35350	C	KEVIN M FITZGERALD	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	ASIAN PEST SERVICES LLC	8424 BLANKENSHIP STREET	APT 304	ALEXANDRIA VA 22309
45060	C	TIMOTHY A GARDNER	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	ASPLUNDH TREE EXPERT	HCR 61 BOX 182		CAPON BRIDGE WV 26711
32607	C	MARK L DODD	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	ASPLUNDH TREE EXPERT CO	2810 ROANOKE AVE		ROANOKE VA 24016
58502	C	THOMAS F MC DONNELL	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	ASPLUNDH TREE EXPERT COMPANY	2729 WINDING DALE DR		RICHMOND VA 23233
19212	C	CHARLES W HATTEN	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	ASPLUNDH TREE EXPERT-RAILROAD DIVISION	1355 GRANDVIEW GARDENS		KENOVA WV 25530
72637	C	JOEL P SENGER	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	AUGUSTA COOPERATIVE FARM BUREAU INC	1205 RICHMOND RD	SUITE B	STAUNTON VA 24401-5060
108243	C	LESLIE K TANKERSLEY	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	BALL SERVICE INC	P O BOX 1155		RAVEN VA 24639
25009	C	BARBARA A MOSELEY	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	BARBARA A MOSELEY	8333 SETTLE SCHOOL ROAD		RIXEYVILLE VA 22737
112762	C	JAMIE LEE GUY	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	BARNES EXTERMINATING COMPANY	1603 ORLANDO		JOHNSON CITY VA 37601
92353	C	KENT D BARTON	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2011	BARTON'S PLANT HEALTH CARE	2609 ARRINGTON ROAD		ARRINGTON VA 22922

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68213	C	GREGORY M THOMPSON	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	BASNIGHT LAND & LAWN INC	225 SIGN PINE RD		CHESAPEAKE VA 23322
94513	C	ROBERT F BREDIMUS	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	BAYMARK CONSTRUCTION CORP	8386 SEASIDE RD		MARIONVILLE VA 23408
82384	G	SHELDON P CASH	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	BEDFORD CO DEPT OF SOLID WASTE	1244 POWELL LANE		BEDFORD VA 24523
98309	G	MICHAEL A WITT	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	BEDFORD COUNTY PUBLIC SERVICE AUTHORITY	5390 ROCK CLIFF ROAD		BEDFORD VA 24523
85046	G	BEATE A JENSEN	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	BELMONT GARI MELCHERS ESTATE & MEM GDNS	224 WASHINGTON STREET		FREDERICKSBURG VA 22405
89128	N	WILLIAM J KEENE	30-JUN-2012	AQUATIC PEST CONTROL-GENERAL	30-JUN-2012	BLACKSBURG COUNTRY CLUB	1064 CLUBHOUSE RD		BLACKSBURG VA 24060
36450	C	BERN M BONIFANT	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	BLUE HERON SERVICES	19898 ALEXANDRA'S GROVE DR		ASHBURN VA 20147
113761	C	CALEB A WEIRICH	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	BLUE RIDGE LAWN CARE	1378 GOOD HOPE CHURCH ROAD		ARODA VA 22709
101118	N	VINCE F DI STEFANO	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2011	BLUE RIDGE SHADOWS GOLF COURSE	195 HOSPITALITY DRIVE		FRONT ROYAL VA 22630
65561	N	NATHAN W SHIFFLETT	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2013	BOARS HEAD INN	P O BOX 5307		CHARLOTTESVILLE VA 22905
100510	C	BRIAN T BANKS	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	BRIAN T BANKS	1673 JEB STUART HIGHWAY		MEADOWS OF DAN VA 24120-4117

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111513	G	KEVIN D ALLISON	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	BRISTOL VIRGINIA UTILITIES	208 SPRINGVIEW DR		GRAY TN 37615
44031	C	CHARLES EVANS BROOKS JR	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	BROOKS LAWN MAINTENANCE AND LANDSCAPE	4141 DAM NECK RD		VIRGINIA BEACH VA 23456
100862	C	JOHN D FITZGERALD	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	BRYANS COMPLETE LAWN SERVICE (BCLS)	6098 GREEN HAVEN DRIVE		MECHANICSVILLE VA 23111
27450	N	JOHN W BRYANT JR	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	BRYANT FARM	31503 PETERSBURG ROAD		WAVERLY VA 23890
87119	G	RAYMOND B ALLEN	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2011	BUCKINGHAM COUNTY WATER SYSTEM	21203 NORTH JAMES MADISON HWY		DILLWYN VA 23936
80478	C	KEVIN B MEIER	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	BUDGET LAWN CARE INC	4208 RIVERDALE AVE		GLEN ALLEN VA 23060
100787	C	JAMES W MILLS JR	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2015	BUG OUT EXTERMINATING CO	P O BOX 234		QUINTON VA 23141
48071	N	RONALD R JUDGE	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2014	BUSCH ENTERTAINMENT CORP	1 BUSCH GARDENS BLVD		WILLIAMSBURG VA 23185
82490	C	CHRISTOPHER E ALLEY	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2013	C E ALLEY	8140 PIPER DR		WEST POINT VA 23181
12865	G	GAYRE BENNETT KELLEY	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	CAMPBELL COUNTY PUBLIC SCHOOLS	P O BOX 99	684 VILLAGE HWY	RUSTBURG VA 24588
85947	G	FRANK LEO DAVIS JR	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	CAMPBELL COUNTY UTILITIES	1885 BROOKNEAL HIGHWAY		RUSTBURG VA 24588

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56701	G	DAVID THOMAS UNDERWOOD	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	CAPITAL REGION AIRPORT COMMISSION	1 RICHARD E BYRD TERMINAL DRIVE		RICHMOND VA 23250
43294	N	TIMOTHY JOHN SCOTT	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	CAPTAINS COVE GOLF & YACHT CLUB INC	37473 CASTAWAY DR		GREENBACKVILLE VA 23356
22769	C	WALTER CARTER CRABBE	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	CAR-AN FLYING SERVICE	P O BOX 209		MELFA VA 23410
80107	C	JIMMY D MC KINNEY	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2011	CAROLINA SILVICS INC	908 INDIAN TRAIL RD		EDENTON NC 27932
55263	C	ANTHONY JAMES CLAUD	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	CARPE DIEM	1601 COUNTY STREET		PORTSMOUTH VA 23704
48790	C	DAVID JAMES CASTELVECCHI	30-JUN-2012	AQUATIC PEST CONTROL-GENERAL	30-JUN-2012	CASTELVECCHI LAWN CARE	5407 BEAVER SPRINGS RD		MIDLOTHAIN VA 23112
35610	N	RONALD L PONTON	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	CENTRAL VA ELECTRIC COOP	195 MOUNTAIN BREEZE DR		LOVINGSTON VA 22949
24177	C	DONALD BENNETT WEAVER	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	CERTIFIED PEST CONTROL	P O BOX 338		HALIFAX VA 24558
107299	C	LAWRENCE A OTT	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2013	CHAPEL VALLEY LANDSCAPE COMPANY	3824 JIM SMITH LANE		NEW WINDSOR MD 21776
97591	G	LARRY L SHERRILL	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	CHARLOTTE COUNTY PUBLIC SCHOOLS	204 JACKSON STREET		DRAKES BRANCH VA 23937
79777	G	DOUGLAS L BRADY	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	CHESAPEAKE BAY BRIDGE & TUNNEL	6156 NARROW CHANNEL DR		CAPE CHARLES VA 23310

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30579	G	JAMES EDWARD JONES	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	CHESAPEAKE CITY PARKS & REC	112 MANN DRIVE		CHESAPEAKE VA 23322-5214
96526	N	WILLIAM N EDWARDS	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	CHESAPEAKE ENERGY	302 BERTS LANE		HAYSI VA 24256
33676	G	ROBERT L SMITH	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	CHESAPEAKE HEALTH DEPARTMENT	P O BOX 15905		CHESAPEAKE VA 23328
79394	C	JOSEPH I ARIAS	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	CHESAPEAKE LAWNSCAPES INC	2324 ST BRIDES RD W		CHESAPEAKE VA 23322
23892	G	LEROY J BOHN	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2014	CHESAPEAKE MOSQUITO CONTROL	900 HOLLOWELL LANE		CHESAPEAKE VA 23320
81548	G	CHRISTOPHER L AMERSON	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	CHESAPEAKE PARKS DEPARTMENT	925 EXECUTIVE BLVD		CHESAPEAKE VA 23325
98393	C	AUSTIN E JAMISON	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2011	CHESAPEAKE WILDLIFE HERITAGE	5497 WYANT LN		CHARLOTTESVILLE VA 22903-7324
30715	G	BERNICE V STANLEY	30-JUN-2012	AQUATIC PEST CONTROL-GENERAL	30-JUN-2014	CHESTERFIELD CO PKS & RECREATION	19900 TEMPLETON RD		CARSON VA 23830
80459	G	HEATHER NOEL BARRAR	30-JUN-2011	FOREST PEST CONTROL	30-JUN-2013	CHESTERFIELD CO PLANNING DEPARTMENT	825 WATCH HILL ROAD		MIDLOTHIAN VA 23114
32601	G	JOHN R ARMISTEAD	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	CHESTERFIELD CO SCHOOLS	6300 BEAVER LN		AMELIA VA 23002
112328	G	JAMES S BOOKWALTER	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2011	CHESTERFIELD COUNTY	13400 HULL STREET ROAD		MIDLOTHIAN VA 23112

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108901	N	SHANE W SMITH	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	CHINCOTEAGUE BAY TRAILS END ASSOCIATION	8333 TAN HOUSE ROAD		SNOW HILL MD 21863
101674	C	CHRISTOPHER MICHAEL SCOTT	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	CHRISTOPHER MICHAEL SCOTT	P O BOX 33		LOCUSTVILLE VA 23404
35606	G	MARLA N LATIMER	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	CHRISTOPHER NEWPORT UNIVERSITY-GROUNDS DEPT	GROUNDS DEPT	1 UNIVERSITY PLACE	NEWPORT NEWS VA 23606
50231	G	JERRY C DIERUF	30-JUN-2012	FOREST PEST CONTROL	30-JUN-2014	CITY OF ALEXANDRIA	1108 JEFFERSON ST		ALEXANDRIA VA 22314
56162	G	JAMES MICHAEL COLEMAN	30-JUN-2012	AQUATIC PEST CONTROL-GENERAL	30-JUN-2012	CITY OF BEDFORD	1526 TURKEY MTN ROAD		BEDFORD VA 24523
104904	G	MICHAEL G COSBY	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	CITY OF BUENA VISTA	P O BOX 109		BUENA VISTA VA 24416
43164	G	BRUCE MERCER JR	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	CITY OF CHESAPEAKE	2201 POCATY RD		CHESAPEAKE VA 23322
30594	G	VIRGINIA D LANDERS	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	CITY OF CHESAPEAKE PUBLIC WORKS	2224 KINGS HIGHWAY		SUFFOLK VA 23435
55766	G	LINWOOD E POPE	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2014	CITY OF EMPORIA	201 S MAIN STREET		EMPORIA VA 23847
103110	G	KYLE O BOWERS	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	CITY OF GALAX	1283 HAPPY HOLLOW RD		GALAX VA 24333
34647	G	WILLIAM L KNOX	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2014	CITY OF HAMPTON	419 N ARMISTEAD AVENUE		HAMPTON VA 23669

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45919	G	MARY ELIZABETH HAINES	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	CITY OF HAMPTON PARKS & RECREATION	130 PIEDMONT AVE		HAMPTON VA 23661
70505	G	JULIE THOMPSON FANSLER	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	CITY OF HARRISONBURG	320 E MOSBY RD		HARRISONBURG VA 22815
81223	G	MICHELE A CORNEAU	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	CITY OF HOPEWELL	300 N MAIN ST		HOPEWELL VA 23860
79235	G	JENNINGS H WINSTON	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	CITY OF LEXINGTON PUBLIC WORKS DEPT	505 LONGHOLLOW ROAD		BUENA VISTA VA 24416
47746	G	ROBERT JEROME WHITMORE	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	CITY OF LYNCHBURG	800 ORCHARD ST		LYNCHBURG VA 24501
57887	G	STEVEN H SEEBA	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	CITY OF MANASSAS	4328 S STARCREST DR		WARRENTON VA 20185
82225	G	RANDY DAVID GREGORY	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2015	CITY OF MARTINSVILLE	P O BOX 3172		MARTINSVILLE VA 24112
66874	G	BRIAN F KETCHUM	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	CITY OF NEWPORT NEWS	511 OYSTER POINT RD		NEWPORT NEWS VA 23602-6919
99606	G	LARRY C KIMMONS	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2013	CITY OF NEWPORT NEWS PUBLIC WORKS	112 ASPENWOOD DR		HAMPTON VA 23666
87474	G	JOHN R TUBERSON	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	CITY OF NORFOLK	2205 MCKANN AVE		NORFOLK VA 23509
84293	G	WILLIAM A BRANCH	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2011	CITY OF NORFOLK-PARKS & FORESTRY	6040 WATERWORKS ROAD		NORFOLK VA 23502

CERT NO [1]	CLASS [2]	APPLICATOR NAME	EXPIRATION DATE	CATEGORY	RECERTIFICATION BEFORE	BUSINESS NAME	ADDRESS 1	ADDRESS 2	CITY STATE ZIP
26802	G	JERRY CAGLE	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2014	CITY OF POQUOSON PUBLIC WORKS	10 HOLLY STREET		POQUOSON VA 23662
71299	G	GEORGE M WOJCIK	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	CITY OF PORTSMOUTH PUBLIC UTILITIES	2001 FREDERICK BLVD		PORTSMOUTH VA 23704
107099	G	TERRI LEE O BRIEN	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	CITY OF RADFORD	6777 FALLING BRANCH RD		RADFORD VA 24141
52999	G	JOHN ARTHUR HAY	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	CITY OF RICHMOND	2920 STRATFORD ROAD		RICHMOND VA 23225
85593	G	GREGORY T SINK	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	CITY OF ROANOKE	1802 COURTLAND RD NE		ROANOKE VA 24012
55258	G	ELIZABETH C CARSON	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	CITY OF SALEM	1228 INDIANA STREET		SALEM VA 24153-0889
112810	G	STEVEN W DUNN	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2011	CITY OF SUFFOLK	2632 DESERT RD		SUFFOLK VA 23434-8968
108071	G	JAY P KISER	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2014	CITY OF SUFFOLK MOSQUITO CONTROL	866 CAROLINA ROAD		SUFFOLK VA 23434
82130	G	NORMAN A GREFE	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	CITY OF SUFFOLK PUBLIC WORKS	750 BALDWIN AVE	APT C5	NORFOLK VA 23517
76721	G	LORRAINE A E BROWN	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2013	CITY OF VA BEACH BLDG MAINTENANCE	2224 POPLAR POINT ROAD		VIRGINIA BEACH VA 23454
97861	G	SHANNON WRIGHT	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	CITY OF VA BEACH PARKS & REC/LANDSCAPE SRVS	4141 DAM NECK ROAD		VIRGINIA BEACH VA 23456

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7544	G	JOHN M POPE	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2014	CITY OF VA BEACH PUBLIC WORKS	848 ST JAMES DRIVE		VIRGINIA BEACH VA 23455
37557	G	JOHN E RUNBERG JR	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	CITY OF VA BEACH/LANDSCAPE SERVICES DIVISION	4141 DAM NECK RD		VIRGINIA BEACH VA 23456
69929	G	ROBERT J DE BELLIS	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2013	CITY OF WILLIAMSBURG	401 LAFAYETTE STREET		WILLIAMSBURG VA 23185
62495	C	EPHRAIM R SEIDMAN	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2011	CLARK	3220 PATTERSON AVENUE		RICHMOND VA 23221
85827	G	WILLIAM P WETHERALL JR	30-JUN-2012	FOREST PEST CONTROL	30-JUN-2012	CLARKE COUNTY	457 KENNEL ROAD		BOYCE VA 22620
70228	C	PATRICK P PATTERSON	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	CLARKE ENVIRONMENTAL MOSQUITO MANAGEMENT INC	7303 GATEWAY COURT		MANASSAS VA 20109
110962	C	DAVID W TURNER	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	CLASS A GROUNDS MANAGEMENT LLC	1500 NEW YORK AVE		GLEN ALLEN VA 23030
60855	C	THOMAS B COSTELLO	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	CLEGG'S TERMITE & PEST CONTROL INC	2401 REICHARD ST		DURHAM NC 27705
67936	C	JOSHUA M WEINSTEIN	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	CLIPPER'S INC	P O BOX 220833		CHANTILLY VA 20153
111591	C	JOHNNY MIDDLEBROOKS	30-JUN-2011	FOREST PEST CONTROL	30-JUN-2011	COASTAL AIR SERVICE, INC.	7424 COASTAL DR		PANAMA CITY FL 32404
89178	C	JOANNE D PRASSAS	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	COASTAL LAWN SERVICE INC	126 W SEMPLE RD		WILLIAMSBURG VA 23185

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92564	N	KELLY K KELLER	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	COLUMBIA GAS TRANSMISSION	431 MEADOW DR		EDINBURG VA 22824
89311	C	JOSEPH S DELIA	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	COMMERCIAL GROUNDS MAINTENANCE CO	1018 WEEPING WILLOW DRIVE		CHESAPEAKE VA 23322
65293	C	CHAD R COLEY	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	COMMONWEALTH ENVIRONMENTAL INC	1121 W HIGH STREET		SOUTH HILL VA 23970
88004	C	WILLIE W JENNINGS	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	COMMUNITY BUSINESS GROUP	4118 SUMMERS HILL LN		PRINCE GEORGE VA 23875
31234	N	CHARLES R HARMON	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	COMMUNITY ELECTRIC COOP	25465 OLD MILL ROAD		WINDSOR VA 23487
102090	C	TOM M WOODS	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	COMPLETE INDUSTRIES INC	P O BOX 1584		BOWIE MD 20717
51483	C	WILLIAM CHARLES D ASCOLI	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	COMPLETE LAWN SERVICE	124 OSAGE STREET		VIRGINIA BEACH VA 23462
51551	C	BRIAN PATRICK SIMMONS	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2015	CONNORS TERMITE & PEST CONTROL INC	P O BOX 1480		SPRINGFIELD VA 22151
35904	C	JEFFREY WAYNE BROWER	30-JUN-2011	FOREST PEST CONTROL	30-JUN-2013	CONSERVATION SERVICES INC	50 LODGE LANE	SUITE 114	VERONA VA 24482
103015	C	JEFFREY L THOMPSON	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	COOPER'S LAWN AERATION SERVICE LC	213 JERSEY AVE		VIRGINIA BEACH VA 23462-2509
59190	N	CHRISTIAN D SAIN	30-JUN-2012	AQUATIC PEST CONTROL-GENERAL	30-JUN-2012	COUNTRY CLUB OF VIRGINIA	6031 ST ANDRRES LANE		RICHMOND VA 23226
44997	C	SCOTT JAMES EVANS	30-JUN-2012	AQUATIC PEST CONTROL-GENERAL	30-JUN-2014	COUNTY FARM SERVICE INC	23445 CEDAR RIDGE ROAD		RAPIDAN VA 22733

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85907	G	LESLIE E REDD	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	COUNTY OF HALIFAX	15120 HALIFAX ROAD		JAVA VA 24565
67942	C	MATTHEW C W CRABBE	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2014	CRABBE AVIATION LLC	8271 ELIZABETH ANN DR		MECHANICSVILLE VA 23111
30195	C	EDWARD S SCHENK	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	CROP PRODUCTION SERVICES INC	7 ANSON ST		OCEAN ISLE BEACH NC 28469
106862	G	WILLIAM CARLTON BAUMAN	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	CUMBERLAND GAP NATIONAL HISTORIC PARK	106 4 1/2 STREET		WILLIAMSTOWN WV 26187
106826	C	DAVID M WHITE	30-JUN-2011	FOREST PEST CONTROL	30-JUN-2011	CUSTOM AIR, LLC	P O BOX 350		LOUISVILLE MS 39339
112235	C	ELBERT J CUTRIGHT JR	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	CUTRIGHT MOWING SERVICE	21101 OLD HICKORY RD		COURTLAND VA 23837
50397	C	LARRY E SHARPE	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	CWC ENTERPRISES INC	600 HUDGINS ROAD		FREDERICKSBURG VA 22408-4147
93077	G	ROBERT H DAUGHERTY	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	DANVILLE PUBLIC SCHOOLS	112 TALBOT DR		DANVILLE VA 24540
52483	G	KYLE E HARRIS	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	DANVILLE PUBLIC WORKS DEPT	998 SOUTH BOSTON RD		DANVILLE VA 24540
81946	G	ROBERT A CIRE JR	30-JUN-2012	FOREST PEST CONTROL	30-JUN-2012	DCR - DIVISION OF NATURAL HERITAGE	5162 VALLEYPOINTE PARKWAY		ROANOKE VA 24019
49907	C	JOHN G RHOADES	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	DEANGELO BROTHERS INC	100 N CONAHAN DR		HAZLETON PA 18201
89989	G	ERIK S MOLLEEN	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	DEPT OF CONSERVATION & RECREATION	2500 SHORE DRIVE		VIRGINIA BEACH VA 23451
64959	G	ROBERT F HATCHER	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	DEPT OF MILITARY AFFAIRS	5415 ANDERSON HIGHWAY		POWHATAN VA 23139

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59513	G	MARILYN C AILES	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	DEPT OF NAVY	31050 LIBERTY COURT		HALLWOOD VA 23359
30283	G	DENNIS L ROLLINS	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	DEPT OF VETERAN AFFAIRS MEDICAL CTR	315 DOROTHY DRIVE		YORKTOWN VA 23692
85759	C	JOSEPH A DICKENS JR	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	DICKENS CONSTRUCTION	465 RURITAN DRIVE		EMPORIA VA 23847
115689	C	KAREN M WEST	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	DIVERSIFIED SERVICE CONTRACTING INC	P O BOX 8127	SW	WASHINGTON DC 20032
35856	C	JAMES M MITCHELL	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	DODSON BROS EXTERMINATING COMPANY INC	P O BOX 10249		LYNCHBURG VA 24506
105388	N	RAYMOND T NASH	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2013	DOMINION VALLEY COUNTRY CLUB	15551 DOMINION VALLEY DR		HAYMARKET VA 20169
44887	N	DONALD WAYNE HOOVER	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	DOMINION VIRGINIA POWER	13502 RAFTERSRIDGE CT		MIDLOTHIAN VA 23113
111442	C	GEOFFREY P ELLISON	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	DRENNEN FORESTRY SERVICES INC	801 5TH AVE		CULLMAN AL 35055
93689	C	DAVID S CUTLIP	30-JUN-2012	AQUATIC PEST CONTROL-GENERAL	30-JUN-2014	DSC AQUATIC SOLUTIONS INC	7900 BROMPTON STREET		SPRINGFIELD VA 22152
56815	C	DALE IVEN BOWMAN	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	DUGWELL PEST CONTROL LLC	257 MIRACLE ROAD		ROCKY MOUNT VA 24151
90293	C	JOHN C CALHOON	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	DYNAMIC AVIATION	P O BOX 7		BRIDGEWATER VA 22812

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11023	C	JOHN WILLIAM CONQUEST JR	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	E S ACTION	P O BOX 11		WALLOPS ISLAND VA 23337
57864	C	EARL D SAYERS JR	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	EARL D SAYERS JR	101 HILLCREST DR		BLUEFIELD VA 24605
56829	C	KENT J NIESE	30-JUN-2012	FOREST PEST CONTROL	30-JUN-2014	EARLS SPRAY SERVICE INC	3791 ROAD 12		LEIPSIC OH 45856
46521	C	ROBERT ERWIN EAST JR	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	EAST AGRA INC	P O BOX 674		STUARTS DRAFT VA 24477
74868	N	JASON S FLOWERS	30-JUN-2012	AQUATIC PEST CONTROL-GENERAL	30-JUN-2012	EAST COAST ATHLETICS LLC	6800 MILL TRAIL RD		CHARLES CITY VA 23030
114007	C	ART NAVEIRA	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	EAST COAST RIGHT OF WAY MAINTENANCE INC	P O BOX 670		ANDREWS NC 28901
114871	G	KURT M VOLLMER	30-JUN-2012	AQUATIC PEST CONTROL-GENERAL	30-JUN-2012	EASTERN SHORE AG RESEARCH & EXT CTR	3346 RESEARCH DR		PAINTER VA 23420
95214	C	BENJAMIN A LEWIS	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	EASTERN SHORE LANDSCAPE MANAGEMENT INC	P O BOX 550		BELLE HAVEN VA 23306
2014	C	BRYAN K POWELL	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2013	EASTERN SHORE TERMITE CONTROL INC	P O BOX 330		MELFA VA 23410
78226	C	JOHN L TUTTLE	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	EASTERN TREE COMPANY INC	2891 JUDES FERRY RD		POWHATAN VA 23139

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100200	C	WESLEY H BELL	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	EASTERN VIRGINIA TURF MANAGEMENT	P O BOX 2133		SPOTSYLVANIA VA 22553
91959	C	ANDREW M DOWNEY	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	ECOLAB PEST ELIMINATION	208 OLD SHORE ROAD		BLACKSTONE VA 23824
111367	C	DEREK BENNETT	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	ECOLOGICAL RESTORATION & MANAGEMENT INC	9475 DEERECO RD	SUITE 406	TIMONIUM MD 21093
109187	C	JASON P DYMCZYNSKI	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	ECOTEK PEST DEFENSE LLC	316 SINGLETON CIRCLE		WARRENTON VA 20186
112214	C	ZACKARY S MURRAY	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	EDKO LLC	P O BOX 13131		MONROE LA 71213
109941	C	MARY ELLEN BUNKER	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	ELITE ENVIRONMENTAL	61 CHURCH RD		ARNOLD MD 21012
103600	C	JOSEPH M SECOGES	30-JUN-2012	FOREST PEST CONTROL	30-JUN-2012	ELLETT VALLEY FOREST MANAGEMENT LLC	701 ELLETT RD		BLACKSBURG VA 24060
115256	C	JOSHUA L ELLIS	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	ELLIS OUTFITTING LLC	1824 SUGAR RIDGE RD		SPRING HILL TN 37174-9528
71690	C	MONTE R ELSWICK	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	ELSWICK & ELSWICK INC	885 MARLBORO RD		LOTHIAN MD 20711
54319	C	CARL ANTHONY ENNIS	30-JUN-2012	AQUATIC PEST CONTROL-GENERAL	30-JUN-2012	EMCOR GOVERNMENT SERVICES	P O BOX 6653		YORKTOWN VA 23690
69941	C	VERONICA G MC CLINTOCK	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	EMERALD FOREST INCORPORATED	4651 BACKWOODS ROAD		CHESAPEAKE VA 23322
33194	C	KEVIN F DELANEY	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	ENVIROCO SERVICES INC	2104 PRINCESS ANNE CT		VIRGINIA BEACH VA 23457

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114899	N	DAVID L GODLEY	30-JUN-2012	AQUATIC PEST CONTROL-GENERAL	30-JUN-2012	ENVIRONMENTAL BANC & EXCHANGE LLC	909 CAPABILITY DR	SUITE 3100	RALEIGH NC 27606
82397	C	ERIC D GOODRICH	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2013	ENVIRONMENTAL QUALITY RESOURCES LLC	1405 BENSON CT	UNIT C	ARBUTUS MD 21227
79009	C	JONATHAN P STANTON	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2014	ENVIRONMENTAL TERMITE AND PEST CONTROL SERVICES LLC	27 N KING ST		LEESBURG VA 20176
71268	C	MICHAEL D WAYBRIGHT JR	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	ENVIRONMENTALLY SAFER PEST CONTROL	810 MASSANUTTEN AVE		LURAY VA 22835-1635
111831	C	TODD A FRITCHMAN	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2011	ENVIROTECH ENVIRONMENTAL CONSULTANTS INC	16394 SAMUEL PAYNTER BLVD	SUITE 203	MILTON DE 19968
35036	C	KENNETH L EPLING	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2014	EPLINGS TERMITE & PEST CONTROL INC	P O BOX 792		WHITE MARSH VA 23183
54624	C	JOSEPH WILLIAM RAMSEY	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2015	EXTERMINATING UNLIMITED INC	P O BOX 1565		MECHANICSVILLE VA 23116
110816	C	STEPHEN C GOIN	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2013	F A BARTLETT TREE EXPERT COMPANY	2810 ROANOKE AVE		ROANOKE VA 24015
79892	C	BENJAMIN ROSE	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2013	F A BARTLETT TREE EXPERT COMPANY INC	P O BOX 398		MARSHALL VA 20116
106274	C	STEPHEN G JORDAN	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	F A BARTLETT TREE EXPERTS CO	7823-LL LOISDALE ROAD		SPRINGFIELD VA 22150

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85544	G	JAMES M HALSTEAD	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2013	FAIRFAX CO DEPT OF HOUSING	9600 OX RD		LORTON VA 22079
81271	G	CHARLES G LAYTON	30-JUN-2011	FOREST PEST CONTROL	30-JUN-2013	FAIRFAX CO GYPSY MOTH	12055 GOVERNMENT CENTER PKWAY	SUITE 518	FAIRFAX VA 22035
50227	G	WAYNE LEON BRISSEY	30-JUN-2012	AQUATIC PEST CONTROL-GENERAL	30-JUN-2012	FAIRFAX CO PARK AUTHORITY	6707 DOANE AVENUE		SPRINGFIELD VA 22152
85542	G	ROBERT E BRUTSKI	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2013	FAIRFAX CO WATER AUTHORITY	135 SEQUESTER DRIVE		STAFFORD VA 22556
90790	G	HEATHER A FINCH	30-JUN-2011	FOREST PEST CONTROL	30-JUN-2013	FAIRFAX COUNTY DPWES	7263 BOTHA RD		BEALETON VA 22712
54204	G	FRANK TERREL FINCH	30-JUN-2012	FOREST PEST CONTROL	30-JUN-2014	FAIRFAX COUNTY GOVERNMENT	7263 BOTHA ROAD		BEALETON VA 22712
72326	G	PATRICIA A PETRO	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	FAIRFAX COUNTY HEALTH DEPARTMENT	10777 MAIN STREET	SUITE 102	FAIRFAX VA 22030
63464	N	FLOYD P WILSON III	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	FARMINGTON COUNTRY CLUB	1625 COUNTRY CLUB CIRCLE		CHARLOTTESVILLE VA 22901
23944	G	DONALD SCOTT BAGEANT	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	FED EMERGENCY MGMT AGENCY (FEMA)	517 GOLDS HILL RD		WINCHESTER VA 22603
112760	C	MARYLEE B TAFT	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	FIRE ANT CONTROL TEAM INC	1414 SALEM CHURCH RD		ELIZABETH CITY NC 27909
86032	C	HARRY E FLYTHE	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	FLYTHE LAND MAINTENANCE INC	4619 SHILOH ROAD		HAHIRA GA 31632-2300
90458	G	DOUGLAS E TRUMP	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	FRANKLIN CITY OF	1050 PRETLOW ST		FRANKLIN VA 23851

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87595	G	LAURA N SHIFFLETT	30-JUN-2012	FOREST PEST CONTROL	30-JUN-2014	FREDERICK CO GYPSY MOTH PROGRAM	1805 BACK MTN ROAD		WINCHESTER VA 22602
81585	N	ERNEST D STANLEY	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	FREDERICKSBURG COUNTRY CLUB	5540 FAIR OAK LANE		WOODFORD VA 22580
35357	C	RICHARD A LARIVIERE	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	GAL CONSTRUCTION COMPANY INC	P O BOX 171		LEBANON IN 46052
71407	C	PAUL J FISCHER	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	GLOBAL PEST SERVICES	820 GREENBRIER CIRCLE	SUITE 21	CHESAPEAKE VA 23320
73373	G	STEVEN R BARANSKI	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2015	GLOUCESTER COUNTY MOSQUITO CONTROL	P O BOX 329		GLOUCESTER VA 23061
112189	C	STEFANIE S GOODMAN	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	GOODMAN'S CONCRETE AND LANDSCAPING	132 GOODMAN LANE		GRETNA VA 24557
25154	N	ROBERT B BARKSDALE	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2015	GORDON TRENT GOLF COURSE	P O BOX 527		BLUE RIDGE VA 24064
103430	C	MARK H LLOYD	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	GRACE SERVICES INC	24 HAMILTON AVE		POLAND OH 44514
113830	C	SETH H BOWEN	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	GREEN ACRES LAWN & LANDSCAPING	2066 WILBOURNE ROAD		SKIPWITH VA 23968
45519	C	NICHOLAS J PETTI	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2014	GREEN BRANDS LLC	201 E POTOMAC ST		BRUNSWICK MD 21716
70861	C	JOHN B SNYDER	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	GREEN DAY LLC	14178 BURWELLS BAY ROAD		SMITHFIELD VA 23430
114285	C	STEVEN M HAWKINS	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	GREEN MEADOW OF WV, INC.	P O BOX 1362		CROSS LANES WV 25356

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95868	C	ANTHONY T QUIGG	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	GREEN SHOES LAWN CARE LLC	5341 CHALLEDON DR		VIRGINIA BEACH VA 23462
110632	N	LEONARD B PRITCHETT	30-JUN-2012	AQUATIC PEST CONTROL-GENERAL	30-JUN-2012	GREENBRIER COUNTRY CLUB	120 W FINNEY AVE	APT D	SUFFOLK VA 23434
111459	C	GEORGE M PIASECKI	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2015	GREENBRIER PLANT HEALTH CARE INC	1410 STONEHOUSE ROAD		CALDWELL WV 24925
76706	G	MARC TRAVIS ESTES	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	GREENE COUNTY	3236 SHELBY RD		MADISON VA 22727
7513	C	PAUL ROSS LILLARD	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	GREENERY SCENERY LANDSCAPES LLC	1317 MOZART DRIVE		VIRGINIA BEACH VA 23454
53633	C	THOMAS S HOPKINS	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	GREENLINK INCORPORATED	P O BOX 299		DAMASCUS MD 20872
71128	G	GLEN R GIBSON	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	GREENSVILLE CO WATER & SEWER AUTHORITY	312 WEST YORK DRIVE		EMPORIA VA 23847
98782	C	CHARLES G LEWIS	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	GREENWOOD HELICOPTERS INC	P O BOX 280		WASHINGTON NC 27889
112113	C	ROBERT M DYSON	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	GREGORY TERMITE & PEST CONTROL INC	49 ORCHARD PARK DR	APT 125	GREENVILLE SC 29615
82911	C	DANIEL HAMMOND	30-JUN-2011	FOREST PEST CONTROL	30-JUN-2013	H & H FOREST MANAGEMENT INC	828 N MECKLENBURG AVE		SOUTH HILL VA 23970
111850	C	JETSON D TAYLOR	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	H D MACHINES LLC	127 RUSSELL DR		MERIDIAN MS 39303
88742	C	HENRY C HADDOCK	30-JUN-2012	AQUATIC PEST CONTROL-GENERAL	30-JUN-2012	HADDOCK FLYING SERVICE INC	1111 GOURDIN RD		SALTERS SC 29590

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65809	G	LARRY D ROLLER	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	HALIFAX CO PUBLIC SCHOOLS	6183 JAMES D HAGOOD HWY		SCOTTSBURG VA 24589
3884	G	HAROLD SAMUEL REED	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2011	HAMPTON PARKS & REC DEPT	22 LINCOLN STREET		HAMPTON VA 23669
23601	G	JACK M ELBERFELD	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2016	HAMPTON PUBLIC WORKS	464 BEAUMONT ST		HAMPTON VA 23669
56180	C	MICHAEL D ROWLAND	30-JUN-2011	FOREST PEST CONTROL	30-JUN-2013	HANCOCK FOREST MANAGEMENT	2486 CRITTENDEN MILL RD		TAPPAHANNOCK VA 22560
665	C	GLENN A MARTIN	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2014	HELICOPTER APPLICATORS INC	1670 YORK ROAD		GETTYSBURG PA 17325
32103	C	JAMES L MURPHY	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	HELICOPTER MINIT-MEN INC	P O BOX 21758		COLUMBUS OH 43221-0758
103512	C	STEPHEN D BUTTS	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	HENDRIX AND DAIL INC	P O BOX 648		GREENVILLE NC 27835
29506	G	DAVID RALPH PITTS JR	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2014	HENRICO CO PUBLIC SCHOOLS	5409 JEFFERSON DR		QUINTON VA 23141
74729	G	RANDY B BUCHANAN	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2015	HENRICO CO PUBLIC WORKS	7546 LAKESHORE PLACE		QUINTON VA 23141
95775	G	MICHAEL E WARD	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	HENRY COUNTY PUBLIC SERVICE AUTHORITY	P O BOX 7		COLLINSVILLE VA 24078
79508	C	TIMOTHY J HERETICK	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	HERETICK FEED & SEED CO INC	6071 MILL CREEK ROAD		PRINCE GEORGE VA 23875
103919	C	NATHAN J KUHN	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2011	HGS LLC	106 N THOMPSON STREET		RICHMOND VA 23225

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100512	C	DAVID B MEANS	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	HGS LLC DBA ANGLER ENVIRONMENTAL	210 W 1ST STREET		FRONT ROYAL VA 22630
108911	C	AVERY D HILLIARD	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	HICO SERVICES INC	P O BOX 184		DOSWELL VA 23047
86201	C	LAURA ANNE FISHER	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	HOLLANDBOND INC	54 W 29TH ST		RICHMOND VA 23225
106467	C	MICHAEL JACOBS	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2015	HOME PARAMOUNT PEST CONTROL COMPANIES #202	P O BOX 850		FOREST HILL MD 21050
51308	C	ERIC A HUFF	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2014	HOME PARAMOUNT PEST CONTROL COMPANY #201	P.O. BOX 850	ATTN: JUDY WHIPP	FOREST HILL MD 21050
69272	C	DAVID H GAYLOR	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2015	HOME PARAMOUNT PEST CONTROL COMPANY #203	P O BOX 850		FOREST HILL MD 21050-0850
68199	C	CHARLES EDDIE PRESGRAVES	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2014	HOME PARAMOUNT PEST CONTROL COMPANY #204	P O BOX 850		FOREST HILL MD 20150
57039	C	CHARLES ANTHONY TAYLOR SR	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2014	HOME PARAMOUNT PEST CONTROL COMPANY #205	P O BOX 850		FOREST HILL MD 21050
72698	C	DENNIS R LUCK JR	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2015	HOME PARAMOUNT PEST CONTROL COMPANY #206	P O BOX 850		FOREST HILL MD 21050
88828	C	MICHAEL R WEISS	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2014	HOME PARAMOUNT PEST CONTROL COMPANY #209	P O BOX 850		FOREST HILL MD 21050
73472	C	GARLAND WAYNE WALLACE	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2014	HOME PARAMOUNT PEST CONTROL COMPANY #233	P O BOX 850		FOREST HILL MD 21050

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92635	C	SEAN P ALSIP	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2015	HOME PARAMOUNT PEST CONTROL COMPANY #236	P O BOX 850		FOREST HILL MD 21050
105743	C	GREGORY ROBERT NYGREN	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	HOMESHIELD PEST CONTROL LLC	1716 SOUTHPARK CT	SUITE E	CHESAPEAKE VA 23320
101186	G	MELANIE A FRISCH	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	IMCOM DIRECTORATES OF PUBLIC WORKS	9430 JACKSON LOOP		FORT BELVOIR VA 22060
81586	C	JOHN P CONLEY	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	INDUSTRIAL HELICOPTERS INC	P O BOX 61906		LAFAYETTE LA 70596-1906
44278	C	JOHN FRANCIS KOIS	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	INFRASTRUCTURE CORP OF AMERICA INC (ICA)	12008 SYCAMORE SHOAL DR		BUMPASS VA 23024
44410	C	ADAM THOMAS ZIEGER	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	INSECT GUARD OF VIRGINIA, INC.	P O BOX 570		EASTVILLE VA 23347
90579	C	STEVEN T MANNING	30-JUN-2012	FOREST PEST CONTROL	30-JUN-2012	INVASIVE PLANT CONTROL INC	P O BOX 50556		NASHVILLE TN 37205
66705	C	ALAN R IRBY	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	IRBY'S PROPERTY MAINTENANCE INC	6121 JAMES D HAGOOD HWY		SCOTTSBURG VA 24589
92057	C	SCOTT D UNGER	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2015	J C EHRLICH CO INC	214 N WAVERLY ST		SHILLINGTON PA 19607
90543	C	DAVID H MC MULLAN	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	J C EHRLICH COMPANY INC	12924 INDEPENDENCE ROAD		CLEAR SPRING MD 21722
50137	C	JOHN HERSHEL CARTER	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	J H CARTER INC	8710 HICKORY ROAD		PETERSBURG VA 23803
37155	C	JACK B ROBINSON	30-JUN-2012	FOREST PEST CONTROL	30-JUN-2014	JACK B ROBINSON INC	P O BOX 1558		LANCASTER SC 29721

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111705	C	CLINT W BRYANT	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2011	JAMES C JUSTICE COMPANIES	P O BOX 7		TURBEVILLE SC 29162
37650	G	WILLIAM R HALL	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2014	JAMES CITY CTY MOSQUITO CN	2829 STARLING DRIVE		WILLIAMSBURG VA 23185
112062	C	JAMES DAVID MC CULLY	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2011	JAMES MCCULLY JR	879 GULF COURSE RD		LITTLETON NC 27850
61063	C	ROBERT T STEELEY	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	JAMES RIVER GROUNDS MANAGEMENT INC	11008 WASHINGTON HWY		GLEN ALLEN VA 23059-1904
46984	C	JAMES S WEBER	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	JAMES WEBER LANDSCAPING LLC	214 HAMPTON DR		SPOTSYLVANIA VA 22551
53428	C	JOHN M MUDRE	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2011	JMM ENVIRONMENTAL SERVICES	13231 STABLE BROOK WAY		HERNDON VA 20171
84952	C	GARY R MAUL	30-JUN-2012	AQUATIC PEST CONTROL-GENERAL	30-JUN-2012	JOHN DEERE LANDSCAPES #788 NEWPORT NEWS VA	701 C FLAGSTONE WAY		NEWPORT NEWS VA 23608
23252	C	JOHN L EDWARDS	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	JOHN EDWARDS PEST AND LAWN CONTROL INC	2505 TARKINGTON COURT		CHESAPEAKE VA 23322
5436	C	DENNIS WAYNE OVERBY	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	JUSTINS LAWN SERVICE LLC	30223 VICKS MILLPOND ROAD		BRANCHVILLE VA 23828
108982	C	RICHARD KARG	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	K & D ROUND'S LANDSCAPE SERVICES INC	3478 WESTMINSTER AVE		NORFOLK VA 23504-4619

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33550	C	KEVIN J KORDEK	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	K E B ENTERPRISES INC	P O BOX 9194		VIRGINIA BEACH VA 23450-9194
33316	C	CARL L CALFO	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	K W REESE INC	6502 MORNINGSIDE COURT		MIDDLETOWN MD 21769
97885	N	CHARLES R BRICE	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	KELLOGG BROWN AND ROOT	2605 CREEKWOOD DRIVE		SALEM VA 24153-8128
64279	C	BRETT A HORNER	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	KINETIC RESOURCES, LLC	518 PLEASANTS DR		FREDERICKSBURG VA 22407-1439
110822	G	WILLIAM D O CONNOR	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	KING GEORGE COUNTY	10459 COURTHOUSE DRIVE		KING GEORGE VA 22485
108507	N	CHAD D COMPTON	30-JUN-2012	AQUATIC PEST CONTROL-GENERAL	30-JUN-2012	KINGSMILL RESORT	1010 KINGSMILL RD		WILLIAMSBURG VA 23185
59450	C	CLYDE G LYNN	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2015	KLEEN LINE LTD	P O BOX 1148		GRIFTON NC 28530
51788	C	EUGENE KRITTER	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	KRITTER CROP DUSTING INC	20634 MOUNT PONY ROAD		CULPEPER VA 22701
104634	C	SEAN L HALL	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	KUMIS LANDSCAPING	1876 MOUNTAINWOOD DR		SALEM VA 24153
95663	C	QUINTIN L LUCAS	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	L & L LANDSCAPING INC	11395 MOUNT HOPE CHURCH RD		DOSWELL VA 23047

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30920	C	JOHN MICHAEL HENRIETTA	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	L DOUGLAS BIRCKHEAD	103 SUMMIT STREET		CHARLOTTESVILLE VA 22903
111782	C	BETH A KELLEY	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	LACY ENTERPRISES LLC	1085 RIVER BEND DRIVE		BUMPASS VA 23024
100080	N	JASON S PAKKALA	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2011	LAKE MANASSAS LLC	15141 QUAIL RIDGE DR		AMISSVILLE VA 20106
82017	N	RODERICK A AHLFIELD	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	LAKE OF THE WOODS ASSOCIATION	P O BOX 5		BURR HILL VA 22433
82524	C	THOMAS W FISCHER	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	LAKELAND CEMETERY SERVICES INC	852 FREEWAY ROAD		MANITOWOC WI 54220
112239	C	JAMES R CARR	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	LANDWORKS UNLIMITED INC	216 ROBINSON WAY		WINDSOR VA 23487
76723	C	KENNETH R COMBS JR	30-JUN-2012	AQUATIC PEST CONTROL-GENERAL	30-JUN-2012	LASTING IMPRESSIONS LANDSCAPE CONTRACTORS INC	P O BOX 1581		BOWIE MD 20717
92735	C	WILLIAM M KEARNS	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	LAUREL RIDGE LAND CLEARING INC	158 HERMITAGE CIRCLE		LIGONIER PA 15658
88176	C	BRIAN D ULSH	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	LAWN BARBER CORPORATION, THE	1110 W PEMBROKE AVE	SUITE 4	HAMPTON VA 23661

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87600	C	ERIC S NEWPORT	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	LAWN DOCTOR OF STAFFORD-CULPEPER-GAINESVILLE-BRISTOW-HAYMARK	113 GREENFIELD ROAD		STAFFORD VA 22554
16656	C	WILBERT H LAWRENCE SR	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2015	LAWRENCE LANDSCAPING AND MAINTENANCE INC	2227 COUNTY STREET		PORTSMOUTH VA 23704-2913
51112	C	WARREN LEE BIRCKHEAD	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	LEE B ENTERPRISES INC	5405 BEARS LANE		WARRENTON VA 20187
115567	C	JOSEPH W PRITCHARD	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	LEVEL GREEN LANDSCAPE LLC	2071 SHIPLEY FARM RD		JESSUP MD 20794
32563	N	PEGGY L COMBS	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2013	LEWIS GINTER BOTANICAL GARDEN	9000 HORRIGAN CT	APT A	HENRICO VA 23294
53420	C	JAMES RICHARD RAMIREZ	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	LEWIS TREE SERVICE INC	160 CRESCENT LANE		CLARKSVILLE VA 23927
69124	C	GLENN S TILLEY	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	LONESOME PINE LANDSCAPING INC	905 HANBURY COURT		CHESAPEAKE VA 23322
14988	G	RICHARD ALLEN JONES	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	LYNCHBURG VDACS OFFICE	269 JAMESWOOD DR		FOREST VA 24551-2876
24453	C	MICHAEL LEE BRITTIN	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	M L B ENTERPRISES INC	28 LEWIS LOOP ROAD BLDG	BLDG 1286	HAMPTON VA 23681
112063	C	BENTON H HALL	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	MAINSCAPES INC	32 OLMSTEAD GREEN COURT		BALTIMORE MD 21210

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35436	G	CHARLES T ASHLIN	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	MARION CORR TREATMENT CTR	416 KIAWANA ROAD		ATKINS VA 24311
9191	C	DALE FRANCIS MARSH	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	MARSH ENTERPRISES	15774 CASHVILLE ROAD		ONANCOCK VA 23417
58860	C	MARSHALL R PURYEAR	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	MARSHALL PURYEAR	850 OVERBEY ROAD		NELSON VA 24580
68852	C	WARREN R MARTIN	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	MARTINS LAWN SERVICE	385 MARTINS LANE		PINEY RIVER VA 22964
80713	G	BOBBY D HERNDON	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	MARTINSVILLE CITY PUBLIC SCHOOLS	8876 CHATHAM RD		MARTINSVILLE VA 24112
81513	G	PAUL E NUWER	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2015	MARYLAND DEPT OF AGRIC	27722 NANTICOKE RD	UNIT 2	SALISBURY MD 21801
88590	C	MATTHEW D C STEELE	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	MATT STEELE LANDSCAPING	4141 DAM NECK RD		VIRGINIA BEACH VA 23456
29322	N	WILLIAM C PERKINS	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	MATTAPONI SPRINGS GOLF CLUB	6252 LAWYERS RD		SPOTSYLVANIA VA 22553
75021	C	JOHN C MATTHEWS	30-JUN-2011	FOREST PEST CONTROL	30-JUN-2011	MATTHEWS TIMBERLAND SERVICE INC	P O BOX 255	6173 RACE TRACK ROAD	CASTALIA NC 27816
88182	C	HILARY H JONES III	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2015	MAXIMUM ENVIRONMENTAL SERVICES	P O BOX 7622		NORFOLK VA 23509
87765	C	ROBERT A MEAD	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2015	MEAD TREE AND TURF CARE INC	3316 HIPSLEY MILL RD		WOODBINE MD 21797

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58782	N	DAVID TYLER BOWLER	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	MECKLENBURG ELECTRIC COOP	P O BOX 2451		CHASE CITY VA 23924
90906	C	THOMAS H SEARS	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2015	MERCIER'S INC	318 BALTIMORE ANNAPOLIS BLVD		SEVERNA PARK MD 21146
77486	G	JOSEPH S SHAW	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	METRO WASHINGTON AIRPORT AUTH	DULLES AIRPORT	44701 PROPELLER CT	DULLES VA 20166
29262	C	MICHAEL EDWARD WALLACE	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	MICHAEL E WALLACE	607 HILL BETT LN		AYLETT VA 23009-2426
98980	C	RICHARD JOSEPH FREEMAN	30-JUN-2011	FOREST PEST CONTROL	30-JUN-2011	MISTLETOE MEADOWS	583 BURNT HILL RD		LAUREL SPRINGS NC 28644
79351	G	KELLY D MARTIN	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	MONTGOMERY COUNTY PUBLIC SCHOOLS	301 GIVENS LN LOT 197		BLACKSBURG VA 24060
44313	C	JOHN A THOMPSON	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	MOORE HARVEY INC	P O BOX 4605		ROANOKE VA 24015
83841	C	ROBIN W MOORE	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	MOORE'S GROUNDS MAINTENANCE INC	234 MOUNTAIN RIDGE DR		APPOMATTOX VA 24522
115151	C	JOEY D OSBORNE	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	MOSQUITO AUTHORITY INC	342 6TH ST NW		HICKORY NC 28601
107389	C	DAMIEN R SANCHEZ	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	MOSQUITO MANAGEMENT LLC	12587 FAIR LAKES CR	NO 315	FAIRFAX VA 22033
108404	C	PATRICK R HARDERS	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	MOSQUITO SQUAD OF NORTHERN VIRGINIA, LLC	7933 REBEL WALK DR		MANASSAS VA 20109

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113812	C	ROBERT M STANTON	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	MOSQUITO SQUAD OF VIRGINIA BEACH	P O BOX 1332		VIRGINIA BEACH VA 23451
107611	C	RICHARD W CRAWFORD	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	MRC ENTERPRISES LLC	7408 MUIRFIELD ROAD		NORFOLK VA 23508
28713	G	WILLIAM LOPEZ	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	N N R H A MAINTENANCE DEPT	618 18TH STREET		NEWPORT NEWS VA 23607
32013	G	JOSEPH A RUEDI JR	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	NATIONAL PARK SERVICE	5953 PARTLOW ROAD		SPOTSYLVANIA VA 22553
109631	G	ANTHONY M HIZA	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	NATIONAL ZOOLOGICAL PARK	10303 GRANITE CREEK LANE		OAKTON VA 22124-2721
84401	C	BRYAN L LILLY	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	NATURAL ELEMENTS, LLC	20 FAMILY LANE		HUNTLY VA 22640
70435	C	CRAWFORD CRAIG	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	NATURCHEM INC	1029 BROMPTON LN		GREENVILLE NC 27834
106329	C	JEFF H MOONEYHAM	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	NATURCHEM WEST INC	3137 LAMURA LANE		SMYRNA TN 37167
110420	C	ROBERT L TURNER JR	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	NELSON TREE SERVICE INC	2395 DELSEA DRIVE		FRANKLINVILLE NJ 08322
113858	C	STEVEN D WARD	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	NEVETS DRAW LLC	7530 AIRPORT RD		QUINTON VA 23141
86147	G	JAMES H ELLIOTT	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	NEW RIVER TRAIL STATE PARK	1132 FOSTER FALLS RD		MAX MEADOWS VA 24360
88284	G	CONNIE M HARTSFIELD	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2015	NEWPORT NEWS CITY PUBLIC WORKS	1001 CENTER AVENUE		NEWPORT NEWS VA 23605

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53832	G	MICHELLE DIANE FULLER	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	NORFOLK HEALTH DEPT VECTOR	6911 BONNOT DRIVE		NORFOLK VA 23513
26640	G	DONALD A VICK	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	NORFOLK PARKS & FORESTRY	2839 DANA STREET		NORFOLK VA 23509
33640	G	AGNES M FLEMMING	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	NORFOLK PUBLIC HEALTH DEPT	830 SOUTHAMPTON AVE		NORFOLK VA 23510
96879	G	PENELOPE A SMELSER	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	NORFOLK VECTOR CONTROL	2800 TARRANT ST		NORFOLK VA 23509
115579	G	JUSTIN J NAWROCKI	30-JUN-2012	AQUATIC PEST CONTROL-GENERAL	30-JUN-2012	NORTH CAROLINA STATE UNIVERSITY	4401 WILLIAMS HALL	CAMPUS BOX 7620	RALEIGH NC 27695
83510	C	RONALD W BIVENS	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2015	NORTHEAST SERVICE CORP	18543 COOKS ROAD	P O BOX 216	CASSVILLE PA 16623
46322	N	MICHAEL S FINERFROCK	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	NORTHERN NECK ELECTRIC COOP	P O BOX 288		WARSAW VA 22572
83899	G	BRANDON W DILLISTIN	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	NORTHERN NECK SWCD	1809 SLABTOWN RD		LANCASTER VA 22503
104507	G	RICHARD S BAILEY	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	NORTHERN VA REGIONAL PARK AUTHORITY	5091 S 7TH RD NO 202		ARLINGTON VA 22204
3723	G	DANIEL WINGO WEBSTER	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	NOTTOWAY CORRECTIONAL CNTR	3574 WEST CREEK RD		CREWE VA 23930
109508	C	MICHAEL D JENNINGS	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	NOXIOUS VEGETATION CONTROL INC	3136 TRABUE ROAD		COLUMBUS OH 43204

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91739	C	NATHANIEL ROOTS	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	N-V-1 LAWNCARE & PEST CONTROL	6449 DABNEYS MILL RD		MANQUIN VA 23106
107463	C	NATE P BELLOTTI	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	ON POINT PEST DEFENSE LLC	6070 DEER HILL COURT		CENTREVILLE VA 20121-3045
25861	C	JOHN M CURRY	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2014	ORKIN EXTERMINATING CO INC	14456 SILVERDALE DR		WOODBRIDGE VA 22193
46753	C	OVERTON NICHOLS JR	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	ORKIN EXTERMINATING CO INC BR 453	5741 BAYSIDE ROAD	NO 106	VIRGINIA BEACH VA 23455
58359	C	STEVEN DECKER VAUGHAN	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2014	ORKIN EXTERMINATING CO INC-BR 454	10101 LEADBETTER PLACE		ASHLAND VA 23112
68187	C	ERIC R JEWELL	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2014	ORKIN EXTERMINATING CO INC-BR 456	291 INDUSTRIAL DRIVE		ROANOKE VA 24019
38076	C	MICHAEL S MAC VEY	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	ORKIN EXTERMINATING CO INC-BR 457	1533 TECHNOLOGY DRIVE	SUITE 102	CHESAPEAKE VA 23320
37569	C	KEVIN A CONNOR	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2013	ORKIN PEST CONTROL	12616 LAKE RIDGE DRIVE		WOODBRIDGE VA 22192
63451	C	WALTER J O SHEA	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	O'SHEA'S PEST MANAGEMENT	1020 CAMINO REAL SOUTH		VIRGINIA BEACH VA 23456
48166	C	LEO PATRICK KRAFT	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	OSMOSE UTILITIES SERVICES, INC.	2112 BUTNER MILL ROAD		EAST BEND NC 27018
45541	C	GEORGE A DEAN	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	P C L C COMPANY L P	5828 WARD CT		VA BEACH VA 23455

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85054	C	JOHN W HOUCHINS	30-JUN-2011	FOREST PEST CONTROL	30-JUN-2011	PACIULLI, SIMMONS & ASSOCIATES, LTD	11212 WAPLES MILL ROAD	STE 100	FAIRFAX VA 22030
87750	G	RUTH (CHRIS) A ANDERSON	30-JUN-2011	FOREST PEST CONTROL	30-JUN-2015	PAGE COUNTY GYPSY MOTH OFFICE	101 S COURT ST	GYPSY MOTH OFFICE	LURAY VA 22835
113855	C	EUGENE M SAVILLE	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	PANHANDLE PEST MANAGEMENT LLC	16 HAINES COURT		MARTINSBURG WV 25404
46571	C	JERRY L SMITH	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	PENN LINE CORPORATION	300 SCOTTDALE AVE		SCOTTDALE PA 15683
87674	C	JOSEPH S TOMAJKO	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2015	PENN LINE SERVICE INC	P O BOX 462	300 SCOTTSDALE AVE	SCOTTSDALE PA 15683
100208	C	JOSE RENE RIVAS	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	PERSONAL TOUCH BY J R RIVAS INC	P O BOX 520		DEMOPOLIS AL 36732
101902	C	JEFFREY M VAN DIEPEN	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	PESTMASTER SERVICES INC	137 E SOUTH ST		BISHOP CA 93514
35185	C	MICHAEL B GREEN	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	PESTMASTERS INC	6525 DICKEN PLACE		RICHMOND VA 23230
47980	C	BRANDAN J PETTI	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2013	PETTI ENTERPRISES, LLC	4 WEEMS LANE	# 296	WINCHESTER VA 22601
33330	C	KENNY RAY MIDDLETON	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	PHILLIPS TREE EXPERTS INC	P O BOX 664		CORBIN KY 40702-0664
68317	C	WALTER CALLOY PITTMAN II	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2015	PITTMANS TREE & LANDSCAPING INC	P O BOX 531		FRONT ROYAL VA 22630
82101	G	RICHARD A LAWRENCE	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	PITTSYLVANIA COUNTY SCHOOLS	P O BOX 232		CHATHAM VA 24531

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101631	C	ROBERT A CERNUDA II	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	PLM LAKE AND LAND MANAGEMENT CORP.	P O BOX 890		GEORGETOWN SC 29442
79390	G	JOHN A HOPKINS	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	PORTSMOUTH NAVAL HOSPITAL	628 PARKER RD		CHESAPEAKE VA 23322
34194	G	MARGARET PITTENGER	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	PORTSMOUTH PARKS & RECREATION	801 CRAWFORD ST		PORTSMOUTH VA 23704
53994	G	DOROTHY MAE CARNEY	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2014	PORTSMOUTH PUBLIC WORKS	2001 FREDERICK BLVD		PORTSMOUTH VA 23701
113329	C	JARROD L REED	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	PREMIER LANDSCAPES, INC.	105 NILES WHEELOCK RD		JONESBOROUGH TN 37659
106638	G	RONALD GENE VAN EPS	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	PRINCE EDWARD COUNTY	P O BOX 382		FARMVILLE VA 23901
83597	G	KARRIE L COX	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	PRINCE WILLIAM CO GYPSY MOTH	620 KELLOGG MILL ROAD		FREDERICKSBURG VA 22406
23604	G	ROBERT L GLADDEN	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	PRINCE WILLIAM CO PUBLIC SCHOOLS	2143 YORK DRIVE		WOODBRIDGE VA 22191
55760	G	PATRICK W MC GUIRE	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	PRINCE WILLIAM CO PUBLIC WORKS	15 CLARA STREET		STAFFORD VA 22556
91363	G	JEFFREY W GALLAGHER	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2013	PRINCE WILLIAM COUNTY	4092 MERCHANT PLAZA SUITE A		WOODBRIDGE VA 22192
79041	G	JOHN D CHILDERS	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	PRINCE WILLIAM COUNTY PUBLIC SCHOOLS	5304 SAPHIRE COURT		WOODBRIDGE VA 22193

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62417	G	TAMMY K WYATT	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	PRINCE WILLIAM COUNTY PUBLIC WORKS	4092 MERCHANT PLAZA	SUITE A	WOODBRIDGE VA 22192
95946	G	IRIS N HERNANDEZ	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	PRINCE WILLIAM HEALTH DISTRICT	P O BOX 1185		MANASSAS VA 20108
56834	G	FLOYD LEWIS JONES JR	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2014	PRINCE WM CO GYPSY MOTH PROGRAM	32 HOLLY BROOKE COURT		STAFFORD VA 22554
86454	G	ELIZABETH D LINSTROM	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	PRINCE WM CO PUBLIC WORKS	3501 BEECHWOOD LANE		TRIANGLE VA 22172
103079	N	MATTHEW R BOYCE	30-JUN-2012	AQUATIC PEST CONTROL-GENERAL	30-JUN-2012	PRINCESS ANNE COUNTRY CLUB	3800 PACIFIC AVENUE		VIRGINIA BEACH VA 23451
47276	C	TONDRA D HARRIS	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	PRIORITY PEST CONTROL	9 LILAC COURT		NEWPORT NEWS VA 23601
68195	C	KEVIN M MISIEWICZ	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	PRO GREEN PEST & LAWN SERVICE LLC	572 DICKENSON DR		INWOOD WV 25428
65782	C	CHRISTOPHER L PEARCE	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	PROACTIVE PROPERTY SERVICES LLC	4765 WEST RUN RD		CHARLES CITY VA 23030
62351	C	JAMES J SAMIS	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2015	PROFESSIONAL WEED CONTROL SERVICE INC	31510 ZION RD		PARSONSBURG MD 21849
91218	C	JEROME W HAVERLAND	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	PROGRESSIVE SOLUTIONS LLC	374 BOOKER ROAD		THORNHILL TN 37881
69925	C	KENNETH L WARD	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	PROPERTY MAINTENANCE SOLUTIONS	4300 WILLIS WHARF RD	P O BOX 1415	EXMORE VA 23350

CERT NO [1]	CLASS [2]	APPLICATOR NAME	EXPIRATION DATE	CATEGORY	RECERTIFICATION BEFORE	BUSINESS NAME	ADDRESS 1	ADDRESS 2	CITY STATE ZIP
90977	C	RAYMOND H BOWMAN	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	QLC INC	P O BOX 66		HARDY VA 24101
88129	C	CRAIG S FRIBERG	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	QUALITY CUTS	442 MC CARTY RD		FREDERICKSBURG VA 22405
105723	C	HANK F HIRSCH	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	R K ENVIRONMENTAL SERVICES LLC	130 BROADWAY		BERGEN NJ 07626
95384	C	WILLIAM J TARR	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	R L TAYLOR INC	P O BOX 701		ATLANTIC VA 23303-0701
113352	C	NWORAH A NWAJEI	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	RAMCO INC	6715 BACKLICK ROAD	SUITE 203	SPRINGFIELD VA 22150-2708
14711	N	EUGENE R CRISP	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	RAPPAHANNOCK ELECTRIC COOP	4607 KINGSROW COURT		GLEN ALLEN VA 23060
81285	C	DONNA SUE RATLIFF	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	RAYS REPAIR & CONSTRUCTION INC	1301 LOG CABIN RD		BEAVERDAM VA 23015
70341	C	DAVID P WOOD	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	RAYTHEON SUPPORT SERVICE CO	15821 PAMUNKEY CHURCH RD		LANEXA VA 23089
25154	C	ROBERT B BARKSDALE	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2015	RBB SALES & CONSULTING INC	P O BOX 527		BLUE RIDGE VA 24064
83439	C	ANDREW L ROBINSON	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	RBS INC	11162 HIGHWAY ONE		SOUTH HILL VA 23970
36379	C	TONY LEWIS REAVES	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	REAVES LAWN & GARDEN INC	ONE BROAD STREET		SOUTH BOSTON VA 24592
62340	C	CURTIS W KESSINGER	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	RELIANCE PEST & TERMITE INC	622 PROPERITY WAY		CHESAPEAKE VA 23320-7029

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98677	C	LARRY W WATSON II	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2011	RESOURCE MANAGEMENT ASSOCIATES	P O BOX 119		LOCUSTVILLE VA 23404
65848	N	RICHARD THOMAS ZEISLER	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	RESTON ASSOCIATION	12250 SUNSET HILLS ROAD		RESTON VA 20190
115171	C	ENGLISH BLAINE MC CLURE	30-JUN-2012	AQUATIC PEST CONTROL-GENERAL	30-JUN-2012	RESTORATION AND RECOVERY SERVICES LLC	514 DANIELS ST #200		RALEIGH NC 27605
99639	C	DAVID L HARDIN	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2015	RESTORATION ECOLOGICAL SERVICES INC	8945 WHITE LANE		EASTON MD 21601
80487	C	GLENN H GARRETT	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2011	RETENTION POND SERVICES INC	451 LANDMARK DRIVE		WILMINGTON NC 28412
89267	C	JEB S WILSON	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	REW'S LAWN & FIELD SERVICE	25096 BAYLY'S NECK ROAD		ACCOMAC VA 23301
32363	C	JACK S REYNOLDS JR	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	REYNOLDS LANDSCAPING INC	871 CANAL DR		CHESAPEAKE VA 23323
108729	C	RUSSELL G WYATT	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	RJWV, LLC	7130 GLEN FOREST DRIVE	STE 110	RICHMOND VA 23226
87073	C	W DAVID MITCHELL	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	ROADSIDE INC	128 DEALBA LANE		SEAFORD VA 23696
91989	N	SCOTT J THOMAS	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2011	ROBERT TRENT JONES GOLF CLUB ON LAKE MANASSAS	P O BOX 621		GAINESVILLE VA 20156
108926	C	WILLIAM F GILLETTE	30-JUN-2011	FOREST PEST CONTROL	30-JUN-2011	ROCK SPRINGS FORESTRY, INC.	21396 BRANDY POND ROAD		CAPRON VA 23829

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70148	C	THOMAS M MOFFITT	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	ROGERS ENTERPRISES INC	14 BALDWIN DRIVE		FREDERICKSBURG VA 22406
115679	C	CHRISTOPHER K SANDERS	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	ROTOR BLADE, LLC	600 ASHLEY WAY		BLUEFIELD VA 24605
51220	C	ALFRED D SHUMAKER	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	RSG LANDSCAPING & LAWN CARE	1420 LOCKEWOOD DR		LYNCHBURG VA 24502
755	C	RODNEY D OSBURN	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	RWC INC	6210 FROST DRIVE		WESTERVILLE OH 43082
101542	C	STEVEN TRAVIS JONES	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	S C JONES SERVICES INC	115 PRODUCTION DRIVE		YORKTOWN VA 23693
113481	C	KEVIN D MILLER	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	SAFE-WAY TERMITE & PEST CONTROL INC	1056 OLD ELIZABETHTON HWY		BLUFF CITY TN 37618
101164	C	ROSCOE E SCARCE	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	SCARCE HOME IMPROVEMENT AND LAWN CARE	451 GARDEN DRIVE		DRY FORK VA 24549
95421	C	WILLIAM A BROADWATER	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	SCOTT FARMERS COOPERATIVE INC	P O BOX 187		GATE CITY VA 24251
81183	G	MARY WILLEFORD-BAIR	30-JUN-2011	FOREST PEST CONTROL	30-JUN-2015	SHENANDOAH NATIONAL PARK	3655 US HWY 211 EAST		LURAY VA 22835
27586	N	SAMUEL GENE LILLY	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	SHENANDOAH VALLEY ELEC COOP	P O BOX 8		DAYTON VA 22821-0008
89796	N	RONALD L CROWE	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	SHENANDOAH VALLEY ELECTRIC COMPANY	719 S OX ROAD		EDINBURG VA 22824
88912	N	JEFFREY B MARTIN	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	SHORE HEALTH SERVICES	7067 WHITTINGTON RD		EXMORE VA 23350

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111818	C	STEFAN J GORZULA	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2011	SHORT ENTERPRISES, INC.	5805C ROYAL RIDGE DR		SPRINGFIELD VA 22152
88011	C	DWIGHT K LAUER	30-JUN-2011	FOREST PEST CONTROL	30-JUN-2011	SILVICS ANALYTIC	122 TODD CIRCLE		WINGATE NC 28173
84412	C	RICKIE L SIMPSON	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	SIMPSONS LAWN CARE	6918 BLOOMSBERRY LANE		SPOTSYLVANIA VA 22553
81992	C	FRANK R WIEGERSMA	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2011	SKIP'S AQUATIC SOLUTIONS, LLC	390 BARKER RD		HENDERSON NC 27537
33982	N	DAVID L HOLLOWELL	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	SLEEPY HOLE GOLF COURSE	4714 HATTON PT RD		PORTSMOUTH VA 23703
115506	N	BRUCE PATRICK FRANCISCO	30-JUN-2012	AQUATIC PEST CONTROL-GENERAL	30-JUN-2012	SMITH RIVER SPORTS COMPLEX	999 BECKHAM CHURCH RD		AXTON VA 24054
97135	G	GREGORY A OSE	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2013	SMITHSONIAN INSTITUTION	DEPT OF PATHOLOGY	P O BOX 37012 MRC 5501	WASHINGTON DC 20013-7012
76946	C	JAMES L GRIFFITH	30-JUN-2012	AQUATIC PEST CONTROL-GENERAL	30-JUN-2012	SOD INSTALLERS INC.	2824 SEABOARD RD		VIRGINIA BEACH VA 23456
64402	N	GUY T MC ALLISTER	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	SOLUTIONS LAND & FOREST SERVICES	535 COTTONWOOD LANE		FINCASTLE VA 24090
34574	C	THOMAS I STANSFIELD	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	SOURCE ONE GROUNDS MAINTENANCE INC	P O BOX 6701		ASHLAND VA 23005
108330	C	HUNTER REED EDWARDS	30-JUN-2012	FOREST PEST CONTROL	30-JUN-2012	SOUTH CENTRAL LAND MANAGEMENT COMPANY	1047 PAPA MOORES TR		SOUTH BOSTON VA 24592

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16682	G	JAMES PORTER BABB	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	SOUTHAMPTON CORRECTIONAL CENTER FARM	23373 HANGING TREE RD		COURTLAND VA 23837
107984	G	CHARLOTTE A BRAYMAN	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2013	SOUTHAMPTON COUNTY	16787 DRY BREAD RD		EMPORIA VA 23847
82503	C	DONALD D HOPSON	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	SOUTHEAST WOODLAND SERVICES	P O BOX 462		PINEOLA NC 28662
95585	C	DAVID S SPIVEY	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2015	SPENCE'S PEST CONTROL CO	10107 DAKINS DRIVE		RICHMOND VA 23236
88482	G	DAVID W BECK	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	SPOTSYLVANIA COUNTY	10900 H C C DRIVE		FREDERICKSBURG VA 22408
87426	G	MARK S VAN DEVENDER	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	SPOTSYLVANIA COUNTY UTILITIES	14711 SOUTH RIVER RD		WOODFORD VA 22580-2730
110866	G	JAMES D JERRELL II	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	SPOTSYLVANIA PARKS & RECREATION	P O BOX 28		SPOTSYLVANIA VA 22553
94506	C	JUSTIN P SHIFLETT	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	SPRINGER LANDSCAPING INC	P O BOX 86		SANDSTON VA 23150
32818	C	MICHAEL S BEDWELL	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	SPRINGFIELD NURSERY INC	6705 B ELECTRONIC DRIVE		SPRINGFIELD VA 22151
84537	G	FRED C ARMENTROUT	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	STAFFORD CO PARKS & RECREATION	69 SKYLINE DRIVE		FREDERICKSBURG VA 22406
78861	G	DAVID J DANNER	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	STAFFORD COUNTY GOVERNMENT	5418 HAMS FORD ROAD		WOODFORD VA 22580
94813	C	DEAN C STOCKNER	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	STOCKNERS ROCKVILLE NURSERIES	P O BOX 82		ROCKVILLE VA 23146

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88894	C	JOHN E BARNES III	30-JUN-2012	AQUATIC PEST CONTROL-GENERAL	30-JUN-2012	STORMWATER POND MANAGEMENT	105 BARNES LANE		KNOTTS ISLAND NC 27950
60925	C	SCOTT G PETERMAN	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	SUBURBAN PEST SERVICE INC	6965 GATEWAY COURT		MANASSAS VA 20109
173	C	JAMES C CARLTON	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	SUMMIT HELICOPTERS INC/C3M INC	P O BOX 39		CLOVERDALE VA 24077
45416	C	MICHAEL H FOLEY	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	SUPERIOR FORESTRY SERVICE INC	P O BOX 25		TILLY AR 72679
106768	C	STANLEY J HEBERT JR	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	T & M AVIATION, INC.	P O BOX 267		PERRY LA 70575
101609	C	PATRICIA H ALLEN	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	T & P QUALITY CLEANING AND LAWN CARE	P O BOX 293		CHASE CITY VA 23924
69599	C	THOMAS WILLIAM MORRIS III	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2011	T G MORRIS ENTERPRISES INC	701 INDUSTRY DRIVE		HAMPTON VA 23661
85768	C	TIMOTHY E HARRIS	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	T. E. HARRIS CONSTRUCTION CO INC	6836 QUAIL PLACE		ROANOKE VA 24019
106454	N	RAYMOND L BARKER	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	TALL PINES HARBOR CAMPGROUND	P O BOX 375		SANFORD VA 23426
68121	C	MICHAEL D GRUNAWALT	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	TEAM HENRY ENTERPRISES LLC	817 48TH STREET		NEWPORT NEWS VA 23607
9488	C	JOHN CABELL HORSLEY JR	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	TERMINIX COMPANY INC	P O BOX 3226		PORTSMOUTH VA 23701

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33679	C	JERRY F SWEENEY	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2016	TERMINIX INTERNATIONAL COMPANY LP	7870 VILLA PARK DR	SUITE 600	RICHMOND VA 23228
58179	C	BRUCE K CLARK	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	TERMINIX SEVA INC	P O BOX 1434		NEW BERN NC 28563
59475	C	JAMES M BUFFEY	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	THE BRICKMAN GROUP LTD	8515 HENRICO AVE		RICHMOND VA 23229-6415
97147	C	SETH A STYGAR	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	THE CARE OF TREES INC	22830 QUICKSILVER DRIVE		DULLES VA 20166
106745	C	TRAVIS G COLLINS	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	THE F A BARTLETT TREE EXPERT COMPANY	8979 POCAHONTAS TRAIL	UNIT B	WILLIAMSBURG VA 23185
53433	N	DENNIS R BRIDGE	30-JUN-2012	FOREST PEST CONTROL	30-JUN-2012	THE GLATFELTER PULP WOOD CO	P O BOX 34		TREVILIANS VA 23170
63438	C	RICHARD LANE DIGGS	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	THE GREENER SIDE	8996 MIDWAY RD		RICHMOND VA 23229
70357	C	KENNETH B PARTIN	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	THE LAWN BEAUTICIAN	109 TERMINAL ST		HOPEWELL VA 23860
55444	C	ALLAN WINFIELD WHITTAKER	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	THE LAWN RANGER INC	P O BOX 65		MECHANICSVILLE VA 23111
3965	C	RONALD LEWIS LEMARR	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	THE LEMARR GROUP	119 JOHN MOSBY HIGHWAY		PARIS VA 20130
103713	N	EDWARD F EVERS	30-JUN-2012	AQUATIC PEST CONTROL-GENERAL	30-JUN-2012	THE MANOR GOLF CLUB	3463 FARMVILLE RD		FARMVILLE VA 23901
46558	N	GREGORY SCOTT MEADE	30-JUN-2012	FOREST PEST CONTROL	30-JUN-2012	THE NATURE CONSERVANCY	146 E MAIN ST		ABINGDON VA 24210

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114586	C	DANIEL W PARSONS	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	THE PARSONS GROUP LTD	4686 SNOW HILL RD		SALISBURY MD 21804
96047	C	LLOYD DENNIS JUSTICE	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	THE STERITECH GROUP INC	103 HAWKESBURY RD		SIMPSONVILLE SC 29681
71096	C	ERIC V SJURSETH	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	THE TURF BUTLER LLC	P O BOX 247		SOUTH HILL VA 23970
110658	C	DAVID M THOMAS	30-JUN-2012	AQUATIC PEST CONTROL-GENERAL	30-JUN-2012	THOMAS AQUATICS	1802 OAKDALE AVE		RICHMOND VA 23227
52239	C	RONALD M RUBIN	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	THRIVE	1590 STOWE ROAD		RESTON VA 20194
85567	C	ALTON BEN BROWN	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	TIDEWATER EXTERMINATING INC	11073 WARWICK BLVD		NEWPORT NEWS VA 23601
101803	N	PETER E HOPKINS	30-JUN-2012	AQUATIC PEST CONTROL-GENERAL	30-JUN-2012	TIMBERLAKE HOMEOWNERS ASSOCIATION	280 TIMBERLAKE DR		LYNCHBURG VA 24502
112504	C	JAMES 0 HATCHER	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2011	TIMMONS GROUP, INC	5586 ANDERSON HWY		POWHATAN VA 23139-5415
56328	C	TODD MATHEW EHRENZELLER	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	TME ENTERPRISES INC	2365 HAVERSHAM CLOSE		VIRGINIA BEACH VA 23454-1154
55462	C	JOHN GARNETT FRANTZ	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	TOTAL LANDSCAPES INC	4 CROAKER CIRCLE		WILLIAMSBURG VA 23188

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105346	C	KEITH E RUTLEDGE	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2011	TOTAL LAWN CARE	P O BOX 773		DUBLIN VA 24084
104486	G	JEFFREY P ROWLAND	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	TOWN OF ALTAVISTA	745 IRBY CIR		GRETNA VA 24557
98779	G	ROBERT D GOWEN	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	TOWN OF AMHERST	245 DEERFIELD DRIVE		AMHERST VA 24521
85666	G	HUGH T BERKLEY	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2011	TOWN OF BLACKSTONE	2614 ROBERTSONS ROAD		BLACKSTONE VA 23824
103583	G	ROBERT J TENNYSON	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	TOWN OF BRIDGEWATER	P O BOX 212		BRIDGEWATER VA 22812
110437	G	DAVID W FAUBER	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	TOWN OF CAPE CHARLES	6545 BROADWATER CIR		CAPE CHARLES VA 23310
77578	G	ROBERT J WATSON	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2015	TOWN OF CHINCOTEAGUE	5357 DEEP HOLE ROAD		CHINCOTEAGUE VA 23336
94103	G	KEVIN W HAMM	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	TOWN OF CHRISTIANSBURG	280 JOHN LEMLEY LN		CHRISTIANSBURG VA 24073
82304	G	DAVID O LEE	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2011	TOWN OF CULPEPER	17373 HAWTHORNE AVENUE		CULPEPER VA 22701
25154	G	ROBERT B BARKSDALE	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2015	TOWN OF EXMORE	P O BOX 527		BLUE RIDGE VA 24064
86386	G	ROBIN C ATKINS	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	TOWN OF FARMVILLE	814 LONGWOOD AVE		FARMVILLE VA 23901

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69498	G	JACKIE D PERRY	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	TOWN OF MARION	P O BOX 1005		MARION VA 24354
45949	G	WILLIAM T SHAW	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	TOWNS OF ONLEY-PARKSLEY	1700 NORTH MAIN STREET	ATTN: JERRY PRUYNE	SUFFOLK VA 23434
89648	C	DANIEL T MATTESON	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	TOWNSEND TREE SERVICE CO	P O BOX 128		PARKER CITY IN 47368-0128
99032	N	MARK LYNDEN STEADMAN	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2013	TRADITION GOLF CLUB AT BROAD BAY	2220 WILLOW OAK CIR	APT 101	VIRGINIA BEACH VA 23451
64423	C	CALVIN R BURNLEY	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	TREE TECH INC	P O BOX 227		FOREST VA 24551
83926	C	TRAVIS D FOGLE	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	TRIANGLE HOME SERVICES INC	3197 ATLEE RIDGE RD		NEW WINDSOR MD 21776
111777	C	RANDY L LANIER	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	TRI-RIVER LAWN CARE	1248 LEES CHAPEL ROAD		SANFORD NC 27330
56054	C	BRAD W BROWN	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2011	TRU GREEN LIMITED PARTNERSHIP	106 EXECUTIVE DR		STERLING VA 20166
31169	C	BRUCE TAYLOR	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	TRUGREEN LAWNCARE	6977 OLD BRENTFORD ROAD		ALEXANDRIA VA 22310
70036	C	THEODORE M EVAN JR	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	TRUGREEN LIMITED PARTNERSHIP	650 C NELMS CIRCLE		FREDERICKSBURG VA 22406
100852	C	BRADLEY H JOHNSON	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	TRUGREEN LP	811 BLUE CRAB ROAD		NEWPORT NEWS VA 23606-0507

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84672	C	DEBRA L FORD	30-JUN-2012	AQUATIC PEST CONTROL-GENERAL	30-JUN-2012	TUCKAHOE LANDSCAPING & LAWN CARE INC	11191 TISBERRY LANE		ASHLAND VA 23005
89257	C	TED NEUMAN	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	TYMATT INDUSTRIES INC	5823 GREENOCK RD		LOTHIAN MD 20711
53079	G	HARRY REED JEAVONS	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	U S AIR FORCE	37 SWEENEY BLVD	1 CES/CEVQ	LANGLEY AFB VA 23665-2107
77126	G	DONALD A TEIG	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	U S AIR FORCE RESERVE	2903 BROAD WING AVE		PANAMA CITY FL 32405-6679
43547	G	WILLIAM CLAUDE SIPLE	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	U S ARMY CORPS OF ENGINEERS	102 DICKSON PLACE		CLIFTON FORGE VA 24422
82948	G	MARK S BREIDENBAUGH	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	U S DEPT OF DEFENSE	YOUNGSTOWN AIR RESERVE STATION	757 AS	VIENNA OH 44473
55953	G	DAVID L PETERSON	30-JUN-2012	AQUATIC PEST CONTROL-GENERAL	30-JUN-2012	U S FISH & WILDLIFE SERVICE	11110 KIMAGES ROAD		CHARLES CITY VA 23030
73275	G	DOROTHY YVONNE NORMAN	30-JUN-2011	FOREST PEST CONTROL	30-JUN-2011	U S FOREST SERVICE	GENERAL DELIVERY		SELMA VA 24474
92667	G	BRIAN L EICK	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2015	U S INTERIOR DEPT	APPOMATTOX COURT HOUSE NHP	BOX 218	APPOMATTOX VA 24522
38489	C	EDWARD A WHITING	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2016	U S PEST CONTROL INC	P O BOX 350		HIGHLAND SPRINGS VA 23075
16719	N	STEPHEN B GLASS	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	UNIVERSITY OF RICHMOND	PHYSICAL PLANT DEPT		RICHMOND VA 23173

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98928	G	RANDALL S ALLEN	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	UPPER OCCOQUAN SEWAGE AUTHORITY	14631 COMPTON RD		CENTREVILLE VA 20121-2506
103509	G	JESUS A COTA	30-JUN-2012	FOREST PEST CONTROL	30-JUN-2014	USDA FOREST SERVICE	13902 LEETON CIR		CHANTILLY VA 20151
30778	G	DON JACKSON YANCEY	30-JUN-2012	FOREST PEST CONTROL	30-JUN-2012	USDA NRCS	390 GREENHOUSE ROAD		RUSTBURG VA 24588
57327	G	CHRISTINA MARIE UPERTI	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	VA BEACH CITY DEPT OF LANDSCAPE	PARKS & LANDSCAPE SERVS DIV	4141 DAM NECK ROAD	VIRGINIA BEACH VA 23456
35266	G	PHILIP E MEEKINS JR	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	VA BEACH MOSQUITO CONTROL	1848 PLEASANT RIDGE RD		VIRGINIA BEACH VA 23457
24159	G	STUART K SUTPHIN	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	VA COOP EXTENSION SERVICE	580 MOUNTAIN TOP DRIVE		CHATHAM VA 24531
94027	G	KEVIN H COX	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	VA DCR - DIVISON OF STATE PARKS	P O BOX 1232		STUART VA 24171
27446	G	SAMUEL W BAILEY	30-JUN-2011	FOREST PEST CONTROL	30-JUN-2015	VA DEPT OF CONSERVATION & RECREATION	5818 BISHOP CREEK RD		LYNCH STATION VA 24571
80	G	RICHARD A BEAVER	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2015	VA DEPT OF CORRECTIONS	22 CLARKE ROAD		RICHMOND VA 23226
2007	G	ROBERT WADE STEMPEL	30-JUN-2011	FOREST PEST CONTROL	30-JUN-2013	VA DEPT OF FORESTRY	135 BANK STREET		WAVERLY VA 23890
63421	G	MICHAEL L VEST	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	VA DEPT OF GAME & INLAND FISHERIES	BOX 675 HOCKLEY NECK RD		STEVENSVILLE VA 23161
91200	G	DOUGLAS R HUBBARD	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2014	VA DEPT OF HEALTH	413 HUNTFIELD CT NE		LEESBURG VA 20176

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84149	G	BRIAN CLAY SAWYERS	30-JUN-2012	FOREST PEST CONTROL	30-JUN-2012	VA TECH DEPT OF FORESTRY	407 SCENIC DRIVE		STUART VA 24171
82229	C	PHILIP M SHANNON	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	VALENTINE SERVICES INC	4466 LADYSMITH RD		RUTHER GLEN VA 22546-2714
45677	C	BRYAN T CHAMBLIN	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	VALLEY LANDSCAPING	750 DEN HILL RD		CHRISTIANSBURG VA 24073
74416	C	THOMAS F GRAVELY JR	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	VALLEY TURF INC	P O BOX 3471		RADFORD VA 24143
48468	C	STEVE N TUCK JR	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	VALLEYCREST LANDSCAPE MAINTENANCE INC	8406 ERLE ROAD STE B		MECHANICSVILLE VA 23111
51433	G	ROBERT DALE CHRISTIAN	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	VDACS	110 HERMITAGE RD		NEWPORT NEWS VA 23606-1448
7637	G	DAVID A JOHNSON	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	VDOT ENVIRONMENTAL SECTION	1700 NORTH MAIN STREET	ATTN: JERRY PRUYNE	SUFFOLK VA 23434-4322
42254	G	RICHARD ALLEN CLATTERBUCK	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	VDOT MATERIALS SECTION	195 GEER LANE		BRIGHTWOOD VA 22715
2221	G	KIM ALEXANDER MC LAUGHLIN	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	VDOT ROADSIDE MANAGEMENT DIVISION	P O BOX 3071		SALEM VA 24153
107379	G	DAVID K SCHNAKE	30-JUN-2011	FOREST PEST CONTROL	30-JUN-2013	VIRGINIA DEPARTMENT OF FORESTRY	135 BANK ST		WAVERLY VA 23890
35961	C	CARLTON DWAYNE HUFF	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	VIRGINIA FOREST SERVICE LLC	1494 FISHERS GAP RD		GALAX VA 24333

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70114	C	KEVIN R TUCKER	30-JUN-2012	AQUATIC PEST CONTROL-GENERAL	30-JUN-2014	VIRGINIA LAKE MANAGEMENT COMPANY INC	P O BOX 969		VIRGINIA BEACH VA 23451
7595	C	JOSEPH HESCOTTE JONES	30-JUN-2011	FOREST PEST CONTROL	30-JUN-2011	VIRGINIA REFORESTATION LLC	P O BOX 295		WHITE HALL VA 22987
86072	G	ANDY F RANSONE	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	VIRGINIA STATE PARKS	185 RIVERVIEW ROAD		LANCASTER VA 22503
65686	C	RANDOLPH D HOOVER	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	VIRGINIA TURF MANAGEMENT ASSOCIATES INC	1703 MONTICELLO AVE		NORFOLK VA 23510
87557	C	JOSEPH T IVERS	30-JUN-2012	AQUATIC PEST CONTROL-GENERAL	30-JUN-2012	VIRGINIA WATERS & WETLANDS INC	6799 KENNEDY RD SUITE A		WARRENTON VA 20186
69617	C	THOMAS A GLASHEEN	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	VMS INC	2819 JUDES FERRY RD		POWHATAN VA 23139
24426	G	PERRY LLOYD HIPKINS	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	VPI & SU	199 ALPINE ROAD		NEWPORT VA 24128
30744	C	JAMES F WAGNER	30-JUN-2012	FOREST PEST CONTROL	30-JUN-2012	WAGNER FORESTRY	5400 CALLANDS ROAD		CHATHAM VA 24531
35434	C	JAMES H WARD	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2014	WARD PEST CONTROL INC	4625 OLD DOMINION DR STE B-1		ARLINGTON VA 22207-3420
68103	G	HARRY C KISNER JR	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2011	WARREN CO PARKS & RECREATION	200 E 8TH STREET		FRONT ROYAL VA 22630
113613	G	CAROLYN S HATHAWAY	30-JUN-2011	FOREST PEST CONTROL	30-JUN-2011	WARREN COUNTY	1418 LINDEN ST		FRONT ROYAL VA 22630-4559

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33331	N	HENRY T PAGE	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2013	WATERFRONT COUNTRY CLUB	200 LARBOARD DRIVE		MONETA VA 24121
29657	C	LYLE H ANDERSON	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	WEED CONTROL INC	216 SIMMONS DRIVE		CLOVERDALE VA 24077
750	C	BRIAN G O NEILL	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2014	WEEDS INC	250 BODLEY ROAD		ASTON PA 19014
64339	C	RONALD A STONE	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	WEEDS NO MORE INC	P O BOX 236		WALTERSBURG PA 15488
52303	C	MICHAEL LYNN ALLEN	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	WEST CENTRAL LAWN & LANDSCAPING INC	6294 CUMBERLAND GAP RD		NEWPORT VA 24128
92672	G	WALTER E FEURER	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	WEST POINT TOWN OF	108 TANBARK LANE		WILLIAMSBURG VA 23188
46532	C	JEFFREY L HOLLIDAY	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2014	WESTERN EXTERMINATING CO OF VA	10813 MIDLOTHIAN TURNPIKE		RICHMOND VA 23235
44450	C	MICHAEL A WOODS	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2014	WESTERN INDUSTRIES-SOUTH INC	4205 VIRGINIA BEACH BLVD		VIRGINIA BEACH VA 23452
107794	G	BEN LEE	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	WESTERN VIRGINIA WATER AUTHORITY	1502 BROWNLEE AVE SE		ROANOKE VA 24014
84477	C	DANIEL L FISK	30-JUN-2012	AQUATIC PEST CONTROL-GENERAL	30-JUN-2012	WETLAND STUDIES AND SOLUTIONS INC	5300 WELLINGTON BRANCH DRIVE	SUITE 100	GAINESVILLE VA 20155
70359	C	CLYDE MAYBERRY JR	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2011	WILCO ENTERPRISES INC	9196 RICHMOND HIGHWAY	APT C306	FORT BELVOIR VA 22060

CERT NO [1]	CLASS [2]	APPLICATOR NAME	EXPIRATION DATE	CATEGORY	RECERTIFICATION BEFORE	BUSINESS NAME	ADDRESS 1	ADDRESS 2	CITY STATE ZIP
75939	C	WILLIAM F SCHOOLS	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	WILLIAM F SCHOOLS GROUNDS MAINTENANCE	1517 SYCAMORE DR		TAPPAHANNOCK VA 22560
98739	C	HAZAEL JOSEPH WILLIAMS IV	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2011	WILLIAMS BROTHERS TREE AND LAWN SERVICE	54 KERRY LANE		STAUNTON VA 24401
109145	C	PATRICIA M HOLLINGSHEAD	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	WILLIAMS FORESTRY & ASSOCIATES	105 TROPIC STREET		JACKSON OH 45640
50265	N	TRACEY WAYNE MOSER	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2011	WILLIAMS GAS PIPELINE	945 TRANSCO RD		CHATHAM VA 24531
67359	C	JAMES LEE ORRELL	30-JUN-2011	AQUATIC PEST CONTROL-GENERAL	30-JUN-2011	WILLIAMSBURG ENVIRONMENTAL GROUP INC	5209 CENTER STREET		WILLIAMSBURG VA 23188
115539	C	BENJAMIN T WOODARD	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2012	WOODARD HOLDINGS, INC.	531 WILLOWTREE DRIVE		HENRICO VA 23229
86561	C	DANIEL V REYNOLDS	30-JUN-2012	FOREST PEST CONTROL	30-JUN-2012	WOODLAND VEGETATION MANAGEMENT INC	5236 PINE CONE LANE		FARMVILLE NC 27828-7500
115541	C	HECTOR BRAVO	30-JUN-2012	RIGHT-OF-WAY PEST CONTROL	30-JUN-2012	WOODS PLUS INC	P O BOX 408		GREELEYVILLE SC 29056
101214	G	ANTHONY P DUNCAN	30-JUN-2011	RIGHT-OF-WAY PEST CONTROL	30-JUN-2013	WYTHEVILLE TOWN OF	150 E MONROE STREET		WYTHEVILLE VA 24382
53014	G	THOMAS J GALLAGHER	30-JUN-2011	PUBLIC HEALTH PEST CONTROL	30-JUN-2015	YORK COUNTY	P O BOX 532		YORKTOWN VA 23692
44691	G	JAMES K RINDFLEISCH	30-JUN-2012	PUBLIC HEALTH PEST CONTROL	30-JUN-2014	YORK CTY MOSQUITO CONTROL	P O BOX 532		YORKTOWN VA 23690

1 - Certification Number per Virginia Department of Agriculture and Consumer Services for Certified Operators
2 - C = Commercial Applicator, N = Non-Commercial Applicator, G = Government Entity

ATTACHMENT C

PESTICIDE DISCHARGE MANAGEMENT PLAN
FORM AND INSTRUCTIONS
(To Be Included with Final Fact Sheet)

ATTACHMENT D

PESTICIDE DISCHARGE MANAGEMENT PLAN
EXAMPLE
(To Be Included with Final Fact Sheet)

ATTACHMENT E
Threatened and Endangered Fauna

FRESHWATER FISHES
Blackbanded sunfish *Enneacanthus chaetodon* SE
Blackside dace *Phoxinus cumberlandensis* FT ST
Carolina darter *Etheostoma collis* ST
Duskytail darter *Etheostoma percnurum* FE SE
Emerald shiner *Notropis atherinoides* ST
Golden darter *Etheostoma denoncourti* ST
Greenfin darter *Etheostoma chlorobranchium* ST
Longhead darter *Percina macrocephala* ST
Orangefin madtom *Noturus gilberti* ST
Paddlefish *Polyodon spathula* ST
Roanoke logperch *Percina rex* FE SE
Sharphead darter *Etheostoma acuticeps* SE
Shortnose sturgeon *Acipenser brevirostrum* FE SE
Slender chub *Erimystax cahni* FT ST
Spotfin chub *Erimonax monachus* FT ST
Steelcolor shiner *Cyprinella whipplei* ST
Tennessee dace *Phoxinus tennesseensis* SE
Variegate darter *Etheostoma variatum* SE
Western sand darter *Ammocrypta clara* ST
Whitemouth shiner *Notropis alborus* ST
Yellowfin madtom *Noturus flavipinnis* FT ST

AMPHIBIANS
Frogs
Barking treefrog *Hyla gratiosa* ST
Salamanders
Eastern tiger salamander *Ambystoma tigrinum tigrinum* SE
Mabee's salamander *Ambystoma mabeei* ST
Shenandoah salamander *Plethodon shenandoah* FE SE

REPTILES
Lizards
Eastern glass lizard *Ophisaurus ventralis* ST
Snakes
Canebrake rattlesnake *Crotalus horridus* SE
(Coastal Plain population of timber rattlesnake)
Turtles
Bog (= Muhlenberg) turtle *Glyptemys (=Clemmys) muhlenbergii* FT SE
Eastern chicken turtle *Deirochelys reticularia reticularia* SE
Green sea turtle *Chelonia mydas* FT ST
Hawksbill sea turtle *Eretmochelys imbricata* FE SE
Kemp's ridley sea turtle *Lepidochelys kempii* FE SE
Leatherback sea turtle *Dermochelys coriacea* FE SE
Loggerhead sea turtle *Caretta caretta* FT ST
Wood turtle *Glyptemys insculpta* ST

BIRDS
Bachman's sparrow *Aimophila aestivalis* ST
Bachman's warbler (=wood) *Vermivora bachmanii* FE SE
Bald eagle *Haliaeetus leucocephalus* ST
Bewick's wren *Thryomanes bewickii* SE
Gull-billed tern *Sterna nilotica* ST
Henslow's sparrow *Ammodramus henslowii* ST
Kirtland's warbler (=wood) *Dendroica kirtlandii* FE SE
Loggerhead shrike *Lanius ludovicianus* ST
Peregrine falcon *Falco peregrinus* ST
Piping plover *Charadrius melodus* FT ST
Red-cockaded woodpecker *Picoides borealis* FE SE
Roseate tern *Sterna dougallii dougallii* FE SE
Upland sandpiper *Bartramia longicauda* ST
Wilson's plover *Charadrius wilsonia* SE

MAMMALS
American water shrew *Sorex palustris* SE
Carolina northern flying squirrel *Glaucomys sabrinus coloratus* FE SE
Delmarva Peninsula fox squirrel *Sciurus niger cinereus* FE SE
Dismal Swamp southeastern shrew *Sorex longirostris fisheri* ST
Eastern puma (=cougar) *Puma (=Felis) concolor cougar* FE SE
Gray bat *Myotis grisescens* FE SE
Gray wolf *Canis lupus* FE SE
Indiana bat *Myotis sodalis* FE SE
Rafinesque's eastern big-eared bat *Corynorhinus rafinesquii macrotis* SE
Rock vole *Microtus chrotorrhinus* SE
Snowshoe hare *Lepus americanus* SE
Virginia big-eared bat *Corynorhinus (= Plecotus) townsendii virginianus* FE SE
Virginia northern flying squirrel *Glaucomys sabrinus fuscus* SE

MARINE MAMMALS
Blue whale *Balaenoptera musculus* FE SE
Finback whale *Balaenoptera physalus* FE SE
Humpback whale *Megaptera novaeangliae* FE SE
Right whale *Balaena glacialis* (incl. *australis*) FE SE
Sei whale *Balaenoptera borealis* FE SE
Sperm whale *Physeter catodon (= macrocephalus)* FE SE
West Indian manatee *Trichechus manatus* FE SE

ATTACHMENT E, continued….
Threatened and Endangered Fauna

FE=Federal Endangered
FT=Federal Threatened
SE=State Endangered
ST=State Threatened

MOLLUSKS
Freshwater Mollusks
Appalachian monkeyface (pearlymussel) *Quadrula sparsa* FE SE
Atlantic pigtoe *Fusconaia masoni* ST
Birdwing pearlymussel *Conradilla caelata (= Lemiox rimosus)* FE SE
Black sandshell *Ligumia recta* ST
Brook floater *Alasmidonta varicosa* SE
Cracking pearlymussel *Hemistena lata* FE SE
Cumberland bean (pearlymussel) *Villosa trabalis* FE SE
Cumberland monkeyface (pearlymussel) *Quadrula intermedia* FE SE
Cumberlandian combshell *Epioblasma brevidens* FE SE
Deertoe *Truncilla truncata* SE
Common Name Scientific Name Federal State
Dromedary pearlymussel *Dromus dromas* FE SE
Dwarf wedgemussel *Alasmidonta heterodon* FE SE
Elephantear *Elliptio crassidens* SE
Fanshell *Cyprogenia stegaria* FE SE
Fine-rayed pigtoe *Fusconaia cuneolus* FE SE
Fluted kidneyshell *Ptychobranchus subtentum (*Federal Candidate)
Fragile papershell *Leptodea fragilis* ST
Green blossom (pearlymussel) *Epioblasma torulosa gubernaculum* FE SE
Green floater *Lasmigona subviridis* ST
James spinymussel *Pleurobema collina* FE SE
Little-wing pearlymussel *Pegias fabula* FE SE
Ohio pigtoe *Pleurobema cordatum* SE
Oyster mussel *Epioblasma capsaeformis* FE SE
Pimpleback *Quadrula pustulosa pustulosa* ST
Pink mucket (pearlymussel) *Lampsilis abrupta* FE SE
Pistolgrip *Tritogonia verrucosa* ST
Purple bean *Villosa perpurpurea* FE SE
Purple lilliput *Toxolasma lividus* SE
Pyramid pigtoe *Pleurobema rubrum* SE
Rayed bean *Villosa fabalis (*Federal Candidate)
Rough pigtoe *Pleurobema plenum* FE SE
Rough rabbitsfoot *Quadrula cylindrica strigillata* FE SE
Sheepnose *Plethobasus cyphyus* ST
Shiny pigtoe *Fusconaia cor* FE SE
Slabside pearlymussel *Lexingtonia dolabelloides* ST
Slippershell mussel *Alasmidonta viridis* SE
Snuffbox *Epioblasma triquetra* SE
Spectaclecase *Cumberlandia monodonta* SE
Tan riffleshell *Epioblasma florentina walkeri (= E. walkeri)* FE SE
Tennessee heelsplitter *Lasmigona holstonia* SE
Freshwater & Land Snails
Appalachian springsnail *Fontigens bottimeri* SE
Brown supercoil *Paravitrea septadens* ST
Rubble coil *Helicodiscus lirellus* SE
Shaggy coil *Helicodiscus diadema* SE
Spider elimia *Elimia arachnoidea* SE
Spiny riversnail *Io fluvialis* ST
Spirit supercoil *Paravitrea hera* SE
Springsnail (no common name) *Fontigens morrisoni* SE
Thankless ghostsnail *Holsingeria unthanksensis* SE
Virginia fringed mountain snail *Polygriscus virginianus* FE SE

FRESHWATER CRUSTACEANS
Big Sandy crayfish *Cambarus veteranus* SE
Lee County Cave isopod *Lirceus usdagalun* FE SE
Madison Cave amphipod *Stygobromus stegerorum* ST
Madison Cave isopod *Antrolana lira* FT ST

MILLIPEDES
Ellett Valley pseudotremia *Pseudotremia cavernarum* ST
Laurel Creek xystodesmid *Sigmoria whiteheadi* ST

For further information or details regarding this list or any species listed herein, please contact:
Wildlife Diversity Division
Virginia Department of Game and Inland Fisheries
(804) 367-6913

ATTACHMENT E, continued…
Threatened and Endangered Plants and Insects

Threatened per § 3.2-1000-1011 Code of Virginia
Panax quinquefolius L , Wild Ginseng (threatened only when occurring in the wild)

Threatened per 2VAC5-320-10 Virginia Administrative Code
1. Aeschynomene virginica, sensitive-joint vetch.
2. Amaranthus pumilus, seabeach amaranth.
3. Arabis serotina, shale barren rock cress.
4. Cicindela dorsalis dorsalis, Northeastern beach tiger beetle.
5. Echinacea laevigata, smooth coneflower.
6. Juncus caesariensis, New Jersey rush.
7. Lycopodiella margueritiae, Northern prostrate clubmoss.
8. Nuphar sagittifolia, narrow-leaved spatterdock.
9. Platanthera leucophaea, Eastern prairie fringed orchid.
10. Pyrgus wyandot, Appalachian grizzled skipper.
11. Rhus michauxii, Michaux's sumac.
12. Scirpus flaccidifolius, reclining bulrush.

Endangered per § 3.2-1000-1011 Code of Virginia
Betula uber, Virginia birch or round-leaf birch

Endangered per 2VAC5-320-10 Virginia Administrative Code
1. Cardamine micranthera, small-anthered bittercress.
2. Carex juniperorum, juniper sedge.
3. Corallorhiza bentley, Bentley's coralroot.
4. Fimbristylis perpusilla, Harper's fimbristylis.
5. Helenium virginicum, Virginia sneezeweed.
6. Helonias bullata, swamp-pink.
7. Ilex collina, long-stalked holly.
8. Iliamna corei, Peter's mountain mallow.
9. Isotria medeoloides, small whorled pogonia.
10. Neonympha mitchellii, Mitchell's satyr butterfly.
11. Nestronia umbellula, nestronia.
12. Ptilimnium nodosum, harperella.
13. Puto kosztarabi, Buffalo Mountain mealybug.
14. Pseudanophthalmus holsingeri, Holsinger's cave beetle.
15. Scirpus ancistrochaetus, Northeastern bulrush.
16. Sigara depressa, Virginia Piedmont water boatman.
17. Spiraea virginiana, Virginia spiraea.
18. Trifolium calcaricum, running glade clover.

Federally Endangered
1. *Nicrophorus americanus*, American burying beetle