Public Hearing (12/15/10)
CEC – Recycled Water
Deadline: 1/10/11 by 12 noon

commentletters - Comment Letter - CEC Monitoring for Recycled Water

From: John Ackerman <jma439@gmail.com>
To: commentletters <commentletters@waterboards.ca.gov>
Date: Sunday, December 12, 2010 7:30 AM
Subject: Comment Letter - CEC Monitoring for Recycled Water

RECEIVED
DEC 12 2010
SWRCB EXECUTIVE

Jeanine Townsend, Clerk to the Board
State Water Resources Control Board
1001 I Street, 24th Floor
Sacramento, CA 95814
Re: Addendum 2. to initial Public Comment emailed to you on 12-03-10 re: Dec. 15, 2010 Public Comment session in Sacramento
From: John M. Ackerman, M.D.

Dear Ms. Townsend:

Please include this article as: The Second Addendum to our Initial Public Comment emailed to you on 12-03-10.

Please confirm receipt and that all 3 entries (Initial Public Comment plus Addendum 1. and Addendum 2.) are entered into the Public Record.

You will also receive these 3 entries by certified mail with request for signature on receipt.

Thank you very much.

Respectfully,

John M. Ackerman, M.D.

http://www.ncbi.nlm.nih.gov/pubmed/19321192
>
Sci Total Environ. 2009 Jun 1;407(12):3702-6. Epub 2009 Mar 24.
Wastewater treatment contributes to selective increase of antibiotic resistance among Acinetobacter spp.
Zhang Y, Marrs CF, Simon C, Xi C.
Department of Environmental Health Sciences, University of Michigan, Ann Arbor, USA.
Abstract

The occurrence and spread of multi-drug resistant bacteria is a pressing public health problem. The emergence of bacterial resistance to antibiotics is common in areas where antibiotics are heavily used, and antibiotic-resistant bacteria also increasingly occur in aquatic environments. The purpose of the present study was to evaluate the impact of the wastewater treatment process on the prevalence of antibiotic resistance in Acinetobacter spp. in the wastewater and its receiving water. During two different events (high-temperature, high-flow, 31 degrees C; and low-temperature, low-flow, 8 degrees C), 366 strains of Acinetobacter spp. were isolated from five different sites, three in a wastewater treatment plant (raw influent, second effluent, and final effluent) and two in the receiving body (upstream and downstream of the treated wastewater discharge point). The antibiotic susceptibility phenotypes were determined by the disc-diffusion method for 8 antibiotics, amoxicillin/clavulanic acid

(AMC), chloramphenicol (CHL), ciprofloxacin (CIP), colistin (CL), gentamicin (GM), rifampin (RA), sulfisoxazole (SU), and trimethoprim (TMP). The prevalence of antibiotic resistance in Acinetobacter isolates to AMC, CHL, RA, and multi-drug (three antibiotics or more) significantly increased ($p<0.01$) from the raw influent samples (AMC, 8.7%; CHL, 25.2%; RA, 63.1%; multi-drug, 33.0%) to the final effluent samples (AMC, 37.9%; CHL, 69.0%; RA, 84.5%; multi-drug, 72.4%), and was significantly higher ($p<0.05$) in the downstream samples (AMC, 25.8%; CHL, 48.4%; RA, 85.5%; multi-drug, 56.5%) than in the upstream samples (AMC, 9.5%; CHL, 27.0%; RA, 65.1%; multi-drug, 28.6%). These results suggest that wastewater treatment process contributes to the selective increase of antibiotic resistant bacteria and the occurrence of multi-drug resistant bacteria in aquatic environments.
PMID: 19321192 [PubMed - indexed for MEDLINE]
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Most infections occur in immunocompromised individuals, and the strain *A. baumannii* is the second most commonly isolated nonfermenting bacteria in human specimens.

Acinetobacter is frequently isolated in nosocomial infections and is especially prevalent in intensive care units, where both sporadic cases as well as epidemic and endemic occurrence is common. *A. baumannii* is a frequent cause of nosocomial pneumonia, especially of *late-onset* ventilator associated pneumonia. It can cause various other infections including skin and wound infections, bacteremia, and meningitis, but *A. lwoffi* is mostly responsible for the latter. *A. baumannii* can survive on the human skin or dry surfaces for weeks.

Since the start of the Iraq War, over 700 U.S. soldiers have been infected or colonized by *A. baumannii*. Four civilians undergoing treatment for serious illnesses at Walter Reed Army Medical Center in Washington, D.C., contracted *A. baumannii* infections and died. At Landstuhl Regional Medical Center, a U.S. military hospital in Germany, another civilian under treatment, a 63-year-old German woman, contracted the same strain of *A. baumannii* infecting troops in the facility and also died. These infections appear to have been hospital acquired. [1] Based on genotyping of *A. baumannii* cultured from patients prior to the start of the Iraq War it is likely the soldiers contracted the infections while hospitalized for treatment in Europe.

[edit] Treatment

Acinetobacter species are innately resistant to many classes of antibiotics, including penicillin, chloramphenicol, and often aminoglycosides. Resistance to fluoroquinolones has been reported during therapy and this has also resulted in increased resistance to other drug classes mediated through active drug efflux. A dramatic increase in antibiotic resistance in *Acinetobacter* strains has been reported by the CDC and the carbapenems are recognised as the gold-standard and treatment of last resort.[4]
Acinetobacter species are unusual in that they are sensitive to sulbactam; sulbactam is most commonly used to inhibit bacterial beta-lactamase, but this is an example of the antibacterial property of sulbactam itself.
[5]

In November, 2004, the CDC reported an increasing number of *A. baumannii* bloodstream infections in patients at military medical facilities in which service members injured in the Iraq/Kuwait region during Operation Iraqi Freedom (OIF) and in Afghanistan during Operation Enduring Freedom (OEF) were treated.[6] Most of these were multidrug-resistant. Among one set of isolates from Walter Reed Army Medical Center, 13 (35%) were susceptible to imipenem only, and two (4%) were resistant to all drugs tested. One antimicrobial agent, colistin (polymyxin E), has been used to treat infections with multidrug-resistant *A. baumannii*; however, antimicrobial susceptibility testing for colistin was not performed on isolates described in this report. Because *A. baumannii* can survive on dry surfaces for up to 20 days, they pose a high risk of spread and contamination in hospitals, potentially putting immune-compromised and other patients at risk for drug-resistant infections that are often fatal and, in general, expensive to treat.

Comments, Draft Spray Applications Permit

11 December 2010

State Water Resources Control Board
commentletters@waterboards.ca.gov

Re Draft Spray Applications Permit

Following are comments on behalf of Public Employees for Environmental Responsibility, a national non-profit environmental group. It is PEER's position that the Draft General Permit perpetuates experiments on introduction of toxic compounds into the environment that are poorly conceived and inadequately monitored. The general discrepancies of the subject document are presented first, followed by specific comments keyed to the text of the Draft proposal.

GENERAL COMMENTS

Although the Permit Application is addressed to a body with jurisdiction over water quality issues and is narrowly focused on monitoring and preventing surface water quality degradation in California, approval of the use of pesticides discussed herein perpetuates broad-scale application of these toxics into non-aquatic environments with no assessment of potential impacts or monitoring to assess actual impacts to non-aquatic ecosystems.

The Bureau of Land Management is currently embarked on a 17 western states, including California, program of vegetation manipulation by use of pesticides (Programmatic Environmental Impact Statement, Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States). This program is not mentioned in the Draft Spray Applications Permit, nor is there any recognition of need for agency coordination.

The idea that pesticide use according to label instructions "...will cause no harm or adverse impact on non-target organisms that cannot be reduced or mitigated with protective measures or use restrictions" is in essence based on faith in the absence of full information on the composition of the pesticides, including "inert" components, which are trade secrets. Potential additive or synergistic effects of combinations of constituents in the pesticides, their breakdown products, and the environment to which they are discharged are grossly ignored in this document.

Threats from discharge of residual pesticides to surface waters throughout California to beneficial uses of those waters cannot be "properly controlled and regulated" in the absence of even elementary knowledge of the compositions of the pesticides or of their interactions with other components of the environment. Of the 16 pesticides discussed in detail, only one had even a rudimentary assessment of ambient water quality that could be used to provide monitoring triggers. The result is that monitoring triggers default to an arbitrary $1/10^{th}$ of lowest LC50 values.

All of the toxicity data provided on the 16 pesticides discussed in detail are based on single-pesticide experiments with one or more of six aquatic organisms. The data are mostly older than 16 years, and as old as 37 years. With one exception of deliberately mixed pesticides, no experiments are reported for mixtures of pesticides, and receiving waters are not analyzed for other pesticides with which discharged ones may mix with additive or synergistic effects. Discussions of toxicity supported by experiments commonly are extrapolated to non-aquatic organisms exposed to the pesticides by implication.

COMMENTS KEYED TO TEXT

H. Receiving Water Monitoring Triggers

p. 9-10. It is stated that since information regarding residual pesticides deposited in the receiving water…is not adequate to develop receiving water limitations for individual and combinations of pesticides, this General Permit only contains receiving water monitoring triggers for residual pesticides of concern.

Comment: pesticides not reaching concern level may contain "inerts" that are of concern (Holly Knight and Caroline Cox, Worst Kept Secrets: Toxic Inert Ingredients in Pesticides, Northwest Coalition for Alternatives to Pesticides, 1998; U.S. Environmental Protection Agency, Inert (Other) Pesticide Ingredients in Pesticide Products—Categorized List of Inert (Other) Pesticide Ingredients, 2005; of 2,500 inert ingredients listed, 394 are or have been listed as active ingredients in other products, 209 of those are hazardous air and water pollutants, 14 are extremely hazardous, 84 must be reported to EPA's Toxics Release Inventory, and 21 are known or suspected human carcinogens. See Howard Wilshire and others, The American West at Risk: Science, Myths, and Politics of Land Abuse and Recovery (New York, Oxford University Press 2008) Chapter 2, Box 2.1, 66-67).

E, H. Toxic Pollutants, Aquatic Communities

p. 13 E, H. Comment: If, in general, potentially detrimental effects of combinations of pesticide residues or with pollutants in the receiving waters are unknown, prohibiting them from receiving waters is an exercise in futility

VII. Receiving Water Monitoring Triggers

p. 13, Table 3. Comment: These are solely single-pesticide triggers, not accounting for potential combinations

C. Pesticide Application Plan (PAP)

p. 15. Comment: PAP elements for off-target drift (8, 9) are loose, particularly if aerial spraying is used. Drift of aerosols can be long distance, eliminating or substantially circumscribing knowledge of the fate of the pesticides.

ATTACHMENT C – MONITORING AND REPORTING PROGRAM

p. C-2. Program is designed to address two key questions:

Question 1. Does the pesticide residue from applications cause an exceedance of receiving water limitations or monitoring triggers?

Question 2. Does the pesticide residue, including active ingredients, inert ingredients, and degradates, in any combination cause or contribute to an exceedance of the "no toxics in toxic amount" narrative toxicity objective?

Comment: The paucity of information on the nature of inert ingredients, degradates of active and inert ingredients, and combinations severely limit answers to these questions. Furthermore, it is not clear whether characterization of receiving waters includes measurement of the concentrations of these constituents or their interactions with discharged residues.

B. Monitoring Requirements

p. C-7. Item 3 under PAP logical framework. Comment: knowledge of the mechanisms of transport, fate, and effects of pesticides commonly is insufficient—worst case scenario cannot, in general, be specified in the absence of pesticide-specific component and breakdown product combinations

ATTACHMENT D—FACT SHEET

Pesticide Program Descriptions

California Department of Food and Agriculture (CDFA) Programs

p. D-8.A. Invasive Insect Control. CDFA's beetle program uses products such as Sevin SL (active ingredient carbaryl) and Merit 75 WSP (active ingredient imidacloprid).
Comment: What other pesticides are used and what are their active and inert ingredients. No toxicity summary is provided for carbaryl

p. D-8. A. Invasive Insect Control. Beef curly top virus control, sugar beets and other crops. Program uses Fyfanon ULV AG (malathion), aerially and ground
Comment: no toxicity summary is provided for malathion

p. D-10. Fruit Fly Program. CDFA uses GF-120 NR Naturalyte (active ingredient: spinosad} and Sevin SL (active ingredient carbaryl), hand spray application. For aerial spray bate, Entrust and Success (active ingredient spinosad) used
Comment: no toxicity summary provided for spinosad or carbaryl

p. D-12. Noxious Weeds Control. Program mainly uses herbicide products with active ingredients aminopyralid, clopyralid, and glyphosate
Comment: no toxicity summary provided for glyphosate

USFS Program Description

p. D-12, 13. Large-area aerial spraying, mainly to control two insects: Douglas Fir Tussock Moth and gypsy moth. DFTM control uses TM-Biocontrol, bio-insecticide, preferred to Btk because it is more host-specific than Btk. Ground treatment for prevention of bark beetle uses insecticides with active ingredients bifenthrin and carbaryl, high-pressure spray guns.

Comment: no toxicity summary for carbaryl; no description of gypsy moth treatments

p. D-16. Adulticides control mature invasive insects—necessary because larvicides not 100% effective. "Chemical pest control is implemented when necessary."

Comment: do not say what substances are used, or identify chemicals used "when necessary"

RATIONALE FOR RECEIVING WATER LIMITATIONS AND MONITORING TRIGGERS

Comment: Considering that the dominant uses of the pesticides discussed in modest detail in following sections are for terrestrial non-aquatic environments, creation of monitoring triggers only for receiving waters of pesticide residues is extremely narrow. This is not consistent with the rationalizations used to justify monitoring triggers on the basis of "safe use in the environment" and the like. The toxicity data provided are confined entirely to a restricted number of aquatic organisms using two to six organisms, always the same, for all pesticides for which toxicity data are provided. Toxicity measurements are all performed as single pesticide formulations with generally no information at all available on effects of mixtures (except for one case where a synergist is deliberately used to enhance active ingredient effects). Description of effects of pesticides on target organisms is spotty, and essentially no useful information is provided for impacts on non-target organisms. Unreasonable claims are made for pesticides that have been in use for long periods (20 years and more) suggesting their use has not harmed wildlife without citing a shred of supporting evidence. There is no discussion whatsoever of the potential for creation of pesticide-resistant organisms by long-term or heavy use of pesticides [see, Howard Wilshire and others The American West at Risk: Science, Myths, and Politics of Land Abuse and Recovery (New York, Oxford University Press 2008), Chapter 2, 55]. Only one of the pesticides (of concern?) listed has any ambient water quality information for use in establishing triggers, so that an arbitrary default value of 1/10th of the lowest LC50 value is used. Supposedly the lowest LC50 value is to include "inerts" but only one such value for one formulation is presented. It seems likely that such values for the trade secret inerts are not known, adding to the arbitrary quality of the triggers used. Of course, if the "inerts" were inert, they would have no LC50 values, but there is much evidence that many pesticide formulations contain active "inerts" [see Howard Wilshire and others, The American West at Risk: Science, Myths, and Politics of Land Abuse and Recovery (New York, Oxford University Press 2008), Chapter 2, Box 2.1, 66-67]

Establishing Receiving Water Monitoring Triggers

p. D-27. '…residual pesticides may cause toxicity to aquatic life. However, information regarding residual pesticides deposited in receiving water as a result of spray applications is not adequate to develop receiving water limitations for individual and combinations of pesticides;

therefore, this General Permit only contains Receiving Water Monitoring Triggers. The monitoring triggers will be used to assess compliance with the narrative toxicity receiving water limitation and initiate additional investigations for the causes of toxicity caused by pesticides used and their additiuve or synergistic effects." [emphasis added]

Comment: That is, studies will be conducted after the fact of pollution that might compromise the beneficial uses of receiving waters.

p. D-27. "This General Permit includes an Instantaneous Maximum Receiving Water Monitoring for residual pesticides of concern."

Comment: Thus leaving the barn door open for unrecognized pesticide ingredients of equal or greater water quality issue to "pesticides-of-concern", and emerging toxic pesticide formulations.

p. D-27. For constituents lacking Ambient Water Quality Criteria, the Instantaneous Maximum Receiving Water Monitoring Trigger is [arbitrarily] set at 1/10th the lowest 50 Percent Lethal Concentration from the Ecotoxicity Database.

Comment: Thus, offering no guarantee of compliance with the narrative toxicity receiving water limitation.

Larvicides

Micrrobial Larvicides

p. D-28. USEPA considers Btk has minimal to zero risk to nontarget organisms. A label limitation needed because of limited data. RWMT not required

Comment: Non requirement of RWMT is not justified if the data supporting EPA's opinion is limited.

p. D-28, 29. NPV virus affects dominantly moths and butterflies. NPV is active ingredient in bio-pesticide, such as TM Biocontrol for crops infested by insects, such as Douglas-fir tussock.

p. D-29. Baculoviruse pathogens that attack insects and other arthropods. The majority of baculoviruses used as biological control agents are in genus NPV.

Comment: What other pathogens than the one discussed are used, and with what effects?

p. D-29. NPV use "in control of Douglas-fir tussock moth can be expected to result in exposure to a wide variety of birds, mammals, fish, aquatic invertebrates, and non-target insects. However, the submitted studies [by manufacturer], scientific literature and twenty years of use of NPV as active ingredient in bio-pesticides for controlling Douglas-fir tussock moth indicate no adverse effects on non-target wildlife, including endangered species."

Comment: To carry any weight, all relevant studies and their limitations must be cited. The claim that 20 years of use has had no adverse effects on wildlife is not credible unless monitoring that is specifically relevant to exposed species is presented. Agency monitoring for such programs as this one envisions are notoriously lacking in effective protocols for assessing wildlife impacts. For example, the Bureau of Land Management routinely states in Records of Decision that monitoring of pesticide and other treatment impacts will be done. Most recently in the Bureau's 17-state vegetation treatment plan it is specifically claimed to be based on monitoring results from past studies [Howard Wilshire, Comments on Draft Programmatic Environmental Impact Statement, Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States, January 7, 2006]. The past studies included the 1991 13-state 10-year program that utilized an array of herbicides. The only "monitoring" done in that 10-year program was a partial list of the types and amounts of herbicides applied, and acreages treated—zero information on biological impacts [Howard Wilshire and others, The American West at Risk: Science, Myths, and Politics of Land Abuse and Recovery, New York, Oxford University Press 2008, Chapter 3, Endnotes 37, 38].

Comment: Issuing this General Permit without a Receiving Water Monitoring Trigger and not requiring monitoring for NPV is unjustified by the unsupported claims made on its behalf.

p. D-30. Spinosad is a naturally occurring insecticide. Because spinosad strongly adsorbs to most soils, it does not leach through soil to groundwater

Comment: this statement implies that some soils do not adsorb spinosad and therefore may transmit the pesticide to groundwater. Furthermore, it is known that soils (and rocks) may shed colloids (soil and mineral particles) into macropores (e.g., fractures) and transport contaminants adsorbed by them to groundwater [see Howard Wilshire and others, The American West at Risk: Science, Myths, and Politics of Land Abuse and Recovery (New York, Oxford University Press 2008) Chapter 7, Box 7.2 201-202]

p. D-30. Issuing this General Permit without a Receiving Water Monitoring Trigger and not requiring monitoring for spinosad is unjustified by the unsupported claims made on its behalf.

Adulticides

Light Brown Apple Moth (LBAM) Pheromone Blend

p. D-31. Adverse effects on non-target organisms are not expected because the pheromones are released in very small quantities and act on a select group of insects, such as LBAMs. Appropriate precautionary labeling of end use products will further minimize potential exposure and mitigate risk to non-target organisms.

Comment: Issuing this General Permit without a Receiving Water Monitoring Trigger and not requiring monitoring for pheromone blend is unjustified by the unsupported claims made on its behalf.

Organophosphate (OP) Insecticides

p. D-31, 32, 33. Malathion is an ultra-low volume, fine aerosol spray that stays aloft for long periods. Ground and aerial applications. "Malathion runoff and spray drift may reach drinking water sources downstream from where the malathion was used."

Comment: this discussion has a notable lack of information on impacts of malathion and malaoxon on non-target organisms.

p. D-33, 34. Naled is an organophosphate ultra-low volume, fine aerosol spray that is potentially lethal to humans, has potential for risks to invertebrates, and is highly toxic to insects such as honeybees. Mainly used for mosquito control, but also used on food and feed crops and in greenhouses.

Comment: No description of application methods is given.

p. D-34, 35. Table D-1, summary of toxicity data for Naled. Ambient water quality data unavailable, so General Permit arbitrarily sets Instantaneous Maximum Receiving Water Monitoring Trigger at 1/10th of the lowest LC50 value.

Comment: Data, mostly short duration exposure, limited to 6 types of aquatic organisms; data are mostly 20 years old or older. Continued use of this highly toxic organophosphate pesticide is not warranted by the limited data available on its impacts on non-target organisms.

p. D-35. Pyrethrin, used for mosquito control, has short life expectancy in water (<34 hours) aerially sprayed according to one study, but sediments adjacent to creeks retained pyrethrin for at least 8 days.

Comment: No information given on non-target impacts

p. D-35, 36. Table D-2, summary of toxicity data for pyrethrin.

Comment: Data, mostly short duration exposure, limited to 6 types of aquatic organisms; data are mostly 15-20 years old or older. Ambient water quality data unavailable, so General Permit arbitrarily sets Instantaneous Maximum Receiving Water Monitoring Trigger at 1/10th of the lowest LC50 value.

p. D-37, 38. Bifenthrin is a pyrethroid insecticide registered for indoor and outdoor residential and commercial areas and agricultural and livestock commodities. Used to control variety of insects including aphids, worms, ants, gnats, beetles, grasshoppers, mites, etc. Bifenthrin is highly toxic on an acute and chronic basis to freshwater fish and aquatic-phase amphibians, and highly toxic to freshwater aquatic invertebrates. Also highly toxic to estuarine/marine fish and invertebrates on an acute basis.

p. D-38. Table D-3, summary of toxicity data for bifenthrin.

Comment: Data on 7 aquatic organisms all older than 20 years. Ambient water quality data unavailable, so General Permit arbitrarily sets Instantaneous Maximum Receiving Water Monitoring Trigger at 1/10th of the lowest LC50 value.

p. D-38. Cyfluthrin is a pyrethroid insecticide that is highly toxic to fish. Used to control chewing and sucking insects such as cutworms, ants, silverfish, cockroaches, termites, grain beetles, mosquitoes, fleas, flies, etc. Highly toxic to marine and freshwater organisms. Breaks down quickly in surface water. Relatively nonsoluble, light so floats. Breaksdown in sunlight in 1 day. Tendency to strongly sorb to suspended sediment and dissolved organic materials, probably reduces cyfluthrin's bioavailability

Comment: Strong sorption to sediments does not reduce cyfluthrin's bioavailability to bottom dwelling aquatic organisms, and the comment that "the extent to which bioavailability is mitigated and the aquatic toxicity of a hydrophobic pyrethroid is reduced in the water column or in sediments is uncertain" is well taken.

p. D-38, 39. Table D-4, summary of toxicity data for Cyfluthrin.

Comment: Data for only 5 aquatic organisms all data 15-20 years old or older. Ambient water quality data unavailable, so General Permit arbitrarily sets Instantaneous Maximum Receiving Water Monitoring Trigger at 1/10th of the lowest LC50 value. Continued use of this highly toxic synthetic pesticide is not warranted by the very limited data on impacts to non-target organisms.

p. D-40. Lambda Cyhalothrin is a broad spectrum pyrethroid insecticide used to control plant sucking bugs such as aphids, beetle adults, and larvae and leaf eating Lepidoptera.

Comment: No information is given on effects of this insecticide on non-target organisms.

p. D-40, 41, Table D-5, summary of toxicity data for Lambda Cyhalothrin.

Comment: Data on 7 aquatic organisms are mostly 15-20 years old or older. Ambient water quality data unavailable, so General Permit arbitrarily sets Instantaneous Maximum Receiving Water Monitoring Trigger at 1/10th of the lowest LC50 value. Continued use of this broad-spectrum pyrethroid insecticide with so little information on its effects on non-target organisms appears unwarranted.

p. D-41. Piperonyl Butoxide (PBO) is a synergist used to increase potency of insecticides like pyrethrins and pyrethroids. One of the commonest ingredients used in household pesticide products. Symptoms of PBO poisoning include anorexia, vomiting, diarrhea, intestinal inflammation, pulmonary hemorrhage and perhaps mild central nervous system depression. It is a possible human carcinogen. Persists in agricultural soils up to 30 days. In water, PBO half life is ~1 day, in sediment up to 24 days and PBO persisted up to 120 days. Aerial spraying resulted in PBO detection in every creek sample at concentrations of 0.44 micrograms/L to 3.92; other study found 4 microgr/L, with one sample at 20 microgr/L; also present in soils. Greatest risk of aerial spraying is synergistic effect on pesticides already present in the environment.

p. D-42, 43. Table D-6, summary of toxicity data for PBO.

Comment: Data on 6 aquatic organisms are 15-20 years old or older. Ambient water quality data unavailable, so General Permit arbitrarily sets Instantaneous Maximum Receiving Water Monitoring Trigger at 1/10th of the lowest LC50 value.

p. D-43, Table D-7, summary of toxicity data for PBO in PBO/Pyrethrin mixture.

Comment: Data on only 3 aquatic organisms are 16 to 35 years old. No information is provided on impacts on any organisms. Ambient water quality data unavailable, so General Permit arbitrarily sets Instantaneous Maximum Receiving Water Monitoring Trigger at 1/10th of the lowest LC50 value. The list of potential effects of PBO poisoning would seem sufficient to prohibit its use in household pesticide products. In view of the absence of information on impacts on non-target organisms as well as environmental persistence continued use of this synergist and mixtures with pyrethrin pesticides should be questioned.

p. D-43, 44. Carbaryl is the active ingredient for insecticides used to control more than 100 species of insects on citrus, fruit, cotton, forests, lawns, nuts, ornamentals, shade trees, and other crops, as well as on poultry, livestock, and pets. It is highly toxic to honey bees and many other beneficial insects and mites. Carbaryl has half life of 7 days in aerobic soils, 28 days in anaerobic soils. Half life from 1 to 32 days in pond water. USEPA has an old water quality criterion for fresh water aquatic life protection of 0.2 microgr/L, but not repeated in current list of recommended criteria. Now uses 2.53 microgr/L based on CA Fish and Game criterion. This General Permit has an Instantaneous Maximum Receiving Water Monitoring Trigger of 2.53 microgr/L.

Comment: No information is provided on the effects of carbaryl on non-target organisms, except to note that it is highly toxic to many beneficial insects and mites. This along with the major discrepancy between older and current water quality criteria should make use of this pesticide problematic.

p. D-44, 45. Esfenvalerate is a synthetic pyrethroid insecticide that has very low solubility in water and a strong tendency to sorb to soil particles. It is therefore expected to be relatively immobile in soil and to show a low tendency to leach. Esfenvalerate is a broad-spectrum nonselective insecticide used for control of a wide selection of arthropod pests. Esfenvalerate is extremely toxic to aquatic organisms, but this may be mitigated by the strong tendency to adsorb to suspended soil particles in the water column

Comment: Substances that sorb to soil particles can be carried long distances by colloids through fast-track avenues (macropores) through soil and rock such as fractures (see Howard Wilshire and others, The American West at Risk: Science, Myths, and Politics of Land Abuse and Recovery (New York, Oxford University Press 2008) Chapter 7, Box 7.2 and cited references).

p. D-45. Table D-8, summary of toxicity data for Esfenvalerate.

Comment: Data provided for only 3 aquatic organisms. Data 16 to 23 years old. Ambient water quality data unavailable, so General Permit arbitrarily sets Instantaneous Maximum Receiving Water Monitoring Trigger at 1/10th of the lowest LC50 value. The extremely limited information provided on non-target impacts of this broad-spectrum insecticide call into question its continued use.

p. D-45, 46. Acetamiprid is a neonicotinoid insecticide used for control of sucking-type insects on leafy vegetables, fruiting vegetables, cole crops, citrus fruits, pome fruits, grapes, cotton, and ornamental plants and flowers.

p. D-45, 46. Table D-9, summary of Toxicity Data for Acetamiprid.

Comment: Data provided for 7 aquatic organisms, data 7-13 years old. No information given on effects of this insecticide on non-target organisms. Ambient water quality data unavailable, so General Permit arbitrarily sets Instantaneous Maximum Receiving Water Monitoring Trigger at 1/10th of the lowest LC50 value.

p. D-46, 47. Imidacloprid is a neonicotinoid insecticides which act on central nervous system of insects with lower toxicity to mammals. Imidacloprid is used to control sucking insects including rice hoppers, aphids, thrips, whiteflies, termites, turf insects, soil insects and some beetles. Most commonly used on rice, cereal, maize, potatoes, vegetables, sugar beets, fruit and others. It is especially systemic when used as a seed or soil treatment.

Comment: No information provided on impacts on non-target organisms.

p. D-47, Table D-10, summary of toxicity data for Imidacloprid.

Comment: Data for 6 aquatic organisms, all 20 years old or older. Ambient water quality data unavailable, so General Permit arbitrarily sets Instantaneous Maximum Receiving Water Monitoring Trigger at 1/10th of the lowest LC50 value.

Herbicides

p. D-47, 48. Aminopyralid is a herbicide used to control broadleaf weeds in grasses. Used on roadsides, non-irrigation ditch banks, rangeland, pastures, and other lands. Slow breakdown in aerobic sediment-water systems (half lives of 462-990 days).

Comment: No information provided on impacts on non-target organisms.

p. D-48. Table D-11, summary of toxicity data for Aminopyralid.

Comment: Data provided for 6 aquatic organisms. Data 7-9 years old. Ambient water quality data unavailable, so General Permit arbitrarily sets Instantaneous Maximum Receiving Water Monitoring Trigger at 1/10th of the lowest LC50 value.

p. D-48, 49. Chlorsulfuron is active ingredient in herbicide used for pre- and post-emergent weeds on cereal grains, pasture and rangeland, industrial sites, and turf grass. It is persistent and highly mobile in environment. Transported to non-target areas by runoff and/or spray drift. Degradation half-lives in soil environments range from 14 to 320 days.

Comment: No information on impacts to non-target organisms, incomplete description of intended effects or their efficiency.

p. D-49. Table D-12, summary of toxicity data for Chlorsulfuron.

Comment: Data for 6 aquatic organisms, none for terrestrial non-aquatic organisms. Ambient water quality data unavailable, so General Permit arbitrarily sets Instantaneous Maximum Receiving Water Monitoring Trigger at 1/10th of the lowest LC50 value. In view of the environmental persistence, mobility, and longevity of this herbicide, along with the very limited information on its impacts on non-target organisms, it appears to be a very poor choice for its intended uses.

p. D-49, 50. Clopyralid active ingredient in herbicides used for control of post-emergent broad leaf weeds in non-cropland areas—industrial mfg and storage sites, ROW roadsides, utilitity corridors, RR.

Comment: No description of effects on non-target organisms.

p. D-50, Table D-13, summary of toxicity data for Clopyralid.

Comment: Data for 4 aquatic organisms, although not used in aquatic environments, all data older than 20 years. Ambient water quality data unavailable, so General Permit arbitrarily sets Instantaneous Maximum Receiving Water Monitoring Trigger at 1/10th of the lowest LC50 value. The lowest LC50 value for one formulation is for an "inert" ingredient, and it is stated that the default trigger must include lowest values of both active and inert ingredients and their percentages in the product. The inert value is to be used for default LC50/10 when that formulation is used, and a higher value when other formulations used. Apparently LC50 values generally are not known for "inert" ingredients, in which case the default values used are generally fiction?

p. D-50, 51. Glyphosate is a broad-spectrum systemic herbicide useful on essentially all annual and perennial plants including grasses, sedges, broad-leaved weeds and woody plants. It can be used on non-cropland and among a great variety of crops. USEPA has promulgated a primary maximum contaminant level of 700 microgr/L for protection of drinking water sources, a number which is protective of all beneficial uses in the receiving water. This General Permit has an Instantaneous Maximum Receiving Water Monitoring Trigger of 700 microgr/L.

Comment: No toxicity data are provided and no information given regarding behavior of glyphosate in mixtures, its breakdown products, or impacts on non-target organisms. There is no discussion of the role of widespread glyphosate use in glyphosate-resistant croplands in development of glysophate-resistant weeds and changes in weed-crop communities (see, for example, M.D.K. Owen and I.A. Zelaya, 2002, Impact of Herbicide Resistant Crops in North America—A Northern Perspective, 13th Australian Weeds Conference, Perth, Australia, September 8-13, 2002, 655-659 and references; Beyond Pesticides, UC Scientists Find Herbicide-Resistant Horseweed In California, Beyond Pesticides (August 16, 2005). [Online]. Available: http://www.beyondpesticides.org

p. D-51. Imazapyr is the active ingredient in several herbicide formulations used to control weed species of grasses, broadleaves, vines, brambles, shrubs and trees, riparian and emerged aquatics. Dissipates rapidly in water. "Due to its safe use in the environment and low toxicity to aquatic life…this General Permit does not have a monitoring trigger for Imazapyr."

Comment: Since most of the uses of Imazapyr listed are for non-aquatic plants and no information provided to substantiate "safe use" in those environments, this statement is too broad.

p. D-51, 52, Table D-14, summary of toxicity data for Imazapyr

Comment: No information provided for impacts on non-target organisms, and none on behavior of Imazapyr in mixtures. Data provided for 4 aquatic organisms, 11-27 years old. Ambient water quality data unavailable

p. D-52, Triclopyr Butoxyethyl Ester (BEE) is an active ingredient in herbicides used for control of woody and broadleaf plants along ROWs, in forests, on industrial lands, and on grasslands and parklands. BEE is moderately to highly toxic to freshwater fish and highly toxic to estuarine/marine fish. Breakdown product 3,5,6-trichloro-2-pyridinol (TCP) is persistent in aquatic environments and has slight to moderate acute toxicity to freshwater fish.

Comment: No information on impacts to non-target organisms.

p. D-53, Table D-15, summary of toxicity data for Triclopyr BEE.

Comment: Data for 4 aquatic organisms, 16-37 years old. Ambient water quality data unavailable, so General Permit arbitrarily sets Instantaneous Maximum Receiving Water Monitoring Trigger at 1/10th of the lowest LC50 value.

p. D-53, 54, Triclopyr triethylamine salt (TEA) is a systemic herbicide used on rice, rangeland, and pasture, ROWs, forestry and turf, including home lawns for control of broadleaf weeds and woody plants. USEPA concluded that triclopyr TEA is practically non-toxic to freshwater fish and aquatic invertebrates. "Unlikely" to result in acute or chronic drinking water risks. "Due to its safe use in the environment, low toxicity to aquatic life, this General Permit does not have a monitoring trigger and does not require monitoring for tryclopyr TEA."

p. D-54, Table D-16, summary of toxicity data for Triclopyr Triethylamine Salt.

Comment: Data on 6 aquatic organisms, all older than 20 years. The statement re safe use in the environment is not substantiated for the wide variety of uses to which the pesticide is put. No information is provided on impacts of pesticide mixtures. The paucity of data on this pesticide does not support exempting it from a monitoring trigger

The inadequacies of the Draft Spray Applications Permit are such that PEER does not believe it is sufficiently mature for approval.

Sincerely,

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