MEMORANDUM

To: ESPAM Model Files
Fr: Bryce Contor
Date: 3 October 2003

Re: Step-by-step details of applying ESPAM.exe and READINP.exe to calibration data for ESPAM1.1

ORGANIZING DATA

A. Create a data directory. In this document, this directory will be referenced as <my directory>. The path name cannot contain spaces at any directory level. Short paths and short path names are safest.

B. Copy the following into the directory:

1. Contents of CD #3 from May Training
2. Contents of CD #4 from May Training
3. The following from the IDWR FTP site, surface-water coalition subdirectory:
   a) VB_UTILS.zip
   b) WaterBudgetData.zip
   c) New missing-data folder (ESPAM_GIS_UPDATE_3Oct2005.zip) from FTP site. Copy contents into folder "DataTables" from CD #3.
4. The following from folder "Practicum One" in CD #1 from May Training:
   a) espam.exe
   b) readinp.exe
   (note that the zip folders on the IDWR FTP site contain the source code but may not contain the compiled executables).

C. Remove the "read only" condition from all files, folders, and subfolders.

D. If ArcCatalog will allow deletion of raster "cetirr038" from the "ET" folder in <my directory>, delete this raster.

E. If ArcCatalog will not allow deletion of this raster, create a new folder (referred to as <NewET> in this document) and use ArcCatalog (not Windows Explorer) to copy all ET rasters *except* cetirr038 into the new folder. If you created a new folder, delete the old one.

F. Copy raster "cetirr038" from the "CorrectedETRaster" folder of the update CD into the ET or <NewET> folder. Use ArcCatalog, not Windows Explorer.

The reason for these manipulations is that all the ET rasters must be in a single directory for operation of espam.exe.

RUNING ESPAM.EXE

G. Navigate to <my directory> and start espam.exe by clicking on the file or opening a command window. Select option "Create New Simulation and Scenario"

H. Complete Screen 1 entries (simulation name, description, creator) as you desire. Do not use spaces or special characters in the simulation name, as it becomes part of the path name for intermediate data.

I. Complete Screen 2 entries as follows:

Time units	Days
Length units	Feet
Modeling start date	05/01/1980
No. stress periods	44
Stress period length	Uniform 182.625 days
Model grid	<my directory>\SpatialData.mdb\Model_Grid
Cell ID field	Cell_ID
Row field	Row_ID
Column field	Col_ID
Number of layers	1
GW withdrawal layer	1

J. Screen three is the "Analysis for Simulation: <my simulation name> Setup Files" screen. No data entry is required or possible; click "RUN."

K. Remaining analyses may be performed in any order. If you stop a session, you can restart it from the main espam.exe screen by clicking "Continue Processing Existing Scenario" and selecting your scenario from the available list.

L. Canal Seepage

1)	GIS layer	<my directory>\SpatialData.mdb\Canals
	1.1) Canal ID field	CANAL_ID
	1.2) Entity ID field	ENTITY_ID
2)	Data table	<my directory>\DataTables\CanalDataBalanced.dbf
	2.1) Stress pd #1 field	SP001
	2.2) Canal ID field	CANAL_ID

This analysis requires one GIS layer and one data table. The data table requires a field for each stress period.

M. Diversions and Returns

1)	Stress pd #1 table	<my directory>\DIV\D4_001.dbf
	1.1) Entity ID field	ENTITY

1.2) Diversion flow field DIVERSION
1.3) Return flow field RETURN

This analysis requires no spatial data, but requires one data table for each stress period.

N. Fixed Point sources and withdrawals.
1) GIS layer <my directory>\SpatialData.mdb\FixPoint
1.1) Source ID field POINT_ID
1.2) Source type field FLAG
1.3) GW withdrawal layer GW_LYR
2) Data table <my directory>\DataTables\FPointDataBalanced.dbf
2.1) Stress pd #1 field SP001
2.2) Source ID field POINT_ID

This analysis requires one spatial data set and one data table. The data table requires one field per stress period.

O. Irrigated agriculture
1) GIS layer for pd #1 <my directory>\SpatialData.mdb\IrrLands_001
1.1) Entity ID field ENTITY_ID
1.2) Source frac. field SRC_FRAC

This analysis may use more than one spatial data set. In model calibration, only this one feature class was used.

P. Irrigation lands ET
1) Raster for pd #1 <my directory>\ET\cetirr001
(or, <my directory>\<NewET>\cetirr001)

This analysis requires one raster per stress period.

Q. Irrigation Discount
1) Data table <my directory>\DataTables\RED_TABLE.dbf
1.1) Water application field TYPE
1.1.1) Value for gravity GR
1.1.2) Value for sprinkler SP
1.2) Stress pd #1 S001

This analysis requires one data table, with one field per stress period. I did not find this file on the May Training CDs. It should be contained in the zip folder of updated files from IDWR.

R. Irrigation Entities
1) Data table <my directory>\DataTables\ENTITY_DATA_TABLE.dbf
1.1) Entity ID field ENTITY_ID

1.2) Source field SRC
1.3) ET Adj. for sprinklers SP_ADJ
1.4) ET Adj. for gravity GV_ADJ
2) Sprinkler percentages <my directory>\DataTables\SPRINK_DATA.dbf
2.1) Entity ID field ENTITY_ID
2.2) Stress pd #1 SP001

This analysis requires one entity data table and one sprinkler percentage table. The sprinkler percentage table requires one field per stress period. These data tables should be in today's update zip file from IDWR. I did not find them on the CDs.

S. Offsite pumping
1) GIS layer <my directory>\SpatialData.mdb\OffsitePoints
1.1) Well ID field WELL_ID
1.2) Entity ID field ENTITY_ID
1.3) GW withdrawal layer GW_LAYER
2) Data table <my directory>\DataTables\OffsiteDataBalanced.dbf
2.1) Well ID field WELL
2.2) Stress pd #1 field SP001

This analysis requires one point feature class and one data table. The data table requires one field per stress period.

T. Perched River Reaches
1) GIS layer <my directory>\SpatialData.mdb\PerchReaches
1.1) Reach ID field REACH
2) Data table <my directory>\DataTables\PerchDataBalanced.dbf
2.1) Stress pd #1 field SP001
2.2) Perch reach ID field PERCH

This analysis requires one line feature class and one data table. The data table requires on field per stress period.

U. Precipitation
1) Stress pd #1 raster <my directory>\PCP\pcp001

This analysis requires one raster per stress period.

V. Recharge on non-irrigated lands
1) Stress pd #1 raster <my directory>\NIR\cor_nirsp001

This analysis requires one raster per stress period.

W. Scenario sources and withdrawals (not used in calibration data set)

X. Soils

1) GIS layer <my directory>\SpatialData.mdb\Soil
1.1) Soil class field SOIL_CLASS

This analysis requires one polygon feature class.

Y. Tributary valley underflow
1) GIS layer <my directory>\SpatialData.mdb\TribUnderflow
1.1) Trib underflow ID field BASIN
` 2) Data table <my directory>\DataTables\TribDataBalanced.dbf
2.1) Stress pd #1 field SP001
2.2) Trib underflow ID field TRIB_ID

This analysis requires one line feature class and one data table. The data table requires one field per stress period.

RUNING READINP.EXE

Z. Start readinp.exe by clicking in Windows explorer or by using a command window.
Enter the name of the simulation: <my simulation name>
Enter the name of the sim directory: <my directory>\<my simulation name>\gisdata\
Recharge array in ASCII (A) or binary (B)? A

Checking "A" creates an ASCII *.rch MODFLOW file, "B" creates a binary file. In either case the *.wel file and the intermediate output files allow viewing of the full output in GIS and/or spreadsheets.

AA. Check file <my directory>\<my simulation name>\gisdata\<my simulation name>.OUT. If it is a very large file with no error messages at the end of the file, the program has run successfully.

VIEWING OUTPUT and BALANCING THE WATER BUDGET

In order to allow this memo to be quickly tested by IDWR, utilities and procedures for viewing output and balancing the water budget will be described in a later memo.