In the opinion of this Panel, the approach of the agricultural orders that have been issued within the framework of the Irrigated Lands Regulatory Program (ILRP) and the Central Valley Region's Dairy General Order is marked by a frame of mind that has been carried over from the regulation of point source discharges. Specifically, we refer to the notion that there is (or should be) a particular measurement or metric (e.g., a suite of measurements and computations) that can be used as an unequivocal tool to determine if an individual discharger is "guilty" or "not guilty".

Indeed, this tool exists even within the framework of agricultural nonpoint source discharges, specifically, the deep percolation of nitrate and minerals from irrigated cropland – it is the strict enforcement of the nitrate MCL in first encountered groundwater. However, from a technical perspective, this tool is limited to hydrogeologic conditions where the sampled groundwater volume can be attributed to a defined recharge area, which must be contained within the area where the regulated discharge occurs. This can be done in areas of very shallow groundwater tables, relatively steady groundwater flow directions, high recharge, large regulated units, and a strong introduced discharge signal (e.g., high concentration or unique chemical). The opposites of these characteristics (i.e., increasing depth to groundwater, non-steady flow directions, lower recharge, smaller regulated units, and a weaker discharge signal) and a large array of other variables and processes that moderate the discharge signal constitute insurmountable technical limits to the applicability of this tool in very large areas of the regulated agricultural landscape.

Even in areas where this tool could provide technical support for a regulatory enforcement mechanism, we recommend against it for the following non-technical reasons:

1. It would require the installation of probably tens of thousands of monitoring wells to monitor every field on every farm which would be a major financial burden on farmers.
2. Nitrate exceedances are expected to be the rule rather than the exception, and strict enforcement of the nitrate MCL would have catastrophic agro-economic consequences.

Regional Boards, so-called Coalitions that have formed in response to the ILRP, and other entities have suggested other proxies or surrogate measurements/metrics to address this problem. Careful review and examination of these surrogate measurements leads the Panel to its most important conclusion that <u>there is no presently available measurement or metric that can realistically be used as an unequivocal tool to determine if an individual discharger is "guilty" or "not guilty".</u>

Absent the enforcement of a simple numerical threshold, the regulation of agricultural non-point source discharges becomes exceedingly difficult and complex. There are two primary reasons:

1. Present crop fertilization guidelines were devised with the primary objective of increasing the yield and quality of crops without consideration of groundwater quality. The addition of a groundwater quality objective (whether absolute in nature or in terms of some desired reduction in groundwater concentrations) is counter to the former and creates an optimization problem between competing objectives. This is a much more difficult problem to solve than the traditional single-objective problem. Addressing this optimization problem will require entirely new thinking in the academic arena, among professionals, on the farm, and in the regulatory community. In addition, no matter how much scientific rigor is applied to address this issue, the relative emphasis on the competing objectives will very likely remain a highly contentious.
2. The absence of a viable numerical value used for regulatory enforcement leaves a vacuum because the goal of implementing management practices that are "being protective of groundwater quality" is nondescript.