

Memorandum

September 4, 2001

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Subject: Standing Water in Structural Best Management Practices for Stormwater Runoff

The role of the Vector-Borne Disease Section (VBDS) in the Caltrans Best Management Practice (BMP) Pilot Retrofit Study is to provide technical expertise and consultation regarding vectors associated with structural BMPs for urban and/or stormwater runoff management. Since mid-1999, VBDS and collaborating vector control agencies have recommended against the implementation of structures that hold permanent or semi-permanent bodies of standing water. Furthermore, VBDS has strongly recommended that structural BMPs be designed to completely drain within 72 hours after the completion of a storm event or non-stormwater discharge. Based on these criteria, all other devices (whether above or below ground) that hold water for longer than 72 hours are unacceptable. However, it is understood that "natural" designs such as wet ponds or modified wetlands may not comply with these criteria. Special care should be taken with such BMPs so that they are designed and maintained in a manner that inhibits or limits vector production. VBDS or local vector control agencies should be consulted during the design process to ensure that public health threats are not created.

Mosquitoes are undoubtedly among the most adaptable vectors that require water for reproduction and mosquito-borne diseases are among the world's leading causes of illness and death. These diseases include mosquito-borne viral encephalitides, dengue fever, yellow fever, malaria, and filariasis. It is worth noting that the West Nile virus was recently introduced into the northeastern United States and is rapidly spreading westward and is expected to reach the Pacific Coast in the near future. The World Health Organization estimates that over 300 million clinical cases each year are

attributable to mosquito-borne disease. Despite great strides over the last 50 years, mosquito-borne diseases continue to pose significant risks to the population in the United States. Current challenges posed by the introduction of exotic diseases such as West Nile virus and the importation of vector species such as the Asian tiger mosquito illustrate the importance of cooperation and partnership at all levels of government to protect public health.

Mosquito populations may increase rapidly and reach large numbers in relatively small bodies of water. At least four of the eight mosquito species that have been shown to utilize structural BMPs in the arid southwest for reproduction may vector disease. With over 50 species of mosquitoes in California, many other species can be expected to use these devices throughout the state. The lifecycle of all mosquitoes consists of four distinct life stages: egg, larva, pupa, and adult. The first three stages occur in water, while adults are active flying insects. Only adult female mosquitoes feed on blood, which they usually require for egg development. The duration of the mosquito lifecycle varies significantly and is influenced by many environmental factors, most notably temperature. Under optimal conditions, some species may undergo complete development from egg-to-adult in as few as four days.

California's well-managed and highly regulated mosquito control programs utilize an integrated approach to mosquito management that includes source reduction, chemical and biological control, and if necessary, legal control. Designing and maintaining structural BMPs such that they drain completely within 72 hours of receiving runoff effectively prevents the successful development of mosquitoes. This proactive rather than reactive approach to the prevention of potential vector problems will ultimately result in cost savings to property owners, reduce pesticide use, and ensure compliance with the California Health and Safety Code.

The Department of Health Services (DHS) has broad public health powers, including the power to abate public nuisances (Health & Safety Code, §100175). In exercising this power, DHS is authorized to commence and maintain all proper and necessary actions and proceedings in order to enjoin and abate nuisances dangerous to health (Health and Safety Code, §100170). The Legislature has, for purposes of mosquito and pest abatement districts, previously determined that breeding places for mosquitoes and water that is a breeding place for mosquitoes are a public nuisance (Health & Safety Code, §§2200 (e)(1)(A), 2200(e)(2), 2800.5(a) & (b)). This would facilitate a determination by DHS as to when a mosquito-related nuisance to public health exists. In addition, DHS is authorized to provide consultation and assistance to local vector control agencies in developing and conducting programs for the prevention and control of vectors, including mosquitoes, and may coordinate and conduct emergency vector control as required (Health & Safety Code §§116110, 116108). This

assistance may include the performance of mosquito prevention and control work. Local mosquito/vector control agencies have specific powers related to the control and abatement of vector-related public nuisances. Like DHS, these districts have the authority to abate nuisances in any action or proceeding by any remedy provided by law (Health & Safety Code, §2272). The term "public nuisance" is specifically defined as:

- 1) Any breeding place for mosquitoes, flies, or other vectors of public health importance that exists by reason of any use made of the land on which it is found, or of any artificial change in its natural condition. Presence of immature arthropods of public health importance shall constitute prima facie evidence that a place is a breeding place for arthropods.
- 2) Water that is a breeding place for mosquitoes, flies, or other arthropods of public health importance.
- 3) The presence of rodents or evidence of rodent activity, such as rodent droppings, trails, or evidence of feeding activity (Health & Safety Code, §2200(e)).

This definition makes it easier for districts to establish an action against a landowner to abate a vector problem. The law defines a nuisance to public health. Local mosquito/vector control agency boards have the authority to:

- 1) Take all necessary or proper steps for the control of mosquitoes, flies, or other vectors, either in the district or in territory not in the district but so situated with respect to the district that mosquitoes, flies, or other vectors may disperse from the territory into the district.
- 2) Abate as nuisances all standing water and other breeding places for mosquitoes, flies, or other vectors, either in the district or in territory not in the district but so situated with respect to the district that mosquitoes, flies, or other vectors from the territory disperse into the district.
- 3) Assess civil penalties not to exceed five hundred dollars (\$500) per day for each day that a notice or hearing order to abate a nuisance has not been complied with.

In conclusion, any standing water has the potential to become a source for mosquitoes and/or other vectors and can be considered a public nuisance. If mosquito breeding occurs, vector control agencies are equipped with broad powers (including civil penalties) to protect public health. DHS commends and supports Caltrans' efforts toward vector prevention within their Storm Water Management Program.

cc: please see next page

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