

Task D.2. Draft Peer Review Report

Peer Review Panel will provide answers to the following questions in the draft consolidated peer review report:

1. Model Documentation provided by the WMDs:
 - A. Does the documentation provide a clear and appropriate description of the NFSEG groundwater flow model and supporting HSPF surface-water models?
 - B. Are the purpose and scope of the documentation clearly stated and sufficient to document the models? Is the content of the documentation consistent with the stated purpose and scope of the document?
 - C. Is the documentation readable? Are the figures clear? Does the format of the documentation need to be modified or expanded?
 - D. After reading the documentation, are the purpose, scope, strengths/weaknesses, intended use, and limitations of the NFSEG model understandable?

2. Model Implementation:
 - A. Is the conceptual model appropriate for the intended use of the model? For example, are critical physical and hydrologic processes represented appropriately?
 - B. Is the model code appropriate, given the intended use of the model?
 - C. Was numerical model constructed in a manner that is consistent with the underlying conceptual model, using appropriate data and methods of analysis?
 - D. Was the hydrologic model code selected appropriate for its intended use?
 - E. Was the use of HSPF as a method to develop recharge and maximum saturated ET that is assigned to the MODFLOW groundwater flow model a valid and defensible method?
 - F. Questions specific to HSPF model:
 - a. The version of HSPF utilized for the hydrologic models is a non-standard version of HSPF that is not publically available. Is the version of HSPF utilized appropriate and defensible?
 - b. Was best available information utilized to develop the HSPF hydrologic models?
 - i. Unique aspects of these systems were represented with Special Actions or with other feature of HSPF and are these conceptually sound and implemented appropriately:
 1. RCHRES representation of Inactive Groundwater Storage to represent spring discharges
 2. Closed basins
 3. Drainage wells and swallets
 4. Implementation of water use
 - a. Agricultural irrigation
 - b. Urban
 - i. Septic
 - ii. Irrigation
 - c. Golf Courses
 - d. Reuse spray fields

3. Model Calibration and Application:
 - A. Is the parameterization scheme used in the PEST calibration appropriate?

- B. Were the types of observations and their implementation in the PEST calibration appropriate, given the intended use of the model?
- C. Have differences between observations and their simulated equivalents (model residuals) been described sufficiently. For example, have an appropriate set of summary statistics, plots, and maps been presented that allow for evaluation of model limitations, (such as model bias and uncertainty) in a manner that meets or exceeds existing professional practices.
- D. Have the values of calibrated parameters been described appropriately, using (for example) maps illustrating the range and spatial distribution of parameter values.
- E. Does the final version of the model appear to be adequately calibrated given the available data for calibration, and the state of knowledge (and lack thereof) of the hydrologic system prior to development of the model?
- F. Is the final version of the model appropriate for the intended planning and regulatory uses in the SRWMD and SJRWMD areas of the model domain? Is the NFSEG v1.1 groundwater flow model a sufficient tool for evaluating individual CUPs and compliance with individual spring MFLs?
- G. Has the complete model water balance, accounting for all water sources and sinks, been assessed and found reasonable?
- H. Have the uncertainty of key model parameters and predictions been assessed using methods that are appropriate and that meet or exceed typical practice for developing groundwater flow models? Has a detailed statistical assessment of uncertainty in modeled groundwater level and spring flow estimates been provided?
- I. Have the limitations of the final version of the NFSEG groundwater flow model been adequately described in the model documentation?
- J. Do NFSEG Charter Objectives 2, 5 and 6 meet their Measures of Success?

Objectives	Measures of Success
2) The model output helps to answer all regional-scale model questions listed in Appendix A.	A reasonable groundwater modeling technical expert would judge the model output useful in answering the questions.
5) The model calibrates to industry standards.	The model calibration statistics meet industry standards provided in the following ASTM standard: (ASTM, 2008, Standard Guide for Calibrating a Ground-Water Flow Model Application, Designation D 5981-96 (2008), ASTM International, West Conshohocken PA, USA, 6 pages.)
6) The model is accepted as a useful tool.	Parties recognize that there is no perfect unique solution when developing a groundwater model, and by the very fact that it is a model of a complex natural system, there will always be uncertainty in the results. Success would be 1) a reasonable, independent groundwater modeling technical expert judging the model developed by this project to be acceptable, by the standards of the profession, for helping to answer the modeling questions that have been asked, and 2) a clear understanding by all involved parties of the uncertainty and limitations of the model for answering these questions.