**CACIE Tool #07.6** – ***RET Recharge (tecplotauto\_ret\_recharge.py)***

**Version** **1.0**

**QA**: **TEST** or **NA** or **QA**

1. **Description and Purpose**

One or two paragraphs describing the tool’s function and purpose.

The RET Recharge tool automates the generation of two-dimensional cartesian plots that depict color-coded areas of recharge for every modeled year during which there was a change in the recharge rate. Each plot is saved as a .png file.

Requires the user to modify the script to hardcode in entries for each directory containing their template .lay file for Tecplot. The .pngs for each model will be saved in a RETfigures folder in the same model directory as the .lay files: “MODELNAME/caret-wb/figsNtables/RET\_Figures/” and the log file is saved to the directory folder from which python script is run.

1. **Functional Requirements**

The functional requirements of the tool will be documented in this section. Each requirement will have an ID, such as: FR-N, where N starts at 1 and increments for each Functional Requirement. Each of the Functional Requirement IDs will have a corresponding test ID listed in the RTM.

FR-1: Connect to the Tecplot software

FR-2: Load layout file (argument from the .bat file)

FR-3: Generate two-dimensional cartesian plot for each year identified with a change in recharge rates.

FR-4: Save each plot as a .png file

1. **Software Requirements Specifications**

The software requirements specification of the tool will be documented in this section.

Python 3.6

Python libraries dependencies:  
tecplot  
tecplot.exception  
tecplot.constant  
os  
sys  
logging  
argparse

1. **Software Design Description**

The software design description of the tool will be documented in this section. The results of a Code Walkthrough with an independent third party will be summarized in this section.

Arguments:  
modelname \_RET\_rch.lay

Functions:  
get\_modelname(filename)  
save\_png(path\_filename)  
create\_logger(path\_filename, log\_level='0')  
get\_layout()

Outputs:   
.pngs files

.bat file: run\_tecplotauto\_ret\_recharge.bat:

* python ../../../tools/tecplotauto/tecplotauto\_ret\_recharge.py modelname\_RET\_rch.lay

1. **Requirements Traceability Matrix**

A requirements traceability matrix for the tool will be documented in this section. At a minimum, the matrix will include IDs of: Functional Requirements and the corresponding Acceptance Test, along with an indication of the test result (Pass/Fail).

Table 1 presents the requirements traceability matrix for the RET Recharge tool.

| **Table 1. RET Recharge Tool Requirements Traceability Matrix** | | |
| --- | --- | --- |
| **Functional  Requirement** | **Acceptance  Test** | **Test Result  (Pass/Fail)** |
| FR-1 | ATC-1 |  |
| FR-2 | ATC-2 |  |
| FR-3 | ATC-3 |  |
| FR-4 | ATC-4 |  |

1. **Test Plan and Cases**

The test plan for the tool will be documented in this section. Each test will have a unique ID and criteria for determining if the test result is pass or fail. The TEST ID will be referenced in the RTM and ATR. An installation test, labeled **IT-1**, will be used by the Tool Runner to confirm the version of the tool being used is running correctly before launching it with the user’s parameters.

The Unit Testing done on the tool will be documented here, also.

The test plan for the ret\_recharge\_pngs tool is as follows.

| **Table 2. RET Recharge Tool Test Plan** | | |
| --- | --- | --- |
| **TEST  ID** | **Test Case** | **Test Result  (Pass/Fail)** |
| IT-1 | Installation Test |  |
| ATC-1 | Confirm script executes (script will terminate if Tecplot connection is not made) |  |
| ATC-2 | Check Tecplot interface to confirm loaded layout filename matches .bat argument filename |  |
| ATC-3 | Visually inspect the saved .png files and confirm each contains a color-coded two-dimensional cartesian plot of recharge rates. |  |
| ATC-4 | Verify that a cross section slice .png file was generated for each year specified in testing\_RET\_rch.dat (open .dat file in text editor of choice and search for “ZONE T=" to find specified years) |  |

1. **Acceptance Test Report**

The test report will state whether the tool is qualified for use, summarize test case results, and report all resolved incidents and resolution of unresolved incidents.

1. **User Guide**

A guide for using the tool will be documented in this section.

1. In TecPlot click Scripting 🡪 PyTecplot Connections 🡪 Accept Connections (needs to be checked) 🡪 Close. Do NOT close Tecplot.
2. Copy CAVE/v3-7/shells ***run\_tecplotauto\_ret\_recharge\_.bat*** to your CAVE/sara-sandbox/ModelName/caret-wb/plts.
3. Open the ***run\_tecplotauto\_ret\_recharge\_.bat*** in your preferred text editor and edit the Tecplot layout name.
4. Click onto the folder with the run\_tecplotauto\_ret\_recharge\_.bat. Deselect all items, then hold Shift, right-click, and then click on “Open Command Window Here.”
5. Type ***run\_tecplotauto\_ret\_recharge\_.bat*** and enter to run the script.
6. Run the script to generate the figures for each RET year.

This script generates \*.png files in the /CAVE/sara-sandbox/ModelName/caret-wb/figsNtables/RET\_figures/ directory.