

DOE'S AQUATIC PLANT AND ALGAE MANAGEMENT GENERAL PERMIT

Preface

This document contains the public comments of Don Russell in regard to the present draft of DOE's Aquatic Plant and Algae Management General Permit.

Specific Objection

The Permit's treatment of nutrient inactivation is not congruent with numerous relevant provisions of the Puget Sound Partnership Action Agenda, WACs, RCWs and ESSB 5699 in several respects. These are: (1) Nutrient inactivation is a Best Management Practice for restoring the natural function and value of phosphorus polluted and malfunctioning lakes; (2) nutrient inactivation applications do not constitute acts of pollution as defined by WAC 173-201A-020; (3) the listing of alum and calcium oxide, hydroxide and carbonate as the only approved nutrient inactivation products with all other nutrient inactivation products subject to the onerous, costly and time consuming provisions of S11. Conditional Approval for the Use of Products Not Specified in the Current Permit is contrary to the objective of incorporating all nutrient inactivation "Best Management Practices" into this Permit.

The following sections of this paper elaborate on each of these three points.

The Nature of Freshwater Toxic Algal Blooms and BMPs

Freshwater toxic algal blooms are the result of phosphorus polluted surface and ground water flowing into lakes (external loading) and the subsequent and recurring release of the phosphorus (internal loading) that is retained (as a result of past and continuing external loading) in lake bottom sediments. The consequence of internal and external phosphorus loading is the explosive increase in the population of cyanobacteria (blue-green algae). More often than not cyanobacteria produce potent liver and nerve toxins that, upon their ingestion or senescence, pose a serious health risk to humans, their pets and livestock, wildlife and fish. Nutrient inactivation treatments are applied to prevent the consequence of phosphorus pollution of lakes, i.e., toxic cyanobacteria blooms. As such nutrient inactivation treatments function to restore the natural function and value of phosphorus polluted (impaired) lakes. That nutrient inactivation treatments are considered acts of pollution by DOE is an oxymoron. This raises the question of why nutrient inactivation treatments are listed as acts of pollution under DOE's current and proposed Aquatic Plant and Algae Management Permit.

For over a hundred years the salts of aluminum, calcium and iron and zero valence iron have been used successfully to remove suspended matter and soluble pollutants from domestic water supplies. It was aluminum sulfate's (alum's) use for domestic water purification purposes that gave rise to the idea that it could also be used to prevent toxic cyanobacteria blooms in lakes by inactivating the accumulated phosphorus in lake bottom sediments. DOE accepted the notion (and included alum in its NPDES permit) that such

an application would inactivate the nutrient (phosphorus) that caused toxic cyanobacteria blooms without requiring a rigorous, time consuming and costly proof of concept study and experimentation. Why then is DOE requiring a rigorous, time consuming and costly proof of concept study and experimentation before iron salts and zero valence iron can be applied to address the problems caused by phosphorus pollution of our lakes? There already exist numerous and exhaustive USGS reports that attest to the success of the application of zero valence iron in inactivating the phosphorus contained in the groundwater flowing into Ashumet Pond in Massachusetts. This Pond is typical of conditions that now exist in many of the cyanobacteria infested groundwater fed lakes located in the Puget Sound Basin.

Funding for studies required by S11. Conditional Approval for the Use of Products Not Specified in the Current Permit on the efficacy of iron salts and zero valence iron to inactivate phosphorus are simply not available, nor I presume is DOE staff personnel or time available to review and approve plans for the application of known, proven and relatively inexpensive nutrient inactivation treatments.

It is my recommendation that the DOE reconsider imposing the burden on citizens having to prove to the DOE what is already known about the efficacy of iron salts and its elemental form (zero valence iron) to inactivate the nutrients that are the proximate cause of toxic freshwater algal blooms. This can be done very simply by either removing nutrient inactivation treatments from DOE's Aquatic Plant and Algae Management General Permit altogether, or, by including (based upon current knowledge and research) iron salts and zero valence iron nutrient inactivation treatments in DOE's Permit.

I suggest that DOE borrow nutrient inactivation language, including iron, from The Practical Guide to Lake Management in Massachusetts, pages 67 through 70. It can be accessed at the following website:

<http://www.mass.gov/dcr/watersupply/lakepond/downloads/practical_guide.pdf>

Applicable RCWs, WACs and Puget Sound Partnership Provisions

RCW 90.48.010 Policy enunciated

It is declared to be the public policy of the state of Washington to maintain the highest possible standards to insure the purity of all waters of the state consistent with public health and public enjoyment thereof, the propagation and protection of wild life, birds, game, fish and other aquatic life, and the industrial development of the state, and to that end require the use of all known available and reasonable methods by industries and others to prevent and control the pollution of the waters of the state of Washington. Consistent with this policy, the state of Washington will exercise its powers, as fully and as effectively as possible, to retain and secure high quality for all waters of the state.

RCW 90.48's focus is on preventing the loss of natural function and value that the introduction of pollutants can have on waters of the state. Application of pesticide products (e.g. herbicides and algaecides) can have adverse impacts on water quality of lakes that are naturally functioning (albeit with excessive aquatic plant and beneficial algae population growth) and therefore their application should be governed by provisions of DOE's Aquatic Plant and Algae Management General Permit. However lakes that malfunction because of excessive external or internal phosphorus loading are polluted and need to be treated to restore their natural function. Nutrient inactivation products negate the adverse impact (cyanobacteria blooms) on lakes caused by external and internal phosphorus (a pollutant) loading and therefore should not be considered as pollutants under the jurisdiction and provisions of DOE's Aquatic Plant and Algae Management General Permit.

WAC 173-201A-020 Definition of Pollution

***"Pollution"** means such contamination, or other alteration of the physical, chemical, or biological properties, of any waters of the state, including change in temperature, taste, color, turbidity, or odor of the waters, or such discharge of any liquid, gaseous, solid, radioactive, or other substance into any waters of the state as will or is likely to create a nuisance or render such waters harmful, detrimental, or injurious to the public health, safety, or welfare, or to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses, or to livestock, wild animals, birds, fish, or other aquatic life.*

DOE places heavy emphasis on the first half of this definition as justification for including nutrient inactivation treatments as acts of pollution without regard to the latter half of this definition (underlined). Nutrient inactivation treatments are designed and applied to bring phosphorus impaired (303 (d) listed) lakes back into compliance with **WAC 173-201A-010** which states:

- (1) *The purpose of this chapter is to establish water quality standards for surface waters of the state of Washington consistent with public health and public enjoyment of the waters and the propagation and protection of fish, shellfish, and wildlife, pursuant to the provisions of chapter 90.48 RCW. All actions must comply with this chapter.*

A complement to **WAC 173-201A-010** is **WAC 173-201A-300** which states:

- (1) *The antidegradation policy is guided by chapter 90.48 RCW, Water Pollution Control Act, chapter 90.54 RCW, Water Resources Act of 1971, and 40 CFR 131.12.*
- (2) *The purpose of the antidegradation policy is to:*
 - (a) *Restore and maintain the highest possible quality of the surface waters of Washington;*

(3) *Habitat restoration. Both temporary harm and permanent loss of existing uses may be allowed by the department where determined necessary to secure greater ecological benefits through major habitat restoration projects designed to return the natural physical structure and associated uses to a water body where the structure has been altered through human action.*

A phosphorus polluted lake can be restored by nutrient inactivation treatments so as ...to return the natural physical structure and associated uses to a water body where the structure has been altered [by phosphorus pollution] through human action.

A Legislative Mandate Regarding Toxic Algae Blooms

ENGROSSED SUBSTITUTE SENATE BILL 5699

AN ACT Relating to preventing and controlling aquatic invasive species and algae

The legislature finds that aquatic invasive species and freshwater aquatic algae are causing economic, environmental, and public health problems that affect the citizens and aquatic resources of our state. The legislature also finds that freshwater algae, particularly blue-green algae, are also seriously degrading the water quality and recreational value of a number of our lakes. Blue-green algae can produce toxins that inhibit recreational uses and pose a threat to humans and pets. It is therefore the intent of the legislature to clarify the roles of the different state agencies involved in these issues in order to address the threat of aquatic invasive species and the problem caused by aquatic freshwater algae, and to provide a dedicated fund source to prevent and control further impacts.

Funds in the aquatic invasive species prevention account must be expended as follows:

(e) To implement an aquatic invasive species early detection and rapid response plan.

(2) Funds in the freshwater aquatic algae control account may be appropriated to the department to develop a freshwater aquatic algae control program. Funds must be expended as follows:

(a) As grants to cities, counties, tribes, special purpose districts, and state agencies to manage excessive freshwater algae, with priority for the treatment of lakes in which harmful algal blooms have occurred within the past three years; and

(b) To provide technical assistance to applicants and the public about aquatic algae control.

(3) The department shall submit a biennial report to the appropriate legislative committees describing the actions taken to implement this section along with suggestions on how to better fulfill the intent of this act.

The Legislature is clear on the subject of freshwater toxic algal blooms. The DOE has been mandated to act to manage and control freshwater toxic algal blooms. The only way to do this is to either prevent phosphorus pollution of lakes from nonpoint sources of pollution in their watersheds in the first place or, lacking that, treat phosphorus polluted lakes to bring them back into compliance with state surface water quality standards, i.e., *WAC 173-201A*. It follows that a full suite of known and proven nutrient inactivation treatments should be included in the Aquatic Plant and Algae Management General Permit.

Puget Sound Partnership's Advocacy in Regard to This Issue

More than 1000 freshwater lakes and streams are classified as "impaired" and low oxygen conditions are increasingly frequent in Puget Sound marine waters. [Page 24 of the PSP's Action Agenda]

PSP's five priority strategies are: *Protect, Restore, Prevent water pollution at its source, Work together, Build and implementation, monitoring, and accountability management system.* [Page 29-30 of PSP Action Agenda]

Priority D: Work effectively and efficiently together on priority actions D.4 Reform the regulatory system to protect habitat at an ecosystem scale. The regulatory system that exists in Washington is fragmented. Regulatory authority has been vested in many different agencies at the federal, state, and local level, which can lead to multiple layers of regulation and reviews, conflicting requirements, and an incoherent approach to protecting [and restoring] the entire spectrum of ecosystem process, structures, and functions. Reforming the environmental regulatory system will provide more certainty that important ecosystem-forming processes remain intact, and should result in a more efficient, predictable permitting system for consumers. [Page 64 of PSP's Action Agenda]

D.4.1 Align federal, state, and local agency regulatory programs in Puget Sound to improve coordination, efficiency, and effectiveness of implementation. This means identifying overlapping authority and conflicts, and amending, realigning, or eliminating programs, laws, and regulations that are not resulting in desired outcomes.

D.4.1.5 Create and implement a streamlined permitting process for habitat restoration projects. [Page 65 of PSP's Action Agenda]

Conclusion

The legislature finds that aquatic invasive species and freshwater aquatic algae are causing economic, environmental, and public health problems that affect the citizens and aquatic resources of our state. The legislature also finds that freshwater algae, particularly blue-green algae, are also seriously degrading the water quality and recreational value of a number of our lakes. Blue-green algae can produce toxins that inhibit recreational uses and pose a threat to humans and pets. It is therefore the intent of

the legislature to clarify the roles of the different state agencies involved in these issues in order to address the threat of aquatic invasive species and the problem caused by aquatic freshwater algae, and to provide a dedicated fund source to prevent and control further impacts.

The intent and language of the nutrient inactivation sections of DOE's Aquatic Plant and Algae Management General Permit is presently incongruent with the intent and language of the Legislature's mandate to DOE in regard to control of freshwater toxic algal blooms and relevant provisions of the WAC, RCW and PSP excerpts (in *italics*) cited above and therefore should be rewritten to both comply with the intent and language of these mandates and facilitate, rather than impede, application of all Best Management Practice products for the inactivation of phosphorus. These products include zero valence aluminum, aluminum sulfate, sodium aluminate, calcium oxide, calcium hydroxide, calcium carbonate, zero valence iron, iron chloride, and iron sulfate. The S11 Conditional Approval for the Use of Products Not Specified in the Current Permit should only apply to products other than those listed above, all of which are well known, established and proven Best Management Practice for the inactivation of phosphorus.

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