Draft
Fisheries Resource Management NPDES and State Waste Discharge General Permit
Fact Sheet

June 3, 2015

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Contents

Summary

This fact sheet is a companion document to the ***National Pollutant Discharge Elimination System (NPDES)*** general permit for fisheries resource management. It explains the nature of the proposed ***discharge***, the Washington State Department of Ecology's (Ecology) decisions on limiting pollutants in the receiving water, and the regulatory and technical basis for these decisions.

Ecology has tentatively determined to issue a permit for the application of the aquatic pesticide rotenone, used to manage fish populations in lakes and streams in the state of Washington. Short-term impacts to existing or designated uses are allowed under the terms of the permit and the surface water quality standards where greater benefits to the health of the aquatic system in the long term are provided WAC 173-201A-410. Short-term modification of the water quality standards is necessary to accommodate the application of rotenone. The permit requires the Washington Department of Fish and Wildlife (WDFW) to conduct monitoring to determine the extent and duration of the short-term water quality reduction resulting from rotenone applications.

Since the *Headwaters, Inc. v. Talent Irrigation District* Ninth Circuit Court decision, Ecology has maintained that to discharge chemicals to ***waters of the state***, coverage under an NPDES permit is required. Ecology has issued general and individual NPDES permits for discharges of aquatic ***pesticides*** and other chemicals since 2002. In 2009, the Sixth Circuit Court ruled in *National Cotton Council et al. v. The Environmental Protection Agency (EPA)* that the discharge of pesticide residues to waters of the state requires NPDES coverage. EPA developed a general NPDES permit for this purpose (effective October 31, 2011). In Washington, the EPA permit covers aquatic pesticide applications on federal and Tribal Lands.

Ecology may change the proposed terms, limits, and conditions contained in the draft permit subsequent to written public comments it receives and from testimony provided at the public hearing. This permit does not authorize a violation of surface water quality standards or the violation of any other applicable local, state, or federal laws or regulations.

Ecology will consider any person who applies rotenone to surface waters of the state without coverage under this general permit, another applicable general permit, or a ***state experimental use permit*** to be operating without a discharge permit and subject to potential enforcement action.

Ecology proposes to issue this general permit so that WDFW dischargers operating under coverage of this permit will comply with the ***Federal Clean Water Act (CWA)*** and with the Washington Water Pollution Act chapter 90.48.080 Revised Code of Washington (RCW).

Brief Review of Regulatory Authority

This review is not intended to be exhaustive. It is to give a broad overview of the laws and rules under which Ecology is given authority to regulate discharges to waters of the state.

The Federal Clean Water Act (CWA)
The CWA, as amended, establishes water quality goals for navigable surface waters of the United States. One of the mechanisms for achieving the goals of the CWA is the NPDES system of permits, which the EPA administers. The EPA has delegated responsibility for administering the NPDES permit program to the State of Washington. In addition to this delegation under the CWA, the state legislature in RCW 90.48.260 defines Ecology's authority and obligations in administering the NPDES permit program. Ecology directly implements the Code of Federal Regulations (CFRs) when developing state NPDES permits.

RCW Chapter 90.48 - the State Water Pollution Control Act
RCW 90.48 declares that maintaining the highest possible standards to ensure purity of all waters of the state is the policy of the State. Healthy water quality must be maintained for public health, public enjoyment, protection of terrestrial and aquatic life, and the industrial development of the state. All known, available, and reasonable methods must be used by industries and others to prevent and control pollution.

In addition, it is unlawful for any person to discharge pollutants to waters of the state. The only time a discharge is lawful is when a permit to discharge is obtained from Ecology prior to the discharge occurring (Chapters 90.48.080 and 90.48.160).

WAC 173-226 - Waste Discharge General Permit Program
The purpose of WAC 173-226 is to establish a state general permit program for the discharge of pollutants to waters of the state under the authority granted to Ecology in RCW 90.48. Permits must satisfy both state and federal laws governing water pollution control.

WAC 173-200 - Water quality standards for ground waters of the state of Washington, and WAC 173-201A, Water quality standards for surface waters of the state of Washington
The water quality standards for the state of Washington determine the existing and beneficial uses of waters of the state. Any permits issued must include effluent limits so that allowed discharges meet the water quality standards, including antidegradation.

Aquatic Pesticide Legal History

The Federal Clean Water Act (CWA)

The Federal Clean Water Act (CWA), 33 U.S.C. §§1251 et seq.,(1972, with major amendments enacted in 1977 and 1987), established water quality goals for navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the NPDES system of permits, which the EPA administers. The EPA has delegated responsibility for administering the NPDES permit program to the State of Washington. EPA delegated authority to Ecology based on chapter 90.48 RCW that defines Ecology's authority and obligations in administering the NPDES permit program. Ecology does not have the authority to issue NPDES permits to federal facilities or to facilities on Tribal Lands.

Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), 7 U.S.C. §§136 et seq. (1979)
The following excerpt is from the EPA 2010 NPDES Pesticides General Permit Fact Sheet, Sec. I.3. History of Pesticide Application Regulation:

> EPA regulates the sale, distribution, and use of pesticides in the U.S. under the statutory framework of the Federal Insecticide, Fungicide, and Rodenticide Act of 1979, to ensure that when used in conformance with the label, pesticides will not pose unreasonable risks to human health and the environment. All new pesticides 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.
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> 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. EPA 2010 NPDES Permit Fact Sheet, Sec. I.3, pg. 5.
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> 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 [EPA] periodically reevaluates pesticides to make sure 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. [EPA] 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/oppsrrd1/registration_review/. EPA 2010 NPDES Permit Fact Sheet, Sec. III.3, pg. 95.

FIFRA, as administered by the EPA and the Washington State Department of Agriculture (WSDA), requires that all persons that apply pesticides classified as restricted use be certified according to the provisions of the act, or that they work under the direct supervision of a certified applicator. Commercial and public applicators must demonstrate a practical knowledge of the principles and practices of pest control and safe use of pesticides, which they accomplish by means of a "core" examination. In addition, applicators using or supervising the use of any restricted use pesticides purposefully applied to standing or running water (excluding applicators engaged in public health related activities) must pass an additional exam to demonstrate competency as described in the code of federal regulations as follows:

> "Applicators shall demonstrate practical knowledge of the secondary effects which can be caused by improper application rates, incorrect formulations, and faulty application of restricted pesticides used in this category. They shall demonstrate practical knowledge of various water use situations and the potential of downstream effects. Further, they must have practical knowledge concerning potential pesticide effects on plants, fish, birds, beneficial insects, and other organisms which may be present in aquatic environments. These applicators shall demonstrate practical knowledge of the principals of limited area application (40 CFR 171.4)."

Any person wishing to apply pesticides to waters of the state must obtain an aquatic pesticide applicator license from the Washington State Department of Agriculture, or operate under the supervision of a licensed applicator. See http://agr.wa.gov/pestfert/licensinged/ for information on Washington State licensing requirements and testing.

Headwaters, Inc. v. Talent Irrigation District, 243 F.3d 526 (9th Cir. 2001)
In May 1996, as part of routine vegetation management, the Talent Irrigation District (TID) in southern Oregon applied the pesticide acrolein to a system of irrigation canals. Acrolein-treated water discharged into a fish-bearing creek causing a fish kill. Subsequently, Headwaters, Inc. and Oregon Natural Resources Council Action filed a Clean Water Act citizen suit against the TID for applying a pesticide into a system of irrigation canals without an NPDES permit.

The Ninth Circuit in *Headwaters* held that the applicator should have obtained coverage under an NPDES permit prior to application of aquatic pesticides to an irrigation canal, because the residual acrolein remaining in the waters was a pollutant, and because the pollutant had leaked into waters not intended to be treated. The Ninth Circuit also held that application of the pesticide in compliance with the FIFRA labeling requirements did not exempt TID from having to obtain an NPDES permit.

Based on the TID court decision, Ecology determined that all pesticide applications to state surface waters required coverage under NPDES permits. Ecology issued its first NPDES general permits for pesticide applications to Washington's surface waters in 2002. Prior to 2001, Ecology regulated the application of aquatic pesticides to most surface waters by issuing administrative orders (called Short-Term Modifications of Water Quality Standards) to Washington-state licensed applicators. Since the *Talent* decision, there have been further court challenges about the applicability of NPDES permits to aquatic pesticide application as discussed below in this section of the Fact Sheet.

League of Wilderness Defenders et al. v. Forsgren, 309 F.3d 1181 (9th Cir. 2002)
In the 1970's, the Douglas fir tussock moth defoliated approximately 700,000 acres of Douglas fir in Idaho, Oregon, and Washington. In response to this outbreak, the United States Forest Service (USFS) developed a system to predict tussock moth outbreaks and control them via aerial spraying of insecticides. Based on its warning system, the USFS predicted an outbreak in 2000-2002 and designed a spraying program.

In 2002, the League of Wilderness Defenders et al. filed suit against the USFS for failing to obtain a NPDES permit under the Clean Water Act for the application of insecticides directly above surface waters. The USFS argued that spray application of insecticides by an airplane was nonpoint pollution and that the discharges fell under federal exemptions (40 CFR 122.3) for silviculture activities.

The Ninth Circuit held that aerial spraying (from an aircraft fitted with tanks) directly to, and over, surface water is a point source of pollution and requires an NPDES permit.

Fairhurst v. Hagener, 422 F.3d 1146 (9th Cir. 2005)
The Montana Department of Fish, Wildlife, and Parks (Department) began a ten-year program to reintroduce threatened native westslope cutthroat trout into Cherry Creek. The Department used antimycin A, a ***piscicide***, to remove nonnative trout from Cherry Creek over several years, after which they planned to reintroduce native trout.

The Department was sued under the citizen suit provision of the CWA for failing to obtain an NPDES permit before applying antimycin-A to surface waters. On appeal, the Ninth Circuit concluded that:

> "A chemical pesticide applied intentionally, in accordance with a FIFRA label, and with no residue or unintended effect is not 'waste,' and thus not a 'pollutant' for the purposes of the Clean Water Act. Because [the Department's] application of antimycin-A to Cherry Creek was intentional, FIFRA compliant, and without residue or unintended effect, the discharged chemical was not a pollutant and [the Department] was not required to obtain a NPDES permit." *Fairhurst*, 422 F.3d at 1152.

Neither the Court nor the EPA offered any guidance regarding which pesticide applications would result in no residue or unintended effect.

Northwest Aquatic Ecosystems v. Ecology, PCHB 05-101 (Feb. 15, 2006)
In February 2006, the Pollution Control Hearings Board (PCHB) issued a final order in PCHB05-101. This case focused on a number of issues, one of which was whether an NPDES permit is required for the use of federally registered pesticides. The PCHB ruled on summary judgment that the *Fairhurst* decision did not provide a blanket exemption from permit coverage for the application of aquatic pesticides. A pesticide application must meet the conditions identified by the *Fairhurst* court before Ecology can consider it outside the category of a pollutant under the CWA. The pesticide must:

(1) Be applied for a beneficial purpose,
(2) Be applied in compliance with FIFRA,
(3) Produce no pesticide residue, and
(4) Produce no unintended effects.

At hearing, Northwest Aquatic Ecosystems failed to provide any evidence specifically addressing how the use of the aquatic herbicides diquat and endothall on the proposed sites would meet the four conditions identified in *Fairhurst.* In the absence of such evidence, *Fairhurst* provided no basis for the PCHB to conclude that an NPDES permit is not required for the proposed pesticide applications.

EPA Final Rule
In November 2006, EPA issued a final rule under the CWA entitled *Application of Pesticides to Waters of the United States in Accordance with FIFRA.* This rule replaced a draft interpretive statement EPA issued in 2003 concerning the use of pesticides in or around waters of the United States. The rule stated that any pesticide meant for use in or near water, applied in accordance with the FIFRA label, is not a pollutant under the CWA. Therefore, such applications are not subject to NPDES permitting.

After EPA issued the rule, Ecology met with stakeholders to seek input on how it should regulate the use of aquatic pesticides. Ecology also provided the public with a three-week comment period. Stakeholders affiliated with each of the seven affected permits (Mosquito, Noxious Weeds, Aquatic Plant and Algae, Irrigation, Oyster Growers, Fish Management, and Invasive Moth) commented. The consensus of these stakeholders was that Ecology should continue to issue joint NPDES/state waste permits to regulate aquatic pesticide applications.

Because of stakeholder consensus and the need for a permit to implement short-term modifications, Ecology decided that Washington would continue to use NPDES permits as the legal vehicle to regulate the use of aquatic pesticides in and around Washington state waters. Ecology believes that these permits provide the best protection of water quality, human health, and the environment.

National Cotton Council, **et al. v. EPA**, 553 F.3d 927 (6th Cir. 2009)
EPA's final rule (described above) was challenged in 11 of the 12 federal circuit courts that are able to hear regulatory arguments. The federal courts combined the petitions into one case at the Sixth Circuit.

The Sixth Circuit vacated the EPA rule, finding that EPA had exempted discharges from the requirement to have a permit that the CWA clearly included within the permit requirement. First, it agreed with the Ninth Circuit's *Fairhurst* decision that if a chemical pesticide is intentionally applied to water for a beneficial purpose, and leaves no waste or residue after performing its intended purpose, the discharge would not require an NPDES permit. Second, the court found excess pesticides and residues that make their way into waters during and after any pesticide application constitute wastes under the CWA and must have NPDES permit coverage before discharge occurs.

The Sixth Circuit granted EPA a stay on the effective date of this ruling for 24 months to allow the agency to develop an NPDES permit for aquatic pesticide discharges. EPA issued its general permit on October 31, 2011, for the discharge of pesticides to manage aquatic plants and algae, aquatic animals, mosquitoes and flying insects, and forest canopy pests. In Washington, EPA's general permit covers aquatic pesticide activities conducted on federal facilities, on federal lands when federal entities conduct or authorize the treatment, and on tribal facilities and lands. The state regulates aquatic pesticide application to all other lands/waters.

Piscicide Use in Fisheries Management

Over the years, fisheries biologists have utilized a number of techniques in efforts to eliminate nuisance fish from lakes (e.g., nets, traps, dynamite, electro-shocking, predator stocking, and even complete drainage). Fisheries biologists believe that the use of fish toxicants has been the most successful; and of these poisons, rotenone is the most commonly used today. In most cases, the technique is relatively simple; all fish in a waterbody are killed so that sport fish, usually trout, can then be stocked, free from predation or competition from other fish species (Bradbury 1986, cited in WDW 1992).

Rotenone is an alkaloid toxicant contained in the roots of certain South American and Asian plants. For centuries, people in those areas have obtained food fish by scattering rotenone in ponds and rivers (Bradbury 1986, cited in WDW 1992).

Michigan biologists in the 1930's were the first to make extensive use of rotenone for fisheries management, and it quickly became popular nationwide (Bradbury 1986, cited in WDW 1992). By 1949, 34 states and several Canadian provinces routinely used rotenone for the management of fish populations (Finlayson et al. 2000). A survey of rotenone use from 1988-2002 showed that rotenone was used by 38 states and 5 Canadian provinces (McClay 2005). Though an initial survey report (1988-1997) pointed to a decline in rotenone use, five additional years of survey data (1988-2003) makes it difficult to determine trends in rotenone usage (McClay 2005).

Agencies place the greatest emphasis on the use of powdered rotenone, especially for treating standing waters. This is probably due to the reduced cost of, and improved distribution techniques for, the powdered formulation, as well as increased environmental and public health concerns for the inert ingredients contained in liquid formulations. Some agencies have found it more difficult to plan and execute treatments using liquid formulations because of the demands for environmental monitoring studies not generally required for projects that utilize the powder

formulation (McClay 2000). In 2004, a new liquid formulation of rotenone (CFT Legumine) was registered which contains significantly fewer volatile organic compounds (VOCs) than previous formulations (McClay 2005).

Current Piscicide Use by the Washington Department of Fish and Wildlife

This section provides information about WDFW's current fishery management program. It was adapted from the following documents:

Washington Department of Wildlife – ***Final Supplemental Environmental Impact Statement (FSEIS)***, Lake and Stream Rehabilitation, 1992-1993, Report #92-14.

Washington Department of Fish and Wildlife – Final Supplemental Environmental Impact Statement (FSEIS), Lake and Stream Rehabilitation: Rotenone Use and Health Risks, January, 2002.

Washington Department of Fish and Wildlife – Final Programmatic Environmental Assessment
For WDFW: Statewide Lake and Stream Rehabilitation Program.
As funded by the USFWS Wildlife and Sportfish Restoration Program
September 30, 2008.

To satisfy the annual demand for productive freshwater fishing, WDFW stocks selected waters with trout and select warmwater gamefish from hatcheries and/or fish from other waters. Many waters are managed for specific fisheries, such as trout-only or warmwater species. The management emphasis for state waters is determined according to habitat parameters, public desires, recreational demands, and previous management efforts. Occasionally, these waters become overpopulated with fish species which are incompatible with the fisheries emphasis. This leads to situation of increased predation and competition with desired gamefish, resulting in poor growth and survival. For example, if carp overpopulate, fish survival decreases and nesting bird habitat is degraded due to siltation and uprooting of emergent vegetation. Infestations by undesirable fish species may occur through migration from other waters or through illegal transport and introductions. When undesirable fish species impact the desired gamefish population, three management options are available:

1. No action;
2. Establish new fisheries management objectives;
3. Eliminate competing species and stock with desired gamefish species.

Option 1 will lead to an increase in undesirable fish population(s), resulting in a waterbody that no longer supports a viable gamefish fishery.

Option 2 may allow for a viable fishery, but can be relatively costly. For example, to establish a trout fishery, the cost of producing ***fingerling trout*** in a state hatchery is about 25% of the cost of producing a ***catchable-size trout*** (WDFW, 1983). In competition with warmwater fish, fingerling trout survival is lower when compared to catchable-size trout. However, catchable-size trout are generally considered to be of lower quality than fingerling trout.

Option 3 allows the lake to continue to provide a viable fishery for the managed fish species. Rotenone is the tool currently used by WDFW to eliminate fish in lakes and is far more economical than options l or 2.

Washington Department of Game (1983) compared the costs of three different management strategies for a typical lowland trout lake in western Washington (Lake Erie, Skagit County).

These options were:

1. Trout-only lake maintained by fry stocking and periodic rotenone treatment;
2. Mixed-species lake maintained by trout fry stocking (no rotenone); and
3. Mixed species lake maintained by catchable-size trout stocking (no rotenone).

The cost of a piscicide treatment was about 25% of the cost of either option 2 or 3. Also, note that option 2 is unlikely to be a viable alternative in many lakes for the reasons already discussed.

An analysis of the costs of rotenone treatment, combined with trout stocking in six eastern Washington lakes, estimated that for each dollar spent on rotenone and stocked trout, anglers spent between $32 and $105. On non-treated trout lakes, the estimated economic gain per dollar spent on trout stocking was between $10 and $15 (Breithaupt, as referenced in Bradbury 1986).

Similar results have been documented in other northwestern states. In 2006, the Oregon Department of Fish and Wildlife used rotenone to remove tui chub from Diamond Lake in order to improve the recreational rainbow trout fishery. Based on 2009 data, an estimation of return on investment for various use-scenarios was conducted and ranged from 309% to 2,454% (Andrew Loftus Consulting 2011). The same study used an estimate of $91.75 spent per angler trip. If the number of angler trips per year decreases due to a decline in the quality of a fishery, then sales and labor income are negatively affected.

Restoration of Native Fish and Habitat

Not all rotenone treatments conducted by WDFW have been conducted to support gamefish management objectives. WDFW has conducted rotenone treatments to support native fish and habitat restoration. Examples of native fish and habitat restoration include:

WDFW has successfully used rotenone to eliminate illegally planted, non-native fish (i.e., northern pike) from lakes where they are likely to negatively impact native fish populations (i.e., Coho salmon) through predation and downstream migration to other waters. Illegally planted fish populations can also serve as a source for additional illegally planted fish into other lakes.

Non-native fish species may also out-compete native fish populations, reducing their population levels or causing them to disappear from a waterbody. WDFW used rotenone to remove brook trout from 5.5 miles of Cee Cee Ah Creek (2008- 2010), allowing for restoration of native cutthroat trout in this stream reach.

Some fish, such as carp, can reduce the quality of waterfowl habitat by destroying aquatic plants and causing turbidity (Ivey et al. 1998). WDFW used rotenone to remove fish populations in Byron Ponds (2008) to improve waterfowl nesting and rearing.

The Northern Leopard Frog is listed as endangered species by Washington State and is listed as a species of concern at the federal level. In 2008, WDFW used a rotenone treatment to remove fish from a portion of the Northern Leopard Frog Management Area in the Potholes Wildlife Area.

Evaluation of Available Fish Control Options

The WDFW Final Supplemental Environmental Impact Statement (FSEIS) – Lake and Stream Rehabilitations (1992) and Appendix II of the FINAL PROGRAMMATIC ENVIRONMENTAL ASSESSMENT (EA) for WDFW Statewide Lake and Stream Rehabilitation Program As funded by the USFWS Wildlife and Sportfish Restoration Program (2008) identifies and evaluates all available control methods for targeted pest (fish) species. These options include the use of fish toxicants (piscicides); predator/competitor stocking; and mechanical means, such as water level drawdown, netting and trapping, dams and barriers, electrofishing, and removing congregations of spawning fish. These options, which are evaluated in the FSEIS and EA, are summarized as follows:

Predator Stocking
The use of apex predators (i.e., Tiger Muskie) for pest control has been used on an experimental basis in some systems with mixed species management goals with varying degrees of success. Large apex predators also eat trout and are not the most desirable option in "trout only" managed waters.

Modification of Regulations
Angling regulations may be modified to address low fish survival and growth in the presence of competing or predatory species. Advantages of this method are that it is low in cost, acceptable to the public, and the fish can be used as food. Limitations are that even successful regulation changes take years to achieve favorable results. Often, because fishing success is poor in compromised waters, the angler effort in a compromised lake is insufficient to effect population changes. Furthermore, many species of fish targeted for control cannot readily be caught by angling or are not considered desirable by anglers.

Mechanical Means
Water level drawdown: Very few lakes have water level control facilities. Accordingly, this is not regarded as an effective option in most situations.

Lake-wide Netting and Trapping
Some accounts show this method to be effective. Most attempts using commercial fishing gear have failed because they are extremely labor intensive and therefore not cost effective. Any benefits are of short duration, as escapement of target fish results in juveniles and other fish filling the niches of the fish that were removed. Removal of all targeted fish is highly unlikely using these methods.

Dams and Barriers
This method prohibits the migration of undesirable spawning fish to their spawning grounds; has little practical value since many undesirable fish species are lake-spawners; and, is less effective under flood conditions, ineffective against downstream migrations of fish and illegal plantings, and is costly to maintain.

Electrofishing
This method has not been practical as a long-term control measure for the same reasons that netting and trapping typically fail.

Removing Congregations of Spawning Fish
Adult fish congregate in spawning areas which are subsequently blocked off. The fish are then poisoned, electroshocked, or netted. This method is rarely appropriate, since most of the species targeted by WDFW spawn lake-wide or over broad areas of the lake rather than congregating in any one section of the water. Similar to the above mentioned physical-removal techniques, this is labor-intensive and would have to be repeated yearly, creating a long-term time and labor investment.

In an email to Ecology, dated August 20, 2014, the WDFW provided a comparison of available fish control methods (Table 1).

Table 1: Comparison of fish control methods

Criteria	Rotenone	Predator / Competitor Introduction (Biological Control)	Mechanical Fish Removal (nets, electrofishing, etc.)
Impact on aquatic environment (water quality and chemically)	Moderate and short term. Total detoxification through natural breakdown takes place normally within 5 weeks (Finlayson et al. 2000), Detoxification time can be reduced with the use of an oxidizer e.g., potassium permanganate.	Minimal and long term.	Minimal and long term.
Ability to meet water quality standards	Excellent – Concentrations of rotenone for proposed work is not toxic to humans (Finlayson et al. 2000) and is difficult to detect after approximately five weeks.	Excellent, since there are no introductions of chemicals.	Excellent, since there are no introductions of chemicals.

Effectiveness for goal	Good to excellent, depending on the target species, the concentration of the rotenone during application and the thoroughness of the application.	Low to significant, depending on the introductions (species and numbers). Results generally are not seen in the short term and can be unpredictable, depending on the target and introduced species.	Low to significant. It can be most effective in smaller waters but is labor intensive and requires a long-term commitment. It is usually only a short-term solution. Success can depend on target species and the target number to remove.
Cost effectiveness	WDFW estimated that for every dollar spent on rotenone and trout stocking, anglers gain between $32 - $105 worth of fishing.	Moderate to good, depending on the numbers of fish introduced.	High cost, labor intensive – low return in most cases.
Suitability for treatment sites	Suitable for most sites.	Suitability is dependent upon the target species and the species introduced and the size of the water. Proper planning is key.	Suitable for very few sites because of drawbacks mentioned.
Protection for human health concerns	Human health concerns can be adequately addressed by following label restrictions, SOP manual and safety procedures, which are part of permit requirements.	No human health concerns.	No human health concerns.
Response to emergency	Can be adequately addressed. Contingency plans are part of permit requirements.	No emergency response necessary.	No emergency response necessary.

Wastewater Characterization

The proposed wastewater discharge is characterized for the following parameters:

Table 2: Pollutant Characterization – Powdered Rotenone Formulations

Product Name	Application Rate	Active Ingredient Concentration in Treated Waters
Prentox ® Prenfish™ Fish Toxicant Powder or Peru Cube Powder®	Application rates on label range from 0.10 - 5 ***ppm*** (based upon 5% active rotenone).	0.005 - 0.20 ppm.
Potassium Permanganate (if deactivation is required)	Variable application rate depending on concentration of rotenone, total alkalinity, and organic demand. Application rates will be calculated and applied in accordance with "Rotenone SOP Manual" by Finlayson et al. (2010a).	Variable concentration in the rotenone ***deactivation zone***, based upon formulas in Finlayson et al. (2010a). Outside of the deactivation zone the concentration shall not exceed 1 ppm.

Table 3: Pollutant Characterization – Liquid Rotenone Formulation

Product Name	Application Rate	Active Ingredient Concentration in Treated Waters
Prentox ® Prenfish™ Toxicant[1]	Application rates on label range from 0.10 - 5 ppm (based upon 5% active rotenone).	0.005 - 0.20 ppm active rotenone.
CFT Legumine™ Fish Toxicant[2]	Application rates on label range from 0.10 - 5 ppm (based upon 5% active rotenone).	0.005 - 0.20 ppm active rotenone.
Potassium Permanganate (if deactivation is required)	Variable application rate depending on concentration of rotenone, total alkalinity, and organic demand. Application rates will be calculated and applied in accordance with "Rotenone SOP Manual" by Finlayson et al. (2010a).	Variable concentration in the rotenone deactivation zone, based upon formulas in Finlayson et al. (2010a). Below, the deactivation zone, the concentration will not exceed 1 ppm.

[1]Inert ingredients include aromatic petroleum solvent, not to exceed 80% (9.9% naphthalene, 1.7% 1,2,4-trimethylbenzene, and 7.5% acetone (Material Safety Data Sheet, U.S. Dept. of Labor)

[2] Inert ingredients include petroleum distillates, specifically N-Methylpyrrolidone (Material Safety Data Sheet, CWE Properties Ltd.)

The permit does not shield inerts or adjuvants for which the chemical composition has not been disclosed to Ecology.

WDFW Lake and Stream Rehabilitation Policy and Procedures

WDFW Policy POL-C3010 Lake and Stream Rehabilitation authorizes the use of rotenone to conduct lake and stream rehabilitation activities. This policy identifies the various roles and actions of WDFW staff involved in the rehabilitation program including relevant deadlines. (Appendix B)

WDFW's document entitled "Schedule of Activities" is an internal WDFW document that summarizes the general timeline involved in the lake rehabilitation program including the schedule of planning, public notification, approval, treatment and post-rehabilitation reporting. (Appendix C)

Pre-Treatment Procedures

WDFW selects lakes or streams for piscicide treatment when a viable fishery can only be maintained with introductions of catchable-size fish, or when removal of non-native fish is necessary to restore native fish or wildlife habitat. The WDFW District Fish Biologist, directly charged with managing recreational fisheries within a geographic area of responsibility, determines which lakes are proposed for treatment. To make this determination, standard indicators of fishery performance are evaluated: average angler catch rate on Opening Day, fish size, and fish population relative abundance. When fishery performance declines and fish sampling data indicate that undesirable fish species are the cause, the District Fish Biologist recommends treatment of the water(s) to his or her supervisor, the Regional Fish Program Manager.

The District Fish Biologist must then complete a pre-rehabilitation plan(s) containing vital information on the proposed treatment(s). In calculating the required concentration for a rotenone treatment, the biologist considers a variety of factors (e.g., target species, water chemistry, past successes or failures, presence of weedy shorelines). Planned rotenone concentrations for a treatment do not exceed that allowed by the FIFRA label and NPDES permit.

The Regional Fish Program Manager presents a list of proposed treatments along with justifications for each waterbody to the Fish Management Division of WDFW. Approval at this stage may depend not only on biological justification, but on other considerations such as the waterbody's public use, its importance as a recreational fishery, and availability of piscicide. WDFW establishes statewide priorities and creates a list of candidate lakes on an annual basis.

After developing a list of candidate lakes, WDFW notifies the public of proposed treatments as well as an opportunity to comment through the ***State Environmental Policy Act (SEPA)*** process through a general news release, usually in early summer. District Fish Biologists also solicit public opinion from lakeshore residents and other interested parties. Public meetings are conducted in the vicinity of the waters proposed for treatment as well as the headquarters office

in Olympia. After opportunities for public comment are completed, WDFW issues a final list of candidate waters as an addendum to the 2002 FSEIS to meet State Environmental Policy Act requirements.

The WDFW Director grants final agency approval of the list of candidate lakes. Even with the Director's approval, WDFW may elect not to treat a lake if all the pre-treatment steps, such as outlet deactivation and/or water control (e.g., diking or damming) have not been completed or other conditions have changed at the intended time of treatment.

Fishing regulations are liberalized through emergency regulation when possible to allow harvest opportunity in waters scheduled for rehabilitation. In some instances, warmwater gamefish, such as bass or panfish, may be collected and transported prior to treatment, to other waters to help enhance their warm-water fishing opportunities.

For a detailed list of treatment-related activities see Appendix C.

Treatment Procedures

The powdered rotenone application method, pioneered by the Utah State Department of Natural Resources – Division of Wildlife Resources, involves mixing powdered rotenone with lake water, using a pump and aspirator, to create a slurry. Standard packaging for powdered rotenone is a sealed, heavy gauge, removable plastic liner inside sealed, pressed fiber 25 or 50 kilogram container. The slurry is discharged directly in to the lake or water body surface (Thompson et al, 2001). For a detailed description of the application procedure, refer to Finlayson et al. 2010a. "Operation of Semi-Closed Aspirator Systems for Application of Powdered Rotenone SOP: 9.0," in Planning and Standard Operating Procedures for Use of Rotenone in Fish Management.

In 2007, the EPA issued a Re-registration Eligibility Decision (RED) for Rotenone (EPA 2007). As a result of the RED for rotenone, the "Operation of Semi-Closed Aspirator Systems for Application of Powdered Rotenone SOP: 9.0" was adopted as a component of the FIFRA label for rotenone.

Application of liquid rotenone occurs where use of pumper boats capable of mixing the powdered rotenone is impractical. Liquid rotenone formulations are mixed with water, according to the FIFRA label, prior to discharge. WDFW uses backpack sprayers, canoes, airboats and helicopters to apply liquid rotenone to areas where access is limited due to shallow water, vegetation or remoteness of the waterbody.

Treatments conducted under this permit must follow all requirements in the FIFRA label for the product being used.

Post-Treatment Procedures

In lakes with a stream outlet, WDFW must control or detoxify runoff from the lake. In some cases, the runoff is minimal and can be dammed off (using sandbags, for example) until the rotenone naturally degrades. When runoff cannot be contained, WDFW applies potassium permanganate into the outlet stream to neutralize the rotenone before it can harm fish and invertebrates downstream. Between 1977 and 1984, WDFW required deactivation by potassium

permanganate in only 16% of the lakes treated. Pfeifer (1985) provides a detailed account of outlet deactivation procedures, including dosage/deactivation curves and case histories in Martha and Silver Lakes, Snohomish County (WDW 1992).

Rotenone typically degrades within a few days to eight weeks in lowland lakes, and may persist somewhat longer in sub-alpine or alpine lakes (WDFW 2002). WDFW District Biologists perform live-fish bioassays to determine toxicity levels in recently-treated lakes. Hatchery trout (5-10 fish) held in live boxes are placed into previously treated waters. Live boxes are checked 48 hours later to determine survival.

The District Fish Biologist submits a post-rehabilitation report to Ecology for each treated water. It describes the efficacy of the treatment, water conditions at the time of treatment, target and non-target species observed post-treatment, amount of rotenone (liquid and powder) used, and any deactivation measures taken (WDW 1992).

WDFW typically restocks fish following piscicide treatment when it fits the management plan for the waterbody. During the post-treatment years, the District Fish Biologist continues to monitor fish survival and growth, as well as catch rates for the water (WDW 1992).

Rotenone and Human Health

A WDFW internal memo summarizes WDFW's human health and safety procedures (February 3, 2001). This memo is included in WDFW's 2002 FSEIS as Appendix C.

Additionally, WDFW follows the American Fisheries Society rotenone standard operating procedures (SOP) manual which provides direction to applicators regarding project planning and safety (Finlayson et al. 2010a). The SOP manual is considered to be part of the FIFRA label for rotenone.

Potential of rotenone to cause Parkinson's disease
The EPA review of rotenone for assessing it's eligibility for re-registration (EPA, 2006a) has raised a concern because the extensive research on Parkinson's disease includes a paper that shows a Parkinson's disease-like effect resulting from rotenone exposure (Betarbet et al., 2000). Turner, L., et al. 2007 at 76.

Although rotenone-induced Parkinsonism is a useful research tool, Betarbet et al. (2000) cautioned that Rotenone had little toxicity when administered orally. A continuous, intravenous administration of rotenone for 1-5 weeks is not representative of any likely exposure to rotenone. However, EPA (2006a) stated that intravenous injection may mimic the inhalation route of exposure because it is a fairly direct route of exposure that avoids any metabolic breakdown that occurs from gut uptake. A subchronic neurotoxicity study via inhalation was recommended for rotenone because inhalation is a potential route of exposure to rotenone. However, with only piscicidal uses of rotenone remaining, the requirement has been placed "in reserve" since chronic exposure to rotenone is most likely from garden, agricultural, and animal uses. For piscicidal uses, chronic inhalation is likely only for handlers and applicators of rotenone who do not wear the required Protective Personal Equipment. It is also possible that inadvertent overspray could result in inhalation exposure of rotenone, but such an event would be a one-

time, acute event because treatment of an individual lake would only re-occur after at least a year, and likely several years. For applicators and other regular handlers of rotenone, the required PPE would preclude any consequential exposure to rotenone, thus removing any possibility of a Parkinson like effect. Turner, L., et al. 2007 at 77.

Finlayson et al. 2012 at 473 concluded that: *Collectively, the toxicology and epidemiological studies present no clear evidence that rotenone is causally linked to PD* (Parkinson's Disease). *Even if there were clear evidence, it would have little impact on the current and proposed use of rotenone in fish management. This is because the toxicology studies demonstrating PD-like effects were conducted using routes of exposure (e.g., intraperitoneal or intravenous injection or oral dosing with solvents) and exposure regimes (e.g., weeks to months) not germane to potential human exposure associated with fishery uses. The epidemiological studies on pesticide use by farmers assessed historical application scenarios that paid little or no attention to personal hygiene, safety, and safety equipment. For the applicator, the use of required PPE will significantly reduce, if not eliminate, exposure. For the general public, restricted access to the treatment area until rotenone subsides to safe levels and the use of potassium permanganate to detoxify water leaving the treatment area will greatly minimize exposure. Although everyone is at some risk of developing PD, the risk of developing PD-like symptoms as a result of rotenone exposure from use in fisheries management is negligible because with recommended care, rotenone exposure has been effectively eliminated.*

Mobility of rotenone and considerations for use in fractured basaltic areas

Rotenone does not create a ground water concern. The strong tendency of rotenone to adsorb to soils, sediments, and other particulate matter precludes leaching almost entirely. The soil-water partition coefficients, K_d, range from 4.2 to 122 Kg/L for a variety of soil types. There is some potential for leaching only when rotenone reaches the most vulnerable soils, i.e., "very sandy soils with low organic content" (USEPA, 2006c); even then, mobility should be limited, and hydrolysis should degrade any rotenone that does reach water. Turner, L., et al. 2007 at 54. *In a recent (2006) treatment of Diamond Lake, Oregon, groundwater samples have been taken in three wells, and no rotenone has been found at the detection limit of 2 ppb. (David Loomis, Project Manager, Oregon Department of Fish and Wildlife, telephone communication, May 14, 2007).* Turner, L., et al. 2007 at 55.

No information on groundwater sampling for rotenone was located for Washington State. Despite the lack of detection anywhere that sampling has been done, the geology of eastern Washington has large expanses of fractured basalt substrate similar to volcanic areas of the Pacific Northwest, California and the Great Basin. Specifically concerns have been raised about the potential migration of rotenone through the fractured basalts of the Columbia plateau. Turner, L., et al. 2007 at 55.

To enter the fractured basaltic geologic system, rotenone would have to move through the lake bed into the fractured basalt area. Once it entered the fractured basalt area, it could move either laterally or vertically through openings, fissures and cracks in the rocks. However, the potential for that movement is expected to be zero because of adsorption to sediments in the lake bottom, and the immobility of rotenone. Turner, L., et al. 2007 at 56.

Lake bottoms are not simply underwater soils. Lakes have some level of algae and aquatic macrophytes. Decaying plant material and waste materials from aquatic animals, accumulate over time and most go to the bottom of the lake creating a lake sediment that is typically rich in organic material. Even a thin sediment layer would create a barrier for rotenone movement since it binds to particulate matter and does not leach. Turner, L., et al. 2007 at 57.

Frequency of Piscicide Treatments

Lakes or ponds treated with rotenone rarely remain free from undesirable fish species. Some undesirable species repopulate the lake from connected surface waters naturally over the course of time. Occasionally, some fish may avoid lethal concentrations of rotenone by taking refuge near underwater springs or freshwater inlets. In addition, intentional illegal introductions of undesirable fish species sometimes occur. Regardless of origin, the effect of undesirable fish species is fairly consistent in trout-managed waters. Trout production tends to decline, and the waterbody may need rehabilitation again. From 1940 to 1984 the average length of time between rotenone treatments, on lakes treated more than once, was 7.74 years (Bradbury 1986).

Target Species

In the eastern half of the state, WDFW has targeted pumpkinseed sunfish for elimination most frequently. In the western half of the state, WDFW has targeted yellow perch most frequently. No piscicide treatments have occurred in Western Washington since Crocker Lake in Jefferson County was treated in 1998 for removal of Northern Pike. Other important target species include Common Carp, Tench, Brown and Yellow Bullhead catfish, Largemouth Bass and Smallmouth Bass. All are non-native species. Native fish and wildlife restoration treatments are anticipated and may include removal of Common Carp to enhance waterfowl habitat or removal of non-native trout to restore native trout populations, and removal of fish to restore amphibian habitat.

A particular lake may experience recurring problems with the same target species over the course of many years. Often, however, the target species on frequently treated lakes changes over the years. This is often the case in "urban" lakes which frequently receive illegal fish introductions.

Timing of Piscicide Treatments

The majority of rotenone treatments occur in the fall months with only a small percentage of treatments occurring in spring. All spring treatments conducted by WDFW have occurred on eastern Washington lakes. From 2002 to 2012, only three treatments were performed in the spring; all others took place in the fall.

WDFW applies rotenone in the fall because water levels are low, aquatic vegetation is sparse, recreational use of the lake is reduced, and thermal stratification has ended in most lakes (allowing rotenone to circulate throughout the water column). WDFW also prefers fall treatments when they are targeting early spring spawners (e.g., perch). WDFW performs occasional spring rotenone treatments on certain lakes with extensive shallow or weedy areas. Higher water levels in the spring make these areas more accessible by boat. Where irrigation water storage affects water level, WDFW treats in early spring when water levels and flows are lowest.

Permit Status

Ecology has permitted the application of rotenone for fish management under the NPDES program. Ecology first issued an individual permit to WDFW for rotenone use on June 5, 2002 which expired on July 5, 2007. As required by law and the permit, WDFW submitted an application for continuing permit coverage 180 days prior to the expiration of the 2002 permit. Ecology administratively extended the permit to allow more time for developing the draft permit. Ecology anticipates making a decision on issuance of this proposed NPDES general permit for fisheries resource management in 2015.

Regulatory Limitations

Introduction to Legal Requirements for Effluent Limitations to Control Pollutants in Discharges

Section 502(11) of the CWA defines "effluent limitation" as any restriction on the quantity, rate, and concentration of chemical, physical, biological, and other constituents which are discharged from point sources into navigable waters, the waters of the contiguous zone, or the ocean, including schedules of compliance. Effluent limitations are among the permit conditions and limitations prescribed in NPDES permits issued under Section 402(a) of the Act, 33 U.S.C. §1342(a). Delegated states (such as Washington) must meet, at a minimum, the requirements set by EPA; however, they have the option of adopting more-stringent requirements.

Types of Effluent Limitations: Technology-Based, and Water-Quality Based

The CWA requires that discharges from existing facilities, at a minimum, meet ***technology-based effluent limitations*** reflecting, among other things, the technological capability of Permittees to control pollutants in their discharges which are economically achievable. State laws (RCW 90.48.010, 90.52.040 and 90.54.020) require the use of "***all known, available, and reasonable methods of prevention, control and treatment***" ***(AKART)***.

Water quality-based effluent limitations (WQBELs)

Water Quality-based effluent limitations (WQBELs) are required by CWA Section 301(b)(1)(C) and in Washington State are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Quality Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC), the National Toxics Rule (40 CFR 131.36) National Primary Drinking Water Regulations (40 CFR Chapter 1, Part 141) and Group A Public Drinking Water Supplies Source Water Protection and Maximum Contaminant Levels (WACs 246-290-135 and 246-290-310). The more stringent (and practicable) of these two limits (technology or water quality-based) must be chosen for each of the parameters of concern, and implemented through NPDES permits. [CWA sections 301(a) and (b)].

Effluent limits in NPDES permits may be expressed as numeric or non-numeric standards. Courts have recognized that there are circumstances when numeric effluent limitations are infeasible and have upheld EPA's regulations allowing permits issued with conditions (e.g., Best Management Practices or "BMPs") designed to reduce the level of effluent discharges to acceptable levels. 40 C.F.R. 122.44(k)(3).

Natural Resources Defense Council v. EPA, 673 F.2d 400 (D.C. Cir. 1982)
In this case challenging EPA's permit regulations the court said that section 502(11) defined "effluent limitation" as "any restriction" on the amounts of pollutants discharged, not just a numerical restriction.

Natural Res. Def. Council, Inc. v. Costle, 568 F.2d 1369 (D.C. Cir. 1977)
While in this case the D.C. Circuit invalidated EPA's regulations to the extent those regulations attempted to exempt certain point source dischargers from regulation, the court nonetheless stressed that when numerical effluent limitations are infeasible, EPA may issue permits with conditions designed to reduce the level of effluent discharges to acceptable levels.

Deactivation of Piscicide Treated Waters
WDFW typically treats "closed basin" lakes that do not discharge (no outlets). However, when rotenone-treated waters may discharge and impact aquatic life outside the area, or when flowing waters are treated, this permit requires rapid deactivation. From 1992 through 2002, such deactivation has been necessary in 3.6% of the lakes treated in Washington (WDFW 2002). From 1992 through 2013, less than 2 percent of outlet streams from rotenone-treated lakes have needed deactivation (email from WDFW's Bruce Bolding August 2014).

Potassium permanganate ($KMnO_4$) quickly deactivates (oxidizes) rotenone formulations (WDFW 2002; Finlayson, et al. 2000; MacMillan 2009). Rotenone degrades naturally within one to eight weeks depending on ***pH***, alkalinity, and temperature (Schnick 1974, cited in WDFW 2002). Rotenone toxicity may last longer in cooler, more sterile sub-alpine or alpine lakes. WDFW has seldom needed potassium permanganate to deactivate rotenone applications. WDFW selects rotenone treatment so that periods of very low or no flow exist during the time that treated waters remain toxic to fish. This permit allows WDFW to apply potassium permanganate by two methods. One method entails dissolving the crystals in water and dripping the solution into the water. The second method meters the crystalline chemical into the receiving water. Archer (2001) found that the free flowing crystalline form used in potable water treatment plant applications was the best product to use for dripping the crystalline form. He stated the ease of controlling application rates as the advantage. Finlayson et al. (2010a) and in Archer (2001) describes the procedure to determine the amount of potassium permanganate required to detoxify a rotenone treatment.

The proposed permit requires that WDFW effectively deactivate treated waters using potassium permanganate so that water quality standards are not exceeded outside of the deactivation zone. For purposes of this permit, deactivation zone is defined as the downstream waters where potassium permanganate has been applied but has not yet fully deactivated the rotenone, due to the lag time normally associated with deactivation. The deactivation zone is typically considered the distance that water would be expected to travel in 20 minutes (Finlayson et al. 2000; Horton 1997). Since the deactivation zone may contain toxic levels of piscicide and potassium permanganate, some fish mortalities will likely occur within this zone.

Since potassium permanganate itself may be toxic to non-targeted organisms at 2 mg/L (Marking and Bills 1975, cited in Archer 2001), deactivation procedures must utilize methods outlined in the Rotenone SOP Manual Finlayson et al. (2010a) to achieve the minimum effective

concentration of potassium permanganate to oxidize the piscicide within the deactivation zone. Outside of the deactivation zone, WDFW must ensure that the piscicide is totally deactivated and residual potassium permanganate levels are maintained at a non-toxic level of 1 mg/L (Finlayson et al, 2010a). Deactivation is most effective for rotenone concentrations of up to about 1 ppm of 5% formulation but is nearly impossible at concentrations greater than 3.2 ppm (Horton 1997). WDFW must closely monitor potassium permanganate concentrations using methods in the Rotenone SOP Manual (Finlayson et al. 2010a) to keep residual permanganate at a level that effectively deactivates piscicides while preventing damage to aquatic life downstream of the treatment area and deactivation zone.

Technology-based limitations

Technology-based effluent limits 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 effluent limitations based upon the type of pollutant or the type of permittee involved.

The CWA establishes two levels of pollution control for existing sources. In the first stage, existing sources that discharge pollutants directly to receiving waters were initially subject to effluent limitations based on the "best practicable control technology currently available" or "BPT." 33 U.S.C. § 1314(b)(1)(B). BPT applies to all pollutants. In the second stage, existing sources that discharge conventional pollutants are subject to effluent limitations based on the "best conventional pollutant control technology," or "BCT." 33 U.S.C. §1314(b)(4)(A); see also 40 C.F.R. §401.16 (list of conventional pollutants) while existing sources that discharge toxic pollutants or "nonconventional" pollutants (*i.e.*, pollutants that are neither "toxic" nor "conventional") are subject to effluent limitations based on "best available technology economically achievable," or "BAT." 33 U.S.C. §1311(b)(2)(A); see also 40 C.F.R. §401.15 (list of toxic pollutants).

The factors to be considered in establishing the levels of these control technologies are specified in section 304(b) of the CWA and EPA's regulations at 40 CFR §125.3.

All NPDES permits are required to consider technology-based limitations (water quality-based effluent limitations may be more stringent). 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).

Washington has similar technology-based limits that are described as AKART methods. State law refers to AKART under RCW's 90.48.010, 90.48.520, 90.52.040, and 90.54.020. The federal technology-based limits and AKART are similar but not equivalent. Ecology may establish AKART: For an industrial category or in an individual permit on a case-by-case basis. That is more stringent than federal regulations. That includes BMPs such as prevention and control methods (e.g., waste minimization, waste/source reduction, or reduction in total contaminant releases to the environment).

Authority to Include Non-Numeric Technology-Based Limits in NPDES Permits

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 C.F.R. § 122.44(k).

EPA has substantial discretion to impose non-quantitative permit requirements pursuant to Section 402(a)(1)), especially when the use of numeric limits is infeasible. *See Natural Resources Defense Council* v. *EPA*, 822 F.2d 104, 122-24 (D.C. Cir. 1987). As recently as 2006, The U.S. Court of Appeals for the Sixth Circuit has once again held that the CWA does not require the EPA to set numeric limits where such limits are infeasible. *Citizens Coal Council v. EPA*, 447 F3d 879 (6th Cir. 2006). The court stated "site-specific BMPs are effluent limitations under the CWA." *Citizens* 399 F.3d at 895 (citing *Waterkeeper Alliance, Inc. v. EPA*, 399 F.3d 486, 502 (2nd Cir. 2005).

Ecology believes that implementing the applicant's Discharge Management Plan (DMP), following all permit conditions, the Washington Pesticide Control Act, the Washington Pesticide Application Act and the FIFRA label will meet AKART for this permit.

According to the Material Safety Data Sheets (MSDS) provided by WDFW, the liquid rotenone product Prentox ® Prenfish™ Toxicant contains 80% inert ingredients, including aromatic petroleum solvents (naphthalene, trimethylbenzene, and acetone). The powdered formulations do not contain these chemicals. CFT Legumine™ Fish Toxicant, the other liquid formulation of rotenone registered in Washington State contains 90% other inert ingredients, including petroleum distillates (n-Methylpyrrolidone). The permit will restrict the use of liquid rotenone (e.g., Prentox ® Prenfish™ Toxicant and CFT Legumine™ Fish Toxicant) because:

According to EPA's IRIS database, benzene is classified as a "known" human carcinogen for all routes of exposure based upon convincing human evidence as well as supporting evidence from animal studies. (U.S. EPA, 1979, 1985, 1998; ATSDR, 1977).

VOCs contained in liquid formulations could cause air quality problems, especially in urban areas classified as non-attainment zones.

When compared to liquid rotenone, powdered rotenone applied using the Utah method, is effective in meeting fish control objectives.

To minimize the release of VOCs the proposed permit limits the use of liquid rotenone products to spot applications and stream treatments in areas that are not practicably accessible by boats used for application of powdered rotenone. WDFW must treat open water areas on lakes that are accessible by pumper boats with powdered rotenone formulations, mixed with water, and applied using the method pioneered by the Utah State Department of Natural Resources – Division of Wildlife Resources. This method involves mixing powdered rotenone with lake water, using specialized equipment, to form slurry that is applied to the surface of the water. This method is defined in Finlayson et al. 2010a. "Operation of Semi-Closed Aspirator Systems for Application

of Powdered Rotenone SOP: 9.0," in *Planning and Standard Operating Procedures for Use of Rotenone in Fish Management*, (American Fisheries Society, 2010), pp 81-85 and is considered part of the pesticide label.

Surface Water Standards

The Washington State Surface Water Quality Standards (chapter 173-201A WAC) were designed to protect existing water quality and preserve the *beneficial uses* of Washington's surface waters. Waste discharge permits must include conditions that ensure the discharge will meet established surface water quality standards (WAC 173-201A-510).

Ecology conditions NPDES and waste discharge permits so that authorized discharges meet water quality standards. The characteristic beneficial uses of surface waters include, but are not limited to, the following (all uses have equal weight): domestic, industrial and agricultural water supply; stock watering; the spawning, rearing, migration and harvesting of fish; the spawning, rearing and harvesting of shellfish; wildlife habitat; recreation (primary contact, sport fishing, boating, and aesthetic enjoyment of nature); commerce; aesthetics and navigation.

Numeric water quality criteria are published in the Water Quality Standards for Surface Waters (chapter 173-201A WAC). They specify the levels of pollutants allowed in receiving water to protect drinking water uses, aquatic life and recreation in and on the water. The standards may be elevated further if the waterbody has been identified as being impaired (303(d) listed) or has had a TMDL completed for the watershed. The EPA has published 91 numeric water quality criteria for the protection of human health that are applicable to dischargers in Washington State (40 CFR 131.36). EPA designed these criteria to protect humans from exposure to pollutants linked to cancer and other diseases, based on consuming fish and shellfish and drinking contaminated surface waters. Ecology has determined that a Permittee's discharge under this Permit does not contain chemicals of concern based on existing data or knowledge.
WAC 173-201A-240 states that "toxic substances shall not be introduced above natural background levels in waters of the state which have the potential either singularly or cumulatively to adversely affect characteristic water uses, cause acute or chronic toxicity to the most sensitive biota dependent upon those waters, or adversely affect public health, as determined by the department." This narrative water quality criteria limits the toxic, radioactive, or other deleterious material concentrations that may be discharged to levels below those which have the potential to:

- Adversely affect designated water uses.
- Cause acute or chronic toxicity to biota.
- Impair aesthetic values.
- Adversely affect human health.

Narrative criteria are statements that describe the desired water quality goal, such as waters being "free from" pollutants such as oil and scum, color and odor, and other substances that can harm people and fish. These criteria are used for pollutants for which numeric criteria are difficult to specify, such as those that offend the senses (e.g., color and odor). Narrative criteria protect the specific designated uses of all freshwaters (WAC 173-201A-200) and of all marine waters (WAC 173-201A-210) in the State of Washington.

Short-Term Water Quality Modification Provisions

The short-term water quality modification provision of the draft permit allows the authorized discharges to cause a temporary diminishment of some designated beneficial uses while it alters the water body to remove fish in waters of the state. The conditions of this permit constitute the requirements of a short-term water quality modification.

A short-term exceedance only applies to short lived (hours or days) impairments, but short-term exceedances may occur periodically throughout the five-year permit term. Short-term exceedances may also extend over the five-year life span of the permit (long-term exceedance) provided the Permittee satisfies the requirements of WAC 173-201A-410.

303(d) IMPAIRED WATER BODIES

Ecology periodically reviews surface water quality data to determine if water bodies meet criteria. Section 303(d) of the Clean Water Act requires that waters that do not meet the criteria undergo an evaluation of the cause and amount of the contaminant. Ecology places limits on the amounts of pollutants allowed to be discharged and published in Total Maximum Daily Load (TMDL) reports.

The current EPA approved assessment and 303(d) list can be found at:
http://www.ecy.wa.gov/programs/wq/303d/index.html

Pesticide applications under the permit in 303(d)-listed water bodies may have additional limits and conditions imposed upon them. The parameters of concern identified in the permit are dissolved oxygen, phosphorus and nitrogen. Water bodies listed on the 303(d) list as impaired for dissolved oxygen are either year-round problems, or seasonally low dissolved oxygen levels. Piscicides, which will kill fish, benthic macro invertebrates and zooplankton, have the potential to adversely affect dissolved oxygen concentrations within a water body. The goal of a piscicide treatment is usually to kill all of the target fish from a specific area for the purposes of lake or stream rehabilitation. As a result of the treatment, a massive die-off of fish can occur in a specific area, creating an oxygen depleting sequence of dead fish – nutrient release – greater plant and phytoplankton growth – greater bacterial biomass. The increased bacteria can consume dissolved oxygen normally available in the system for other organisms. However, with many of the organisms that usually rely on dissolved oxygen being eliminated by the piscicide treatment, the demand for dissolved oxygen is likely less than it would have been prior to the piscicide treatment.

When fish die after a piscicide treatment, they release sequestered nutrients into the water column. The rapid release of nutrients can trigger algae blooms, which can adversely impact water quality and human and environmental health. This response is usually short lived. As zooplankton populations rebound, in the weeks and months after the piscicide treatment, they will often reduce the algae population through grazing (Bradbury 1986).

For treatments on 303 (d) listed water bodies WDFW must develop appropriate mitigation measures in consultation with Ecology. Some mitigation measures may include:

1. Timing of treatment (early vs. late in the season). Avoid treating impaired water bodies during the summer months, when water quality is already lowered.
2. Limiting the area treated at any one time (i.e., partial water body treatments).
3. Manual removal of dead fish ***as practical*** following chemical treatment.

Ground Water Standards

Similar to the Surface Water Quality Standards discussed above, the Ground Water Quality Standards (chapter 173-200 WAC) protect existing and future beneficial uses of ground water. Permits issued by Ecology must not allow violations of those standards except where an overriding public interest is served, and that all pollutants proposed for entry into ground water are provided with AKART treatment prior to entry.

Existing and future beneficial uses of ground water include: drinking water, stream flows through hydrologic connection, stock watering, industrial, commercial, agricultural, irrigation, mining, fish and wildlife maintenance and enhancement, recreation, generation of electric power and preservation of environmental and aesthetic values, and all other uses compatible with the enjoyment of the public waters of the state. At a minimum, to protect all existing and beneficial uses, ground water must be protected to drinking water standard levels.

The ability of rotenone to move through soil is low to slight. Rotenone moves only 2 cm through most types of soils before being bound by organic matter and rapidly degrading (WDFW 2002). An exception would be in sandy soils where it may move about 8 cm. Rotenone binds strongly to organic matter in soil so is unlikely to enter groundwater (Finlayson et al. 2000, Dawson et al. 1991, Turner 2007).

California Department of Fish and Game has monitored rotenone applications for 15 years and has concluded that toxicity and other effects were confined to the treatment and deactivation areas and ground waters were not contaminated (Finlayson et al. 2001).

Based on these properties of rotenone, and because WDFW has no discharge to ground, the permit does not require limits based on potential effects to ground water.

Drinking Water Standards

Federal and State drinking water regulations and standards (WAC 246-290-310 and 40 CFR Chapter 1, Part 141) are legally enforceable and apply to public drinking water supplies. They protect public health by limiting the levels of certain contaminants in drinking water. Potential drinking water contaminants include microorganisms (such as cryptosporidium, Giardia, and E. coli), disinfectants, disinfection by-products, inorganic chemicals (such as nitrates, lead and copper), organic chemicals (such as pesticides), and radionuclides. Federal and State drinking water regulations establish Maximum Contaminant Levels (MCL's), which are numeric limits that cannot be exceeded in the public drinking water supply. For EPA's current list of drinking water standards, see http://water.epa.gov/drink/contaminants/index.cfm#Primary.

Many contaminants are not regulated by drinking water standards, but EPA is considering some as candidates for regulation. See: http://water.epa.gov/scitech/drinkingwater/dws/ccl/index.cfm.

State Regulations also require source water protection around public drinking water supplies (WAC 246-290-135). Source water protection includes maintaining a protective Sanitary Control Area around ground water wells (100 feet for wells and 200 feet for springs) and a wellhead protection area around wells. Land uses or practices that could potentially contaminate a well are not allowed within the Sanitary Control Area, and are strongly recommended against within the six-month time of travel zone of the wellhead protection area.

Permittees must notify water rights holders of treatment when the chemical or product's label has restrictions and/or precautions for potable or domestic water use, irrigation use, or livestock watering.

For potable water rights, the Permittee must provide water for human consumption from the time of treatment until they can demonstrate that rotenone levels have dropped to EPA's drinking water level of concern (LOC) of 40ppb.

For treatments using liquid rotenone formulations that contain VOCs the Permittee must provide an alternative potable water supply for human consumption from the time of piscicide application until VOC levels in the treated water body have dissipated to background levels or fall below 0.5 ppb.

Sediment

The aquatic sediment standards (chapter 173-204 WAC) protect aquatic biota and human health from chemicals that may build up in sediments and cause impacts to aquatic biota over the long term. WAC 173-204-340 (Freshwater sediment quality standards) directs Ecology to determine on a case-by-case basis what criteria, methods, and procedures are necessary to prevent exceedance of the standards criteria. Ecology has determined through a review of the discharger characteristics and rotenone characteristics that this discharge has no reasonable potential to violate the Sediment Management Standards criteria and is not likely to have impacts beyond the short-term water quality modification allowed by the draft permit.

Rotenone toxicity to aquatic invertebrates has been shown to range from 1.8 ppb to 1,700 ppb for 6 h Lethal Concentration$_{50}$ (***LC$_{50}$***) values (Finlayson et al. 2010b). Impact from rotenone treatments on benthic organisms are typically less severe than impacts to zooplankton. Adverse effects have been shown on some groups such as midges, clams, and worms (Durkin 2008).

Rotenone is likely to be adsorbed to the surface of sediment particles when contacted. Such sorption will limit both the movement of the residue and its availability to the flora and fauna in the water body. Temple and Anderson 2008 at 21. Figure 19 in WDFW 1992 illustrates the effect of bottom mud in reducing rotenone toxicity to midge larvae.

Because rotenone is not persistent and is strongly bound to sediments until it breaks down, its use is not considered a concern relative to sediment-dwelling organisms in lakes and streams. Temple and Anderson 2008 at 22.

In a study looking at rotenone toxicity to aquatic invertebrates at both treated and untreated sites on a pair of creeks in California Finlayson et al. (2010b) saw total assemblage abundance decrease as a result of treatment; however, no statistical difference was measured for taxa richness, genera richness, number of individuals within the major insect orders and the number of rare taxa.

Antidegradation

Federal regulations (40 CFR 131.12), the Water Quality Standards for Surface Waters of the State of Washington (WAC 173-201A-300, 310, 320, 330) and Water Quality Standards for Ground Waters of the State of Washington (chapter 173-200 WAC) establish a water quality antidegradation program.

This program establishes three tiers of protection for surface water quality. These three tiers function 1) to protect existing and designated in-stream uses, 2) to limit the conditions under which water of a quality higher than the state standards can be degraded, and 3) to provide a means to set the very best waters of the state aside from future sources of degradation entirely. WAC 173-201A-320 contains the Tier 2 antidegradation provisions for the state's surface water quality standards at http://apps.leg.wa.gov/WAC/default.aspx?dispo=true&cite=173-201A-320.

The antidegradation program also establishes protection for ground water quality, but it does not require a Tier 2 analysis as the Surface Water Quality Standards do. For ground water, existing and future beneficial uses must be maintained and protected against degradation that would prevent or interfere with the use of ground water for a beneficial use. Degradation of ground water is not allowed in national or state parks, wildlife refuges, or waters of exceptional quality (tier 3 waters). If the ground water is of better quality than the criteria assigned to the waters, the better quality waters must be protected against degradation to the existing background quality. The exception to the better quality water protection is if there is an overriding public benefit, and any pollutants allowed into better quality waters is provided with AKART.

A Tier 2 analysis is required when new or expanded actions are expected to cause a measurable change in the quality of a receiving water that is of a higher quality than the criterion designated for that waterbody in the water quality standards (WAC 173-201A-320(1)). WAC 173-201A-320(3) defines a measureable change as specific reductions in water quality, and defines "new or expanded actions" as "human actions that occur or are regulated for the first time, or human actions expanded such that they result in an increase in pollution, after July 1, 2003." This definition includes facilities that first began to discharge pollutants, or increased the discharge of pollutants, after July 1, 2003. The definition also applies to those facilities that discharged pollutants prior to July 1, 2003, but were regulated by Ecology for the first time after July 1, 2003.

Antidegradation Analysis and Antidegradation Plan

The following narrative represents Ecology's antidegradation analysis and antidegradation plan for the Fisheries Resource Management General Permit. The purpose of Washington's Antidegradation Policy (WAC 173-201A-300-330; 2006) is to:

1. Restore and maintain the highest possible quality of the surface waters of Washington.
2. Describe situations under which water quality may be lowered from its current condition.

3. Apply to human activities that are likely to have an impact on the water quality of surface water.
4. Ensure that all human activities likely to contribute to a lowering of water quality, at a minimum, apply AKART.
5. Apply three Tiers of protection (described below) for surface waters of the state.

Tier I ensures existing and designated uses are maintained and protected and applies to all waters and all sources of pollution. Tier II ensures that dischargers do not degrade waters of a higher quality than the criteria assigned unless such lowering of water quality is necessary and in the overriding public interest. Tier II applies only to a specific list of polluting activities. Tier III prevents the degradation of waters formally listed as "outstanding resource waters" and applies to all sources of pollution.

WAC 173-201A-320(6) describes how Ecology implements Tier I and II antidegradation in general permits. All Permittees covered under the general permit must comply with the provisions of Tier 1. Ecology determined that the permit does not cover discharges to Tier III waters.

The water quality standards at WAC 173-201A-320(6) describe how Ecology should conduct an antidegradation Tier II analysis when it issues NPDES general permits. This section of the rule requires Ecology to use the information collected from implementation of the permit, to revise the permit or program requirements.

Ecology developed the proposed permit based on written and oral feedback from WDFW, internal agency staff, and natural resource scientists from other government agencies. Ecology will further revise the draft permit based on a formal public comment period and testimony received at public hearings.

Ecology has required WDFW to complete a zooplankton study (Permit Appendix C) within the first three years from the date of permit issuance. The zooplankton study will provide data for zooplankton populations in treatment and reference lakes and will be used to determine how zooplankton populations recover following piscicide treatment.

Review and refine management and control programs in cycles not to exceed five years or the period of permit reissuance.

This is the first issuance of this general permit; the previous issuance was as an individual permit. It expires (date five years from effective date). Permit issuance includes a public involvement process as described below.

Prior to permit issuance Ecology solicited input from users, developed and revised permit conditions, reviewed relevant data and literature, and collaborated with natural resource scientists before soliciting public comment on the permit and accompanying documents and finalizing the permit.

Include a plan that describes how Ecology will obtain and use information to ensure full compliance with water quality standards. Ecology must develop and document the plan in advance of permit or program approval.

- The information in the Fact Sheet, particularly this antidegradation section, constitutes Ecology's antidegradation plan for the Fisheries Resource Management General Permit. This is despite language in Ecology's guidance document implementing Tier II antidegradation requirements that indicates such a plan may not be required. Ecology *Supplementary Guidance Implementing the Tier II Antidegradation Rules* dated September 2011 (https://fortress.wa.gov/ecy/publications/SummaryPages/1110073.html). A Tier II analysis is not required in association with activities regulated under a short-term modification (WAC 173-201A-410) such as what would occur with construction and maintenance activities or the periodic use of piscicides to control nuisance fish populations.
- Ecology will review the zooplankton study data and review monitoring information and reports.
- Ecology requires Permittees to develop a DMP for this activity.
- As SEPA lead agency, WDFW has made a SEPA determination of significance with adoption of environmental documents. The SEPA determination document issued by WDFW can be found on Ecology's Fisheries Resource Management website.

SEPA Compliance

Piscicide use related to fish management activities has undergone environmental impact evaluations by WDFW in 1992 and 2002. This general permit conditions the use of pesticides to mitigate environmental impacts of concern noted in these evaluations.

For each water proposed for rehabilitation, WDFW provides public announcements including local newspaper notices, internet/web site information, and news releases. WDFW also conducts local public meetings to solicit public input regarding each proposed treatment. WDFW includes all waters proposed for treatment in an annual addendum to the Final Supplemental Environmental Impact Statement (FSEIS) – Lake and Stream Rehabilitations. The FSEIS also provides information about the other options considered prior to choosing pesticides. The FSEIS is subject to a public comment period.

WDFW must complete the annual SEPA process prior to conducting lake or stream rehabilitation activities each year. It is the intent of this permit to authorize fisheries resource management treatments in a manner that also complies with federal and other state requirements.

Integrated Pest Management (IPM)

All NPDES permits issued by Ecology must incorporate requirements to implement reasonable prevention, treatment and control of pollutants.

The legislature established in the Washington Pesticide Control Act (chapter 17.15 RCW) that prevention of pollution in this case is reasonable only in the context of an Integrated Pest Management (IPM) plan. IPM plans require the investigation of all control options, but do not

require non-chemical pest controls as the preferred option. The goal of IPM is to establish the most effective means of control whether chemical, non-chemical, or a combination.

WDFW's fisheries resource management program currently utilizes integrated pest management (IPM) strategies. IPM programs include preventing pest problems, monitoring for the presence of pests, setting a population density at which treatment occurs, and evaluating efficacy of treatments. WDFW has worked to prevent illegal introductions through the creation of education materials, and conducts annual monitoring of fish populations and fish size. WDFW selects lakes or streams for piscicide treatment when a viable fishery can only be maintained with introductions of catchable size fish, or when removal of non-native fish is necessary to restore native fish populations. The DMP, that will be required as a condition of the permit, requires WDFW to develop an action threshold that sets the parameters for when WDFW may use piscicides to control fish populations.

The treatment strategy of an IPM program is chosen after giving equal weight to all control strategies. The chosen control option will best fit the parameters of an individual situation after the ecologic and economic consequence of each option is considered. The treatment alternatives considered for fisheries resource management are fish toxicants, predator stocking, and mechanical removal (Table 1).

The treatment that has been preferred for most situations in the past is application of piscicide. This strategy is thought to give the best chance of eradicating infestations of non-native fish while minimizing risks to human health and to the environment. The success of the treatments is confirmed by fish population sampling and creel surveys.

WDFW will be required to submit a DMP prior to conducting treatments under coverage of this permit. The DMP will serve as the IPM plan for this general permit.

Special Conditions

S1. Permit Coverage

The Fisheries Resource Management Permit was previously an individual permit issued to WDFW for statewide management of fisheries resources. Ecology decided to re-develop the Fisheries Resource Management Permit as an NPDES and State Waste General Permit rather than an individual permit since the activities and the discharges occur statewide and therefore the permit model more closely resembles a general permit.

WDFW is the only entity that may apply for coverage under this permit. Fish are property of the state and WDFW is the agency responsible for management of fish in waters of the state (RCW 77.04.012). Furthermore WDFW is authorized to eradicate undesirable fish species in waters of the state (RCW 77.12.420). WDFW may cooperate with state, county, municipal, federal agencies, and private citizens to conduct fisheries management projects under coverage of this permit.

Activities Covered Under This Permit
Washington's Water Quality statutes and regulations do not allow the discharge of pollutants to waters of the state without a discharge permit (RCW 90.48.080, 90.48.160, 90.48.260, WAC 173-201A).

Piscicides used in water for fisheries management are potential pollutants, and therefore require a discharge permit before application to Washington State surface waters.

The proposed permit limits chemical application to the use of rotenone, and potassium permanganate in fish management activities deemed necessary by WDFW in Waters of the State of Washington.

Ecology proposes to issue this permit for a duration of 5 years from the effective date of the permit.

Geographic Area Covered
The draft permit applies to the application of piscicide for fisheries management, to surface waters of the state of Washington, where Ecology has authority. Surface waters include lakes, rivers, ponds, streams, inland waters, salt waters, wetlands, and all other surface waters and watercourses within the jurisdiction of the state of Washington (RCW 90.48.020, WAC 173-201A-020 and WAC 173-226-030).

EPA has not delegated regulatory authority to Ecology to issue NPDES permits on federal land or "Indian Country" as defined in 18 USC Sec. 1151.

Additional Requirement to Conduct a Zooplankton Study
In the past the Fisheries Resource Management Individual Permit required zooplankton monitoring to examine impacts to zooplankton from rotenone treatment. The data collected was of limited use for describing impacts to zooplankton populations and their recovery after piscicide treatment due to the lack of control sites and the limited number of samples taken. The proposed permit requires WDFW to complete a Zooplankton Study focused on impacts and recovery of zooplankton populations from piscicide treatments in multiple lakes over multiple years. WDFW must complete the Zooplankton Study within three years of permit issuance. See the Fisheries Resource Management Permit Appendix C for an outline of the study.

S2. Permit Administration

Coverage under this general permit is available to the Washington State Department of Fish and Wildlife only.

Ecology received WDFW's re-application for permit coverage under the Fisheries Resource Management NPDES Individual Permit on December 20, 2006, before the 180-day requirement. Ecology considers the WDFW re-application for permit coverage as the application for coverage under the draft Fisheries Resource Management NPDES General Permit.

WAC 173-226-200 contains the requirements for applications for coverage under a general permit. In part, this WAC requires that the applicant submit their application for coverage on a form prescribed by Ecology. The form used by WDFW for their renewal is the form prescribed by Ecology at the time that renewal was required. It contains all the information required in WAC 173-226-200 that Ecology requires to issue permit coverage. A new application form, as required by WAC 173-226-200(4) was developed for this permit and will be available during the public comment period.

How to Terminate Permit Coverage
Ecology plans to issue the permit for a period of up to five years, starting on the effective date of the permit (WAC 173-226-220). Coverage will last from the date of coverage to the date of permit expiration, which may be up to five years, unless the Permittee terminates coverage by submitting a notice of termination or unless Ecology terminates the permit early. If the Permittee does not terminate coverage, the Permittee will continue to incur an annual permit fee, even if it does not treat. It the Permittee terminates its coverage; it will no longer be allowed to discharge piscicides to waters of the state unless it re-applies for a new permit coverage.

S3. Discharge Limits

Compliance with Standards
Permittees must use AKART when applying piscicides. Compliance with this permit, the ***Washington Pesticide Control Act***, the requirements of the ***Federal Insecticide, Fungicide, and Rodenticide Act*** (FIFRA) label, and all other applicable federal and state laws constitute AKART

See also the section "Technology-Based Water Quality Protection Requirements" for a discussion about AKART.

Ecology based the DMP planning requirements on:
1. A similar planning requirement in EPA's NPDES Pesticides General Permit application.
2. In its fact sheet, EPA considers Integrated Pest Management (IPM) to meet technology-based standards.
3. Integrated Pest Management statute (RCW 17.15).
4. Washington's Water Quality Standards (WAC 173-201A-110).

Temporary Exceedance of Water Quality Standards
State Water Quality Standards allow for nonattainment of water quality standards in specific water bodies for short periods (hours or days) to accommodate essential activities and protection of the public interest. WAC 173-201A-410. WAC 173-201A-410(2) allows Ecology to authorize a longer period of nonattainment "where the activity is part of an ongoing or long-term operation and maintenance plan, integrated pest or noxious weed management plan, water body or watershed management plan, or restoration plan." The longer period may be authorized for the duration of the plan, or for five years, whichever is less. The Permittee must develop the plan following the Administrative Procedures Act for public involvement (chapter 34.05 RCW) and must complete a State Environmental Policy Act (chapter 43.21C RCW and chapter 197-11 WAC) review of the proposed activity. Ecology may also request updated plans and addendums

to existing plans. The DMP that WDFW is required to develop under Permit Condition S3.C meets the requirements in WAC 173-201A-410 for the type of plan necessary to authorize a longer duration short-term modification.

Discharge Management Plan (DMP)
Integrated pest management is AKART for this permit. DMPs are plans to help applicants determine appropriate pest management methods, set ***action thresholds***, incorporate principles of IPM, and help reduce pesticide use. EPA requires the development of a DMP in its NPDES permit for aquatic pesticide application and state permits must not be less stringent than federal permits. Ecology will allow elements of the EIS to substitute for applicable DMP elements. DMPs also set out lines of responsibility by identifying responsible parties and applicators and provides up-to-date contact information.

Impaired Water Bodies
Ecology periodically reviews water quality data to determine if water bodies meet criteria. Section 303(d) of the CWA requires that waters not meeting criteria undergo an evaluation of the cause and amount of the contaminant. Ecology publishes Total Maximum Daily Load (TMDL) reports which may establish limits on the amounts of pollutants contributors may discharge.

Applications to water bodies listed on the 303(d) list have additional limits and conditions imposed upon them. The parameters of concern identified in the permit are dissolved oxygen, phosphorous and nitrogen. The Permittee must not cause or contribute to further impairment of 303(d) listed water bodies for the water quality parameter for which the water body is listed.

Chemicals that cause a rapid die-off of animals may trigger release of phosphorus and other nutrients that in turn may trigger algae or cyanobacteria blooms. This may lead to low oxygen conditions developing in the water body.

Endangered and Sensitive Species
EPA has implemented an Endangered Species Protection Program (ESPP) to identify all pesticides that may cause adverse impacts on threatened/endangered species and to implement measures that will mitigate these impacts. When the ESPP identifies an adverse impact, it requires use restrictions to protect these species at the county level. EPA will specify these use restrictions on the product label or by distributing a county-specific Endangered Species Protection Bulletin. Bulletins are enforceable under FIFRA. General Condition G6 of the Fisheries Resource Management Permit requires the Permittee to comply with all applicable federal regulations. See www.epa.gov/espp/frequent-ques.htm for more information.

The U.S. Fish and Wildlife Service and National Marine Fisheries Service are involved in EPA's processes to protect listed species and designated critical habitat in several ways: by consulting with EPA on specific endangered species concerns; by issuing Biological Opinions on certain species; or other ways, as necessary. For details on how EPA evaluates the potential risks from pesticides to listed species and consults with the Services, see their risk assessment process web page at www.epa.gov/espp/litstatus/riskasses.htm.

The issuance of this permit does not have a federal nexus that would trigger formal ESA consultation with the federal services.

WAC173-226-140 requires that Ecology submit all draft general NPDES permits for federal agency review and recommendations. Federal agencies include the EPA, the US Army Corps of Engineers, the US Fish and Wildlife Service, the National Marine Fisheries Service, and any other federal agency upon their request.

S4. The Application of Products

Application Requirements
Under state laws administered by WSDA, all aquatic herbicides are restricted use (WAC 16-228-1231). Only WSDA licensed pesticide applicators with an aquatic endorsement or applicators under direct supervision of a licensed pesticide applicator with an aquatic endorsement may apply pesticides to water. The permit requires that all applicators follow the FIFRA product label, use appropriate application methods, have training in application techniques, and that trained personnel calibrate the application equipment to ensure appropriate label treatment rates.

Authorized Discharges
This permit allows the Permittee, to use chemicals or products identified in the permit that are regulated under FIFRA (Special Condition S4.B). Ecology authorizes these discharges in accordance with WAC 173-201A-410 and chapter 90.48 RCW.

The Permittee must comply with both the pesticide label requirements and the general permit conditions. Coverage under this general permit does not supersede or preempt federal or state label requirements or any other applicable laws and regulations. General permit Condition G6 reminds the Permittee of this fact.

Treatment limitations help mitigate adverse impacts from chemical treatments and Ecology based these limits on the best scientific information available and its best professional judgment.

Chemicals and Products Allowed For Use under this Permit
This permit authorizes and conditions the use of rotenone as a piscicide for fisheries management. In order to deactivate rotenone, this permit authorizes the use of potassium permanganate as an oxidizing agent to deactivate piscicide in downstream waters.

The rotenone product label contains application directions, including a table with various application rates for lakes and ponds. Since these application rates are based upon a concentration of 5% active rotenone, WDFW must make adjustments because the rotenone powder used by WDFW rarely contains exactly 5% active rotenone. To ensure correct application rates, the distributor tests each shipment from the supplier for rotenone content. Powder formulations used in recent years have assayed between 6% and 8% active rotenone. This draft permit requires WDFW to follow all label requirements. WDFW will continue rotenone shipment testing. WDFW will submit information regarding specific treatments to Ecology in an annual report, including the quantity and concentration of rotenone applied to each waterbody and the chemical assay performed by the supplier.

Specific Restrictions on the Application of Pesticides
Unless it is an ***emergency***, Ecology requires the Permittee to minimize treatments that restrict public water use during high use holidays (e.g., Memorial Day, July 4, and Labor Day) and on weekends (173-201A-410 WAC). Water use restrictions occurring during those times will disproportionately impact public use of the waters. While situations may occur when this is the only appropriate time to treat, Ecology strongly encourages the Permittee not to treat during high use times when chemical application may have greater effect on recreational water use.

S5. Posting and Notification Requirements

Ecology based the posting and notification requirements in the Fisheries Resource Management Permit on similar requirements for posting and notification in the Aquatic Plant and Algae Management NPDES permit, the Noxious Weed Control NPDES permit and the Planning and Standard Operating Procedures for Use of Rotenone in Fish Management, 2010 included as part of the FIFRA label.

The Permittee must notify those who legally withdraw surface waters (through a registered surface water right or claim) 14-45 days before treatment. This notification must identify the chemical(s) or product(s) it plans to use, the date(s) of expected treatment, and all water use restrictions and precautions. The Permittee must not treat an area until it has notified people who legally withdraw surface water and it has provided an alternative water supply, when the product's label has restrictions and/or precautions, for potable or domestic water use, irrigation use, or livestock watering.

S6. Monitoring Requirements

Ecology requires monitoring, recording, and reporting (WAC 173-226-090 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and that the discharge complies with the permit's effluent limits. Permittees with coverage under the Permit must monitor the amount of pesticides they use and report this information to Ecology in an annual report (S7.A.3).

Monitoring
The WDFW will conduct monitoring to determine the extent and duration of the short-term water quality reduction resulting from rotenone applications. Monitoring will be adequate to determine if non-target organisms downstream from the treatment area have been adversely impacted by the treatment.

The permit requires monitoring of residual pesticides and oxidizers (i.e., potassium permanganate) if used. The intent is to gather information to confirm the assumptions of persistence and toxicity relative to the rate of application.

Piscicide treatments occurring on a ***chain of lakes*** may be treated as a single waterbody for the purposes of monitoring; each individual water body need not be monitored. If the Permittee chooses not to monitor each individual lake in a lake chain then they must submit a monitoring plan to Ecology for approval one month prior to treatment. A chain of lakes that are physically connected by surface water will have biological connectivity and should have similar water

quality characteristics. Rotenone applied to the upper elevation lakes in a chain of lakes will flow down gradient to the other lakes in the chain. For these reasons, Ecology is allowing for different monitoring requirements when a chain of lakes is treated.

Additionally, the proposed permit requires WDFW to conduct a study to determine the impacts to zooplankton (Permit Appendix C). This information will define the period of temporary diminishment of beneficial uses. Zooplankton sampling at each treatment site will not be part of the monitoring requirements in this permit; instead Ecology will rely on the zooplankton study to characterize the population impacts and recovery of zooplankton in response to rotenone treatment. The zooplankton study can be found in Appendix C of the Draft Fisheries Resource Management NPDES General Permit

For potable water rights the Permittee must demonstrate that rotenone levels have dropped to EPA's estimated drinking water level of concern (LOC) of 40ppb. Permittees must use one of the methods provided in Finlayson et al. 2010a, SOP:16.0.

Rainbow trout have been shown to have LC_{50} values for rotenone that range from a 3 hr LC_{50} of 8.8 ppb to a 96 h LC_{50} of 2.2 ppb (Ling 2003). The EPA reported a 96 h LC_{50} for rainbow trout of 1.94 ppb in the Re-registration and Eligibility Decision (RED) for Rotenone (EPA 2007). These data indicate that rainbow trout will provide a reliable indicator of rotenone toxicity based on measured mortality in a live box bioassay. The trout toxicity bioassay will show that the rotenone concentrations have fallen below the EPA estimated LOC for drinking water (40 ppb) when trout survive in a live box bioassay. The Rotenone SOP Manual (Finlayson et al 2010a), included as part of the FIFRA Label, indicates at SOP:16.0 that trout survival in treated water for 24 h is an acceptable test to demonstrate that rotenone levels are below 40 ppb.

The Individual NPDES Permit for Fisheries Resource Management issued in 2002 required testing of volatile organic compounds (VOCs) and semi-volatile organic compounds (semi-VOCs) when liquid rotenone was used. WDFW has been testing and collecting data on VOCs associated with the use of liquid rotenone since 2002. Ecology has determined that the data reported on VOCs associated with the use of liquid rotenone formulations has been adequately characterized. Ecology will require VOC monitoring when liquid rotenone applications occur on water bodies with surface water rights for potable water, to ensure that surface water withdrawal only resumes after VOC levels have returned to background levels, as determined by pretreatment testing, or have fallen below 0.5 ppb. The results of the VOC testing conducted under the Individual Permit for Fisheries Resource Management can be reviewed in the post-rehabilitation reports submitted by WDFW on the Fisheries Resource Management Permit website.

The concentration of powdered rotenone products may vary by lot (Finlayson et al. 2000). The rotenone supplier analyzes each lot to determine the concentration of active rotenone. WDFW will use the assay to adjust the application rate stated on the label, which contains a general guide that is based upon 5% product. WDFW must report the concentration of active rotenone in the formulation to Ecology in annual Post Treatment Reports.

Analytical Procedures
Sampling and analytical methods used to meet the monitoring requirements specified in this permit must conform to the latest revision of the Guidelines Establishing Test Procedures for the Analysis of Pollutants contained in 40 CFR Part 136 (or as applicable in 40 CFR subchapters N [Parts 400-471] or O [Parts 501-503]) unless otherwise specified in this permit.

With the exception of certain parameters (pH, temperature, alkalinity), Ecology requires that all monitoring data be analyzed and prepared by a laboratory registered or accredited under the provisions of chapter 173-50 WAC, *Accreditation of Environmental Laboratories*.

S7. Reporting and Record Keeping

Special Condition S7 of the permit contains specific conditions based on Ecology's authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-226-090).

Annual Post-Treatment Monitoring Report
The annual Post-treatment Monitoring Report (due December 31) summarizes the results of any monitoring. The annual report summarizes the amount of each chemical used during the course of each treatment season. It allows Ecology to track how much pesticide is used in Washington for a specific use.

Annual Pre-Treatment Plan
The annual Pre-treatment Plan (due April 1) identifies lakes proposed for piscicide treatment, why proposed lakes aren't meeting fisheries management goals, intended outcome measures and a description of impacts. WDFW may decide not to treat all of the lakes proposed in the Pre-treatment Plan.

Records Retention
Applicators must keep all records and documents required for five years. If there is any unresolved litigation regarding the discharge of pollutants by the Permittee, the period of record retention must be extended during the course of the litigation (WAC 173-226-090).

Reporting Permit Violations
WAC 173-226-080 (1)(d) states that a discharge of any pollutant more frequently or at a level in excess of that authorized is a permit violation. Ecology requires that if a Permittee violated the permit conditions, it must take steps to stop and minimize any violations and report those violations to Ecology. For pesticide applications authorized in the Permit, applicators must report violations to the Aquatic Pesticide Permit Manager and the Regional Spills (ERTS Hotline) within 24 hours. This allows Ecology to determine if more action is necessary to mitigate the permit violation.

S8. Annual SEPA Process

The annual SEPA process shall include reference to all methods considered for fish management at each project site, and the advantages and disadvantages of each method evaluated. The SEPA

process is subject to public review during the public comment period on the addendum to the Final Supplemental Environmental Impact Statement.

S9. Spill Prevention and Control

Permittees must handle chemicals and maintain equipment in such a way as to prevent spills, and all significant spills must be reported. WDFW shall submit a spill prevention and response plan to Ecology as part of the permit process.

The Permittee must be prepared to mitigate for any potential spills and, in the event of a spill, perform the necessary cleanup, and notify the appropriate Ecology regional office (see RCW 90.48.080, and WAC 173-226-070).

S10. Best Management Practices

WAC 173-226-070 allows Ecology to place permit conditions to prevent or control pollutant discharges from plant site run off, spillage or leaks, sludge or waste disposal, or materials handling or storage and allows Ecology to require the use of ***Best Management Practices (BMPs)***.

WDFW will continue to examine the possibility of alternatives to reduce the amount of pesticides needed for fisheries resource management. Such methods include:

1. Prevention of an exceedance of water quality standards outside the area intended for rehabilitation.
2. Application of powdered rotenone formulations using the best available and practical technology that minimizes airborne dust.
3. Use of liquid rotenone formulation which contains fewer hydrocarbons (McClay 2005).
4. Informing the public of planned treatment activities.
5. Applying a decision matrix concept to the choice of the most appropriate lakes for treatment.
6. Staff training in the proper application of pesticides and handling of spills.
7. Following the US Fish and Wildlife Service's Standard Operating Procedures Manual for rotenone application (Finlayson et al. 2010a).
8. Preventing the reintroduction of undesirable fish species.

A reduction in the discharge of pollutants to waters of the state can be achieved by using proper BMPs, which include integrated pest management and alternative pest control procedures.

General Conditions

Ecology bases the General Conditions on state and federal law and regulations.

Duty to Reapply
All NPDES permits require the Permittee to reapply for coverage 180 days prior to the expiration date of the general permit in accordance with 40 CFR 122.21 (d), 40 CFR 122.41(b), and WAC 173-226-220(2).

Permit Modifications

Ecology may modify this permit to impose new or modified numerical limits, if necessary to meet Water Quality Standards for Surface Waters, Sediment Quality Standards, or Water Quality Standards for Ground Waters. Ecology would base any modifications on new information obtained from sources such as inspections, effluent monitoring, or Ecology-approved engineering reports. Ecology may also modify this permit because of new or amended state or federal regulations.

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Documents prepared after June 12, 2014 also identify information sources by the following 11 categories:

1. Peer review is overseen by an independent third party.
2. Review is by staff internal to Department of Ecology.
3. Review is by persons that are external to and selected by the Department of Ecology.
4. Documented open public review process that is not limited to invited organizations or individuals.
5. Federal and state statutes.
6. Court and hearings board decisions.
7. Federal and state administrative rules and regulations.
8. Policy and regulatory documents adopted by local governments.
9. Data from primary research, monitoring activities, or other sources, but that has not been incorporated as part of documents reviewed under other processes.
10. Records of best professional judgment of Department of Ecology employees or other individuals.
11. Sources of information that do not fit into one of the other categories listed.

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Chapter 173-226 WAC: Waste Discharge General Permit Program [5]

Chapter 197-11 WAC: SEPA Rules [5]

Chapter 246-290 WAC: Group A Public Water Supplies [5]

Chapter 371-08 WAC: Pollution Control Hearings Board – Practice and Procedure [5]

Appendices

Appendix A – Definitions

AKART: An acronym for "all known, available, and reasonable methods of treatment".

Best Management Practices (BMPs): Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

Catchable-size trout: A trout raised in a hatchery to a size desirable and easily caught by recreational anglers immediately after release. WDFW defines the size of a catchable trout to be greater than 2.5 fish per pound (fpp) or between 11-13 inches in length.

Chain of lakes: Lakes that are physically connected by a channel of surface water but have different names or are un-named.

Deactivation zone: The downstream waters where potassium permanganate has been applied but has not yet fully deactivated the rotenone, due to the lag time normally associated with deactivation. The distance that water can be expected to travel in 20 minutes. Since the deactivation zone may contain toxic levels of rotenone and potassium permanganate, some fish mortalities may occur in this zone.

Discharge: The addition of any pollutant to a water of the state.

Federal Clean Water Act (CWA): The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; U.S.C. §§ 1251 et seq.

Fingerling trout: A trout raised in a hatchery for a short period of time (e.g., usually between 4-6 months) and then released into a lake, pond, reservoir, and/or stream. Fingerling trout utilize a water's natural food base to grow to a catchable size (usually 11-13 inches) by year one. WDFW defines the size of a fingerling trout to be less than 2.5 fish per pound (fpp). Most fingerling trout range between 75-100 fpp (2 to 4 inches) at release.

FSEIS: Final Supplemental Environmental Impact Statement

LC_{50}: Concentration of the test chemical in water in mg/L that causes 50% of the tested organisms to die after a given amount of time.

National Pollutant Discharge Elimination System (NPDES): The NPDES (Section 402 of the Clean Water Act) is the Federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the

authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both State and Federal laws.

Pesticides: "Pesticide" means, but is not limited to: Any substance or mixture of substances intended to prevent, destroy, control, repel, or mitigate any insect, rodent, snail, slug, fungus, weed, and any other form of plant or animal life or virus, except virus on or in a living person or other animal, which is normally considered to be a pest or which the director (of Agriculture) may declare to be a pest (RCW 17.21.020).

pH: The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral and large variations above or below this value are considered harmful to most aquatic life.

Piscicide: Fish poison or toxicant such as rotenone, used for fish control, eradication or sampling.

ppm: Parts per million (equivalent to mg/L or mg/kg).

Technology-based Effluent Limit: A permit limit that is based on the ability of a treatment method to reduce the pollutant.

SEPA: State Environmental Policy Act, chapter 43.21C RCW.

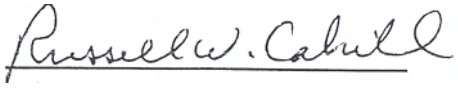
State experimental use permit: A permit issued by WSDA allowing use of pesticides that are not registered, or for experiments involving uses not allowed by the pesticide label. Aquatic applications are limited to one acre or less in size.

Waters of the state: Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Water Quality-based Effluent Limit: A limit on the concentration of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into receiving water.

In the absence of other definitions set forth herein, the definitions set forth in 40 CFR Part 403.3 or in chapter 90.48 RCW apply.

Appendix B – WDFW Policy C-3010

FISH AND WILDLIFE COMMISSION
POLICY DECISION
POLICY TITLE: Lake and Stream POLICY NUMBER: POL-C3010 Rehabilitations
Cancels:
Effective Date: February 8, 2002
Termination Date (if applicable):
See Also:
Approved by:
Fish and Wildlife Commission Chair 

GENERAL POLICIES:
The control of undesirable fish populations using chemical piscicides is a valuable and cost effective management tool for providing quality fishing opportunities and protecting native species in many waters of the state.

Specific policies:

All lake and stream rehabilitations will follow state and federal laws.
All proposed rehabilitations will adhere to state water quality requirements (WAC 173-201A), the Washington Pesticide Control Act (RCW 15.58), State Environmental Policy Act (SEPA) and Federal Clean Water Act.

All applicable environmental, health and safety regulations will be followed.
All proposed rehabilitations will follow and adhere to chemical piscicides labeling restrictions and chemical materials safety data sheet requirements to ensure protection of the public, Department personnel and environment during rehabilitation treatments.

Waters will not be treated in ways which would cause significant negative impacts to fish or wildlife which are state or federally listed as Threatened, Endangered, Sensitive or Candidate Species.
An exception may be granted in the case of a biological emergency.

The public will be part of the decision-making process.
A public meeting will be held in the vicinity of the proposed rehabilitation(s) before a final decision is made.

An appropriate assessment of existing fish populations and associated risks will be undertaken for all natural bodies of water proposed for treatment if they have not been previously treated.

Appendix C – Schedule of Activities

Step	Actions & Timeline for WDFW Rehabs	Approx Date
1	Prioritized list of Waters to Inland Program Manager	March 1
2	Statewide prioritized list of waters to be treated this year	March 1
3	Treatment list based on available piscicide	April 30
4	Order piscicide based on available funds & inventory	April 30
5	Pre-rehab materials to Inland Program Manager	May-June 30
6	Landowner and water rights search	May-June 30
7	First contact letters to landowners and water rights holders announcing intent to treat and meeting dates	May-June 30
8	Inform District/Regional Programs of potential rehabs	May-June 30
9	Survey of shoreline for water withdrawals	May-July 31
10	Final list of waters for public meetings	June-July 1
11	Begin collecting water withdrawal agreement letters	June-July 31
12	Regional Approval Letter and sign-off	June-July 31
13	Agency News Release announcing rehabs and public meetings	July 1 - 21
14	General public meetings	July 7-31
15	Preparation of the SEPA Addendum	July 7-11
16	Schedule meetings with Program Director and Director/Deputy	July 14-18
17	Publish SEPA Addendum for 21-day public review	July 14-18
18	Safety equipment inventory and review	July 31
19	Completion of SEPA 21-day review: respond to any comments	August 15-20
20	Schedule treatments	August 18-31
21	Draft Emergency fishing regulations to HQ office	August 19-25
22	Director & Fish Program AD review and approval	August 25-Sept 5
23	Emergency fishing regulations and news release	Post-Dir Approval
24	Rehab binder updates and completion	Post-Dir Approval
25	Update spill response plans, if needed	September 7
26	Publish legal notifications regarding rehabs	10-21 days prior to treatment
27	Regions notify residents and businesses	10-21 days prior to treatment
28	Posting of waters to be treated	24-48 hours prior to treatment
29	Field staff conduct pre-treatment sampling & water chemistry	Immediately before treatment
30	Application of piscicide w/review of Spill Plan, Safety Plan, Respiratory Protection Plan	Per treatment schedule
31	Post-treatment water sampling	24 hr + 4 wk post-treatment
32	Post-treatment bio-assay	3-8 week post-treatment
33	Post-treatment zooplankton sampling	6 + 12 month post-treatment
34	Post-treatment critique meeting	January
35	DJ Report to USFWS	January 28
36	Post-treatment reports to HQ coordinator	May 1
37	Post-treatment report to DOE	May 31

Appendix D – Public Involvement Information

All comments about the proposed permit must be received or postmarked by 5:00 p.m. on July 17, 2015, to be considered.

Ecology has tentatively determined to issue the Fisheries Management General Permit as identified in Special Condition S1. Permit Coverage.

Ecology will publish a Public Notice of Draft (PNOD) on June 3, 2015, in the Washington State Register. The PNOD informs the public that the draft permit and fact sheet are available for review and comment.

Ecology will also email the notice to those identified as interested parties.

Copies of the draft individual permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the Ecology offices listed below, may be obtained from Ecology's website, or by contacting Ecology by mail, phone, fax, or email.

Permit website:
http://www.ecy.wa.gov/programs/wq/pesticides/final_pesticide_permits/fish/fish_index.html

Ecology Headquarters street address:
300 Desmond Drive
Lacey, WA 98503

Contact Ecology:

Department of Ecology
Water Quality Program
Attn: Nathan Lubliner
PO Box 47696
Olympia, WA 98504-7696

Nathan Lubliner
Email: nathan.lubliner@ecy.wa.gov
Phone: 360-407-6563
Fax: 360-407-6426

Submitting Written and Oral Comments
Ecology will accept written comments on the draft Fisheries Management Individual Permit and Fact Sheet. Ecology will also accept oral comments at the public hearing on July 8, 2015, at the Moses Lake Fire Station 1 starting at 12:00 noon.

Comments should reference specific text when possible.

Ecology prefers comments be submitted by email to: nathan.lubliner@ecy.wa.gov.

Ecology must receive written comments via email or postmarked no later than 5:00 p.m. on July 17, 2015.

Submit written, hard-copy comments to:

Nathan Lubliner
Department of Ecology
PO Box 47696
Olympia, WA 98504-7696

You may also provide formal oral comments by testifying at the public hearing. Written comments will receive the same consideration as oral testimony.

Public Workshop and Hearing
Ecology will host one public workshop and hearing on the draft general permit at the location below. The workshop, held immediately prior to the public hearing, will explain the special conditions of the Fisheries Management Individual Permit and answer questions in order to facilitate meaningful testimony during the hearing. The hearing provides an opportunity for people to give formal oral testimony and comments on the proposed draft permit.

July 8, 2015 (12:00 noon)
Moses Lake:
Moses Lake Fire Station 1
701 E. Third Avenue
Moses Lake, WA 98837

Issuing the Final Permit
Ecology will issue the final permit after it receives and considers all public comments. Ecology expects to make a decision on whether to issue the general permit in summer 2015. It will be effective one month after the issuance date.

For further information, please contact Nathan Lubliner at nathan.lubliner@ecy.wa.gov or 360-407-6563, or by writing to Ecology at the Olympia address listed above.

Appendix E – Your Right to Appeal

You have a right to appeal this permit to the Pollution Control Hearings Board (PCHB) within 30 days of the date of receipt of the final permit. The appeal process is governed by RCW 43.21B and WAC 371-08. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal you must do the following within 30 days of receipt of this permit:

File your appeal and a copy of this permit with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
Serve a copy of your appeal and this permit on Ecology in paper form - by mail or in person (see addresses below). **Email is not accepted**.

You must also comply with other applicable requirements in RCW 43.21B and WAC 371-08.

ADDRESS AND LOCATION INFORMATION

Street Addresses	Mailing Addresses
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503	Department of Ecology Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608
Pollution Control Hearings Board 1111 Israel RD SW Suite 301 Tumwater, WA 98501	Pollution Control Hearings Board PO Box 40903 Olympia, WA 98504-0903

Appendix F – Response to Comments

Look for the Response to Comments document on the Fisheries Management Permit web page.
http://www.ecy.wa.gov/programs/wq/pesticides/final_pesticide_permits/fish/fish_index.html