March 25, 2010

Responses to Second Set of Comments Submitted on Surface Water Quality Protection Concepts

Comment 1. Golf is a sport and a business that maintains high standards to meet golfer's expectations while ensuring environmental protection through the wise us of resources. Environmental best management practices are implemented throughout golf course operations to help ensure those goals are met. Golf provides significant economic values (golf-related activities generated approximately $15.1 billion of direct, indirect and induced economic output to the state in 2006) to the state, and misguided regulations could potentially impact this value.

The commenter believes the draft proposal to prohibit application within 25 feet of any sensitive aquatic site would negatively impact pest control on greens and tees on golf courses located within close proximity to these water bodies. Playing conditions could decline, golfers could leave, which would impact revenues, and some golf facilities would be forced to undergo construction to change the design of some of the most revered golf courses in the world.

Golf course managers pride themselves in using environmentally sound management practices, and minimizing inputs needed to maintain quality playing surfaces, in order to protect water bodies from any potential pesticide contamination.

Bell and Moss (2008) examined the effectiveness of various types of vegetative filter strips, including turfgrass, and concluded that turfgrass stands are impediments to the transport of nutrients and pesticides in runoff. They also concluded that research shows grass buffer strips are not sufficient to prevent substantial runoff caused by the most severe storms, and outlined management strategies that can significantly reduce pesticide runoff from turfgrass stands. Examples are to maintain dense turfgrass stands, minimize pesticide use, incorporate pesticides by light irrigation after application, avoid application to saturated or frozen ground, and avoid applications before intense storms.

Often greens and tees, which can represent less than 5% of a total golf course area, are the only areas treated with pesticides. Golf course managers practice integrated pest management, are licensed by the Department of Pesticide Regulation (DPR), apply pesticides at recommended rates, consult weather forecast before application, use the latest application technology for precise application of pesticides and use buffer strips to protect water bodies. The commenter submitted information about glyphosate use on, and concentrations resulting from, golf courses.

Monitoring conducted by Miltner and Hindahl (2009) in western Washington showed than concentrations of organophosphate pesticides in water were marginally but statistically lower at exit points than at entry points at one golf course, and the same in another golf course. In both golf courses one pesticide was found in water that could be attributed to use on those courses but at 1,000,000 and 1000 times lower, respectively,

that the LC50 for the most sensitive species. The authors concluded that management practices typical of many Pacific Northwest golf courses pose little risk to water quality in golf course streams.

The commenter seeks to clarify how the boundary of a water body is determined and who determines those boundaries, and wants to identify what special provisions could be made for relatively small but critically import areas of the golf course where pesticides are applied.

Response 1. Many of the management practices mentioned by the commenter could be part of the alternative surface water quality management plan specified in the concepts, and some are being considered as alternatives to the holding requirement in the draft concepts. Although buffer strips could be part of the alternative surface water quality management plan, we did not specify buffer strips in the main proposal because it is difficult to specify buffers in a statewide regulation due to variations in factors such as the amount of runoff, slope, soil type, vegetation type and density, and type of pesticide used. We are seeking any universal buffer conditions that could apply statewide. Perhaps the "rough" that may lie between areas of application and sensitive aquatic sites could be one.

The practices mentioned mainly address runoff as a source of contamination. We are still considering potential alternatives to the buffer zones to prevent drift as a source of contamination, such as hooded sprayers, directional buffers that would not apply when wind direction is away from the sensitive site, and new technology nozzles designed to maintain coverage while reducing the number of fine particles that increase drift.

Glyphosate is not one of the pesticides we plan to regulate to protect surface water.

We are still considering what types of water bodies on private property are subject to the regulations, and will review the studies and other information submitted in developing the regulations.

Comment 2. "Post harvest commodity treatment on the farm" should include forests (borax).

Response 2. Borax is not one of the pesticides we are considering in the current concepts so this example would not be applicable. However, if one of the surface water pesticides were applied to harvested trees at or near the site of harvest, it could qualify for the "post harvest commodity treatment on the farm." exemption that we will consider modifying to refer to forestry sites as well.

Comment 3. Does the exemption language "injections into or painted or wicked onto trees, shrubs, or other plants" include cut stump treatments? How about applications to foliage that is not painted or wicked, such as the MalEx™ Shootborer, with permethrin, for western pine shoot borer?

Response 3. We will modify the language to clarify that cut stump treatments are exempted. We will also consider exempting applications made by hand-held equipment designed to apply extremely low volumes, such as droplets per acre in the case of the MalEx™ Shootborer, from the regulations.

Comment 4. In light of the exemption in the Food and Agricultural Code for officials of federal, state, and county departments of agriculture from the pest control license requirement, would an employee of the United States Department of Agriculture (USDA) who is implementing a surface water quality management plan, as defined, be required to obtain and follow a written recommendation by a licensed pest control adviser (PCA)?

Response 4. Yes. The draft surface water concepts consider production agriculture applicators, including those making applications to forest trees for harvest, to be in compliance with the runoff measures if the operator of the property obtains and follows a written recommendation from a licensed PCA for the pesticide application, and possesses and is implementing a surface water quality management plan, as defined, to prevent the pesticide from leaving the property at levels that would adversely affect water quality.

Food and Agricultural Code (FAC) section 11410 defines "agricultural pest control adviser" to mean “any person who offers a recommendation on any agricultural use, who holds himself or herself forth as an authority on any agricultural use, or who solicits services or sales for any agricultural use.” FAC 12001 states that no person shall act, or offer to act, as a PCA without first having secured an agricultural pest control adviser license from the director. But FAC 12001 exempts officials of federal, state, and county departments of agriculture and the University of California personnel engaged in official duties relating to agricultural use from the pest control license requirement if any recommendation by any of these persons as to a specific application on a specific parcel is made in writing.

Current law does not require a production agriculture property operator to be a licensed PCA to make a recommendation for a pesticide application on his or her property, provided the operator puts the recommendation in writing. Nevertheless, the surface water concepts require that operator to get a PCA recommendation for any of the listed pesticides applied under the provisions of a surface water quality management plan, as defined. Similarly, even though a USDA employee is not required to be a licensed PCA when recommending the use of a pesticide on USDA property, the draft surface water concepts currently require the USDA employee to obtain a recommendation from a licensed PCA if any of the listed pesticides is applied under the provisions of a surface water quality management plan.

The purpose for requiring a written recommendation from a licensed PCA is to ensure that the applicator is aware of the potential hazard to surface water, that alternative pest management practices have been considered, and that the application of the listed pesticides is necessary. The recommendation is required, by Food and Agricultural Code section 12003, to include, when applicable, “a warning of the possibility of damages by the pesticide application that reasonably should have been known by the agricultural pest

control adviser to exist." The recommendation is also required, by section 6556, Title 3 of the California Code of Regulations, to include, among others, (1) the criteria used for determining the need for the recommended treatment, and (2) certification that alternatives and mitigation measures that would substantially lessen any significant adverse impact on the environment have been considered and, if feasible, adopted.

Comment 5. Does a seasonally dry creek with no water during an application meet the definition of a sensitive aquatic site?

Response 5. We will consider modifying the definition of sensitive aquatic site to clarify that a seasonally dry creek with no water during an application will not be considered a sensitive aquatic site provided that there is a high likelihood that no water will flow in that creek for at least xx days following application.

Comment 6. Hexazinone is intended to be put down when soils are wet and rain/snow is forecast, so restrictions on weather will make its use problematic.

Response 6. A similar concern was expressed in the first set of comments. Runoff is determined by factors such as soil texture, the amount of soil moisture, the amount and intensity of rainfall, slope, and presence of cover vegetation. The current ground water regulations allow incorporation of preemergent herbicides using a minimum of ¼ inch of irrigation water and a maximum of either one inch or the maximum amount of irrigation water specified on the label, at application rates that do not cause surface water runoff from the treated property or to wells on the treated property. Lighter sandier soils can take higher intensities and amounts of rainfall without runoff, whereas heavier soils can take lower intensities and amounts.

Thus we will consider amending the draft proposal to allow applications of the listed materials to soils at field capacity under certain conditions. For example, we could allow applications to coarse soils (sands, sandy loams, and loamy sands) for rainfall forecast to be 0.5 inches or less, and for all other soils, for rainfall forecast to be less than 0.25 inches. Intensity of rainfall and presence of cover vegetation are other factors we may consider in crafting the regulations.

Comment 7. The choice of diverting rain runoff and holding it is not realistic for treated forestry sites.

Response 7. Our goal is to limit pesticide applications before rain events that are likely to result in runoff. Since holding runoff is problematic in most treated forestry sites, we are open to other management practices that have been demonstrated to or would arguably address this issue. In the case of pre-emergent herbicides that need some rainfall for incorporation, we will determine under what conditions we could allow applications before a predicted amount of rainfall without causing an unacceptable risk to aquatic species.

Comment 8. The surface water quality management plan appears to be geared towards farms and especially towards organic farms. How applicable is this requirement to forested lands?

Response 8. Our intention is to consider any pesticide application that is made under the provisions of a sustainable or green program approved by the DPR Director. In the traditional crop production arena, there are a number of programs that do not focus primarily on organic farms. We are aware of several sustainable forestry programs but do not yet know how well they might fit conditions in California and whether they would be acceptable to DPR.

Comment 9. What is the basis for the uniform 150-foot aerial buffer for forestry pesticides? Were AgDrift or AgDisp models used? What were the modeling parameters used? Insecticides or herbicides? Fine or course droplets?

Response 9. The aerial buffer zone is based on a review of pesticide Reregistration Eligibility Decisions (REDs) and labels, and on the AgDrift model. We are considering whether the 150-foot aerial buffer zone should apply to all the surface water pesticides listed, and whether we need to regulate all the listed pesticides to protect surface water. We are also considering under what conditions wind direction and speed are sufficiently constant so that we could allow directional buffer zones that would not apply when the wind is blowing away from the sensitive aquatic site.

Comment 10. Hexazinone monitoring done in the National Forests indicates that buffers of the size envisioned in the draft concepts may not be necessary. The commenter provided a copy of the Region 5 Final Environmental Impact Statement on Vegetation Management for Reforestation, and the results of several forestry pesticide monitoring projects.

Response 10. We note that the Region 5 Final Environmental Impact Statement on Vegetation Management for Reforestation assumes a "realistic water contamination rate" of 10 parts per billion (ppb) per 1-pound (lb) active ingredient (ai) applied. "The 10 ppb is a conservative rounding up of 7 ppb, calculated by assuming that 1% of any applied herbicide would move to the other side of a 50-foot unsprayed buffer strip as a result of a 5 mile per hour crosswind. The resulting water concentration is based on this errant herbicide being deposited into a 6-inch deep creek." The assumed 10-ppb water concentration did not appear to distinguish between ground and aerial application methods and it is assumed, but uncertain whether, that concentration is only due to drift. The commenter provided a summary of surface water monitoring results for hexazinone, glyphosate and triclopyr from several applications, with the actual monitoring reports listed as references. Of these, hexazinone is the only pesticide listed in the draft concepts.

For hexazinone, the commenter provided a summary of results of surface water monitoring projects conducted at eight sites. Hexazinone was applied by ground or air, depending on the site and date of application, and at rates, not specified for all sites, of

1.6-3 lbs. ai/acre. Application buffer zone distances were specified for some projects. Based on the "realistic water contamination rate" noted above, these application rates would have resulted in assumed water concentrations of 16-30 ppb, all above the 7- ppb U.S. Environmental Protection Agency (EPA) aquatic life benchmark for hexazinone. Application-date monitoring to assess drift was conducted at only some sites, and the summary did not provide sufficient information to evaluate these results. The summary did give a distribution of hexazinone concentrations in surface water but did not distinguish application-day results from monitoring conducted days, months, and up to approximately a year after application. We will ask the commenter to submit the referenced monitoring reports for our review.

Comment 11. The commenter submitted a paper documenting spray deposition from ground-based high-pressure (325-400 pounds per square inch) handgun applications of carbaryl to protect individual forest trees (to a height of approximately 12.2 meters [40 feet]) from bark beetle attack. The paper concluded that no-spray buffers of 15.2 meters (50 ft) to 30.5 meters (100 feet), as specified in contracts or prescriptions for single tree protection treatments, seem appropriate. Buffers of > 22.9 meters (75 feet) but < 38.1 meters (125 feet) were sufficient to protect *Isogenus* sp. and *Pteronarcella badia* (96-hour LC50 values ranging from 2.8-12 ppb), the most sensitive aquatic species.

Response 11. The U.S. EPA aquatic life benchmark for carbaryl is 0.5 ppb based on chronic invertebrate toxicity. The surface water concepts would require a buffer zone of 100 feet (~30 meters) for high-pressure ground applications, which is within the range of buffer distances referenced in the submitted paper. We will consider this paper in developing the surface water regulations.

Comment 12. The commenter submitted copies of a slide presentation entitled "Water Quality Monitoring for Herbicide Residue 1995-2001, Post Wildfire Reforestation Stanislaus National Forest." The slides reference a 1981 M.A.A. (Management Agency Agreement?) with the California State Water Resources Control Board that allows a USFS (U.S. Forest Service?) waiver from waste discharge requirements if best management practices are successfully used. One slide references BMP 5-9: Pesticide Application Monitoring and Evaluation, and BMP 5-12: Streamside Wet Area Protection during Pesticide Spraying (Buffers). One slide entitled "Purpose and Need for Monitoring, NEPA Guidance" lists "Buffer zones (aerial is minimum of 100 feet)", and states ""Do not apply hexazinone 'where it is expected to enter ground water or surface water' (Clarified in 1996 with an SIR to mean de minimis amount)."

Another slide contains a table of buffer zones for hexazinone used in various "projects" that, for aerial applications, are 100 feet for live streams and springs, and for ground applications, are 50 feet for live streams and springs, 10 feet for dry streams, 100 feet for San Domingo Creek and 50 feet for tributaries. Several slides list the water quality objective for hexazinone as 200 ppb. Several slides contain graphs with monitoring results by sampling date that range from zero to more than 65 ppb of hexazinone. A table lists 3 samples as greater than 200 ppb, but emphasizes that approximately 85% of samples had concentrations of less than 10 ppb.

A monitoring summary slide lists two instances of hexazinone misapplication (to rock outcrops near a stream and a helicopter overspray). Among the other points made were that maximum post-application detection levels were generally higher with aerial applications and the key to minimizing detection amount is careful application.

Response 12. A Web search found these BMPs described in a document entitled "CEQA Appendix E, Best Management Practices (BMPS), USDA Forest Service. 2000. Water Quality Management for Forest System Lands in California: Best Management Practices. USDA Forest Service, Pacific Southwest Region 138p." The objective of BMP 5-9 is to determine whether pesticides have been applied safely, restricted to intended target areas, and have not resulted in unexpected non-target effects. The objective of BMP 5-12 is to minimize the risk of pesticide inadvertently entering water or unintentionally altering the riparian area or the wetland.

The lowest (most toxic) U.S. EPA aquatic life benchmark for hexazinone is 7 ppb based on acute toxicity to nonvascular plants. The current Water Quality Control Plan (Basin Plan) For the Sacramento River and San Joaquin River Basins does not appear to include a numeric water quality objective for hexazinone.

We will consider these various points and data in developing the surface water regulations.

Comment 13. Professional aerial applicators use droplet spectrum, application technologies, meteorological conditions and extensive experience to minimize off target impacts from pesticide applications. This is not considered in the draft concepts. For example, the fixed 150-foot buffer for aerial applications from sensitive sites does not take into account that the professional aerial applicators commonly use meteorological conditions to protect sensitive areas while providing complete coverage of the grower's crop. Using GPS, applicators make partial applications when the wind is blowing toward a sensitive site and then return to complete the application when the wind is blowing away from the sensitive site. This draft concept does not appear to acknowledge the drift does not flow upwind. We encourage you to use directional buffers when drafting regulations.

Response 13. See response to comment 9.

Comment 14. We are concerned about the standard use of the 150-foot buffer. What data does the department rely on to require different buffers based on application method? The language in this concept implies that drift potential is greater for aerial application than other methods. What the department fails to consider is that aerial application is the only method by which the actual applicator must be licensed and is held to a higher regulatory standard. Our industry has the highest level of regulatory compliance and the least number of drift incidents as evidenced by the department's own reports. We encourage you to reduce this distance to reflect this reality.

Response 14. See response to comment 9**.** The data collected by the Spray Drift Task Force were under conditions when the ground and aerial applicators were in full compliance with pesticide laws and regulations. Those data showed that aerial applications resulted in greater drift than ground applications.

Comment 15. As defined, sensitive aquatic area includes any irrigation or drainage ditch. This will limit the ability of growers to provide complete coverage to their fields and will likely require additional applications when pests aren't completely controlled. This definition will have a significant impact on agricultural yields and revenues.

Response 15. The definition of sensitive aquatic area is equivalent to the current definition adopted in 2007 in section 6000 of Title 3 of the California Code of Regulations (3CCR) for the purpose of implementing 3CCR section 6960 (Dormant Insecticide Contamination Prevention). The concern is that growers would not be able to treat the parts of their field that are within the buffer zone distances when irrigation canals and drainage ditches are immediately adjacent to fields. Many current labels also require buffer zones between the application site and "aquatic habitat," which is usually specified to include, but is not limited to, lakes, reservoirs, rivers, permanent streams, marshes or natural ponds, estuaries, and commercial fish farm ponds. Irrigation canals and drainage ditches are not specifically included in the label but the "but is not limited to" language allows them to be included. Arguably, irrigation canals and drainage ditches than empty into any of the other specified water bodies should be included. However, it may be problematic for growers and enforcement personnel to determine the destination of water in irrigation canals and drainage ditches. Some drainage ditches for upstream growers can become a source of irrigation water for downstream growers. Similarly, some irrigation canals and laterals can eventually become drainage conveyances that empty into natural water bodies. For those reasons, we are including irrigation canals and drainage ditches in the definition of sensitive aquatic site in these concepts.

We are also considering directional buffer zones that would allow application within buffer zones when the wind is blowing away from the sensitive aquatic site, and application technology, such as hooded sprayers, that might allow ground application within buffer zones.

As part of the formal rulemaking process, we will be required to estimate the impacts of the regulation on costs and revenues, and conduct additional analyses if certain impact levels are exceeded.