The contained set of files is related to the report entitled "Impact of Proposed SNWA Wells on CPB Water Rights" prepared by Jones and Mayo for the Corporation of the Presiding Bishop. The files contained in this folder include the models used for the report. These models were originally taken from the baseline and predictive models provided along with a report entitled "Conflicts Analysis Related to Southern Nevada Water Authority Groundwater Applications in Spring, Cave, Dry Lake, and Delamar Valleys, Nevada, and Vicinity" prepared in 2011 by Watrus and Drici for the Southern Nevada Water Authority (SNWA). The models include the baseline and predictive models, along with two additional predictive models; one with 4 of the proposed SNWA wells removed, and another with 12 of the proposed SNWA wells removed. Observation files were changed to include drain and head observations used by the report. The model files were repositioned from the original file locations so that the 4 scenarios use different input files. As a result, the different scenarios can be run simultaneously.

Running The Models

The MODFLOW executable included requires a 64-bit operating system. The models were run using Windows 7 Enterprise 64-bit operating system. The models can be run by copying the enclosed files to a hard drive, and then by starting one of the batch files described below either by double clicking on it in a Windows File Explorer, or by starting it from a DOS prompt. Individual scenarios can be run from a DOS prompt as described below using run_with_changes.bat. After the models have run, the MODFLOW global and listing file output should be checked to ensure there are no unexpected errors.

File/Folder Descriptions

Baseline - folder containing the baseline model provided with the Watrus and Drici report. This model does not include the SNWA applied for wells.

SNWAPODS - folder containing the predictive model provided with the Watrus and Drici report. This model includes the SNWA applied for wells.

full_ccf, **full_ccf_m4**, and **full_ccf_m12** - these folders contain adjusted model files used by the batch files to run each scenario and output a head and CCF file for each time step.

year_ends, **year_ends_m4**, and **year_ends_m12** - these folders contain adjusted model files used by the batch files to run each scenario and output an observation, head, and CCF file at each of the simulation's year ends.

run_modflow_year_ends.bat - runs the 4 MODFLOW simulations with year end output. The output is sent to 4 separate folders: Baseline_year_ends, SNWAPODS_year_ends, SNWAPODS_year_ends_m4, and SNWAPODS_year_ends_m12. Warning: running all 4 of these scenarios uses about 45 GB of free disk space. This batch file runs all 4 scenarios at once which

may work best on a machine with at least 4 processors.

run_modflow_full_ccf.bat - runs the 4 MODFLOW simulations with year end output. The output is sent to 4 separate folders: Baseline_full_ccf, SNWAPODS_full_ccf, SNWAPODS_full_ccf_m4, and SNWAPODS_full_ccf_m12. Warning: running all 4 of these scenarios uses about 320 GB of free disk space. This batch file runs all 4 scenarios at once which may work best on a machine with at least 4 processors.

run_modflow_all.bat - runs the 4 MODFLOW simulations with both year end output and full CCF output. Warning: running all 8 of these scenarios uses about 365 GB of free disk space. This batch file runs all 8 scenarios at once which may work best on a machine with at least 8 processors.

run_zone_budgets.bat - runs Zonebudget on the 4 full CCF runs. The output is placed in each scenario folder in a file named either zone_budget_baseline.2.csv or zone_budget_snwapods.2.csv.

run_with_changes.bat - can be used to run a single simulation from a DOS prompt. To run a single simulation open a DOS prompt, change the current directory to the same folder as this batch file, run run_with_changes.bat with two parameters. The first parameter is the base model to use (Baseline or SNWAPODS), and the second parameter is the adjusted model files to use. For example to run the SNWAPODS model with 4 wells removed and full CCF output use the following command:

```
run_with_changes.bat  SNWAPODS  full_ccf_m4
```

run_zone_budget_changes.bat - can be used to run Zonebudget for a single scenario. Uses two arguments like run_with_changes.bat above.

mf2000_64.exe - MODFLOW-2000 64-bit executable compiled from the source code provided with the Watrus and Drici report. The source code for this executable was adjusted to output FORTRAN "BINARY" files rather than "UNFORMATTED" files.

zonbud.exe - USGS Zonebudget executable v3.01.

Extras - contains the custom MODFLOW source code provided along with the Watrus and Drici report along with a Microsoft Visual Studio 2008 project to build the MODFLOW executable. The MODFLOW executable was built with Intel(R) Visual Fortran Compiler v11.1.060.