To: Howard Kolb
Agricultural Order Project Lead Staff

From: T.K. Hartz
Department of Plant Sciences
University of California-Davis

Subject: Comment of draft order R3-2011-0006

Dear Howard:

I have a number of questions and concerns regarding the latest draft order; for the sake of brevity I will confine these comments to the major issues regarding nitrate management. As written, I believe these proposed regulations would not fairly spread the burden of water quality improvement, and would cost coastal vegetable and strawberry growers huge amounts of money and management time for very little purpose.

Establishing tiers based on risk:

I agree with the concept of establishing tiers of growers, based on crop type; wine grape production clearly presents fewer water quality challenges than the production of multiple vegetable crops per year, for example. Proximity to an impaired waterbody and organophosphate pesticide use may be appropriate criteria for predicting toxicity and turbidity risk. However, these factors have nothing to do with nitrate risk to groundwater, yet they will be a factor in determining whether a grower is required to monitor groundwater discharges and develop an Irrigation and Nutrient Management Plan (INMP). The technical rationale for using the scale of an operation as a prime determinate of water quality risk is unclear. A substantial percentage of vegetable and strawberry acres are farmed by growers operating less than 1,000 acres; to place significant extra burdens on growers of 1,000 acres or more puts them at a substantial disadvantage with competitors whose water quality impacts may in some cases be more severe.

Individual discharge monitoring:

Individual discharge monitoring would be an onerous burden on Tier 3 growers, and the value of the data generated and reported would be suspect. Given the requirements specified, it is clear that growers will need to engage professionals to perform the monitoring and generate the reports. Whether sufficient professional expertise is available to fill this need is questionable, particularly given the short time for implementation. The cost to individual growers is likely to be extreme, particularly if toxicity testing of runoff and testing of leachate nitrate is required. The degree of variability in pollutant content observed from one field or one irrigation event to another can be extreme, and unless a large number of events are monitored, the data may not reflect water quality impacts representative of the grower operation. This also raises the possibility of ‘strategic’ monitoring, in which irrigation events are chosen for monitoring based on conditions most likely to show good water quality.

It is my opinion that individual discharge monitoring should be de-emphasized because the cost will be extreme, and the value of the data generated will be nebulous. The more valuable information regarding nitrate pollution potential will be annual N loading rate, which tier 2 and 3 growers are required to report.

Irrigation and nutrient management plans:

The requirement to development and implement an INMP is contingent on the calculation of the crop nitrate loading risk. For vegetable and strawberry growers who use sprinklers, at least for crop establishment (this includes the overwhelming majority of growers), the factor that triggers the INMP requirement comes down solely to nitrate concentration of the irrigation water. Water of 40 PPM NO_3^- gives a moderate risk (and no INMP), while water at 50 PPM triggers all the INMP requirements. This places too much emphasis on a factor that represents a small minority of potential N loading in the production of these crops. For example, a lettuce crop may receive an average of 160 lb/acre of fertilizer N, and 10 inches of irrigation water. At 50 PPM NO_3^-, that water input represents only 25 lb N/acre. Modifying the nitrate loading risk index, perhaps by increasing the irrigation nitrate concentration at which the rating of '2' is given, would balance the index more appropriately.

Regarding the INMP requirements, it is unclear what level of detail is required. As written it could be interpreted to require that irrigation and fertilization in each field be monitored, evaluated and recorded. Such detail would overwhelm farm management. The requirement to conduct preplant soil *nitrogen* sampling (by this I assume you mean nitrate sampling) is problematic, because all local research to date has been predicated on pre-sidedress, not preplant, soil nitrate testing. As previously discussed, the requirement to monitor nitrate leaching to groundwater is technically difficult and fraught with uncertainty; reduction of N input to the production system, and documentation of improved irrigation efficiency, should be the focus of effectiveness evaluation.