Summary of Cropland Irrigation Expert Panel Member Response to DE's Supplemental Proposal

Main Points:

1. All members of the Cropland Irrigation BMP Expert Panel were provided copies of DE's supplemental proposal and Panel Chair Tim Sexton's annotated response. There were no objections from the panel members to the Panel Chair's annotated response because is a statement of what proceeded during the report review period and its aftermath and implies no personal preferences or opinions.
2. All of the panelists stand by the recommendations put forth in the Expert Panel report under question, including the core recommendation that more research is needed before a determination can be made regarding the impact of cropland irrigation management systems on water quality, as well as other future research needs.
3. Excluding the Panel Chair, who serves in a management role per the review and approval process articulated in the BMP Panel Protocol, three out of the four panel members respectfully declined to engage in the policy/procedural issues that have been brought forth in response to the report's contents and. Given the lack of any new information that would change their initial science-based recommendations, they have no further input.
4. The USGS members on the panel chose to defend the findings of their work on the Eastern Shore (cited in the report) that indicate increased nitrogen leaching associated with irrigated corn. They also noted strong support for future modeling efforts that would incorporate both agronomic and water quality data. They were concerned with DE's proposal, given that the only data available relating irrigation management directly to water quality indicators demonstrates increased groundwater nitrogen levels attributable to irrigation.

Compiled Panelist Response to DE Cropland Irrigation Proposal

(Edited for clarity)

Judy Denver, USGS (retired) and Mark Nardi, USGS (proxy for J.D. post-retirement):

· USGS strongly supports the need for modeling. However, any modelling that is undertaken needs to incorporate agronomical and environmental (especially groundwater quality) factors to verify and integrate the impact of agricultural practices on water quality.

· USGS stands behind the Bucks Study and its results, as unbiased and objective work that was based on the data collected.

· We (J. Denver and M. Nardi) realize that the Bucks site represents an area of the peninsula that sits upon a very well drained thick oxic aquifer setting. We also know irrigation happens in many different settings on the peninsula. The environmental and agronomic impacts of irrigation will likely vary across hydrogeologic setting and along with producer practices.

· The USGS collected data at two sites (Bucks and Andover), each with paired irrigated and dryland fields. We essentially see the two sites as corn production end members on the Delmarva. At both study sites the intent was to develop a database that could be applied to future modelling of these and other fields. It was our hope that the future modelling effort would combine specific ag practices at the sites with their effects on groundwater with the intent, after model calibration, to run scenarios using differing input parameters such that we could model a broad range of soils,

weather, BMPs, and crop production practices. Our hope was that output from these models could be used as input parameters for the Chesapeake Bay model and other models.

- This modelling approach was proposed by the USGS and was of interest to the Chesapeake Bay program but changes in funding priorities prohibited execution of the modelling work.

Additional comments from J. Denver:

I find it hard to support an estimate with no documentation. Also, USGS published reports are subjected to a very defensible review process by scientists who understand the subject of the report. I have been through many types of peer review and think USGS reviews are at least as rigorous as journal reviews.

I don't understand at all how the following [below] would result in a reasonable model credit if data from our studies indicate irrigation increases leaching at least during a normal rainfall year in our work. Also, a previous groundwater study of dryland farming in Kent County MD using county-wide estimates of fertilizer tonnage, estimated that between 20-35% of applied nitrogen entered the groundwater reservoir (Bohlke and Denver, 1995). I have seen other estimates that concur with that range. Hopefully, current agricultural practices have helped to reduce this number since 1995, but I have not seen any direct evidence of that in groundwater or in streams from agricultural areas. How this was determined is in the report mentioned above.

> *Delaware proposes an investigation of average annualized nitrogen leaching from dryland acreage would result in a reasonable conclusion of model credit, supported by some peer-reviewed reference and:*

Bohlke and Denver, 1995; Water Resources Research, v.31.no.9, pp 2319-2339 (read the discussion for statement above.)

James Adkins, UD:
I have reviewed the attachments and do not want to be involved in any of these procedural issues. I was asked to be a part of this panel to provide technical expertise in regards to irrigation. I have done that to the best of my ability and have reached a final recommendation in agreement with the rest of the panel. At this point my service to the expert panel is complete and please to not ask me to review our decision again unless **new and directly relevant information** has come to light. Thank you for your understanding.

Greg McCarty, USDA-ARS:
After reviewing the material, I am not sure how much help I can be on the issues involved. I stand behind the report's conclusion that current data was limiting and I support the need for development of new data to address the question. I also support the use of models to fill in some of the information gaps but Mark Dubin cautioned against over reliance on models in that their use was outside the norm of other working group approaches.

My government research position is restricted in regard to how much involvement I can have in formulating or influencing policy concerns and I am not sure where such lines would crossed. So I do not want to get involved too deeply in a heated battle over these disputed issues.

Cory Whaley, UD:
I had a chance to review the supplement and proposal. I feel the expert panel made a final recommendation based on the information available. I am not interested in being involved with the procedural issues. If new and relevant information becomes available, I would be happy to offer my agronomic expertise.