takes advantage of both model approaches and improves the ability of the planning tool to mimic real-time operations.

4.2.9. Water Management Options

The Strategic Review (p21 & 23) states that CalSim-II should more explicitly model many demand management and supply augmentation options. The demand management options require that CalSim-II represent demands in greater detail and more explicitly. DWR and Reclamation will consider if modeling of these options may best be achieved through better linkages of CalSim-II to its agricultural (CALAG) and urban (IWR-MAIN, LCPSIM) demand counterparts. This will include how data inputs and outputs can be more easily communicated between these models. Also for consideration is revising urban demands in CalSim-II so as to represent them in their entirety rather than limiting representation to outdoor (consumptive) urban demand.

4.2.10. Objective Function

The Strategic Review (p4) raises an important issue regarding the characterization of reservoir operators' behavior.

"Most successful applications of optimization that attempt to simulate the behavior of a system have calibrated their objective function so that the model results correspond to what actually happens or would happen under a particular hydrologic and demand scenario."

A good example of this approach is the positive mathematical programming technique used in DWR's agricultural production models CVPM and CALAG. The lack of calibration is one reason why the *CalSim-II Simulation of Historical SWP/CVP Operations* study was unable to mimic historical project carryover storage during drought conditions.

In the past, DWRSIM and CalSim-II had a prescriptive rather than a descriptive approach in defining reservoir operation rules. For example, carryover storage targets were developed that maintained minimum storage levels during a prolonged drought while trying to minimize shortages in any particular year. While this is a valid approach, it may lead to over-optimistic model results due to discrepancies between model and actual operators' decisions.

DWR and Reclamation are engaged with their respective project operators to reduce these discrepancies. The difficulty in calibrating CalSim-II to past behavior is that the behavior is dynamic. Reservoir operations continually evolve due to changing regulatory conditions, changing systems demands, and requests from project contractors. The agencies modeling staff, reservoir operators and contractors are working together to develop a CalSim-II module (CAM) that can be used to determine present month decision variables (e.g., allocation levels, expectations on future carryover or fill targets) based on foreseen operations determined through multi-period optimization and hydrologic foresight. If successful, this approach will be extended to other model rule curves, such as balancing north and south of Delta storage.

4.2.11. Land Use

Projected-level land-use in CalSim-II is assumed constant. It is an exogenous input derived from the Central Valley Production Model (CVPM). Land use projections result from assumptions regarding farmer's long-run response to long-term average annual surface water and