

United States Environmental Protection Agency

Final 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

Fact Sheet

Agency: United States Environmental Protection Agency

Action: Notice of NPDES General Permit

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I. Background

The United States Environmental Protection Agency (EPA) is reissuing the National Pollutant Discharge Elimination System (NPDES) pesticide general permit (2021 PGP) which authorizes the point source discharges of biological pesticides, and chemical pesticides that leave a residue, to waters of the United States. The 2021 PGP replaces EPA's 2016 PGP, which expires on October 31, 2021 at midnight. This fact sheet describes the 2021 PGP. The 2021 PGP will be available to Operators in geographic areas where EPA is the NPDES permitting authority. Appendix C of the PGP contains a list of areas eligible for coverage.

Conditions and requirements in the final 2021 PGP remain largely unchanged from the 2011 PGP and 2016 PGP. EPA considered the information gathered during the implementation of the 2016 PGP and comments on the draft 2021 PGP in finalizing the 2021 PGP. Supporting information and materials for the 2021 PGP, including the response to comment document, are included in Docket ID No. EPA-HQ-OW-2020-0005 available at <https://www.regulations.gov/>.

The following is a summary of the 2021 PGP's requirements:

- The PGP defines "Operator" (*i.e.*, the entity required to obtain NPDES permit coverage for discharges) to include any (a) *Applicator* who performs the application of pesticides or has day-to-day control of the application of pesticides that results in a discharge to waters of the United States, or (b) *Decision-maker* who controls any decision to apply pesticides that results in a discharge to waters of the United States. There may be instances when a single entity acts as both an Applicator and a Decision-maker.
- All Applicators are required to minimize pesticide discharges by using only the amount of pesticide and frequency of pesticide application necessary to control the target pest, maintain pesticide application equipment in proper operating condition, control discharges as necessary to meet applicable water quality standards, and monitor for and report any adverse incidents.
- All Decision-makers are required, to the extent not determined by the Applicator, to minimize pesticide discharges by using only the amount of pesticide and frequency of pesticide application necessary to control the target pest. All Decision-makers are also required to control discharges as necessary to meet applicable water quality standards and monitor for and report any adverse incidents.
- Certain Decision-makers [*i.e.*, any agency for which pest management for land resource stewardship is an integral part of the organization's operations, entities with a specific responsibility to control pests (*e.g.*, mosquito and weed control districts), local governments or other entities that apply pesticides in excess of specified annual treatment area thresholds, and entities that discharge pesticides to Tier 3 waters (Outstanding National Resource Waters, 40 CFR 131.12(a)(3)) or to waters of the United States containing National Marine Fisheries Service (NMFS) Listed Resources of Concern] are required also to submit an NOI to obtain authorization to discharge and to implement pest management options to reduce the discharge of pesticides to waters of the United States. Within this group, certain large Decision-makers (any (1) public entity that serves a population greater than 10,000 or (2) private enterprise that exceeds the Small Business

Administration size standard as identified in 13 CFR 121.201) must also develop a Pesticide Discharge Management Plan (PDMP), submit annual reports, and maintain detailed records. Certain small Decision-makers (any (1) public entity that serves a population of 10,000 or less or (2) private enterprise that does not exceed the Small Business Administration size standard as identified in 13 CFR 121.201) are required to complete a pesticide discharge evaluation worksheet for each pesticide application (in lieu of the more comprehensive PDMP), an annual report, and detailed recordkeeping.

- Deadlines for submittal of an NOI to be covered, if required, are provided in Part 1.2.3, Table 1-2, of the 2021 PGP.

While the requirements of the 2021 PGP remain the same as those in the 2011 PGP and 2016 PGP, there are minor updates to the 2016 PGP and to the draft 2021 PGP which are discussed below:

Notices of Intent (NOIs)

Under the 2016 PGP, Decision-makers who were required to submit NOIs were automatically covered under the permit until January 12, 2017. Additional time was provided to allow new Decision-makers enough time to read and understand the permit requirements and comply with the recordkeeping and reporting requirements of the permit and to provide a transition period for existing Decision-makers under the 2011 PGP to resubmit NOIs under the 2016 PGP. For the 2021 permit, EPA is issuing the permit with sufficient time to give Decision-makers time to prepare for filing a notice of intent to be covered under the new permit prior to the October 31, 2021 effective date. Under the 2021 PGP, on the effective date of the permit, Decision-makers who are required to submit an NOI are required to submit ten or thirty (for activities in the NMFS Listed Resources of Concern) days prior to discharging pollutants to a water of the United States. Other Operators who are not required to submit NOIs continue to be automatically covered.

When deleting the January 12, 2017 automatically covered date, EPA mistakenly deleted the entire paragraph. In the final permit, EPA updated Part 1.2.3 of the PGP to keep the following sentences: “All Decision-makers with eligible discharges for which an NOI is required are required to submit an NOI consistent with the earliest applicable due date identified in Table 1-2. Decision-makers may submit multiple NOIs with different activities on each of those NOIs such that discharges from different activities are authorized at different times.”

NPDES eReporting Tool (NeT)

Under the 2016 PGP, Notices of Intent (NOIs), Notices of Termination (NOTs), and annual reports must be prepared and submitted using EPA’s eNOI System unless the Decision-maker has obtained a waiver from electronic reporting requirements. See Part 7.8 of the 2021 PGP for detailed electronic reporting requirements. Under the 2021 PGP, Decision-makers must prepare and submit their NOIs, NOTs, and annual reports using EPA’s NPDES eReporting Tool (NeT) unless the Decision-maker has obtained a waiver from electronic reporting requirements. Conditions to obtain a waiver from electronic reporting requirements under the 2021 PGP are: 1) if the Decision-maker is physically located in a geographic area (*i.e.*, zip code or census tract) that is identified as under-served for broadband Internet access in the most recent report from the

Federal Communications Commission; or 2) if the Decision-maker has limitations regarding available computer access or computer capability.

Part 1.1.2.4 of the PGP

Under the 2016 PGP, the procedures to assist in protecting federally-listed endangered and threatened species and federally designated critical habitats in Part 1.1.2.4 of the permit use the phrase “not likely to adversely affect.” In response to the Endangered Species Act (ESA) consultation for the 2021 PGP, EPA changed the “not likely to adversely affect” phrase to “not likely to result in any short or long term adverse effects” where the Decision-makers select eligibility criterion d, criterion e, or criterion f. To improve instructions and clarifications in the ESA procedures for applicants, EPA also clarified the supporting documentation required to be submitted with the NOI for the eligibility criterion selected. See Part I.7 below for further discussion on the ESA consultation.

Part 1.6 of the PGP

EPA updated, Part 1.6 of the permit to read... “a. ESA Section 7 consultation that Operators have completed with FWS and/or NMFS as a result of a separate federal action and/or b. ESA Section 10 permit issued to the Operator by FWS and/or NMFS as a result of a separate federal action.” This change is to clarify that the ESA consultation in Part 1.6 of the permit is a separate federal action that occurs outside of this permit issuance and does not need to be completed by permittees to be covered under the 2021 PGP.

Part 2.2.3.b of the PGP

Under the 2016 PGP, cultural methods was not included in the list of pest management options Decision-makers must evaluate when developing Pest Management Measures for animal pest control, as tactics of pest management options (preventative, cultural, mechanical/physical, and biological control agents) may overlap for some aquatic systems or specific pest control situations. In response to a comment received, EPA added cultural methods to the list of pest management options for animal pest control under Part 2.2.3.b of the 2021 PGP to clarify that cultural methods can be used as a pest management option for animal pest control.

Part 9.0 of the PGP

Updated Part 9.0 of the PGP to reflect state and tribal Clean Water Act Section 401 certifications.

Appendix A, Definitions, Abbreviations, and Acronyms

EPA has added in Appendix A of the 2021 PGP the definitions for the term “Pesticide discharges to waters of the United States from pesticide application,” “Take” as defined in Section 3 of the Endangered Species Act, 16 U.S.C. § 1532(19), and updated “pesticide residue” definition. EPA also updated the date in the definition for “Decision-maker who is or will be required to submit and NOI” and “NMFS Listed Resources of Concern”. In addition, EPA updated the list of acronyms in Appendix A2.

Appendix B, Standard Permit Conditions

To ensure consistency with 40 CFR 122.41, the standard permit conditions are included in the permit.

Appendix C, Areas Covered

The 2021 PGP is available in those areas where EPA is the NPDES permitting authority; these areas include Indian Country where there is no EPA-approved permitting program, federal facilities, and states that have not been approved to administer the NPDES program. The complete list of areas of geographic coverage of this permit, along with the NPDES permit numbers, are listed in Appendix C of the PGP. Subsequent to issuance of the 2016 PGP, the State of Idaho received authorization to administer the entire NPDES program; therefore, pesticide applications in Idaho (where Idaho has permitting authority) are covered under the state's NPDES program and Indian Country within Idaho is covered under the EPA's 2021 PGP. In addition, since 2016, several tribes were newly recognized by the federal government and are covered under the 2021 PGP. Furthermore, in 2020, Texas received authorization to administer NPDES program for oil and gas activities; therefore, only Indian Country within the state of Texas are covered under the 2021 PGP. Lastly, several tribes denied Clean Water Act 401 certifications and are not covered under the 2021 PGP. These changes are reflected in Appendix C of the PGP.

Appendix D of the PGP, Notice of Intent Form

Updated Appendix D of the PGP to reflect changes to Part 1.1.2.4 of the PGP. EPA changed the sections of the form with the phrase "not likely to adversely affect" and also added fields for Decision-makers to provide the supporting documentation for the eligibility criterion selected.

Appendix F of the PGP, Pesticide Discharge Evaluation Worksheet (PDEW)

Under the 2016 PGP, the PDEW points to the incorrect part of the permit. EPA added an introduction to the PDEW coversheet in the 2021 PGP and corrected the instructions for the PDEW to point Operators to Part 7.3 of the PGP.

Appendix I of the PGP, Endangered Species Procedures

Updated Appendix I of the PGP to reflect changes made to Part 1.1.2.4 of the PGP. Also added a list of pesticides that a NMFS' biological opinion has determined the labeled use would jeopardize the continued existence of ESA-listed species and/or adversely modify designated critical habitat.

1. Clean Water Act

Section 301(a) of the Clean Water Act (CWA) provides that "the discharge of any pollutant by any person shall be unlawful" unless the discharge is in compliance with certain other sections of the Act. 33 U.S.C. 1311(a). The CWA defines "discharge of a pollutant" as "(A) any addition of any pollutant to navigable waters from any point source, (B) any addition of any pollutant to the waters of the contiguous zone or the ocean from any point source other than a vessel or other floating craft." 33 U.S.C. 1362(12). A "point source" is any "discernible, confined and discrete conveyance" but does not include "agricultural stormwater discharges and return flows from irrigated agriculture." 33 U.S.C. 1362(14).

The term “pollutant” includes, among other things, “garbage... chemical wastes, biological materials ...and industrial, municipal, and agricultural waste discharged into water.” 33 U.S.C. 1362(6).

One way a person may discharge a pollutant without violating the section 301 prohibition is by obtaining authorization to discharge (referred to herein as “coverage”) under a section 402 NPDES permit (33 U.S.C. 1342). Under section 402(a)(1), EPA may “issue a permit for the discharge of any pollutant, or combination of pollutants, notwithstanding section 1311(a)” upon certain conditions required by the Act.

2. NPDES Permits

An NPDES permit authorizes the discharge of a pollutant or pollutants into a receiving water under certain conditions. The NPDES program relies on two types of permits: individual and general. An individual permit is a permit specifically tailored for an individual discharger or situations that require individual consideration. Upon receiving the appropriate permit application(s), the permitting authority, *e.g.*, EPA or a state, develops a draft permit for public comment for that particular discharger based on the information contained in the permit application (type of activity, nature of discharge, receiving water quality). Following consideration of public comments, a final permit is then issued to the discharger for a specific time period (not to exceed 5 years) with a provision for reapplying for further permit coverage prior to the expiration date.

In contrast, a general permit covers multiple facilities/sites/activities within a specific category for a specific period of time (not to exceed 5 years). For general permits, the permitting authority, *e.g.*, EPA, or a state, develops and issues the permit in advance, with dischargers then generally obtaining coverage under the permit through submission of a Notice of Intent (NOI). A general permit is also subject to public comment prior to issuance. EPA is the permitting authority for the geographic areas that have not been authorized by EPA to issue NPDES permits. Each permitting authority should review their permittees and geographic area and develop appropriate permits considering technology and water quality. In addition, states may issue a permit that has different requirements from EPA’s permit for similar types of discharges of pollutants, as long as it satisfies the regulatory requirements of the NPDES program, the CWA, and state law.

Under 40 CFR 122.28, general permits may be written to cover categories of point sources having common elements, such as facilities that involve the same or substantially similar types of operations, that discharge the same types of wastes, that require the same effluent limitations or operating conditions, that require the same or similar monitoring, and that discharges are more appropriately controlled under a general permit. The application of biological and chemical pesticides is a category of dischargers that discharges the same types of wastes (*i.e.*, pesticides) such that same or similar permit conditions are appropriate. In addition, given the significant number of pesticide operations requiring NPDES permit coverage and the discharges of pollutants common to these operations, it makes administrative sense to issue the general permit, rather than issuing individual permits to each Operator.

Courts have approved of the use of general permits. See *e.g.*, *Natural Res. Def. Council v. Costle*, 568 F.2d 1369 (D.C. Cir. 1977); *EDC v. US EPA*, 344 F.3d 832, 853 (9th Cir. 2003). The general permit approach allows EPA to allocate resources in a more efficient manner and to

provide more timely coverage and may significantly simplify the permitting process for the majority of pesticide dischargers. As with any permit, the CWA requires the general permit to contain technology-based effluent limitations, as well as any more stringent limits when necessary to meet applicable state water quality standards. State water quality standards apply in the state and in the territorial seas, defined in section 502(8) of the CWA as extending three miles from the baseline. *Pacific Legal Foundation v. Costle*, 586 F.2d 650, 655-656 (9th Cir. 1978); *Natural Resources Defense Council, Inc. v. U.S. EPA*, 863 F.2d 1420, 1435 (9th Cir. 1988).

3. History of Pesticide Application Regulation

EPA regulates the sale, distribution and use of pesticides in the United States under the statutory framework of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) to ensure that when used in conformance with FIFRA labeling directions, pesticides will not pose unreasonable risks to human health and the environment. All new pesticides, for which registration is required, must undergo a registration procedure under FIFRA during which EPA assesses a variety of potential human health and environmental effects associated with use of the product. Under FIFRA, EPA is required to consider the effects of pesticides on the environment by determining, among other things, whether a pesticide “will perform its intended function without unreasonable adverse effects on the environment,” and whether “when used in accordance with widespread and commonly recognized practice [the pesticide] will not generally cause unreasonable adverse effects on the environment.” 7 U.S.C. 136a(c)(5). In performing this analysis, EPA examines the ingredients of a pesticide, the intended type of application site and directions for use, and supporting scientific studies for human health and environmental effects and exposures. The applicant for registration of the pesticide must provide specific data from tests done according to EPA guidelines.

When EPA approves a pesticide for a particular use, the Agency imposes restrictions through labeling requirements governing such use. The restrictions are intended to ensure that the pesticide serves an intended purpose and avoids unreasonable adverse effects. It is illegal under section 12(a)(2)(G) of FIFRA to use a registered pesticide in a manner inconsistent with its labeling. States have primary authority under FIFRA to enforce “use” violations, but both the states and EPA have ample authority to prosecute pesticide misuse when it occurs. 7 U.S.C. 136j(a)(2)(G).

4. Court Decisions Leading to the CWA Regulation Concerning Pesticide Applications

In the past, several courts have addressed the question of whether the CWA requires NPDES permits for pesticide applications. These cases resulted in some confusion among the regulated community and other affected citizens about the applicability of the CWA to pesticides applied to waters of the United States.

On November 27, 2006, EPA issued a final rule (hereinafter called the “2006 NPDES Pesticides Rule”) clarifying two specific circumstances in which an NPDES permit was not required to apply pesticides to or around water. They were: 1) the application of pesticides directly to water to control pests; and 2) the application of pesticides to control pests that are present over, including near, water where a portion of the pesticides will unavoidably be deposited to the water to target the pests, provided that the application is consistent with relevant FIFRA requirements in both instances. The rule became effective on January 26, 2007.

On January 7, 2009, the Sixth Circuit vacated EPA's 2006 NPDES Pesticides Rule under a plain language reading of the CWA. *National Cotton Council of America v. EPA*, 553 F.3d 927 (6th Cir., 2009). The Court held that the CWA unambiguously includes "biological pesticides" and "chemical pesticides" with residuals within its definition of "pollutant." Specifically, an application of chemical pesticides that leaves no excess portion is not a discharge of a pollutant, and the applicator need not obtain an NPDES permit. However, chemical pesticide residuals are pollutants as applied if they are discharged from a point source for which NPDES permits are required. Biological pesticides, on the other hand, are always considered a pollutant under the CWA regardless of whether the application results in residuals or not and require an NPDES permit for all discharges of pollutants from a point source.

As a result of the Court's decision to vacate the 2006 NPDES Pesticides Rule, after October 31, 2011 NPDES permits are required for discharges to waters of the United States of biological pesticides, and of chemical pesticides that leave a residue. EPA and all NPDES-authorized states and territories have developed and are implementing NPDES permits for pollutant discharges resulting from pesticide applications. EPA Regional offices and state NPDES authorities may issue additional general permits or individual permits if appropriate.

5. Publication of Draft Pesticide General Permit

EPA published for purposes of public notice a draft NPDES pesticide general permit for point source discharges from the application of pesticides to waters of the United States on January 15, 2021 (86 FR 4070). The draft permit was developed to apply in all ten EPA Regions in areas where EPA remains the NPDES permitting authority. The federal register notice for the draft permit briefly summarized the requirements in the draft permit and also identified a list of minor proposed changes.

6. Public Comments Received on Draft Pesticide General Permit

EPA received 8 sets of written comments on the draft PGP. EPA has prepared a response to comments document which is available in the docket for the 2021 PGP. Comments were used to inform EPA's decision-making in finalizing the 2021 PGP. This fact sheet does not discuss EPA's rationale for changes made to the permit based on public comments. EPA's response to the comments, including the Agency's rationale for changes to the permit are reflected in the response to comments document also available in the docket. (Docket ID No. EPA-HQ-OW-2020-0005 available at: <https://www.regulations.gov/>)

7. ESA Consultation

The Endangered Species Act (ESA) of 1973 requires all federal agencies to ensure, in consultation with the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) (together, the Services), that any Federal action carried out by the Agency is not likely to jeopardize the continued existence of any endangered species or threatened species (together, listed species), or result in the adverse modification or destruction of habitat of such species that is designated by the Services as critical (critical habitat). See 16 U.S.C 1536(a)(2), 50 CFR 402. When a federal agency's action "may affect" a protected species, that agency is required to consult with one or both of the Services, depending upon the endangered species, or designated critical habitat that may be affected by the action (50 CFR 402.14(a)).

To evaluate how the 2021 PGP would likely affect listed species and their critical habitat (together, listed resources), EPA prepared a Biological Evaluation (BE), a copy of which is available in the administrative record for the 2021 PGP (Docket ID No. EPA-HQ-OW-2020-0005 available at: <https://www.regulations.gov/>), which concluded that in some instances the PGP may affect listed resources. EPA provided the BE to the Services on March 2, 2021.

On July 29, 2021, NMFS provided EPA with its final Biological and Conference Opinion. The final PGP reflects the provisions that were made following consultation with the NMFS and are designed to ensure that discharges allowed under the PGP are not likely to cause jeopardy to the continued existence of listed species and their critical habitat. See Part I.8 for discussion on the final PGP requirements. The final PGP is consistent with the Reasonable and Prudent Alternative (RPA) set forth in NMFS's final Biological Opinion. The Biological Opinion is available in the docket. (Docket ID No. EPA-HQ-OW-2020-0005 available at: <https://www.regulations.gov/>)

EPA continues to be in consultation with FWS. EPA is issuing the 2021 PGP to replace the 2016 PGP that expires on October 31, 2021, because without coverage by an NPDES permit certain discharges to waters of the United States from the application of pesticides will be in violation of the CWA, and could be subject to citizen suits or enforcement actions. For these reasons, EPA has determined that it is of the utmost importance to issue the final PGP while consultation is pending. Once consultation is complete, EPA will modify this permit should the Agency find that the consultation demonstrates that different permit limits or additional conditions to protect listed resources are warranted. Any such change would require public notice and an opportunity for comment. The current permit would remain in effect during those proceedings.

EPA's decision to issue this permit while consultation is ongoing is consistent with ESA section 7(d) because its issuance does not foreclose either the formulation by the Services, or the implementation by EPA, of any alternatives that might be determined in the consultation to be necessary to comply with ESA section 7(a)(2). For further discussion, see memo included in the administrative record for this permit (Docket ID No. EPA-HQ-OW-2020-0005 available at: <https://www.regulations.gov/>).

8. Provisions in the Final 2021 PGP to address National Marine Fisheries Services (NMFS) Listed Resources of Concern

Following ESA consultation with NMFS, the conditions and requirements in the final 2021 PGP remain unchanged from the 2016 PGP and the proposed 2021 PGP, although there are some minor updates to the permit:

- Updated the definition for NMFS Listed of Resources of Concern to include the 2021 Biological Opinion;
- Added the definition for "Take" in Appendix A of the PGP;
- Updated Part 1.1.2.4 of the permit, the NOI form, and the ESA procedures in Appendix I of the permit to improve instructions and clarifications in the ESA procedures for applicants.

- Updated Appendix I of the permit to include list of pesticides that a NMFS' biological opinion has determined the labeled use would jeopardize the continued existence of ESA-listed species and/or adversely modify designated critical habitat.

Permit requirements for Decision-makers with discharges to waters of the United States containing NMFS Listed Resources of Concern continue to include:

- a. submittal of a Notice of Intent (NOI) for coverage under the PGP;
- b. implementation of pest management measures to meet the technology-based effluent limitations that are based on IPM principles, except those Decision-makers that will need to submit an NOI only because they discharge to waters of the United States containing NMFS Listed Resources of Concern, and that also comply with provisions in Part 1.6; and
- c. submittal of annual reports.

EPA's PGP requires anyone seeking permit coverage to determine if their pesticide discharges would be to waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A of the permit. Appendix I contains a four-step process that must be followed for determining whether an Operator is eligible for permit coverage, prior to submittal of the NOI.

NOIs for point source discharges to waters of the United States containing NMFS Listed Resources of Concern are due at least 30 days prior to commencement of discharge to waters of the United States except where pesticide applications are being made in response to a Declared Pest Emergency Situation, as identified in Appendix A of the permit. For those Declared Pest Emergency Situations, NOIs are due no later than 15 days after beginning discharge. Declared Pest Emergency Situations are eligible for permit coverage for a period of at least 60 days after beginning to discharge. Operators may continue to discharge after 60 days in these situations unless EPA notifies them that the discharge raises concern related to NMFS Listed Resources of Concern, in which case EPA will either direct that the discharge cease within the 60 day time frame, or specify additional conditions to protected NMFS Listed Resources of Concern.

Decision-makers can contact EPA or NMFS in advance of NOI submission to assess permit coverage eligibility for planned discharges to waters of the United States containing NMFS Listed Resources of Concern. EPA expects this advance contact will help Decision-makers determine if planned pesticide applications are or are not likely to result in any short or long term adverse effects to listed species and if so, to identify steps that should be taken to ensure that such adverse effects do not occur.

EPA will notify NMFS immediately upon submission of any NOI that identifies discharges to waters of the United States containing NMFS Listed Resources of Concern. NMFS will have 30 days from the NOI submission date to provide EPA with a determination as to whether it believes the eligibility criterion of "not likely to adversely affect listed species or designated critical habitat," has been met, could be met with conditions that NMFS specifies, or has not been met. EPA expects to rely on NMFS' expertise with regard to NMFS Listed Resources of Concern when considering whether the prospective discharges would have any short or long term adverse effects on NMFS Listed Resources of Concern, and whether to withhold authorization. If NMFS does not provide EPA with this information within 30 days of EPA

posting on the Internet receipt of a complete and accurate NOI, the discharges will be authorized 30 days after EPA posts on the Internet receipt of a complete NOI. EPA could, after receiving NMFS' determination (or other issues raised by other parties) decide to place the NOI on hold (i.e., delay authorization to discharge) if necessary. EPA may authorize certain discharges in less than 30 days, but no fewer than 10 days, for any discharges under Criterion B, C, or E of Part 1.1.2.4 of the permit (for which NMFS has already evaluated the effects of these discharges).

II. Structure of the 2021 PGP

1. General

This permit is written for the many specific areas of the country for which EPA remains the NPDES permitting authority. The permit is constructed in such a way that each Region will sign and issue the final PGP and include in that issuance CWA Section 401 certification language for areas in their Region covered by the permit. Specifically, the permit provides coverage for certain point source discharges of pollutants that occur in areas not covered by an authorized state NPDES permit program and includes specific areas (*e.g.*, states, territories, Indian Country, or federal facilities) in all ten EPA Regions. The complete list of areas of geographic coverage of this permit, along with the NPDES permit numbers are listed in Appendix C of the 2021 PGP.

States and territories that are authorized to issue NPDES permits will continue to administer their own NPDES permits to cover such discharges of pollutants. Nothing in the federal regulations precludes a state from adopting or enforcing requirements in their own permits that are appropriate to address discharges of pollutants in their state or are more stringent or more extensive than those required by EPA under the NPDES regulations. See CWA section 510. In fact, the CWA is meant to serve as a baseline for state environmental protection. The CWA and corresponding NPDES regulations require that permits, at a minimum, include the requirements detailed in 40 CFR 122.44 (but not necessarily in the same way as in this permit). States are free to incorporate additional or different requirements that they feel are appropriate to protect water quality. Similarly, how EPA and states interpret information from which permit requirements are developed may differ. For example, the regulations, as written at 40 CFR 122.44(i) specify that monitoring requirements be included to assure compliance with permit limitations. One permit writer may make a best professional judgment (BPJ) determination that monitoring of discharges of pollutants reasonably should occur during pesticide application while a second permit writer may make a BPJ determination that monitoring of discharges of pollutants should reasonably be performed after pesticide application. It is reasonable that the two different permit writers may come to different conclusions about how best to incorporate this requirement into the permit.

Throughout the fact sheet (and permit), EPA uses consistent terms when referring to what activity or discharge of pollutants will be eligible for coverage and who will be responsible to comply with the terms of the permit. Specifically, the permit holder is referred to as the "Operator." This term has a similar meaning to the term "permittee" which is also used in the fact sheet; generally, the term permittee is specific to the period of time that an Operator or contractor is actually covered under the permit. More details on how an Operator may obtain permit coverage and the applicable permit requirements are provided in Part III of the fact sheet.

The permit is divided into nine parts: (1) Coverage Under This Permit, (2) Technology-Based Effluent Limitations, (3) Water Quality-Based Effluent Limitations, (4) Monitoring, (5) Pesticide Discharge Management Plan, (6) corrective action, (7) Recordkeeping and Annual Reporting, (8) EPA contact information and mailing addresses, and (9) Permit Conditions Applicable to Specific States, Indian Country, or Territories. Additionally, the permit includes nine appendices with additional conditions and guidance for permittees: (A) Definitions, Abbreviations, and Acronyms, (B) standard permit conditions, (C) Areas Covered, (D) Notice of Intent Form, (E) Notice of Termination Form, (F) Pesticide Discharge Evaluation Worksheet, (G) Annual Report Template, (H) Adverse Incident Report Template, and (I) Endangered Species Procedures.

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. As will be discussed in more detail in Part III of the fact sheet, the permit establishes different requirements for different types of pesticide use patterns, different types of Operators, and different sizes of areas treated and managed for the control of pests. The organization of the permit is intended to clarify the applicable requirements for Operators to the greatest extent possible.

2. Conformance to Court Decisions

Similar to the 2016 PGP, EPA has structured this 2021 PGP to conform to relevant court decisions. One of these cases held that because the terms of the Nutrient Management Plan (NMP) employed by concentrated animal feeding operations (CAFO) imposed restrictions on discharges of pollutants, those restrictions amounted to effluent limitations that needed to be made part of the permit and to be subject to public and permit writer review. *Waterkeeper Alliance, Inc. v. EPA*, 399 F.3d 486 (2nd Cir. 2005). In this respect, this permit is different from the CAFO requirements. In this permit, EPA explicitly establishes effluent limitations in Parts 2 and 3 that are independent of any documentation and recordkeeping requirements regarding implementation of the limitations. In a separate part of the permit (Part 5) there is a requirement to develop a Pesticide Discharge Management Plan (PDMP). The PDMP is not a limitation and does not itself impose requirements on discharges of pollutants. These are already imposed by the limitations in Parts 2 and 3. The PDMP is rather a tool for those Operators who are defined as Decision-makers to document, among other things, how Pest Management Measures will be implemented to comply with the permit's effluent limitations.

Effluent Limitations in the 2021 PGP

Part 2 of the PGP contains the technology-based effluent limitations. Part 3 of the PGP contains the water quality-based effluent limitations. These Parts of the permit contain effluent limitations, defined in the CWA as restrictions on quantities, rates, and concentrations of constituents that are discharged. CWA section 502(11). Violation of any of these effluent limitations constitutes a violation of the permit. As is described in more detail in Part III.2 of the fact sheet, under the CWA these effluent limitations can be narrative rather than numeric.

The technology-based effluent limitations set forth in Part 2 of the PGP require the Operator to minimize the discharge of pollutants to waters of the United States from the application of pesticides. Consistent with the control level requirements of the CWA, the term “minimize” means to reduce and/or eliminate pollutant discharges to waters of the United States through the use of Pest Management Measures to the extent technologically available and

economically achievable and practicable for the category or class of point sources covered under the permit, taking into account any unique factors relating to the Operators to be covered under the permit. The technology-based effluent limitations section is divided into two parts. The first part applies to all Applicators and addresses the general requirement to minimize discharges from the application of pesticides. In this part, all Applicators must minimize discharges of pollutants by using only the amount of pesticide product per application and frequency of pesticide applications necessary to control the target pest, performing regular maintenance activities, calibrating and cleaning/repairing application equipment, and assessing weather conditions in the treatment area. The second part requires certain Decision-makers to implement pest management measures that involve the following: (1) identifying and assessing the pest problem; (2) assessing effective pest management; and (3) following specified procedures for pesticide application (see Part 2.2 of the PGP).

In addition to the technology-based effluent limitations, Part 3 of the PGP contains the water-quality-based effluent limitations. The Operator must control its discharge of pollutants as necessary to meet applicable water quality standards. Any discharge of pollutants that results in an excursion of any applicable numeric or narrative EPA-approved state, territory, tribal or EPA-promulgated water quality standard is prohibited. In general, based on the data included in the record and the additional requirements in the permit, in addition to FIFRA's requirements and the data and information upon which FIFRA registrations are based, EPA expects that compliance with the technology-based effluent limitations and other terms and conditions in the permit will meet applicable water quality-based effluent limitations. To date, after over eight years of implementation of the prior permits, EPA does not have any evidence in the record that the existing and prior permits are causing water quality problems. However, if at any time the Operator or EPA determines that the discharge of pollutants causes or contributes to an excursion of applicable water quality standards, the Operator must take corrective actions as required in Part 6 of the PGP, and document and report the excursion(s) to EPA as required in Part 7 of the PGP. Furthermore, consistent with Parts 3.0 and 6.3 of the PGP, EPA may impose additional water quality-based limitations on a site-specific basis, or require the Operator to obtain coverage under an individual permit, if information in an NOI, required reports, or from other sources indicates that, after meeting the technology-based limitations in the permit, the discharges of pollutants are not controlled as necessary to meet applicable water quality standards. EPA also notes that among the eligibility requirements for coverage under the permit are requirements that the permit does not cover discharges of any pesticide into a water impaired by a substance which either is an active ingredient in that pesticide or is a degradate of such an active ingredient, or into an Outstanding National Resource Water (40 C.F.R. 131.12), often referred to as a "Tier 3 water" (except for pesticide applications made to restore or maintain water quality or to protect public health or the environment that either do not degrade water quality or only degrade water quality on a short-term or temporary basis). These eligibility conditions further help EPA to issue a general permit while protecting water quality on a water-body-specific basis.

Pesticide Discharge Management Plan (PDMP)

Distinct from the technology-based or water quality-based effluent limitation provisions in the permit, Part 5.0 of the PGP requires Decision-makers that must submit an NOI and that are large entities to prepare a PDMP to document the implementation of Pest Management Measures being used to comply with the effluent limitations set forth in Parts 2.0 and 3.0 of the PGP. A large entity, as defined in Appendix A of the PGP, is (1) a public entity that serves a population

greater than 10,000 people or (2) a private enterprise that exceeds the Small Business Administration “size standards” as provided in 13 CFR 121.201.

In general, Part 5.0 of the PGP requires that the following be documented in the PDMP: (1) pesticide discharge management team information; (2) problem identification; (3) pest management options evaluation; (4) response procedures pertaining to spills and adverse incidents; (5) documentation to support eligibility considerations under other federal laws, and (6) signature requirements. The PDMP must be kept up-to-date and modified whenever necessary to document any corrective actions as necessary to meet the effluent limitations in the permit.

The requirement to prepare a PDMP is not an effluent limitation because it does not restrict quantities, rates, and concentrations of constituents that are discharged. CWA section 502(11). Instead, the requirement to develop a PDMP is a permit “term or condition” authorized under sections 402(a)(2) and 308 of the Act. Section 402(a)(2) states, “[t]he Administrator shall prescribe conditions for [NPDES] permits to assure compliance with the requirements of paragraph (1) of this subsection, including conditions on data and information collection, reporting, and such other requirements as he deems appropriate.” The PDMP requirements set forth in the permit are terms or conditions under the CWA because the Operator is documenting information on how it is complying with the effluent limitations (and inspection and evaluation requirements) contained elsewhere in the permit. Thus, the requirement to develop a PDMP and keep it updated is no different than other information collection conditions, as authorized by section 402(a)(2), in other permits. Failure to have a PDMP, where required, is a violation of the permit.¹

While Part 2 of the PGP requires the Operator to select Pest Management Measures to meet the effluent limitations in the permit, the Pest Management Measures themselves described in the PDMP are not effluent limitations because the permit does not impose on the Operator the obligation to comply with the PDMP; rather, the permit imposes on the Operator the obligation to meet the effluent limitations prescribed in Parts 2.0 and 3.0 of the PGP. Therefore, the Operator is free to change as appropriate the Pest Management Measures used to meet the effluent limitations contained in the permit. This flexibility helps ensure that the Operator is able to adjust its practices as necessary to ensure continued compliance with the permit’s effluent limitations. However, the permit also contains a recordkeeping condition that requires that the PDMP be updated with any such changes in the Operator’s practices. See Part 5.2 of the PGP. Thus, if an Operator’s on-the-ground practices differ from what is in the PDMP, this would constitute a violation of the permit’s recordkeeping requirement to keep the PDMP up-to-date, and not per se a violation of the permit’s effluent limitations, which are distinct from the PDMP. EPA recognizes, however, that because the PDMP documents how the Operator is meeting the effluent limitations contained in the permit, not following through with actions identified by the

¹ 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 2021 PGP, the PDMP serves a similar purpose as the CGP SWPPP.

Operator in the PDMP as the method of complying with the effluent limitations in the permit is relevant to evaluating whether the Operator is complying with the permit's effluent limitations.

Public Availability of Documents

Part 5.3 of the PGP requires that the Operator retain a copy of the current PDMP at the address listed on the NOI and it must be immediately available, at the time of an onsite inspection or upon request to EPA, state, tribal or local agencies governing wastewater discharges of pollutants and/or pesticide applications, and representatives of the United States Fish and Wildlife Service (FWS) or the National Marine Fisheries Service (NMFS). While not required to be submitted to EPA, interested persons can request a copy of the PDMP through EPA, at which point EPA 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 EPA, the Agency 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. NOIs will be publicly available once submitted through the NPDES eReporting Tool (NeT). The NOIs generally will be available to the public for 10 days before permit coverage begins. During this time period, issues can be raised with EPA, which has the authority to deny coverage.

3. Sharing of Responsibilities

This general permit was developed with the understanding that there may be more than one responsible entity for a given discharge of pollutant. As structured, the permit provides for sharing of responsibilities to meet the end goal of discharges of pollutants being in compliance with permit requirements. The NPDES regulations state that "Operators" are responsible for achieving permit compliance. Specifically, 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. EPA acknowledges, 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. The 2021 PGP includes a definition of "Operator" in Appendix A of PGP that is intended to clarify this point, focusing on the fact that Operator control exists both at the "Decision-maker" level about how to control pests, including financial considerations, as well as at the pesticide Applicator" level (such as calibration of pesticide application equipment). In these instances, both Operators, *i.e.*, the Decision-Maker and the Applicator, are required to obtain NPDES permit coverage; however, the permit strives to minimize any potential duplication of effort by identifying which Operator is responsible for certain permit conditions. The permit clarifies these responsibilities by identifying whether EPA expects these activities to be performed by all Operators, or just the Decision-maker or the Applicator.

Entities such as subcontractors that are hired by an owner or other entity but are under the supervision of such owner or entity generally are not Operators. Similarly, entities are likely not an Operator if, for example, they own the land, but the activities are being performed outside of their control (*e.g.*, a public entity is spraying for mosquitoes over private property, or a private party is spraying for weeds on public lands leased from the federal government).

EPA encourages Operators to use already prepared information and explore possible cost savings by sharing responsibilities for implementing aspects of this permit. For example, a mosquito control district may have developed something for their FIFRA program and they

could assume the overall coordination of an integrated pest management program while a hired contractor may be responsible for minimizing the pollutant discharge and for site monitoring and maintaining and calibrating pesticide application equipment. In instances where multiple Operators are responsible for the discharge from larger pesticide application activities, some form of written explanation of the division of responsibilities should be documented. However, any and all Operators covered under the permit are still responsible for any violation that may occur, though EPA may consider this written division of responsibilities when determining the appropriate enforcement response to a violation.

III. Summary of 2021 PGP Conditions

1. Coverage Under the 2021 PGP

1.1 Eligibility

1.1.1 Activities Covered

The activities covered under this 2021 PGP remain unchanged from the 2016 PGP. Only Operators meeting the eligibility requirements outlined in the 2021 PGP may be covered under the permit. If an Operator does not meet the eligibility provisions described in Part 1.1 of the PGP, the Operator's point source discharges of pollutants to waters of the United States² from the application of pesticides will be in violation of the CWA, unless the Operator has obtained coverage under another permit or the CWA exempts these discharges of pollutants from NPDES permit requirements. The activities covered by this permit generally include the use patterns and types of pest control activities described in the vacated 2006 NPDES Pesticides Rule. Under CWA section 502(14), agricultural stormwater and irrigation return flow are exempt from NPDES permits. Also, applications that do not reach waters of the United States do not need permit coverage. Thus, the 2021 PGP covers the discharge of pollutants (biological pesticides and chemical pesticides which leave a residue) to waters of the United States resulting from the following use patterns: (1) Mosquito and Other Flying Insect Pest Control; (2) Weed and Algae Control; (3) Animal Pest Control; and (4) Forest Canopy Pest Control, as summarized below:

Mosquito and Other Flying Insect Pest Control

This use pattern includes the application, by any means, of chemical and biological insecticides and larvicides into or over water to control insects that breed or live in, over, or near waters of the United States. Applications of this nature usually involve the use of ultra-low volume sprays or granular larvicides discharged over large swaths of mosquito breeding habitat and often are performed several times per year.

Weed and Algae Pest Control

This use pattern includes the application, by any means, of contact or systemic herbicides to control vegetation and algae (and plant pathogens such as fungi) in waters of the United States and at water's edge, including ditches and/or canals. Applications of this nature typically are single spot pesticide applications to control infestations or staged

² For information on the definition of "waters of the United States" and litigation updates, see <https://www.epa.gov/nwpr>.

large scale pesticide applications intended to control pests in several acres of waterway. Pesticide applications in a treatment area may be performed one or more times per year to control the pest problem.

Animal Pest Control

This use pattern includes the application, by any means, of pesticides into waters of the United States to control a range of animal pests for purposes such as fisheries management, invasive species eradication, or equipment operation and maintenance. Applications of this nature are often made over an entire or large portion of a waterbody as typically the target pests are mobile. Multiple pesticide applications to a waterbody for animal pest control are often made several years apart.

Forest Canopy Pest Control

This use pattern includes pest control projects in, over, or to forest canopies (aerially or from the ground) to control pests in the forest canopy where waters of the United States exist below the canopy. Applications of this nature usually occur over large tracts of land and are typically made in response to specific pest outbreaks. EPA understands that for this use pattern pesticides will be unavoidably discharged into waters of the United States in the course of controlling pests over a forest canopy as a result of pesticide application. These pests are not necessarily aquatic (*e.g.*, airborne non-aquatic insects) but are detrimental to industry, the environment, and public health. Note: EPA recognizes that mosquito adulticides are applied to forest canopies, and this application is covered under the “Mosquito and Other Flying Insect Pest Control” use pattern.

In the 2006 NPDES Pesticides Rule, EPA expressly noted that the rule did not cover either “spray drift” – the airborne movement of pesticide sprays away from the target application site into waters of the United States – or applications of pesticides to terrestrial agricultural crops where runoff from the crop, either as irrigation return flow or agricultural stormwater, discharges into waters of the United States.

Consistent with the 2006 NPDES Pesticides Rule and the 2016 PGP, this 2021 PGP does not cover spray drift resulting from pesticide applications. Instead, to address spray drift, EPA is actively engaged in several initiatives to help minimize pesticide drift problems such as: (1) evaluating potential for drift as a routine part of pesticides risk assessments; (2) in collaboration with experts, improving scientific models and methods for estimating drift and risks from drift; (3) strengthening labeling for new pesticides and when re-evaluating older pesticides; (improving the clarity and enforceability of product label directions and drift management restrictions; and (4) promoting applicator education and training programs. More information on EPA’s work on reducing pesticide drift is available at <https://www.epa.gov/reducing-pesticide-drift>.

Irrigation return flow (such as runoff from a crop field due to irrigation of that field) and agricultural stormwater runoff do not require NPDES permits, as exempted from the definition of point source under section 502(14) of the CWA. Neither the 2006 NPDES Pesticides Rule, the Sixth Circuit Court vacatur of that rule, nor any version of the PGP have changed in any way the determination of whether certain types of stormwater discharges are required to obtain permit coverage, or under which permit coverage is required. This is true whether the discharge of pollutants contains pesticides or pesticide residues resulting from the application of pesticides. In

particular, non-agricultural stormwater that may contain pesticides would not be eligible for coverage under the permit, and is not required to obtain NPDES permit coverage unless otherwise required under section 402(p) of the Clean Water Act. Existing stormwater permits for construction, industrial activity, and regulated municipal separate storm sewer systems (MS4s) already address pesticides in stormwater from those sources. Thus, stormwater is either: (a) already subject to NPDES permit requirements pursuant to section 402(p) of the CWA or (b) is a discharge for which NPDES permit coverage is not currently required under section 402(p). The regulations that specify what types of stormwater require NPDES permits can be found in 40 CFR §122.26 and 122.30-122.37.

EPA determined that the four use patterns included in the 2021 PGP would encompass the majority of pesticide applications that would result in point source discharges of pollutants to waters of the United States and generally represent the use patterns intended to be addressed by the 2006 rule that is now vacated. This permit does not cover, nor is permit coverage required, for pesticides applications that do not result in a point source discharge of pollutants to waters of the United States, such as for the purpose of controlling pests on agricultural crops, forest floors, or range lands. However, the application of herbicides in waters of the United States and the control of pests on plants grown in waters of the United States, such as perennial obligate hydrophytes, is within the permit's scope of coverage. This fact sheet does not identify every activity which may involve a point source discharge of pollutants to waters of the United States that would require a permit; rather, the fact sheet focuses on the activities for which coverage under the 2021 PGP is available. The existence of this general permit does not alter the requirement that discharges of pollutants to waters of the United States that are not covered by this permit be covered by an individual permit or another general permit.

Scope of Permit

The Sixth Circuit Court of Appeals found that if a chemical pesticide leaves any excess or residue after performing its intended purpose, such excess or residue would be considered a pollutant under the CWA. The Court also found that, unlike chemical pesticides, not only would the residue and excess quantities of a biological pesticide be considered a pollutant, but so too would the biological pesticide itself under the CWA.

As defined in 40 CFR 122.2, "*Pesticide residue* for the purpose of determining whether an NPDES permit is needed for discharges of pollutants to waters of the United States from pesticide application, means that portion of a pesticide application that is discharged from a point source to waters of the United States and no longer provides pesticidal benefits. It also includes any degradates of the pesticide."

A permit would not be necessary if it is determined that pesticide residual does not enter waters of the United States. The Operator applying pesticides with a discharge to waters of the United States can support their determination with scientific data. Such data should show what level of the pesticide can be detected in water, and at what level in water the pesticide provides a pesticidal benefit. Such data should address the properties of the chemical pesticide under different water conditions (e.g., different pH, organic content, temperature, depth, etc.) that might affect the pesticide's properties.

EPA offers the following guidance with respect to the use patterns of chemical pesticides covered by this general permit.

1. If the application of a chemical pesticide is made over waters of the United States to control pests over the water, any amount of the pesticide that falls into waters of the United States is “excess” pesticide and would require coverage by an NPDES permit.
2. If the application of a chemical pesticide is made into waters of the United States to control a pest in such waters, any amount of the pesticide that remains in those waters and no longer provides any pesticidal benefit is a “residual” and would require coverage by an NPDES permit. See 40 CFR 122.2 for the definition of pesticide residue.
3. This permit authorizes discharges of pollutants associated with four categories of pesticide application activities: mosquito and other flying insect pest control, weed and algae pest control, animal pest control, forest canopy pest control. As noted above, only point source discharges of pollutants to waters of the United States require a permit, and it is beyond the scope of this fact sheet to identify all specific activities that do or do not require a permit. However, to the extent that activities that fall within the four covered categories require a permit, they can be authorized by this general permit if all eligibility requirements are met. For two of the categories, weed and algae pest control and animal pest control, the permit specifies that covered activities include applications to control pests “in water and at water’s edge.” EPA intends for the phrase “at water’s edge” to allow coverage of activities targeting pests that are not necessarily “in” the water but are near the water such that control of the pests results in a point-source discharge of pollutants to waters of the United States. The category forest canopy pest control is for applications to a forest canopy. EPA intends that this can include both mature and immature forest canopies, including canopies that may not be continuously connected, where control of pests associated with the canopy (*i.e.*, branches and leaves of the trees) results in a point source discharges of pollutants to waters of the United States.

For purposes of this permit, EPA is relying on existing regulatory definitions in 40 CFR 174.3 and 158.2100(a) developed under FIFRA to define the term “biological pesticides.” For purposes of this permit, EPA identifies biological pesticides (also called “biopesticides” under FIFRA regulations) to include microbial pesticides [40 CFR 158.2100(b)], biochemical pesticides [40 CFR 158.2000(a)(1)] and plant-incorporated protectants. [40 CFR 174.3]

EPA recognizes that there are many site-specific situations which will determine whether a pesticide application operation needs permit coverage. EPA is not attempting to define all such situations in this fact sheet. Additionally, any pesticide application activities that do not fall within the four use patterns covered by this permit will require coverage under some other NPDES permit if those activities result in point source discharges of pollutants to waters of the United States. However, the Agency does want to make it clear that to the extent pesticide application operations need permit coverage, this permit is available for the four pesticide use categories.

Additionally, as described in Part I.4 of the fact sheet, the permit does not cover discharges of pollutants that, by law, are not required to obtain NPDES permit coverage. Of note, the CWA specifically excludes from the definition of point source, “agricultural stormwater discharges and

return flow from irrigated agriculture.” Nothing in this permit changes the effect of those statutory exemptions.

See Appendix D of the fact sheet for discussion on the cost impact and the universe of Operators covered under this permit.

1.1.2 Limitations on Coverage

1.1.2.1 Discharges of Pollutants to Water Quality Impaired Waters

This permit specifies eligibility requirements for coverage under this general permit for discharge of pollutants to impaired waters. The requirements remain unchanged from the 2011 PGP and 2016 PGP. Coverage under the permit is only available for certain discharges of pollutants to impaired waters. Discharges of pollutants to waters which are impaired for a substance which is not an active ingredient in that pesticide or a degradate of such an active ingredient are eligible for coverage. Discharges of pollutants to waters impaired for temperature or some other indicator parameter, or for physical impairments such as “habitat alteration” are also eligible for 2021 PGP coverage, unless otherwise notified by EPA. Conversely, the permit is not available for the discharge of any pesticide to water that is impaired for a substance that is an active ingredient in that pesticide or a degradate of such an active ingredient. For example, application of the pesticide copper sulfate to a waterbody impaired for either copper or sulfates would not be eligible for coverage under this permit, because copper sulfate can degrade into these two substances. In this instance, the Operator would have to choose between obtaining coverage under an individual permit for such a discharge or selecting some other means of pest management, *e.g.*, using mechanical means or a different pesticide active ingredient.

For this permit, EPA determined that it does not have information warranting a limitation for all impaired waters regardless of the impairment. In fact, the application of a pesticide to water in some instances actually improves the quality of the water, such as when used to control algae growth that can deplete oxygen levels in water. It is important to note that this permit allows EPA, based on additional information, to opt not to approve coverage under the 2021 PGP, or at a later date to require an Operator covered under the 2021 PGP to apply for coverage under an individual permit.

For purposes of this permit, impaired waters are those that have been identified by a state, territory, tribe, or EPA pursuant to Section 303(d) of the CWA as not meeting applicable water quality standards. Impaired waters for purposes of the 2021 PGP include both waters with EPA-approved and EPA-established Total Maximum Daily Loads (TMDLs), and those for which EPA has not yet approved or established a TMDL. (A list of impaired waters, along with the pollutants or pollution identified as the cause of the impairment is available at <https://www.epa.gov/tmdl>). Since the 303(d) list provides the most readily-available evidence of impairment, Operators should use it when deciding whether their discharges of pollutants meet the eligibility requirements regarding waterbodies impaired for specific pesticides. Thus, these requirements will further ensure protection of water quality.

Also, several states have listed waters as impaired for “pesticides” but have not identified the specific pesticide for which the waterbody is impaired. Without additional information suggesting that the waterbody is impaired for a specific active ingredient or degradate of that active ingredient, EPA is providing coverage under this permit for discharges of pollutants to

waters that are impaired generally for “pesticides.” The Agency expects that as these impaired waters are further assessed, specific pesticides or classes of pesticides will be identified as the cause of the impairment, at which point dischargers will no longer be eligible to obtain permit coverage under the 2021 PGP for discharges of those named pesticide active ingredients or degradates of such. Additional discussion of existing impairments identified for which pesticides are identified as the source of the impairment is provided in Part III.3 of the fact sheet.

1.1.2.2 Discharges of Pollutants to Waters Designated as Tier 3 for Antidegradation Purposes

This permit specifies requirements for coverage under this general permit for discharges of pollutants to Tier 3 waters. These waters are called “Outstanding National Resource Waters” in the regulations. 40 C.F.R. 131.12. The requirements remain unchanged from the 2011 PGP and 2016 PGP. This permit provides coverage for discharges of pollutants made to restore or maintain water quality or to protect public health or the environment that either do not degrade water quality or only degrade water quality on a short-term or temporary basis. This is consistent with EPA’s longstanding view that “[s]tates may allow some limited activities which result in temporary and short-term changes in water quality. Such activities are considered to be consistent with the intent and purpose of [a Tier 3 water].” 48 FR 51400, 51403 (1983).

States and tribes provide the most stringent level of antidegradation protection, *i.e.*, Tier 3 protection. These waters are often regarded as the highest quality waters of the United States, but the Tier 3 designation also provides special protection for waters of exceptional ecological significance, *i.e.*, those which are important, unique, or sensitive ecologically. Except for certain temporary changes, Tier 3 protection means that water quality cannot be lowered in such waters. In broad terms, EPA’s view of “temporary” is weeks and months, not years. States and tribes make the decision of which water bodies to designate as Tier 3. A list of Tier 3 waters in areas where the 2021 PGP is available can be accessed on the Internet at <https://www.epa.gov/npdes/pesticide-permitting>.

This permit requires additional documentation and reporting for discharges of pollutants to Tier 3 waters. See Part 5.1.2 of the PGP. Any Decision-maker planning to discharge to a Tier 3 water must submit a Notice of Intent (NOI) consistent with Part 1.2.2 of the PGP. NOIs for such discharges of pollutants are required to identify the Tier 3 water by name, and provide a discussion of the environmental problem and demonstration that the pollutant discharge is necessary to protect water quality, the environment, and/or public health. This NOI requirement includes the requirement for any Decision-maker already covered under the 2021 PGP who wants to discharge to a Tier 3 water at a later date, to submit an updated NOI containing the information identified above for discharges of pollutants to Tier 3 waters. Additionally, NOIs for any discharges of pollutants to Tier 3 waters must be submitted at least 10 days before beginning discharge unless discharges of pollutants are in response to a Declared Pest Emergency Situation, in which case, an NOI is due for such discharges of pollutants no later than 15 days after beginning discharge (if water contains NMFS Listed Resource of Concern) or 30 days after beginning discharge (if no NMFS Listed Resource of Concern). Decision-makers are required to submit an NOI consistent with the earliest due date identified in Table 1-2 of the PGP.

Of note, some states have adopted alternative approaches to designating Tier 2 or Tier 3 waters. These are collectively referred to as “Tier 2.5” waters since they fall between Tiers 2 and

3 in terms of characteristics and regulations supporting them. Tier 2.5 waters are commonly described as providing protection more stringent than Tier 2 but allowing some added flexibility that a Tier 3 water would not. Refer to Memorandum from William Diamond (Former Director, Standards and Applied Science Division) to Victoria Binetti (Chief, Region III, Program and Support Branch), June 13, 1991. Examples of Tier 2.5 waters exist in Massachusetts, which designates “outstanding resource waters” (ORWs). These waters have exceptional sociologic, recreational, ecological and/or aesthetic values and are subject to more stringent requirements under both the Massachusetts Water Quality Standards and the Massachusetts Stormwater Management Standards. ORWs include vernal pools certified by the Natural Heritage Program of the Massachusetts Department of Fisheries and Wildlife and Environmental Law Enforcement, all Class A designated public water supplies with their bordering vegetated wetlands, and other waters specifically designated. The 2021 PGP does not restrict eligibility for discharges of pollutants to Tier 2.5 waters.

1.1.2.3 Discharges of Pollutants Currently or Previously Covered by Another Permit

Part 1.1.2.3 of the PGP describes situations where an Operator is ineligible for coverage under this permit because of coverage under another permit. The permit provisions remain unchanged from the 2011 PGP and 2016 PGP. These include discharges of pollutants currently covered under an NPDES permit and discharges of pollutants from activities where the associated NPDES permit has been or is in the process of being denied, terminated, or revoked by EPA (although this last provision does not apply to the routine reissuance of permits every five years).

1.1.2.4 Endangered and Threatened Species and Critical Habitat Protection

The 2021 PGP specifies procedures to assist in protecting federally-listed endangered and threatened species and federally designated critical habitats under the Endangered Species Act (ESA). These 2021 PGP terms remain unchanged from EPA’s 2016’s PGP except for changes to improve instructions and clarifications in the ESA procedures for applicants.

The provisions described below are designed to ensure that discharges of pollutants covered under the 2021 PGP are not likely to result in any short or long term adverse effects to NMFS Listed Resources of Concern, except as provided in eligibility Criterion B, C, and, for 60 days, D, in Part 1.1.2.4 of the PGP. These permit provisions include eligibility criteria for permit coverage as well as requiring compliance with technology-based effluent limitations in Part 2.2 of the PGP and recordkeeping and reporting requirements for Decision-makers with discharges of pollutants to waters of the United States containing NMFS Listed Resources of Concern.

The 2021 PGP, under Part 1.1.2.4, requires Operators to certify that they are eligible for permit coverage under one of the six eligibility criteria (A-F) as follows and to provide the supporting documentation with the NOI:

Criterion A. Pesticide application activities will not result in a point source discharge to one or more waters of the United States containing National Marine Fisheries Service (NMFS) Listed Resources of Concern, as defined in Appendix A, for this permit. In this case, no further certification is necessary. Decision-makers not otherwise required to submit an NOI are not required to do so merely to check Criterion A. However, Decision-makers who must submit an NOI anyway should check Criterion A if they do not discharge to a water of the United States

containing NMFS Listed Species of Concern. Decision-makers are required to attach to the NOI an aerial image of the pest management area(s) using the maps and resources at <https://www.epa.gov/npdes/pesticide-permitting-ESA-procedures>.

Criterion B. Pesticide application activities will discharge to one or more receiving waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A, but consultation with NMFS under section 7 of the ESA has been concluded for pesticide application activities covered under this permit. Consultations can be either formal or informal, and would have occurred only as a result of a separate federal action. The consultation addressed the effects of pesticide discharges and discharge-related activities on federally-listed threatened or endangered species and federally-designated critical habitat, and must have resulted in either:

- i. A biological opinion from NMFS finding no likely jeopardy to listed species and no destruction/adverse modification of federally-designated critical habitat and the Reasonable and Prudent Measures to minimize take have been or are in the process of being implemented; or
- ii. Written concurrence from NMFS with a finding that the pesticide discharges and discharge-related activities are not likely to adversely affect federally-listed species or federally-designated critical habitat.

Decision-makers are required to provide any tracking numbers of identifiers associated with the consultation (e.g., IPaC number, ECO number), the Services field office/regional office(s) providing the consultation, any copies of supporting correspondence with USFWS and/or NMFS, identification of the federal action agency(ies) involved, and the date the consultation was completed.

Criterion C. Pesticide application activities will discharge to one or more waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A, but any “take” of these resources associated with such pesticide application activities has been authorized through NMFS’ issuance of a permit under section 10 of the ESA, and such authorization addresses the effects of the pesticide discharges and discharge-related activities on federally-listed species and federally-designated critical habitat. (The term “take” means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. See Section 3 of the Endangered Species Act, 16 U.S.C. § 1532(19).) Decision-makers are required to provide any tracking numbers of identifiers associated with the section 10 permit, the date the section 10 permit was granted, whether the permit was granted by the USFWS and/or NMFS, and the field office/regional office(s) granting the permit.

Criterion D. Pesticide application activities were, or will be, discharged to one or more waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A, but only in response to a Declared Pest Emergency Situation. Decision-makers must provide EPA with their rationale supporting the determination whether the discharge is likely to result in any short or long term adverse effects to NMFS Listed Resources of Concern, including the description of appropriate measures to be undertaken to avoid or eliminate the likelihood of any short or long term adverse effects. Decision-makers are required to provide information on anticipated applications and provide a rationale as to why any short or long term adverse effects are not expected or why the pest emergency poses a greater threat to the ESA-listed species than the pesticide application.

Criterion E. Pesticide application activities for which permit coverage is being requested in the NOI will discharge to one or more waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A. Eligible discharges include those where the Decision-maker includes in the NOI written correspondence from NMFS that pesticide application activities performed consistent with appropriate measures will avoid or eliminate the likelihood of any short or long term adverse effects to NMFS Listed Resources of Concern. Eligibility under this criterion is contingent upon the Decision-maker following the measures described in correspondence from NMFS designed to avoid or eliminate the likelihood of any short or long term adverse effects.

Criterion F. Pesticide application activities for which permit coverage is being requested in the NOI will discharge to one or more waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A. Eligible discharges include those from pesticide application activities that are demonstrated by the Decision-maker as not likely to result in any short or long term adverse effects to NMFS Listed Resources of Concern or that the pest poses a greater threat to the NMFS Listed Resources of Concern than does the discharge of the pesticide. Decision-makers must provide EPA with their documentation demonstrating the basis for their finding.

Criteria E and F, at least 30 days prior to beginning to discharge, require an Operator to demonstrate:

- Pesticides being discharged or to be discharged are known not to cause any short or long term adverse effects, or are or will be discharged at concentrations determined not to cause any short or long term adverse effects, to NMFS Listed Resources of Concern (Criterion F), or
- NMFS Listed Resources of Concern are or will not be exposed to pesticide pollutants produced by the discharge (e.g., species will not occur in the discharge area during that time of year, the species will not be present in the hydrologic unit in which the discharge will occur, the species is not present because of the presence of the pest being controlled, etc) (Criterion F), or
- Other considerations that demonstrate the discharge is not likely to result in any short or long term adverse effects to NMFS Listed Resources of Concern (Criterion F), or
- They have obtained written correspondence from NMFS indicating that pesticide application activities performed consistently with appropriate measures will avoid or eliminate the likelihood of any short or long term adverse effects to Listed Resources of Concern. Eligibility under this criterion is contingent upon the Decision-maker following the measures described in correspondence from NMFS designed to avoid or eliminate the likelihood of any short or long term adverse effects (Criterion E).

Any Decision-maker planning to discharge pollutants to waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A of the PGP, must submit a Notice of Intent consistent with Part 1.2.2 of the PGP. The specific requirements of the PGP NOI are identified in the NOI form provided in Appendix D of the PGP. Also, refer to

Appendix I of the PGP for the ESA Review Procedures to determine eligibility prior to submittal of the NOI. This NOI requirement includes the requirement for any Decision-maker already covered under the permit who discharges pollutants to any waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A of the PGP, that were not identified in a previously submitted NOI, to submit an updated NOI containing the information identified in Appendix D of the PGP. Additionally, NOIs for any discharges of pollutants to waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A of the PGP, must be submitted at least 30 days before beginning discharge. EPA may authorize certain discharges of pollutants in less than 30 days, but no fewer than 10 days, for any discharges of pollutants under Criterion B, C, or E of Part 1.1.2.4 of the PGP. Where eligibility is determined consistent with Criterion D, response to a Declared Pest Emergency Situation, an NOI is due for such discharges of pollutants no later than 15 days after beginning discharged.

1.2 Authorization to Discharge Pollutants Under this Permit

1.2.1 How to Obtain Authorization

The NPDES general permit regulations, at 40 CFR §122.28(b)(2), require that Operators submit an NOI to obtain coverage under an existing general permit for which that discharge is eligible. However, those regulations, at §122.28(b)(2)(v), provide that at the discretion of the Director (which, for the 2021 PGP, is EPA), certain discharges of pollutants can be authorized under a general permit without submitting an NOI where EPA finds that an NOI would be inappropriate for such discharges. In making such a finding, EPA must consider the following criteria: 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 of pollutants; other means of identifying discharges of pollutants covered by the permit; and the estimated number of discharges of pollutants to be covered by the permit.

This 2021 PGP is requiring submission of an NOI for certain discharges of pollutants and is providing automatic coverage for certain other discharges of pollutants. The requirements remain unchanged from the 2011 PGP and 2016 PGP. EPA is requiring submission of an NOI for certain discharges of pollutants and is providing automatic coverage for certain other discharges of pollutants for which EPA determined it would be inappropriate to require an NOI. EPA is exempting Operators of pesticide research and development activities from the need to submit an NOI because these activities are typically smaller and in many instances, are already covered under FIFRA's section 5 (experimental use permits). Similarly, the 2021 PGP exempts these activities from many requirements of the permit where such activities are inconsistent with the research plan.

As discussed in Appendix D of the fact sheet, EPA expects a large number of discharges of pollutants from the application of pesticides spanning a wide range of Operators and activities will require NPDES permit coverage. Conditions and requirements in this permit remain largely unchanged from the 2011 PGP and 2016 PGP. EPA's consideration of the regulatory criteria in §122.28(b)(2)(v) is as follows based on information collected in the 2011 PGP development:

Type and Expected Nature of Discharge

All discharges of pollutants that would be authorized by the 2021 PGP involve either (1) applications made directly into or over waters of the United States to control pests in or over the water, or (2) applications to control pests near the water's edge such that pesticides will be unavoidably deposited into waters of the United States. The 2021 PGP is structured by pesticide use patterns. These use patterns were developed to include discharges of pollutants that are similar in type and nature, and therefore represent the type of discharges of pollutants and expected nature of the discharges of pollutants covered under this permit. The PGP covers the four use patterns described in Part III.1.1 of the fact sheet. EPA evaluated each use pattern independently with the goal of identifying the significant activities resulting in discharges of pollutants that should be covered under this 2021 PGP.

Potential for Toxic and Conventional Pollutants in the Discharge

EPA does not expect the potential for toxic and conventional pollutants in the discharges from pesticides to vary among use patterns. EPA would expect, however, that the potential for impacts from high concentrations of toxic or conventional pollutants in the discharge would be smaller when fewer acres or linear feet are treated.

Expected Volume of Discharge

EPA also considered the expected volume of discharges of pollutants from each use pattern. It is difficult to estimate the expected volume of discharges of pollutants for each use pattern because Pest Management Measures used by Operators to meet the permit's technology based effluent limitations may vary based on site-specific conditions. For example, the volume of the discharge may vary depending on the specific pesticide being used, the intensity of the pest pressure based on the specific pest problem, and the pest management strategy deemed to be most effective for the pest problem. Moreover, minimizing the discharge of pollutant necessary to manage pests successfully will vary among Operators depending on which Pest Management Measures the Operator uses. Nonetheless, EPA expects that, in general, the volume of the discharge will vary proportionally with the number of acres and linear miles treated.

Other Means to Identify Discharges of Pollutants

EPA also considered other means of identifying types of discharges of pollutants covered by this permit. EPA may be able to identify pollutant discharges from Operator-submitted data, ambient water sampling data, and other information submitted by pollutant dischargers pursuant to federal or state law. However, EPA recognizes that the availability and quality of these data may be limited and highly variable across the scope of activities and areas covered under the 2021 PGP.

Number of Discharges of Pollutants

Last, EPA considered the estimated number of discharges of pollutants to be covered by the permit. While the exact number of entities and thus the number of discharges of pollutants that may be covered by the permit is unknown, EPA projects based on earlier estimates for the PGP that the 2021 PGP will cover approximately 14,300 Operators per year in the areas where EPA is the NPDES permitting authority. Of this total, a large majority represent dischargers performing small pesticide applications that EPA considers to have very low potential for

impact. Thus, requiring an NOI from all dischargers would be a large burden of little value for permitting authorities and permittees alike. See Appendix D of the fact sheet for discussion on the universe of Operators covered under this permit.

In analyzing these regulatory criteria, the Agency gave particular weight to the expected volume of the discharges of pollutants and the estimated number of discharges of pollutants to be covered by the permit. After considering the universe of entities to be covered under the permit, EPA found a logical break between entities applying pesticides to larger areas versus smaller areas, and a difference between the types of entities generally responsible for performing such pest control activities. As a result, NOI requirements are based on the size of areas treated and the entity making the decision to perform pesticide applications. In addition, EPA identified a need for additional information for any discharges of pollutants to outstanding national resource waters (Tier 3 waters) and to waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A of the PGP, and is including NOI requirements for all discharges of pollutants to these waters as well.

1.2.2 Decision-makers Required to Submit an NOI

To obtain authorization under the 2021 PGP, Operators (Decision-makers and Applicators) must meet the Part 1.1 eligibility requirements of the PGP. If required by Part 1.2.2 of the PGP, certain Decision-makers must submit a complete and accurate NOI no later than the appropriate deadline described in Part 1.2.3 of the PGP.

Table 1-1 in Part 1.2.2 of the PGP identifies which Decision-makers are or will be required to submit an NOI. Based on the analysis outlined in Part 1.2.1 above, For-Hire Applicators, who are not Decision-makers as defined in Appendix A of the PGP, are not required to submit NOIs. In addition, Decision-makers who apply pesticides to relatively small areas are not required to submit NOIs (except for certain Operators that the Agency finds have a significant role in pest control for public health and environmental protection and should be expected to provide Agency notice of such activities). Nonetheless, EPA emphasizes that even if an NOI is not required, Operators covered automatically are still subject to all applicable requirements. EPA is requiring NOIs from the following types of Decision-makers:

- Decision-makers exceeding an annual treatment area threshold;
- Other Decision-makers specifically in the business of pest control;
- Decision-makers discharging pollutants to Tier 3 waters; and
- Decision-makers discharging pollutants to waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A of the PGP.

This permit provision remains unchanged from the 2011 PGP and 2016 PGP. A more detailed discussion of EPA's rationale for requiring NOIs for these three categories of Decision-makers follows.

NOIs for Decision-Makers Exceeding an Annual Treatment Area Threshold

During the 2011 PGP development, EPA developed annual treatment area thresholds for each use pattern that will only require larger Operators applying pesticides to larger areas to submit an NOI. To determine the appropriate annual treatment area thresholds that would trigger the NOI requirement, EPA's Office of Water, Office of Chemical Safety and Pollution

Prevention and the ten EPA Regional Offices engaged in discussions with USDA, states as co-regulators, and representatives from industry including pesticide registrants, applicators, and land managers. Based on these discussions, the comments received during the 2011 PGP development, and EPA's best professional judgment, EPA developed annual treatment area thresholds that establish NOI requirements for applications to larger areas, which are believed to have the greatest potential for impact to waters of the United States. EPA recognizes there are many unknowns concerning the size, organization, and activities of the permitted universe. Considerable variation in the availability of data and in the consistency of requirements across regions and states resulted in EPA relying heavily on its best professional judgment in setting the NOI annual treatment area thresholds for each of the use patterns. If a Decision-maker, otherwise not required to submit an NOI, anticipates it will exceed an applicable annual treatment area threshold during any time in a given calendar year of the permit cycle, that Decision-maker must then submit an NOI consistent with the due dates described in Part 1.2.3 of the PGP.

When calculating the size of the treatment area for comparing to an annual treatment area threshold, EPA uses the term "at water's edge adjacent to waters of the United States" to identify those areas where pesticides are applied to control pests that are present near water where a portion of the pesticides will unavoidably be deposited to the water to target the pests. EPA's use of the word "adjacent" in identifying these areas is merely used to identify areas near waters of the United States and is not intended to mean "adjacent" as defined in regulation for use when defining the term "waters of the United States."

To avoid duplication of submission, EPA is requiring that the Decision-maker responsible for such applications be the Operator required to submit the NOI. So, where a Decision-maker hires an Applicator to perform the pest control activities, the NOI is to be submitted by the Decision-maker.

EPA's rationale for the annual treatment area threshold and Decision-makers required to submit NOIs for each use pattern is as follows:

Mosquito Control and Other Flying Insect Pest Control

For Mosquitoes and Other Flying Insect Pests, the annual treatment area threshold has been set at 6,400 acres of pesticide application to waters of the United States. Calculation of annual treatment area for mosquito control should only count areas treated with adulticide. Larviciding is not to be used in the calculations. EPA understands that the vast majority of mosquito control and abatement districts in the United States manage areas significantly larger than this threshold and may reasonably expect to exceed it during any given year. For instance, information from the state of Florida on 49 independent mosquito control districts shows that 48 of the 49 districts annually apply to more than 6,400 acres, which indicates that applications exceeding this area are quite typical. Similarly, data provided in EPA's 2011 *Economic Achievability Analysis of the Pesticide General Permit (PGP) for Point Source Discharges from the Application of Pesticides* and included in the administrative record for this permit, show similar findings as in Florida. Furthermore, the effective control of other aquatic breeding, flying insects, such as the blackfly, necessitates applications that approach or exceed this threshold. Therefore, the threshold

appropriately captures most Decision-makers engaging in this use pattern.³ The Agency has determined this appropriately captures those two classes of entities that either (1) are established with a specific purpose of pest control or that (2) treat large enough areas to warrant notice to the Agency.

Weed and Algae Control

For Weeds and Algae, the annual treatment area threshold has been set at 80 acres or 20 linear miles of pesticide application to canals and other waters of the United States. This threshold has been set to capture Decision-makers treating relatively large portions of surface waters and watersheds, such as water management districts, wildlife and game departments, and some homeowner and lake associations. For example, Florida's South Florida Water Management District usually applies pesticides to 60 acres at a time hundreds of times per year for various invasive plants on Florida's Lake Okeechobee. After reviewing the operations of major irrigation and flood control systems as part of the initial PGP development, EPA expects that generally, relatively large entities such as South Florida Water Management District, California Department of Water Resources, or organizations with comparable resources are the types of entities that manage 20 or more miles of engineered irrigation systems, and that this is a reasonable limit to trigger the NOI requirement. The same rationale is applied to managers of ditch and canal banks. Therefore, the threshold appropriately captures the relatively large applications but excludes a significant number of small applications. Similar to mosquito control, weed control districts, or similar pest control districts created specifically for the control of pests that treat areas below the threshold, should be required to submit NOIs. As such, the permit requires all weed control districts or similar pest control districts as well as any other Decision-makers treating over the annual treatment area threshold to submit an NOI. The Agency has determined that this appropriately captures those two classes of entities that either (1) are established with a specific purpose of pest control or that (2) treat large enough areas to warrant notice to the Agency.

Animal Pest Control

For Animal Pest Control, the annual treatment area threshold has been set at 80 acres or 20 linear miles of pesticide application to canals and other waters of the United States. Invasive and nuisance aquatic animals are most commonly treated by public agencies such as departments of fish and game, or utilities such as water management districts. The high mobility and prolific breeding abilities that necessitate control of aquatic animals usually mean that pesticide applications most often occur in the entirety or large portions of the water bodies they inhabit. For example, fishery management applications using rotenone often occur in the entire lake, and thus any similar application to a lake of more than 80 acres in area will trigger the annual treatment area threshold. EPA expects that for this reason, only spot applications to eradicate small emergent populations of sessile animals or applications to very small water bodies might be excluded from an NOI requirement. Therefore, the threshold appropriately captures the relatively large Decision-makers engaging in this use pattern.

³ As discussed below, EPA also finds that even those mosquito control districts that treat areas below the threshold should be required to submit NOIs, as these entities were created specifically for the control of pests and should provide notice to the Agency of their activities.

Forest Canopy Pest Control

For Forest Canopy Pest Control, the annual treatment area threshold has been set at 6,400 acres of pesticide application to waters of the United States. Forest canopy pest suppression programs are designed to blanket large tracts of terrain, throughout which Operators may not be able to see waters of the United States beneath the canopy. EPA has set the annual treatment area threshold for this use pattern with the understanding that this will exclude only the smallest applications from the NOI requirement. These smaller applications generally occur on private lands. Therefore, the threshold appropriately captures most Decision-makers engaging in this use pattern, particularly public agencies managing large tracts of land.

NOIs for Certain Entities Regardless of the Annual Treatment Area Threshold

In addition to NOIs from Decision-makers treating the largest areas, EPA is also requiring NOIs from certain other types of entities with land resource stewardship responsibilities that involve the routine control of pests. For these entities, the 2021 PGP requires NOIs regardless of the size of the area treated. In general, EPA expects that in many instances these entities will exceed one or more of the annual treatment area thresholds. Nonetheless, the Agency finds that regardless of the size of the treatment area, any Agency for which pest management for land resource stewardship is an integral part of the organization's operations should also be required to submit NOIs. Such entities may include federal government agencies such as the U.S. Forest Service (U.S. Department of Agriculture) and the Bureau of Land Management (Department of the Interior), state government agencies such as natural resources departments, or pest control districts. EPA's rationale for imposing the NOI requirement is premised on these entities (public, quasi-public, and private) having as an integral responsibility controlling pests. The specific entities required to submit NOIs regardless of whether an annual treatment area threshold is exceeded are as follows:

Any Agency for which pest management for land resource stewardship is an integral part of the organization's operations – Any agency that has pest control as an integral part of the organization's operations or responsibilities is required to submit an NOI. Information in the record indicates that many pest control activities performed by these entities will meet or exceed the threshold requirement to submit an NOI. Even when these activities do not exceed the thresholds, however, they are subject to the NOI requirement if the pesticide application is an integral part of their operations and responsibilities. EPA also recognizes, however, that some of these agencies may perform ad-hoc pest control on a small-scale that is not an integral part of the organization's operations but rather incidental, for example, to its occupancy of a building.

Mosquito control districts (or similar pest control districts, such as vector control districts) – In many parts of the country, state and territorial governments have established special districts for the purpose of mosquito control. Generally, these districts treat large areas that would exceed EPA's annual treatment area thresholds; however, EPA is requiring any such district, regardless of the area treated, to submit an NOI.

Irrigation control districts (or other similar public or private entities supplying irrigation waters) – In many parts of the country, special districts have been established for the purpose of maintaining irrigation canals and ditches. Generally, these districts treat large areas that exceed EPA's annual treatment area thresholds; however, EPA is requiring any such district, regardless of the area treated, to submit an NOI.

Weed control districts (or other similar special purpose districts created with a responsibility of pest control) – EPA is aware of some weed control districts created across the country with the specific responsibility to control pests. The Agency has determined that these types of entities, who perform pest management and control, as the primary function of their organization, should provide notice to the Agency of such activities regardless of the size of the area treated.

NOIs for Discharges of Pollutants to Tier 3 Waters

Any Decision-maker requesting to discharge pollutants to Tier 3 waters may seek coverage under the 2021 PGP provided that the discharge of pollutants is short-term or temporarily lowers water quality due to pesticide applications that are necessary to protect the water quality, environment, or public health. Any Decision-maker wanting coverage under the 2021 PGP for such a discharge will be required to identify the Tier 3 water by name with authorization to discharge pollutants to Tier 3 waters limited to only such named waters.

NOIs for Discharges of Pollutants to Waters of the United States Containing NMFS Listed Resources of Concern, as Defined in Appendix A of the PGP

Any Decision-maker with any discharges of pollutants to waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A of the PGP, may seek coverage under the permit by submitting a complete and accurate NOI form that includes certifying eligibility under one of the five criteria (B-F) in Part 1.1.2.4 of the PGP.

Contents of the NOI

Pursuant to 40 CFR §122.28(b)(2)(ii), the contents of any NOI must be specified in the general permit and require the submission of information necessary for adequate program implementation, including at a minimum:

- the legal name and address of the Owner or Operator,
- the facility name and address,
- type of facility or discharges of pollutants,
- the receiving stream(s), and
- signed in accordance with §122.22.

The specific requirements of the 2021 PGP NOI are identified in the NOI form provided in Appendix D of the PGP but include those elements identified in the regulations described above with three additional data elements that are important to fully characterize the activities for which permit coverage is being provided, namely identification of:

- pesticide use activities that trigger the PGP requirements to develop a pesticide discharge management plan and submit an annual report;
- impaired water(s) and/or Tier 3 water(s) for which permit coverage is being requested for discharges of pollutants to these waters and demonstration of eligibility for such discharges; and
- whether pollutant discharges will be to waters of the United States containing NMFS Listed Resources of Concern, and, if so, what pest(s) are to be controlled; the pesticide product(s) to be discharged; the planned quantity and rate of discharge(s) of pollutants; the number of planned discharges of pollutants; and signed certification by the Decision-maker that one of the six eligibility criteria in Part 1.1.2.4 of the PGP have

been met. EPA recognizes the implementation of pest management measures as specified in the permit may involve a degree of “adaptive management” such that exact timing and quantities of applications cannot be determined in advance for the duration of the permit. EPA expects the Decision-maker to provide the required information to the extent feasible and consistent with the implementation of the selected pest management measures.

Also, the 2021 PGP requires Decision-makers to submit changes to previous NOI forms where, for example, coverage for an additional discharge of pollutants not included in the original NOI is being requested. EPA expects these NOI change requests to be submitted primarily in four instances: (1) coverage for a new or expanded pest management area or a new pesticide use pattern is being requested, (2) discharge to a not-previously identified Tier 3 water is identified for permit coverage, or (3) discharge to any not-previously identified waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A of the PGP, is being requested or (4) changes in the treatment area, pesticide product, method or rate of application, or approximate dates of applications for discharges of pollutants to waters of the United States containing NMFS Listed Resources of Concern. In cases where this information was previously provided to the extent feasible and consistent with the implementation of selected pest management practices, a revised NOI is not required as long as the discharge continues to be consistent with the information provided in the original NOI submission. In these four instances, Decision-makers are required to submit revised NOIs that reflect changes in the areas and types of activities for which coverage is being requested.

1.2.3 Discharge Authorization Date

For any discharges of pollutants occurring after the effective date of the final permit and for which Operators are not required to submit an NOI, Operators will receive permit coverage for those discharges of pollutants under the 2021 PGP. Dischargers who obtained automatic coverage under the 2016 PGP (i.e., Operators who are not required to submit an NOI) and continue to discharge pollutants after the effective date of the final permit will receive uninterrupted permit coverage. Decision-makers required to submit NOIs, as detailed in Part 1.2.2 of the PGP, are authorized consistent with the timeframes and provisions detailed in Part 1.2.3 of the PGP. Decision-makers who are required to submit an NOI must begin complying with requirements in Part 2.2 of the PGP as of the discharge authorization date.

NOIs are required from Decision-makers according to the schedule detailed in Table 1-2 in the PGP and as described below:

- Other than for discharges of pollutants in response to a Declared Pest Emergency Situation or that are to NMFS Listed Resources of Concern, both of which are described below, Decision-makers who discharge after the effective date of the final permit will be authorized 10 days after EPA posts on its public Internet website, at <https://www.epa.gov/npdes/pesticide-permitting>, receipt of a complete and accurate NOI unless EPA places a hold on the authorization (i.e., delay authorization). NOIs submitted electronically will be posted on the NPDES website instantaneously with the Operator authorized to discharge 10 days after the posting, providing EPA does not place a hold on the authorization for that NOI. EPA will send automatic confirmation of receipt of NOIs and of discharge authorization. The Agency may place an

authorization on hold if the Agency determines, including based on information provided by other interested parties (*e.g.*, US FWS, NMFS), that the Operator may not be eligible for PGP coverage. See Part 1.1 of the PGP for the eligibility criteria. Thus, an NOI must be submitted no later than 10 days before the first discharge for any discharges of pollutants occurring after the effective date of the final permit.

- Any Decision-maker who discharges pollutants in response to a Declared Pest Emergency Situation, as defined in Appendix A of the PGP, that is not to waters of the United States containing NMFS Listed Resources of Concern, for which that activity triggers the requirement to submit an NOI, is authorized to discharge pollutants immediately; however, a complete and accurate NOI is required to be submitted no later than 30 days after beginning to discharge. This delay in NOI submission and immediate authorization is to allow pest managers the opportunity to respond to pest emergencies without delay.
- In any Declared Pest Emergency Situation for discharges of pollutants to waters of the United States containing NMFS Listed Resources of Concern, the discharges of pollutants are authorized for at least 60 days or until EPA determines that the discharges of pollutants may not continue (or places additional conditions on the discharge) due to concerns related to compliance with the ESA-related conditions of the 2021 PGP. These Decision-makers must file an NOI no later than 15 days after beginning to discharge pollutants. The NOI must identify:
 1. The location of the pest management area in detail or include a map of the location;
 2. Pest(s) to be controlled;
 3. Pesticide product(s) to be discharged and method of application;
 4. Planned quantity and rate of discharge(s) for each method of application;
 5. Number of planned discharges of pollutants;
 6. Approximate date(s) of planned discharge(s) of pollutants; and
 7. Whether the discharge of pollutants is likely to result in any short or long term adverse effects to NMFS Listed Resource of Concern, including the description of appropriate measures to be undertaken to avoid or eliminate the likelihood of any short or long term adverse effects on that identified NMFS Listed Resource of Concern.

For discharges of pollutants that have already occurred prior to NOI submission, items 1 through 6 above must also be identified in that NOI.

In any Declared Pest Emergency Situation in areas with waters of the United States containing NMFS Listed Resources of Concern, NMFS will have 30 days after submission of an NOI (*e.g.*, when EPA posts on the Internet receipt of a complete and accurate NOI) to provide EPA with a determination as to whether NMFS believes the eligibility criteria of “not likely to result in any short or long term adverse effects to listed species or designated critical habitat” has been met, per Part 1.1.2.4 of the PGP (see also 50 CFR 402.14), could be met with conditions that NMFS identifies, or has not been met. EPA expects to rely on NMFS’ determination in deciding whether to disallow continued permit coverage or if additional conditions are necessary to meet the eligibility criteria of “not likely to result in any short or long term adverse effects to listed species or designated critical habitat.” See Part 1.1.2.4 of the PGP. See also 50

CFR 402.14. If NMFS does not provide EPA with a recommendation within 30 days of EPA posting on the Internet receipt of a complete and accurate NOI, authorization for these discharges of pollutants will continue. If EPA identifies additional permit conditions, or includes additional permit conditions recommended by NMFS, as necessary to qualify discharges of pollutants as eligible for coverage beyond 60 days under the 2021 PGP, those conditions remain in effect for the life of the permit. EPA will advise the Decision-maker within 15 days of receiving a determination from NMFS whether the discharge of pollutants or discharges of pollutants qualify for coverage beyond the 60-day authorization provided under the 2021 PGP. If the decision maker does not hear from EPA, the decision maker may assume that permit authorization continues unless notified otherwise. This approach provides a reasonable amount of time for Operators to quickly respond to any Declared Pest Emergency Situation (*i.e.*, 60 days after beginning to discharge pollutants), yet provides the Agency with an opportunity to ensure that subsequent discharges of pollutants are controlled as necessary to protect water quality and any NMFS Listed Resources of Concern.

- For any discharges of pollutants to waters of the United States containing NMFS Listed Resources of Concern and beginning on or after the effective date of the final permit an NOI will need to be submitted no later than 30 days before the first discharge occurs. NOIs submitted electronically will be posted on the NPDES website instantaneously with the Operator authorized to discharge 30 days after the posting, providing EPA does not place a hold on the authorization for that NOI. EPA will send automatic confirmation of receipt of NOIs and of discharge authorization. The additional timeframe allows NMFS to have sufficient time to review NOI submissions as a result of discharges of pollutants to waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A of the PGP. EPA may authorize certain discharges of pollutants in less than 30 days, but no fewer than 10 days, after submission of an NOI for any discharges of pollutants under eligibility Criterion B, C, or E, of Part 1.1.2.4 of the PGP. This is because under eligibility criteria B and C, Operators would have already consulted with NMFS and under criterion E, the Operator would have received a written letter from NMFS that the discharge of pollutants will not adversely affect NMFS Listed Resources of Concern. Early submittal and review of NOIs will help ensure that any issues are addressed and resolved in a timely manner so that appropriate pesticide applications can proceed as planned. The Agency may place an authorization on hold if the Agency determines, including based on information provided by other interested parties and from the Services' review, that the Operator may not be eligible for PGP coverage. In determining whether to withhold permit authorization under this permit, EPA expects to rely on NMFS expertise in making a determination as to whether there is likely to be adverse effect. Within 30 days after EPA posts on the Internet receipt of a complete and accurate NOI, for those discharges of pollutants to waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A of the PGP, NMFS will provide EPA with a determination as to whether NMFS has determined the eligibility criteria of “not likely to result in any short or long term adverse effects to listed species or designated critical habitat” has been met, could be met with conditions the NMFS identifies, or has not been met. EPA expects to rely on NMFS' determination in deciding whether to disallow continued permit coverage or if

additional conditions are necessary. EPA notes that it may be advantageous to the Decision-maker to work with NMFS prior to submitting the NOI, and to obtain written correspondence from NMFS, if possible, that pesticide application activities performed consistent with appropriate measures will avoid or eliminate the likelihood of any short or long term adverse effects. In this case, as noted above, EPA may authorize discharges of pollutants in as few as 10 days after the NOI is submitted, although the operator may not assume authorization before 30 days unless specifically so notified by EPA.

NOIs submitted electronically will be posted on the NPDES website instantaneously with the Operator authorized to discharge pollutants 10 or 30 days after the posting, providing EPA does not place a hold on the authorization for that NOI. EPA will send automatic confirmation of receipt of NOIs and of discharge authorization.

The 2021 PGP contains standard language that provides EPA with the authority to modify permit terms or terminate permit coverage as appropriate. NMFS and any other interested persons may provide information to EPA noting any concerns with authorized discharges of pollutants, including those resulting from Declared Pest Emergency Situations. EPA will consider that information and take future action as appropriate. As provided in the 2021 PGP, in general, EPA may take the following actions:

Part 1.3 - Require Operators to apply for and/or obtain authorization to discharge under either an NPDES individual permit or an alternative NPDES general permit.

Appendix B, Standard Permit Conditions, 40 CFR 122.41(a) Duty to comply - Terminate, revoke and reissue, or modify a permit for any permit noncompliance, that is also grounds for enforcement action.

Part 1.2.3; Part 6.3; Appendix B, Standard Permit Conditions, 40 CFR 122.41(f) Permit actions - Modify, revoke and reissue, or terminate a permit for cause.

1.2.4 Continuation of this Permit

The 2021 PGP specifies procedures for continued coverage under a general permit if the permit expires prior to a replacement permit being issued. The procedures remain unchanged from EPA's 2016 PGP. In short, the expired permit would remain in full force and effect in accordance with the Administrative Procedure Act (5 U.S.C. 558(c)) and EPA's implementing regulations at 40 CFR 122.6. Any permittee granted coverage prior to the permit's expiration date will automatically remain covered by the continued permit until the earliest of:

- (a) Authorization under a new version of the PGP following timely and accurate submittal of a complete NOI (if required);
- (b) The processing and posting of a Notice of Termination (NOT) consistent with Part 1.2.5.1 of the PGP;
- (c) The issuance of an individual permit;
- (d) A formal permit decision by EPA not to reissue the general permit, at which time EPA will identify a reasonable time period for covered dischargers to seek coverage under an alternative general permit or an individual permit. Coverage under this permit will cease when coverage under another permit is granted/authorized; or

- (e) EPA has informed the permittee that the permittee's discharges of pollutants are no longer covered under the permit.

If EPA fails to issue a final general permit prior to the expiration of a previous general permit the permit will be administratively continued in accordance with section 558(c) of the Administrative Procedure Act (5 U.S.C. 558(c)) and EPA's implementing regulations at 40 CFR 122.6 and will remain in force and effect for discharges of pollutants that were covered prior to expiration. However, EPA does not have the authority to provide coverage under an administratively extended permit to entities not authorized prior to the expiration date of the permit.

1.2.5 Terminating Coverage

The 2021 PGP specifies procedures for terminating coverage under this general permit. The procedures remain unchanged from EPA's 2016 PGP.

1.2.5.1 Submitting a Notice of Termination

To terminate coverage under the permit, any Decision-maker who submitted a Notice of Intent to obtain permit coverage is required to submit a Notice of Termination (NOT) in accordance with information identified in Appendix E of the PGP. The Decision-maker's authorization to discharge pollutants under the permit terminates at midnight of the day that a complete NOT is processed and posted on EPA's website (<https://www.epa.gov/npdes/pesticide-permitting>). Dischargers automatically covered (as identified in Part 1.2.3 of the PGP) are automatically terminated upon permanent cessation of discharge consistent with any of the criteria identified in Part 1.2.5.2 of the PGP.

EPA requires Decision-makers who file an NOT to notify EPA that its obligation to manage pollutant discharges is no longer necessary for one of the EPA-approved reasons (as described in Part III.1.2.5.2 of the fact sheet). If EPA determines that the Decision-maker has not satisfied one of the conditions in Part 1.2.5.2 of the PGP for being able to submit an NOT (*e.g.*, the Decision-maker continues to have a discharge of pollutants) then the notice is not valid and the Decision-maker must continue to comply with the conditions of the PGP. Likewise, if EPA determines that the NOT is incomplete, the Decision-maker may be found to be in violation of reporting requirements.

1.2.5.2 When to Submit a Notice of Termination

Once all point source discharges associated with pesticide application have ceased, the Decision-maker must submit an NOT, as described in Part 1.2.5.1 of the PGP, within 30 days after one or more of the following conditions have been met: (1) a new Decision-maker has taken over responsibility for the pest control activities; (2) all discharges have ceased from the application of pesticides for which permit coverage was obtained and discharges of pollutants are not expected during the remainder of the permit term for any of the use patterns as identified in Part 1.1.1 of the PGP, or (3) coverage under an individual permit or alternative general permit has been obtained for all discharges of pollutants required to be covered by an NPDES permit, unless coverage was obtained consistent with Part 1.3 of the PGP, in which case, coverage under this permit will terminate automatically.

In the PGP, EPA is requiring an NOT from Operators who on their own switch to a different permit to provide the Agency with clear notice that the Operator's discharge of pollutants is not covered under two NPDES permits. Operators who terminate coverage based on an EPA request consistent with Part 1.3 of the PGP are not required to submit an NOT.

1.2.5.3 Termination for Operators not Required to Submit an NOI

Operators covered under the PGP who are not required to submit an NOI are terminated from permit coverage when there is no longer a discharge from the application of pesticides, or the discharges of pollutants are covered under an NPDES individual permit or alternative NPDES general permit. Operators not required to submit an NOI are also not required to submit an NOT.

1.3 Alternative Permits

The 2021 PGP specifies requirements and procedures for coverage under an alternative permit. The requirements and procedures remain unchanged from EPA's 2016 PGP.

1.3.1 Requirements for Coverage Under an Alternative Permit

EPA may require an individual permit (in accordance with 40 CFR 122.28(b)(3)(ii)) or coverage under an alternative NPDES general permit instead of the PGP. The regulations also provide that any interested party may petition EPA to take such an action. The issuance of the individual permit or alternative NPDES general permit is in accordance with 40 CFR part 124 and provides for public comment and appeal of any final permit decision. The circumstances in which such an action would be taken are set forth at 40 CFR 122.28(b)(3).

1.3.2 Operator Requesting Coverage under an Alternative Permit

After receiving permit coverage under the PGP, the Operator may request to be excluded from such coverage by applying for an individual permit or alternative NPDES general permit. In this case, the Operator must submit an individual permit application in accordance with 40 CFR 122.28(b)(3)(iii), along with a statement of reasons supporting the request, to EPA at the applicable EPA Regional Office listed in Part 8.2 of the PGP. The request may be granted by issuance of an individual permit or authorization of coverage under an alternative general permit if the reasons are adequate to support the request. Under this scenario, if an individual permit is issued, or authorization to discharge pollutants under an alternative general permit is granted, coverage under this permit is automatically terminated under 40 CFR 122.28(b)(3)(iv) on the effective date of the individual permit or the date of authorization of coverage under the alternative general permit.

Part 1.3.2 of the PGP explains an Operators ability to apply for coverage under an individual permit in lieu of coverage under this general permit and describes the steps to take to be excluded from this permit after being authorized under this permit. Cases where an individual NPDES permit may be required are described fully in 40 CFR 122.28(b)(3)(iii). The following are the pertinent situations for this permit where an individual permit may be necessary:

- a) A Water Quality Management plan containing requirements applicable to such point sources is approved;

- b) Circumstances have changed since the time of the request to be covered so that the discharger is no longer appropriately controlled under the general permit, or either a temporary or permanent reduction or elimination of the authorized discharge is necessary; or
- c) The discharge(s) is a significant contributor of pollutants. In making this determination, EPA may consider the following factors:
 - (1) The location of the discharge of pollutants with respect to waters of the United States;
 - (2) The size of the discharge of pollutants;
 - (3) The quantity and nature of the pollutants discharged to waters of the United States; and
 - (4) Other relevant factors.

EPA may require an Operator to apply for an individual permit only if EPA notifies the Operator in writing that a permit application for an individual permit is required. See 40 CFR 124.52. This notice must include a brief statement of the reasons for this decision, an application form, a statement setting a time for the Operator to file the application, information on appeals rights, and a statement that on the effective date of the individual NPDES permit the general permit as it applies to the individual Operator shall automatically terminate. EPA may grant additional time upon request of the applicant.

When an individual NPDES permit is issued to an Operator otherwise subject to a general NPDES permit, the applicability of the general permit to the individual NPDES Operator is automatically terminated on the effective date of the individual permit.

Note that an individual permit is required for discharges from the application of pesticides to waters where such waters are impaired by a substance which either is an active ingredient in that pesticide or is a degradate of such an active ingredient, and for certain applications of pesticides to Tier 3 waters where such applications are not made to restore or maintain water quality or to protect public health or the environment in such a way that they either do not degrade water quality or only degrade water quality on a short-term or temporary basis. In these cases, authorization under this general permit would not have been available in the first place.

1.4 Severability

Invalidation of a portion of this permit does not necessarily render the whole permit invalid. If any provisions of this permit are reviewed and vacated by a court, only those provisions vacated will be deemed invalidated by EPA. The remainder of the permit conditions will remain in effect. EPA will evaluate the effect of such invalidation on a case-by-case basis.

1.5 Other Federal and State Laws

Part 1.5 of the PGP includes the following language: “Operators must comply with all other applicable federal and state laws and regulations that pertain to the application of pesticides. For example, this permit does not negate the requirements under the FIFRA and its implementing regulations to use registered pesticides consistent with the product’s labeling. In fact, applications in violation of certain FIFRA requirements could also be a violation of the permit and therefore a violation of the CWA (*e.g.*, exceeding label application rates).

Additionally, other laws and regulations might apply to certain activities that are also covered under this permit (*e.g.*, United States Coast Guard regulations).”

This part of the PGP is intended to clarify that Operators are still required to comply with other applicable laws, and that merely complying with the conditions of this permit may not result in compliance with all other applicable regulations. In fact, compliance with certain permit terms expressly requires Operators to comply with other laws to demonstrate compliance with this permit. For example, the PGP requires Operators to use “Pest Management Measures” to “minimize” discharges of pollutants. As these terms are defined in Appendix A of the PGP, Operators must use practices that comply with, among other things, “relevant legal requirements” to reduce and/or eliminate pollutant discharges to waters of the United States.

1.6 Federally Listed Endangered and Threatened Species and Designated Critical Habitat.

Part 1.6 of the PGP clarifies that Operators are required to comply with conditions and/or requirements for discharges of pollutants to waters of the United States resulting from any ESA Section 7 consultation or ESA Section 10 permit as a result of a separate federal action for pesticides application activities covered under this permit. Operators seeking coverage under this permit do not have a separate obligation to consult with the FWS or NMFS under Section 7 of the ESA prior to submitting an NOI. As the Federal entity issuing this permit, EPA has the statutory requirement, and obligation to consult with FWS and NMFS. However, if any consultation has been conducted between an Operator and the Services because of other actions to consult, and the results of that consultation are relevant to an Operator's expected discharge(s), then this permit obliges the Operator to comply with any additional conditions or limits on the discharge of pollutants resulting from such consultation.

2. Effluent Limitations

Background

The CWA requires that all point source discharges of pollutants from existing facilities, or in this case, pesticide applications, meet technology-based effluent limitations⁴ (TBELs) representing the applicable levels of control. 33 U.S.C. 1311(b)(1)(A)(BPT), (b)(2)(A)(BAT), (b)(2)(E)(BCT). Additionally, water quality-based effluent limitations (WQBELs) are required where the technology-based effluent limitations are not sufficient to protect applicable water quality standards. 33 U.S.C. 1311(b)(1)(C). Water quality-based requirements will be discussed in greater depth in Part III.3 of the fact sheet. The technology-based effluent limitations

⁴ *Natural Res. Def. Council, Inc. v. EPA*, 673 F.2d 400, 403 (D.C. Cir. 1982) (noting that “section 502(11) defines ‘effluent limitation’ as ‘any restriction’ on the amounts of pollutants discharged, not just a numerical restriction”; holding that section of CWA authorizing courts of appeals to review promulgation of “any effluent limitation or other limitation” did not confine the court’s review to the EPA’s establishment of numerical limitations on pollutant discharges, but instead authorized review of other limitations under the definition) (emphasis added). In *Natural Res. Def. Council, Inc. v. Costle*, 568 F.2d 1369 (D.C. Cir. 1977), the D.C. Circuit stressed that when numerical effluent limitations are infeasible, EPA may issue permits with conditions designed to reduce the level of effluent discharges of pollutants to acceptable levels.

contained in the PGP are non-numeric and constitute the levels of control that reduce the area and duration of the discharge of pollutants to waters of the United States.

The Clean Water Act Requires EPA to Develop Effluent Limitations that Represent the Following:

Best Practicable Control Technology Currently Available (BPT)

The CWA requires BPT effluent limitations for conventional, toxic, and non-conventional pollutants. Section 304(a)(4) designates the following as conventional pollutants: biochemical oxygen demand (BOD), total suspended solids, fecal coliform, pH, and any additional pollutants defined by the Administrator as conventional. The Administrator designated oil and grease as an additional conventional pollutant on July 30, 1979. 40 CFR 401.16. EPA has identified 65 pollutants and classes of pollutants as toxic pollutants, of which 126 specific substances have been designated priority toxic pollutants. 40 CFR 401.15 and 40 CFR Part 423 Appendix A. All other pollutants are considered to be non-conventional.

In specifying BPT, under CWA section 301(b)(1)(A); 304(b)(1)(B); 40 CFR 125.3(d)(1), EPA evaluates a number of factors. EPA first considers the total cost of applying the control technology in relation to the effluent reduction benefits. The Agency also considers the age of the equipment and facilities, the processes employed, and any required process changes, engineering aspects of the control technologies, non-water quality environmental impacts (including energy requirements), and such other factors as the EPA Administrator deems appropriate. Traditionally, EPA establishes BPT effluent limitations based on the average of the best performance of facilities within the industry of various ages, sizes, processes, or other common characteristics. Where existing performance is uniformly inadequate, BPT may reflect higher levels of control than currently in place in an industrial category if the Agency determines that the technology can be practically applied.

Best Conventional Pollutant Control Technology (BCT)

The 1977 amendments to the CWA required EPA to identify effluent reduction levels for conventional pollutants associated with BCT for discharges from existing industrial point sources. CWA section 301(b)(2)(E); 304(b)(4)(B); 40 CFR 125.3(d)(2). In addition to considering the other factors specified in section 304(b)(4)(B) to establish BCT limitations, EPA also considers a two part “cost-reasonableness” test. EPA explained its methodology for the development of BCT limitations in 1986. 51 FR 24974 (July 9, 1986).

Best Available Technology Economically Achievable (BAT)

For toxic pollutants and non-conventional pollutants, EPA includes technology-based effluent limitations based on BAT in NPDES permits. CWA section 301(b)(2)(A); 304(b)(2)(B); 40 CFR 125.3(d)(3). In establishing BAT, the technology must be technologically “available” and “economically achievable.” The factors considered in assessing BAT include the cost of achieving BAT effluent reductions, the age of equipment and facilities involved, the process employed, potential process changes, non-water quality environmental impacts, including energy requirements and other such factors as the EPA Administrator deems appropriate. The Agency retains considerable discretion in assigning the weight accorded to these factors. BAT limitations may be based on effluent reductions attainable through changes in an Operator’s processes and

operations. Where existing performance is uniformly inadequate, BAT may reflect a higher level of performance than is currently being achieved within a particular subcategory based on technology transferred from a different subcategory or category. BAT may be based upon process changes or internal controls, even when these technologies are not common industry practice.

The PGP contains effluent limitations that correspond to required levels of technology-based control (BPT, BCT, BAT) for discharges of pollutants under the CWA. Some effluent limitations have been established by examining other existing laws, requirements and practices. Because these are demonstrated practices, EPA has found that they are technologically available and economically practicable (BPT) or achievable (BAT).

Technology-Based Effluent Limitations

Technology-based effluent limitations are in many cases established by EPA in regulations known as effluent limitations guidelines, or “ELGs.” EPA establishes these regulations for specific industry categories or subcategories after conducting an in-depth analysis of that industry. The CWA sets forth different standards for the ELGs based upon the type of pollutant or the type of permittee involved. Where EPA has not issued effluent guidelines for an industry, EPA and State permitting authorities establish effluent limitations for NPDES permits on a case-by-case basis based on their best professional judgment. See 33 U.S.C. § 1342(a)(1); 40 C.F.R. § 125.3(c)(2).

As stated above, the CWA establishes two levels of technology-based controls. The first level of control, “best practicable control technology currently available,” or “BPT” applies to all pollutants. CWA section 304(b)(1)(B); 33 U.S.C. 1314(b)(1)(B). BPT represents the initial stage of pollutant discharge reduction, designed to bring all sources in an industrial category up to the level of the average of the best source in that category. See *EPA v. National Crushed Stone Association*, 449 U.S. 64, 75-76 (1980). In the second level of control, all point sources are required to meet effluent limitations based on “best conventional pollutant control technology,” or “BCT” CWA section 304(b)(4)(B); 33 U.S.C. 1314(b)(4)(B) or “best available technology economically achievable,” or “BAT” CWA section 301(b)(2)(A); 33 U.S.C. 1311(b)(2)(A), depending on the types of pollutants discharged. BCT applies to conventional pollutants, listed at 40 CFR 401.16 (biological oxygen demand (BOD), pH, fecal coliform, TSS, and oil and grease). BAT applies to toxic and non-conventional pollutants. Technology-based limitations are to be applied throughout industry without regard to receiving water quality. *Appalachian Power Co. v. EPA*, 671 F.2d 801 (4th Cir. 1982).

EPA’s Authority to Include Non-Numeric Technology-Based Limitations in this Permit

All NPDES permits are required to contain technology-based effluent limitations. 40 CFR §§ 122.44(a)(1) and 125.3. CWA sections 301(b)(1)(A) for (BPT); 301(b)(2)(A) for (BAT); and 301(b)(2)(E) for (BCT). Technology-based effluent limitations in the PGP represent the BPT (for conventional, toxic, and non-conventional pollutants), BCT (for conventional pollutants), and BAT (for toxic pollutants and non-conventional) levels of control for the applicable pollutants. When EPA has not promulgated effluent limitation guidelines for an industry, or if an Operator is discharging a pollutant not considered in the development of the effluent guideline, permit limitations are based on the best professional judgment (BPJ, sometimes also referred to as “best engineering judgment”) of the permit writer. 33 U.S.C. § 1342(a)(1); 40 CFR 125.3(c). See

Student Public Interest Group v. Fritzsche, Dodge & Olcott, 759 F.2d 1131, 1134 (3rd Cir. 1985); *American Petroleum Inst. v. EPA*, 787 F.2d 965, 971 (5th Cir. 1986). For the 2021 PGP, the technology-based effluent limitations are based on BPJ decision-making because no ELG applies.

Under EPA's regulations, non-numeric effluent limitations are authorized in lieu of numeric limitations, where "[n]umeric effluent limitations are infeasible." 40 CFR 122.44(k)(3). As far back as 1977, courts have recognized that there are circumstances when numeric effluent limitations are infeasible and have held that EPA may issue permits with conditions (*e.g.*, narrative effluent limitations or best management practices) designed to reduce the level of effluent discharges to acceptable levels. *Natural Res. Def. Council, Inc. v. Costle*, 568 F.2d 1369, 1380 (D.C.Cir.1977).

Through the Agency's NPDES permit regulations, EPA interpreted the CWA to allow best management practices (BMPs) to take the place of numeric effluent limitations under certain circumstances. Federal regulations at 40 CFR §122.44(k), entitled "Establishing limitations, standards, and other permit conditions (applicable to state NPDES programs ...)," provides that permits may include BMPs to control or abate the discharge of pollutants when: (1) "[a]uthorized under section 402(p) of the CWA for the control of stormwater discharges"; or (2) "[n]umeric effluent limitations are infeasible." 40 CFR § 122.44(k).

Courts have held that the CWA does not require EPA to set numeric limitations where such limits are infeasible. *Citizens Coal Council v. EPA*, 447 F.3d 879, 895-96 (6th Cir. 2006). The Sixth Circuit cited *Waterkeeper Alliance, Inc. v. EPA*, 399 F.3d 486, 502 (2nd Cir. 2005), stating "site-specific BMPs are effluent limitations under the CWA." Additionally, the Sixth Circuit cited *Natural Res. Def. Council, Inc. v. EPA*, 673 F.2d 400, 403 (D.C.Cir.1982) noting that "section 502(11) [of the CWA] defines 'effluent limitation' as 'any restriction' on the amounts of pollutants discharged, not just a numerical restriction."⁵

For the PGP, EPA is using the term "Pest Management Measures," as defined in Appendix A of the PGP, to represent those practices used to meet the non-numeric effluent limitations.

EPA's Decision to Include Non-Numeric Technology-Based Effluent Limitations in the PGP and Rationale for Why the Limits Represent the Appropriate (BPT, BCT, or BAT) Level of Control.

As described above, numeric effluent limitations are not always feasible because the discharges of pollutants pose challenges not presented by other types of NPDES-regulated discharges of pollutants. The technology-based effluent limitations remain unchanged from EPA's 2016 PGP. The technology-based effluent limitations in this permit are non-numeric based on the following facts:

- The point in time for which a numeric effluent limitation would apply is not easily determinable. For discharges of pollutants from the application of pesticides, the discharges of pollutants can be highly intermittent with those discharges of pollutants not practically separable from the pesticide application itself. For example, the

⁵ See also; *Northwest Env'tl. Advocates v. City of Portland*, 56 F.3d 979, 988 (9th Cir. 1995) (finding that a narrative effluent limitation was an enforceable condition of an NPDES permit).

discharge from the application of a chemical pesticide to waters of the United States is a discharge of pollutants when there is a residual remaining in the ambient water after the pesticide is no longer serving its intended purpose (*i.e.*, acting as a pesticide against targeted pests in the applied medium). This discharge of pollutants also will have combined with any other discharges of pollutants to that waterbody (be it from other point sources, non-point source runoff, air deposition, etc.). Given this situation, it is not clear what would be measured for a numeric limit or when.

- For discharges from the application of pesticides, there are often many short durations, highly variable, pollutant discharges to surface waters from many different locations for which it would be difficult to establish a numeric limitation at each location. This variability makes setting reasonable and fair numeric effluent limitations for pesticide applications extremely difficult. Even in a normal plant specific setting, EPA takes into account the variability of pollutant removal performance at a facility operated in compliance with applicable statutory and regulatory requirements to derive technology-based limitations. In the water-quality based effluent limitations context, EPA takes into account ambient conditions of the waterbody which can require complex modelling and formulas to derive what discharge of pollutant level is necessary, without being overly stringent, to protect water quality. In the context of pesticide application, the numbers of variables that would affect such a calculation becomes unworkable. In this situation, requiring the use of standard control practices (*i.e.*, narrative non-numeric effluent limitations), provides a reasonable approach to control pesticide discharges of pollutants.
- The precise location for which a numeric effluent limitation would apply is not clear. Discharges from the application of pesticides are different from discharges of pollutants of process wastewater from a particular industrial or commercial facility where the effluent is more predictable and easily identified as an effluent from a conveyance (*e.g.*, pipe or ditch), can be precisely measured for compliance prior to discharge, and can be more effectively analyzed to develop numeric effluent limitations.
- EPA does not have sufficient information to develop numeric effluent limitations at this time. To develop numeric technology-based effluent limitations, EPA must evaluate factors outlined in 40 CFR 125.3, such as the age of equipment and facilities involved, the process employed, the potential process changes, and non-water quality environmental impacts. In addition, EPA estimates that more than 400 pesticide active ingredients contained in over 3,500 pesticide products may be covered under this permit.

In the context of this general permit, EPA has determined these non-numeric effluent limits represent the best practicable technology (BPT) for all pollutants, the best conventional pollutant control technology for conventional pollutants (BCT) and the best available technology economically achievable (BAT) for toxic and non-conventional pollutants. EPA has determined that the combination of pollution reduction practices described below are the most environmentally sound way to control the point source discharges of biological pesticides, and chemical pesticides that leave a residue.

Technology-based effluent limitations in this permit are presented specific to each pesticide use pattern to reflect the variations in procedures and expectations for the use and application of pesticides. These non-numeric effluent limitations are expected to reduce the point source discharges of pollutants to waters of the United States, thereby protecting the receiving waters, including to the extent necessary to meet applicable water quality standards. EPA notes that the PGP uses the term “Pest Management Measures.” Use of the term Pest Management Measures is intended to better describe the range of pollutant reduction practices that may be employed when applying pesticides, whether they are structural, non-structural or procedural and includes BMPs as one of the components.

The BAT/BPT/BCT effluent limitations in this permit are expressed as specific pollution prevention requirements for minimizing the pollutant levels in the discharge. In the context of this general permit, these requirements represent the best technologically available and economically practicable and achievable controls. EPA has determined that the combination of pollution prevention approaches and structural management practices required by these limits are the most environmentally sound way to control the discharge of pollutants to meet the effluent limitations. Pollution prevention continues to be the cornerstone of the NPDES program.

Requirements are technologically available

EPA has found that the requirements of this permit represent the appropriate level of control representing BPT, BCT, and BAT. The PGP requires certain Operators to implement Pest Management Measures to meet the technology-based effluent limitations that are based on IPM principles. See further discussion of pest management measures below. Unlike other general permits, the technology available to Operators depends on the type of Operator (e.g. Applicator v. Decision-maker). For this reason, technology-based effluent limitations vary depending on Operator type. As an example of an effluent limit that meets BPT and BAT standards, applicators are required to maintain pesticide application equipment in proper operating condition, including requirement to calibrate, clean, and repair such equipment and prevent leaks, spills, or other unintended discharges. This effluent limitation is not appropriate for decision-makers that do not apply the pesticide themselves and as such, is not an effluent limitation for decision-makers. EPA determined that calibrating, cleaning, and repairing pesticide application equipment is technologically available and based on EPA’s evaluation of this industry, is currently being implemented by many operators and is a practice that every operator should be doing when using pesticides, as a way to prevent leaks, spills, and other unintended discharges, such as over-applying pesticides as a result of poorly maintained equipment.

Requirements meet the BPT and BAT economic tests set forth in the CWA

There are different economic considerations under BPT, BCT, and BAT. EPA finds that the limits in the PGP meet the BPT and BAT economic tests. Because the types of controls under consideration minimize toxic, nonconventional, and conventional pollutants, conventional pollutants are controlled by the same practices that control toxic and nonconventional pollutants. Hence, EPA is evaluating effluent limits using a BPT and a BAT standard, but since conventional pollutants will also be adequately controlled by these same effluent limits for which EPA applied the BPT and BAT tests, EPA has determined that it is not necessary to conduct BCT economic tests.

Under BPT, EPA has determined that the requirements of this 2021 PGP are economically practicable since they contain the same requirements as found in the 2011 PGP and the 2016 PGP. To make the original BPT determination, EPA considered the reasonableness of the relationship between the costs of application of technology in relation to the effluent reduction benefit derived. CWA section 301(b)(1)(B); 40 CFR 125.3(d)(1). This analysis was documented in the fact sheet accompanying the 2011 PGP (available at <https://downloads.regulations.gov/EPA-HQ-OW-2010-0257-1276/content.pdf>). EPA estimates that the 2021 PGP will cover approximately 14,300 Operators. In light of the original BPT determination and the fact that the 2021 PGP does not alter per entity compliance costs, EPA finds that the BPT limits have a cost that is justified by the effluent reduction resulting from the BPT effluent limitations and that for BAT, the costs are economically achievable because they can reasonably be borne by the industry as a whole.

EPA continues to study the efficacy of various types of pollution prevention measures and BMPs; however, for this permit numeric limitations are still not feasible.

Requirements have acceptable non-water quality environmental impacts.

EPA finds that the controls in the permit have acceptable non-water quality environmental impacts. Because the 2021 PGP contains the same requirements as the 2016 PGP there are no significant changes to the non-water quality environmental impacts. EPA also notes that the requirement to comply with the FIFRA label incorporates the consideration of the environmental impacts of the pesticide's use with the benefits of the pesticide's use. When EPA determines that a pesticide product can be registered for use, the Agency has concluded that the use of the pesticide product will not cause unreasonable adverse effects to humans or the environment when applied according to the label directions and restrictions. "Unreasonable adverse effects" takes into account the economic, social, and environmental costs and benefits of the use of the pesticide. EPA finds that the pollutant discharges authorized by this permit have recreational, environmental or other human benefits. For example, permittees will discharge pollutants to control for mosquitos and other flying insects in order to prevent the spread of infectious diseases, such as malaria, vesicular stomatitis, and West Nile Virus. Control of weed, algae, and plant pathogens promotes healthy aquatic communities and recreational and other benefits for the human population. Permittees will also discharge pollutants to control invasive and nuisance aquatic animals, such as fish, lampreys, and mollusks, which negatively affect aquatic biodiversity, human health, and economic stability. Pollutant discharges will also control pests that threaten the health of the forest canopy, such as the gypsy moth. This permit includes permit terms which provide reasonable protection to impacted waters of the United States without constraining the use of these pesticides which provide acceptable non-water quality environmental impacts.

Pest Management Measures Used to Meet the Technology-Based Effluent Limitations

Just as there is variability in the pesticide applications as described above, there is variability in the Pest Management Measures that can be used to meet the effluent limitations. Therefore, EPA is not mandating the specific Pest Management Measures Operators must implement to meet the limitations. This is analogous to an industrial situation where discharges of pollutants to waters of the United States are via pipes and a numeric effluent limitation may be specified as a given quantity of pollutant that may be discharged, but EPA would not specify

what technology should be employed to meet that limitation. For pesticides, namely mosquitocides, for example, Part 2.2.1.b of the PGP requires mosquito control Decision-makers to consider mechanical/physical methods of control to eliminate or reduce mosquito habitat. How this is achieved will vary by Operator: For some, this may be achieved through elimination of development habitat (e.g., filling low areas, dredging, etc.) while for others these measures will not be feasible. Thus, a given Pest Management Measure may be acceptable and appropriate in some circumstances but not in others. In this respect, the non-numeric effluent limitations in the PGP are similar to performance-based numeric effluent limitations, which also do not require specific control technologies as long as the limitations are met.

Pest Management Measures can be actions (including processes, procedures, schedules of activities, prohibitions on practices, and other management practices), or structural or installed devices to prevent or reduce water pollution. The key is determining what measure is appropriate for the situation in order to meet the effluent limitation. In this permit, Operators are required to implement site-specific Pest Management Measures to meet these effluent limitations. The permit along with this fact sheet provide examples of Pest Management Measures, but Operators must tailor these to their situations as well as improve upon them as necessary to meet the effluent limitations.

The approach to Pest Management Measures in this permit is consistent with the CWA as well as its implementing regulations at 40 CFR 122.44(k)(4). Section 402(a)(2) of the CWA states: “The administrator shall prescribe conditions for such permits to assure compliance with the requirements in paragraph (1) . . . including conditions on data and information collection, reporting and such other requirements as he deems appropriate.” (Section 402(a)(1) includes effluent limitation requirements.) This statutory provision is reflected in the CWA implementing regulations, which state that BMPs (in this case, specifically Pest Management Measures) can be included in permits when, “[t]he practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the CWA.” 40 CFR 122.44(k)(4).

Implementation of Pest Management Measures

Part 2.0 of the PGP requires Operators to implement Pest Management Measures to meet the technology-based effluent limitations listed in that Part. It also provides Operators with important considerations for the implementation of their specific Pest Management Measures. Some Decision-makers will have to document how such factors were taken into account in the implementation of their Pest Management Measures (See Part 5 of the PGP). EPA recognizes that not all of these considerations will be applicable to every pest management area nor will they always affect the choice of Pest Management Measures. EPA expects that Operators have the experience and working knowledge to apply pesticides properly. The 2021 PGP requires the Operator to apply such expertise and working knowledge to use best professional judgment in meeting the permit terms. If Operators find their Pest Management Measures are not minimizing discharges of pollutants adequately, the Pest Management Measures must be modified as expeditiously as practicable. See Part 6 of the PGP, Corrective Action.

EPA recognizes that Operators need the flexibility to tailor Pest Management Measures to their situation as well as improve upon them as necessary to meet the technology-based effluent limitations. Decision-makers will tailor Pest Management Measures based on available

information and the best professional judgment of qualified personnel. For example, while Part 2.2 of the PGP requires Decision-makers to evaluate other means than pesticide use, the Decision-makers ultimately decide what ultimate pest control method is employed. Thus, while mechanical pest removal or less toxic chemicals may be possible options, the Decision-maker is in the best position to know what method is most appropriate and effective against the target pest.

Pest Management Measures and Technology-Based Effluent Limitations – Definition of “Minimize”

EPA has found that the requirements of the 2021 PGP represent the appropriate BPT, BCT and BAT level of control. The non-numeric effluent limitations require Operators to “minimize” discharges of pollutants. Consistent with the control level requirements of the CWA, the term “minimize” means to reduce and/or eliminate pollutants discharges to waters of the United States through the use of Pest Management Measures to the extent technologically available and economically achievable and practicable. For many pesticide applications, minimization of the discharge of pesticides to waters of the United States can be achieved without using highly engineered, complex pest control systems. The specific limits included in Part 2.0 of the PGP emphasize effective “low-tech” approaches, including using only the amount of pesticide product and frequency of pesticide application necessary to control the target pest, performing equipment maintenance and calibration, assessing weather conditions prior to pesticide application, accurately identifying the pest problem, efficiently and effectively managing the pest problem, and properly using pesticides.

Statutes, Regulations, and Other Requirements

In addition to the applicable permit requirements, Operators must comply with all applicable statutes, regulations and other requirements including, but not limited to, requirements contained in the labeling of pesticide products approved under FIFRA (“FIFRA labeling”). See Part 1.5 of the PGP. See also Part 2.0 (“As stated in Part 1.5, this permit requires all Operators to comply with all other applicable federal or state laws and regulations that pertain to application of pesticides by the Operator.”). Although the FIFRA label and labeling requirements are not effluent limitations, it is illegal to use a registered pesticide inconsistent with its labeling. In fact, Operators discharging under EPA’s PGP must comply with FIFRA labeling requirements in order to be in compliance with the PGP technology-based effluent limits. Per Parts 2.1 and 2.2 of the PGP, “To meet the effluent limitations of this permit, all Applicators [or Decision-makers] must implement Part 2.1 [or Part 2.2] to minimize the discharge of pesticides to waters of the United States from the application of pesticides, through the use of Pest Management Measures, as defined in Appendix A.” Per Appendix A, Pest Management Measure means “any practice used to meet the effluent limitations that comply with manufacturer specifications, industry standards and recommended industry practices related to the application of pesticides, relevant legal requirements and other provisions that a prudent Operator would implement to reduce and/or eliminate pesticide discharges to waters of the United States.” Pest Management Measures include FIFRA labeling requirements. Therefore, if Operators apply a pesticide in a manner inconsistent with any relevant water-quality related FIFRA labeling requirements such as those relating to application sites, rates, frequency, and methods, as well as provisions concerning proper storage and disposal of pesticide wastes and containers, the Operators would be in violation of the effluent limitation to minimize pesticides entering the waters of the United

States. For example, an Operator, who is a pesticide Applicator, decides to use a mosquito adulticide pesticide product with a FIFRA label that contains the following language, "Apply this product at a rate not to exceed one pound per acre." The Applicator applies this product at higher than the allowable rate, which results in excess product being discharged into waters of the United States. EPA would find that this application was a misuse of the pesticide under the FIFRA label. Because of the misuse the Agency might also determine that the effluent limitation that requires the Operator to minimize discharges of pollutants to waters of the United States was violated, depending on the specific facts and circumstances. Therefore, pesticide use inconsistent with certain FIFRA labeling requirements could result in the Operator being held liable for a CWA violation as well as a FIFRA violation.

Technology-Based Effluent Limitations in the PGP

In the PGP, all Operators are classified as either "Applicators" or "Decision-makers" or both. An Applicator is an entity who performs the application of a pesticide or who has day-to-day control of the application (*i.e.*, they are authorized to direct workers to carry out those activities) that results in a discharge to waters of the United States. A Decision-maker is an entity with control over the decision to perform pesticide applications, including the ability to modify those decisions that result in discharges of pollutants to waters of the United States. As such, more than one Operator may be responsible for compliance with this permit for any single discharge from the application of pesticides. EPA has delineated the non-numeric effluent limitations into tasks that EPA expects the Applicator to perform and tasks that EPA expects the Decision-maker to perform. In doing so, EPA has assigned the Applicator and the Decision-maker different responsibilities.

2.1 Applicators' Responsibilities

Part 2.1 of the PGP contains the general technology-based effluent limitations that *all* Applicators must perform, regardless of pesticide use pattern. These effluent limitations are generally preventative in nature and are designed to minimize pesticide discharges into waters of the United States. All Applicators are required to minimize the discharge of pesticides to waters of the United States by doing the following:

2.1.1 To the extent not determined by the Decision-maker, use only the amount of pesticide and frequency of pesticide application necessary to control the target pest, using equipment and application procedures appropriate for this task.

As noted earlier, 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 use only the amount of pesticide and frequency of pesticide application necessary to control the target pest. Using only the amount of pesticide and frequency of pesticide application needed ensures maximum efficiency in pest control with the minimum quantity of pesticide. Using only the amount and frequency of applications necessary can result in cost and time savings to the user. To minimize discharges of pollutants, Operators should base the rate and frequency of application on what is known to be effective against the target pest.

2.1.2 Maintain pesticide application equipment in proper operating condition, including requirement to calibrate, clean, and repair such equipment and prevent leaks, spills, or other unintended discharges.

Common-sense and good housekeeping practices enable pesticide users to save time and money and reduce the potential for unintended discharge of pesticides to waters of the United States. 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 waters of the United States. Some basic practices 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.

To minimize discharges of pollutants, Applicators 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 maintenance 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.

2.1.3 Assess weather conditions (*e.g.*, temperature, precipitation, and wind speed) in the treatment area to ensure application is consistent with all applicable federal requirements.

Weather conditions may affect the results of pesticide application. Applicators must assess the treatment area to determine whether weather conditions support pest populations and are suitable for pesticide application.

2.2 Decision-makers' Responsibilities

As noted above, NPDES permits must contain technology-based effluent limitations. Part 2.2 of the PGP contains the effluent limitations that Decision-makers must perform. The 2021 PGP requires *all* Decision-makers, to the extent Decision-makers determine the amount of pesticide or frequency of pesticide application, to minimize the discharge of pesticides to waters of the United States from the application of pesticides, through the use of Pest Management Measures, as defined in Appendix A of the PGP, by using only the amount of pesticide and frequency of pesticide application necessary to control the target pest.

In addition, Part 2.2 of the PGP requires that any Decision-maker who is required to submit a Notice of Intent (NOI) to identify the pest problem, implement effective and efficient pest management options, and adhere to certain pesticide use provisions. (For purposes of the discussion below on Part 2.2 of the PGP, the term Decision-maker means any Decision-maker who is or will be required to submit an NOI.) Parts 2.2.1 – 2.2.4 of the PGP do not apply to Decision-makers who will need to submit an NOI only because they discharge pollutants to waters of the United States containing NMFS Listed Resources of Concern and whose: (1) Pesticide application activities for which permit coverage is being requested will discharge pollutants to one or more receiving waters of the United States containing NMFS Listed Resources of Concern, but consultation with NMFS under Section 7 of the ESA has been concluded for pesticide application activities covered under this permit; or (2) Pesticide application activities for which permit coverage is being requested will discharge pollutants to one or more waters of the United States containing NMFS Listed Resources of Concern, but all “take” of these resources associated with such pesticide application activities has been authorized through NMFS’ issuance of a permit under Section 10 of the ESA, and such authorization addresses the effects of the pesticide discharges and discharge-related activities on federally-listed species and federally-designated critical habitat. However, these Decision-makers must comply with all applicable conditions and/or requirements resulting from ESA Section 7 consultation or ESA Section 10 permit.

Decision-makers 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. These additional technology-based effluent limitations are based on integrated pest management principles. EPA is requiring certain Decision-makers to also comply with a different technology-based effluent limitation than Applicators because the Agency has determined that they are the Best Available Technology Economically Achievable for these Operators. These requirements are aimed at reducing discharge of pesticides to waters of the United States and lessening the adverse effects of pesticides that are applied. Each pesticide use pattern has specific limitations, and these requirements are divided into three different sections: (1) identify the problem, (2) pest management options, and (3) pesticide use. For each pest management area, Decision-makers must identify the problem prior to pesticide application, consider using a combination of chemicals and non-chemical Pest Management Measures, and perform surveillance before pesticide application to reduce environmental impacts.

EPA is requiring these additional technology-based effluent limitation requirements from Decision-makers and not the Applicators because the measures necessary to meet these requirements are within the control of the Decision-makers, not the Applicators.

As stated above, these technology-based effluent limitations are based on integrated pest management principles. Integrated pest management, 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) Integrated pest management is not a single pest control method but, rather, a series of pest management evaluations, decisions and controls. In evaluating available and relevant information, EPA found that some commercial (For-Hire Applicators) and non-commercial (*e.g.*, state governments, federal governments, local governments, utilities) entities are currently implementing integrated pest management or components of integrated pest management to minimize pesticide use. For example, federal agencies are required to implement integrated pest management under 7 USC 136r-1, “Federal agencies shall use Integrated Pest Management techniques in carrying out pest management through procurement and regulatory policies, and other activities.” In addition, Executive Order 13514 (October 5, 2009) requires the head of each federal agency to implement integrated pest management and other appropriate landscape management practices as a means to promote pollution prevention and eliminate waste.

Below is a general discussion describing the limitations for all pesticide use patterns. Following the general discussion are more detailed descriptions of each specific requirement under each pesticide use pattern.

Any Decision-maker who is or will be required to submit an NOI must do the following regardless of the pesticide use pattern, except those Decision-makers who will need to submit an NOI only because they discharge pollutants to waters of the United States containing NMFS Listed Resources of Concern and that also comply with provisions in Part 1.6 of the PGP:

Identify the Problem

Decision-makers 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 Measures (pesticidal or non-pesticidal methods), and in developing an action threshold. Action threshold is defined in Appendix A of the PGP as the point at which pest populations or environmental conditions cannot be tolerated, necessitating that pest control action be taken based on economic, human health, aesthetic, or other effects. An action threshold helps 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) and/or is an invasive species. 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. Sometimes pre-emergent pesticide application is needed, as a preventive measure to keep aquatic weeds at bay. Action thresholds, often expressed as number of pests per unit area, can vary by pest, by site, and by season. In a new pest management program, action thresholds may be difficult to establish and as a practical approach should first focus on 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, Decision-makers may use existing data to meet the conditions of this permit. For example, a mosquito district may use surveillance data from an adjacent district to identify pests in their pest management area. Decision-makers may also use relevant historical site data.

Pest Management Options

Decision-makers are required to implement efficient and effective means of Pest Management Measures that most successfully minimize discharges of pollutants to waters of the United States resulting from the application of pesticides. Decision-makers must evaluate both pesticide and non-pesticide methods. Decision-makers 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, Decision-makers must consider impacts to water quality, impacts to non-target organisms, feasibility, and cost effectiveness. Combinations of various management options are frequently the most effective Pest Management Measures 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 pesticide use pattern.

Pesticide Use

Decision-makers are required to conduct pest surveillance in an area that is representative of the pest problem 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 only apply pesticides 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 pesticide use pattern in Parts 2.2.1 through 2.2.4 of the PGP. For additional information and other limits on pesticide use, see specific discussion under each pesticide use pattern.

2.2.1 Mosquito and Other Flying Insect Pests Control

Part 2.2.1.a -- Identify the Problem

Prior to the first pesticide application covered under this permit that will result in a discharge to waters of the United States, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year, any Decision-maker who is or will be required to submit an NOI must do the following for each pest management area, as defined in Appendix A. Decision-makers must identify the pest problem in their pest management areas prior to the first application covered under the permit. Knowledge of the pest problem is an important step to developing Pest Management Measures. Re-evaluation of the pest problem is also important to ensure Pest Management Measures are still applicable. Decision-makers must identify the pest problem at least once each calendar year prior to the first application for that calendar year.

Establish densities for larval and adult mosquito or flying insect pest populations or identify environmental condition(s), either current or based on historical data, to serve as

action threshold(s) for implementing Pest Management Measures. Decision-makers must develop action thresholds for larval and adult mosquitoes 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. For example, an action threshold could be the number and distribution of service requests received from the public. It is a predetermined pest level (or other indicator) that is deemed to be unacceptable. For example, in Maryland, “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 3 mosquitoes in 2 minutes. The action threshold for aerial spraying is 12 mosquitoes per minute.”⁶ For larvae control, action thresholds are determined by standard mosquito dipping techniques. For example, in Canyon County Mosquito Abatement District, Idaho⁷, they 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 the pest is capable of transmitting a human pathogen (*e.g.*, mosquitoes and the West Nile virus).

Identify the target pest(s) to develop Pest Management Measures based on developmental and behavioral considerations for each pest. Knowledge of the developmental biology of mosquitoes is essential to developing Pest Management Measures for mosquito control.

Prior to the first pesticide application covered under the permit, Operators must ensure proper identification of mosquito to better understand the biology of the target pest and develop Pest Management Measures. 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 Measures. Identification of the target pest will aid in development of Pest Management Measures aimed at both the immature and adult developmental stages. Identification of the target pest for a specific area allows 1) identification of potential breeding sites, 2) evaluation of alternative Pest Management Measures aimed at controlling the immature stages (habitat modification, source reduction, larvicides, biological larvicides, and oils), and 3) assessment of potential for disease transmission.

Similarly, for black flies, prior to first pesticide application covered under this permit, Operators must ensure proper identification of the pest to develop Pest Management Measures. Due to preferred hosts and developmental habitats, proper identification of the pest is

⁶ http://mda.maryland.gov/plants-pests/Pages/mosquito_control_program_description.aspx

⁷ <http://www.canyoncountymosquito.com/CCMADMosquitoPesticideUsePlan.pdf>

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 pest. 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 waters of the United States.

Identify known breeding sites for source reduction, larval control program, and habitat management. Once pests have been identified, mapping is a valuable tool in assessing mosquito habitats and designing control programs for a specific area to minimize pesticide discharges into waters of the United States. Maps may simply be township/city/county maps but may also include aerial photo assessments, topographic maps, and satellite imagery where available and/practicable. Mapping is essential to identify pest 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, 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 Measures (whether source reduction, biological, or chemical) for each particular pest is chosen. Operators must identify known breeding sites prior to the first pesticide application covered under this permit.

In conjunction with identifying the target pest, mapping should be considered part of control programs aimed at black fly management. 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. Pest 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 discharges into waters of the United States.

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. Decision-makers must analyze existing surveillance data to identify any new source of pest problems.

In the event there are no data for the pest management area in the past calendar year, use other available data as appropriate to meet the permit conditions in Part 2.2.1.a. Decision-makers may use historical data or neighboring district data to identify the pest and establish action thresholds.

Part 2.2.1.b -- Pest Management Options

Prior to the first pesticide application covered under this permit that will result in a discharge to waters of the United States, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year, any Decision-maker who is or

will be required to submit NOIs must select and implement efficient and effective means of Pest Management Measures that minimize discharges resulting from the application of pesticides to control mosquitoes or other flying insect pests. In developing the Pest Management Measures for each pest management area, the Decision-maker must evaluate the following management options, including a combination of these management options, considering impact to water quality, impact to non-target organisms, feasibility, and cost effectiveness: No action; Prevention; Mechanical/physical methods; Cultural methods; Biological control agents; and Pesticides. Decision-makers are required to evaluate management options and implement Pest Management Measures to minimize pesticide discharges into waters of the United States prior to the first pesticide application covered under this permit. For black flies, Pest Management Measures will vary by locality (*i.e.*, stream size, stream substrate, and stream vegetation), black fly species (5 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 options are frequently the most effective Pest Management Measures over the long term. The goal should be to emphasize long-term control rather than a temporary fix. Decision-makers must reevaluate every year prior to the first pesticide application for that calendar year.

Based on problem identification, two preventive measures other than pesticides should be evaluated for black flies. 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. The following describes the management options that must be evaluated. Tactics of preventative, cultural, mechanical/physical, and biological Pest Management Measures may overlap for some aquatic systems or specific pest control situations.

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, biological control, and pesticide use in non-waters of the United States.

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. aegypti*, *Ae. albopictus*, *Cx. p. pipiens*, and *Cx. salinarius*. 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 Agents. 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 program with results reported from excellent control to no control at all. Concerns over placing *Gambusia* in habitats where other fish species assemblages are threatened have been ongoing. 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.

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 two to three 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 expend 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 the PGP must be met.

Part 2.2.1.c. -- Pesticide Use

Conduct larval and/or adult surveillance in an area that is representative of the pest problem or evaluate existing larval surveillance data, environmental conditions, or data from adjacent area prior to each pesticide application to assess the pest management area and to determine when action threshold(s) is met. 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. Decision-makers are required to conduct a surveillance program to minimize discharges of pollutants from control activities. Surveillance is necessary not only to establish pests' 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 Pest Management Measures. Adult surveillance can be conducted using a variety of methods including but not limited to 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 integrated pest management 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 Pest Management Measures. 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.

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.*, omentol and CO₂). 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 Measure.

Aside from surveillance data, Decision-makers may also evaluate environmental conditions to assess the pest management area. For example, if the pest management area is known for pest development after flooding then Pest Management Measures may be needed after a rainstorm.

Reduce the impact on the environment and on non-target organisms by applying the pesticide only when the action threshold(s) has been met. Operators must apply pesticide only as indicated by action thresholds for the pest management area. As noted above, action thresholds, established by the Decision-maker, 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 the larval action threshold(s) has 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 applications. 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 pesticide application 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.

Bacillus thuringiensis var *israelensis* (Bti) is the primary larvicide used for black fly control in the United States. 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 discharges into waters of the United States, 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.

A 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 discharges into waters of the United States.

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 the adult action threshold(s) has been met. Chemical pesticide applications 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 pesticide application 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.

Environmental conditions may also 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 applications made when mosquitoes are up and flying is a residual barrier treatment application. Barrier applications 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 applications 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.

Pesticide control of black flies in the United States 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 United States.

Recommended Mosquito Control References

EPA recommends the following sources for additional information on Pest Management Measures for mosquito control:

Anderson, RR and LC Harrington et al. 2010. Mosquito Biology for the Homeowner. Cornell Cooperative Extension – Medical Entomology Extension. Available at:
http://blogs.cornell.edu/harrington/files/2014/01/Mosquito-Biology-for-the-Homeowner_final-2014-18iwdiw.pdf

American Mosquito Control Association. 2009. Mosquito Information. Available at:
<https://www.mosquito.org/page/mosquitoinfo>

American Mosquito Control Association. 2009. Mosquito Info: Control.
<https://www.mosquito.org/page/control>

California Department of Public Health. 2008. Best Management Practices for Mosquito Control on California State Properties. Available at:
http://westnile.ca.gov/downloads.php?download_id=996&filename=CDPH_BMP_MosquitoControl6-08.pdf

Commonwealth of Massachusetts Department of Food and Agriculture State Reclamation and Mosquito Control Board. 1998. Generic Environmental Impact Report (GEIR)

For the Massachusetts Mosquito Control. Available at:
<http://www.mass.gov/eea/docs/agr/mosquitos/geir-docs/geir-full-text.pdf>

Florida Coordinating Council on Mosquito Control. 2018. Florida Mosquito Control – The State of Mission as defined by mosquito controllers, regulators, and environmental managers. Available online at: <https://fmel.ifas.ufl.edu/media/fmelifasufledu/7-15-2018-white-paper.pdf>

New York City Department of Health and Human Hygiene. 2016. Comprehensive Mosquito Surveillance and Control Plan. Available at:
<https://www1.nyc.gov/assets/doh/downloads/pdf/wnv/2016/wnvplan2016.pdf>

Grodner, MG, J Criswell, C Sutherland, P Spradley, DL Rennie, ME Merchant, M Johnsen, and S Sawlis. 2007. The Best Way to Control Mosquitoes - Integrated Mosquito Management Explained. Available at: <http://www.uaex.edu/publications/pdf/ag1166.pdf>

Kwasny, DC, M Wolder, and CR Isola. 2004. Technical Guide to Best Management Practices for Mosquito Control in Managed Wetlands. Central Valley Joint Venture. Available at: <http://www.centralvalleyjointventure.org/assets/pdf/CVJV-Mosquito-BMP.pdf>

Rose, RI. 2001. Pesticides and Public Health: Integrated Methods of Mosquito Management. Emerging Infectious Diseases 7:1.

State of Massachusetts. 2008. Massachusetts Best Management Practices and Guidance for Freshwater Mosquito Control. Available at: <http://www.mass.gov/eea/docs/agr/mosquitos/docs/mepa/document-2-freshwater-bmp-to-mepa-oct-24-2008.pdf>

State of New Hampshire. 2008. Policy for Mosquito Control on State Lands. Available at: EPA docket number EPA-HQ-OW-2020-0005

State of New Mexico. 2008. Philosophy of Mosquito Control. <http://nmhealth.org/publication/view/guide/992/>

Washington State Department of Ecology/Water Quality Program. 2004. Best Management Practices for Mosquito Control. Available at: <https://fortress.wa.gov/ecy/publications/publications/0310023.pdf>

Recommended Black Fly Control References

EPA recommends the following sources for additional information on Pest Management Measures for black fly control:

Commonwealth of Pennsylvania. 2009. Black Fly Suppression Program. Available at: <https://www.dep.pa.gov/Business/Water/CleanWater/BlackFly/Pages/default.aspx>

Government of Alberta – Agriculture and Rural Development. 1993. Black Fly Control. Available at: <https://open.alberta.ca/dataset/2397254#summary>

Greater Los Angeles Vector Control District. 2016. Black Flies – Vector Services and Information. Available at: <http://www.glacvcd.org/vector-information/black-flies/>

Metropolitan Mosquito Control District. 2009. Biting Gnat/Black Fly Control. Available at: <http://www.mmcd.org/biting-gnat-control/>

North Carolina Cooperative Extension. 2005. Insect Notes – Black Flies and Their Control. Available at: <http://www.ces.ncsu.edu/depts/ent/notes/Urban/blackfly.htm>

North Elba – Black Fly Control Dept. 2009. About the black fly control program. Available at: <http://www.northelba.org/?page=services/black-fly-control-dept>

Ohio State University Extension. 1997. Factsheet – Black Flies. HYG-2167-97.

The Merck Veterinary Manual. 2016. Black Flies. Available at:

<https://www.merckvetmanual.com/integumentary-system/flies/black-flies>

Undeen, AH and DP Malloy. 1996. Use of stream width for determining the dosage rates of *Bacillus Thuringiensis* Var. *israelensis* for larval black fly (Diptera: Simuliidae) control. Journal of the American Mosquito Control Association. 12(2):312-315.

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/>

2.2.2 Weed and Algae Pest Control

Part 2.2.2.a -- Identify the Problem

Prior to the first pesticide application covered under this permit that will result in a discharge to waters of the United States, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year, any Decision-maker who is or will be required to submit NOI must do the following for each pest management area, as defined in Appendix A. Decision-makers 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 Measures. Re-evaluation of the pest problem is also important to ensure Pest Management Measures are still applicable. Decision-makers must identify the pest problem at least once each calendar year prior to the first application for that calendar year.

Identify areas with pest problems and characterize the extent of the problems, including, for example, water use goals not attained (e.g., wildlife habitat, fisheries, vegetation, and recreation). Decision-makers must be well-acquainted with the unique regional conditions of their sites and available Pest Management Measures for controlling the pest 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 target pest, as well as water use goals and complaints or reports of weeds and algae from the public.

Identify target pest(s). Positive identification of the pest is required because many pests within the same genera may require different levels and types of Pest Management Measures. Pest identification is important when determining the best Pest Management Measures for each pest and for determining application areas. Decision-makers should develop Pest Management Measures based on identification of the targeted pest which occur in their area.

Identify possible factors causing or contributing to the pest 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 pest infestations, the identification of possible sources (*e.g.*, outflows from other water systems/bodies) may help in reducing the need for pesticide. Potential weed and algae causes, such as changes in nutrient levels or accidental or intentional introduction of exotic species, must be identified.

Establish any pest- and site-specific action threshold, as defined in Appendix A, for implementing Part 2.2.2b. Any data and/or information regarding pest can be used to establish an action threshold. An action threshold must be established.

In the event there are no data for the pest management area in the past calendar year, use other available data as appropriate to meet the permit conditions in Part 2.2.2.a.

Decision-makers may use historical data or neighboring district data to identify the pest and establish action thresholds.

Part 2.2.2.b -- Pest Management Options

Prior to the first pesticide application covered under this permit that will result in a discharge to waters of the United States, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year, any Decision-maker who is or will be required to submit an NOI must select and implement efficient and effective means of Pest Management Measures that minimize discharges resulting from the application of pesticides to control pests. In developing the Pest Management Measures for each pest management area, the Decision-makers must evaluate the following management options, including a combination of these management options, considering impact to water quality, impact to non-target organisms, feasibility, and cost effectiveness: No action; Prevention; Mechanical/physical methods; Cultural methods; Biological control agents; and Pesticides. Decision-makers must evaluate management options and implement Pest Management Measures to minimize pesticide discharges into waters of the United States prior to the first pesticide application covered under this permit. As noted above, combinations of various management options are frequently the most effective Pest Management Measures over the long term. The goal should be to emphasize long-term control rather than a temporary fix. Decision-makers must reevaluate every year prior to the first pesticide application for that calendar year. All Pest Management Measures must be implemented in a manner that reduces impacts to non-target species. The following describes the management options that must be evaluated. Tactics of preventative, cultural, mechanical/physical, and biological Pest Management Measures may overlap for some aquatic systems or specific pest control situations.

No Action

No action is to be taken, although pest problem has been identified. This may be appropriate in cases where, for example, available pest management options 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 pest is the most efficient way to reduce the threat of nuisance species (ANS TaskForce, <http://www.anstaskforce.gov/default.php>). 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 pest, private entities (aquaculture) and the public have the necessary knowledge to assist in local pest control by reducing conditions that encourage the spread of pests in their immediate surroundings. For example, recreational water users provide a pathway of unintentional introductions. Increasing public awareness of 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 (*e.g.*, hand weeding). Monitoring and detection also play important roles in the prevention of the spread and introduction of weeds and algae.

Mechanical or Physical Methods

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

Cultural Methods

Cultural techniques include the use of pond dyes and water-level drawdown. The use of certain pond dyes may help manage filamentous algae and submersed (underwater) vegetation. Several pond colorants and one or two dyes are EPA-registered for 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.

Biological Control Agents

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

Pesticides

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 as well as plants at or near the water's edge 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.⁸

Part 2.2.2.c. -- Pesticide Use

Conduct surveillance in an area that is representative of the pest problem prior to each pesticide application to assess the pest management area and to determine when the action threshold(s) is met. Often, each weed and algae and pest management area warrant different Pest Management Measures tailored to regional conditions. The Pest Management Measures should consist of combinations of mechanical, biological, and/or pesticidal control methods. All Pest Management Measures must be conducted in a manner that minimizes impacts to non-target species.

Decision-makers should apply chemical pesticides only after considering the alternatives and determining those alternatives not to be appropriate Pest Management Measures. Also, Decision-makers should conduct surveillance (*e.g.*, pest counts or area survey) prior to application of pesticides to determine when the action threshold is met thus necessitating the need for implementing Pest Management 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 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 thresholds help determine both the need to implement Pest Management Measures 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 pesticide applications 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 Weed and Algae Control References

EPA recommends the following sources for additional information on Pest Management Measures for weed and algae control:

Aquatic Nuisance Species Taskforce. Available at <http://www.anstaskforce.gov/default.php>.

Getsinger, K., Moore, M. D., Layne, C. P., Petty, D. G., L, S., Sprecher, Dibble, E. D., Karcas, E., Maceina, M., Mudrak, V., Lembi, C., Madsen, J. D., Stewart, R. M., Anderson, L., Haller, W., Confrancesco, A., Newman, R., & Nibling, F. (2005). Aquatic Plant Management Best

⁸ <https://www.regulations.gov/document?D=EPA-HQ-OW-2015-0499-0022>
(<http://www.ecy.wa.gov/programs/wq/plants/management/aqua028.html>)

Management Practices in Support of Fish and Wildlife Habitat. Aquatic Ecosystem Restoration Foundation. Lansing, MI.

Gettys, L. A., Haller, W. T., & Bellaud, M. (2009). Biology and control of aquatic plants. *Marietta GA: Aquatic Ecosystem Restoration Foundation*. Available at http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5373509.pdf

2.2.3 Animal Pest Control

Part 2.2.3.a -- Identify the Problem

Prior to the first pesticide application covered under this permit that will result in a discharge to waters of the United States, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year, any Decision-maker who is or will be required to submit an NOI must do the following for each pest management area, as defined in Appendix A. Decision-makers 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 Measures. Re-evaluation of the pest problem is also important to ensure Pest Management Measures are still applicable. Decision-makers must identify the pest problem at least once each calendar year prior to the first application for that calendar year.

Identify areas with pest problems and characterize the extent of the problems, including, for example, water use goals not attained (e.g., wildlife habitat, fisheries, vegetation, and recreation). Decision-makers must be well-acquainted with the unique regional conditions of their sites and available Pest Management Measures for controlling the pest 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 distribution of desired aquatic species, as well as water use goals and complaints or reports of pests from the public.

Identify target pest(s). Positive identification of the pest is required because many pests within the same genus may require different levels and types of Pest Management Measures. Animal identification is important when determining the best Pest Management Measures for each particular pest and for determining application areas. Decision-makers must develop Pest Management Measures based on identification of the targeted pest which occur in their area.

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 infestations, the identification of possible sources (e.g., outflows from other water systems/bodies) may help in minimizing the need for implementing Pest Management Measures. Potential factors which could lead to the establishment of animal populations such as accidental or intentional introduction of exotic species must be identified before Pest Management Measures are implemented.

Establish any pest- and site-specific action threshold, as defined in Appendix A, for implementing Part 2.2.3.b. An action threshold should be established before implementing Pest Management Measures. Any data and/or information regarding pest can serve as an action threshold.

In the event there are no data for the pest management area in the past calendar year, use other available data as appropriate to meet the permit conditions in Part 2.2.3.a.

Decision-makers may use historical data or neighboring district data to identify the pest and establish action thresholds.

Part 2.2.3.b -- Pest Management Options

Prior to the first pesticide application covered under this permit that will result in a discharge to waters of the United States, and at least once each year thereafter prior to the first pesticide application during that calendar year, any Decision-maker who is or will be required to submit an NOI must select and implement efficient and effective means of Pest Management Measures that minimize discharges resulting from the application of pesticides to control pests. In developing the Pest Management Measures for each pest management area, the Decision-maker must evaluate the following management options, including a combination of management options, considering impact to water quality, impact to non-target organisms, feasibility, and cost effectiveness: No action; Prevention; Mechanical/physical methods; Cultural Methods; Biological control agents; and Pesticides. Decision-makers are required to evaluate management options and implement Pest Management Measures to minimize pesticide discharges into waters of the United States prior to the first pesticide application covered under this permit. As noted above, combinations of various management options are frequently the most effective Pest Management Measures over the long term. The goal should be to emphasize long-term control rather than a temporary fix. Decision-makers must reevaluate every year prior to the first pesticide application for that calendar year. All Pest Management Measures must be conducted in a manner that minimizes impacts to non-target species. The following describes the management options that must be evaluated. Tactics of preventative, cultural, mechanical/physical, and biological Pest Management Measures may overlap for some aquatic systems or specific pest control situations.

No Action

No action is to be taken, although an 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 nuisance species is the most efficient way to reduce the threat of aquatic nuisance animals (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 animals, private entities (aquaculturists) and the public have the necessary knowledge to assist in local animal control by reducing conditions that encourage the spread of animals in their immediate surroundings. For example, recreational water users provide a pathway of unintentional introductions. Increasing public awareness of pests, 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 pests.

Mechanical or Physical Methods

Mechanical and biological controls will be the appropriate methods in some cases of pest control, 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.

Cultural Methods

Cultural control methods can include physical removal or make the habitat unsuitable for a pest. Cultural methods vary depending on the target pest and may involve tactics that overlap with preventative and mechanical methods. Some examples of cultural methods to manage aquatic animal pests include draining and rinsing boats prior to relocation, using underwater sounds that deter fish, drawdown of water, and managing vegetation.

Biological Control Agents

Biological control of animals may be achieved through the introduction of diseases, predators, or parasites. While biological control generally has limited application for control of animals, Decision-makers should fully consider this option.

Pesticides

Chemical and biological pesticides such as lampricides, molluscides, insecticides, and piscicides, are registered for use to control animal pests. These pesticides are specifically formulated for use in water where aquatic nuisance animals 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 2.2.3.c. -- Pesticide Use

Conduct surveillance in an area that is representative of the pest problem prior to each application to assess the pest management area and to determine when the action threshold(s) is met. Often, each animal and pest management area warrant different Pest Management Measures, tailored to the regional conditions. Pest Management Measures should consist of combinations of mechanical, biological, and/or pesticidal control methods. All Pest Management 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 Pest Management 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 best management practices. If pesticides are used, they must only be used as needed as determined by an action threshold, and Pest Management Measures must be implemented, including use of the

minimum effective application rate. Also, the Decision-maker 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 implementing Pest Management 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(s) has been met. The pest 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 pesticide applications 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. For piscicides, chemical deactivation is currently required for all lotic (flowing water) environments. Management agencies typically work downstream throughout the watershed in consecutive treatments as this will require the least amount of chemical deactivation. Most invertebrates repopulate treated areas through immigration (typically in the direction of flow); as such headwater streams/tributaries seem to be effective at accomplishing this. EPA also notes that not all piscicides are that harmful to invertebrate populations (*e.g.*, antimycin is more selective for scaled fish). It can be difficult to know the point at which headwater streams are "fishless"; however, most fishery management agencies do not treat streams unless they are considered a refuge for target species.

Recommended Animal Pest Control References

EPA recommends the following sources for additional information on Pest Management Measures for animal control:

Aquatic Nuisance Species Taskforce. Online: <http://www.anstaskforce.gov/>.

Getsinger, K., Moore, M. D., Layne, C. P., Petty, D. G., L, S., Sprecher, Dibble, E. D., Karcas, E., Maceina, M., Mudrak, V., Lembi, C., Madsen, J. D., Stewart, R. M., Anderson, L., Haller, W., Confrancesco, A., Newman, R., & Nibling, F. (2005). Aquatic Plant Management Best Management Practices in Support of Fish and Wildlife Habitat. Aquatic Ecosystem Restoration Foundation. Lansing, MI.

Aquatic Nuisance Pest Task Force (ANP). (2011). Northern Snakehead. Fish and Wildlife Services. Retrieved May 18, 2021 from: <https://www.fws.gov/anstaskforce/spoc/snakehead.php>

Gaikowski, M. (2018). Asian Carp Control. U.S. Department of the Interior. Retrieved May 18, 2021 from: <https://www.doi.gov/ocl/asian-carp-control>

National Park Service (NPS). (2019). Asian Carp Overview. National Park Service. Retrieved May 18, 2021 from: <https://www.nps.gov/miss/learn/nature/ascarpover.htm>

2.2.4 Forest Canopy Pest Control

Part 2.2.4.a -- Identify the Problem

Prior to the first pesticide application covered under this permit that will result in a discharge to waters of the United States, and at least once each calendar year thereafter prior to the first pesticide application in that calendar year, any Decision-maker who is or will be required to submit an NOI must do the following for each pest management area, as defined in Appendix A. In order to reduce pesticide discharges into waters of the United States associated with forest canopy pest control, it is important for Decision-makers 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 not implementing Pest Management Measures.

Establish any pest- and site-specific action threshold, as defined in Appendix A, for implementing Part 2.2.4.b. Decision-makers must develop action thresholds for the target pests prior to the first pesticide application as covered under the PGP. 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 Management Measures must be taken. Action thresholds help determine both the need for implementing Pest Management Measures and the proper timing of such actions. It is a predetermined pest level that is deemed to be unacceptable.

Identify target pest(s) to develop Pest Management Measures 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 pest 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 Pest Management Measures, applicable control techniques, and most effective chemical pesticides for the target pests (insecticide class, resistance, etc.). Failure to identify pests can lead to unwarranted control activities and/or the need for chemical application with potential for discharges of pollutants into waters of the United States. 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.

Identify current distribution of the target pest and assess potential distribution in the absence of Pest Management 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 Pest Management Measures. 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 Pest Management Measures. 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 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.

In the event there are no data for the pest management area in the past calendar year, use other available data as appropriate to meet the permit conditions in Part 2.2.4.a. Decision-makers may use historical data or neighboring district data to identify the pest and establish action thresholds.

Part 2.2.4.b. -- Pest Management Options

Prior to the first pesticide application covered under this permit that will result in a discharge to waters of the United States, and at least once each calendar year thereafter prior to the first pesticide application for that calendar year, any Decision-maker who is or will be required to submit an NOI must select and implement efficient and effective means of Pest Management Measures that minimize discharges resulting from the application of pesticides to control pests. In developing the Pest Management Measures for each management area, the Decision-maker must evaluate the following management options, including a combination of management options, considering impact to water quality, impact to non-target organisms, 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, Pest Management Measures 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 options are frequently the most effective Pest Management Measures over the long term. The goal of Pest Management Measures in forest canopy pest control should be to emphasize long-term control rather than a temporary fix.

All Pest Management 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. Tactics of preventative, cultural, mechanical/physical, and biological Pest Management Measures may overlap for some aquatic systems or specific pest control situations.

No Action

No action is to be taken, although a pest 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/Physical Methods

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 measures and 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 (*e.g.*, gypsy moth).

Cultural Methods

Cultural control methods are Pest Management Measures 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.

Biological Control Agents

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 Pest Management Measures. The latter two control approaches are often utilized when controlling for gypsy moth.

Pesticides

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. They are aerially applied. As described below, once the determination is made to use pesticides, additional requirements must be met.

Part 2.2.4.c. -- Pesticide Use

Conduct surveillance in an area that is representative of the pest problem prior to each application to assess the pest management area and to determine when the pest action threshold is met. Decision-makers must apply pesticides only as needed as determined by pre-established criteria and pest action thresholds. Decision-makers 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 Measures. 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 pesticides 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 into 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 the efficacy of Pest Management Measures and to monitor for new pests. Surveillance can determine if the current techniques are effective and whether additional Pest Management Measures are required, particularly pesticide application. Based on follow-up surveillance activity, Decision-makers can make informed decisions which serve to increase the effectiveness of their control programs and minimize the potential for pollutant discharges to waters of the United States. Surveillance is necessary not only to establish the pest presence and its 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.

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 threshold(s) have been met. Forest canopy pest 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 should be considered. Environmental factors such as temperature, as well as biological factors such as migration timing, should be considered when deciding on application timing. Partial site pesticide applications 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 should weigh the potential 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. Gypsy moth caterpillars are susceptible to control by chemical pesticides, or by ingestion of nucleopolyhedrosis virus occlusion bodies.

Recommended Forest Canopy Pest Control Reference

EPA recommends the following sources for additional information on Pest Management Measures 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>

USDA. (rev. 2019). Gypsy Moth Program Manual. http://www.aphis.usda.gov/import_export/plants/manuals/domestic/downloads/gypsy_moth.pdf

USDA. 2016. Asian Gypsy Moth Factsheet. http://www.aphis.usda.gov/publications/plant_health/content/printable_version/fs_phasiangm.pdf

Reardon, Podgwaite, and Zerillo. GYPCHEK- Environmentally Safe Viral Insecticide for Gypsy Moth. FHTET-2012-01. 2nd ed. March 2016. U.S. Department of Agriculture, Forest Service. http://www.fs.fed.us/foresthealth/technology/pdfs/Gypchek_FHTET-2012-01_2ndEd.pdf

Kucera, Daniel and P. Orr. Spruce Budworm in the Eastern United States. U.S. Department of Agriculture, Forest Service. Forest Insect and Disease Leaflet 160. https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsbdev2_042853.pdf

Michael, Jerry. 2004. Best Management Practices for Silvicultural Chemicals and the Science behind Them. Water, Air, and Pollution: Focus. 4(1), 95-11

3. Water Quality-Based Effluent Limitations

In addition to technology-based effluent limitations for all discharges of pollutants, the CWA requires additional effluent limitations that are as stringent as necessary to achieve water quality standards. These are called water quality-based effluent limitations (WQBELs). Permit writers are to assess whether the technology-based effluent limitations are protective of water quality standards, and if not, permit writers must also include WQBELs as necessary to ensure that the discharge of pollutants will not cause an excursion above any state water quality standard, including state narrative criteria for water quality (see 40 CFR 122.44(d)). In developing WQBELs, permit writers must consider the potential impact of every proposed surface water discharge of pollutants on the quality of the receiving water. Unlike individual permits that include requirements tailored to site-specific considerations, general permits, while tailored to specific industrial processes or types of discharges of pollutants (e.g., from the application of pesticides), often do not contain site-specific WQBELs. Instead, in general, EPA includes a narrative statement that addresses WQBELs. In this permit the WQBEL is as follows:

All Operators must control discharges as necessary to meet applicable numeric and narrative state, territory, or tribal water quality standards, for any discharges authorized under this permit, with compliance required upon beginning such discharge.

If at any time an Operator becomes aware (e.g., through self-monitoring or by notification from the state, tribe, or territory), or EPA determines, that a discharge causes or contributes to an excursion of any applicable water quality standards, the Operator must take corrective action as required in Part 6 up to and including the ceasing of the discharge, if necessary.

The first sentence includes the general requirement to control discharges of pollutants as necessary to meet water quality standards, while the second sentence implements this requirement in more specific terms by imposing on Operators a responsibility to take corrective action in response to an excursion of applicable water quality standards, whether discovered by

EPA or by the Operator. Failure to take such corrective action is a violation of the permit. Additionally, the permit includes a provision, in Part 1.2.3 of the PGP, that specifies that EPA may determine that additional technology-based and/or water quality-based effluent limitations are necessary, or may deny coverage under this permit and require submission of an application for an individual NPDES permit, as detailed in Part 1.3.

Each Operator is required to control its discharge of pollutants as necessary to meet applicable water quality standards. In general, EPA expects that compliance with the other conditions in this permit (*e.g.*, the technology-based limitations, corrective actions, etc.) will result in discharges of pollutants that are controlled as necessary to meet applicable water quality standards based on the cumulative effect of the following factors, which are described below:

- (1) Under FIFRA, EPA evaluates risk associated with pesticides and mitigates unreasonable ecological risk. Compliance with FIFRA is required. (See Part III.1.5 of the fact sheet.)
- (2) In developing the PGP, EPA evaluated national-scale ambient monitoring data, as well as the frequency of the identification of specific pesticides as the cause of water impairments, to assess whether pesticide residues are currently present in waters at levels that would exceed water quality standards. The monitoring data, although limited in scope, show that, in most samples, most pesticides were below ambient water quality criteria or benchmarks developed by EPA's Office of Pesticide Programs (OPP). For the assessment of the USGS National Water-Quality Assessment Program's 1992-2001 data, ambient water quality criteria were available for 7 of the 83 analytes and one or more OPP benchmarks were available for 60 of the 83 analytes. For the small number of pesticides found in monitoring data to be present above such benchmarks, the evaluation, as summarized in Appendices B and C of the fact sheet for the 2011 PGP, also documents risk mitigation actions taken by EPA (such as cancellation of pesticide uses) that EPA expects have reduced the levels of those pesticides in water. EPA also assessed the study USGS National Water-Quality Assessment Program (NAWQA) released in 2014. A summary of the evaluation and risk mitigation actions taken by EPA is available in Appendices B and C of the fact sheet for this permit.
- (3) Technology-based effluent limitations in the PGP provide further protections beyond compliance with existing FIFRA requirements.
- (4) Biological pesticides discharged to waters, by regulatory definition, do not work through a toxic mode of action. For chemical pesticides, the discharges of pollutants covered under the PGP are the residues after the pesticide has performed its intended purpose. Thus, the residue will be no higher than, and in many instances, lower than, the concentration of the pesticide as applied.
- (5) The PGP excludes pesticide applications that result in discharges of any pollutant to (1) waters impaired for an active ingredient of that pesticide or a degradate of such an active ingredient, or (2) any Tier 3 waters (*i.e.*, outstanding national resource waters) except for pesticide applications made to restore or maintain water quality or to protect public health or the environment that either do not degrade water quality or only degrade water quality on a short-term or temporary basis.
- (6) EPA has no evidence in the record that implementation of the 2011 and 2016 PGP has resulted in documented water quality problems.

In addition to the six factors identified above, EPA cannot issue an NPDES permit until the state, territory or tribe in which the discharge originates certifies that the discharge will comply with applicable provisions of the CWA or waives certification. Therefore, Part 9 of the PGP includes conditions included by States, and authorized Tribes in their CWA § 401 certification actions on the draft 2021 PGP, which meet the requirements of CWA Section 401 and EPA's CWA Section 401 implementing regulations. 40 C.F.R. § 124.53(e)(1).

This PGP requires Operators to control discharges of pollutants as necessary to meet applicable water quality standards. When the Operator or EPA determines a discharge of pollutants will cause or contribute to an excursion above any WQS, including failure to protect and maintain existing designated uses of receiving waters, the Operator must take corrective action to ensure that the situation is eliminated and will not be repeated in the future. (See Part 6.0 of the PGP). If additional Pest Management Measures are required, the Operator is required to follow and document, as applicable, the process for Pest Management Measure selection, installation, implementation and maintenance, and cooperate to eliminate the identified problem within the timeframe stipulated in Part 6.0 of the PGP.

(1) Under FIFRA, EPA evaluates risks associated with pesticides and considers mitigation measures to address risks that exceed levels of concern.

Background

EPA regulates the use of pesticides under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). In general, FIFRA authorizes EPA to register each pesticide product intended for distribution or sale in the United States. To register a pesticide, the Agency must determine that its use in accordance with the label will not cause “unreasonable adverse effects on the environment.” (see, *e.g.*, FIFRA sec. 3(c)(5)). FIFRA defines that term to mean, in part, “any unreasonable risk to man or the environment, taking into account the economic, social, and environmental costs and benefits of the use of any pesticide” (FIFRA sec. 2(bb)). The “unreasonable adverse effects” standard requires EPA, in effect, to balance the human health and ecological risks of using a pesticide against its economic, social, human health, and ecological benefits. Pesticides are registered for sale and distribution only if EPA determines that the benefits outweigh the risks. In making decisions on whether to register a pesticide, EPA considers the use directions on proposed product labeling and evaluates data on product chemistry, human health, ecological effects, and environmental fate to assess the potential risks associated with the use(s) proposed by the applicants for registration and expressed on the labeling. Among other things, the Agency evaluates the risks to human health and the environment (including water quality) posed by the use of the pesticide.

As stated above, EPA reviews and approves pesticide product labeling. EPA implements risk mitigation measures identified through the risk assessment process by placing use restrictions and warnings on labeling to ensure the use of the pesticide (under actual use circumstances and commonly accepted practice) will not cause any “unreasonable adverse effects on the environment.” It is a violation under FIFRA sec. 12(a)(2)(G) (FIFRA’s “misuse” provision) to use a registered pesticide inconsistent with its labeling.

After a pesticide has been registered, changes in science, public policy, and pesticide use practices will occur over time. FIFRA, as amended by the Food Quality Protection Act of 1996,

mandates a registration review program, under which the Agency periodically reevaluates pesticides to ensure that as the ability to assess risk evolves and as policies and practices change, all registered pesticides continue to meet the statutory standard of no unreasonable adverse effects to human health or the environment. The Agency is implementing the registration review program pursuant to Section 3(g) of FIFRA and will review each registered pesticide every 15 years to determine whether it continues to meet the FIFRA standard for registration. Information on this program is provided at: <http://www.epa.gov/pesticide-reevaluation>.

Ecological Risk Assessment

The following is a discussion about the FIFRA risk assessment process with a focus on Ecological (specifically aquatic) Assessments. Entities seeking pesticide registrations bear the burden of demonstrating their products meet the statutory standard under FIFRA. As set forth in 40 CFR Part 158, applicants for pesticide registrations must provide EPA with a suite of product chemistry, residue chemistry, toxicity, environmental fate, and ecotoxicity studies, to support an application for registration. To support outdoor uses, studies are required that provide information related to the environmental fate and transport of the chemical and that measure the acute and chronic toxicity to terrestrial and aquatic organisms. These studies, along with open literature that meet data quality guidelines, are the basis for the ecological risk assessments. The ecological risk assessment combines the results of an environmental exposure assessment and an ecological effect assessment for a pesticide active ingredients to produce a quantitative measure of potential risk.⁹ A risk characterization is also presented to put the quantitative assessment of risk in the context of other lines of evidence, such as available monitoring data and incident reports, and to discuss uncertainties in the risk assessment. The quantitative and qualitative determination of potential ecological risk is independent of economic or other benefit considerations.

Aquatic Exposure Characterization

EPA estimates pesticide concentrations in aquatic environments to determine if exposure to a pesticide active ingredient is at a level that could cause unreasonable adverse effects to aquatic organisms. EPA estimates pesticide concentrations in water using peer-reviewed simulation modeling because there are not sufficient monitoring data to estimate exposure to aquatic organisms under all potential use conditions. When available, monitoring data are used to help characterize aquatic exposure.

EPA also estimates potential exposure from uses involving direct application to water. The model used for pesticides applied directly to water uses environmental fate data to simulate partitioning of the pesticide between the water column and bottom sediment in a standard rice paddy. This modeling is conservative because it does not simulate degradation of the applied pesticide, as would be necessary to estimate the amount of residue remaining after the pesticide product had performed its intended function. Depending on the rate of degradation, the initial concentration as estimated by the model could be much higher than the residual concentration remaining after pesticide application has been completed. Additionally, this modeling scenario is conservative because the resulting exposure estimate is the concentration in the paddy water

⁹ As part of the risk assessment, EPA also examines available information to determine the need to expand beyond the focus on the active ingredient to consider pesticide formulation, inert ingredients, or degradates.

itself, not taking into account dilution which would occur when paddy water is diluted by precipitation or when it is released into a receiving water body. See the U.S. EPA. 2004. Overview of the Ecological Risk Assessment Process in the Office of Pesticide Programs. Office of Prevention, Pesticides, and Toxic Substances. Office of Pesticide Programs. Washington, D.C. January 23, 2004. <https://www.epa.gov/endangered-species/ecological-risk-assessment-process-under-endangered-species-act>

As discussed above, when available, EPA uses ambient water monitoring data as a line of evidence to characterize aquatic exposure in ecological and human health risk assessments. The United States Geological Survey (USGS) maintains several sources of pesticide monitoring data. These sources include the National Water Quality Assessment program (NAWQA), the Toxic Substances Hydrology Program, and the National Stream Quality Accounting Network (NASQAN). EPA sources of water monitoring data include STORET, a storage and retrieval database of national water quality information, the Safe Drinking Water Information System (SDWIS), Office of Water compliance monitoring data, and the USGS/EPA Reservoir Monitoring Program. In addition to the federal data sources, monitoring data are sometimes available from States, pesticide registrants, and the open literature.

These monitoring data are evaluated on a case-by-case basis to help characterize the likelihood, extent, and nature of pesticide concentration in water under current use practices and actual field conditions. EPA considers the locations and frequency of sampling, the analytical methods, the detection limits, and the purpose of the monitoring studies from which the data are derived when determining how such data will be incorporated into the FIFRA risk assessment and the usefulness of the monitoring data for an aquatic exposure assessment. For example, a monitoring study targeted to measure concentrations of a pesticide in a watershed with high agricultural use of that pesticide will not provide much insight on the potential exposure from its use as a mosquito adulticide. Similarly, a general survey of ambient water quality might not necessarily target specific pesticide use areas or the time of year when pesticide concentrations may be at their peak, and for this reason may not provide a reliable estimate of acute exposure. However, if monitoring data from such a study shows higher confirmed detections than estimated by modeling, the higher monitoring values typically would be used in the risk assessment.

Aquatic Effects

To determine if a pesticide is sufficiently toxic at its estimated exposure concentrations to cause unreasonable adverse effects in the environment, EPA reviews available ecotoxicity data. These data may come from a number of sources, including direct guideline study submissions required in support of registration, and open literature data retrieved through ECOTOX¹⁰. The typical assessment endpoints for pesticide ecological risk assessments are reduced survival from direct acute exposures and survival, growth, and reproductive impairment from direct chronic

¹⁰ U.S. EPA. 2007. Ecotoxicity Database (ECOTOX) Mid-Continent Ecology Division, National Health and Environmental Effects Research Laboratory. U.S. Environmental Protection Agency, Office of Research and Development. <https://www.epa.gov/chemical-research/ecotoxicology-database>.

exposures. As noted in the OPP Overview¹¹ document, which describes the process OPP uses to conduct ecological risk assessment under FIFRA, OPP evaluates other data on sublethal effects in addition to direct effects on survival, growth, and reproduction.

In general, the current FIFRA data regulations require studies that include but are not limited to a suite of aquatic toxicity studies for effects characterization. These test requirements are defined for each chemical class by use category (40 CFR Part 158 Subpart D; Wildlife and Aquatic Organism data requirements; http://edocket.access.gpo.gov/cfr_2007/julqtr/40cfr158.490.htm) and are performed on a limited number of laboratory test organisms in the following broad taxonomic groupings:

- Freshwater fish,
- Freshwater invertebrates,
- Estuarine/marine fish,
- Estuarine/marine invertebrates, and
- Algae and aquatic plants.

Within each of these very broad taxonomic groups, the most sensitive acute and chronic toxicity value is selected from all available test data, including open literature and registrant submissions. If additional toxicity data for more species of organisms in a particular group are available, the most sensitive toxicity values from all sources for other species/studies that meet data quality standards are used in the risk assessment.¹² Aquatic toxicity data are required for each active ingredient, but aquatic toxicity data are also required on the typical end use product for any pesticide that will be introduced directly to aquatic environments (40 CFR Part 158.630).

Risk Characterization

Risk characterization is the integration of effects and exposure characterization to determine the ecological risk from the use of the pesticide and the likelihood of effects on non-target species based on the pesticide-use scenarios. In FIFRA screening-level assessments, OPP relies on the deterministic risk quotient (RQ) method to compare estimated exposure to toxicity endpoints. Estimated environmental concentrations (EECs) derived in the exposure characterization are divided by acute and chronic toxicity endpoints identified in the effects characterization. Risk quotients are then compared to the Agency's Levels of Concern (LOCs). These LOCs are the Agency's interpretative policy and are used to analyze the potential risk to non-target organisms and the need to consider regulatory action. These criteria are used to indicate when a pesticide use as directed on the label has the potential to cause adverse effects on non-target organisms. If a risk of concern is identified, risk mitigation measures are considered.

Risk Mitigation

EPA acknowledges that there are uncertainties in its pesticide risk assessments (see full discussion below), nonetheless the Agency reduces the risks of concern by imposing additional

¹¹ U.S. EPA. 2004. Overview of the Ecological Risk Assessment Process in the Office of Pesticide Programs. Office of Prevention, Pesticides, and Toxic Substances. Office of Pesticide Programs. Washington, D.C. January 23, 2004. Support Document 1: Study Classification used by EFED in Data Evaluation Records (DERs) <https://www.epa.gov/sites/production/files/2014-11/documents/ecorisk-overview.pdf>

¹² *Ibid* U.S. EPA 2004

restrictions on the use of a pesticide to reduce pesticide concentrations in the aquatic environment. Mitigation measures may include limits on the amount and frequency that a pesticide may be applied, or the application methods may be restricted to limit off-site transport. Mitigation may also limit the geographical areas to which a pesticide can be applied or may include mandatory buffer distances from sensitive habitats. Mitigation measures are implemented through product labeling instructions, with which pesticide users are required to comply.

In some cases, EPA restricts the use of a pesticide so that levels of pesticide predicted by the model to reach water are below the relevant aquatic benchmarks (see Aquatic Benchmarks discussion below). In other cases, using the FIFRA risk-benefit balancing standard, EPA may permit the use of a pesticide even though the estimated water concentration might exceed a relevant benchmark. In such cases, the decision incorporates consideration of the benefits of the pesticide use and other lines of evidence, such as any available National Recommended Water Quality Criterion for ambient water quality, concerning the conservativeness of the modeling assessment and available monitoring data.

Uncertainties with Risk Assessment and Mitigation

For the majority of pesticides, the Agency relies on simulation modeling to predict potential aquatic exposure following pesticide applications. There are uncertainties embedded in the FIFRA exposure assessment, for example, the extent to which the simulated scenario represents actual use conditions in terms of hydrologic vulnerability and the amount and frequency with which pesticides are applied. In order to account for the inherent uncertainty, the Agency uses a combination of parameters and assumptions in the models that results in estimated potential exposure concentrations that are high-end and are not likely to underestimate actual aquatic exposure. This allows the Agency to identify pesticides that are not likely to pose a risk to aquatic life.

In the effects characterization under FIFRA, the lowest acute and chronic toxicity values from the most sensitive species tested in acceptable studies are used as the relevant endpoint for evaluating risk to various taxa. Implicit in the use of the lowest toxicity values for the most sensitive species is the presumption that these toxicity values afford protection not only for the individual surrogate species but for other untested taxa as well.

In the FIFRA risk characterization, data gaps are also considered as a source of uncertainty in the risk assessment conclusions, and each risk assessment discusses the potential for additional data to affect the risk assessment conclusions.

An additional source of uncertainty in assessing risk to aquatic life is the impacts of multiple stressors on aquatic organisms. A United States Geological Survey (USGS) 10-year study (*Gilliom et al., 2006*) shows that the most common form of pesticide exposure for aquatic organisms is simultaneous exposure to multiple pesticides. More than 50 percent of all stream samples contained five or more pesticides, although the majority of mixtures are comprised mainly of agricultural herbicides and degradates of these herbicides, or urban/residential use insecticides in urban streams. Pesticides that will be applied under the PGP may also co-occur with other manmade contaminants and/or other pesticides from other uses. For instance, the USGS has also performed monitoring studies which revealed the widespread presence of some pharmaceuticals and personal care products in drinking water. However, although pesticides may

be detected with other chemicals or in discharges of pollutants covered by other NPDES permits, the majority of research and data on the effects of pesticides has focused on individual pesticides rather than on additive and synergistic toxic effects of exposure to multiple pesticides and/or non-pesticide toxicants.

Possible interactions among pesticides or between pesticides and other contaminants may occur including: independent, additive, antagonistic, or synergistic. The variety of chemical interactions presented in the available literature¹³ suggests that the interaction can be a function of many factors including but not necessarily limited to: (1) the exposed species, (2) the co-contaminants in the mixture, (3) the ratio of concentrations in the mixture, (4) differences in the pattern and duration of exposure among contaminants, and (5) the differential effects of other physical/chemical characteristics of the receiving waters (*e.g.*, organic matter present in sediment and suspended water). Quantitatively predicting the combined effects of all these variables on mixture toxicity to any given taxon with confidence is beyond the capabilities of the available data. In order to assess the impacts of environmental mixtures on aquatic life, states have included ambient toxicity testing (also called Whole Effluent Toxicity or WET testing) in their monitoring programs. WET testing allows states to identify potential impacts to aquatic life and identify the toxicant(s) and through the toxicity reduction evaluation, reduce the source(s) of the toxicant(s). The level of toxic effect to the most sensitive tested species is therefore assumed to be protective of other species that may be present in any given water body and is assumed to represent the most toxic component of a mixture. Note that a discussion of EPA's consideration of WET testing as a condition of the permit is discussed in Part III.4 of the fact sheet.

Aquatic Benchmarks

EPA's Office of Pesticide Programs (OPP) derives aquatic benchmarks by multiplying the most sensitive toxicity values (*i.e.*, the lowest acceptable toxicity value for the most sensitive species within a taxonomic group) by their respective (level of concern) LOC. These taxon-specific benchmarks, based on toxicity data used by OPP in assessments for FIFRA pesticide registration decision-making, are considered estimates of the concentrations below which pesticides are not expected to have the potential for adverse effects for the particular taxon for which those data serve as surrogates. It is reasonable to assume that above these levels, there may be potential for the pesticide to cause adverse effects to the given taxon.

EPA's Office of Water (OW) and OPP agreed that these values can be used by States and others to evaluate potential risks of pesticides in the aquatic environment, if a National Recommended Water Quality Criterion for ambient water quality is not available.¹⁴ A number of states have used these benchmark values as indicators of whether pesticide residues detected in surface water warrant additional action such as refined monitoring efforts. While benchmarks can be useful as a screening tool, they do not provide the information necessary to link detected concentrations with their sources.

¹³ National Research Council 2013. *Assessing Risks to Endangered and Threatened Species from Pesticides*. Washington, DC: The National Academies Press.

¹⁴ Correspondence to SFIREG, November 3, 2006 from Office of Water director.

In response to recommendations and input from stakeholders, EPA developed a webpage of non-regulatory “OPP Aquatic Benchmarks.”¹⁵

As described above, EPA’s FIFRA risk assessment process includes a number of conservative assumptions that taken as a whole mitigate unreasonable ecological risk and protect water quality.

(2) Examination of national-scale ambient monitoring data to assess whether pesticide residues are currently present in waters at levels that would exceed water quality standards.

Environmental Science and Technology: Pesticides in U.S. Streams and Rivers: Occurrence and Trends during 1992–2011

In addition to the protective nature of the pesticide risk assessment, EPA reviewed readily available surface-water monitoring data from the USGS National Water-Quality Assessment (NAWQA) Project. In 2006, the USGS NAWQA¹⁶ released a 10-year (1992–2001) study of 51 major river basins and aquifer systems that account for more than 70 percent of total United States water use, and more than 50 percent of the United States drinking water supply. During the 2011 PGP development, EPA reviewed the data and found a total of 20 pesticides or degradates exceeded an EPA benchmark in one or more agricultural stream and/or urban stream (see the 2011 PGP, Appendix A of the fact sheet for a complete list of pesticides/degradates that had exceedances). Since 2001, EPA noted that regulatory actions taken under FIFRA with respect to all 20 pesticides found to be in excess of a benchmark, and many of their uses have been canceled (several detections were of pesticides no longer in use prior to the start of the study). See the 2011 PGP, Appendix C of the fact sheet for a summary of pesticide-specific exceedance data and risk mitigation actions.

In 2014, the USGS NAWQA¹⁷ released a study of pesticide monitoring in streams and rivers across the U.S. for the decade of 2002–2011 that compares monitoring data to previously reported findings from the decade of 1992–2001. During the 2016 PGP development, EPA reviewed this USGS second decadal report and noted the findings in the accompanied fact sheet. As USGS has not released another similar report, for this PGP’s fact sheet, EPA noted below the findings from the last review and updated EPA’s regulatory actions under FIFRA. This report indicated that with regard to chronic aquatic life benchmarks, during 1992 – 2001, 16 pesticides exceeded a chronic aquatic life benchmark, while during 2002 – 2011, twenty-one pesticides exceeded a chronic aquatic life benchmark. See Appendix A of the fact sheet. Forty-seven pesticides were assessed in both decades. For 10 of these¹⁸ with benchmark exceedances in both

¹⁵ OPP Aquatic Benchmark Table <https://www.epa.gov/pesticide-science-and-assessing-pesticide-risks/aquatic-life-benchmarks-pesticide-registration>

¹⁶ Gilliom and others 2006. The Quality of Our Nation’s Waters-Pesticides in the Nation’s Streams and Ground Water, 1992–2001: U.S. Geological Survey Circular 1291, 172p.

¹⁷ Stone and others 2014. An Overview Comparing Results From Two Decades of Monitoring for Pesticides in the Nation’s Streams and Rivers, 1992–2001 and 2002–2011. U.S. Geological Survey Scientific Investigations Report 2014–5154, 23 p.

¹⁸ Metolachlor, Atrazine, Diazinon, Malathion, Chlorpyrifos, Carbaryl, Azinphos methyl, cis-Permethrin, Disulfoton, Parathion.

decades, exceedance frequencies were mostly lower during 2002 – 2011.^{19 20} This research found that the proportion of assessed streams with one or more pesticides that exceeded a chronic aquatic life benchmark were very similar between the two decades for agricultural (69% for 1992 – 2001 compared to 61% for 2002 – 2011) and mixed use streams (45% compared to 46%). For urban streams the percentage increased from 53% during 1992 – 2001 to 90% during 2002 – 2011 predominantly due to the use of fipronil and dichlorvos in the latter decade (these two pesticides are among those not assessed for 1992 – 2001). Additional detail on the nature of EPA’s regulatory actions under FIFRA appears in Appendices B and C of the fact sheet.

State Water Quality Monitoring under CWA

States must place waterbodies not meeting water quality standards on a list (303(d) list) which identifies the pollutant or pollutants causing or expected to cause the impairment. The Office of Water’s Impaired Waters and Total Maximum Daily Loads website²¹ (accessed February 2020) indicates 303(d) impairments in several states for 18 currently registered specific pesticides and 4 general classes of pesticides (*e.g.*, pyrethroids; Table 1). With the adoption of a 303 list, states are required to develop a Total Maximum Daily Load (TMDL). States also must include a priority ranking for developing those TMDLs. A critical component in the TMDL process is to identify the sources of each parameter for which the waterbody is listed. Then, the State must develop waste load allocation(s) for point source(s) and load allocation(s) for nonpoint source(s).

Table 1. Currently registered pesticide active ingredients listed as causes of 303(d) impairment (data accessed February 2020)

Cause of Impairment	States
Aldicarb	CA
Atrazine	IL, KS, LA, MO, NE, OH
Bifenthrin	CA
Carbaryl	CA
Chlorpyrifos	CA, ID, MN, OK, OR, WA
Cypermethrin	CA
Diazinon	CA, KS, OK, WA
Dichlorvos	CA
Dimethoate	CA
Diuron	CA
Malathion	CA, ID
Naphthalene	CA, NH, WA
Oxyfluorfen	CA

¹⁹ Stone and others 2014. Pesticides in U.S. Streams and Rivers: Occurrence and Trends during 1992-2011. Environmental Science and Technology, 2014, 48, 11025-11030.

²⁰ EPA notes that none of these 10 pesticides are among the top 10 solid or top 10 liquid or top 10 briquettes pesticide active ingredients applied under the 2016 PGP as reported in the 2018 annual report data. Seven of these top ten 10 pesticides are biological pesticides.

²¹ http://iaspub.epa.gov/waters10/attains_nation_cy.control?p_report_type=T

Cause of Impairment	States
Permethrin	CA
Prometryn	CA
Simazine	CA
Trifluralin	CA
Pesticides – listed generically	CA, IN, NY, OH, PA, PR

According to the Office of Water’s Impaired Waters and Total Maximum Daily Loads website there are a total of 72,667 causes of impairments for 303(d) listed waters²². Of these, approximately 2.4% (a total of 1,774) are listed as pesticides. The majority (73.6% or 1,306 of the 1,774) of impairments attributed to pesticides are for those no longer registered for use by EPA. A total of 23% (415 of the 1,774) of impairments are attributed to currently registered pesticides, with an additional 3% (53 of the 1,774) of the impairments listed generically for pesticides, such as for “pesticides” or “organochlorine pesticides.” Combined, these two categories of listings account for 0.6% (468 of 72,667) of the total causes of impairments for 303(d) listed waters nationally. Additionally, 4,741 impairments are listed for “impaired biota” and 1,209 impairments are for an “unknown” or “cause unknown – fish kills”, which together account for about 8% of all impairments.

EPA has compared available CWA 303(d) impairment information regarding water quality impairments caused by pesticides for states expected to be covered by the 2021 PGP with active ingredient information submitted pursuant to the annual report requirements in the 2016 PGP. Annual report data for 2017-2019 was examined. EPA found that of the 17 pesticide active ingredients identified on the relevant 303(d) lists as causes of water quality impairment, 7 of these pesticides have been cancelled²³ and others have significant restrictions. Based on annual report data,²⁴ none of the 303(d) impairments caused by pesticides in PGP states for the 303(d) reported years were for pesticides applied under the PGP in those respective states.²⁵

2017 National Water Quality Inventory Report

States, tribes, and territories are required to report biennially on the water quality of navigable waters in their boundaries, and the extent to which these waters support designated uses, under Section 305(b) of the Clean Water Act. In the report to Congress²⁶, which was submitted in August 2017, the Agency summarized the findings of four statistically representative National Aquatic Resource Surveys and the site-specific assessment results reported by the states in their Integrated 305(b)/303(d) Reports. States identified a wide range of assessed waters as not fully supporting at least one of their designated uses. Mercury (primarily

²² http://iaspub.epa.gov/waters10/attains_nation_cy.control?p_report_type=T#causes_303d

²³ DDE is also effectively cancelled with the cancellation of DDT.

²⁴ Note that not all aquatic pesticide dischargers are required to submit annual reports. Annual reports are required from decision-makers required to submit an NOI and who are large entities, and decision-makers with discharges of pollutants to water containing NMFS listed resources of concern.

²⁵ See sec. 1.1.2.1 of the PGP.

²⁶ <https://www.epa.gov/waterdata/2017-national-water-quality-inventory-report-congress>

in fish tissue), pathogens, nutrients, PCBs, sediment, and organic enrichment/oxygen depletion were all cited as leading causes of impairment in assessed waters.

While pesticides are not always monitored when assessing water quality, the Report to Congress indicated that pesticides were not among the most common causes of impairments except for the Great Lakes shoreline. “States assessed 4,431 of the nation’s 5,000 miles of Great Lakes shoreline miles. Of these assessed miles, 4,353 were reported as impaired for one or more designated use. The leading causes of impairment included PCBs, dioxins, and pesticides. The leading probable sources of impairment were atmospheric deposition, legacy/historical pollution – primarily contaminated sediment – and agriculture.” The Report does not indicate whether any impairments identified by the states were caused by discharges of pollutants that will be subject to NPDES permits under the CWA.

Interpretation of Monitoring Data Relevant to the 2021 PGP

When re-evaluating the registrations of existing pesticides, the Agency considers available surface-water monitoring data as a line of evidence regarding potential aquatic risk in addition to considering exposure estimates derived from simulation models. Such monitoring data can provide a measure of trends in aquatic exposure associated with mitigation measures imposed by the Agency. For instance, the USGS’s 2009 report of *Trends of Pesticide Concentrations in Corn-belt Streams* states, “(t)he declines in pesticide concentrations closely followed declines in their annual applications, indicating that reducing pesticide use is an effective and reliable strategy for reducing pesticide contamination in streams.” Similarly, a study entitled *Trends in pesticide concentrations and use for major rivers of the United States*²⁷ found that “pesticides strongly dominated by agricultural use (cyanazine, alachlor, atrazine and its degradate deethylatrazine, metolachlor, and carbofuran) has widespread agreement between concentration trends and use trends” and that “pesticides with substantial use in both agricultural and nonagricultural applications (simazine, chlorpyrifos, malathion, diazinon and carbaryl) had concentration trends that were mostly explained by a combination of agricultural use trends, regulatory changes, and urban use changes inferred from concentrations trends in urban streams.”

Monitoring studies are valuable because they may specifically target areas in which pesticides considered in the study are likely to be used. This is an effective way of evaluating impact from mitigation measures, or the increase in use of other pesticides that might replace pesticides to which mitigation measures are applied.

The best way to interpret the likely causes of pesticide detections in surface water is to consider any detection in light of the design of the monitoring study itself. For instance, the USGS’s study *The Quality of Our Nation’s Water – Pesticides in the Nation’s Streams and Ground Water, 1992-2001*, described above, used a targeted approach, focusing on areas of relatively homogenous land-use and environmental settings to relate pesticide occurrence to individual non-point sources. The sampling was also most intensive during periods of high pesticide use and runoff. Such a design can best capture transport of pesticide to surface water from runoff from treated agricultural fields (or treated buildings/lawns) in a watershed. But, the timing and location of sample collection may not be as effective in capturing residues of

²⁷ Ryberg and Gilliom, *Science of the Total Environment* 538 (2015) 431-444, Elsevier B.V.

pesticides applied for purposes covered under the General Permit. Concentrations detected could at times reflect such uses, but the design of the study was meant to capture more diffuse non-point transport of pesticides in watersheds, and not point source discharge.

Uncertainties with Monitoring Data

The Agency recognizes that monitoring of pesticide levels in water has limitations in its ability to identify whether use of specific pesticide may adversely affect water quality. The product monitoring data give only a “snapshot” of the concentration in a particular waterbody at a particular time. While the USGS (*Gilliom et al., 2006*) intensified the frequency of its monitoring during times of the year when most agricultural pesticide usage commonly occurred, their sampling did not necessarily account for timing of specific pesticide applications, frequency of applications, and meteorological events that can cause pesticides to reach surface water as covered by this permit. Thus, monitoring may not collect a sample when pesticide concentrations are at peak levels or when present in the water. Moreover, if monitoring detects the presence of a pesticide, the data usually do not identify the source or if the pesticide residue is actually still a product serving its intended purpose. Ambient monitoring cannot determine whether the contamination was due to lawful use (and if so, which one) or unlawful pesticide use, an accidental spill or discharge of pollutants, or whether the residues detected were from runoff, or from aquatic uses such as those to be included in the NPDES general permit. Monitoring data are often difficult to interpret because the ancillary data on pesticide usage in a basin, and factors that could make the location more or less vulnerable, are often not available.

(3) Technology-based effluent limitations in the 2021 PGP provide further protections beyond compliance with existing FIFRA requirements.

EPA has evaluated available information and expects that the technology-based effluent limitations are as stringent as necessary to meet applicable WQS. These effluent limitations require Operators to minimize the discharge of pollutants through the use of the most efficient and effective means of Pest Management Measures, including pesticide and non-pesticide methods.

The technology-based effluent limitations require Applicators to minimize the discharge of pollutants by using only the amount of pesticide and frequency of pesticide application necessary to control the target pest, maintaining pesticide application equipment in proper operating condition, and ensuring weather conditions in the treatment area are appropriate for pesticide application.

The Applicator, to the extent not determined by the Decision-maker, must also use only the amount of pesticide and frequency of pesticide application necessary to control the target pest, using equipment and application procedures appropriate for the task.

Certain Decision-makers are also required to more fully assess and implement procedures to minimize the discharge of pollutants. In this assessment, these Decision-makers must consider human health and ecological impacts, feasibility, and cost effectiveness and include prevention, mechanical/physical methods, cultural methods, biological control agents, and as a final resort, the application of pesticides. To ensure that pollutant discharges are minimized, these Decision-makers must identify target pest species and areas where those pests occur, identify the possible sources of the problem, and establish action thresholds or similar measures for implementing

pest management strategies. The technology-based effluent limitations in Part 2.2 of the PGP also require certain Decision-makers, as appropriate, to analyze surveillance data prior to each pesticide application to determine when pest action thresholds are met.

The general permit includes several other provisions that the Agency expects to provide further protections beyond compliance with FIFRA requirements. For instance, Part 4 of the PGP requires Operators to monitor pesticide applications activities to minimize discharges of pollutants and during any post-application monitoring to determine effectiveness of the pesticide application. In addition, Part 6.0 of the PGP contains requirements for all Operators to document and report adverse incidents involving non-target organisms or the environment, and to take corrective action if it is determined that revising Pest Management Measures can help to prevent future incidents. An adverse incident report calls attention to a situation in which water quality may be impacted by pesticide use and may indicate that corrective action is required to ensure that water quality standards are further protected during future applications. The permit also requires Operators to take corrective actions to eliminate other situations such as unauthorized releases (*i.e.*, spills or leaks) or the failure to meet applicable water quality standards. These requirements are discussed further in Part III.6 of the fact sheet. EPA expects this approach will further reduce discharges of pollutants to waters of the United States from the use patterns covered under this permit.

(4) Biological pesticides either do not work through a toxic mode of action, or when they do, are toxic only to a very narrow range of target pest organisms. For chemical pesticides, the discharges of pollutants covered under this permit are the residues after the pesticide has performed its intended purpose.

The permit provides coverage for point source discharges of pollutants from certain applications of pesticides, as identified in Part 1.1.1. of the PGP. Discharges of pollutants from the application of both chemical and biological pesticides are covered under the permit, consistent with the Sixth Circuit Court's reading of the CWA term "pollutant" in *National Cotton Council v. EPA*.

For chemical or conventional pesticides applied directly to waters (*e.g.*, for aquatic weed control and aquatic nuisance pest control), it is the pesticide residue, including excess pesticide that is present outside of the treatment area or within the treatment area once the target pests have been controlled that is considered a pollutant under the 2021 PGP. For any pesticide applied over water (*e.g.*, mosquito control), any pesticide or pesticide residue that is incidentally deposited in waters of the United States is considered a pollutant since the intended purpose of the application is to target pests above the water. Therefore, the concentrations of "pollutants" will be no higher, and in many instances significantly lower, than the product concentrations considered in EPA's assessment when the Agency registered the pesticide products for the relevant uses.

Discharges of biological pesticides require permit coverage regardless of whether or not a residue exists. Biological pesticides or biopesticides are certain types of pesticides derived from such natural materials as animals, plants, bacteria, and certain minerals. Two classes of biopesticides are relevant to this permit, microbial pesticides and biochemical pesticides. Microbial pesticides consist of a microorganism (*e.g.*, a bacterium, fungus, virus, or protozoan) as the active ingredient. The most widely used microbial pesticides are subspecies and strains of

Bacillus thuringiensis, or Bt which operate by a toxic mode of action, yet they are toxic only to a very narrow range of target pest organisms (mosquito larvae). Biochemical pesticides, as defined in 40 CFR 158.2000(a), are naturally occurring substances that control pests by non-toxic mechanisms. Biochemical pesticides include substances, such as insect sex pheromones that interfere with mating, as well as naturally-occurring repellants and attractants.

Biopesticides are usually inherently less toxic than conventional pesticides and generally only affect the target pests and closely related organisms. Often, they are effective in very small quantities and decompose quickly thereby resulting in lower exposures and largely avoiding the pollution problems caused by chemical pesticides. When used as a component of Integrated Pest Management (IPM) programs, biopesticides can greatly decrease the use of chemical pesticides; however, use of biopesticides effectively requires users to have a very good understanding of pest management. Since biochemical pesticides, by regulatory definition, do not work through a toxic mode of action they may be less likely to result in an excursion of a water quality standard.

(5) The 2021 PGP excludes with certain exceptions pesticide applications that result in discharges of any pesticide to (1) waters impaired for an active ingredient in that pesticide or a degradate of such active ingredient or (2) any Tier 3 waters (i.e., Outstanding National Resource Waters) except for applications made to restore or maintain water quality or to protect public health or the environment that either do not degrade water quality or only degrade water quality on a short-term or temporary basis.

EPA identified two scenarios where it finds the 2021 PGP may not be adequately protective of water quality standards and has excluded those discharges of pollutants from coverage under the permit. Namely, the 2021 PGP excludes from coverage: (1) any discharges from a pesticide application to waters of the United States if the water is identified as impaired by a substance which either is an active ingredient in that pesticide or is a degradate of such an active ingredient and (2) discharges of pollutants to Tier 3 Waters (i.e., Outstanding National Resource Waters) except for pesticide applications made to restore or maintain water quality or to protect public health or the environment that either do not degrade water quality or only degrade water quality on a short-term or temporary basis. Any Operator desiring to discharge pollutants in either of these two scenarios is required to submit an application for an NPDES individual permit. Links to lists of impaired waters and Tier 3 waters is available at <https://www.epa.gov/npdes/pesticide-permitting>. Additional discussion of the basis for these requirements is provided in Part III.1.1.2 of the fact sheet.

(6) EPA has no evidence in the record that implementation of the 2011 PGP and 2016 PGP have resulted in documented water quality problems.

EPA has not received any adverse incident reports documenting water quality problems under the 2011 PGP and 2016 PGP to date. EPA is also not aware of any negative public health or environmental impact resulting from discharges of pollutants authorized for use under the 2011 PGP and 2016 PGP.

4. Site Monitoring

Monitoring is required in any NPDES permit to demonstrate compliance with the permit conditions. Monitoring requirements apply from the time any authorized Operator begins discharging pollutants under the 2021 PGP. These requirements are not tied to submission of an

NOI. There are a variety of monitoring methods that a “traditional” NPDES permit may require, including end-of-pipe monitoring to show compliance with relevant water quality-based and technology-based effluent limitations prior to discharging pollutants to a receiving waterbody. Monitoring may also pertain to actions taken to ensure that recordkeeping or other permit control activities are being properly implemented. Water quality monitoring of receiving streams is not typically required in NPDES permits unless it is required to determine among other things, compliance with mixing zone dilution standards or some other special permit condition.

Pursuant to CWA sections 308 and 402(a)(2), 40 CFR 122.43(a), and other applicable implementing regulations, the following requirements have been included in the permit, as discussed below. The monitoring requirements of the 2021 PGP are narrative and demonstrate compliance with permit conditions by using currently established pesticide use routines for monitoring pest control. For instance, the 2021 PGP requires routine visual inspections (described below) to be conducted as part of the pest control activity and/or as part of post-application pest surveillance, and calls for records of the pollutant discharge volume to be kept. The monitoring requirements of the permit are reasonable measures of good pest management practice that the conscientious Operator should be currently employing to ensure environmental health and safety and optimal control of pest organisms.

Monitoring of pollutant discharges poses several challenges not generally encountered in “traditional” NPDES permitting situations. For example, there is no “wastewater discharge” per se from pesticide applications that is analogous to end-of-pipe discharges of pollutants. For example, a manufacturing plant would 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 be inappropriate to compare with any type of technology based effluent limitation or water quality standard.

EPA considered requiring ambient water quality monitoring. However, EPA thinks that it was infeasible for the following reasons:

- 1) 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.
- 2) Lack of applicable measurable standards: Federal pesticide-specific ambient water quality criteria do not exist at this time for the vast majority of constituents in the products authorized for use under the PGP.
- 3) 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.
- 4) 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 all pesticides.

- 5) 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 infeasibility of requiring ambient water quality data to demonstrate permit compliance, EPA thinks that there are suitable alternative monitoring activities to determine permit compliance, other than ambient water quality monitoring, for the PGP.

Additionally, in assessing the appropriateness of requiring ambient water quality monitoring, EPA also considered Whole Effluent Toxicity (WET) testing as a possible option for assessing Operator compliance with permit conditions; however, WET testing in an NPDES permit program is best used to monitor whether an Operator’s discharge of pollutants is toxic and not whether a receiving stream (*i.e.*, the ambient environment), that may be influenced by a number of different discharges of pollutants from different Operators and different sources, is toxic. In addition, WET testing would not indicate the actual source of the toxicity. If a waterbody is found to be toxic or to contain pollutants above water quality standards, it can be quite complex to identify the source of the toxicity, which may or may not actually be the NPDES permittee performing the monitoring.

Thus, the monitoring program that EPA has developed for the PGP has been tailored to accommodate the unique situations related to pesticide applications. Routine visual monitoring is required in the PGP and can be used to determine if any pesticide use practices may need to be revised to ensure that avoidable adverse impacts to the environment do not occur (See Part III.4.2 of this fact sheet). Monitoring records required by those Operators who submit NOIs will establish a history that may indicate if or when practices need to be reconsidered. The monitoring requirements in the PGP remain unchanged from EPA’s 2016 PGP.

4.1 Visual Monitoring Requirements for Pesticide Applicators

Visual monitoring assessments are required as a means of identifying, for example, instances of detrimental impact to non-target organisms, disruption or degradation of wildlife habitat, or the prevention of designated recreational or municipal uses of a waterbody that may possibly be related to the Operator’s use of pesticides in a given area. This requirement consists of visually monitoring the area to and around where pesticides are applied for possible and observable adverse incidents, such as unanticipated death or distress of non-target organisms and disruption of wildlife habitat, recreational or municipal water use.

Visual monitoring assessments are required during the pesticide application when feasibility and safety allow. Visual monitoring is not required during the course of pesticide application when that application is performed in darkness as it would be infeasible for the inspector to note adverse effects under these circumstances. Additionally, the following scenarios often preclude visual monitoring during pesticide application:

1. Applications made from an aircraft
2. Applications made from a moving road vehicle when the Applicator is the driver
3. Applications made from moving watercraft when the Applicator is the driver

4. Applications made from a moving off-road wheeled or tracked vehicle when the Applicator is the driver.

4.2 Visual Monitoring Requirements for all Operators

Visual monitoring must also be conducted during any post-application surveillance, such as to determine the efficacy of the pesticide application. Visual monitoring of this type is required of all Operators but only if the Operator, be it the Applicator or the Decision-maker or both, performs post application surveillance in the course of business. EPA expects that post-application visual assessments are reasonably conducted on foot or from a stationary vehicle, although they might also be conducted from a moving vehicle, including a boat or plane, in certain circumstances.

5. Pesticide Discharge Management Plan (PDMP)

Any Decision-maker who is or will be required to submit an NOI and is not a small entity²⁸ must develop a PDMP, except for any pesticide applications made in response to a Declared Pest Emergency situation, as defined in Appendix A of the PGP or any Decision-maker who is or will be required to submit an NOI *solely* because of discharges of pollutants to waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A of the PGP. EPA defines a Decision-maker that is not a small entity as a *large entity* in the permit. Large entity Decision-makers must prepare the PDMP by the time the NOI is filed.

Any Decision-maker who is or will be required to submit an NOI and is a small entity (*i.e.*, is below the Small Business Association (SBA) size standard, as defined in 13 CFR. 121.201, or is a public entity serving a population of 10,000 or less), is not required to develop a PDMP. Small entity Decision-makers are required to document activities as described in Part III.7.3 of the fact sheet. EPA recognizes that the SBA defines “small entities” as including government entities that serve populations of less than 50,000 persons. However, EPA’s NPDES program has historically considered “major” municipal NPDES permits as those that serve greater than 10,000 persons (*i.e.*, with a wastewater treatment plant design of greater than one million gallons a day). ‘Major NPDES’ permittees have increased recordkeeping and public notice obligations over ‘minor NPDES,’ which is consistent with EPA’s intent for the PGP to impose additional recordkeeping and reporting information only on these larger communities.

The PDMP itself does not contain effluent limitations; rather it constitutes a tool both to assist the Decision-maker in documenting what pest management measures it is implementing to meet the effluent limitations, and to assist the permitting/compliance authority in determining whether the effluent limitations are being met. Developing a PDMP helps Decision-makers ensure they have (1) taken steps to identify the pest problem, (2) evaluated pest management options, and (3) selected appropriate pest management measures to control pollutant discharges. A PDMP is a “living” document that requires reviews and must be kept up-to-date. Where pest management measures are modified or replaced to meet effluent limitations, such as in response to a Part 6.1 triggering condition in the PGP, such changes must be documented in the PDMP. All changes to the PDMP must be made before the next pesticide application that results in a

²⁸ A small entity is any (1) private enterprise that does not exceed the Small Business Administration size standard as identified at 13 CFR 121.201, or (2) local government that serves a population of 10,000 or less.

discharge of pollutants, if practicable, or if not, no later than 90 days after any change in pesticide application activities. Failure of a Decision-maker to develop and maintain an up-to-date PDMP is a violation of the PGP. This recordkeeping violation is separate and distinct from a violation of any of the other substantive requirements in the permit (*e.g.*, effluent limitations, corrective action, monitoring, reporting, and state-specific requirements).

A PDMP must include identification of the pesticide discharge management team, a description of the pest problem, and a description of the pest management options evaluation. Decision-makers must also provide response procedures for spill response and adverse incident response. The size of a pest management area is determined by the Decision-maker responsible for and with the authority to conduct pest management activities. For example, the pest management area for a mosquito control district is the total area of the district. Once the plan is developed, the Decision-maker must maintain the plan thereafter for the duration of coverage under this general permit. For any Decision-maker for which the annual treatment area threshold triggers the NOI requirement (and the Decision-maker is a large entity), the Decision-maker must keep the plan up-to-date for the duration of permit coverage even if the annual treatment area subsequently falls below the annual treatment area threshold.

Decision-makers may choose to reference other documents, such as a pre-existing pest management plan or spill prevention and response plan, in the PDMP rather than recreating the same text in the PDMP. It is not required that a Decision-maker must have authored the pre-existing plan in order to use it. When referencing other documents, the Decision-maker is responsible for ensuring his/her PDMP and the other documents together contain all the necessary elements for a complete PDMP, as specified in Part 5.1 of the PGP. In addition, the Decision-maker must ensure that a copy of relevant portions of those referenced documents is attached to the PDMP and is located on-site and it is available for review, consistent with Part 5.3 of the PGP.

5.1 Contents of the PDMP

The PDMP prepared under the PGP must meet specific requirements under Part 5.1 of the PGP. Generally, Decision-makers must document the following: (1) a pesticide discharge management team; (2) a description of the pest management area and the pest problem; (3) a description of pest management options evaluation; (4) response procedures for spill response and adverse incident response; and (5) any eligibility considerations under other federal laws.

Pesticide Discharge Management Team

The PGP requires that a qualified individual or team of individuals be identified to manage pollutant discharges covered under the permit. 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 Pest Management 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. EPA expects most Decision-makers will have more than one individual on the team, except for those with relatively simple plans and/or staff limitations. The PGP requires that team members have ready access to any applicable portions of the PDMP and the permit.

Problem Identification

This section includes the pest problem description, action threshold(s), a general location map, and water quality standards.

1. Pest Problem Description.

The PGP requires that the PDMP include a description of the pest problem at the pest management area. A detailed pest management area description assists Decision-makers in subsequent efforts to identify and set priorities for the evaluation and selection of Pest Management Measures taken to meet effluent limitations set forth in Parts 2 and 3 of the PGP 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. The PGP allows use of historical data or other available data (*e.g.*, from another similar site) 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.

2. Action Threshold(s)

The PGP 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 and method(s) to determine when the action threshold(s) has been met. An action threshold is a level of pest prevalence (or other indicator) at which an Operator takes action to reduce the pest population.

3. General Location 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 the waters of the United States. 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.

4. Water Quality Standards

Operators must identify any Tier 3 Waters (Outstanding National Resource Waters) and any water(s) impaired for a specific pesticide or its degradates to which there may be a discharge of pollutants. Internet links to all state, territory and tribal water quality standards are available at: <http://www.epa.gov/wqs-tech>.

Description of Pest Management Measures Options Evaluation

The PGP requires that the PDMP include a description of the Pest Management Measures implemented to meet the applicable technology-based or water quality-based effluent limitations. The description must include a brief explanation of the Pest Management Measures used at the site to reduce pollutant discharge, including evaluation and implementation of the six management options (no action, prevention, mechanical/physical methods, cultural methods, biological control agents, and pesticides). Decision-makers must consider impact to non-target organisms, impact to water quality, feasibility, and cost effectiveness when evaluating and selecting the most efficient and effective means of Pest Management Measures to minimize pollutant discharge to waters of the United States.

All six management options may not be available for a specific use category and/or treatment area. However, the PDMP must include documentation of how the six management options, including combination of these options, were evaluated prior to selecting site specific Pest Management Measures. For the no action option, Operators should document the impact of this option without any current Pest Management Measures at the site. For the prevention management option, the Decision-maker 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, Decision-makers may include a list of active ingredients evaluated. Discussion may also identify specific equipment or methods that will prevent or reduce the risks to non-target organisms and pollutant discharges to waters of the United States.

Response Procedures

The following procedures necessary to minimize discharges of pollutants must be documented in the PDMP:

1. 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.

2. Adverse Incident Response Procedures

In the PDMP, Decision-makers must document appropriate procedures for responding to an adverse incident resulting from pesticide applications. Decision-makers must identify and document the following:

- Procedures for responding to any adverse incident resulting from pesticide applications;

- Procedures for notification of the adverse incident, both internal to the Decision-maker's agency/organization and external;
- State/Federal permitting agency contacts with phone numbers;
- Name, location, and telephone of nearest emergency medical facility; and
- Name, location, and telephone of nearest hazardous chemical responder (including police and fire department).

Documentation to Support Eligibility Considerations under other Federal Laws

Decision-makers must keep, with the PDMP, documentation supporting their determination with regard to Part 1.1.2.4 of the PGP (Endangered and Threatened Species and Critical Habitat Protection).

Signature Requirements

The PDMP must be signed and certified in accordance with the signatory requirements in the Standard Permit Conditions part of the PGP (Appendix B, 40 CFR 122.41(k) Signatory requirement). This requirement is consistent with standard NPDES permit conditions described in 40 CFR 122.22 and is intended to ensure that the Decision-maker 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.

5.2 Pesticide Discharge Management Plan Modifications.

The PGP requires that the PDMP be updated whenever any of the triggering conditions for corrective action in Part 6.1 of the PGP occur, or when a review following the triggering conditions in Part 6.1 requires the Operator to revise his/her Pest Management Measures as necessary to meet the effluent limitations in the PGP (Part 2). Keeping the PDMP up-to-date will help the Decision-maker ensure that the condition that triggered the corrective action does not reoccur. All changes to the PDMP must be made before the next pesticide application that results in a discharge of pollutants, if practicable, or if not, no later than 90 days after any change in pesticide application activities or after an annual review.

It is important to note that failure to update the PDMP in accordance with Part 5.2 of the PGP is a recordkeeping violation, not a violation of an effluent limit. For example, if the Decision-maker changes its spill response procedures but fails to update its PDMP to reflect these changes, a recordkeeping violation will result. The Decision-maker must revise its PDMP to reflect the new procedures and include documentation of the corrective action (in accordance with Part 6 of the PGP) to return to full compliance.

5.3 Pesticide Discharge Management Plan Availability.

The PGP requires that a copy of the current PDMP, along with all supporting maps and documents, be kept at the address provided on the NOI. The PDMP and all supporting documents must be immediately available to representatives of EPA, a state, tribal, or local agency governing pesticide applications, as well as representatives of the United States Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service (NMFS) at the time of an on-site inspection or upon request. This requirement is consistent with standard NPDES permit conditions described in 40 CFR 122.41. Part 5.3 of the PGP indicates that EPA may provide access to portions of your PDMP to a member of the public upon request. Confidential Business

Information (CBI) may be withheld from the public, but consistent with 40 CFR Part 2, may not be withheld from EPA or the Services.

6. Corrective Action

The purpose of including corrective action requirements in the PGP is to assist this universe of NPDES permittees with effectively meeting technology-based and water-quality-based effluent limitations and implementing Pest Management Measures in the PGP. Corrective action requirements apply from the time any authorized Operator begins discharging pollutants under the PGP. These requirements are not tied to submission of an NOI. Corrective actions in this permit are follow-up actions an Operator must take to assess and correct problems. They require review and revision of Pest Management Measures and pesticide application activities, as necessary, to ensure that these problems are eliminated and will not be repeated in the future. The PGP 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. This approach will help Operators in complying with the requirements of the permit on a consistent basis. Compliance issues with some of the permit's requirements -- for instance, those related to reporting and recordkeeping and some of those related to operation and maintenance -- may be able to be corrected immediately simply by following already established procedures, and therefore, are not considered problems that trigger the corrective action provisions of the PGP.

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 Pest Management Measures to meet effluent limitations. However, failure to conduct (and document) corrective action reviews in such cases does constitute a permit violation.

6.1 Situations Requiring Revision of Pest Management Measures

Operators are required to review and, as necessary, revise the selection and implementation of their Pest Management Measures to eliminate any of the following situations:

- An unauthorized release or discharge of pollutants associated with the application of pesticides (*e.g.*, spill, leak, or discharge not authorized by this or another NPDES permit) occurs;
- Operators become aware, or EPA concludes, that Pest Management Measures are not adequate/sufficient for the discharge of pollutants to meet applicable water quality standards;
- Any monitoring activities indicate failure to meet applicable technology-based effluent limitations in Part 2 of the PGP;
- An inspection or evaluation by an EPA official, or local, state, or Tribal entity, determines that modifications are necessary to meet the non-numeric effluent limitations detailed in Part 2 of the PGP; or
- An Operator observes or is otherwise made aware (*e.g.*, a third-party notification) of an adverse incident.

EPA considers the above situations to be of significant concern. Thus, EPA is requiring Operators to assess the cause of these situations, which may be affiliated with the Operator's discharge from the application of pesticides and to take any necessary steps to eliminate the situation and ensure that the situation will not be repeated in the future.

The purpose of Part 6.1 of the PGP is to ensure compliance with corrective action requirements through increased accountability and oversight. EPA views ongoing assessment of the effectiveness of Pest Management Measures and corrective actions as integral to an effective pesticide management program. Written records associated with corrective action assessments must be kept with the other recordkeeping documentation required by this permit.

6.2 Corrective Action Deadlines

The PGP requires that corrective action be completed “before or, if not practicable, as soon as possible after the next pesticide application that results in a discharge.” EPA emphasizes that this timeframe is not a grace period within which an Operator is relieved of any liability for a permit violation. EPA is adopting this flexible deadline to account for the variation in types of responses (*e.g.*, evaluate situation and select, design, install, and implement new or modified Pest Management Measures) that may be necessary to address any identified situations of concern. EPA recognizes that in rare cases a corrective action review may identify the need for substantial improvements to the Operator’s Pest Management Measures and does not want to limit the selection and implementation of such controls with an inflexible deadline. Another possibility is that EPA or the Operator may determine that further monitoring is needed under Part 6.3 of the PGP to pinpoint the source of the problem, and this monitoring may need to be conducted during future pesticide application activities. In the vast majority of cases, however, corrective action reviews will identify responses that can be taken quickly, either before the next pesticide application that results in a discharge or shortly thereafter.

6.3 Effect of Corrective Action

The occurrence of a situation described in Part 6.1 of the PGP may, but does not necessarily, constitute a violation of the 2021 PGP. The occurrence of a situation identified in Part 6.1 does require the Operator to immediately review and as necessary, revise the selection and implementation of their Pest Management Measures to eliminate the situation. Part 6.3 of the PGP explains that taking corrective action does not absolve the Operator of any liability for a permit violation requiring that action, however, failure to take required corrective action will constitute an original or an additional permit violation. EPA will consider the appropriateness and promptness of corrective action in determining enforcement responses to permit violations. EPA may impose additional requirements and schedules of compliance, including requirements to submit additional information concerning the condition(s) triggering corrective action, additional site-specific water-quality based limitations, additional monitoring requirements, or other schedules and requirements more stringent than specified in this permit. Those requirements and schedules will supersede those of Parts 6.1 and 6.2 of the PGP if such requirements conflict.

6.4 Adverse Incident Documentation and Reporting

Part 6.4 of the PGP requires Operators to take specific actions in response to identified adverse incidents which may have resulted from a discharge from the Operator’s pesticide application. Namely, Operators are required to provide oral notice to EPA within 24 hours and then follow-up with a written report within 30 days of becoming aware of the adverse incident. EPA defines an “adverse incident” in Appendix A of the PGP, but generally it is defined as any effect of a pesticide’s use that is unexpected or unintended, in which there is evidence that a

person or non-target organism has likely been exposed to a pesticide residue and suffered a toxic or adverse effect.

Part 6.4.1 of the PGP requires Operators to call the appropriate EPA Incident Reporting Contact within 24 hours of any identified adverse incident and provide basic information about it. The purpose of this requirement is twofold: (1) to provide an opportunity for the Agency to respond to these incidents as soon as reasonably can be expected, and (2) to provide a basis for potential corrective actions. EPA does not expect this initial notification to be detailed but merely a reporting of the date of the finding, a general discussion of the incident and a review of the necessity to conduct corrective action. The PGP requires Operators to document the information identified in Part 6.4.1, including the date and time that EPA was notified and a description of any deviations from Part 6.4.1 notification requirements based on nuances of the adverse incident. For example, an Operator may decide to notify multiple EPA contacts because of the severity of the adverse incident. This type of information should be included in the written documentation of the 24-hour notification as described below.

Part 6.4.2 of the PGP requires Operators to provide a written report of the adverse incident to the appropriate EPA Regional office and to the State Lead Agency for pesticide regulation within 30 days of discovering the adverse incident. The adverse incident report must include the following information:

- Information required to be provided in Part 6.4.1.1 of the PGP;
- Date and time you contacted EPA notifying the Agency of the adverse incident;
- 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 individuals and approximate size of dead or distressed organisms;
- Magnitude of the effect (*e.g.*, aquatic square area or total stream distance affected);
- Quantity of pesticide applied and EPA registration number of pesticide product, intended use site (*e.g.*, banks, above, or direct to water), and method of application;
- Description of the habitat and the circumstances under which the incident occurred (including any available ambient water data for pesticides applied);
- Information on any laboratory tests performed and test results; and
- Actions to be taken to prevent recurrence of the incident.

Adverse incident information associated with discharges from the application of pesticides is useful to the Agency because the information:

- Provides the Agency with an indication of the effectiveness of the permit in controlling discharges of pollutants to protect water quality, including data upon which the Agency may base future permit decisions (*e.g.*, modifications to or reissuance of this permit).
- May be considered when reviewing applications for registration of new pesticides that are chemically similar to existing pesticides, as well as re-evaluations of existing pesticides;
- May be considered in ecological risk assessment and during deliberations on risk management decisions;

- May be reviewed to determine trends that may indicate potential ecological impacts with an existing pesticide and/or to track improvements when mitigation measures are applied;
- 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.

Currently, there is no database that includes adverse reporting from anyone other than the registrant under 6(a)(2) of FIFRA. EPA does not consider inclusion of adverse incident reporting in the NPDES permit to be a duplicative requirement to the FIFRA section 6(a)(2) requirements for registrant reporting of adverse incidents. This is because pesticide registrants are not likely to be directly covered under the PGP. Although some pesticide product labels may require that adverse incidents be reported, requiring the reporting of all adverse incidents and follow-up corrective actions may address the lack of a universal, mandatory legal duty for pesticide users to report adverse incidents, at least for the pesticide use patterns covered by the PGP.

EPA acknowledges that assessing and correcting adverse incidents may be complicated in certain instances. For example, symptoms associated with adverse incidents are often vague or mimic other causes which may lead to incorrect diagnoses. Thus, it may be difficult to identify and track chronic effects resulting from pollutant discharges. It may also be difficult to observe adverse effects because of limited visibility or access such as dead fish poisoned in a wetland under dense vegetation or in sparsely populated areas or because scavengers scatter or devour carcasses before discovery. It is important, however, to identify to the extent feasible situations where adverse effects occur where discharges from the application of pesticides also occur.

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. EPA acknowledges that some degree of detrimental impact to non-target species may occur and may be acceptable during the course of normal pesticide application. EPA expects 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 a visual inspection, Operators should watch for distressed or dead juvenile and small fish, 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 pest control 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 Pest Management Measures.

Complete information concerning adverse impacts will aid EPA in any review of current or future pesticide use, adherence to Pest Management Measures, or effectiveness of these measures. Reporting of adverse incidents is not required under this permit in the following situations: (1) you are aware of facts that indicate that the adverse incident was not related to toxic effects or exposure from the pesticide application; (2) you have been notified in writing by EPA that the reporting requirement has been waived for this incident or category of incidents; (3) you receive information notifying you of an adverse incident but that information is clearly erroneous; (4) an adverse incident occurs to pests that are similar in kind to pests identified as potential targets on the FIFRA label. However, even for these situations, certain records must be kept on site by those Decision-makers who are required to submit NOIs, pursuant to Part 7.3 and 7.4 of the PGP.

6.5 Reportable Spills and Leaks

Part 6.5.1 of the PGP requires Operators to call the appropriate EPA Incident Reporting Contact to report any spill or leak of a hazardous substance or oil into waters of the United States with 24 hours of becoming aware of the spill or leak.²⁹ Part 6.5.2 of the PGP requires Operators to document this notification within 30 days of becoming aware of such spill or leak. If the spill or leak triggers the notification in Part 6.5.1 and results in an adverse incident, then Operators must report the incident per the guidelines in Part 6.4.1 and 6.4.2 of the PGP. If the spill or leak triggers the notification in Part 6.5.1, but does not result in an adverse incident, then Operators must document and retain information outlined in Part 6.5.2 within 30 days of becoming aware of the situation. This documentation provides a written record of what you reported to EPA orally. It should also include a description of the reporting system that will be used to alert responsible managers and legal authorities in the event of a future spill or leak and a description of preventive measures to prevent, contain, or treat spills and leaks of these materials. Part 6.4.3 of the PGP requires Operators to notify either the National Marine Fisheries Service or the United States Fish and Wildlife Service if the Operator becomes aware of an incident that may have resulted from a discharge from the pesticide application that adversely affects a federally-listed threatened or endangered species or its federally-designated critical habitat. This information will be used by EPA to ascertain compliance with permit conditions.

6.6 Documentation for Other Corrective Action

For any event described in Part 6.1 of the PGP, other than for adverse incidents or reportable spills or leaks, immediate reporting to EPA is not required, but Operators must document basic information describing the event and the Operators' response to that event within 30 days. For triggering events in Part 6.1, where the Operator determines that revision to Pest Management Measures is not necessary, the Operator must still document the review and the basis for this determination. EPA is not requiring Operators to submit this documentation to the Agency. Rather, EPA expects Operators to retain this information on-site and upon request, to make any such records available to EPA or any other Federal, state, or local regulatory agency governing pesticide applications. A summary of this information must also be included in the annual report for Operators subject to the annual reporting requirement.

²⁹ 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.

7. Recordkeeping and Annual Reporting

The PGP requires all Decision-makers and Applicators to maintain certain records to help them assess performance of Pest Management Measures and to document compliance with permit conditions. Recordkeeping and reporting requirements apply from the time any authorized Operator begins discharging pollutants under the PGP. These requirements are consistent with Federal regulations at 40 CFR 122.41(j), but have been tailored to more closely reflect the requirements in the PGP. The PGP requires a basic set of records to be maintained by all Decision-makers and Applicators, as well as separate requirements depending on the type of Operator (*i.e.*, Applicator, For-Hire Applicators, NOI submitting Decision-maker who is a small entity and NOI submitting Decision-maker who is a large entity). Part 7 of the PGP sets forth the recordkeeping requirements for each of these types of Operators. Operators can rely on records and documents developed for other programs, such as requirements under FIFRA, provided all requirements of the permit are satisfied.

EPA has found that it is appropriate and reasonable to require different records for different types of Operators, reasoning that the recordkeeping responsibilities assigned in the permit reflect the nature of involvement in pesticide application activities for the Operators described. The following sections describe the sets of records that the PGP requires different types of Operators keep and enumerates the specific information items to be recorded.

7.1 Records to be Kept by all Operators (all Decision-makers and all Applicators)

These records must be kept by *all* Operators, including those not submitting an NOI. Although this section is a universal requirement, these particular records are necessary only in the event of an adverse incident, the case that corrective action was required, or in the event of a discharge resulting from a spill or leak.

- a. A copy of any Adverse Incident Reports (See Part 6.4.2);
- b. Rationale for any determination that reporting of an identified adverse incident is not required, consistent with allowances identified in Part 6.4.1.2;
- c. A copy of any corrective action documentation (See Part 6.6); and,
- d. A copy of any spill and leak or other unpermitted discharge of pollutants documentation (See Part. 6.5.2)

7.2 Records to be Kept by all For-Hire Applicators

All Operators who are For-Hire Applicators, as defined in Appendix A of the PGP, must keep the records listed above, as well as records that specifically document pesticide application equipment maintenance and details of the pesticide application event. Since Decision-makers who are not themselves performing pesticide applications are generally not able to record such information, EPA requires different recordkeeping requirements depending on the type of Operator.

- a. Documentation of equipment calibration; and
- b. Information on each treatment area to which pesticides are discharged, including:
 1. Description of each treatment area, including location and size (acres or linear feet) of treatment area and identification of any waters, either by name or by location, to which pesticide(s) are discharged;

2. Pesticide use pattern(s) (*i.e.*, mosquito and other flying insects, weed and algae, animal pest, or forest canopy);
3. Target pest(s);
4. Documentation of any assessment of weather conditions in the treatment area prior to and during application to ensure application is consistent with all applicable federal requirements;
5. Name of each pesticide product used including the EPA registration number;
6. Quantity of each pesticide product applied to each treatment area;
7. Pesticide application date(s); and
8. Whether or not visual monitoring was conducted during pesticide application and/or post-application and if not, why not and whether any unusual or unexpected effects identified to non-target organisms.

7.3 Records to be Kept by Small Entities, Submitting an NOI

As mentioned in Part 5, any Decision-maker that is required to submit an NOI and is below the SBA thresholds for small businesses or is a public entity serving a population of fewer than 10,000, is defined as a *small entity* in the permit. Small entities are required to keep a basic records set, outlined in Part 7.3 of the PGP, all of which can be recorded on the Pesticide Discharge Evaluation Worksheet provided in the PGP Appendix F.

Decision-makers who are required to submit an NOI and who are defined as small entities (as identified in Part 5) are required to keep the following records at the address provided on the NOI, as identified in Part 1.2.2 of the PGP. A worksheet for documenting this information on each treatment area is provided in Appendix F of the PGP, Pesticide Discharge Evaluation Worksheet.

- a. Copy of the NOI submitted to EPA, any correspondence exchanged between the Decision-maker and EPA specific to coverage under this permit, and a copy of the EPA acknowledgment letter with the assigned permit tracking number;
- b. Documentation of equipment calibration (only if Decision-maker is also the Applicator);
- c. Information on each treatment area to which pesticides are discharged, including:
 1. Description of treatment area, including location and size (acres or linear feet) of treatment area and identification of any waters of the United States, either by name or by location, to which pesticide(s) are discharged;
 2. Pesticide use pattern(s) (*i.e.*, mosquito and other flying insects, weed and algae, animal pest, or forest canopy);
 3. Target pest(s) and explanation of need for pest control;
 4. Description of pest management measure(s) implemented prior to the first pesticide application;
 5. Company name and contact information for pesticide applicator;
 6. Name of each pesticide product used including the EPA registration number;
 7. Quantity of each pesticide product applied to each treatment area;
 8. Pesticide Application Start Date;
 9. Pesticide Application End Date; and

10. Whether or not visual monitoring was conducted during pesticide application and/or post-application and if not, why not and whether any unusual or unexpected effects identified to non-target organisms.

7.4 Records to be Kept by Large Entities, Submitting an NOI

Any Decision-maker who is required to submit an NOI and is above the Small Business Administration (SBA) threshold for a small business or a public entity who serves a population of 10,000 or more is defined as a *large entity* in the permit. Large entities are required to keep the records listed in Part 7.4 of the PGP. EPA expects that large entities will have a greater capability than small entities to record specific details of the pest treatment area, and is therefore requiring slightly more comprehensive recordkeeping. In addition, much of the records set for large entities are reflected in the annual report that these entities must submit. The reported information will allow EPA to better characterize the discharges resulting from pesticide applications in a variety of different circumstances.

Decision-makers who are to submit an NOI and are defined as large entities (as defined in Appendix A of the PGP)) must keep the following records as identified in Part 7.4 of the PGP.

- a. Copy of the NOI submitted to EPA, any correspondence exchanged between the Decision-maker and EPA specific to coverage under this permit, and a copy of the EPA acknowledgment letter with the assigned permit tracking number;
- b. A copy of the PDMP, including any modifications made to the PDMP during the term of this permit;
- c. Copy of annual reports submitted to EPA;
- d. Documentation of equipment calibration (only if Decision-maker is also the Applicator);
- e. Information on each treatment area to which pesticides are discharged, including:
 1. Description of each treatment area, including location and size (acres or linear feet) of treatment area and identification of any waters of the United States, either by name or by location, to which pesticide(s) are discharged;
 2. Pesticide use pattern(s) (*i.e.*, mosquito and other flying insects, weed and algae, animal pest, or forest canopy);
 3. Target pest(s) and explanation of need for pest control;
 4. Action Thresholds;
 5. Method and/or data used to determine that action threshold(s) has been met;
 6. Description of pest management measure(s) implemented prior to the first pesticide application;
 7. Company name and contact information for pesticide applicator;
 8. Name of each pesticide product used including the EPA registration number;
 9. Quantity of each pesticide product applied to each treatment area;
 10. Pesticide application date(s); and
 11. Whether or not visual monitoring was conducted during pesticide application and/or post-application and if not, why not and whether any unusual or unexpected effects identified to non-target organisms.

7.5 Retention of Records

All required records must be prepared as soon as possible but no later than 14 days following completion of the associated activity. Operators must retain copies of these documents for a period of at least 3 years from the date their coverage under this permit expires or is terminated.

EPA recommends that all Decision-makers keep records of acres or linear miles treated each calendar year for all applicable use patterns covered under this general permit. This record will help Decision-makers estimate when they will exceed the annual treatment area threshold (requiring submission of an NOI), or to complete an annual report if required.

7.6 Annual Reports

In addition to recordkeeping, EPA is requiring Decision-makers who are required to submit an NOI and are large entities as identified in Part 5 of the PGP to submit annual reports that contain basic information on their pollutant discharges to waters of the United States. An annual report form, along with instructions on how to complete it is available in Appendix G of the PGP.

The annual report must include information for the calendar year, with the first annual report required to include activities for the portion of the calendar year after the effective date of the NOI. If the effective date of the NOI is after December 1, the Operator is not required to submit an annual report for that first partial year but must submit annual reports thereafter, with the first annual report submitted also including information from the first partial year. When an Operator terminates permit coverage, as specified in Part 1.2.5 of the PGP, the Operator must submit an annual report for the portion of the year up through the date of the termination. The annual report is due no later than 45 days after the termination date, or February 15 of the following year, whichever is earlier.

This information in the annual report will be used by EPA to assess permit compliance and to determine whether additional controls on pollutant discharges are necessary to protect water quality. For example, these data will help the Agency identify where pollutant discharges are occurring, and the types of pesticides being discharged. The annual report provides specific information concerning the scope and nature of discharges of pollutants permitted under the 2021 PGP. Annual reports submitted under EPA 2011 PGP and 2016 PGP are available online at <https://www.epa.gov/npdes/pesticide-permitting>. A summary of data submitted in the annual reports is in the administrative record for this 2021 PGP. See *2017-2019 PGP Annual Report Data* document in the docket at EPA-HQ-OW-2020-0005.

The annual report is a summary of the pest control activities for each applicable use pattern and must contain:

- a. Decision-maker's name and contact information;
- b. NPDES permit tracking number(s);
- c. Contact person name, title, e-mail address (if any), and phone number; and
- d. For each treatment area, report the following information:

1. Description of treatment area, including location and size (acres or linear feet) of treatment area and identification of any waters of the United States, either by name or by location, to which pesticide(s) are discharged;
2. Pesticide use pattern(s) (*i.e.*, mosquito and other flying insects, weed and algae, animal pest, or forest canopy) and target pest(s);
3. Company name(s) and contact information for pesticide applicator(s), if different from the Decision-maker;
4. Total amount of each pesticide product applied for the reporting year by the EPA registration number(s) and by application method (*e.g.*, aerially by fixed-wing or rotary aircraft, ground based spray, etc.);
5. Whether this pest control activity was addressed in a PDMP prior to pesticide application;
6. If applicable, any adverse incidents as a result of these treatment(s), for incidents, as described in Part 6.4.1; and
7. If applicable, description of any corrective action(s), including spill responses, resulting from pesticide application activities and the rationale for such action(s).

7.7 Annual Reporting for Any Decision-maker with Discharges of Pollutants to Waters of the United States Containing NMFS Listed Resources of Concern, as Defined in Appendix A of the Permit, and Who is a *Small Entity*

Any Decision-maker who is required to submit an NOI for discharges of pollutants to waters of the United States containing NMFS Listed Resources of Concern, as defined in Appendix A of the PGP, and is a small entity, as defined in Appendix A of the PGP, must submit an annual report to EPA. Large entities with discharges of pollutants to waters of the United States containing NMFS Listed Resources of Concern are required to submit annual reports consistent with Part 7.6 of the PGP. Decision-makers must submit the annual report electronically through EPA's NPDES eReporting Tool (NeT), available at <https://www.epa.gov/npdes/pesticide-permitting>, unless NeT is otherwise unavailable or the Decision-maker meets the waiver requirements for submitting a paper annual report. Decision-makers waived from the requirement to use NeT for annual report submission must certify on the paper annual report submitted to EPA the rationale for eligibility to use the waiver. The annual report must be submitted to EPA Headquarters (either through NeT or if NeT is otherwise unavailable or the Decision-maker meets the NeT waiver requirement, to the EPA Headquarters address identified in Part 8.1 of the PGP) no later than February 15 of the following year for all pesticide activities covered under this permit occurring during the previous calendar year. Annual reporting requirements begin with those activities occurring during calendar year 2022.

When Decision-makers terminate permit coverage, as specified in Part 1.2.5 of the PGP, an annual report must be submitted for the portion of the year up through the date of termination. The annual report is due no later than February 15 of the next year.

For small entities, the annual report is a summary of the pest control activities for each applicable use pattern that results in a discharge of pollutants to waters of the United States containing a NMFS Listed Resource of Concern, as defined in Appendix A of the PGP. For small entities, discharges of pollutants to waters that do not contain NMFS Listed Resources of Concern do not need to be included in the annual report. The annual report must contain:

- a. Decision-maker's name and contact information;
- b. NPDES permit tracking number(s);
- c. Contact person name, title, e-mail address (if any), and phone number; and
- d. For each treatment area, report the following information:
 1. Description of treatment area, including location and size (acres or linear feet) of treatment area and identification of any waters of the United States, either by name or by location, to which pesticide(s) are discharged;
 2. Pesticide use pattern(s) (*i.e.*, mosquito and other flying insects, weed and algae, animal pest, or forest canopy) and target pest(s);
 3. Company name(s) and contact information for pesticide applicator(s), if different from the Decision-maker;
 4. Total amount of each pesticide product applied for the reporting year by the EPA registration number(s) and by application method (*e.g.*, aerially by fixed-wing or rotary aircraft, ground based spray, etc.);
 5. The approximate date of any discharge of pollutants;
 6. If applicable, any adverse incidents as a result of these treatment(s), for incidents, as described in Part 6.4.1; and
 7. If applicable, description of any corrective action(s), including spill responses, resulting from pesticide application activities and the rationale for such action(s).

7.8 Electronic Reporting Requirement

Any Decision-makers required to submit Notices of Intent (NOIs), Notices of Termination (NOTs), and/or Annual Reports, must submit them electronically unless a waiver is granted. Part 7.8 of the PGP outlines the conditions for obtaining a waiver. The 2021 PGP requires that all NOIs, NOTs, and annual reports be submitted electronically, unless EPA's NPDES eReporting Tool (NeT) is otherwise unavailable or the Decision-maker has obtained a waiver from the requirement to use the NeT. Electronic reporting improves efficiency for both Decision-makers and EPA and allows Decision-makers to obtain authorization to discharge in a timely manner (as is important for many pesticide applications).

In those rare cases where Decision-makers are unable to report electronically, the 2021 PGP contains language that allows for hard copy submittal of information when the following exemptions apply: (1) If the Decision-maker is physically located in a geographic area (*i.e.*, zip code or census tract) that is identified as under-served for broadband Internet access in the most recent report from the Federal Communications Commission; or (2) If the Decision-maker has limitations regarding available computer access or computer capability. A Decision-maker who wishes to use paper submittals must submit a request to the EPA contact in the appropriate EPA Regional Office listed in Part 8 of the PGP to obtain a waiver from submitting reports electronically.

8. EPA Contact and Mailing Addresses

Part 8 of the PGP identifies contact information and mailing addresses for any applicable reporting requirements of the PGP. Note that depending on the requirement, some reports/notifications are to go to the EPA Regional office while others are to be sent to an EPA Headquarters location. Generally, Regions are notified for information that may require rapid

review and response by the Region to address potential adverse effects or other concerns requiring more immediate attention.

9. Permit Conditions Applicable to Specific States, Indian Country, or Territories

Part 9.0 of the PGP, when finalized, will include specific permit conditions provided by states, territories, and tribes as part of their Clean Water Act (CWA) Section 401 certifications and their Coastal Zone Management Act (CZMA) concurrences.

EPA cannot issue an NPDES permit until the state, territory or tribe in which the discharge originates certifies that the discharge will comply with applicable provisions of the CWA, or waives certification. Part 9 of the PGP identified provisions provided to EPA by States, Territories and Tribes in their CWA § 401 certifications that the States, Territories and Tribes deem necessary to assure compliance with applicable provisions of the CWA and any other appropriate requirements of State, Territory and Tribal law. See 33 U.S.C. 1341(d); 40 CFR § 124.53(e)(1). Pursuant to CWA § 401(d), EPA attached those State, Territory and Tribal provisions to the PGP; those that constitute effluent or other limitations or monitoring requirements are enforceable conditions of the federal permit. *American Rivers, Inc. v. FERC*, 129 F.3d 99, 107 (2nd Cir. 1997). These conditions are subject to review in State, Territory and Tribal administrative and judicial tribunals with appropriate jurisdiction. 40 CFR § 124.55(e); *American Rivers, Inc. v. FERC*, 129 F.3d 99, 102 (2nd Cir. 1997); *Roosevelt Campobello Int'l Park Comm'n v. EPA*, 684 F.2d 1041, 1056 (1st Cir. 1982).

The Coastal Zone Management Act (CZMA) and its implementing regulations (15 CFR Part 930) require that any Federal licensed activity directly affecting the coastal zone of a state with an approved Coastal Zone Management Program (CZMP) be consistent with the enforceable policies of that approved program to the maximum extent practicable. Agency general permits that do not involve case-by-case or individualized determinations by the Agency are federal activities for the purposes of CZMA section 307(c)(1). For the PGP, EPA made a consistency determination regarding the enforceable policies in each approved state CZM program for the coastal zones including state waters where the final 2021 PGP authorizes discharges of pollutants. [15 CFR 930.31(d)].

10. Permit Appendices

A. Definitions and Acronyms

Appendix A of the PGP provides permit-specific definitions of statutory, regulatory, and other terms important for understanding its requirements. Any terms that are not listed in this definitions part have the meaning given to the terms by 40 CFR Part 122.2 (the definitions section of the NPDES regulations). To develop these definitions, EPA has, where possible, relied on existing definitions in other laws and regulations applicable to this universe of permittees in order to provide consistency with those laws and provide permittees with a familiar framework.

B. Standard Permit Conditions

Federal regulations require that all NPDES permits contain the standard permit conditions specified in 40 CFR 122.41. Appendix B of the PGP includes all of the standard permit conditions published in federal regulations at 40 CFR §122.41.

C. Areas Covered

As noted above, the PGP is available in those areas where EPA remains the NPDES permitting authority for discharges from the application of pesticides to or over, including near, waters of the United States. NPDES-authorized states issue permits elsewhere in the United States for these types of discharges of pollutants. Appendix C of the PGP includes a list of those areas where this EPA permit is available which includes portions of all ten EPA Regions where EPA remains the NPDES permitting authority.

D. Notice of Intent Form

Part 1.2.2 of the PGP identifies certain Decision-makers required to prepare and submit a complete and accurate Notice of Intent (NOI) form to be authorized to discharge pollutants under the PGP. Decision-makers must submit NOIs in accordance with the deadlines provided in Part 1.2.3 of the PGP. The NOI form provides EPA with the information necessary to determine a Decision-maker's eligibility to discharge pollutants under this permit and enables EPA to better match up Operators with other reporting requirements and to prioritize oversight activities. Appendix D of the PGP contains information that is required to be provided on the NOI form. Except in special circumstances, EPA requires that Decision-makers submit that information electronically, using EPA's NeT available at <https://www.epa.gov/npdes/pesticide-permitting>, because it is easier (including availability of online instructions and help menus to guide you through the process), faster (NOIs can be processed 2 weeks or more faster than paper forms), and more accurate (NeT will ensure form is completed and will auto check certain key elements to improve accuracy of information submitted). See Part 7.8 of the PGP for waiver information.

E. Notice of Termination Form

Part 1.2.5 of the PGP requires certain Decision-makers (*i.e.*, those required to submit an NOI to be authorized under this permit) to submit a Notice of Termination (NOT) form within 30 days of the occurrence of one of several different triggering events: (1) when a new Decision-maker has taken over responsibility for the pest control activity, (2) the Decision-maker has ceased aquatic pesticide application covered under the general permit, (3) there is not and no longer will be pollutant discharge, or (4) the Decision-maker has obtained coverage under an individual permit or an alternative general permit. Appendix E of the PGP contains a copy of the information required to be submitted on the NOT form. Like the NOI, EPA requires that Decision-makers complete and submit the NOT form electronically using EPA's NeT available at <https://www.epa.gov/npdes/pesticide-permitting>, except in specified circumstances. See Part 7.8 of the PGP for waiver information.

F. Pesticide Discharge Evaluation Worksheet

Part 7.3 of the PGP requires Decision-makers who are required to submit an NOI and are small entities, as defined in Appendix A of the PGP, to complete and retain a worksheet for at least 3 years from when an Operator's coverage under the PGP expires or is terminated. Decision-makers are required to make this worksheet available to EPA, including an authorized representative of EPA, upon request. Appendix F of the PGP contains a copy of the worksheet required to be retained by Decision-makers.

G. Annual Report Template

Part 7.6 of the PGP requires Decision-makers who: (1) are required to submit an NOI and are large entities, as identified in Part 5 of the PGP; and/or (2) discharge of pollutants to waters of the United States containing NMFS Listed Resources of Concern, to submit Annual Reports. The Annual Report must be submitted no later than February 15 of the following year for all pesticide activities covered under the PGP occurring during the previous calendar year. When Decision-makers terminate permit coverage, as specified in Part 1.2.5 of the PGP, an Annual Report must be submitted for the portion of the year up through the date of termination. Appendix G of the PGP contains a copy of the information required to be submitted with an Annual Report. Like the NOI and NOT, EPA requires that Decision-makers complete and submit the Annual Report form electronically using EPA's NeT that is available for use at <https://www.epa.gov/npdes/pesticide-permitting> unless eNOI is otherwise unavailable or the Decision-maker has obtained a waiver from the requirement to use NeT for submitting the Annual Report. See Part 7.8 of the PGP for waiver information.

H. Adverse Incident Report Template

Part 6.4 of the PGP requires Operators to: (1) provide oral notice to EPA within 24 hours, and (2) submit a written report within 30 days of becoming aware of an adverse incident which may have resulted from a discharge from the Operator's pesticide application. Adverse Incident, as defined in the PGP Appendix A, is an unusual or unexpected incident that an Operator has observed upon inspection or of which the Operator otherwise become aware, in which: (1) There is evidence that a person or non-target organism has likely been exposed to a pesticide residue, and (2) The person or non-target organism suffered a toxic or adverse effect. Appendix H of the PGP contains a copy of the information required to be submitted to the appropriate EPA Regional office and to the State Lead Agency within 30 days of discovering the adverse incident.

I. Endangered Species Procedures

The PGP specifies procedures to protect federally-listed endangered and threatened species and its designated critical habitat. As discussed in section 1.1.2.4 of the PGP, coverage under this permit is available only for discharges of pollutants and discharge-related activities that are not likely to result in any short or long term adverse effects to species that are federally-listed as endangered or threatened under the ESA or federally-designated critical habitat under the ESA, except as provided in eligibility Criterion B, C and, for 60 day, D. For discharges of pollutants to a subset of these resources, identified in this permit as NMFS Listed Resources of Concern, which are defined in Appendix A of the PGP, the operator must document that discharges of pollutants meet these conditions by certifying eligibility under one of Criteria A-F. (Note that operators not otherwise required to submit an NOI do not need to do so merely to certify under Criterion A, which indicates that discharges of pollutants will not occur to waters of the U.S. where NMFS Listed Resources of Concern are present.) Appendix I contains a four-step process that must be followed for determining whether an Operator is eligible for permit coverage, prior to submittal of the NOI. In order to become eligible for this permit, each Operator must determine its compliance with one of six eligibility criteria (A – F). If Operators cannot determine if they meet one of the eligibility criteria related to NMFS Listed Resources of Concern, the operator cannot submit an NOI to gain coverage under the PGP. In these instances, the Operator may consider applying to EPA for an individual NPDES permit.

IV. Fact Sheet Appendices

APPENDIX A. List of Pesticides and Degradates Which Exceeded Aquatic-life Benchmarks in the USGS 2014 Study and the CA Central Valley Regional 303(d) Impairment List of Pesticides.

Table A1. Sites that exceed one or more aquatic-life benchmarks in the last decade (2002-2011) USGS 2014 study

Pesticide/Degradate	Sites that exceed one or more aquatic-life benchmarks			
	Agricultural sites	Urban Sites	Mixed sites	Total exceedances
Acetochlor	2			2
Alfa-endosulfan			1	1
Atrazine	1			1
AZM	5	1	2	8
Carbofuran	2		1	3
Carbaryl	1	5		6
Chlorpyrifos	4			4
Cis-permethrin	2	2	5	9
Diazinon	1	4	2	7
Disulfoton	2	1	1	4
Disulfoton-sulfone		1		1
Dichlorvos	1	19	3	23
Dicrotophos	1			1
Ethoprophos	1			1
Fipronil	10	52	23	85
Fipronil sulfone		2		2
Lambda-cyhalothrin	1		1	2
Linuron		3		3
Malathion	7	12	8	27
Metolachlor	32	1	34	67
Parathion-methyl	1			1

Table A1a. Percentage of sites that exceed one or more aquatic-life benchmarks in the last decade (2002-2011) in the USGS 2014 study

Pesticide/Degradate	Percentage of sites that exceed one or more aquatic-life benchmarks		
	Agricultural sites	Urban Sites	Mixed sites
Acetochlor	9.1	0.0	0.0
Alfa-endosulfan	0.0	0.0	3.7
Atrazine	4.5	0.0	0.0
AZM	13.6	3.7	7.4
Carbofuran	4.5	0.0	3.7
Carbaryl	4.5	7.4	0.0
Chlorpyrifos	9.1	0.0	0.0
Cis-permethrin	4.5	7.4	18.5
Diazinon	4.5	11.1	7.4
Disulfoton	9.1	3.7	3.7
Disulfoton-sulfone	0.0	3.7	0.0
Dichlorvos	4.5	51.9	11.1
Dicrotophos	4.5	0.0	0.0
Ethoprophos	4.5	0.0	0.0
Fipronil	36.4	77.8	48.1
Fipronil sulfone	0.0	7.4	0.0
Lambda-cyhalothrin	4.5	0.0	3.7
Linuron	0.0	11.1	0.0
Malathion	27.3	33.3	18.5
Metolachlor	63.6	3.7	29.6
Parathion-methyl	4.5	0.0	0.0

Table A2. Pesticides/Degradates that are listed as 303(d) impairments from the CA Central Valley (USEPA Approved 2008-2010 list)

Note: This table includes pesticides that have been cancelled.

Pesticide/Degradate	# of impairments	WQS being exceeded
Aldicarb	1	Narrative toxicity and pesticide objectives – one-tenth the 48-hr LC50 Chironomus tentans.
Azinphos-methyl	3	Narrative toxicity and pesticide objectives – USEPA ambient water quality criteria (USEPA, 1976).
Bifenthrin	1	Narrative toxicity and pesticide objectives - one tenth the 96-hour LC50 for Haylella azteca.
Carbofuran	1	Narrative toxicity and pesticide objectives – USEPA recommended water quality criterion for the protection of freshwater aquatic life.
Chlordane	2	Fish tissue samples exceed narrative toxicity objective. Composites exceeded the 5.6 ug/kg OEHHA screening value for total chlordane in fish tissue.
Chlorpyrifos	72	Numeric site-specific water quality objective for chlorpyrifos or narrative toxicity and pesticides objective – exceedance of 1-hour and/or 4-day average maximum concentration criterion above the allowable frequency.

Pesticide/Degradate	# of impairments	WQS being exceeded
DDD	1	Samples exceeded the California Toxic Rule/USEPA (CTR/USEPA) criteria limit of 0.00083 µg/L for DDD based on a human health carcinogenic risk level of 10 ⁻⁶ for consumption of water and aquatic organisms.
DDE	9	Samples exceed the 0.00059 µg/L California Toxic Rule/USEPA (CTR/USEPA) criteria limit based on a human health 10 ⁻⁶ carcinogenic risk level for consumption of water and aquatic organisms for DDE.
DDT	23	Placeholder to support decision made prior to 2006.
Diazinon	63	Numeric site-specific water quality objective for diazinon or narrative toxicity and pesticides objectives – exceedances of 1-hour and/or 4-day average maximum concentration criterion above the allowable frequency.
Dichlorvos	2	Narrative toxicity and pesticides objectives – one-tenth the 96-hour LC50 for <i>Daphnia magna</i> .
Dieldrin	10	Samples exceed the California Toxic Rule/USEPA (CTR/USEPA) criteria for Dieldrin of 0.00014 µg/L based on a human health 10 ⁻⁶ carcinogenic risk level for water and fish consumption.
Dimethoate	8	Narrative toxicity and pesticides objectives – one-tenth LC50 for the most sensitive species in freshwater (<i>Cyclops strenuus</i> , a copepod crustacean).
Disulfoton	1	Narrative toxicity and pesticides objectives – USEPA National Ambient Water Quality Disulfoton Criterion for freshwater aquatic life protection, maximum concentration of 0.05 µg/L.
Diuron	8	Narrative toxicity and pesticides objectives – the 96-hour EC50 for <i>Chlorella pyrenoidosa</i> (1.3 µg/L).
Group A Pesticides	19	Placeholder to support decision made prior to 2006.
Hexachlorobenzene/ HCB	1	Samples exceed USEPA IRIS Reference Dose (RfD) for maximum Hexachlorobenzene content in surface water with a limit of < 0.00075 µg/L.
Lindane/ gamma Hexachlorohexane (gamma HCL)	1	Samples exceeded the CTR criteria of 0.019 mg/g for human consumption of water and organisms.
Malathion	4	Narrative toxicity and pesticides objectives – The USEPA recommended 4-day average criterion continuous concentration (CCC) (0.1 µg/L) (USEPA, 1976). The California Department of Fish and Game Hazard Assessment Criterion 1-hr average concentration (CMC) (0.43 µg/L) (CDFG, 1998)..
Organophosphorus Pesticides	1	Narrative toxicity and pesticides objectives – Toxicity and chemistry results indicating organophosphorus pesticide toxicity..
Oxyfluorfen	2	Narrative toxicity and pesticides objectives – the 96-hour EC50 for <i>Selenastrum capricornutum</i> , a green algae.
cis-Permethrin	1	Narrative toxicity and pesticides objectives – one-tenth the LC50 value for the most sensitive freshwater species, <i>Tanytarsus</i> sp.
Prometryn	1	Narrative toxicity objective; 96-hour EC50 value for <i>Navicula pelliculosa</i> , a freshwater diatom.

Pesticide/Degradate	# of impairments	WQS being exceeded
Pyrethroids	14	Narrative toxicity objective; sediment-bound toxicity; chemical analysis; and TIE manipulations indicate pyrethroid pesticides are the likely cause.
Simazine	3	Drinking water primary Maximum Contaminant Limit (MCL) (4 µg/L).
Toxaphene	2	Samples exceeded the OEHHA Screening Value (30 ng/g).
Trifluralin	1	Narrative toxicity and pesticides objectives; interpreted using LOEC for <i>Pimephales promelas</i> of 0.7 ug/L.

APPENDIX B. Chemicals and Exceedances in USGS 2014 Study and Subsequent Mitigation Measures that Reduce Pesticides Residues in Waters.

Chemical	Recent Actions
Acetochlor	Acetochlor is currently undergoing Registration Review ³⁰ .
Atrazine	Intensive monitoring program (2003 IRED). Atrazine is currently undergoing Registration Review.
Azinphos-methyl	In 2006, EPA issued its final decision on Azinphos-methyl that phased out the remaining uses by September 30, 2012.
Carbaryl	Lawn broadcast uses of liquid formulations cancelled; certain other uses and application methods cancelled; reduced application rates for some uses; prohibit most aerial applications (2003 IRED). Carbaryl is currently undergoing Registration Review.
Carbofuran	Domestic sales phased out in 2013 (2006 IRED). Technical registrations remain for export of the active ingredient.
Chlorpyrifos	Residential uses cancelled (except for roach baits in child-resistant packaging and ant mound treatments); agricultural use restrictions including reduced application rates and fewer applications per season, increase in retreatment intervals and addition of buffer zones around water bodies; some aerial application uses cancelled (2001 IRED). Chlorpyrifos is currently undergoing Registration Review.
Cis-permethrin	Standard pyrethroid specific spray drift language, including a 25 foot aquatic buffer zone for ground applications, 100-foot for aerial application, and 450 foot for ULV applications; amended agricultural labels to include new use pattern (rate reductions, seasonal maximum reductions, and minimum retreatment interval) identified for the selected crop uses (2006 RED). Cis-permethrin is currently undergoing Registration Review.
Diazinon	Residential uses and granular uses cancelled; aerial application cancelled; seed treatment uses cancelled (2002 IRED). Diazinon is currently undergoing Registration Review.
Dichlorvos (DDVP)	Dichlorvos is currently undergoing Registration Review.
Dicrotophos	Dicrotophos is currently undergoing Registration Review.
Disulfoton	Cancellations for EPA Reg. Nos. 264-723, 264-734, 5481-8989, and 432-1286 were effective December 31, 2009. Cancellations EPA Reg. Nos. 264-725 and 72155-49 were effective December 31, 2010. All disulfoton registrations are now cancelled (2002 IRED).
Endosulfan	In July 2010, EPA signed a Memorandum of Agreement with the registrants of endosulfan that resulted in voluntary cancellation and phase-out of all existing endosulfan uses in the U.S. the last endosulfan

³⁰ For a current Registration Review schedule, please go to: <https://www.epa.gov/pesticide-reevaluation/registration-review-schedules>

Chemical	Recent Actions
	uses ended on July 31, 2016, and there are currently no existing registrations.
Ethoprophos	Ethoprophos is currently undergoing Registration Review.
Fipronil	Fipronil is currently undergoing Registration Review.
Lambda-Cyhalothrin	Lambda-Cyhalothrin is currently undergoing Registration Review.
Linuron	Linuron is currently undergoing Registration Review.
Malathion	Some uses cancelled; reduced application rates and frequency of application for many crops; 25 and 50 foot buffer zones for non-ULV and ULV aerial applications near water bodies; droplet size, wind speed, and application altitude specifications for mosquito adulticide use; spray drift minimization label statements for agricultural and public health products; environmental hazard precautionary label statements required for agricultural, public health, and residential products (2006 RED; 2009 RED Revision). Malathion is currently undergoing Registration Review.
Methyl-parathion	On July 16, 2010 the cancellation order to voluntarily cancel all product registrations containing methyl parathion was published. This cancellation order terminated the last methyl parathion products registered for use in the U.S., effective December 31, 2012. End-use products could not be sold after August 31, 2013, and end-use products cannot legally be used after December 31, 2013. There are currently no existing end-use registrations.
S-metolachlor	S-metolachlor is currently undergoing Registration Review.

APPENDIX C. Summary of Pesticide-Specific Exceedance Data and Risk Mitigation Actions.

- Of the 75 pesticides and 8 degradates analyzed, 19 pesticides in use at the time of the USGS 2014 study were measured at concentrations that exceeded EPA benchmarks: 4 herbicides (acetochlor, atrazine, linuron, and metalochlor SS) and 15 insecticides (azinphos-methyl, carbaryl, carbofuran, cis-permethrin, chlorpyrifos, diazinon, dichlorvos, dichlorovos, disulfoton, endosulfan, ethoprophos, fipronil, lambda-cyhalothrin malathion, and methyl parathion).
- Six pesticides accounted for the majority of the exceedances: fipronil, S-metolachlor, malathion, dichlorvos, cis-permethrin, and azinphos-methyl. These pesticides are discussed in more detail below:

Fipronil

Fipronil entered Registration Review in June of 2011. The preliminary risk assessments for fipronil are expected to be completed in 2020. Any potential mitigation would be included in a proposed registration review decision.

S-metolachlor

Metolachlor and S-metolachlor entered Registration Review in December of 2014. The preliminary risk assessments for metolachlor and S-metolachlor are were publish in 2019. Any potential mitigation would be included in a proposed registration review decision.

Malathion

The revision of the malathion RED was completed in 2009. Mitigation required by the RED reduced maximum application rates and the number of applications allowed annually. Malathion entered Registration Review in June of 2011. The preliminary human health risk assessment for malathion published in August of 2016. The draft biological evaluation, with coordination from both The National Marine Fisheries Service and US Fish and Wildlife Services, including an endangered species and environmental fate and effects risk assessment published in April 2016. The draft biological evaluation identified potential risks to listed birds, mammals, amphibians, reptiles, terrestrial invertebrates, fish, aquatic invertebrates, and plants. EPA also made “likely to adversely affect” determinations for 97% of all listed species assessed and “likely to adversely affect determinations” for 99% of all critical habitats as a result of current labeled malathion usage. Any potential mitigation would be included in a proposed registration review decision.

Dichlorvos (DDVP)

Dichlorvos entered Registration Review in June of 2009. The preliminary risk assessments for dichlorvos are expected to be published in 2020. Any potential mitigation would be included in a proposed registration review decision.

Cis-permethrin

The permethrin RED was completed in 2006. Mitigation included standard pyrethroid specific spray drift language, including a 25-foot aquatic buffer one for ground applications, 100-foot for aerial application, and 450 foot for ULV applications. Agricultural labels were amended to include new use pattern (rate reductions, seasonal maximum reductions, and minimum retreatment interval) identified for the selected crop uses. Include stewardship language in the directions for use section of all products registered for outdoor use in residential areas. Cis-permethrin entered Registration Review in June of 2011. The preliminary risk assessments for cis-permethrin were published in 2016. Any potential mitigation would be included in a proposed registration review decision.

Azinphos-methyl

As part of EPA’s 2006 final decision on azinphos-methyl all remaining uses were phased out by September 30, 2012.

APPENDIX D. Cost Impacts and Number of Entities Covered

EPA projects that this permit will result in no incremental cost impacts on regulated entities since the requirements in the permit are substantively the same as those found in both the 2016 PGP as well as the 2011 PGP. For a description of EPA's estimate of the covered universe for these two earlier versions of the PGP, please refer to "*Cost Impact Analysis for the EPA's 2016 Pesticide General Permit (PGP)*" in the docket at EPA-HQ-OW-2015-0499 and "Economic Analysis of the Pesticide General Permit (PGP) for Point Source Discharges from the Application of Pesticides" for the 2011 PGP in the docket at EPA-HQ-OW-2010-0257-0151.

Although EPA does not anticipate any incremental cost impacts to regulated entities as a result of reissuance of the permit, the Agency is updating its projection of entities covered by the permit to reflect changes in NPDES permitting authorities. In particular, since issuance of the 2016 PGP, the State of Idaho received authorization to administer the entire NPDES program. As a consequence, EPA has removed Operators in Idaho from its estimate of total number of entities covered by the PGP since Operators in Idaho will now need to seek coverage under the state's NPDES permitting program.

EPA also notes that subsequent to issuance of the 2016 PGP, the federal government has formally recognized several Indian tribes. EPA has not revised the number of entities needing PGP coverage in Indian territories since the Agency's inquiries determined that no pesticide applications are known to occur within these newly recognized tribal lands that would require coverage under the permit.

As shown in Table 1, EPA estimates that this PGP will cover approximately 14,300 Operators. As a point of reference, EPA estimated for the 2016 PGP that approximately 31,000 Operators would be covered under the federal permit, out of which more than half were based in Idaho.

Table 1: Estimate of Entities Covered Under the 2021 PGP

State/Tribe Not Authorized for NPDES	Mosquito and Other Flying Insect Pest Control	Weed and Algae Pest Control	Animal Pest Control	Forest Canopy Pest Control	Total
Massachusetts	9	2,153	26	214	2,402
New Hampshire	44	642	10	85	781
New Mexico	13	10,285	8	26	10,332
District of Columbia	1	8	2	0	11
Territories	1	314	38	4	357
Tribes	17	93	25	34	169
Federal Facilities	65	65	65	50	245
Total	150	13,560	174	413	14,297

EPA continues to estimate that a total of 365,000 Operators across the U.S. will be covered under state-issued NPDES PGPs and the federal NPDES PGPs together.

This permit specifies procedures to assist in protecting federally-listed endangered and threatened species and federally designated critical habitats under the Endangered Species Act (ESA). These procedures are carried forward from EPA's 2016 PGP and only apply to Decision-makers in the limited areas where NMFS Listed Resources of Concern, as defined in Appendix A of the PGP, are present. EPA estimated 714 potentially affected entities which overlap with NMFS Listed Resources of Concern for the 2011 PGP. As in the 2011 PGP, these are potentially affected entities who may (in addition to other costs as a result of the permit) incur costs solely because of discharges of pollutants to waters of the United States containing NMFS Listed Resources of Concern. Though this permit will not cover pesticide discharges in the State of Idaho and may extend to pesticide activities in the newly recognized Indian tribes; EPA continues to estimate that less than 2 percent of the total number of Operators would need to meet additional permit requirements beyond those in the 2021 PGP's ESA related provisions. Under the 2016 PGP, EPA received less than 50 Notices of Intent that included areas which overlap with NMFS Listed Resources of Concern. EPA is not changing the estimated potentially affected entities value (714), as any additional potential entities are captured in that value based on actual data.

EPA acknowledges the difficulty of developing definitive estimates of entities and activities potentially covered under this permit and points to two main limitations of the available data. First, no direct source of information exists on the number of Applicators or patterns of application for aquatic pesticides. As a result, EPA needed to derive its estimates from secondary sources of information, and in some cases it needed to make a variety of assumptions. Second, the CWA does not define the terms "application" or "applicator" as it relates to discharges from pesticide applications, so available data may not all use similar definitions of these terms.