



# Nevada Irrigation District

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via Electronic Mail

February 7, 2023

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**RE: Response to January 25, 2023 Plan for Water Comment Letter**

Dear Ms. Sheehan and Mr. Zettler-Mann,

Thank you for your letter dated January 25, 2023, regarding the District's the Plan for Water (PFW) process. Below are responses to your recommendations regarding ongoing stakeholder input in the PFW process:

*Comment: How does NID define applied raw water and demand raw water? How does the model consider applied water vs. demand water. Are they considered together? Separate? Unable to differentiate?*

**Response: For the PFW, NID does not define applied raw water separately from demand raw water in the model. The raw water system is managed as a whole and not based on individual water use at any specific parcel. However, with that said predicted raw water demand by land type within the district will be utilized to calibrate the model to help ensure total demand is consistent with known and future designated land use.**

*Comment: We have reviewed the glossary of terms that NID has published for the PFW and have found it to be fairly limited. With respect to definitions more broadly, we recommend that NID develop a robust glossary with the community using mutually accepted definitions as part of the PFW process. This is analogous to the State and Federal general, coordinated, specific, and water quality plans; all have specific definitions included to fit the goals, objectives, and science of each document. We would be happy to share and develop these definitions with NID.*

— a. Specifically, the PFW glossary of terms published by NID conflates the definition of terms with NID operations and analysis which can serve to confuse the formal definition with NID operations or business. Some examples include:

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i. *“FERC Relicensing” which includes a discussion of dams owned and operated by NID, but does not actually define the FERC relicensing process, what it entails, how frequently it happens, or any of the other relevant information for someone who is not familiar with the process to understand it.*

ii. *“Instream Flow” which does not define instream flow, but instream use instead, which is a different concept. The definition goes on to define instream use (not instream flow as the heading says) as “water discharge at least partly controlled by a dam or diversion structure” which is inaccurate.*

iii. *“Surface Water” which begins with an appropriate definition. But the second sentence invokes an inappropriate judgment that the water cycle is water “lost.”*

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— b. *Alignment with Statewide and Regional adopted water resources planning, management, and operational terms is essential for robust decision-making in the face of climate change. A Basic-Water Glossary has been developed for the California Water Plan and its Updates to foster public understanding. The California Water Plan is the Statewide Water Resources Strategic/Master Planning effort. While it is expected that terms may be defined somewhat differently for the Plan for Water and its many connected parts, we encourage NID to start with these broadly accepted definitions and modify as needed to be placed in context with the various levels of NID’s planning, management, and operations.*

**Response: If you would like to propose specific revisions to the glossary please do so and they will be considered for inclusion.**

*Comment: What are the limitations of NID’s historical water use data as it applies to setting a believable benchmark for historical water demand?*

— a. *Specifically, in a system with significant unaccountable losses, and very little means of knowing exactly what demand is, what is the margin of error (in units of AF, miner’s inches or gallons) that the use of historical demand data could be over or underestimating the actual demand? We are primarily interested in raw water use.*

**Response: There will always be uncertainties in the exact values of the losses or the demands and in the output of any model. That is why a range of potential demands, from minimum to maximum will be developed, which in turn provides an estimate of the range of losses. This is also the reason staff recommended the model be updated every five years to allow for new data to inform model refinement over time.**

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*Comment: What are the limitations of NID’s historical water use data as it applies to setting a believable benchmark for historical water demand?*

**Response: See answer to comment above.**

*Comment: How does the consultant plan to deal with the 30m x 30m spatial resolution of the OpenET data set which relies on Landsat data? Especially as related to the mixed pixel problem and unirrigated forest type land covers adjacent to, and bordering irrigated lands.*

**Response: OpenET uses accessible satellite-based estimates of evapotranspiration (ET). ET is a sensitive parameter that will be used to develop crop coefficients in the IDC model to simulate demand. ET adds to the amount of demand required in the basin and is driven by temperature and land use. The range of land use conditions will be analyzed to account for the uncertainty introduced by the mixed pixels.**

*Comment: In the last PFW meeting, there was a discussion about "ground truthing." We would like to know how NID will corroborate information received through existing datasets with a real time on-the ground accounting of water demand.*

- a. Has NID considered instituting raw water customer audits? This can engage the customer to see what is actually happening on site, the intentions of the customer for the future, the willingness of the customer to undertake water conservation efforts, the current irrigation practices and potential Best Management Practices.*

**Response: The discussion about ground truthing was related to quality control (QC) of land use determination in databases. Ground truthing was performed by the database developers to ensure the areas identify match the land use definition in the database. If they did not match, they were corrected as best as possible. Consultants will be using land use datasets that were QCd with ground truthing such as Land IQ. The effects of projected land use scenarios on demand will be evaluated through sensitivity analyses to identify "bookend" results. This approach will capture the range of land use values and will compensate for any potential discrepancies caused by misrepresenting some land use parcels. The Consultant will be using data sets for analysis that are recognized and accepted in the professional field of practice.**

**At this time, there is no water audit planned as described in your comment. With that said, NID is not opposed to implementing programs, surveys, and/or audits to better understand conservation opportunities and customer water use.**

*Comment: How are different inputs weighted in the Demand model?*

- a. If agriculture demand at a farm (represented by X pixels) relies on Open ET data, DWR crop data, historical NID data, and NID crop surveys, how is the accuracy of each dataset assessed and weighted relative to the others?*

**Response: Inputs are not weighted individually in the model. Land use data will be assessed to review the potential variability in the models including the documented quality of the data. The results of the inputs will be two boundary conditions representing maximum and minimum levels of development, plus a representative**

**condition that simulates a normal expected level of land use. Various simulation to exercise different ranges of various parameters will be analyzed in addition to performing sensitivity analysis for significant inputs like land use.**

**For the historical model, the primary data sources we propose to use are:**

- **Land use: DWR's statewide crop mapping, filling in any gaps in that data with DWR's County land use survey data, USDA's CropScape data, and general plan/zoning data.**
- **Population: CA Dept. of Finance population estimates**
- **Per capita water use: potable water production records from SWRCB and cities**
- **ET: OpenET ETc, spatial CIMIS ETo data**

**Other data sources were proposed primarily for comparison and checking trends, etc.**

*Comment: We would like to see an example of what the Demand model output looks like given a set of hypothetical inputs, as well as a robust sensitivity analysis of the model. Examples of questions the sensitivity analysis should help us understand include:*

- a. If urban demand doubles and all other variables (e.g. evapotranspiration, raw water demand and environmental requirements) remain equal, how does that impact the model output?*
- b. What if all demand remains the same, but there is zero environmental loss (e.g. no evaporation, no infiltration through canals, etc.)?*
- c. In predicting future demand, how does the model respond to a dry climate with less water, similar or increases in environmental water requirements, and the total water available in the system? And as a percentage of nonenvironmental water demand.*

**Response: The demand model IDC will output monthly timeseries of demand values at each demand node in units of acre-feet in dss format, the USACE HEC timeseries database format used in ResSim and other HEC software. The model is under development and model output has not yet been tested. A sensitivity analyses will be prepared that will help address the questions provided. Sensitivity analyses will be performed on demand estimates. In addition, Consultant will be addressing the bookend scenarios to capture the range of potential demand scenarios in the projected time period under a set of climate change scenarios.**

*Comment: Please explain how farm gates and orifice plates function, how they are used and how the assumed 6" head required for a defined miner's inch of water maintained consistently throughout the length of a canal?*

**Response: The farm gates and orifice plates are the structure designed to perform the**

**dual functions of measuring and controlling irrigation water. The District normally uses the structures to divert water from District canals to smaller privately owned laterals. The head is assumed to be maintained by the downstream gate, the water surface upstream of any particular orifice is assumed to remain at a constant level during the operations. If there are low sections of canal due to topography, check structures are installed horizontal to the invert of the canal to ensure head pressure standards.**

**It should also be noted that the farm gates and orifice structures are intended to regulate and measure maximum deliveries to any specific parcel but are not used to manage water delivery throughout the entire system. Even with the treated water system, where the District can monitor water use more accurately on a parcel by parcel basis, the data is not used to manage the system due to the constant fluctuation of water use at any given parcel and the length of time it takes the District to move water from the upper elevations to the point of delivery. As such, the District manages the water system based on macro level data and not at the micro level. With that said, the District is committed to implementing canal modernization to increase our water delivery efficiency within the raw water system and reduce apparent water loss.**

*Comment: Please explain how ditch end spill is maintained or controlled, how it relates to maintaining the farm gate orifice head consistently throughout the canal and show us a picture or two of a typical canal end configuration?*

**Response: Ditch end spill is maintained and controlled through the completion of daily or more frequent physical checks of the ditch ends during irrigation season. If water observed spilling out the end of a canal (over the tail water v-notch), the head gate to the canal is reregulated (i.e. reduced).**

*Comment: In addition to providing responses to the questions outlined above, we respectfully request that NID provide critical PFW meeting documents such as the "Demand Model Data Sources and Assumptions" well in advance as we have previously requested. This time is critical for stakeholders to absorb, understand the information, and develop any questions, concerns or feedback. We also request that NID set aside dedicated time during PFW meetings to address the Demand Model Sources and Assumptions document and any future PFW documents, as well as take time to answer any questions individuals may have.*

Specifically related to the Demand Model Data Sources and Assumptions document, we would like to know what the anticipated process is for making changes to this draft document, and if there are deadlines, we should be aware of with respect to providing input on the document. We would like this to be a focus of discussion, which may necessitate scheduling a longer PFW meeting if necessary.

Thank you in advance for providing us with clarifications on the questions above. Providing clarity on these items will ensure that we are well informed as we continue to participate in this incredibly important process.

**Response: The Demand Model Data Sources and Assumptions matrix was provided to Ms. Sheehan and Ms. Gianna Setoudeh (among many other interested parties) on December 15, 2022, in preparation for a premeeting that was held on December 21, 2022, to discuss the very same materials and provide an opportunity for input. The same materials were then once again issued as part of the agenda packet that was posted the week prior to the January 10, 2023, PFW meeting.**

**If you have input, please provide it for consideration prior to the next PFW meeting on February 21, 2023. As you are also aware, we have scheduled another pre-meeting that representatives from your organizations and other community stakeholders have been invited to on February 10, 2023. Please also feel free to provide input at that meeting. If input received requires an additional meeting to discuss, we will be more than happy to accommodate the request.**

If you have any additional questions or comments, please do not hesitate to contact us.

Thank you,



Jennifer Hanson  
General Manager