**CACIE Tool #14.3** – ***Bottom Flux (ca-botflux.pl)***

**Version** **1.0**

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

1. **Description and Purpose**

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

Script creates a tecplot file with darcy flux magnitude and calculates a user-specified massi (activity) flux out of the bottom of the model domain.

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: Verify the user entered an accepted unit for output mass / activity

FR-2: Opens 4 input files (plot, surf, domain, modgrid) and 2 output files (outplot, outmodplot)

FR-3: Load surface file for grid, creates elements (polys)

FR-4: Load domain file to get plotting extent

FR-5: Scan STOMP Plot file – extract year, find number of nodes for number of datasets

FR-6: Find variable columns

FR-7: Calculate 3D velocity vector magnitude

FR-8: Load mudflow grid coordinates

FR-9: Verify point is within mod block, add it to a list and add coordinates to hash

FR-10: Write Tecplot file for STOMP grid

FR-11: Write Tecplot file for Modflow grid

1. **Software Requirements Specifications**

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

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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:

Plot

Surface

Domain

Modgrid

Solute

User solute unit

Output plot

Output modplot

Output files:

Output plot

Output modplot

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 Bottom Flux tool.

| **Table 1. Bottom Flux Tool Requirements Traceability Matrix** | | |
| --- | --- | --- |
| **Functional Requirement** | **Acceptance Test** | **Test Result (Pass/Fail)** |
| FR-1 |  |  |
| FR-2 |  |  |
| FR-3 |  |  |
| FR-4 |  |  |
| FR-5 |  |  |
| FR-6 |  |  |
| FR-7 |  |  |
| FR-8 |  |  |
| FR-9 |  |  |
| FR-10 |  |  |
| FR-11 |  |  |

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 Bottom Flux Tool is as follows.

| **Table 2. Bottom Flux Tool Test Plan** | | |
| --- | --- | --- |
| **TEST ID** | **Test Case** | **Test Result (Pass/Fail)** |
| IT-1 | Installation Test |  |
| ATC-X |  |  |
| ATC-X |  |  |

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.